DEPARTMENT OF
ECOLOGY
State of Washington

Concise Explanatory Statement

Chapter 173-204 WAC

Sediment Management Standards

Summary of rule making and response to comments

February 2013
Publication no. 13-09-044

Publication and Contact Information

This publication is available on the Department of Ecology's website at www.ecy.wa.gov/biblio/1309044.html

For more information contact:

Toxics Cleanup Program
P.O. Box 47600
Olympia, WA 98504-7600

Phone: 360-407-7170

Washington State Department of Ecology - www.ecy.wa.gov

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

Ecology publishes this document to meet the requirements of the Washington State Administrative Procedure Act (RCW 34.05.325)

If you need this document in a format for the visually impaired, call the Toxics Cleanup Program at 360-407-7170. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Concise Explanatory Statement

Chapter 173-204 WAC
Sediment Management Standards

Toxics Cleanup Program
Washington State Department of Ecology
Olympia, Washington 98504-7600

This page is intentionally blank.

Table of Contents

Acronyms and Abbreviations

APA	Administrative Procedure Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CSL	Cleanup Screening Level
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
MTCA	Model Toxics Control Act
RCW	Revised Code of Washington
SCO	Sediment Cleanup Objective
SMS	Sediment Management Standards
WAC	Washington Administrative Code

Chapter 1: Introduction

1.1 Purpose of this Document

The purpose of a Concise Explanatory Statement is to:

- Provide reasons for adopting a rule.
- Describe any differences between the proposed and adopted rule.
- Provide Ecology's response to public comments on the proposed rule.

The documentation is required by the Administrative Procedure Act (RCW 34.05.325).

This Concise Explanatory Statement is for the Washington State Department of Ecology's (Ecology) adoption of amendments to the following rule:

Title:	Sediment Management Standards
WAC Chapter:	Chapter 173-204 WAC
Adopted date:	February 14, 2013
Effective date:	September 1, 2013

To see more information related to this rule making or other Ecology rule makings, visit our web site: www.ecy.wa.gov/lawsandrules.

1.2 Regulatory History and Scope of Rulemaking

Chapter 173-204 WAC, the Sediment Management Standards (SMS) rule, was adopted in 1991 with subsequent revisions in 1995 and 2013. The goal of the SMS is to reduce and ultimately eliminate adverse effects on biological resources and significant threats to human health from surface sediment contamination. The SMS rule contains six parts that have different functions. Part V, Establishing Cleanup Standards, includes a sediment cleanup decision framework that governs the cleanup of contaminated sediment sites, including how sites are identified, investigated, cleaned up, and monitored. The 2013 revisions focus on Part V of the SMS rule and include:

- Integrating the SMS and Model Toxics Control Act (MTCA), Chapter 173-340 WAC cleanup requirements where appropriate.
- Clarifying requirements for protection of human health from sediment contamination.
- Clarifying requirements for protection of higher trophic level species from sediment contamination.
- Promulgating numeric chemical and biological criteria for freshwater sediment to protect the benthic community.

- Clarifying requirements for coordinating source control and cleanup actions at cleanup sites.

1.3 Reasons for Adopting Rule Amendments

Before these amendments, there were conflicting requirements for cleanup of contaminated sediments specified in two different regulations. Processes, requirements, and terminology in the SMS rule were different than in MTCA. The adopted amendments address those differences and reconcile the terminology to make the cleanup process more efficient and predictable.

The SMS rule did not adequately address human and environmental health risks from bioaccumulative chemicals. The amendments add to the existing SMS decision framework information on how to address bioaccumulative chemicals and set standards that protect human health and upper trophic level organisms.

Previously, the SMS included adopted numeric chemical and biological benthic criteria for marine sediments but not for freshwater sediments. The amendments include chemical and biological benthic criteria to support cleanup decisions at freshwater sediment cleanup sites.

Previously, source control requirements were not well understood at cleanup sites. The amendments clarify requirements for coordinating cleanup actions and source control requirements to prevent recontamination and help cleanup actions reach completion.

1.4 Public Outreach and Advisory Group Process for the Proposed Rule Amendments

In 2009, Ecology began a rule scoping process by conducting meetings with interested stakeholders to understand their highest priority rule issues. Ecology carefully considered this feedback to decide which issues to include for rulemaking, developed Issue Papers that provided more details on each issue, and submitted them for informal public comment.

On February 10, 2009, Ecology filed a CR-101 with the Office of the Code Reviser, a statement for proposed rulemaking that included both the SMS and MTCA rules. Ecology then formed two rule advisory groups, the MTCA/SMS Advisory Group and the Sediment Workgroup. These meetings were open to the public and Ecology solicited public feedback at each meeting. In 2010, Ecology continued the advisory group process and held a total of 16 meetings.

Subsequent to the original CR-101 filing, the agency decided to limit the scope of rulemaking to the SMS rule and re-filed the CR-101 on October 25, 2011. In 2011, Ecology drafted rule language based on feedback from the advisory groups and the public. The advisory groups were reconvened for three meetings in fall 2011, including some new members, to discuss the informal draft rule language and provide informal public comment.

Ecology presented progress on the rule issues and updates from the advisory groups at the Sediment Management Annual Review Meetings each year and solicited public comment. In addition, Ecology presented rule issues and updates at various conferences, including the

Environmental Law Education Center annual sediment conferences. Ecology held additional meetings with interested stakeholders on request.

In 2012, Ecology reviewed all of the public comments received on the informal draft rule language. After carefully considering all of these comments, Ecology developed the proposed amendments to the rule.

1.5 Public Comment on Proposed Rule Amendments

On August 15, 2012, Ecology filed the CR-102 with the Office of the Code Reviser, the proposed amendments to the SMS rule. The proposed rule amendments were published in the *Washington State Register* (WSR 12-17-084). In addition, notice of the proposed rule amendments and opportunity to comment on those amendments were:

- Posted on Ecology's public involvement calendar and rule-making web sites:
  - apps.ecy.wa.gov/pubcalendar/calendar.asp.
  - http://www.ecy.wa.gov/laws-rules/wac173340/0807/0807.html.
  - http://www.ecy.wa.gov/programs/tcp/regs/2011-SMS/2011-SMS-hp.html.

- E-mailed to about 3,200 interested people on Ecology's listservs, including MTCA-SMS-Rule-Update, Ecology-News, Ecology-Water-Quality-Info, and an interested parties mailing list.

- Posted in 5 editions of Ecology's *Site Register* (August 23, September 6, September 20, October 4, and October 18, 2012) and distributed to over 1,500 people: www.ecy.wa.gov/programs/tcp/pub_inv/pub_inv2.html.

- Distributed in a news release to news outlets throughout the state. The news release is available at: http://www.ecy.wa.gov/news/2012/273.html.

Ecology held six open houses followed by public hearings on the proposed rule amendments, during which the public could ask questions and provide oral testimony:

1. Pacific Market Center
   6100 4th Avenue S
   Seattle, WA 98108
   September 26, 2012 at 9:00 am

2. Pacific Market Center
   6100 4th Avenue S
   Seattle, WA 98108
   September 26, 2012 at 5:00 pm

3. Whatcom Community College
   Heiner Theater
   237 W Kellogg Rd
   Bellingham, WA 98226
   September 27, 2012 at 5:00 pm

4. Department of Ecology
   Headquarters Office
   300 Desmond Drive SE
   Lacey, WA 98503
   October 1, 2012 at 6:00 pm

5. CenterPlace Regional Event Center
   Great Room
   2426 N. Discovery Pl.
   Spokane, WA 99216
   October 3, 2012 at 5:00 pm

6. Hampton Inn Richland
   Columbia Pointe Ballroom
   486 Bradley Blvd.
   Richland, WA 99352
   October 4, 2012 at 5:00 pm

In total, 20 people attended the open houses/public hearings. None of the attendees gave oral testimony during the public hearings. The transcripts of the public hearings are attached as Appendix A.

Ecology accepted comments on the rule proposal between August 15, 2012 and October 29, 2012 (for 76 days). The comment period was originally scheduled to end on October 15, but was extended to October 29, 2012 at the request of the public. Comments were received in writing through letters and e-mails. In total, 47 individuals or organizations submitted comments on the proposed rule amendments. Ecology has identified a total of 907 separate comments. An index cross-referencing commenters, their comments, and the summarized issues is attached as Appendix B. The original comment letters, with comment numbers assigned, are attached as Appendix C.

1.6 Differences between Proposed and Adopted Rule Amendments

The Administrative Procedures Act requires Ecology to describe the differences between the text of the proposed rule as published in the *Washington State Register* and the text of the rule as adopted, other than editing changes, stating the reasons for the differences (RCW 34.05.325(6)(a)(ii)).

There are some differences between the proposed rule amendments filed on August 15, 2012 and the adopted rule amendments filed on February 14, 2013. Ecology made these changes for all or some of the following reasons:

- In response to comments we received.
- To ensure clarity and consistency.
- To meet the intent of the authorizing statute.

The changes Ecology made to the text of the proposed rule amendments, including all deletions and additions, are provided in Appendix D. The changes (other than editing) to each rule section and Ecology's reasons for making them are summarized in Chapters 2–16.

1.7 Organization and Format of this Document

This Concise Explanatory Statement is organized into 23 chapters. Chapter 1 provides information on the rule-making process and public participation process.

Chapters 2–20 address the adopted rule amendments, organized by rule section. Each of these chapters is broken into three sections:

- Section 1 – Summary of Proposed Rule Amendments

- Section 2 – Differences between Proposed and Adopted Rule Amendments
- Section 3 – Responses to Comments

Responses to the public comments are presented in a summarized format. Ecology reviewed the public comments and grouped them into a series of issues, organized by subsection of the rule. Each issue reflects a related set of comments or questions raised by one or more individuals or organizations on one subsection of the rule. In cases where numerous comments were received on a single subsection, the comments have been broken up into topic areas for clarity. These are identified with the same issue number, but different letters (e.g., 13-7A and 13-7B).

Following the number and title of each issue and the subsection of the rule in which it can be found, the commenter(s) who raised that issue and their specific comment numbers are listed. If you wish to read the original comments, you can use the name of the commenter and their comment number to find the appropriate section of the commenter's letter in Appendix C. Ecology has provided a summary response to each issue. More detailed responses are provided in Appendix E to certain comment letters that contained more detailed analyses and reviews (see below).

Chapter 21 includes responses to coordination and process comments. Chapter 22 includes responses to comments on the supporting documents, including the Environmental Impact Statement, the Small Business Economic Impact Statement, and the Cost-Benefit and Least Burdensome Alternatives Analysis, as well as a summary of comments on the Sediment Cleanup User's Manual II guidance document. Chapter 23 provides references referred to in the comments or responses.

This document also includes the following appendices:

- *Appendix A – Transcripts of Public Hearings.* This appendix includes a complete transcript of each of the six public hearings.

- *Appendix B – Commenter Index.* This appendix includes a complete list of the individuals or organizations who provided comments on the proposed rule amendments and where in this document you can find Ecology's responses to their comments.

- *Appendix C – Copy of Written Comments.* This appendix includes a copy of all written comments received by Ecology on the proposed rule amendments. Each comment letter has been divided into individual comments, numbered for easy reference throughout this document.

- *Appendix D – Differences between Proposed and Adopted Rule Language.* This appendix includes the complete text of the proposed rule amendments with the changes from the proposed to the adopted rule marked. The changes are identified by highlighted text that is either in red strike out or blue underlined.

- *Appendix E – Additional Freshwater Benthic Criteria Analyses.* This appendix includes additional analyses conducted for the proposed freshwater criteria in response to comments received during the scientific peer review process and public comment period.

This page is intentionally blank.

Chapter 2: Part I. Authority and Purpose (WAC 173-204-100 - 130)

This chapter provides a summary of the rule amendments concerning the authorities and purpose of the rule. The chapter summarizes the proposed amendments to the rules (Section 2.1), describes differences between the proposed and adopted amendments to the rules (Section 2.2), and responds to public comments on the proposed rule (Section 2.3).

2.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included minor clarifications for consistency with other amendments.

2.2 Differences between the Proposed and Adopted Amendments

To ensure clarity and consistency, the following revisions were made:

- Rule citations were changed to appropriately correspond to definition changes.
- The underlying authorities for Part V were revised to reflect Ecology's decision to adopt Part V, Sediment Cleanup Standards, under RCW 70.105D, the Model Toxics Control Act.

2.3 Responses to Comments

Because this is an introductory section of the rule, many of the more technical comments made on the summary language of this section have been summarized and responded to in the substantive section of the rule that applies.

Issue 2-1: Resuspension, -110(3)

- Commenter: Umatilla Tribes (323)

Summary of comments received:

- Please clarify whether this language could be applied to dredging, which can resuspend sediments, or any other activity that can resuspend capped sediments. Please provide examples of how this would be applied to either allow or prohibit dredging in port environments.

Response:

This language applies to Part IV, -400 through -420, which includes provisions for dredging and dredged material management. Any dredging in waters of the state must receive authorization

under Section 401 of the federal Clean Water Act via Chapter 90.48 RCW and Chapter 173-225 WAC. The authorization mandates compliance with standards to protect both water and sediment quality as well as best management practices that must be employed and maintained.

Issue 2-2: Sediment recovery zones, -110(4)

- Commenters: Anchor QEA (64), King County (386), Port of Port Angeles (627), Port of Seattle (648)

Summary of comments received:

- The new requirement to establish sediment recovery zones (SRZs) at cleanup sites where standards cannot be met in 10 years is highly problematic. This will stymie cleanup, as this provision of the existing SMS has proven unworkable in the past. Sediment cleanup levels for bioaccumulative chemicals are likely to be exceeded at nearly every site by sources that cannot be controlled through the cleanup program, and thus this section should be deleted.

- There is a place for a revised SRZ concept under certain circumstances, e.g., for low-level margins around large sites or for multi-source sites with a coordinated potentially liable person group and active municipal/county participation. Case studies would need to be thoroughly worked through to understand how this could be structured to have the desired effect and work in reality.

- We support the change in applicability of SRZs to areas exceeding the cleanup standards. This use of the SRZ makes more sense and distinguishes it from areas undergoing monitored natural recovery to meet the SCO.

Response:

Ecology has revised the proposed rule language in -500, -570, and -590 to clarify the requirements for establishment of an SRZ to facilitate the process. The original SMS rule did not allow 10 years of recovery before establishment of an SRZ and required establishment of a sediment recovery zone if the sediment quality standards could not be met by the end of cleanup construction. The intent of the proposed rule revision is to provide more flexibility for sites that will take longer to meet sediment cleanup standards by requiring an SRZ if the sediment cleanup standard is not met within 10 years after completing construction of the active components of the cleanup action. This provides more time to meet the cleanup standards while providing assurance that the cleanup will be monitored to ensure cleanup standards are met within the specified time frame. See Chapter 19 for further detail on SRZs.

Ecology recognizes that cleanup sites may need site-specific SRZ requirements. The draft Sediment Cleanup Users Manual II has been updated to provide guidance on this requirement.

Issue 2-3: Advancements in science, -130(1)

- Commenter: Umatilla Tribes (327)

Summary of comments received:

- Please explain how subsequent MTCA revisions incorporate new toxicology data or other advancements in best available science.

Response:

The SMS rule has provisions in -130(1) through -130(8) allowing site-specific decisions to be made and guidance developed based on the latest science. The MTCA rule has similar provisions. For the SMS rule, including statewide sediment cleanup and sediment management programs, Ecology participates in the Sediment Management Annual Review Meetings, through which technology and policies are continually updated, submitted for formal public comment, and incorporated into guidance and/or subsequent rules as appropriate.

Issue 2-4: Beneficial uses, -130(2)

- Commenter: Umatilla Tribes (328)

Summary of comments received:

- Please clarify whether beneficial uses for swimming or fish are subordinated to other beneficial uses, given the broad definition of beneficial use found in WAC 173-204-200.

Response:

Ecology is retaining the original definition in the rule. According to the original 1990 responsiveness summary, the original definition of beneficial use was derived from Chapter 173-201 WAC (now Chapter 173-201A WAC), Water Quality Standards; Chapter 173-500 WAC, Water Resources Management Program; and Chapter 173-200 WAC, Water Quality Standards for Ground Waters. Chapter 173-201A does not contain a succinct definition of beneficial uses. However, all uses of water identified throughout that rule are included within the original definition in -200.

Ecology acknowledges that this is a broad definition and some beneficial uses of a water body may make the water unsuitable for other beneficial uses. WAC 173-201A-010(1)(c) states that in cases where there are multiple beneficial uses of a water body, the uses that result in the most stringent standards apply. This provision is reiterated in -130(2).

Issue 2-5: Annual review, -130(6)

- Commenter: King County (387)

Summary of comments received:

- Annual review seems ambitious and may distract from pursuing cleanup actions. A 3–5-year review period seems sufficient and would free up staff resources.

Response:

Ecology is retaining the original rule language. While we agree an annual review process can be burdensome, Ecology has been able to meet this requirement by engaging in the Sediment Management Annual Review Meetings, at which technology and policies are continually updated, submitted for formal public comment, and incorporated into guidance and/or subsequent rules as appropriate.

Issue 2-6: PSEP protocols, -130(9)

- Commenter: Lon Kissinger (209)

Summary of comments received:

- The sensitivity of the analytical methods in the Puget Sound Estuary Program (PSEP) protocols should be evaluated to determine whether they can detect low levels associated with human health risks.

Response:

Ecology recognizes that the current PSEP protocols may not be up to date for detection of bioaccumulative chemicals that pose a risk to human health and the environment at very low concentrations. Sections -130(2) through -130(8) allow Ecology to use latest science and alternate technologies, which would include new analytical methods as appropriate. New tables are being added to the Sediment Cleanup User's Manual II to address this issue as well.

Issue 2-7: Applicable or Relevant and Appropriate Requirements (ARARs), -130(11)

- Commenter: King County (388)

Summary of comments received:

- It is not appropriate to define CERCLA ARARs in a state rule. Identifying the entire chapter as an ARAR also seems inappropriate. However, it is not clear under what circumstances on a portion of the SMS might apply. Please clarify.

Response:

Ecology is retaining the original rule language. This section of the rule was not proposed for revisions, other than to update references to revised sections. Therefore, substantive changes to this section are beyond the scope of this rule-making. This section is intended to state that the SMS rule in its entirety should be considered at CERCLA cleanup sites. This language does not direct the actions of EPA but rather indicates how the Ecology will respond when the SMS rule has been identified as an ARAR for a CERCLA cleanup action.

Chapter 3: Part II. Definitions (WAC 173-204-200 and new -505)

This chapter provides a summary of the rule amendments concerning definitions. The chapter summarizes the proposed amendments to the rules (Section 3.1), describes differences between the proposed and adopted amendments to the rules (Section 3.2), and responds to public comments on the proposed rules (Section 3.3).

3.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included definitions that were added to clarify existing terms, revise existing definitions, or to define new terms. The following definitions were added or revised:

Definitions added to clarify existing terms:
Active cleanup action
Anthropogenic
Applicable local, state and federal laws
Beneficial reuse
Biologically active zone
Cleanup screening level
Cleanup action
Contaminant
Department
Enhanced natural recovery
Include
Natural recovery
Non-anthropogenically affected
Sediment
Sediment cleanup objective

Sediment cleanup standard
Sediment quality standard

Existing definitions clarified:
Acute
Best management practices
Bioassay
Contaminated sediment
Sediment cleanup unit
Sediment recovery zone
Surface sediment

New definitions to define new terms:
Monitored natural recovery
Natural background
Point of compliance
Practical quantitation limit
Regional background
Sediment cleanup level
Technically possible

3.2 Differences between the Proposed and Adopted Amendments

The proposed amendments were originally made to the existing section -200. Adopted amendments to the definitions that only apply to Part V have been moved to a new section -505 to clearly indicate that they apply to Part V only.

Therefore, to ensure clarity and consistency, the following revisions were made:

- The following definitions were moved from -200 to Part V -505: active cleanup action, applicable laws, beneficial reuse, biologically active zone, cleanup action, cleanup screening level, contaminant, enhanced natural recovery, include, monitored natural recovery, natural background, natural recovery, point of compliance, practical

quantitation limit, regional background, sediment cleanup level, sediment cleanup objective, sediment cleanup standard, sediment recovery zone, sediment cleanup unit, and technically possible.

- The original definitions in -200 for the following terms were restored: acute, beneficial use, bioassay, person, and surface sediment(s)/sediment(s).

In response to comments received, the following revisions to the definitions were made:

- "Active cleanup action" was revised to clarify types of cleanup actions.
- "Anthropogenic" was deleted because the term is not used in Part V, which is the focus of the rule revisions.
- "Applicable laws" was revised to include relevant and appropriate requirements of local and tribal laws.
- "Beneficial reuse" was revised to clarify the definition for levels of contamination and types of reuse.
- "Best management practices" was revised by deleting the requirement for department approval.
- "Cleanup action" was revised to clarify contaminants and when a remedial action is considered a final cleanup action or an interim action.
- "Contaminant" was revised to be consistent with MTCA.
- "Contaminated sediment" was revised to restore "surface" to the term sediment.
- "Control sediment sample" was revised to clarify that it applies to benthic criteria.
- "Enhanced natural recovery" was revised to change "remedy" to "cleanup action."
- "Minor adverse effects" was revised to reflect comparison to control for freshwater criteria.
- "Monitored natural recovery" was revised to include benthic infauna.
- "Natural recovery" was revised to clarify the example in the definition.
- "No adverse effects" was revised to reflect comparison to control for freshwater criteria.
- "Nonanthropogenically affected" was deleted because the term is not used in Part V, which is the focus of the rule revisions.
- A new definition of "practicable" was added to Part V to clarify the term as it applies to -570 and -590.
- "Regional background" was revised to eliminate duplicative phrasing in -560.
- "Sediment cleanup level" was revised to clarify that it can be established between the SCO and the CSL.
- "Sediment cleanup standard" was revised to clarify its relationship to relevant terms.
- "Sediment cleanup unit" was revised to include regional background as a consideration in defining a unit.
- "Sediment quality standard" was removed because the term does not apply to Part V.
- "Sediment recovery zone" was revised consistent with revisions to -500, -570, and -590.
- "Surface sediment or sediment" was revised for Part V to clarify the definition.

3.3 Responses to Comments

Issue 3-1: Definitions—General, -505

- Commenters: King County (382,389,403), NAVFAC (531), USACE-NWD (778), Weyerhaeuser (884,885)

Summary of comments received:

- Please define all terms within this WAC chapter rather than by reference to another WAC chapter. It is cumbersome for the reader to cross-reference to another chapter and could be problematic if the definitions in that chapter change. For example, please add the MTCA definitions of "point of compliance" and "institutional controls" to this chapter.

- Please further define "cleanup screening level," "sediment cleanup level," sediment cleanup objective," and "sediment cleanup standard," and provide more detail on the intent of how these values will be used in the two-tier framework, site identification, hazard ranking, identification of site units, compliance with remediation levels, and site closure. The current rule does not present a clear process that specifically details how these levels are used.

- We support the addition and use of the terms enhanced natural recovery, natural background, natural recovery, monitored natural recovery, site cleanup unit, nonanthropogenically affected, and regional background. These concepts, reasonably applied, should facilitate cleanup while avoiding high-cost/low-value scenarios. However, they do add to the complexity of the rule and Ecology should be cautious in how they are applied.

- The definitions of freshwater, low-salinity, and marine sediments are currently based on salinity, but have no temporal consideration. Therefore, some estuarine sediments will likely shift between regulatory classifications with the tidal cycle. The definitions of fresh and marine waters in the Surface Water Quality Standards, WAC 173-201A-260(3)(e), provide a more definitive division between classifications in an estuarine system. Ecology should consider reconciling the two sets of definitions to avoid uncertainty.

Response:

Ecology has revised the rule language where appropriate to minimize the amount of cross-referencing for the reader. The definition of "point of compliance" in the proposed rule language has been retained. See Issues 3-21 and 6-16 for further discussion of this issue.

Ecology has revised the rule language in -500, -510, -520, and -560 to further clarify how the terms "cleanup screening level," "sediment cleanup level," sediment cleanup objective," and "sediment cleanup standard" apply to the framework for establishing sediment cleanup standards.

See the response to Issue 3-15 regarding freshwater and low-salinity sediments.

Issue 3-2: Definition of "active cleanup action," was 200(1), now -505(1)

- Commenters: AECOM (27), Anchor QEA (65), AWB (79), Dow Chemical (357), Georgia-Pacific (361), Greenbrier (371), Nippon (541), Port of Port Angeles (628)

Summary of comments received:

- This section, together with -570(3)(h), creates a presumption for an active remedy that will slow cleanup efforts, and should be removed from the rule.

- Add "monitored" before "natural recovery." [Refers to a previous version.]

- Add that passive actions can be part of an overall cleanup.

Response:

Ecology has revised the proposed definition of active cleanup action to clarify that engineered controls are cleanup actions. This definition is consistent with historic practice for sediment cleanup. The expectations in -500 have been changed to clarify Ecology's intent regarding the use of active and passive cleanup actions for sediment cleanup. See Chapters 6 and 17 for further discussion of active and passive cleanup actions.

Issue 3-3: Definition of "acute," was 200(2), now -200(1)

- Commenter: Lon Kissinger (210)

Summary of comments received:

- "Acute" also has meanings related to short-term exposure and toxic effects to humans.

Response:

Ecology has revised the original rule language in -200 and the new section -505 to reflect that a definition applies unless the context indicates otherwise. Ecology acknowledges that the existing definition of "acute" applies to benthic toxicity, which was the original intent. This original definition has not been changed. The term "acute," as it applies to human health in -561, clearly indicates a different context than the definition.

Issue 3-4: Definition of "applicable laws," was 200(5), now -505(2)

- Commenters: Yakama Nation (274), Colville Tribe (287,291), Umatilla Tribes (315), NWIFC (543,558), CILP (680), Spokane Tribe (697), Squaxin Island Tribe (707,708), Suquamish Tribe (740), Swinomish Tribe (763), Tulalip Tribes (775), USDOI (798)

Summary of comments received:

- Tribal standards for protection of human health and the environment must be clearly recognized in the rule as applicable. Not doing so fails to recognize tribal sovereignty and honor the Centennial Accord.

Response:

Ecology has revised the proposed rule language by changing the definition of "applicable laws" to clarify that relevant and appropriate requirements may also include local and tribal laws that Ecology determines meet the criteria in WAC 173-340-710(4). Relevant and appropriate requirements are those cleanup standards that address problems or situations sufficiently similar to those encountered at the site such that their use is well suited to the particular site. The determination of "relevant and appropriate" relies on Ecology's best professional judgment, considering environmental and technical factors at the site. Ecology expects that tribal laws may be determined to be relevant and appropriate in cases where releases of hazardous substances at a cleanup site are impacting tribal lands. Once a requirement is determined by Ecology to be relevant and appropriate, it must be complied with as an applicable law.

Issue 3-5: Definition of "beneficial reuse," was 200(8), now -505(3)

- Commenters: King County (390), DNR (820)

Summary of comments received:

- We request clarification of this term with respect to the dredged material management program definition of beneficial use.

- It is not necessary to limit this to replacing another "natural uncontaminated" material. The definition works without it. We do not understand the reason for this limitation.

Response:

The rule language has been revised as follows:

- Clarification that this term applies to sediment generated from a site during cleanup. The definition is based on the description in EPA's beneficial use planning manual (USEPA, 2007a).

- Deletion of the requirement to limit beneficial reuse to sediment with "low levels of contamination," as it is conceivable that sediment with high levels of contamination could still be reused. For example, the gravel fraction of oil-contaminated sediment could be used in the manufacture of asphalt.

- Deletion of the requirement that beneficial use is to replace natural uncontaminated material, because the sediment could be reused to replace or cover waste materials, such as use as cover material at a landfill.

Issue 3-6: Definition of "beneficial uses," was 200(7), now -200(4)

- Commenters: Boeing (155), Umatilla Tribes (328)

Summary of comments received:

- The definition of this term should be revised to match the current water quality standards, i.e., "uses designated to waters of the state by WAC 173-201A which included uses for aquatic life, recreation, water supply, and miscellaneous uses including harvesting, commerce and navigational, boating, and aesthetics."

- This term is so broadly defined that it would allow almost any use, even if it degrades sediment quality and impedes other beneficial uses.

Response:

Ecology is retaining the original definition in the rule. According to the original 1990 responsiveness summary, the original definition of beneficial use was derived from Chapter 173-201 WAC (now Chapter 173-201A WAC), Water Quality Standards; Chapter 173-500 WAC, Water Resources Management Program; and Chapter 173-200 WAC, Water Quality Standards for Ground Waters. Chapter 173-201A does not contain a succinct definition of beneficial uses, but all uses of water identified throughout that rule are included within the original definition in -200.

Ecology acknowledges that this is a broad definition and some beneficial uses of a water body may make the water unsuitable for other beneficial uses. WAC 173-201A-010(1)(c) states that in cases where there are multiple beneficial uses of a water body, the uses that result in the most stringent standards apply.

Issue 3-7: Definition of "best management practices," was -200(9), now -200(5)

- Commenter: Port of Port Angeles (629)

Summary of comments received:

- This definition requires department approval, which would severely limit use of new and improved best management practices, especially for storm water, dredge return water, and other areas due to lack of time and availability of staff at Ecology. This added language is of no benefit, please remove it.

Response:

Ecology has revised the proposed rule language. The original definition of "best management practices" in -200 has been re-instated and the language pertaining to department approval has been deleted. This revisions was made because this term is not used in Part V, which is the focus of the rule revisions. If best management practices are required for National Pollutant Discharge Elimination System (NPDES)-permitted discharges as part of a cleanup, department approval would be required under WAC 173-201A-020.

Issue 3-8: Definition of "biologically active zone," was -200(11), now -505(4)

- Commenters: King County (391), Pioneer (573), Port of Port Angeles (630), Waterkeepers (859)

Summary of comments received:

- The current phrasing could suggest that nearly any endemic benthic species is critical to the benthic community. We suspect this was not the intent and suggest that "critical species" be better defined.

- This new definition includes everything from plant roots to groundwater, most of which are not pathways of concern at many sites. It introduces confusion into the heart of compliance—the point of compliance. Please clarify the definition in rule or in guidance.

- Recommend stating that a biologically active zone of 10 cm should be assumed at all sites unless site-specific data are presented otherwise. This will minimize the time and cost associated with establishing the biologically active zone at all sites.

- A minimum of 20 cm in conjunction with the metrics described would be more acceptable. Changes to this language making it appear that the biologically active zone could be less than 10 cm provides less protection than the existing SMS.

Response:

Ecology is adopting the proposed rule language. The intent of this definition was to provide guidelines for defining the biologically active zone that did not exist in the original rule. More detailed information is provided in the draft Sediment Cleanup Users Manual II. A default of 10 or 20 cm is inappropriate to adopt in rule due to the diversity of the biologically active zone in freshwater sediment environments. In practice, Ecology has defaulted to 10 cm for marine sediments, but not to the exclusion of establishing a deeper biologically active zone at some sites. For example, the Middle Waterway cleanup in Tacoma had a biologically active zone of approximately 100 cm due to the presence of ghost shrimp.

Issue 3-9: Definition of "chronic," was -200(12) now -200(7)

- Commenter: Lon Kissinger (211)

Summary of comments received:

- "Chronic" also has meanings related to long-term exposure and toxic effects to humans.

Response:

The rule language in -200 and the new section -505 has been revised to reflect that a definition applies unless the context indicates otherwise. Ecology acknowledges that the original definition of "chronic" applies to benthic toxicity, which was the original intent. This original definition has not been changed. The term "chronic" as it applies to human health in -561 clearly indicates a different context than the definition.

Issue 3-10: Definition of "cleanup screening level," was -200(14), now -505(6)

- Commenters: AECOM (29), Umatilla Tribes (329), Pioneer (574)

Summary of comments received:

- Add language indicating that the CSL shall not be lower than the maximum of regional background and the practical quantitation limit.

- Delete the word "action" to reflect that the CSL can be met through monitored natural recovery.

- Cleanup screening levels should include provisions for cumulative risk to humans or biota. Please clarify that the risk levels are for cumulative risk and provide a definition and example of cumulative risk.

Response:

Ecology has revised the proposed rule language. The language in -560, which describes how the CSL is established, has been revised to clarify that the CSL is the highest value of the risk-based concentration, regional background, or the practical quantitation limit.

The term "action" in the definition of the CSL has been retained as it applies to both active and passive cleanup actions, including monitored natural recovery.

Cumulative risk to humans is addressed in -561 and cumulative risk to biota is addressed in -562, -563, and -564. Cleanup standards, which may include the CSL, are established based on these risk assessments. See Issues 13-3, 13-4, and 13-6 for further detail on cumulative risks for human health.

Issue 3-11: Definition of "contaminant," was -200(15), now -505(7)

- Commenters: Anchor QEA (66), AWB (80), Georgia-Pacific (362), Greenbrier (371), Nippon (541), Port of Port Angeles (632), Port of Seattle (649)

Summary of comments received:

- This definition needs to be expanded to reflect that contaminant bioavailability varies considerably among sites and to encourage development of site-specific cleanup levels using approaches developed by the Interstate Technology & Regulatory Council and others.

Response:

Ecology has revised the proposed rule language to be consistent with the MTCA definition (WAC 173-340-200). The term "contaminant" in the adopted rule means "any hazardous substance that does not occur naturally or occurs at greater than natural background levels." Ecology acknowledges that bioavailability is an important variable in determining cleanup levels. This is why site-specific bioassays and benthic infauna tests can be used to over-ride benthic chemical criteria. In addition, site-specific risk assessments and tissue chemistry will aid in determining bioavailability of contaminants to upper trophic levels or human health.

Issue 3-12: Definition of "contaminated sediment," was -200(16), now -200(8)

- Commenter: King County (392,393)

Summary of comments received:

- Deletion of "surface" from the definition is not appropriate unless the definition is revised to be tied to exposure. This will be harder to define and apply, so we suggest retaining "surface."

- We request that the reference to WAC 173-204-560 be more specific to the tables in -562 and -563.

Response:

Ecology has revised the proposed rule language. The word "surface" was originally removed from the definition in the proposed rule because deeper contaminated sediment could be a concern at sites due to exposure through activities such as dredging, erosion, or bioturbation. Ecology has reinstated the term "surface" because the definition of "surface sediment" can include deeper sediment. The reference to -560 includes human health and benthic criteria, as well as limitations such as background and PQLs. Therefore, narrowing this definition to the benthic criteria in -562 and -563 is not consistent with how contaminated sediment is defined and does not address all potential receptors and exposure pathways.

Issue 3-13: Definition of "control sediment sample," was -200(17), now -200(9)

- Commenter: King County (393)

Summary of comments received:

- We request that the reference to WAC 173-204-560 be more specific to the bioassay tables in -562 and -563.

Response:

The rule language has been revised accordingly.

Issue 3-14: Definition of "enhanced natural recovery," was -200(19), now -505(8)

- Commenter: AECOM (28)

Summary of comments received:

- Add "or change the physical characteristics" of contaminated sediments, to reflect that this alternative can be used to modify the substrate for ecological or engineering reasons.

Response:

Ecology is adopting the proposed rule language. Ecology believes the suggested addition is captured in the proposed rule language.

Issue 3-15: Definition of "freshwater sediments," was -200(20), now -200(11)

- Commenter: Boeing (119)

Summary of comments received:

- The definition of freshwater sediments (<0.5 ppt) is inconsistent with that used in the water quality program (<1 ppt), potentially leading to a situation in which overlying water and sediment are classified differently.

- The proposed amendments should clarify how temporal variability and water stratification in estuarine systems factor into these classifications for sediments.

Response:

Ecology is adopting the original rule language. Estuarine dynamics and salinity concentrations in sediment porewater vs. the water column are very different, and it is not necessarily appropriate to harmonize their definitions. Porewater salinity maintains greater stability over longer periods relative to overlying water. For the water column, the transition between freshwater and marine is clear, while the transition zone for low-salinity sediment ranges from 0.5–25 ppt.

The water column transition of freshwater to marine, based on a daily vertical average, is appropriate because there are clear water quality criteria for marine and freshwaters. However

for sediments, the low-salinity sediment ranges and transitions vary. For low-salinity sediments, either marine or freshwater bioassays could be used. The choice of bioassays should not be based on a one-time average porewater (or water column) salinity, since this can vary dramatically depending on seasonal river flows and daily tidal cycles that drive the extent to which a "salt wedge" encroaches into the lower reaches of a river.

With regard to salinity tolerance, the SMS biological test species range widely. For example, *Hyalella* is found in water as saline as 20 ppt. The "marine" amphipod *Eohaustorius* is found in waters ranging from fresh to marine. The species selected would depend on the benthic receptors present and type of contamination, and the test porewater salinity would be adjusted accordingly.

Issue 3-16: Definition of "minor adverse effects," was -200(25)(c), now -200(15)(c)

- Commenters: Lon Kissinger (212), Umatilla Tribes (321)

Summary of comments received:

- Should hazard quotients or risk levels be identified here?

- This section is unclear – minor adverse effects is partially defined as "significant human health risk as predicted by exceedance of an appropriate chemical, biological, or other deleterious substance standard." What is the relationship between minor adverse effects, significant effects, screening levels, and risk-based targets?

Response:

Ecology is adopting the original rule language. The no adverse and minor adverse effects levels for human health risk are the existing narrative standard of "no significant health risk" for Parts III and IV of the rule. Ecology agrees there is not a clear distinction between these two effects levels for human health risk in Parts III and IV. However, Part V includes a distinction between the SCO and CSL for human health risk. Section -561 differentiates human health target risk levels for carcinogens at the SCO in -561(2)(a) and the CSL in -561(3)(b). However, these SCO and CSL levels are not defined as no or minor adverse effects levels (these are terms related only to benthic criteria) nor are they defined as screening levels. These SCO and CSL levels are incorporated into the framework for setting sediment cleanup standards in -560.

Issue 3-17: Definition of "monitored natural recovery," was -200(26), now -505(10)

- Commenters: AECOM (30), Dow Chemical (357), Greenbrier (371), King County (394,395), NAVFAC (540), SMWG (692)

Summary of comments received:

- Why would monitoring of sediment, tissue, and biota be required to assess the effectiveness of natural recovery at all sites? We assume that "biota" means benthic infauna. Other organisms may have home ranges larger than the site and their tissues may not reflect changes at the site. We suggest "…one or more of the following: sediment

quality, tissue, or benthic infaunal invertebrates." Why would evaluation of benthic infauna be needed if natural recovery is intended to be protective of the human health pathway?

- Add "means a remedy that…" for consistency with other cleanup definitions.

- Include a new definition of monitored natural recovery as follows: "Monitored natural recovery is a passive remedial technology wherein the natural recovery of sediment is monitored in an area that is above cleanup standards but below remedial action levels. Monitoring is required to ensure effectiveness." [Refers to a previous version.]

Response:

Ecology has revised the proposed rule language by adding a reference to "remedy" and providing more flexibility for selecting appropriate monitoring methods.

Issue 3-18: Definition of "natural background," was -200(27), now -505(11)

- Commenters: AWB (81), Boeing (153), Yakama Nation (274,278), Umatilla Tribes (315), Greenbrier (371), King County (396), Landau Assts. (492), NAVFAC (527), NWIFC (543,551), Port of Port Angeles (633), CILP (673), Spokane Tribe (701), Squaxin Island Tribe (707,708), Suquamish Tribe (740,746), Swinomish Tribe (757),Tulalip Tribes (772,775)

Summary of comments received:

- The definition of natural background should include polynuclear aromatic hydrocarbons (PAHs), dioxins, and mercury as examples of persistent organic compounds and metals that are present throughout much of the state through global distribution.

- We understand that there are certain naturally occurring contaminants. However, Ecology's definition includes a number of anthropogenically derived compounds such as polychlorinated biphenyls (PCBs) that continue to harm our people and natural resources. This definition should only include substances that are truly of natural origin.

- This is a good concept, but should acknowledge that determination of natural background may need to consider geographic region, sediment morphology, grain size, and presence of naturally occurring organic matter.

- The term "localized activity" is vague and needs to be better defined. It is not that clear which anthropogenic effects are included and which are not.

- In the third sentence, remove "low" as these concentrations may not be considered particularly low.

Response:

Ecology is adopting the proposed rule language.

Ecology agrees that carcinogenic PAHs, dioxins/furans, and mercury are additional examples of persistent and bioaccumulative chemicals that could be included in this definition. However, one of the goals of this rulemaking was harmonization with MTCA, so this definition has not been changed.

The MTCA definition of natural background includes PCBs as an example of a persistent organic chemical that has been widely used and released to the environment. It can be found at low concentrations in nearly all surface soil and sediment sampled if analyzed with appropriately sensitive analytical methods. PCBs, for example, have been found at trace levels in the Arctic and in sediments in remote areas throughout Puget Sound, both far removed from any known sources. As a result, Ecology believes it is important to recognize in the definition of natural background that truly pristine surface sediment unaffected by humans does not exist.
Ecology agrees that there are several factors that should be taken into account when establishing natural background, such as the suggestions listed above.

The definitions of both natural and regional background, considered together, are intended to clarify "localized activity." In essence, natural background is intended to reflect sediment concentrations in areas well removed from developed areas and any known, suspected, and potential sources. Regional background is discussed in more detail in Chapter 12.

Issue 3-19: Definition of "natural recovery," was -200(28), now -505(12)

- Commenters: Dow Chemical (357), Greenbrier (371), King County (397), SMWG (693)

Summary of comments received:

- The definition focuses too narrowly on deposition. To broaden the definition, we suggest deleting everything after the first sentence.

- Suggest the following edits: "…natural recovery is the deposition of a <u>new</u> layer of ~~clean~~ sediment over an area of contaminated sediment resulting in burial <u>over time</u>…"

Response:

The proposed rule language has been revised to reflect that the definition includes one example of natural recovery. Ecology agrees that natural recovery could include methods other than natural deposition of clean sediment over contaminated sediment.

Issue 3-20: Definition of "no adverse effects," was -200(29), now -200(16)

- Commenters: Lon Kissinger (213), Umatilla Tribes (321,322)

Summary of comments received:

- There doesn't seem to be a clear distinction between this and "minor adverse effects." Please clarify the definitions.

- The rule does not seem to set no adverse impact or no significant levels for benthic or human health effects. Please clarify which sets of criteria are considered protective of human health and the environment.

Response:

Ecology is adopting the original rule language. The distinction between no adverse effects and minor adverse effects for the benthic community is determined by the benthic chemical and biological criteria in -562 (Tables III and IV) and -563 (Tables VI and VII). For the purposes of Part V, the SCO is the no adverse effects level. This means that chemical concentrations or biological effects at or below the SCO are expected to not have adverse effects on the benthic community. In addition, chemical concentrations or biological effects above the SCO up to the CSL are estimated to contribute to minor adverse effects, and concentrations above the CSL are estimated to contribute to moderate or severe adverse effects to the benthic community.

The no adverse and minor adverse effects levels for human health risk are the narrative standard of "no significant health risk" for Parts III and IV of the rule. Ecology agrees there is not a clear distinction between these two effects levels for human health risk in Parts III and IV. However, Part V includes a distinction between the SCO and CSL for carcinogenic effects as detailed in -561(2)(a)(ii) and -561(3)(b)(ii). See Issue 3-16 for further discussion of this issue.

Issue 3-21: Definition of "point of compliance," was -200(33), now -505(13)

- Commenters: City of Seattle (258), King County (398)

Summary of comments received:

- Include the concept of area-weighted averaging depending on the exposure route.

- Clarify that the point of compliance only applies to surface sediments.

- Add "and depths" after "locations."

Response:

Ecology is adopting the proposed rule language. The definition means the locations where the sediment cleanup level must be achieved, which includes both a vertical and horizontal dimension. The point of compliance is established within sediment or surface sediment, as those terms are now defined in -505. As specified in -560(6), points of compliance must be established within the biologically active zone to protect aquatic life or at a different depth to protect human health.

The point of compliance and the method used to determine compliance are different concepts. However, Ecology agrees that area-weighted or other averaging approaches may be appropriate to determine compliance with sediment cleanup standards for bioaccumulative chemicals. Ecology has revised the rule language in -560(7) to clarify this concept. Ecology has also included details on compliance monitoring in the Sediment Cleanup Users Manual II. See Issues 6-12 and 6-16 for further discussion of this issue.

Issue 3-22: Definition of "practical quantitation limit," was -200(35), now -505(15)

- Commenters: Boeing (151), King County (399)

Summary of comments received:

- Use of alternative analytical methods should only be required if the method detection limit (MDL) is above the SCO or other criteria. In many cases it will be impossible for analytical methods to achieve human health-based standards.

- Edit the definition as follows: …When the MDL~~limit~~ for an analytical method is higher than the concentrations based on protection of human health or the environment, the department may require the use of another method to lower the practical ~~quantitation limit~~MDL.

- We are concerned about the use of the practical quantitation limit (PQL) for regulatory purposes before a common definition has been accepted and implemented by all laboratories.

- The text implies that if you can't meet bioaccumulation-based standards, a possibly unapproved method could be required.

- The text in this definition is inconsistent with that for Tables IV and VII; please clarify or make consistent the text in these sections.

Response:

Ecology is adopting the proposed rule language. The definition of practical PQL is consistent with MTCA (WAC 173-340-200) and is representative of the term as used among laboratories. Tables IV and VII (now Tables III and VI) do not contain a definition of the PQL.

Ecology may require the use of an approved alternate method to achieve lower PQLs if it is necessary to accurately quantify chemical concentrations, identify and quantify potential sources, and conduct risk assessments during the remedial investigation. Any alternate method would require appropriate quality control and assurance methods to ensure validity of the data.

See Issue 12-8 for further discussion of practical quantitation limits.

Issue 3-23: Definition of "reference sediment sample," was -200(39), now -200(22)

- Commenter: King County (393,401)

Summary of comments received:

- We request that the reference to WAC 173-204-560 be more specific to the bioassay tables in -562 and -563.

- This definition contradicts those of regional and natural backgrounds, both of which account for some regional and anthropogenic influences. This definition should at least include anthropogenic influences.

- We recommend that reference sediment samples be allowed from areas at or below the SQS to allow for matching grain size and other characteristics to test samples.

Response:

Ecology has revised the original definition of "reference sediment." The revision more clearly specifies that the definition applies to the benthic biological criteria in -562 and -563.

This definition applies to interpretation of bioassay results to determine no or minor adverse effects to the benthic community. Therefore, reference samples at or above the sediment quality standard or the SCO would not be appropriate.

This term and definition do not apply to the establishment or application of natural or regional background.

Issue 3-24: Definition of "regional background," was -200(38), now -505(16)

- Commenters: AECOM (9,32), Anchor QEA (67), AWB (82), Boeing (101), BP Cherry Point (172), Colville Tribe (292), Georgia-Pacific (363), Greenbrier (371), King County (400), Landau Assts. (493), NAVFAC (527), Nippon (541), NWIFC (552), Pioneer (575), Port of Olympia (614), Port of Port Angeles (634), Port of Seattle (650), Squaxin Island Tribe (707), Tom Newlon (710,711), Suquamish Tribe (740), Swinomish Tribe (758), Tulalip Tribes (775), WSPA (864), Weyerhaeuser (886)

Summary of comments received:

Note: comments relating to the definition of regional background are summarized and responded to here. Comments relating to the use or calculation of regional background are summarized and responded to in Chapter 12, Sediment Cleanup Standards – General Requirements.

- The definition of regional background is generally workable, but will be highly dependent on exactly how it is calculated.

- The rule amendments do not sufficiently define regional background. Better distinctions between and definitions of natural, regional, and area background are needed.

- The difference between natural and regional background is particularly confusing in light of the "non-natural" definition of natural background.

- Recommend deleting "or equal to" from this definition. Regional background needs to be distinct from natural background for the two-tiered framework to be meaningful.

- It is not very clear which anthropogenic sources are included and which are not.

- Please clarify the term "specific source or release."

- It is important to include stormwater collected into pipes or ditches. Therefore the word "nonpoint" should be removed. Edit the definition as follows: "…primarily attributable to diffuse ~~nonpoint~~ sources, such as atmospheric deposition of storm water, ~~not attributable to a specific source or release~~ outside a depositional zone of discharge."

- Regional background should include contributions from multiple urban stormwater sources that are not associated with historic legacy contamination.

- Regional background should include contributions from non-point sources. Include a statement at the end: "However, contributions from ambient, non-point sources are expected."

- The reference to area background is potentially confusing and should be deleted.

- Regional background should be based on area-weighted averaging. This should be stated in the definition.

Response:

Ecology has revised the proposed rule language. The term "nonpoint" and the last sentence referring to natural and area background have been deleted from the definition of regional background. Additional detail has been added to -560(5) to clarify how regional background will be determined as well as the relationship between regional background and natural background.

Ecology agrees that regional background is a key concept in the proposed rule. This is a necessary concept due to the unique nature of sediment as a repository for upland sources and the continuous movement of contaminants in the aquatic environment. Sediments receive contaminants from diffuse sources such as air emissions and numerous point and nonpoint stormwater discharges. These types of sources are not easily distinguishable from one another and do not have distinct and identifiable depositional zones once they reach the aquatic environment. Unlike most upland environments, contaminants in sediment can be redistributed well beyond the source by currents, wave action, and biological and human activity such as bioturbation and propeller wash. This can result in contaminants from one source being distributed and mixed with many other sources within an embayment or river, making it difficult to distinguish particular sources or releases. This can also result in large areas of sediment

(hundreds or thousands of acres) with low levels of contamination that are not practical or technically possible to address through traditional active cleanup actions such as dredging and capping.

Consistent with this discussion, regional background is intended to represent that concentration resulting from these diffuse sources and activities and not primarily attributable to specific sources or releases. See Chapter 12 for additional discussion of regional background.

Issue 3-25: Definition of "remedial action level" or "remediation level"

- Commenter: AECOM (31,34)

Summary of comments received:

- Include a new definition as follows: "Remedial action level means the concentration above which active remediation takes place."

Response:

Ecology is adopting the proposed rule language. Ecology considered adding remediation levels but decided not to include this concept due to a desire not to make the proposed rule more complex. While not specifically incorporated into the rule, the concept of remedial action levels is included in the MTCA rule and remains applicable to sediment cleanup. For example, they may be used to distinguish between remedial alternatives that address different cleanup areas, volumes, or methods. The term is defined in WAC 173-340-200 and its use is further explained in WAC 173-340-355.

A cleanup action will often involve a combination of cleanup action components, such as dredging and monitored natural recovery. Remediation levels are used to distinguish areas within a site or ranges of concentrations within which the different cleanup action components will be used (e.g., treatment above X concentration, and monitored natural recovery between X concentration and the cleanup level). Remediation levels are not the same as cleanup levels. A cleanup level specifies the concentration above which some type of remediation is necessary.

Issue 3-26: Definition of "sediment," was -200(40), now -200(24)

- Commenters: AECOM (33), Boeing (96,152), Lon Kissinger (214), Umatilla Tribes (333), King County (376,402), Port of Port Angeles (636), Weyerhaeuser (887)

Summary of comments received:

- A statement should be added to the definition of sediment to exclude suspended and settled particulates in engineered and artificial water bodies such as stormwater systems, drainage ditches, irrigation ditches, wastewater lagoons, treatment wetlands, retention ponds, and evaporation ponds. These systems should be encouraged as part of source control.

- How do intertidal sediments exposed at low tide fit in here? This doesn't seem to fit with "bed or bottom of a body of water."

- Replace "contiguous" with "consecutive."

- The concept of "exposed" in this definition is confusing. Suggest deletion of the phrase referring to exposure, which is better placed in the definition of contaminated sediment.

- The definition should include "that it supports or could support aquatic biota." Sediment is placed by water-borne processes.

- Please clarify whether this includes only the biologically active zone or underlying layers down to bedrock or some other depth.

- The last sentence is of concern and expands the scope of the SMS to pore water and suspended particulates. The effects of dredging in these areas are already accounted for in the feasibility study. The expansion of authority is not warranted or necessary.

- This definition effectively duplicates "surface sediment." Is there a need for both?

Response:

Ecology has revised the proposed definition of "sediment" as it relates to Part V. Parts III and IV of the rule were not subject to substantive revisions during this rule-making, so Ecology reinstated the original definitions of "sediment" and "surface sediment" in -200 except as they relate to Part V. Ecology has moved the revised definition of "sediment" to Part V, and this revised definition only applies to that section of the rule.

Key concepts in the revised definition include limiting its application to settled particulate matter below the high water mark and to water bodies where water is present for six consecutive weeks. The term "contiguous" in the proposed rule has been replaced with "consecutive" to clarify the intent of the definition.

This new definition is intended to include intertidal sediments that may be exposed at low tide and sediment below the high water mark within a fresh water body with fluctuating water levels. Drainage ditches, ponds, and wetlands, whether natural or manmade, with water present for six or more consecutive weeks are included in this definition. These systems are open and thus accessible to invertebrates, fish, and wildlife and may represent direct and indirect exposure routes to all trophic levels including humans.

The definition is intended to exclude drainage ditches and small ponds, whether natural or manmade, where water is present only for a few days or weeks due to spring runoff or precipitation events. In these cases, the more likely exposure routes are direct contact by humans and terrestrial plants and animals and leaching to groundwater. Therefore, it is expected that cleanup standards would be based on the soil cleanup standards in WAC 173-340 in these areas, rather than sediment cleanup standards.

Underlying layers of sediment below the biologically active zone are included in this definition. Examples include:

- Deeper contaminated sediment exposed by dredging or erosion.
- Deeper contaminated sediment in beach areas where digging for clams or construction activity could result in exposure.
- Deeper contaminated sediment as a source to surface sediments, such as sediment contaminated by historical practices or contaminated groundwater.

Because all sediment captured by this definition supports or has the potential to support aquatic biota, the suggested phrase has not been added to the definition as it could result in the exclusion of highly contaminated sediment, which is inconsistent with the intent of the rule.

Sediments in upland engineered treatment works and conveyance systems, including engineered wastewater treatment works, wetlands, catch-basins, and pipes, that are sources to receiving surface waters and sediment are expected to be protective of humans and aquatic life.

Issue 3-27: Definition of "sediment cleanup level," was -200(41), now -505(17)

- Commenter: Lon Kissinger (215)

Summary of comments received:

- To make a distinction between this and SCO, add that this is the level that is actually selected to be achieved?

Response:

Ecology has revised the proposed rule language to clarify the concept of the sediment cleanup level. It is the concentration or level of biological effects that must be achieved at a site or sediment cleanup unit and may be established between the SCO and CSL on a site-specific basis in accordance with the requirements in -560(2). Ecology has revised the rule language in -560(2) to further clarify how cleanup levels are established between the SCO and the CSL. The relationship between cleanup level and the SCO and CSL is further explained in 500(5)(a).

Issue 3-28: Definition of "sediment cleanup objective," was 200(42), now -505(18)

- Commenter: Pioneer (577)

Summary of comments received:

- State that the SCO shall not be lower than the maximum of natural background and the PQL.

Response:

Ecology is adopting the proposed rule language. A more detailed description of the limitations on the SCO is provided in -560(2) and -560(3) and states the SCO shall not be established below natural background or the practical quantitation limit. This is also emphasized in -500(5)(a)(i)(A).

Issue 3-29: Definitions of "sediment cleanup objective" and "sediment quality standard," was -200(42),(45), now -505(18) and deleted

- Commenter: Boeing (154)

Summary of comments received:

- There is some confusion in the use of these two terms in the rule. We believe that the SCO is intended to represent the lower end of the tier for setting cleanup standards (i.e., highest of risk-based concentration, natural background, and practical quantification limit), while the sediment quality standard (SQS) is the lower level that is protective of benthic effects. However, this is not used consistently in the proposed rule.

- In particular, the SCO is used in place of the SQS in many places, including WAC 173-204-562(2), -562(2)(a), -562(2)(d), -562(3)(a), Table V, -563(1), -563(2), -563(2)(a), -563(2)(d), -563(3), and -563(3)(a). These sections should be corrected.

Response:

Ecology agrees that the use of the terms SCO and SQS can be confusing, which is why definitions for these terms were added to the proposed rule.

The SQS is used in Parts III and IV of the rule. The commenter is correct that the SQS represents the lowest concentration protective of benthic effects. It also includes a narrative standard for human health. Ecology has revised the rule language by deleting the definition of "sediment quality standard" in -200. This term is defined in Part III, which makes a definition here duplicative and unnecessary.

The SCO is used in Part V of the rule. Therefore, Ecology has moved this definition to Part V, -505. The commenter is correct that the SCO is intended to represent the lower bound for establishing sediment cleanup levels.

Issue 3-30: Definition of "sediment cleanup standard," was -200(43), now -505(19)

- Commenters: Lon Kissinger (216), King County (403), Pioneer (578)

Summary of comments received:

- Sediment cleanups to protect human health will generally address contamination on an area basis. Clarify this in the definition (e.g., "the site areas, point locations, or sediment cleanup unit where the sediment cleanup levels must be attained").

- This definition is confusing, as it contains other definitions of cleanup levels, points of compliance, and "additional regulatory requirements." Recommend instead: "Sediment cleanup standard means a department approved chemical concentration of level of biological effects that must be met at a point of compliance with specified institutional controls and other regulatory requirements."

- State that the SCO shall not be lower than the maximum of natural background and the PQL.

Response:

Ecology has revised the proposed definition to clarify that sediment cleanup standards are the standards identified in RCW 70.105D.030(2)(e) and to be consistent with the MTCA rule definition. Section -560(7) has been revised to clarify that compliance monitoring may be based on an area-weighted averaging approach. Ecology agrees that it is appropriate to measure compliance with cleanup standards based on human health exposure on an area-weighted basis in some cases. However, for some exposure pathways or receptors, such as direct contact with sediment on a beach or shellfish that are relatively immobile, evaluation on a station-by-station basis may be more appropriate. Ecology has provided further guidance on compliance monitoring in the Sediment Cleanup Users Manual II.

Sections -500(5) and -560(6) have been revised to clarify the relationship between sediment cleanup standard, sediment cleanup level, and point of compliance.

A more detailed description of the limitations on the SCO is provided in -560(2) and -560(3). The rule clearly provides that the SCO shall not be established below natural background or the practical quantitation limit. This point is further emphasized in -500(5)(a)(i)(A). See Issue 3-21 for further detail on the point of compliance.

Issue 3-31: Definition of "sediment cleanup unit," was -200(47), now -505(20)

- Commenters: Port of Olympia (606), WPPA (805)

Summary of comments received:

- This definition is a very helpful concept that allows smaller portions of a site to be addressed expeditiously even when development is the driver behind cleanup. This incentivizes cleanup that might not otherwise occur.

- We are encouraged by the definition of a sediment cleanup unit, which allows smaller portions of a site to be expedited and provides a helpful and reasonable approach.

Response:

Comments noted.

Issue 3-32: Definition of "sediment impact zone," was -200(44), now -200(23)

- Commenter: Boeing (156)

Summary of comments received:

- Edit this definition to remove "non-point source" and replace with "other."

Response:

Comment noted. Since Part IV and related definitions are not part of the current rulemaking, Ecology is unable to revise the rule as requested.

Issue 3-33: Definition of "sediment quality standard," was -200(45), now deleted

- Commenters: Lon Kissinger (217), Tom Newlon (712)

Summary of comments received:

- Why isn't human health included here?

- The definition of sediment quality standard (SQS) now does not match up with that in Part III, which is where the SQS is defined and includes human health. No changes to Part III are proposed, which is surprising since a framework for human health criteria is currently located there that will now be inconsistent with the human health criteria in Part V.

- These definitions in Part III and Part V need to be made consistent, either by adding the human health framework in Part V to Part III, or by limiting Part III to benthic criteria, or by using the same terminology in both sections and avoiding the proliferation of new acronyms in Part V that will be confusing to long-time users of the rule.

Response:

Ecology has revised the proposed rule language by deleting the definition of "sediment quality standard." This term is defined in Part III, which makes a definition here duplicative and unnecessary.

Since Part III and related definitions are not part of the current rulemaking, Ecology is unable to make additional revisions as requested.

Issue 3-34: Definition of "sediment recovery zone," was -200(45), now -505(21)

- Commenters: AECOM (35,60), Anchor QEA (68), AWB (83), Georgia-Pacific (364), Greenbrier (371), King County (404,405), Nippon (541), Port of Olympia (605), Port of Port Angeles (637), Port of Seattle (651), TransAlta (768,769), WPPA (811)

Summary of comments received:

- The language in this section should be changed to 10 years after the completion of active cleanup, to avoid significantly shortening the reasonable restoration timeframe.

- We support the change in the sediment recovery zone definition to areas with ongoing discharges. This is where they will be needed.

- Clarify that concentrations within the sediment recovery zone are above the SCO but below the cleanup standard. We assume this is different from monitored natural recovery that is above the cleanup standard.

- The last sentence should be deleted, as Ecology does not have the staff to conduct these reviews and approvals.

- Why was the text changed from sediment quality standard to sediment quality objective? [Refers to a previous version.]

Response:

The proposed rule language has been revised to require establishment of a sediment recovery zone when cleanup actions cannot achieve sediment cleanup standards within 10 years after completing construction of the active components of the cleanup action (rather than from the start of the cleanup action). Other requirements previously included in this definition have been removed and replaced with a reference to -570 and -590. See Chapter 19 for further information.

Issue 3-35: Definition of "technically possible," was 200(49), now -505(22)

- Commenters: Dow Chemical (357), Greenbrier (371), King County (406), Pioneer (576), Port of Port Angeles (638), Port of Seattle (652), SMWG (690), WPPA (810), WSPA (867)

Summary of comments received:

- Many projects are technically possible, but infeasible for a variety of reasons, including cost. No public entity responsible for public funds can function without regard to cost. Please delete this term globally and retain the original criteria used.

- MTCA has had a definition of "practicable" that has worked well for almost 2 decades. The definition of "practicable" sets up the ability to conduct the disproportionate cost analysis (DCA), an important tool for sediment cleanups. Is it Ecology's intent to

eliminate cost from consideration in sediment cleanups as well as the DCA? The current draft is quite different from what Ecology had previously presented.

- Recommend revising this term to "technically practicable" using its original definition in the SMS rule. Further recommend that all references to "technically possible" be replaced with "technically practicable." To expedite cleanups, Ecology should work with potentially liable persons to identify practical solutions rather than spend significant time and resources evaluating solutions that will be effectively impossible to implement.

- Suggest removing "regardless of cost" from this definition.

Response:

Ecology is adopting the proposed rule language. This definition is consistent with MTCA, WAC 173-340-200, which does not allow cost as a consideration when establishing a cleanup standard. The reasoning behind this approach is discussed in the 1991 MTCA responsiveness summary (Ecology, 1991).

Regarding what factors may be considered when establishing a sediment cleanup level between the SCO and the CSL, Ecology is adopting the proposed rule language in -560(2). Ecology has decided not to allow consideration of cost when establishing cleanup levels. Cost is still considered when selecting a cleanup action. See Chapter 12 and Issue 12-2C for further detail on the issue of cost and "technical possibility."

Issue 3-36: Definition of "test sediment," was -200(50), now -200(25)

- Commenter: King County (407)

Summary of comments received:

- Sections WAC 173-204-580/590 would also seem to be applicable here.

Response:

Comment noted. The reference to -560 also applies to -575 (renumbered from -580) and -590.

This page is intentionally blank.

Chapter 4: Part III. Sediment Quality Standards (WAC 173-204-300)

This chapter provides a summary of the rule amendments concerning the authorities and purpose of the rule. The chapter summarizes the proposed amendments to the rules (Section 4.1), describes differences between the proposed and adopted amendments to the rules (Section 4.2), and responds to public comments on the proposed rule (Section 4.3).

4.1 Summary of Proposed Amendments

Part III of the SMS was not proposed for amendment as part of this rulemaking effort. However, comments were received on Part III. Although these comments are out of scope of the current rule amendment process, they are summarized below.

4.2 Differences between the Proposed and Adopted Amendments

Because Part III of the rule was not proposed for amendment, there are no substantive differences between the proposed and adopted amendments. For clarity and consistency, references to definition numbers in -200 have been revised to reflect revisions to that section and typographical symbol errors have been corrected.

4.3 Responses to Comments

Issue 4-1: Consistency with water quality standards

- Commenter: Umatilla Tribes (316,324,337)

Summary of comments received:

- SMS should be consistent with the water quality standards and be protective of designated uses of the water body.

- Clarify whether this rule relates to stream classification and how Ecology will keep this rule consistent with the protections necessary for cold-water salmon streams that have the most stringent sediment criteria for water quality.

- Please incorporate antidegradation policies for tribal usual and accustomed fishing areas.

Response:

Section -120(2) requires Ecology to protect designated uses as specified in WAC 173-201A and the federal Clean Water Act.

Section -130(2) requires that the most restrictive standard applies to protect the beneficial or designated use.

The anti-degradation policy in -120 applies to all surface waters of the state, inclusive of usual and accustomed fishing areas.

The MTCA law and SMS rule require that all cleanup actions at a particular site comply with all legally applicable state and federal laws. These applicable laws include the Water Pollution Control Act, RCW 90.48.

Issue 4-2: 303(d) listing and total maximum daily loads

- Commenters: AECOM (18), Umatilla Tribes (315), King County (375), NWIFC (556), Spokane Tribe (705), Squaxin Island Tribe (707), Suquamish Tribe (740), Swinomish Tribe (761), Tulalip Tribes (773–775)

Summary of comments received:

- Sediment criteria for 303(d) listing should be limited to the SQS/CSL criteria in Parts III and IV of the rule.

- Consistency is needed in the approach to the freshwater and marine/estuarine environments. The freshwater benthic standards should be included as water quality standards so that Ecology can add all impaired water bodies to the 303(d) list and take action as necessary. There is no sound basis for the two sets of standards to have different regulatory status.

- We do not recommend using criteria that are area-based (e.g., human health, upper trophic level exposures) for 303(d) listing.

- What will happen if sediment cleanup occurs and tissue concentrations remain elevated above water quality standards? We are greatly concerned that these criteria will be used to identify impaired water bodies, with subsequent limitations on discharges and/or total maximum daily loads (TMDLs) that would need to be developed. This may have a significant negative effect on development and expansion of treatment plants.

Response:

Comment noted regarding Parts III and IV for 303(d) listing, and regarding consistency between freshwater and marine standards. Because Part III of the rule was not proposed for amendment, Ecology was unable to make the requested revisions.

The 303(d) sediment listing policy "1-11 Ensuring Credible Water Quality Data for Management and Assessment Report" does not currently include sediment listings that are area-based for human health and upper trophic levels or based on tissue concentrations.

Ecology has revised the proposed rule language to clarify that Part V shall not be used in Ecology's implementation of federal Clean Water Act requirements. Therefore Ecology will be revising the 303(d) sediment listing policy 1-11, and 303(d) listing decisions will not be based on standards from Part V.

If, after a sediment cleanup occurs, tissue concentrations remain elevated above a regulatory threshold for water body 303(d) listings, Ecology will endeavor to determine the contaminant source(s) through the cleanup site identification process, National Pollutant Discharge Elimination System permitting program, and TMDL investigations. Under the MTCA law and SMS rule, all cleanup actions at a particular site must comply with all legally applicable state and federal laws. These applicable laws include applicable water quality standards in the Water Pollution Control Act, RCW 90.48.

Issue 4-3: Confirmatory designation, -310(2)

- Commenters: Lon Kissinger (218), Pioneer (579)

Summary of comments received:

- Clarify here that this confirmatory override is only for benthic criteria.

- This section references WAC 173-204-315, but that section was not included in the rule.

Response:

The confirmatory designation subsection references -315, which applies to benthic criteria. Since Part III is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Section -315 was not revised, and therefore was not included as part of the rule document issued for public comment. Section -315 remains as part of the rule.

Issue 4-4: Marine sediment quality standards, -310(2)(b)

- Commenter: King County (408)

Summary of comments received:

- The confirmatory designation should not be reserved. Include specific criteria for demonstrating bioavailability since chemical concentrations alone are not adequate.

Response:

Comment noted. Since Part III is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Issue 4-5: Non-Puget Sound marine sediment quality standards, -320(1)(c)

- Commenter: USACE-NWD (783)

Summary of comments received:

- These standards are still reserved. It would be helpful to provide some indication of whether these values are likely to be dramatically different from the Puget Sound numbers.

Response:

Ecology believes it is technically and scientifically reasonable to apply the Apparent Effects Thresholds (AETs) marine criteria to all marine areas of Washington State. Over the last 20 years, these marine criteria have been widely used from the Canadian border to coastal areas of Washington and Oregon in both cleanup and dredging programs. These marine areas are similar in terms of their benthic communities and use the same test species for monitoring.

Issue 4-6: Low-salinity sediment quality standards, -320(2)

- Commenters: City of Seattle (260), Pioneer (572), Weyerhaeuser (907)

Summary of comments received:

- Low-salinity standards seem to have been deleted from the rule. Was this intentional? How will the regulatory direction for addressing low-salinity sediments be provided?

Response:

This section was not proposed for revisions, so it was not included in the rule revision document issued for public comment. It has not been deleted from the rule and remains as a narrative standard.

Issue 4-7: Marine sediment quality standards, -320(2)(a)

- Commenter: Lon Kissinger (219–221, 224, 226)

Summary of comments received:

- Where are human health criteria addressed? Add chemicals of human health concern such as carcinogenic polynuclear aromatic hydrocarbons, dioxins/furans, etc.

- Will the practical quantitation limits be suitable for human health? The Puget Sound Estuary Program protocol analytical limits should be evaluated with this in mind.

- Consider adding references describing the derivation of the SQS values.

Response:

Comment noted regarding the human health criteria. Since Part III is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Practical quantitation limits are not applicable to this section.

Please refer to the following publication for derivation of the marine chemical criteria: http://www.ecy.wa.gov/programs/tcp/smu/sed_pubs.htm#Apparent Effects Threshold.

Issue 4-8: Marine SQS chemical criteria, -320(2)(c)

- Commenter: King County (409)

Summary of comments received:

- The first sentence is incorrect, as there are also non-normalized ppb listings in the table. Suggest including both in the section.

Response:

Comment noted. Since Part III is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Issue 4-9: Benzofluoranthenes, -320(2)(f)

- Commenter: King County (410)

Summary of comments received:

- Add "benzofluoranthenes" before the isomers.

Response:

Comment noted. Since Part III is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Issue 4-10: Table I

- Commenter: Pioneer (580)

Summary of comments received:

- Why don't SQS values for total petroleum hydrocarbon (TPH)-diesel and TPH-residual appear in this table when these are included in Table VII for freshwater sediments?

Response:

At the time the marine chemical criteria were developed, Ecology did not have sufficient data on

TPH to develop and adopt numeric criteria.

Issue 4-11: Biological effects criteria, -320(3)

- Commenter: King County (411)

Summary of comments received:

- The p-value symbols are not correctly shown.
- Is the t-test still appropriate? Or might a nonparametric test be more appropriate? What about median or geometric mean rather than arithmetic mean?
- Need to state whether the hypothesis is one-tailed or two-tailed and the basis for the choice.

Response:

The p-value symbol formatting error has been corrected. Ecology has revised the marine bioassay test interpretation protocols through the Sediment Management Annual Review Meetings and subsequently integrated these changes into the Environmental Information Management database analytical tool (MyEIM). In addition, these revised protocols have been incorporated into the Sediment Cleanup Users Manual II. The MyEIM analytical tool includes the ability to determine whether a parametric test or non-parametric equivalent test is appropriate, conducts the necessary data transformations, allows selection of an appropriate reference sediment, and determines compliance with the biological standards.

The statistical tests used are one-tailed tests for both the growth and mortality endpoints. To ensure proper methods are used for data analysis, Ecology requires submittal to EIM. The bioassay module is available for anyone to perform data analyses.

Issue 4-12: Benthic abundance, -320(3)(c)

- Commenters: King County (412), USACE-NWD (785)

Summary of comments received:

- It is essential that benthic abundance samples have at least three replicates. A single sample is not sufficient due to variability of infauna, especially in sandy sediments.
- We recommend that a more robust endpoint be developed for benthic infaunal abundance, based on the following reports that were developed to refine the endpoint: PTI (1993), Weston (1995), SEA (1996), SEA and Weston (1999), and SEA and MER (2000).

Response:

Comments noted. Since Part III is not part of the current rulemaking, Ecology was unable to revise the rule as requested. Ecology will consider updating the Sediment Cleanup Users Manual II to address these benthic abundance comments in conjunction with the Sediment Management Annual Review Meeting process.

Issue 4-13: Microtox, -320(3)(e)

- Commenter: King County (413)

Summary of comments received:

- Ecology has long recognized that the Microtox bioassay has poor predictive ability. It should be dropped from the suite of bioassays.

Response:

Comments noted. Since Part III is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Issue 4-14: Marine sediment human health criteria, -320(4)

- Commenter: Lon Kissinger (222)

Summary of comments received:

- Consider a general statement that sediment human health criteria will consider exposure to sediment contaminants either via direct contact or indirect exposure via consumption of aquatic organisms. May also want to bring in the concept of reasonable maximum exposure and risk levels of concern.

Response:

Comment noted. Since Part III is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Issue 4-15: Non-anthropogenically affected sediment quality criteria, -320(6)

- Commenter: Lon Kissinger (223)

Summary of comments received:

- Need to address in rule or guidance how to calculate these values.

Response:

Comment noted. Since Part III is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Issue 4-16: Freshwater sediment quality standards, -340

- Commenters: King County (414)

Summary of comments received:

- The dual promulgation of SMS under the Clean Water Act and MTCA authorities makes sections like this one particularly problematic. Ecology should add text to the preamble describing that the current revisions were conducted only for parts of SMS to simplify review and adoption under MTCA only.

Response:

Ecology has revised the proposed rule language in -500(1) to clarify that Part V is promulgated under MTCA only. Since Part III is not part of the current rulemaking, Ecology was unable to revise this part of the rule as requested.

Issue 4-17: Benthic community data, -350(2)

- Commenter: King County (415)

Summary of comments received:

- Only benthic samples with replicates should be included in the station inventory to determine whether stations pass or fail benthic standards.

Response:

Comment noted. Since Part III is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Chapter 5: Part IV. Sediment Source Control (WAC 173-204-400 through -415)

This chapter provides a summary of the rule amendments concerning the authorities and purpose of the rule. The chapter summarizes the proposed amendments to the rules (Section 5.1), describes differences between the proposed and adopted amendments to the rules (Section 5.2), and responds to public comments on the proposed rule (Section 5.3).

5.1 Summary of Proposed Amendments

Part IV of the SMS was not proposed for amendment as part of this rulemaking effort. However, comments were received on Part IV. Although these comments are out of scope of the current rule amendment process, they are summarized below.

5.2 Differences between the Proposed and Adopted Amendments

Because Part IV of the rule was not proposed for amendment, there are no substantive differences between the proposed and adopted amendments. To ensure clarity and consistency, the following revisions were made:

- The references to definition numbers in -200 have been revised to accurately reflect the revisions to that section.
- Typographical symbol errors have been corrected.

5.3 Responses to Comments

Issue 5-1: NPDES terminology

- Commenter: Boeing (156)

Summary of comments received:

- Use of "point" and "non-point" sources should be deleted from rule terminology, as these terms are mainly used in the context of National Pollutant Discharge Elimination System permits and are not defined in SMS.

- Edit WAC 173-204-100(5) to delete "point and nonpoint source" and to replace "water quality management" with "waste discharge permit."

- Edit WAC 173-204-400(2) as follows: "…wastewater, storm water, and ~~nonpoint source~~ or other discharges to surface waters…"

- Remove "or nonpoint source" from WAC 173-204-410(6)(c).

Response:

Comments noted. Since Part IV is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Issue 5-2: General considerations, -400(1)

- Commenters: Boise (164), BP Cherry Point (180,181), Umatilla Tribes (338), WSWRA (834)

Summary of comments received:

- Please clarify the applicability of the standards in the revised rule to point source compliance and permit holders.

- We have concerns regarding the proposed rule and its potential impact on herbicide use under the National Pollutant Discharge Elimination System (NPDES). Specifically, copper sulfate is an important aquatic herbicide in Washington applied to canals to maintain water flow to agricultural areas. Copper is also a metal of interest under water quality regulations. We use a variety of management practices to ensure that copper water quality limits are not exceeded at the point of compliance, including best management practices, engineering controls, and mixing. We request that Ecology consider the potential impacts of the SMS on successful operation of irrigation districts.

- If natural background is the goal for each embayment, how will pollutant loadings for surface runoff and point sources be set to support that goal?

- If the new rules do not apply to NPDES permitting, how can potentially liable persons be sure that their sites will not be recontaminated by other point source dischargers?

- Clarify whether this rule applies to in-stream mining.

Response:

Part IV of the rule applies to NPDES permitted dischargers, which would include point source discharges. This part establishes criteria and requirements that permittees must meet to protect sediment quality.

The commenter provided data regarding copper concentrations from these types of discharges, which shows copper concentrations substantially lower than the proposed sediment chemical criteria. If these data are reflective of these types of discharges, it does not appear these discharges are a concern for sediment quality in terms of cleanup.

Natural background applies to establishing cleanup standards for sediment cleanup sites. Ecology will require potentially liable persons to conduct source control of their discharges to ensure the long-term success of their cleanup. Other permits will be conditioned appropriately through the NPDES permit program.

The concepts of site units, regional background, and addressing the responsibility for recontamination were added to the rule to speak to the issue of recontamination from other discharges. Ecology may also review whether a discharge from another point source is sufficient to warrant consideration as a separate MTCA site.

The current SMS rule revisions do not directly apply to in-stream mining unless the activity creates a cleanup site.

Issue 5-3: All known and reasonable technologies vs. best management practices, -400(2)

- Commenter: Boeing (111)

Summary of comments received:

- Stormwater best management practices are sufficient for achieving treatment as needed. We suggest edits to WAC 173-204-400(2) to eliminate requirements for all known and reasonable technologies at all facilities, regardless of the specific type of discharge.

Response:

Comment noted. Since Part IV is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Issue 5-4: Discharge permit conditions, -400(6)

- Commenters: Boeing (110), Umatilla Tribes (334), WSWRA (835,840,841)

Summary of comments received:

- Source control at MTCA/CERCLA sites should be implemented by MTCA order rather than through National Pollutant Discharge Elimination System (NPDES) permits governed by Part IV of SMS to avoid inconsistencies among facilities contributing to the same area.

- Edits are suggested to WAC 173-204-400(6) to ensure consistency among nearby facilities discharging to the same area.

- How would multiple discharges be addressed that might cumulatively result in exceedance of risk levels? How would Ecology regulate or allow any new discharge under its antidegradation policy?

- Weigh the operational and economic impacts of increased limitations on copper sulfate discharges that, based on Ecology Environmental Information Management System data

and US Geological Survey data from central and eastern Washington, we don't believe would be supported by environmental or human health risks.

- We request that source control implementation of the new standards through NPDES permits for copper sulfate be done in a site-specific manner, taking into account district-specific water chemistry, regional background levels, water flow, frequency of application, and dissolved organic carbon.

Response:

Under Part IV, Ecology has the authority to condition discharges for potentially liable persons through an administrative order under either MTCA or the Water Pollution Control Act. Since Part IV is not part of the current rulemaking, Ecology was unable to make changes to that section of the rule. Ecology has many regulatory options available to address source control at MTCA and Superfund sites, and will determine the appropriate option on a site-specific basis.

NPDES-permitted discharges are generally regulated under WAC 173-201A. Ecology has a number of tools to address multiple discharges, such as conducting and implementing a Total Maximum Daily Load for chemicals of concern.

Comment noted on the issue of copper sulfate, which is outside the scope of the current rule revisions.

Issue 5-5: Sediment impact zone (SIZ) goals and policies, -410(1)(a)

- Commenter: DNR (823)

Summary of comments received:

- We are concerned that sediment testing is rarely if ever required for water quality standards, and that effluent is not necessarily tested for SMS chemicals of concern, even under industrial and stormwater permits. Will Ecology use the SIZ requirements to better coordinate sediment management and water quality standards?

Response:

If a sediment impact zone is established for a discharge, Ecology will require testing for the appropriate chemicals of concern. The SMS requirements will be fully implemented for any discharge that has been issued a sediment impact zone.

Issue 5-6: Stormwater permits, -410(6)(d)

- Commenter: Umatilla Tribes (335)

Summary of comments received:

- Clarify whether a city can have a single combined sewer overflow permit for stormwater discharges, and explain how a large and small city must meet the same concentration limits.

Response:

Comment noted. This issue is outside the scope of the current rulemaking and too complex to answer in this format. Ecology recommends that the commenter contact the Water Quality Program local office for further information.

Issue 5-7: Dredged material manuals, -410(7)(a)(iii)

- Commenter: USACE-NWD (786)

Summary of comments received:

- This manual was never adopted by the Puget Sound Dredged Disposal Analysis or the Dredged Material Management Program (DMMP). Instead, DMMP developed a manual entitled the Dredged Material Evaluation and Disposal Procedures (User's Manual), which can be found on the DMMP website.

Response:

Comment noted. Since Part IV is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Issue 5-8: was Table I, now Table II

- Commenter: USACE-NWD (787)

Summary of comments received:

- Please verify the value for 80–100% fines, as it appears out of line with the other data in the table.

Response:

Ecology has verified this value and found it to be correct. Sediments with 80–100% silt/clay particles are highly compact and, therefore, have lower affinity for binding organic carbon than the 50–80% silt/clay mix.

Issue 5-9: Sediment impact zones for marine finfish rearing facilities, -412(4)

- Commenter: King County (416)

Summary of comments received:

- Finfish rearing facilities should be held to all of the same administrative and technical standards as any other sediment impact zone proponent.

Response:

Comment noted.

Issue 5-10: Sediment impact zones (SIZs), -415

- Commenters: Boeing (112), Lon Kissinger (225), Umatilla Tribes (336,339)

Summary of comments received:

- SIZs are one additional tool already in the rule that could be used at complex urban cleanup sites. An SIZ should be included in a case study to examine how this existing tool could work alongside other approaches, particularly with respect to urban stormwater.

- To what extent has bioaccumulation modeling been considered to evaluate the impact of contaminants on tissues for human health concerns?

- Please clarify Ecology's criteria for requiring dredging vs. capping as maintenance activities in an SIZ.

- Please identify areas where sediment quality is currently good and clarify how the anti-degradation policy protects those areas.

Response:

Comment noted regarding case studies for SIZs.

Bioaccumulation modeling can and has been used in a weight-of-evidence approach to assess risks to human health and the environment.

SIZ requirements are established on a case-by-case basis. The criteria in Part IV for SIZ maintenance and in Part V for assessing the effectiveness of actions would be used in decision-making.

The anti-degradation policy in -120 applies to sediment statewide and requires that sediment quality higher than the existing criteria must be maintained. Ecology recommends the commenter query the Environmental Information Management database for complete information on statewide sediment quality at: http://www.ecy.wa.gov/database.html.

Issue 5-11: Public interest, -415(1)(c)

- Commenter: Waterkeepers (856)

Summary of comments received:

- We do not see how authorizing sediment impact zones (SIZs) for a polluting activity is more in the public interest than reducing sediment chemical concentrations below the sediment standards.

Response:

Ecology agrees it is in the public interest to reduce sediment chemical concentrations in the vicinity of discharges to the sediment standards. However, this may not be feasible at all sites. Issuance of an SIZ is one tool Ecology may use to address discharges that are not feasible to immediately reduce to the sediment standards. This tool is meant as an interim measure that can be used in conjunction with other tools, such as establishment of permit limits, implementation of new best management practices, and effluent treatment to reduce sediment concentrations over time to sediment quality standards.

Issue 5-12: Adverse effects to biological resources, -415(1)(f)

- Commenter: Waterkeepers (858)

Summary of comments received:

- How will cost be used in determining the minimum practicable chemical contamination and biological effects levels? While cost is a factor it should not be given the same weight as other considerations such as environmental effects, short/long-term viability, and technical feasibility. This section refers to subsection (4), however, that section does not ensure compliance with these levels.

Response:

Cost is weighed and balanced with technical feasibility and net environment benefits to establish an acceptable concentration.

Issue 5-13: Design requirements, -415(4)

- Commenter: Waterkeepers (858)

Summary of comments received:

- This section delineates many actions and studies, but does not limit the amount of toxics entering and remaining in the sediment. Describe how these actions and studies will be used to limit the amount of pollutants entering the sediment.

Response:

Issuance of a sediment impact zone (SIZ) is one tool Ecology may use to address discharges associated with contaminated sediment. This tool is meant as an interim measure that can be used in conjunction with other tools, such as establishment of permit limits, implementation of new best management practices, and effluent treatment, to reduce sediment concentrations over time to achieve sediment quality standards. The SIZ maximum criteria provide an upper bound on the concentrations that may build up in sediment, and concentrations for an individual SIZ must be set at the lowest practicable concentration between the sediment quality standards and the SIZ maximum criteria.

Issue 5-14: Freshwater sediment impact zone maximum criteria, -420(1)(d)

- Commenter: King County (417)

Summary of comments received:

- With promulgation of the freshwater criteria, why is this section reserved? Please add the CSLs similar to marine sediments.

Response:

Since Part IV is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

Issue 5-15: Sediment impact zone maximum chemical criteria, -420(2)

- Commenters: AECOM (19), Umatilla Tribes (340–342)

Summary of comments received:

- Human health risks are based on area-wide exposures. If human health-based limits are included in National Pollutant Discharge Elimination System permits, area-wide alternatives to the existing discharge zone concept should be considered.

- We believe that the maximum criterion for lead should probably be much lower. The state background for lead in soil is around 50 ppm, which is an appropriate target for human health.

- Will polynuclear aromatic hydrocarbons (PAHs) other than those listed be included in total PAHs or some other metric? The rule discusses congeners, does that apply to DDTs or to mixtures such oil or diesel?

- Is the method for polychlorinated biphenyls (PCBs) congeners or Aroclors?

Response:

Comments noted regarding area-wide alternatives and the criterion for lead. Since Part IV is not part of the current rulemaking, Ecology was unable to revise the rule as requested.

PAHs refer to those listed in Table II. This part of the rule does not include congeners. The chemical criteria applicable to this part are in Table II.

The PCB method is for total Aroclors.

This page is intentionally blank.

Chapter 6: Part V. Sediment Cleanup Decision Process and Policies (WAC 173-204-500)

This chapter provides a summary of the rule amendments concerning the cleanup decision process. The chapter summarizes the proposed amendments to the rule (Section 6.1), describes differences between the proposed and adopted amendments to the rule (Section 6.2), and responds to public comments on the proposed rule (Section 6.3).

6.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included revisions to clarify the cleanup decision process and the department's thinking on how to conduct cleanup in the presence of widespread contamination of ubiquitous, bioaccumulative chemicals from numerous sources. The changes include:

- Clarification on establishing site units.
- Options for addressing recontamination of a cleaned up site.
- Clarification on cleanup timeframes.
- Emphasis on source control measures.
- Part V promulgation under MCTA authority for cleanup purposes.

6.2 Differences between the Proposed and Adopted Amendments

To meet the intent of RCW 70.105D, the following revision was made:

- The authorizing statute and how Part V provisions will be used were clarified in -500(1).

To ensure clarity and consistency, and in response to comments received, the following revisions were made:

- The relationship between the restoration time frame and cleanup actions and Ecology's expectations and preference regarding the type of cleanup actions for specific types of sites were clarified in -500(4)(c).

- Ecology's expectations regarding discharge monitoring were revised in -500(4)(d).

- The terminology regarding protection of human health at "no significant health threat" in -500(5) was made consistent with Part I.

- The relationships between sediment cleanup standards, sediment cleanup levels, sediment cleanup objectives, cleanup screening levels, and points of compliance were clarified in -500(5)(a).

- The use of passive cleanup actions was clarified in -500(5)(b).

- Compliance with applicable laws was included in the presumption of protectiveness provision in -500(5)(c).

6.3 Responses to Comments

Issue 6-1A: General conceptual framework – support

- Commenters: Anchor QEA (62), Boeing (92), Georgia-Pacific (358), Nippon (541), Port of Port Angeles (625), DNR (819)

Summary of comments received:

- We appreciate that Ecology has attempted to address the many technical and policy issues involved in making the SMS both more protective and implementable, including:
    - A multi-phase approach for sediment recovery over large areas and long timeframes.
    - A regional background approach.
    - Sediment cleanup units within larger bay-wide sites.
    - Practical incentives to encourage PLPs to take action and settle their liability.
    - Strategic analysis of cross-program issues.

- We appreciate the addition of many important concepts in the SMS rule, in particular:
    - Sediment cleanup units.
    - The two-tier framework.
    - Sediment recovery zones.
    - Site-specific human health and higher trophic level assessments.

- We support Ecology's goal of implementing stricter cleanup standards as well as the development of region-wide cleanup models with individual cleanup units and sites within a bay or watershed. This proposal is an important step forward that acknowledges the nature of widespread sediment contamination.

Response:

Comments noted.

Issue 6-1B: General conceptual framework – protectiveness

- Commenters: Yakama Nation (274), Umatilla Tribes (315), NWIFC (543), CILP (666,667), Squaxin Island Tribe (707,708), Suquamish Tribe (740), Tulalip Tribes (775)

Summary of comments received:

- The proposed amendments appear to have been written from the perspective of assisting the potentially liable persons (PLPs) instead of the more appropriate perspective of

protecting the public health. The SMS are in need of a fundamental shift from making them easier to meet towards protection of human health and the environment.

- The proposed SMS framework will delay actual cleanups while the standards are debated anew at each site and decrease the protectiveness and scope of cleanups, yet permit PLPs to resolve liability and walk away from contaminants left in place, even where these pose threats to human and ecological health.

- Ecology's approach will decrease the protectiveness and scope of cleanups by decreasing the number and size of sites, considering them clean while contamination still remains at levels of human health and ecological risk, underestimating risks to human health and the environment, and redefining natural background so that toxic contaminants are forever considered part of our baseline environment.

Response:

The SMS rule and proposed revisions create a framework for managing risk from sediment contamination. This is accomplished by establishing stringent acceptable levels of risk and associated policies to protect human health and the environment and emphasizing active cleanup measures and quicker restoration timeframes, while also considering practical factors in cleanup such as implementability, technical effectiveness, and cost.

For example, this risk management approach is the basis for allowing the use of natural background as a cleanup level in some circumstances, a policy that is consistent with the MTCA rule. See the response to Issue 3-19 for additional discussion of natural background. This risk management approach is also consistent with using regional background to address contaminants found in sediment in more urban areas resulting from everyday activities such as driving automobiles and the widespread use of various products that collectively are very difficult to associate with specific sources. See Chapter 12 for further detail on regional background.

The formal authorization of sediment cleanup units provides a practical administrative process for addressing complex cleanups and authorizing cleanup to be conducted efficiently in contaminated areas that pose higher risks to human health and the environment.

Ecology believes that the revised rule includes a more effective framework for making cleanup decisions than currently exists for sediment sites. By providing predictability and incentives for PLPs to conduct cleanups, over time it will reduce, not increase, risks to human health and the environment.

Issue 6-1C: General conceptual framework – implementability

- Commenters: City of Seattle (256), King County (373,384), NAVFAC (906), Port of Olympia (602), Port of Port Angeles (623), WPPA (808), Weyerhaeuser (882)

Summary of comments received:

- We continue to be concerned that the overall framework for the rule, especially those changes made after the Sediment Advisory Group process, is unworkable and does not adequately address issues unique to sediment cleanup such as ubiquitous low-level contamination, multiparty liability, and recontamination. This will have the opposite effect of that intended by delaying cleanups.

- We remain concerned about provisions in the draft rule that may inevitably make cleanups impossibly expensive, while at the same time cost considerations have been removed from rule language. This approach creates a rule that is theoretically beneficial but fundamentally unworkable, meaning that many projects will not begin or progress. Disincentivizing cleanup projects in this way will result in reduced environmental benefits.

- Ecology worked hard to strike a balance between environmental protection/risk reduction and implementability and incentivizing sediment cleanups. However, we are concerned that the amendments will lead to cleanup levels near natural background and few, if any, implementable remedial alternatives. Specifically:
    - Removal of cost from calculating cleanup standards.
    - The definition of regional background.
    - Inability to rely on natural recovery when a more permanent cleanup is "technically possible" regardless of cost.

- The current proposals generate significant uncertainty and barriers to implementation. Such areas include: cross-program coordination with water quality standards, tissue residues at natural or regional background levels, and prescriptive high-cost/low-value sediment remediation choices.

- The rule as proposed may place a significant burden of cost and complexity for risk evaluation of small sites.

- There are many places in the rule where the phrase "at the department's discretion" appears, which positions Ecology as the ultimate decision-maker. While the guidance document is helpful, Ecology should recognize the ability of other professionals to contribute to site decisions, and include language such as "after considering relevant and credible information."

Response:

Ecology believes that addressing responsibility for recontamination will help encourage early actions and faster cleanups, especially in complex urban environments with multiple sources of potential recontamination. The potential for recontamination from anthropogenic background is reflected in how cleanup levels are established, with cleanup levels potentially being higher than the SCO. See Issues 6-6 and 12-10A–C for further discussion of recontamination, establishment of regional background, and its role in setting cleanup standards.

Ecology acknowledges that removal of cost as a factor in establishing sediment cleanup levels is an important change. However, Ecology believes this change is appropriate as it clarifies the process of setting sediment cleanup levels and should be considered in the context of other changes to the rule that increase flexibility for setting sediment cleanup levels and managing the obligations of a potentially liable person. See Chapters 11 and 12 for further detail regarding remedy selection, establishment and use of background, and the role of cost in establishing cleanup standards and remedy selection.

Ecology agrees that small sites may not require as extensive characterization and risk assessment costs as larger sites and believes the rule allows flexibility to accommodate different types of sites. Further guidance on this issue is included in the Sediment Cleanup Users Manual II.

Ecology agrees that participation by the public, including professionals with expertise in various fields, is essential in making effective cleanup decisions and Ecology will continue to engage in this kind of decision making in the future.

Issue 6-2: Separation of water quality and cleanup programs

- Commenters: Boise (159,162,163), Umatilla Tribes (315), King County (378), Landau Assts. (494), NWIFC (555), NWPPA (563,565), Spokane Tribe (705), Squaxin Island Tribe (707), Suquamish Tribe (740,741), Swinomish Tribe (761), TransAlta (766), Tulalip Tribes (773,775), WSWRA (835), WSPA (863), Weyerhaeuser (883)

Summary of comments received:

- We support Ecology's decision to promulgate these rule revisions under MTCA authority rather than Clean Water Act authority.

- The language could be strengthened by stating that these standards will not be used for National Pollutant Discharge Elimination System (NPDES) permitting.

- If Ecology intends to use these sediment cleanup standards as source control compliance standards, separate rulemaking, including a cost-benefit analysis, should be initiated.

- The SMS rule and fish consumption technical document should not impact currently allowable levels of herbicide discharge under NPDES.

- The proposed SMS amendments to Part V must be consistent with the entire chapter, including all the laws that authorize the chapter listed in Part I, specifically, the Water Pollution Control Act. These amendments must also conform to the designated uses policy of Part I. Thus, Part V must include that these rules are promulgated under RCW 90.48 as well as MTCA. We request amendments to this effect in -500(1), (2), (3), and (6).

- WAC 173-204-500(3) should explicitly state that the sediment cleanup decision process shall include consideration of all applicable water quality standards and that provisions in

the SMS shall not supersede any standards or laws that would require more stringent cleanup standards.

- Ecology's decision to promulgate Part V under MTCA only creates inconsistency within the rule and with federal water quality regulations, divorces sediment standards from water quality criteria, and seeks to avoid the federal review and approval process.

- A cleanup should be considered successful if it gets the site as clean as practicable given ongoing inputs to the water body or regional background. After this level of cleanup, Clean Water Act programs are the appropriate vehicle for addressing residual risks, not MTCA.

Response:

Ecology has revised the rule language to clarify that Part V is promulgated under the MTCA law. The rule clearly states that Part V shall not be used in Ecology's implementation of federal Clean Water Act requirements. Ecology does not view this as being internally inconsistent, because Parts I–VI of the rule address different aspects of sediment management. Part V has, and continues to be, applicable to managing cleanup of contaminated sediment. Because the state's authority to require cleanup of contaminated sites is provided in the MTCA law, it is appropriate to clarify that Part V derives its authority from the state's cleanup law.

Regarding issues related to EPA review of the rule as water quality standards, see the response to Issue 21-8.

Ecology will continue to control the effects of discharges to sediments using NPDES permits through Part IV of the rule, which has not been revised.

The MTCA law and SMS rule require that all cleanup actions at a particular site comply with all legally applicable state and federal laws. These applicable laws include the Water Pollution Control Act, RCW 90.48. If a cleanup action is considered exempt from the procedural requirements of an applicable law, Ecology must consult with the appropriate state agency to ensure compliance with the substantive provisions of that law. This must also include providing an opportunity for public comment.

Issue 6-3: Cleanup process expectations, -500(4)

- Commenters: AECOM (36), King County (418), Port of Olympia (607), Tom Newlon (713), WPPA (806)

Summary of comments received:

- The cleanup process expectations are a helpful context for how Ecology will implement these cleanup rules, particularly regarding recontamination.

- Are "expectations" legally enforceable by Ecology or citizen lawsuit? This portion of the revised rule reads more like a guidance document than administrative law. We

recommend rewriting to clearly spell out cleanup process requirements with a concluding paragraph allowing for exceptions when circumstances dictate.

- Expectations tend to morph over time into firm requirements that limit the range of possible solutions. Expectations and statements about what generally should happen are better suited to guidance documents.

- We agree with the acknowledgment that these expectations may not be applicable to all sites.

Response:

Ecology agrees that "expectations" are a helpful tool for conveying Ecology's intent, especially where there are interrelated rule provisions. These expectations are not intended to be enforceable through a citizen lawsuit. They are intended to provide guidance to Ecology site managers, potentially liable persons, the public, and the courts regarding expected outcomes of regulatory requirements at a majority of sites. For that reason, Ecology believes it is important to include these statements in the regulations.

Issue 6-4: Sediment cleanup units, -500(4)(a)(i)

- Commenters: AECOM (12,13), Boeing (94,97,99), Port of Olympia (606), Tom Newlon (714), Waterkeepers (843), Weyerhaeuser (888)

Summary of comments received:

- The site unit concept is vitally important to moving forward with sediment cleanups in Washington. This incentivizes cleanup that might not otherwise occur.

- The strategy for using sediment cleanup units will likely be developed on a site-specific basis. However, we have not seen examples of how this will work. For example, how does it expedite cleanup? What prevents one potentially liable person (PLP) from expediting and gaining from their part of the cleanup while other parts languish? There should be a legal agreement between the PLP and Ecology to ensure that the cleanup process is completed and the PLP is held financially responsible. They should either meet agreed-upon incremental goals for the overall cleanup or contribute to a fund for cleanup of the site.

- We support the concept of site units, but need more details on reaching a final cleanup for a site unit.

- Establishing Ecology's expectations on cleanup and settlement of site units in this section is useful, as it may help guide the Attorney General's office in interpreting the regulations in a less constrained manner than in the past.

- We support both partial and full liability settlements and encourage Ecology to maintain flexibility for determining settlement options, particularly for large bay-wide sites with multiple PLPs. However, this information is not provided in this section.

- The rule should clearly state that site unit settlements would include contribution protection and covenants not to sue, similar to other MTCA settlements.

- PLPs should be able to settle site units ahead of large multi-party allocation processes if they conduct their own cleanup and contribute to a bay-wide fund.

Response:

Ecology agrees that sediment cleanup units can be a useful tool for getting cleanup accomplished. Site-specific experience has found that entering into a settlement agreement on smaller parts of a larger bay-wide site can accelerate the cleanup of the site as a whole. However, a settlement agreement with a PLP for a unit does not mean that the PLP has fulfilled their responsibilities for the entire site. Given the wide variety of circumstances likely to be encountered, Ecology believes it is appropriate to include the concept of sediment cleanup units as an expectation and not provide detail in the rule that might constrain the usefulness of this mechanism in the future.

Ecology recognizes that entering into a settlement agreement with one PLP may put them at an advantage over other PLPs. That is why, in part, public notice and a comment opportunity is provided for all settlement agreements. Also, as noted above, a settlement agreement with a PLP for a unit does not mean that the PLP has fulfilled their responsibilities for the remaining portions of the site. The consent decree will provide details of the scope of the settlement. As Part V of the SMS rule is promulgated under the MTCA law, settlements will follow the requirements set out in that law. As set out in MTCA, a settlement agreement may contain a covenant not to sue, but only of a scope commensurate with the settlement agreement and containing an appropriate reopener clause. A settlement agreement that resolves the PLP's liability to the state will contain contribution protection, but only for matters addressed in the settlement.

Issue 6-5: Source control, -500(4)(a)(iii)

- Commenters: Umatilla (324), NAVFAC (533,534), Tom Newlon (714), Waterkeepers (844)

Summary of comments received:

- How will the rule impact National Pollutant Discharge Elimination System (NPDES) permitting and compliance? If it does not, how can potentially liable parties (PLPs) be certain that their sites will not be recontaminated by point source discharges? If natural background is the goal, how will pollutant loadings for surface runoff and point source discharges be set to support that?

- To the extent that PLPs will have to go to unusual or very costly lengths to control their sources such as stormwater, more than would otherwise be required by source control programs, cleanup of site units will be discouraged or delayed.

- This language is too vague to be useful. We suggest the following: "all sources of contamination will be identified and stormwater pollutants controlled by accepted best management practices (BMPs) through source reduction strategies or a capture and treat technology. Pre- and post-treatment stormwater samples will be taken to ensure that reduction of contamination was successful."

- Add a sentence to this section indicating that if source control has not be analyzed or implemented for a cleanup site, the site will be relisted until source control is completed.

- Please provide rationale for inclusion or exclusion of nonpoint sources such as fertilizers in rivers that then flow into a contaminated harbor or bay.

Response:

Ecology is adopting the proposed language.

NPDES permitting and compliance is addressed in Parts III and IV of this rule, which are not proposed for amendments during this rule-making.

Source control has been, and will continue to be, an integral part of cleanup of contaminated sediment sites. Examples include preventing the flow of contaminated groundwater and surface water from upland disposal sites and subsequent releases to sediments, cleaning out stormwater catch basins and pipes, and identifying and reducing stormwater sources of sediment contamination.

Ecology does not agree that source control measures should be limited to those required by an existing NPDES permit or BMPs, as these may not be sufficient to prevent sediment recontamination. For example, these regulatory standards typically address ongoing point-source discharges from active operations, not historical sources. BMPs may not adequately address the contaminants of concern. This section is not specific to point or non-point sources, as both could be concerns at sites.

While a site may become relisted because source control measures have not been adequately implemented, Ecology does not agree that relisting should be automatic at all sites. Sites are only listed if criteria are exceeded. Additionally, Ecology may determine that a discharge from another source is sufficient to warrant consideration as a separate MTCA site.

Issue 6-6: Recontamination, -500(4)(b)

- Commenters: AECOM (12,15,37), BP Cherry Point (177), City of Seattle (261,262), King County (419,420), Landau Assts. (491), NAVFAC (524), Port of Olympia (608), Tom Newlon (714), WSPA (865), Weyerhaeuser (889)

Summary of comments received:

- We support Ecology's approach for assigning responsibility for addressing recontamination after cleanup to the party responsible for the recontamination. This will encourage early action and faster cleanups.

- This "expectation" alone does not provide sufficient certainty for potentially liable persons (PLPs) to conduct early cleanups. Specific provisions for settlement need to be added to the rule to provide more incentive for early cleanups to occur.

- We are concerned about the burden of proof that may be required for the PLP to demonstrate that recontamination is occurring from diffuse, surrounding contamination. How will compliance monitoring be used to determine achievement of the cleanup level under such circumstances? It would be helpful if the demonstration the PLP was required to make was that it complied with the source control requirements for its facility.

- Suggest editing this section to read "… when the person(s) can demonstrate <u>compliance with all applicable regulatory requirements for discharges that could affect sediment quality, or can demonstrate that any violations were not likely to have contributed significantly to recontamination of the unit</u>." The language should be extended to exempt from further cleanup recontamination that may occur due to any person's permitted releases.

- We support Ecology's emphasis on source control and believe it can be just as important as cleanup, depending on the contaminant. However, source control should be based on sound science, including fate and transport modeling to identify other sources that may be contributing to a site.

- The only way this can work is if there is careful assessment and control of all sources affecting a site unit. The PLPs will need to coordinate closely with municipal and county sources. We do not see this regularly happening and are concerned with ending up with all the remaining liability.

- The current language places the entire future liability burden on the remaining PLPs after a site unit cleanup, even if they also do not have control over all the existing ubiquitous sources (e.g., atmospheric deposition, sediment redistribution). This is unfair and a significant change from the current joint and several liability scheme. Alternative language is proposed.

- Recontamination can also occur from disturbance, redistribution, and redeposition of contaminated sediments from adjacent areas. It would be helpful if these potential sources of recontamination were mentioned.

- Please clarify that non-point diffuse sources are included here. In other words, if recontamination is due to a non-point source, the person conducting the original cleanup would not be required to take further action.

- Recontamination should be defined as concentrations above the sediment standard, not the SCO.

Response:

Ecology is adopting the proposed rule language. Ecology acknowledges and concurs that addressing responsibility for recontamination will help encourage early actions and faster cleanups, especially in complex urban environments with multiple sources of potential recontamination. That is why this expectation has been included. The potential for recontamination from anthropogenic background is reflected in how cleanup levels are established, and is one reason why cleanup levels may be higher than the SCO. See Chapter 12 for further detail on regional background and its role in establishing sediment cleanup levels.

Sediment cleanup actions must meet the requirements in -570(3). To meet these requirements, cleanups must be able to achieve and maintain compliance with sediment cleanup standards. To maintain compliance, the potentially liable person's contaminant sources must be adequately controlled. If existing controls are insufficient, additional source control measures may be necessary as part of a cleanup action. Cleanups that do not comply with cleanup standards are considered interim actions under MTCA (WAC 173-340-430).

MTCA includes standards for when a person is liable for cleanup at a site, and Ecology cannot alter those statutory standards through rulemaking. This rulemaking does not change the joint and several liability that applies to cleanup sites. This provision was included in the form of an expectation. Determining a PLP's obligations at a site will take into account many factors, such as the actual scope of the release and monitoring requirements, which will depend on site-specific conditions at a site or sediment cleanup unit.

A PLP's obligations at a site, and when Ecology considers those obligations to be met, will be stated in the administrative mechanism for the cleanup plan. Ecology anticipates that a PLP conducting a cleanup action within a site or sediment cleanup unit will not be responsible for a violation of a cleanup standard (and any additional cleanup that might be required based on that violation) if the violation is not caused by a source or ongoing discharge under that PLP's authority or responsibility. This could include either point or non-point sources. Whether recontamination caused by redistribution of contaminated sediments from outside a site or sediment cleanup unit is included will depend on the scope of the cleanup relative to the entire site.

Ecology recognizes that some sources of sediment contamination may already be controlled under other applicable laws to protect water quality. However, those controls may not be sufficient to protect sediment quality and prevent recontamination above sediment cleanup standards. In these cases, additional source control measures may be necessary to comply with sediment cleanup standards and address a PLP's obligations under MTCA.

Issue 6-7: Restoration timeframe, -500(4)(c)

- Commenters: AECOM (3,51), Anchor QEA (69), AWB (84), Boeing (107), BP Cherry Point (185), Dow Chemical (357), Georgia-Pacific (365), Greenbrier (371), King County

(421), Landau Assts. (495), NAVFAC (532), Nippon (541), Port of Port Angeles (639), Port of Seattle (651), SMWG (687), Tom Newlon (715), Weyerhaeuser (890)

Summary of comments received:

- Due to limited "fish windows" for in-water work, it may be impractical to implement cleanups in a single construction season. Suggest instead "restoration will be completed as soon as practicable, consistent with the general requirements of WAC 173-204-570" or remove this statement from the rule.

- This expectation favors faster cleanups over more complete cleanups.

- Sediment cleanups should not be required to use active cleanup actions when passive actions may have fewer environmental impacts and achieve the same goals, even if they are cleanups of smaller sites or site units. The size of the site is not relevant to selection of the appropriate alternative.

- Use of the word "restoration" in the last sentence is confusing as it is not clear what is intended.

- This section should be deleted, as parties already have a large cost incentive to complete active cleanup as quickly as possible.

Response:

The proposed rule language has been revised as follows:

- Eliminated the reference to a single construction season.

- Clarified the department's expectations of the role of active and passive cleanup actions for sediment cleanup.

- Replaced "restoration" with "achieve sediment cleanup standards" here and throughout Part V of the rule.

Issue 6-8: Sediment recovery zones, was -500(4)(d), now deleted

- Commenters: AECOM (17,38,51), Anchor QEA (64,68,70), AWB (78,85), Boeing (156), BP Cherry Point (186), Georgia-Pacific (366), Nippon (541), Pioneer (581), Port of Olympia (609), Port of Port Angeles (640), Port of Seattle (648,651), Tom Newlon (716), TransAlta (767), WPPA (806), Waterkeepers (857)

Summary of comments received:

- The requirement for sediment recovery zones at any site that cannot meet the cleanup standards within 10 years is highly problematic. This provision of the existing SMS regulations has proven unworkable, and would be required far more often with the lower

cleanup standards in the proposed rule. Sediment recovery zones should be entirely removed from the rule.

- A sediment recovery zone should not be an option for a cleanup action. This simply allows pollution to remain in place, an unacceptable solution.

- Compliance monitoring and the 10-year timeframe to meet cleanup standards should begin at the end of active construction rather than at the beginning. Only if cleanup standards cannot be met within 10 years of completion of active construction should a sediment recovery zone be used.

- Replace "10 years" with "10 or more years as approved by the department on a site-specific basis" to give Ecology more flexibility in establishing the restoration time frame.

- Remove "point and nonpoint source" and replace with "regulated and unregulated."

- If sediment recovery zones are a requirement elsewhere in the regulation, they do not need to be written in as an expectation.

Response:

The rule language has been revised by deleting this expectation related to restoration timeframe. See Chapters 17 and 19 for further discussion of this issue.

Issue 6-9: Compliance monitoring, was -500(4)(e), now -500(4)(d)

- Commenters: King County (422), Tom Newlon (717), Waterkeepers (851)

Summary of comments received:

- Please remove "more intensive discharge monitoring" from this section. Cleanup should only move ahead once sources are controlled, in which case this monitoring is not necessary. If targets are not met, then additional actions are triggered. This language opens the door for unnecessary sampling to be requested by staff not involved in the water quality permit process.

- Please be more specific about when more intensive discharge monitoring would be required. It is too easy to require testing for a complete suite of hazardous substances, which is much more than is normally required under Clean Water Act monitoring. There should be a reason to believe that a particular contaminant is affecting sediment quality rather than an open-ended statement such as this.

- In the sentence "Monitoring will typically include…" add "especially where these initially exceeded cleanup standards…"

Response:

The rule language has been revised from "more intensive discharge monitoring" to "where site-specific circumstances warrant, more discharge monitoring may be required…" It is Ecology's intent to require monitoring of discharges for the chemicals of concern related to the sediment cleanup. This may be beyond that required by current permit requirements, which often focus on surface water quality indicator parameters and treatment efficiency rather than chemicals of concern in sediment.

Issue 6-10: Scope of information, was -500(4)(f), now -500)(4)(e)

- Commenter: Waterkeepers (852)

Summary of comments received:

- Please require that the characterization include the full lateral and vertical extent of contamination for each site. In the absence of this information, a site unit cannot be defined and inadequate cleanup will ensue. Lack of complete characterization has led to inefficient decision-making processes and a more costly cleanup process at numerous sites. It is much more cost-effective to do a full characterization at the beginning of the investigation.

Response:

Ecology is adopting the proposed rule language. Section -560(5) requires that sufficient information be collected, developed, and evaluated to enable Ecology to establish cleanup standards and select cleanup actions. Since this section is an expectation, it does not include all of the requirements for conducting a remedial investigation and feasibility study.

A sufficient site characterization should be completed as early in the process and with as few sampling events as possible. However, determining what information is necessary may not be possible or cost-effective until later in the process.

While Ecology agrees that a sufficient characterization of the lateral and vertical extent of contamination throughout the site is desirable, this may not be appropriate or necessary in all cases. For example, a characterization may be conducted for the more limited purpose of establishing and cleaning up a sediment cleanup unit within a site. In this case, it may not be necessary to identify all of the contamination sources to the site or define the full extent of the site, as opposed to just the unit. However, if a potentially liable person wanted to enter into a settlement agreement to fulfill their responsibilities for the cleanup of the entire site, then a more complete characterization of the site would likely be necessary.

See the responses in Chapter 11, Remedial Investigation and Feasibility Study, for more discussion.

Issue 6-11: Relationship between sediment cleanup standards and cleanup actions, -500(5)

- Commenter: King County (423)

Summary of comments received:

- It is unreasonable to state that risks to human health can be eliminated when including cancer risk evaluations. It would be more appropriate to state that the goal for human health is to reduce and ultimately achieve risk levels as defined by WAC 173-340-708. This would better express that the goal is acceptable risk and that eliminating all risk is not possible.

Response:

Ecology has revised the proposed rule language to clarify that the goal is to reduce and ultimately eliminate significant health threats to humans from sediment contamination. This revision is consistent with the statement in -100(2). Ecology agrees that risks to humans cannot be eliminated. Target risk levels for human health are specified in -561.

Issue 6-12: Sediment cleanup standards, -500(5)(a)

- Commenters: AECOM (44), Lon Kissinger (227), Umatilla Tribes (343), King County (424,425)

Summary of comments received:

- Recommend bringing in the concept of "area of compliance" for human health concerns. Area-weighted average concentrations should be used.

- Delete "or biologically active zone," as the point of compliance should include this.

- Please address cumulative impacts to human health and benthos.

- Recommended text edits not applicable to the proposed rule. [Refers to a previous version.]

Response:

Ecology has revised the proposed rule language in -560(7) to clarify that area-weighted or other averaging approaches may be appropriate to determine compliance with sediment cleanup standards for bioaccumulative chemicals. Ecology is also developing detailed guidance on compliance monitoring for the Sediment Cleanup Users Manual II. However, Ecology did not revise the rule language in -500(5)(a) to address this issue because the point of compliance and the approach used to determine compliance with cleanup standards are different concepts.

Ecology has revised the proposed rule language in -500(5)(a) and (5)(a)(i) to clarify that the point of compliance includes the biologically active zone. The point of compliance must be established at a point that is protective of both human health and the environment. The provision in -560(6) states that the point of compliance could be established within the biologically active zone for protection of aquatic life or at a different depth to protect human health. See Issues 3-21 and 6-16 for further detail on the issue of point of compliance.

Ecology is adopting the proposed rule language regarding how cumulative impacts are considered when establishing sediment cleanup levels. Cumulative impacts to humans from multiple carcinogens and non-carcinogens are considered under -561(2)(a) and (3)(b). The benthic criteria were also developed to be protective of exposure of the benthic community to sediment contaminated with multiple chemicals. See Chapter 13 for further detail on this issue.

Issue 6-13: Sediment cleanup levels, -500(5)(a)(i)

- Commenters: AECOM (39), Dow Chemical (357), Greenbrier (371), King County (374,426), Pioneer (582), Port of Olympia (610), SMWG (690), WPPA (812), Weyerhaeuser (891)

Summary of comments received:

- Replace these criteria for upward adjustment of the SCO with cost, technical feasibility, and net environmental benefit. Alternatively, replace "technically possible" with "technically practicable."

- "Technically possible" is problematic, because cleanups can be technically possible without being cost-effective or providing any additional risk reduction.

- It is unclear how technical possibility can be considered if the cleanup level cannot be adjusted above the CSL. It is also unclear how adverse impacts on the aquatic environment would be considered. Please clarify.

- Edit text to read "Sediment cleanup levels define the chemical concentration or biological effects levels that ~~that~~ must be achieved through active or passive cleanup measures." This allows for the use of monitored natural recovery in reaching the levels. [Refers to a previous version.]

Response:

Ecology is adopting the proposed rule language in -500(5)(a)(i) that allows the cleanup standard to be adjusted upward from the SCO only if (1) achieving the SCO would not be technically possible, or (2) achieving the SCO would have a net adverse environment impact.

Ecology has revised the proposed rule language by making some editorial changes to this provision and to -560(2) to clarify how sediment cleanup levels are established and net adverse environmental impacts considered. This section is intended only as an overview, with -560(2) providing more detailed requirements for establishing sediment cleanup levels.

As an example of how this standard could be used to justify a higher cleanup level, it may be possible to achieve the SCO at a site through dredging and capping with a clean layer of sediment. However, adverse environmental impacts, such as the impacts of dredging on productive shellfish or eelgrass beds, could outweigh the benefits of cleanup to the SCO with reduced risks.

For discussion of whether cost should be considered as a factor, see the response to Issue 12-2C.

Issue 6-14: Sediment cleanup objective, -500(5)(a)(i)(A)

- Commenters: Larry Dunn (195), Lon Kissinger (228), NAVFAC (523)

Summary of comments received:

- Requiring SCOs to be met through a combination of cleanup actions and source control could take a very long time and be unachievable. Workable solutions need to be provided for reaching final cleanups. Add that institutional controls and access restrictions can be used.

- Practical quantitation limits (PQLs) should not be included in setting the SCOs, only risk-based levels and natural background.

- Reference procedures, data, or guidance for calculating natural background and comparing it to the sediment cleanup objective.

Response:

Ecology is adopting the proposed rule language with a minor editorial change to clarify that the PQL is the level that can be reliably measured. Ecology expects that a combination of cleanup actions and comprehensive source control measures will be needed to achieve sediment cleanup objectives at many sites. Section -560(2) states that cleanup actions must achieve sediment cleanup levels, which may be established above SCOs if achieving the SCOs is not technically possible or would cause a net adverse environment impact.

Section -570(3)(h) states that cleanup actions may include passive actions, such as monitored natural recovery, institutional controls, and monitoring. However, cleanup actions may not rely exclusively on passive actions where it is technically possible to implement a more permanent cleanup action.

Cleanup actions may also include source control measures. Such measures may be necessary to achieve and maintain sediment cleanup levels where there are ongoing discharges. Ecology expects that source control measures, on a broad scale, will be necessary to achieve sediment cleanup objectives over a longer period of time.

Ecology believes that SCOs and sediment cleanup levels should not be established below either natural background levels or PQLs. This is consistent with how Ecology currently considers

those non-risk-based factors when establishing cleanup levels for other media under MTCA (see WAC 173-340-705(6) and -706(6)). For additional discussion, see the response to Issue 6-21.

Ecology decided not to adopt specific procedures in the rule for calculating background due to the need for site-specific flexibility. However, Ecology is providing additional guidance in the Sediment Cleanup Users Manual II. See Issues 12-4 and 12-7 for further discussion of this issue.

Issue 6-15: Cleanup screening level, -500(5)(a)(i)(B)

- Commenter: Lon Kissinger (229)

Summary of comments received:

- Reference procedures, data, or guidance for calculating regional background and comparing it to the CSL.

Response:

Ecology is adopting the proposed rule language in -500(5)(a)(i)(B). As noted in this provision, the CSLs are established in accordance with the requirements in -560(4). If the risk-based concentration established under -560(4)(a) is below the regional background level, then the CSL may be established at a concentration equal to regional background.

Ecology has adopted the proposed rule language in -560(5) regarding how regional background will be established. Ecology decided not to adopt specific procedures in the rule for calculating regional background due to the need for site-specific flexibility. However, Ecology is providing more guidance in the Sediment Cleanup Users Manual II. Ecology intends to use latest science and appropriately representative data to establish regional background where appropriate. For additional information, see responses to Issues 12-4 and 12-10.

Issue 6-16: Points of compliance, -500(5)(a)(ii)

- Commenter: King County (427)

Summary of comments received:

- Please clarify what is meant by different points of compliance for human health. Is this for intertidal sediments where people may be exposed through direct contact? Aside from that, points of compliance for human health should be established on an area-wide basis.

Response:

Ecology has revised the proposed rule language and moved it to -560(6). The revised language clarifies that the point of compliance for sediment must be established at a point that is protective of both human health and the environment. The point of compliance and the method used to determine compliance are different concepts. However, Ecology agrees that area-weighted or other averaging approaches may be appropriate to determine compliance with sediment cleanup

standards for bioaccumulative chemicals. Ecology has revised the rule language in -560(7) to clarify this concept.

For bioaccumulative chemicals, the point of compliance and how to determine compliance with cleanup standards may be different depending on the receptor and exposure pathway. For example, the point of compliance for protection of humans from direct contact with contaminated intertidal sediment may be deeper and measured on a point-by-point basis, compared to a point of compliance to protect human health or upper trophic levels through consumption of fish, which may be shallower and measured on an area-weighted basis. Ecology has also drafted detailed guidance on compliance monitoring for the Sediment Cleanup Users Manual II.

Issue 6-17: Cleanup actions, -500(5)(b)

- Commenters: AECOM (5), BP Cherry Point (174,176), City of Seattle (263), NAVFAC (513,521), Tom Newlon (719,720)

Summary of comments received:

- There appears to be no provision for reaching a final remedy without meeting SCOs, which may be impossible at many sites.

- Amend this section to account for interim cleanup actions, which are not required to comply with all relevant and appropriate requirements (ARARs) or cleanup standards. Revise this to read that "Final cleanup actions must achieve sediment cleanup standards…"

- Add institutional controls and access restrictions to active and passive cleanup alternatives to demonstrate compliance with human health standards.

- The last sentence should be revised to reflect that the required source control measures should be those under the control of the party: "At sites where there are significant ongoing sources within the control of the party carrying out the cleanup action, the cleanup actions will usually also include source control measures."

- The current language implies that source control measures are subject to MTCA/SMS decision-making process and that the Cleanup Action Plan would specify the source control measures that are required. Yet, there are no regulations or guidance on how to evaluate alternative source control actions. Change to "cleanup actions will usually be accompanied by source control measures." In the expectations, state that source control activities are outside the remedial investigation/feasibility study process.

Response:

Ecology is adopting the proposed rule language. Sections -500 and -560 allow sediment cleanup standards to be adjusted upward from the SCO through a variety of mechanisms and these sediment cleanup standards can be the basis for a settlement. Section -570(3),

requires that cleanup actions comply with sediment cleanup standards, which is the sediment cleanup level at the point of compliance. Sections -500(5)(a)(i) and -560(2) allow adjustment of cleanup levels above the SCO if meeting the SCO is not technically possible or results in net adverse environmental impacts. Therefore, cleanup actions at a site may meet the cleanup level (which may not be the SCO) and Ecology may determine that a potentially liable person has met their cleanup obligations for the site.

Interim actions are authorized under the MTCA rule (WAC 173-340-430) and are applicable to sediment cleanup. The proposed rule language definition of "cleanup action" in -505 has been revised to include the concept of "interim actions." This clarifies when a remedial action taken at a site or sediment cleanup unit is considered an interim action or a cleanup action. To be considered a cleanup action, a remedial action must comply with sediment cleanup standards and other applicable laws.

As discussed in -500(5)(b), a cleanup action will often involve a combination of cleanup action components, both active and passive. Institutional controls are considered to be passive and are expected to be part of many cleanup actions.

Source control has been, and will continue to be, an integral part of sediment cleanup under both the SMS and MTCA when source controls are necessary to comply with cleanup standards. Examples include preventing the flow of contaminated groundwater and surface water from upland sources to sediment, cleaning out catch basins and piping, and identifying and eliminating sources of contamination in stormwater outfalls. Source control measures will be evaluated using the remedy selection criteria in -570 as part of the alternatives analysis. Ecology's expectation regarding controlling sources of recontamination is stated in -500(4)(b). For further discussion, see Issue 6-6.

Issue 6-18: Active cleanup actions, -500(5)(b)(i)

- Commenters: BP Cherry Point (190), King County (428), Tom Newlon (721), Waterkeepers (853), Weyerhaeuser (892)

Summary of comments received:

- The selection of a remedy should be based on short-term impacts, long-term benefits, costs, and technical practicability based on site-specific goals and conditions. There is no preferred technology for remediation of contaminated sediments as active cleanup measures can do more harm than passive ones under some conditions, as well as increase costs. This is what the alternatives evaluation process is for. The last sentence should be deleted.

- Enhanced natural recovery is not appropriate in many areas as a cleanup action because it mainly dilutes the contamination that is present. This should only be considered to speed up a natural deposition process. In an area without much deposition it will not be sufficient, and in erosional areas it should not be used at all. The reference to enhanced natural recovery should state that it can only be used in depositional areas.

Response:

Ecology is adopting the proposed rule language. The minimum requirements for a cleanup action are set forth in -570(3). The statement in -500(5)(b)(i) that active cleanup actions are preferred is not itself a requirement. Rather, the statement is intended to reflect the preferences for permanence and reasonable restoration time frames in the remedy selection process. Those preferences are set forth in the MTCA law (RCW 70.105D.030(1)(b) and (2)(d)). Cleanup actions that are more permanent and provide a shorter restoration time frame tend to be more active. However, Ecology agrees that many factors must be considered during the remedy selection process under -570, including cost and adverse environmental impacts. In addition, the process may result in selection of cleanup actions with more passive components, such as monitored natural recovery and institutional controls.

Ecology concurs that enhanced natural recovery may not be appropriate in some areas. For example, using a placed layer of clean sediment is not suitable in areas where the layer will not remain intact. However, the statement in -500(5)(b)(i) is not intended to provide guidance on when specific cleanup action components may be appropriate to use. Rather, the statement is only intended to identify which cleanup action components are considered active. Requirements for cleanup actions are set forth in -570(3).

Issue 6-19: Passive cleanup actions, -500(5)(b)(ii)

- Commenters: Dow Chemical (357), Greenbrier (371), King County (429,430), SMWG (687)

Summary of comments received:

- Passive cleanups should not be limited to only being used with active cleanups. There may be instances where greater harm would occur to the benthic community through habitat destruction, especially if natural recovery can be achieved in a few years following adequate source control.

- We suggest that institutional controls be separated out similar to Superfund. Institutional controls would be required if the cleanup does not meet the cleanup levels. This could be in either subsection 5(b)(iv) or 5(c).

- It is not clear how institutional controls are intended to be used when the region is above natural background-based objectives.

Response:

Ecology is adopting the proposed rule language with a minor editorial change of "when appropriate" to recognize that passive cleanup measures may not be appropriate at all sites. Ecology maintains that remedies consisting solely of passive measures (such as monitored natural recovery) or institutional controls (such as fish consumption advisories) are inconsistent with the permanent to the maximum extent practicable and reasonable restoration timeframe

requirements of MTCA.

Ecology considers institutional controls a passive cleanup action. Institutional controls at sediment sites have been used primarily to protect remedies (such as anchoring restrictions and land use restrictions to protect an engineered cap). Ecology anticipates this will continue to be their primary use in the future and will not rely on fish advisories alone as an institutional control. Where fish or shellfish tissue monitoring results are above levels of health concern, fish advisories or other harvest restrictions may be issued by the Washington Department of Health or the Washington Department of Fish and Wildlife.

Issue 6-20: Source control, -500(5)(b)(iii)

- Commenter: AECOM (14,16,20)

Summary of comments received:

- The National Pollutant Discharge Elimination System permitting program addresses only a small portion of ongoing sources in urban watersheds and may not be the appropriate mechanism for source control in many cases.

- Use existing water quality programs (inspections, best management practices, etc.) to implement source control, to the extent possible.

- Chemicals with ongoing urban contributions (e.g., phthalates) should be handled differently than legacy chemicals.

- Several lines of evidence should be considered when evaluating achievable and sufficient source control, including modeling.

Response:

Ecology has revised the proposed rule language in -500(5)(b)(iii) to emphasize that source control may be required as part of a cleanup action. Under MTCA, Ecology has the authority to require additional source control as part of a cleanup action if such controls are necessary to comply with cleanup standards. Source control has been, and will continue to be, an integral part of cleanup of contaminated sediment sites. Examples include preventing the flow of contaminated groundwater and surface water from upland disposal sites or releases to sediment, cleaning out stormwater catch basins and pipes, and identifying and reducing stormwater sources of sediment contamination.

Ecology recognizes that source control measures will vary from site to site and different authorities and technologies may be used to implement different source control measures. Factors such as the chemicals present, whether a source is ongoing or a result of past operations, modeling results, and other site-specific information can be considered in making such a determination.

Issue 6-21: Presumption of protectiveness, -500(5)(c)

- Commenter: Suquamish Tribe (749)

Summary of comments received:

- The rule language should distinguish between sediment standards that are truly protective and those based on regional background or practical quantitation limits (PQLs) that do not meet this presumption of protectiveness.

Response:

Ecology has revised the proposed rule language in -500(5)(c) to clarify that, to be presumed protective, sediment cleanup actions must achieve sediment cleanup levels at the points of compliance and comply with applicable laws as defined in -505. This presumption of protectiveness is intended to be consistent with MTCA (WAC 173-340-702(5)). Despite some changes in how sediment cleanup levels are established, Ecology believes the current presumption should continue to apply to sediment cleanup actions.

As specified in -100(2), the sediment quality goal is to reduce and ultimately eliminate adverse effects on biological resources and significant health threats to humans from sediment contamination. The SMS rule provides two means for achieving that goal: source control and cleanup actions. Ecology recognizes that cleanup actions alone may not be sufficient to achieve that goal and that additional measures to control sources may be necessary.

Ecology has revised -570(3)(k) in the SMS rule to clarify that periodic reviews are required at sites where sediment cleanup levels are based on PQLs. The framework for establishing sediment cleanup levels based on risk, natural background, or the PQL is consistent with how cleanup levels are established for other media under MTCA (WAC 173-340-705(6) and -706(6)). While Ecology recognizes that requiring cleanup below current detection limits would be unreasonable, Ecology also agrees that PQL-based cleanup standards should be periodically reviewed and Ecology must consider the availability of improved analytical techniques, consistent with the MTCA rule (WAC 173-340-420(2)(b) and WAC 173-340-420(4)(f)). For additional discussion of this issue, see Ecology (1991), Part VIII.

With respect to anthropogenic background, Ecology may already consider it when setting cleanup levels for other media under MTCA, including ground water, surface water, and air. While anthropogenic background is considered differently for sediments than for these other media, this change to the rule makes it more consistent with the MTCA rule.

Issue 6-22: Applicability of new cleanup standards, -500(6)(b)

- Commenters: AECOM (40), King County (431), Port of Olympia (611), Waterkeepers (854)

Summary of comments received:

- This section should read "site or site unit."

- Delete "unless the department determines that the previous cleanup action is no longer sufficiently protective of human health and the environment." This creates uncertainty about whether sites will be grandfathered in and effectively prevents closure.

- We believe it is essential for Ecology to retain its right to protect human health and the environment by amending cleanup actions. What process would Ecology use to make this determination?

Response:

Ecology has revised the proposed rule language to incorporate sediment cleanup units. The remainder of the language has been retained as proposed. This language parallels similar language in MTCA (WAC 173-340-702(12)). The MTCA law and SMS rule require cleanups to be protective of human health and the environment. RCW 70.105D.040 also requires all settlements to contain a reopener "…if factors not known at the time of entry of the settlement agreement are discovered and present a previously unknown threat to human health or the environment."

While Ecology believes the adopted rule protects human health and the environment under most circumstances, there is a potential that site-specific conditions could result in a remedy not being protective. For these reasons, Ecology has retained the authority to require additional cleanup.

Chapter 7: Identifying Sediment Station Clusters of Potential Concern (WAC 173-204-510)

This chapter provides a summary of the rule amendments concerning how impacted sediments are identified. The chapter summarizes the proposed amendments to the rule (Section 7.1), describes differences between the proposed and adopted amendments to the rule (Section 7.2), and responds to public comments on the proposed rule (Section 7.3).

7.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included minor clarifications for consistency with other amendments.

7.2 Differences between the Proposed and Adopted Amendments

To ensure clarity and consistency, and in response to comments received, the following revisions were made:

- Language was clarified in -510(2)(a) through (d) regarding when a station cluster of concern is identified based on benthic, human health, or background criteria.
- Language was clarified in -510(2)(c)(i) so that the reference to background is regional background.
- The term "contaminant" was replaced with "chemical" to ensure consistent usage of the term and to clarify the intent of separating evaluations based on chemical and biological criteria.
- Language was revised in -510(3) to state that notification is dependent on the results of the hazard assessment and evaluation process in -520.

7.3 Responses to Comments

Issue 7-1: Human health risk, -510

- Commenters: Lon Kissinger (205,208,230), King County (432)

Summary of comments received:

- The three-station procedures used in this section for benthic criteria do not work as well for human health, which is typically based on an area-wide approach. This approach should be revised to use an area-weighted average over a site or site unit.

Response:

Ecology has revised the rule language to clarify that the three-station approach is one approach, but not the only approach, for identifying cleanup sites based on risks to human health.

Issue 7-2: Station clusters, -510(2)

- Commenters: Umatilla Tribes (343), Waterkeepers (860), Weyerhaeuser (893)

Summary of comments received:

- Better definitions of "station" and "station cluster" are needed here. For example, how far apart can individual stations be, how big is a station, etc.

- Is it clear that the three stations used to define a station cluster of potential concern need to be contiguous?

- Please address cumulative risks to human health and benthos here.

Response:

Ecology is retaining the original rule language. A station is intended to be a single sampling station and must be chemically and spatially similar to the other stations. This does not necessarily require all of the stations in a cluster to be contiguous. The Sediment Cleanup Users Manual II and the current Sampling Analysis Plan Appendix provide more detail on station cluster identification and protocols for sampling stations. This section refers to the benthic and human health criteria that address risks from all chemicals at the site.

Issue 7-3: Statistical approach, -510(2)(a)(i)

- Commenter: Lon Kissinger (231)

Summary of comments received:

- The choice of statistic for comparison of the site concentration to a risk-based concentration is out of line with MTCA and EPA practice. Three stations would be insufficient to calculate a 95% upper confidence limit on the mean.

Response:

Ecology is retaining the original rule language. At this early stage in the cleanup process, there are usually limited data available. Ecology agrees that three stations are generally insufficient for calculating an upper confidence limit. That is why the policy choice was made for the original rule to use a simple average of the three highest chemical concentrations in a cluster to identify sites requiring further evaluation, and that original rule language has been retained. While this

may not be as conservative as calculating an upper confidence limit, Ecology has found this to be a reasonably conservative approach for identifying sediment sites.

Issue 7-4: Identifying station clusters of potential concern, -510(2)(c)(i)

- Commenters: Lon Kissinger (232), City of Seattle (264), King County (432,433)

Summary of comments received:

- Because three stations exceed a risk-based value does not mean that the risk-based concentration over the entire area of concern is exceeded. This approach should be revised to use an area-weighted average over a site or site unit.

- This approach also implies that if three stations were above regional background, it would be a station cluster of concern. This definition will result in vast areas of Puget Sound and other waterways as "station clusters of potential concern" because it will often be the case that at least three of the stations exceed these values.

- Delete "or background" as this is already included in the CSL.

- The definition does not specify how multiple chemicals are treated.

Response:

The rule language has been revised to specifically refer to regional background concentrations in -510(2)(c)(i). Once station clusters of potential concern are identified in -510, a hazard assessment and further evaluation may be conducted under -520 to determine if the station clusters of potential concern are identified as cleanup sites or areas for potential further investigation. Section -520(3)(d) has been revised to clarify that the three-station approach is only one approach for identifying cleanup sites or areas for potential further investigation based on regional background or human health criteria. This approach is appropriate for initially identifying sediment areas that may require further investigation. Ecology agrees that an exceedance of human health criteria at a single station does not necessarily equate to significant risk over a larger area and that area-weighted averaging may be an appropriate approach. In addition, -510(3) has been revised to clarify that notification is dependent on the results of the hazard assessment in -520.

The rule addresses each station and station cluster on an individual chemical basis. A station cluster of potential concern may be identified for multiple chemicals. The language was revised to clarify this intent.

Issue 7-5: Station clusters of low concern, -510(2)(d)

- Commenter: Weyerhaeuser (894)

Summary of comments received:

- The reference to (b)(i) can be shortened to (b); there is no (b)(i). There is a similar reference in -520(3)(a).

Response:

Ecology has revised the rule language appropriately.

Issue 7-6: No further cleanup action, -510(4)

- Commenter: King County (434)

Summary of comments received:

- The final sentence should be deleted, since this is a no further action decision.

Response:

Ecology is retaining the original rule language. This language refers to identified station clusters of low concern that have not been identified as cleanup sites. However, the sediment quality goal is the SCO, and Ecology must retain the ability to evaluate these station clusters if they are above the SCO.

Chapter 8: Hazard Assessment and Site Identification (WAC 173-204-520)

This chapter provides a summary of the rule amendments concerning how cleanup sites are identified. The chapter summarizes the proposed amendments to the rule (Section 8.1), describes differences between the proposed and adopted amendments to the rule (Section 8.2), and responds to public comments on the proposed rule (Section 8.3).

8.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included minor clarifications for consistency with the other proposed amendments.

8.2 Differences between the Proposed and Adopted Amendments

To ensure clarity and consistency, the following revisions were made:

- WAC 173-204-520(2)(a)(vi) was revised for consistency with other subsections.
- Clarification was added to WAC 173-204-520(3)(a) on how background concentrations are incorporated into site identification.
- WAC 173-204-520(3)(d) was re-worded to clarify how human health, background, other deleterious substances, and nonanthropogenically affected criteria are used to identify cleanup sites or areas for potential further investigation.
- The term "contaminant" was replaced with "chemical" to ensure consistent usage of the term and clarify the intent of separating evaluations based on chemical and biological criteria.

8.3 Responses to Comments

Issue 8-1: Human health risk approach, -520(2) and (3)

- Commenter: Lon Kissinger (205,233,235,236)

Summary of comments received:

- The three-station procedures used in this section for benthic criteria do not work as well for human health, which is typically based on an area-wide approach. The relevant exposure area and area-based chemical concentrations should be brought forward here.

Response:

Ecology has revised the rule language to clarify that the three-station method is one approach for identifying cleanup sites or identifying areas for potential further investigation based on CSL exceedances of regional background or human health criteria.

Issue 8-2: Contaminants exceeding the SCOs, -520(2)(a)(i)

- Commenter: King County (435)

Summary of comments received:

- How can one determine whether the SCOs have been exceeded before they have been set? Should be SQS, the original language.

Response:

Ecology is adopting the proposed rule language. The SQS criteria do not apply to Part V, only to Part III. The SCO language now applies to the numeric benthic criteria, which are established in the rule.

Issue 8-3: Contaminants exceeding the CSLs, -520(2)(a)(vi)

- Commenters: Lon Kissinger (234), King County (435)

Summary of comments received:

- Should this be "is <u>not</u> met"?

- How can one determine whether the CSLs have been exceeded before they have been set? Should be SQS, the original language.

Response:

Ecology has revised the original rule language from "met" to "not met" in -520(2)(a)(vi) to clarify the intent and make the language consistent with other subsections. The SQS criteria do not apply to Part V, only to Part III. The CSL language applies to the numeric benthic criteria, which are established in the rule.

Issue 8-4: Compiling information, -520(2)(f)

- Commenter: King County (436)

Summary of comments received:

- Please clarify that the responsibility is to collect the information that the department has available. It is too onerous to require an open-ended search.

Response:

Ecology is retaining the original rule language. These other sources will often include information not in Ecology's records. Ecology must maintain the authority to require submittal of existing and available sediment quality information from potentially liable persons to make appropriately informed regulatory decisions.

Issue 8-5: Station clusters of potential concern, -520(3)(a)

- Commenter: King County (437)

Summary of comments received:

- This may not need to be the same criteria that trigger a cleanup. The scale of the problem may not be broad enough to warrant action or a more detailed evaluation. For example, a small cluster of bioaccumulative chemicals may not create a tissue problem. Recommend leaving this open to department discretion but using some higher levels to trigger cleanup.

Response:

Ecology is retaining the original rule language. This rule language applies to benthic criteria and has worked well for identifying and managing sediment quality since adoption of the SMS rule in 1991. Rule language addressing the potential need to use a different approach for bioaccumulative chemicals has been added in -520(3)(d).

Issue 8-6: Site identification, -520(3)(b)

- Commenter: WSPA (874)

Summary of comments received:

- Insufficient detail is provided to understand what type of testing should be conducted for cleanup site determination. Also, if biological test results override chemistry, there is no apparent need to conduct chemical analyses. We recommend Ecology provide further clarification.

Response:

Ecology is adopting the proposed rule language. The rule references the benthic biological criteria and tests required in -562 and -563. The rule language states that biological test results

can override chemistry results and the option remains to conduct biological testing rather than chemistry.

Issue 8-7: Human health risk, -520(3)(d)

- Commenter: King County (433)

Summary of comments received:

- Delete “or background” as this is already included in the CSL.

Response:

The rule language has been revised to clarify that the CSL includes regional background and human health criteria.

Chapter 9: Evaluation and Listing of Sites (WAC 173-204-530)

This chapter provides a summary of the rule amendments concerning how identified cleanup sites are further evaluated. The chapter summarizes the proposed amendments to the rule (Section 9.1), describes differences between the proposed and adopted amendments to the rule (Section 9.2), and responds to public comments on the proposed rule (Section 9.3).

9.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included minor clarifications for consistency with other amendments.

9.2 Differences between the Proposed and Adopted Amendments

The rule language in WAC 173-204-530(6)(a)(i) was revised to reflect the intent of the original rule regarding delisting a site based on meeting cleanup requirements.

9.3 Responses to Comments

Issue 9-1: Site list, -530(1)

- Commenter: Waterkeepers (847)

Summary of comments received:

- Provide the name of the sediment site list as well as its location and the frequency with which it is updated.

Response:

Ecology provides a list of cleanup sites and accompanying documentation and information at the following web site: http://www.ecy.wa.gov/cleanup.html, which is updated regularly as new information is available. A search can be conducted using the "Cleanup Site Search Tool," the Integrated Site Information System, or the Facility/Site Database.

Issue 9-2: Site evaluation, -530(2)

- Commenter: Umatilla Tribes (345)

Summary of comments received:

- Clarify the role that human health plays in identifying sites that require remediation. Include a rationale addressing whether exceedance of a numeric standard triggers an evaluation and remedial investigation/feasibility study. There needs to be more explanation of how cumulative health risks relate to site identification and screening.

Response:

Ecology is adopting the proposed rule language. Section -520(3)(d) includes provisions for identification of potential cleanup sites and further evaluation or investigation based on CSL exceedances of human health or regional background criteria in -560 and -561. These criteria include risks from single and multiple chemicals associated with the site.

Issue 9-3: Site delisting, -530(6)(a)(i)

- Commenters: BP Cherry Point (178), Dow Chemical (357), Greenbrier (371), NAVFAC (513,522), SMWG (695)

Summary of comments received:

- This definition should be expanded from delisting of a site to delisting of a sediment cleanup unit. This would encourage early actions, expedite cleanup, and accelerate risk reduction for the overall site. Include covenants not to sue.

- There is no mechanism in the rule to reach remedy completion without meeting the SCO. The SMS rule should include mechanisms for reaching a final cleanup action.

- If the cleanup standards are close to background, the requirements of this section may be very difficult to achieve, especially when there is surrounding urban contamination.

- It appears that completing a cleanup action and meeting the standards is not sufficient for delisting, which may not be allowed until long-term monitoring and 5-year reviews have been completed. Sites could be delisted under Superfund but remain listed under MTCA.

Response:

Ecology is adopting the original rule language that allows delisting of sites, but not parts of sites (e.g., sediment cleanup units). Ecology anticipates that in appropriate situations, a settlement agreement may be entered into for a site unit. However, a settlement agreement with a potentially liable person for a unit does not mean that they have fulfilled their responsibilities for the remaining portions of the site. See Issue 6-4 for further detail.

The rule language has been revised by re-instating the original language in -530(6)(a)(i) to allow site delisting, along with final settlements, if required cleanup actions and cleanup standards have been achieved, excluding confirmational monitoring. Sediment cleanup standards may be above the SCO as provided under -560(2)(a)(ii).

Chapter 10: Types of Cleanup and Authority (WAC 173-204-540)

This chapter provides a summary of the rule amendments concerning cleanup authority. The chapter summarizes the proposed amendments to the rule (Section 10.1), describes differences between the proposed and adopted amendments to the rule (Section 10.2), and responds to public comments on the proposed rule (Section 10.3).

10.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included:

- The "Voluntary cleanup" subsection was changed to "Other party initiated cleanup" to reflect the reality that sediment cleanups cannot be conducted without an agency permit and oversight. Therefore, by definition under MTCA, they are not independent or voluntary cleanups.

- The "Partial cleanup" subsection was removed.

- The section number was changed from -550 to -540.

10.2 Differences between the Proposed and Adopted Amendments

To ensure clarity and consistency, the following revisions were made:

- The language was revised in -550(1) to better explain the intent of this section.

- The language was revised in -550(2) to clarify the authority under MTCA as it applies to a release or threatened release.

- The language was revised in -550(3) to clarify terms (remedial action), Part V under MTCA authority, and the role of CERCLA.

10.3 Responses to Comments

Issue 10-1: Types of cleanup and authority, -540(1)

- Commenter: King County (385)

Summary of comments received:

- It is not clear why Ecology would drop authority for cleanups under 90.48. This is an appropriate authority for cleanups and has been useful in the past under certain situations. We think this option should be retained.

Response:

Ecology has revised the rule language to clarify that Part V is promulgated under the MTCA law. The rule clearly states that Part V shall not be used in Ecology's implementation of federal Clean Water Act requirements. Ecology has not limited its authority to issue administrative orders under the Water Pollution Control Act to address a discharge of pollutants to waters of the state.

Issue 10-2: Voluntary cleanup, -540(2)

- Commenters: King County (438), Tom Newlon (722)

Summary of comments received:

- Ecology should reinstate voluntary cleanups. The deletion of voluntary cleanups suggests that all sediment cleanups would have to be done by Ecology or under an Ecology or EPA order or decree. However, voluntary cleanups have been an important tool for getting cleanup done in the past and require a number of federal and state permits to ensure that they are carried out in an environmentally beneficial manner. Voluntary cleanups help ensure that cleanup actions are conducted as early as possible.

- How does deletion of voluntary cleanups affect MTCA grant eligibility? King County has relied on these grants in the past as they are an important sediment cleanup tool. Please ensure that this does not affect grant eligibility.

Response:

Ecology is adopting the proposed rule language, which includes deletion of the reference to voluntary cleanups. This deletion is not intended to imply that all sediment cleanups have to be done by Ecology or through an Ecology or EPA order or decree. Under MTCA, "voluntary" or "independent" cleanups can be done without any Ecology oversight. However, for sediment cleanups, a truly "independent" cleanup is not feasible because of state and federal permitting requirements, which is why this provision was deleted.

Issue 10-3: Federal-conducted or supervised remedial actions, -540(3)(b)

- Commenters: NAVFAC (539), Tom Newlon (723)

Summary of comments received:

- Determination of all relevant and appropriate requirements (ARARs) is an important part of the CERCLA process. ARARs are identified on a site-specific basis. It is inappropriate to state that the SMS in its entirety will be an ARAR for federal cleanups.

- CERCLA provides that only state requirements that are more stringent than CERCLA are considered ARARs. Thus, not all of SMS can be considered an ARAR. State regulations

should not be providing interpretation of federal law, particularly when the interpretation may be incorrect.

Response:

Ecology is adopting the proposed rule language. This language does not direct the actions of EPA but rather indicates how the Ecology will respond when the SMS rule has been identified as an ARAR for a CERCLA cleanup action.

Issue 10-4: Incidental remedial actions, -540(3)(c)

- Commenters: Port of Olympia (612), WPPA (807)

Summary of comments received:

- We appreciate retaining incidental cleanups in the rule.

- We would like to tie this section to WAC 173-322-070 to allow ports and other local governments to utilize grant funds to help defray the costs of incidental cleanup. We are proposing a new subsection to WAC 173-322-080(2) to accomplish this. For incidental cleanup actions completed as part of a larger site where Oversight Remedial Action Grants have already been awarded, we would appreciate Ecology working with an eligible potentially liable person to allow the use of grant funds where appropriate.

Response:

Comment noted. Incidental cleanups are an important mechanism for making incremental progress for sediment sites. An amendment to WAC 173-322 is beyond the scope of this rulemaking, so no change has been made to that rule. Since there are no truly independent sediment cleanups, additional thought will need to be given to how MTCA grants could be made available for incidental sediment cleanups, should Ecology decide to include this in grant-eligible activities.

This page is intentionally blank.

Chapter 11: Remedial Investigation and Feasibility Study (WAC 173-204-550)

This chapter provides a summary of the rule amendments concerning the remedial investigation and feasibility study. The chapter summarizes the proposed amendments to the rule (Section 11.1), describes differences between the proposed and adopted amendments to the rule (Section 11.2), and responds to public comments on the proposed rule (Section 11.3).

11.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included:

- Re-titled "**Remedial investigation and feasibility study.**"
- Revised to focus on the content required to develop a remedial investigation and feasibility study.
- The requirements for remedy selection were moved to a new section -570, Selection of cleanup actions.
- The requirements for sediment recovery zones were moved to section -590, Sediment recovery zones.
- Terminology was revised to harmonize with MTCA.
- Added MTCA requirements to the SMS requirements to develop a remedial investigation and feasibility study work plan and report.
- Changed section number from -560 to -550.

11.2 Differences between the Proposed and Adopted Amendments

In response to comments received, the following revisions were made:

- Section -550(4) Remedial Investigation Work Plan, addition of:
    - Data gaps analysis.
    - Receptors and exposure pathways to the conceptual site model requirements.
    - Analytical methods requirements.
- Section -550(5): Public participation plan requirements for early coordination and consistency with MTCA were added.
- Section -550(6) Remedial Investigation Report:
    - Requirements were more clearly specified regarding what must be included in a remedial investigation report for a site or sediment cleanup unit.

- Consideration of land use classification was added.
- Impact on ecological receptors was included with reference to natural resources and habitat.
- Contaminant sources were clarified to be confirmed and suspected sources.
- Human health risk assessment language was re-instated.

- Section -550(7) Feasibility Study Report:
  - Language was clarified regarding terminology for sites and sediment cleanup units and contaminants, as well as requirements that must be included in a report for a site or sediment cleanup unit.
  - Some language in -550(7)(i) regarding sediment recovery zone requirements was moved to -590.

- -550(8) Sampling access was reinstated.

11.3 Responses to Comments

Issue 11-1: Scope, -550(2)

- Commenters: BP Cherry Point (192), Lon Kissinger (237), King County (384,439)

Summary of comments received:

- Add human and ecological receptors present, and current and potential future uses of the site.

- The rule may place a large burden for risk analysis on smaller sites. How can this be alleviated?

- Why is Ecology no longer willing to consider cost mitigation factors? Some liable parties genuinely don't have the financial resources, which could preclude cleanup.

- There are a number of areas where decisions are left to Ecology's judgment, providing uncertainty as to the level of effort. We understand some flexibility is appropriate for site-specific considerations, but overall there seems to be a lot of room for judgment calls by Ecology in the process.

Response:

Ecology is adopting the proposed rule. Human and ecological receptors, exposure pathways, and present and future uses of the site are factors that determine the scope of a remedial investigation/feasibility study (RI/FS).

Ecology does not agree that the rule increases the burden for smaller sites. The scope of an RI is dependent on site-specific circumstances. Additional flexibility for the required scope is built in by prefacing the RI requirements with "as appropriate."

Cost has been removed as a factor for determining the scope as it conflicts with the requirement for sufficient information to establish sediment cleanup standards and select cleanup actions. If a potentially liable person lacks sufficient resources to conduct an RI, options are available such as seeking contribution from other potentially liable persons, mixed funding under RCW 70.105D.070(2)(xi), or grants for public entities.

Ecology agrees there are a number of provisions that are left to Ecology's judgment. However, several advisory committee members stated that less detail is preferable to specific requirements in some cases. The intent of this language is to strike a balance between level of detail and discretion to move cleanup forward without conducting unnecessary analyses.

Issue 11-2: Remedial investigation work plan, -550(4)

- Commenters: Boeing (141), Lon Kissinger (238,239)

Summary of comments received:

- We support inclusion of a conceptual site model and cleanup action alternatives likely to be evaluated as part of the work plan, as this may expedite the overall process.

- This list seems incomplete. The conceptual site model should be expanded on. The work plan should describe what is known about ecological receptors, exposure pathways and areas, contaminant levels of concern associated with these pathways, locations and sources of contaminants, transport pathways, bioaccumulation, and natural and regional background concentrations. Data gaps to be filled should be identified.

- It may be challenging to develop a timeline for more complicated sediment sites such as urban bays.

Response:

The rule language has been revised to incorporate additional information where appropriate, and "schedule" has been changed to "proposed schedule." Ecology concurs that it will be challenging to develop a schedule for more complicated sites. This change is intended to reflect this reality.

Comment noted on conceptual site models and cleanup action alternatives.

Issue 11-3: Public participation plan requirements, -550(5)

- Commenters: Umatilla Tribes (344), Waterkeepers (848,849)

Summary of comments received:

- Add government-to-government consultation separate from the public participation process.

- The public notice period should be 30 days for smaller cleanups and longer for larger or more complex cleanups. This will allow for full public participation.

- The current requirements for the Public Participation Plan focus too much on getting information out to the public and getting information from the public. There is no actual dialogue or discussion with the public. We experience this in actual practice, with a disconnect between public concerns and agency response and action. We would like to have more discussion early in the work plan and RI/FS process. Otherwise we find that the decisions have basically been made before the public gets to weigh in.

- At a minimum, there should be early discussion with the public during selection of the biologically active zone, the proposed sediment cleanup standards, and the cleanup alternatives before the official RI/FS comes out for public comment.

Response:

Ecology has revised the rule language to encourage early public involvement by adding a reference to MTCA WAC 173-340-600, which provides for early public involvement, a minimum 30-day public comment period, and more detail on public participation.

The original rule contained a provision for appropriate coordination and consultation with affected tribes in -130(5), which is separate from the public participation requirements. This rule language has not been modified. Ecology has engaged in consultation with affected tribes at multiple sites as part of the sediment cleanup process. To avoid repetition, consultation has not been added to this subsection.

The Public Participation Plan requirements set out the minimum actions required at a site. On a site-specific basis, Ecology may determine that additional public outreach is appropriate. It is fitting to make this determination on a site-by-site basis to avoid unnecessary expenditure of resources.

Issue 11-4: Remedial investigation and feasibility study reports, -550(6) and (7)

- Commenters: Lon Kissinger (207,240), Tom Newlon (724)

Summary of comments received:

- The remedial investigation (RI) and feasibility study (FS) report contents do not provide all the information actually needed for site evaluation, comparison of cleanup alternatives, and selection of a cleanup action.

- The human health risk assessment was removed from the report contents and should be restored.

- There is no explicit mention of risks to ecological receptors.

- The report should include selection of background data and how site concentrations differ from background.

- Every element of a full RI/FS may not be needed for smaller sites and/or site units. The rule should maintain flexibility under these circumstances and add text to state that a streamlined approach may be used upon approval by Ecology.

Response:

Ecology has revised the rule language as follows:

- Additional information has been added where appropriate, including the requirement for a human health risk assessment.

- When background is the basis for a cleanup standard, information and analyses will be required explaining the basis for the site-specific cleanup standard.

- Additional flexibility for the required scope has been added by prefacing the feasibility study requirements with "as appropriate."

Issue 11-5: General site information, -550(6)(a)

- Commenter: King County (440)

Summary of comments received:

- This indicates that past and present owners must be listed. Is there a practical limit on the available information that needs to be considered? How far back in time do past operations need to be documented? Particularly for small cleanups, this could be onerous. Please clarify that this is only needed if trying to identify sources.

Response:

Ecology is retaining the original rule language. Owners and operators is a term with a specific meaning in MTCA. This includes past owners and operators that may have contributed to a release or owned the property at the time of the release. The extent of the information necessary to meet the remedial investigation requirements will be determined on a site-specific basis by Ecology.

Issue 11-6: Site conditions map, -550(6)(b)

- Commenters: AECOM (41,42), Boeing (142), DNR (824)

Summary of comments received:

- We support the inclusion of site unit boundaries and sediment cleanup standards in the remedial investigation (RI), assuming technical practicability is a consideration in setting the boundary. The proposed points of compliance and biologically active zone should be established in the RI, as these are risk-based.

- The site conditions map should also display ownership boundaries in relation to delineation of concentrations of chemicals of concern.

- Show the sediment cleanup unit boundary if part of a much larger site defined by low cleanup levels. [Refers to a previous version.]

- Include "proposed" or "potential" before cleanup standards, levels, and objectives, as these are not set at the RI stage. [Refers to a previous version.]

Response:

The rule language has been revised to reflect these comments.

Issue 11-7: Proposed sediment cleanup unit boundary, was -550(6)(b)(ii)(D), now -550(6)(b)(iii)

- Commenter: King County (441)

Summary of comments received:

- To propose a sediment cleanup unit boundary, regional background would need to have been established for some sites. Please clarify that Ecology would do this.

Response:

Please see the discussion under Issue 12-10, Regional Background.

Issue 11-8: Land use, -550(6)(c)(iv)

- Commenter: DNR (825)

Summary of comments received:

- The information collected should also include state/Department of Natural Resources (DNR) use authorizations, as well as information relating to the state land classifications at a site that determine the present and proposed land uses that DNR may allow under its statutory authorities. DNR is concerned that impacts to state-owned aquatic land management have not been addressed sufficiently in the rule. DNR is directed by statute

to manage these lands to provide a balance between public use and access, water-dependent uses, environmental protection, and utilizing renewable resources.

Response:

The rule has been revised by adding aquatic state land classification to this provision.

Issue 11-9: Natural resources and habitat, -550(6)(c)(v)

- Commenter: DNR (828)

Summary of comments received:

- It should be noted that the Department of Natural Resources (DNR) manages many of these natural resources and habitat under statutory requirements. These requirements should be recognized as applicable or relevant and appropriate requirements (ARARs).

Response:

Ecology is adopting the proposed rule language. DNR's requirements are considered potential ARARs where they meet the criteria specified in MTCA section -710. ARARs are required to be identified in the feasibility study in -550(7)(i).

Issue 11-10: Confirmed and suspected contaminant sources, -550(6)(d)

- Commenters: AECOM (20), Boeing (143), King County (442)

Summary of comments received:

- What is a "potential sources"? "Source," along with several modifiers such as diffuse, historic, ongoing, etc. are used in the rule. All such terms should be defined as this rule creates a broad undefined requirement for source control.

- Several lines of evidence should be considered when evaluating achievable and sufficient source control, including modeling.

- We believe it will be difficult to include a recommended compliance timeframe for source control in the remedial investigation (RI), before alternatives are evaluated in the feasibility study (FS). Therefore, we recommend moving this provision to WAC 173-204-550(7)(k) in the contents of the FS.

Response:

Ecology has revised the rule language as follows:

- "Potential sources" has been replaced with "suspected sources."

- A requirement to present information in the RI on "existing" compliance timeframes has been added. Ecology concurs that recommending a compliance timeframe this early in the site investigation process is inappropriate.

Ecology believes that sufficient flexibility exists in the FS requirements to require or allow the use of modeling and concurs that modeling is an important tool for evaluating source control effectiveness.

Issue 11-11: Feasibility study report, -550(7)

- Commenters: AECOM (24,43), Pioneer (583)

Summary of comments received:

- Recommend revising/reorganizing this section to present the entire process for evaluating remedial alternatives in the feasibility study (FS). The current text is confusing and many key concepts in the remedy selection process are incorporated only by reference.

- Recommend reorganizing this section consistent with EPA's nine remedy selection criteria, including threshold, balancing, and modifying categories.

- Multiple preliminary cleanup standards should be considered in developing alternatives to evaluate trade-offs among the evaluation criteria and fully represent site-specific conditions.

- Indicate that there could be different cleanup standards for different alternatives.

Response:

Ecology is adopting the proposed rule language. Ecology recognizes that cross-referencing may be confusing and some rearranging of text was done in the adopted rule to address this issue. However, eliminating all cross-references was not possible without creating a longer and more complex rule. Various members of the rule advisory committees mentioned that the MTCA disproportionate cost process for selecting sediment remedies works well and should not be replaced with new language in the SMS rule except where needed to integrate the two rules.

EPA's nine remedy selection criteria were considered during the original MTCA rule making in 1991 and subsequent revisions. Appropriate parts of these criteria were incorporated into the MTCA rule, which are now referenced in the SMS rule. Ecology decided not to revisit this decision based in part on SMS advisory committee feedback that the MTCA disproportionate cost process works well for sediment sites and a desire to maintain consistency between both rules.

At this stage in the remedy selection process, Ecology will have discussed with the potentially liable person the cleanup standards that are likely to be established for the site or site unit. The FS alternatives analysis evaluates different amounts and methods of cleanup to achieve these cleanup standards, but not different cleanup standards. For example, alternatives might include

different amounts of dredging or aerial extent of capping, coupled with monitored natural recovery and institutional controls.

Issue 11-12: Alternatives evaluation criteria, -550(7)(f)

- Commenter: Lon Kissinger (241), King County (444)

Summary of comments received:

- The evaluation criteria of protection of human health and the environment, as well as community acceptance, should be returned to the feasibility study report.

- All of the factors used to evaluate alternatives should not have been removed and need to be added back into WAC 173-204-570(3).

Response:

Ecology is adopting the proposed rule language. The above-mentioned factors are included in MTCA section -360, which is referenced in SMS -570(4).

Issue 11-13: Sediment recovery zones, -550(7)(j)

- Commenter: King County (443)

Summary of comments received:

- Why was subsection (E) removed? This concept is appropriate and should be incorporated into WAC 173-204-590.

Response:

Ecology is adopting the proposed rule language. This provision was moved to -590 for clarity.

Issue 11-14: Sampling access, -550(8)

- Commenter: King County (445)

Summary of comments received:

- Why was the section on sampling access removed? It does not appear to have been incorporated into other sections. It may be appropriate to include under each section in which sampling may be required or in -600.

Response:

The rule language has been revised by restoring this provision.

This page is intentionally blank.

Chapter 12: Sediment Cleanup Standards – General Requirements (WAC 173-204-560)

This chapter provides a summary of the rule amendments concerning how sediment cleanup standards are established. The chapter summarizes the proposed amendments to the rule (Section 12.1), describes differences between the proposed and adopted amendments to the rule (Section 12.2), and responds to public comments on the proposed rule (Section 12.3).

12.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included:

- The section was re-titled to "**Sediment Cleanup Standards—General Requirements.**"
- The existing two-tier framework of an upper and lower tier of allowable concentrations for determining a cleanup standard was retained and expanded to include cleanup standards for protection of human health, the marine and freshwater benthic community, and higher trophic level species.
- The section incorporates background sediment concentrations and practical quantitation limits into the two-tier framework. Two types of background were included in the two-tier framework: natural and regional.
- For Part V, the term "sediment quality standard" was replaced with the existing term "sediment cleanup objective (SCO)" and the term "minimum cleanup level" was replaced with "cleanup screening level (CSL)." These terminology changes were necessary to separate Part V terminology from Parts I–IV due to Ecology's decision to promulgate Part V under MTCA authority only.
- The criteria for establishing a cleanup standard was changed from "cost, technical feasibility, and net environmental benefit" to "technical possibility and net adverse environmental effects."
- The process for establishing cleanup standards between the SCO and CSL was clarified.
- It was clarified that Ecology may determine that a potentially liable person has met their cleanup obligations at a site when the cleanup standards have been met.
- The section number was changed from -570 to -560.

12.2 Differences between the Proposed and Adopted Amendments

In response to comments received, the following revisions were made:

- Clarified the process of adjusting the sediment cleanup standard upward from the SCO in -560(2)(a).

- Clarified that the criterion for higher trophic level species is the no adverse effects level in -560(3)(a) and -560(4)(a).

- Added provisions for regional background in areas where regional background has not been established in -560(5).

- Clarified the definition of point of compliance in -560(6).

- Added provisions for compliance monitoring that included area-averaging approaches in -560(7).

To meet the intent of the authorizing statute, the applicability of Part V in determining cleanup standards was clarified in -560(1).

12.3 Responses to Comments

Issue 12-1: Applicability and purpose, -560(1)

- Commenters: Umatilla Tribes (320,332), Landau Assts. (496), Weyerhaeuser (895)

Summary of comments received:

- SMS standards should include radionuclides, given that there are rivers with radionuclide contamination in Washington. Please clarify whether this is the case and whether risks from chemicals and radionuclides would be combined.

- Clarify whether this rule addresses microbial agents.

- While MTCA contains this language, it is not obvious how the SMS would be applied to a threatened release. Is this just boilerplate language, or are there provisions in the SMS that Ecology believes would work better than the water quality program to regulate discharges of contaminants? How would a station cluster of potential concern ever be defined based on a threatened release?

Response:

The rule amendments do not change the applicability of MTCA. Ecology has the authority to regulate releases or threatened releases of hazardous substances (RCW 70.105D.030). The term "hazardous substance" is defined in RCW 70.105D.020(10). Among other things, MTCA includes as "hazardous substances" those materials that are considered "hazardous substances" under the federal cleanup law (the Comprehensive Environmental Response, Compensation and Liability Act). Radionuclides are captured within MTCA's definition through this incorporation. To the extent the state is not preempted by the federal Atomic Energy Act of 1954, Ecology may

apply MTCA to releases of radionuclides. However, before doing so, Ecology will consider the potential application of other authorities to address such releases pursuant to WAC 173-340-310(5)(d)(iii) and WAC 173-204-540(2). If Ecology applies MTCA to releases of radionuclides, Ecology will assess their hazards site-specifically.

Regarding microbial agents, if such an agent (or a byproduct from its decomposition) is determined to be a "hazardous substance" under MTCA, then Ecology may regulate the release or threatened release of that substance and establish cleanup standards for that substance. Risks to human health would be assessed under -561. Risks to the benthic community would be assessed under -562 or -563, as applicable.

The rule amendments do not change Ecology's authority to regulate threatened releases of hazardous substances under MTCA (RCW 70.105D.030). Examples of threatened releases to sediment include eroding banks with contaminated soils, contaminants in groundwater reaching a shoreline, or sunken vessels. Any of these could threaten release of hazardous substances to sediments and require action to prevent or minimize such a release to protect sediment quality. A station cluster of potential concern would not be defined based on a threatened release.

Issue 12-2A: Method for establishing sediment cleanup levels – support, -560(2)

- Commenters: AECOM (6), AWB (76), Boeing (100), Greenbrier (371), Landau Assts. (489), Pioneer (571), WSPA (864)

Summary of comments received:

- We agree with a two-tiered approach for establishing cleanup standards for ecological and human health. Maintaining site-specific flexibility is critical to success of the rule.

- Regional and natural background concentrations are important elements of the two-tiered framework.

Response:

Comments noted.

Issue 12-2B: Method for establishing sediment cleanup levels – protectiveness, -560(2)

- Commenters: Yakama Nation (274,280), Umatilla Tribes (315), NWIFC (543,549,550), CILP (668,672,681), Spokane Tribe (700), Squaxin Island Tribe (707,708), Suquamish Tribe (740,745), Swinomish Tribe (755,756), Tulalip Tribes (775), Waterkeepers (842,846)

Summary of comments received:

- The two-tiered approach is not as protective as it should be. The SCO should be based on natural concentrations and the CSL should be removed from the rule. Minor adverse effects should not become the new baseline.

- SCO and CSL should be based only on risk-based concentrations and not regional background.

- There are too many ways to move the cleanup standards upward from protective risk-based concentrations, including natural background that includes anthropogenic contamination, regional background, and median practical quantitation limits (PQLs). This sets a low bar for cleanups and allows potentially liable parties to walk away and leave contamination that carries high risks to high fish consuming populations in place in perpetuity.

- The rule allows cleanup standards to be "as close as practicable to the SCO based on technical possibility and adverse environmental impacts." Practicability includes consideration of cost, which is not an appropriate basis for allowing less protective cleanups. Do not include language in the SMS that allows cleanups to be based on the least protective option, regardless of the amount of contamination remaining.

- Rather than adjusting the cleanup standards upward, Ecology should demonstrate how it will meet its objective of reducing and ultimately eliminating adverse effects on biological resources and significant health threats to humans from surface sediment contamination.

Response:

Ecology is adopting the proposed rule language with a two-tier framework for setting cleanup standards that includes the SCO (which may be based on natural background) and the CSL (which may be based on regional background).

The original rule allowed a cleanup standard to be adjusted above the SCO up to the CSL. For benthic risks, the CSL is the minor adverse effects level. Therefore, establishing a cleanup standard between the SCO and the CSL does not set a new baseline.

Ecology agrees that setting cleanup standards strictly based on risks to human health and the environment would be more conservative than the proposed rule, which incorporates anthropogenic background. However, this type of framework would not be consistent with WAC 173-340 and is an infeasible approach for most cleanup sites. Ecology must consider background concentrations as a practical alternative for getting cleanup accomplished.

Ecology agrees the proposed rule was not clearly written regarding the intent of the term "practicable." Ecology has revised the proposed rule language in -560 to clarify that upward adjustment from the SCO is to be based on technical possibility and net adverse environmental impacts. A new definition of "practicable" has been added to -505 as it relates to remedy

selection. Practicability, which includes consideration of cost, is factored in during the remedy selection process in -570.

Ecology believes that the sediment quality goal of eliminating adverse effects to biological resources and significant health threats to humans can be met by adopting the proposed rule, which provides a protective and implementable framework for conducting cleanup followed by effective statewide source control measures.

Issue 12-2C: Method for establishing sediment cleanup levels – practicability and cost, -560(2)

- Commenters: AECOM (1), Anchor QEA (71), AWB (86), Boeing (93,103), Boise (161), BP Cherry Point (170,184), City of Seattle (265), Dow Chemical (357), Georgia-Pacific (367), Greenbrier (371), King County (374,378), Landau Assts. (497), NAVFAC (511,516,520), Nippon (541), Pioneer (584), Port of Olympia (603,613), Port of Port Angeles (641), Port of Seattle (654), SMWG (690), Tom Newlon (718,725,726), WPPA (810,813)

Summary of comments received:

- In adjusting cleanup standards upward from the SCO, retain the previous rule language allowing consideration of technical practicability, net environmental benefit, and cost, rather than "technical possibility." This approach has been used for more than 20 years successfully.

- The previous rule language stating "the cleanup level will be selected within the allowable range between the SQS and CSL and be as close as practicable to the cleanup objective" should remain as it was.

- While harmonizing MTCA and SMS is a valid goal, there are important differences between upland and sediment cleanups that warrant consideration. The proposed approach is less flexible than the current rule and does not reflect the complexities and uncertainties of cleaning up sediments.

- Retain consideration of cost in setting site-specific cleanup levels as it has provided valuable flexibility in the existing rule. It also reflects the realities that municipalities and counties face when prioritizing among various environmental projects and programs with limited funds.

- Using the term "technically possible" excludes consideration of cost and would result in highly problematic cleanup scenarios that are too large, long-term, expensive, and impactful to the environment. This will likely impede progress at cleanup sites. Replace with "technically practicable."

- Cost needs to be considered when setting the cleanup standard. It is not as helpful to do it later in the process while evaluating alternatives, because there are fewer cost-effective alternatives for cleanup up sediments than there are upland sites.

- If this language is retained, "adverse impact on the aquatic environment" should include both short- and long-term positive effects as well as both short- and long-term adverse impacts.

- Natural background should not be the goal in urban areas that have been impacted by long and complex histories of industrial use. Regional background is a much more reasonable goal under these circumstances. The rule does not explain how an isolated site can achieve and maintain natural background levels in such an area.

- We are concerned that the approaches Ecology is currently considering will not provide enough separation between site units and bay-wide contamination. It will not help to expedite cleanups if regional background is set too low, especially since the human health and practical quantitation limit components are already similar.

- The implications of the changes to the human health criteria are that nearly every site will require cleanup to natural background, leaving these areas on the impaired sites list even after cleanup to regional background. This does not make sense in terms of moving sites forward and off the cleanup list.

Response:

Ecology is adopting the proposed rule language. Ecology acknowledges that removal of cost as a factor in establishing sediment cleanup levels is an important change. However, Ecology believes this change is appropriate as it clarifies the process of setting sediment cleanup levels and should be considered in the context of other changes to the rule that increase flexibility for setting sediment cleanup levels and managing the obligations of a potentially liable person (PLP). Those changes and the factors Ecology considered are discussed below.

1) Under the adopted rule, the sediment cleanup level may be set above the SCO. Similar to the original rule, sediment cleanup levels may be established within a two-tier framework: the SCO as the lower tier and the CSL as the upper tier. Sediment cleanup levels may be established above the SCO, but no higher than the CSL.

   Under the adopted rule, the factors that may be considered when establishing sediment cleanup levels have changed. While cost is not considered, sediment cleanup levels may be established above the SCO if achieving the SCO is not technically possible or results in net adverse environmental impacts.

2) Under the original rule, the SCO defined the scope of remedial action (the goal for cleanup) and the obligations of a PLP. Once a cleanup site was identified, the SCO defined the level above which a PLP retained obligations at the site and some type of remedial action (such as dredging and monitored natural recovery, including sediment recovery zones) was necessary.

   Under the adopted rule, the sediment cleanup level, not the SCO, defines the scope of remedial action (goal for cleanup) and the obligations of a PLP at the site. This is a significant change from the original rule and provides more flexibility in management of a site. As noted above, the sediment cleanup level may be established above the SCO if

specified conditions exist. This change may therefore reduce the scope of remedial action, allowing for a PLP to meet their obligations at a site sooner than under the original rule.

3) Under the original rule, the SCO defined the scope of remedial action and a PLP's obligations at a site. Cost was not considered when setting this goal, but was considered when selecting the means of achieving that goal (cleanup actions) and the sediment cleanup level.

   Under the adopted rule, the sediment cleanup level defines the scope of remedial action and a PLP's obligations at the site. Cost is not considered when setting this goal, but may continue to be considered when selecting the means of achieving that goal (cleanup actions) and the concentrations at which different cleanup action components are performed (remediation levels).

4) Under the original rule, there was not a clear process for incorporating cost to establish sediment cleanup levels, which has resulted in inconsistent cleanup decisions and delays.

   Under the adopted rule, consideration of cost is consistent with the MTCA rule, in which cost may only be considered when selecting the means of achieving the goal (cleanup actions) and the concentrations at which different cleanup action components are performed (remediation levels). The reasons for this decision are discussed in Ecology (1991), Part VII. In -570(4), Ecology incorporated the disproportionate cost analysis from the MTCA rule. This analysis is used to determine whether a cleanup action is permanent to the maximum extent practicable. By providing a clear and consistent process for selecting cleanup actions, Ecology expects to reduce confusion and delays.

5) Under the original rule, which included application of the requirements in the MTCA rule, natural background was considered when establishing both the SCO and the CSL. However, anthropogenic background and the potential for recontamination were not considered when establishing the CSL.

   Under the adopted rule, natural background is still considered when establishing the SCO. In addition, regional background is now considered when setting the CSL. The CSL is the highest of regional background, the practical quantitation limit, or a risk-based level. As discussed above, sediment cleanup levels may be established as high as the CSL under certain conditions. The concept of regional background is intended to address the recontamination potential of the site or site unit that is likely to occur from diffuse sources outside the site or outside the authority of the potentially liable person. For more discussion on which sources are considered when establishing regional background, see the response to Issue 12-10B. Where appropriate, regional background is intended to be clearly different than natural background. For more discussion, see the responses to Issues 12-10A through 12-10C.

   Ecology may already consider anthropogenic background when setting cleanup levels for other media under MTCA, including ground water, surface water, and air (WAC 173-340-706(1)(a)). While anthropogenic background is considered differently for sediments than for these other media, this change to the rule makes it more consistent with the MTCA rule. For discussion of why it was included in the MTCA rule, see Ecology (1991), Part XIV.

6) Under the original rule, a narrative standard existed for human health of "no significant health threat to humans." Ecology determined that the more specific human health provisions (including target risk levels) in the MTCA rule must be used to interpret this narrative standard for cleanup purposes. Therefore, under the original rule a target risk of one in one million (1×10^{-6}) was considered when establishing both the SCO and the CSL.

   Under the revised rule, the human health CSL for carcinogens is based on a target risk of one in one hundred thousand (1×10^{-5}) and the SCO is based on a target risk of one in one million (1×10^{-6}). This is a change from the original rule and increases the flexibility in how sediment cleanup levels are set.

Regarding consideration of net adverse environmental impacts when adjusting sediment cleanup levels above the SCO, the rule language has been revised to incorporate both short- and long-term positive effects and adverse impacts in -560(2)(a)(iii)(B). For examples of how net adverse environmental impacts would be considered when setting sediment cleanup levels, see the response to Issue 6-13.

The concept of background, including both regional and natural background, is intended to address the complex nature of sediment contamination. Under the adopted rule, natural background is considered when establishing the SCO in -560(3)(b) and regional background is considered when establishing the CSL in -560(4)(b). The SCO may not be established below natural background. As noted above, the sediment cleanup level may be adjusted upward above the SCO if certain conditions exist. The sediment cleanup level, not the SCO, defines the goal for cleanup.

The current 303(d) sediment listing Policy 1-11 allows sediment listings to be moved from Category 5 (the 303(d) list) to Category 4B (the approved total maximum daily load/cleanup plan list) once a Cleanup Action Plan or Record of Decision is final. However, Ecology plans to update Policy 1-11 before the effective date of the rule to reflect the revisions to Part V of the rule, which states that Part V may not be used for federal Cleanup Water Act purposes. The current Policy 1-11 will not apply once the adopted rule is in effect.

Issue 12-2D: Method for establishing sediment cleanup levels – other modifications to the framework, -560(2)

- Commenters: AECOM (45), Boise (160,167), Colville Tribe (295,308,314), Umatilla Tribes (324), Georgia-Pacific (367), NAVFAC (512), Nippon (541), NWPPA (564,570), Pioneer (585), Tom Newlon (727), USDOI (804)

Summary of comments received:

- Allow upward adjustment of the CSL or of standards above the CSL if it is not practicable to achieve.

- There is no need to give Ecology discretion to establish more stringent cleanup levels beyond the procedures for adjustment already included in the rule. Section 540(2)(b) should be deleted.

- Several sections of the rule allow site managers to adjust cleanup standards to be more stringent based on site-specific information, yet upward adjustment is not allowed. Modifications should allow adjustment in either direction based on sound science and site-specific information.

- Provide a basis for establishing sediment cleanup levels below the SCOs. In particular, tribal laws and regulations must be acknowledged as applicable. Incorporate tribal standards for water bodies within reservations and usual and accustomed fishing areas.

- Allow for use of regional background to set the SCO in recognition that diffuse sources are responsible for most sediment deposition. Setting the cleanup goal at natural background effectively eliminates the use of regional background and consideration of diffuse, non-point sources.

Response:

Ecology is adopting the proposed rule language. Sediment cleanup levels may not be adjusted above the CSL. The CSL is used to identify cleanup sites and to establish an upper bound on sediment cleanup levels. Cleanups that do not achieve cleanup standards are considered interim actions under MTCA (WAC 173-340-430).

Ecology needs to maintain the authority to require more stringent cleanup levels on a site-specific basis to protect human health and the environment. The proposed rule allows upwards adjustments from the SCO in -560(2)(a)(ii) as appropriate.

The original rule contained a provision in -130(5) for appropriate coordination and consultation with affected tribes. This rule language has not been modified. In addition, the proposed rule language has been revised in -505(2) to state that Ecology may determine, on a site-specific basis, that tribal laws are relevant and appropriate requirements provided certain criteria are met. See Issue 3-4 for further detail on applicable laws.

Issue 12-2E: Method for establishing sediment cleanup levels – clarity, -560(2)

- Commenters: City of Seattle (265), NAVFAC (519), Port of Olympia (604), WPPA (810)

Summary of comments received:

- The use of the term “practicable” and “technically possible” in the same sentence on adjusting the SCOs upward is internally inconsistent and likely to cause considerable confusion, since one allows consideration of cost and the other doesn’t.

- It is not clear where in the remedial investigation/feasibility study process “technically possible” and “adverse environmental impacts” are evaluated. It is also not clear how consistent this language is with Figure 1, which seems to allow consideration of toxicity test results, food web modeling, and background in selecting the cleanup level. Please clarify and better define this process.

Response:

Ecology has revised the proposed rule language to clarify the definition of "practicable," which has been added to -505. The figure that accompanied the proposed rule language was provided for clarification and was not part of the rule language. It stated that the cleanup level is established as close as "practicable" to the SCO, but was not intended to include cost as a factor. The intent of the proposed language was that the SCO would be the starting concentration and, to adjust upward from the SCO, both technical possibility and net adverse environmental impacts must be considered. Cost is not a factor when adjusting the cleanup level, but cost is considered during the remedy selection process. Ecology agrees that the proposed rule language did not clearly state this intent, due to the definition of "practicable" in -200.

The remedy selection process includes establishment of sediment cleanup standards, including sediment cleanup levels and points of compliance. This process is detailed in -560 and referenced in -570(3)(c). Proposed cleanup standards are established before the feasibility study and are not intended to require a separate disproportionate cost analysis. Cleanup standards are finalized upon approval of the Cleanup Action Plan.

Issue 12-3: Sediment cleanup objectives, -560(3)

- Commenter: Umatilla Tribes (346)

Summary of comments received:

- Clarify in plain language whether the "highest cleanup level" means the most stringent level or the highest allowable concentrations (least stringent level).

Response:

The adopted rule language sets the SCO, which is the lower end of the range for establishing a sediment cleanup level, as the highest concentration of the following:

- Natural background concentration.
- Practical quantitation limit.
- Risk-based concentration.

Issue 12-4: Establishing background concentrations, -560(3)(b), (4)(b), and (5)

- Commenters: AECOM (2), BP Cherry Point (172,173), Lon Kissinger (242), Colville Tribe (292,309,311)

Summary of comments received:

- The process of setting background concentrations should be transparent, collaborative, and peer-reviewed.

- The process of setting background concentrations should be consistent across sites.

- The proposed rule fails to adequately define or provide a consistent basis for determining natural or regional background. Because this is such an important part of setting cleanup standards, Ecology should define background concentrations or formal procedures for determining them.

- Ecology should assume the responsibility for determining background concentrations for larger embayments and watersheds to ensure consistency. The most recent and comprehensive data sets should be used, ensuring that data are of appropriate quality and extent. Statistical tests should be used that are more ecologically conservative. Potentially liable persons should also have the opportunity to propose alternative chemical-specific values or geographic scale for consideration by the department.

- Procedures for selecting or developing regional background data and the statistics used to characterize background should be provided.

Response:

Ecology has revised the proposed rule language to clarify how regional background will be established. Natural or regional background concentrations will be set by Ecology.

Ecology plans to conduct the work to establish regional background in a select number of bays in Puget Sound. In addition, at the direction of Ecology, a potentially liable person may be required to compile and collect data to be used by Ecology in setting regional background for a site. This process will be collaborative and transparent and Ecology anticipates providing opportunity for stakeholders to review and comment on sampling plans and results. As the work is conducted, Ecology will incorporate the results into the Sediment Cleanup Users Manual II as case studies to provide methodological and protocol recommendations.

Ecology intends to ensure consistency regarding sampling and analytical methods, statistical analyses, parameters, and processes used to determine regional background among regions through appropriate agency oversight and providing guidance in the Sediment Cleanup User's Manual II.

Ecology has decided not to include regional background concentrations for any chemical in the rule as concentration will change, and likely decrease, over time. Because regional background will likely not be static, it would not be appropriate to identify in rule. Ecology will review and establish background concentrations for each site as appropriate.

Issue 12-5: Area-weighted averaging, -560(3)(a)(i),(iii) and (4)(a)(i),(iii)

- Commenters: AECOM (2,22), BP Cherry Point (183)

Summary of comments received:

- The rule should recognize that standards to protect human health and higher trophic levels are usually not applied on a point-by-point basis, and should allow for area-weighted averaging.

Response:

The proposed rule language has been revised in -560(7) to reflect the option of using an area-weighted averaging approach to establish compliance with sediment cleanup standards.

Issue 12-6: Higher trophic levels, -560(3)(a)(iii) and (4)(a)(iii)

- Commenter: King County (446)

Summary of comments received:

- The SQO and CSL requirements for higher trophic levels are the same, whereas they are different for human health and benthic invertebrates. A similar tiered structure needs to be presented for higher trophic levels.

Response:

Ecology is unable at this time to establish a two-tiered framework for higher trophic levels. If the science advances to allow establishment of numeric criteria at SCO and CSL levels, Ecology will consider adoption into guidance or rule as appropriate. See the Sediment Cleanup Users Manual II for the most current information on tissue concentrations protective of fish, wildlife, and birds and alternatives for developing sediment concentrations based on these tissue concentrations.

Issue 12-7: Natural background, -560(3)(b)

- Commenters: Umatilla Tribes (330), Suquamish Tribe (746), DNR (821), WSPA (864)

Summary of comments received:

- We recommend that Ecology establish natural background levels that are representative and scientifically sound.

- Ecology does not have adequate data to define natural background in sediments or tissues, particularly given the inclusion of persistent organic compounds in the definition. This database would be crucial to the regulatory decision-making process, and should not be left to potentially liable persons as a piecemeal effort.

- In determining natural background, older data may have higher limits of detection or practical quantitation limits, which could introduce statistical bias. What methods will Ecology use to ensure that such biases will not be introduced?

- These levels should not be allowed to increase over time.

Response:

Ecology's intent is to utilize latest science and appropriately representative data to establish natural background. Ecology believes that sufficient data exists for certain chemicals to establish a Puget Sound-wide natural background. However, Ecology agrees that additional data for some chemicals, such as carcinogenic polynuclear aromatic hydrocarbons and polychlorinated biphenyl congeners, is necessary to establish natural background. Ecology will work to continue to build an appropriate database.

Appropriate quality assurance/quality control measures will be employed to ensure the data are screened for appropriate practical quantitation limits.

Ecology does not anticipate that natural background concentrations will increase over time.

Issue 12-8: Practical quantitation limits (PQLs), -560(3)(c) and -560(4)(c)

- Commenters: Larry Dunn (193,196), Yakama Nation (274), Colville Tribe (293,312), Umatilla Tribes (315), NWIFC (543,553), CILP (674), Spokane Tribe (700,703), Squaxin Island Tribe (707,708), Suquamish Tribe (740,747), Swinomish Tribe (759), Tulalip Tribes (775), USDOI (802), DNR (822)

Summary of comments received:

- The PQL should not be used in setting the sediment cleanup objective, only risk-based levels or natural background.

- PQLs are inappropriate if they are not below risk-based levels. For all of the contaminants addressed in the rule, methods have been developed with detection limits sufficient to assess human health and ecological risks. Therefore, there should be no need to adjust cleanup standards (either SCO or CSL) upward to PQLs.

- PQLs may go down over time and/or vary from method to method. Thus, it is possible that if the PQL is used as the cleanup standard, different concentrations may be quantifiable between when the cleanup standard is set and when the remedy is implemented, especially for contaminants such as dioxins. How will Ecology handle a lowered SCO or CSL in these cases?

Response:

Ecology is adopting the proposed rule language that provides for establishment of a cleanup standard at the PQL. This provision is consistent with MTCA and takes into account the ability to implement a cleanup and achieve cleanup standards that are within reliable analytical limits.

The use of PQLs that are reliably reproducible by laboratories is necessary to allow for effective and implementable cleanups and monitoring. For certain chemicals, such as dioxins/furans,

concentrations at regulatory risk-based levels may be an order(s) of magnitude lower than can currently be reliably measured. Establishing a PQL or measuring compliance below this concentration is infeasible.

Cleanups with standards established at the PQL must undergo periodic reviews, which includes using latest science to review compliance with standards, remedy effectiveness, and lower PQLs if determined appropriate for protection of human health and the environment. If lower PQLs are routinely achievable at the time of the periodic review, Ecology could consider using these values at that time.

Issue 12-9: Cleanup screening level, -560(4)

- Commenters: AECOM (49,52,53), Waterkeepers (842)

Summary of comments received:

- The CSL should not be set below the highest of the risk-based level, regional background, and the practical quantitation limit (PQL).

- To be protective of human health and biota, the CSL should be the lowest of the three values, not the highest.

Response:

Ecology is adopting the proposed rule language. The CSL is established at the highest of the risk-based level, regional background, or PQL. The CSL is used to identify cleanup sites and serves as the upper bound of potential cleanup standards. The SCO, which is lower (more stringent) than the CSL, is the sediment quality goal. The sediment cleanup standard for a site is set within this range, as close as technically possible to the SCO.

Issue 12-10A: Regional background – concept, -560(5)

- Commenters: Anchor (67), City of Seattle (259), Yakama Nation (274,279), Umatilla Tribes (315), Georgia-Pacific (363), Landau Assts. (498), NWIFC (543), Pioneer (571,586), Port of Olympia (615), Port of Port Angeles (634), Port of Seattle (650), CILP (682), Spokane Tribe (702), Squaxin Island Tribe (707,708), Tom Newlon (728), Suquamish Tribe (740,748), Swinomish Tribe (758), Tulalip Tribes (775), Waterkeepers (842), Weyerhaeuser (896)

Summary of comments received:

- Regional background must be greater than natural background concentrations in areas with diffuse non-point sources for the two-tier framework to be useful. We are concerned that the approaches Ecology is currently considering will not provide enough separation between site units and bay-wide contamination. It will not help to expedite cleanups if regional background is set too low, especially since the human health and practical quantitation limit components are already similar.

- The concept of regional background could allow existing widespread concentrations to remain indefinitely, harming cleanup and restoration efforts across the state. It is likely that past reductions in widespread contamination would not have been achieved if this concept had been in place. Ecology should remove regional background from the rule.

- Regional background is not a measure of protectiveness, as it incorporates impaired conditions that may present a threat to human health or the environment. This concept could result in a downward spiral of residual contamination, fish advisories, and ever less protective cleanups. Regional background should not be used in setting cleanup standards.

- We find this concept alarming. Under this approach, sediments in entire regions could increase in toxicity incrementally, and no-one would be held accountable. This approach will disproportionately affect lower-income citizens, who already struggle with the impacts of contamination and habitat loss. The target for cleanup should be natural background, even if it takes many years to achieve. We request that regional background be removed from the rule.

- We are concerned at how it appears background may be defined in areas affecting our waters. Regional background leaves too many avenues for leaving contamination in place when political will for cleanup is lacking. We request that it be removed from the rule.

- Concentrations below regional background should be addressed through source control programs rather than through MTCA.

- Regional background is already defined in -200. This definition is slightly different and should be referenced to section -200 or the first sentence deleted.

Response:

Regional background is an important new concept in the rule. It is intended to accelerate the cleanup of complex sites by providing a straight-forward way to define and clean up units, which are typically areas with high levels of contamination, and to bound cleanup levels so that cleanup can proceed expeditiously. Providing options for expediting cleanups in these areas will significantly reduce exposure and risk to humans and aquatic life. Areas defined as cleanup units will predominantly be located in the nearshore environment, which provides critical habitat for aquatic life and poses high risk to humans by direct contact with sediment, eating shellfish living in the nearshore, or eating fish that accumulate contaminants from aquatic life living in the nearshore.

Ecology's experience has shown that cleanup of more highly contaminated areas, source control, and other pollution reduction and prevention efforts can significantly reduce overall baywide contaminant levels and contribute to habitat and natural resource restoration. Examples include the cleanups and ongoing source control efforts in Commencement Bay in Tacoma and Elliott Bay in Seattle. Long-term monitoring has shown concentrations for some chemicals decreasing over time (https://fortress.wa.gov/ecy/publications/publications/1003021.pdf and https://fortress.wa.gov/ecy/publications/publications/0903043.pdf).

It is expected that regional background will gradually decrease over time as sediment contamination caused by current and historic sources and ongoing releases continues to be cleaned up and broad scale source control and pollution prevention programs are effectively implemented.

Ecology acknowledges that for this concept to work optimally, regional background must be distinguishable from contamination caused by specific releases or sources, such as a wastewater outfall or a cleanup site. This may not be possible in all areas or embayments.

If Ecology determines that a potentially liable person has met their cleanup obligations for individual sediment cleanup unit(s), this does not mean that the potentially liable person has met their obligations for the remainder of the site in which the unit(s) are located.

Issue 12-10B: Regional background – inclusion/exclusion of sources, -560(5)

- Commenters: Anchor (67), AWB (82), Boeing (101), BP Cherry Point (172,173), Larry Dunn (197), Umatilla Tribes (331), Dow Chemical (357), Georgia-Pacific (363), Greenbrier (371), King County (400,448), Landau Assts. (498), NWIFC (543), Pioneer (586), Port of Olympia (614), Port of Seattle (650), SMWG (689), Squaxin Island Tribe (707), Suquamish Tribe (740), Swinomish Tribe (758), Tulalip Tribes (775), WPPA (814)

Summary of comments received:

- "Diffuse non-point sources not attributable to any source" needs to be better defined. All contaminants have a source, though it may not be well controlled. How do stormwater and CSO sources fit into this definition? We assume these would be included, because the inputs are often diffuse within the drainage basin, and it is difficult to find specific sources to control.

- Regional background should include contributions from non-point sources such as stormwater, even if they are collected into a pipe or drainage ditch. Edit this section as follows: "…primarily attributable to <u>diffuse sources, such as</u> atmospheric deposition or storm water, <u>outside a depositional zone of discharge</u> ~~diffuse nonpoint sources not attributable to any source~~.

- Setting regional background at levels that do not include contributions from nearby point sources, especially those that may not be controlled in the near future, will inevitably result in recontamination of the cleanup site. Demonstrating who is responsible for the resulting recontamination may be exceedingly difficult. This approach does not reduce risk below levels that could be achieved by setting the cleanup standard at the level that takes into account the existing point source, nor is this type of remedy cost-effective or sustainable. Regional background should be expanded to include these sources.

- Regional background should exclude elevated levels of contamination (i.e., "known or suspected contaminant sources").

- Ecology should not be too conservative in what data it excludes for regional background. It is often difficult to distinguish between influences from "diffuse non-point sources" and a "suspected contaminant source."

- It is not clear how a liable party could demonstrate that stormwater or atmospheric deposition is not related to a specific source or release.

- How will regional background be determined if a bay has been impacted over many generations?

- Explain how Ecology will manage combined point and nonpoint sources in the Yakima River using this concept.

Response:

Ecology agrees that regional background is a key concept in the proposed rule. Regional background is a necessary concept due to the unique nature of sediment as a repository for contaminants and the continuous movement of contaminants in the aquatic environment. Sediments receive contaminants from diffuse sources such as surface runoff from numerous point and nonpoint stormwater discharges and air deposition. These types of sources may not be distinguishable from one another and do not have distinct and identifiable depositional zones. Ecology has identified surface runoff as the most significant contributor of toxic chemicals to Puget Sound (https://fortress.wa.gov/ecy/publications/summarypages/0810084.html).

Unlike most upland environments, contaminants in sediment can be redistributed well beyond the source by currents, wave action, and biological and human activity such as bioturbation and propeller wash. This can result in contaminants from one source being distributed and mixed with many other sources within an embayment or river, making it difficult to distinguish particular sources or releases. This can also result in large areas of sediment (hundreds or thousands of acres) with low levels of contamination that are not practical or technically possible to address through traditional active cleanup actions such as dredging and capping. Regional background is intended to represent that concentration resulting from these diffuse sources and activities and not primarily attributable to specific sources or releases. Ecology has revised the rule language defining regional background in -505 by deleting "nonpoint." See Issue 3-24 for further detail.

Regional background will be determined using sediment samples outside the depositional areas of known historic and ongoing discharges. Due to the area-specific nature of regional background, a state-wide regional background is not appropriate as it will vary based on the unique sources in different embayments, rivers, or watersheds. It is expected that regional background will typically be above natural background, but this will not always be the case. For example, in embayments with only one or a few known sources of contamination, it is likely that regional and natural background will be the same.

It is expected that regional background will decrease over time as sediment contamination caused by current and historic sources and ongoing releases are cleaned up and source control and pollution prevention programs are effectively implemented.

Issue 12-10C: Regional background – calculation methods, -560(5)

- Commenters: AECOM (9–11,48), Boeing (101), BP Cherry Point (172,173), Larry Dunn (197), Colville Tribe (286,310,311), Umatilla Tribes (330), King County (400,447,449), Landau Assts. (498), NAVFAC (526,528), NWIFC (543), Port of Olympia (614), Port of Seattle (650), Squaxin Island Tribe (707), Suquamish Tribe (740), Tulalip Tribes (775), USDOI (801), DNR (829), Waterkeepers (842), WSPA (864)

Summary of comments received:

- Methods for calculating regional background should be described, including number and type of samples, acceptance criteria, analytical and quality assurance/quality control methods, and statistical analyses. The current section is far too discretionary and open-ended and provides little regulatory certainty.

- Regional background should be determined using appropriate statistical methods that exclude outliers. Older data for an area may have higher limits of detection or practical quantification limits, which could introduce statistical bias. What methods will Ecology use to ensure that bias from higher detection limits in older data will not be introduced?

- Ecology should not shift the burden of determining regional background to the implementer as this section appears to do. Please clarify that Ecology is responsible for determining regional background. We recommend that Ecology conduct special studies to establish regional background levels that are representative and scientifically sound.

- Ecology should develop a process and funding for determining regional background. Requiring the first person to conduct a remedial action in an area to establish regional background will discourage early cleanups.

- We are concerned that Ecology does not have the staff to do this work, and that potentially liable persons will attempt to define regional background in a manner consistent with their interests, which we already see happening at some cleanups.

- Once Ecology defines regional background for an area, will there be a process for either increasing or decreasing it due to changes in environmental concentrations related to global sources or regional source control?

- These levels should not be allowed to increase over time.

- Please describe how Ecology will define geographic areas for determination of regional background, and how the public will be able to provide input and comment on regional background area determinations.

- Regional background should be defined on an appropriate geographic scale. Freshwater environments have the most potential for misapplication. The US Geological Survey has defined watersheds on varying scales; the second-level (4-digit) classification would be most appropriate for these purposes.

- We recommend using data from the National Uranium Resource Evaluation program to establish regional background concentrations for metals-dominated sites in the Upper Columbia River area.

- Regional background should be based on area-weighted averaging to reflect its purpose as a proxy for human health and bioaccumulative risks.

- Consider using modeling or fish tissue concentrations to set regional background. Be flexible in the methods used to set cleanup standards.

- Calculation of regional background should use data from sediment types representative of the region (e.g., grain size, organic matter).

- Limit regional background evaluations to contaminants of concern for human health.

Response:

Ecology has revised the proposed rule language. Section -560(5) has been clarified to describe the process and responsibilities for establishing regional background. As noted above, regional background will be determined using sediment samples outside the depositional areas of known historical and ongoing discharges. Regional background will be different for different embayments and rivers or watersheds, because there are differences in diffuse sources and activities among these areas. Given the wide variety of circumstances likely to be encountered, Ecology does not believe it is appropriate to more specifically define in rule the criteria that will be used to define a geographic area used in this calculation, as that could constrain the usefulness of this concept.

While existing sediment sampling data exist, these data were not collected for purposes of defining background, have inconsistent quality assurance/control procedures, and can have inappropriately high detection limits. For these reasons, Ecology is seeking funding to invest in sampling to establish regional background in areas with multiple contaminated sediment sites, while acknowledging limited funding and staff resources. Ecology currently has funding to determine regional background for a select number of embayments. This will include sampling for bioaccumulative chemicals most commonly found in the state.

The adopted rule provides Ecology with the authority to require potentially liable persons to conduct sampling, with Ecology oversight, to determine regional background. However, Ecology will make the final determination of what is considered regional background. In addition, Ecology has the option of defaulting to natural background, upon consultation with potentially liable persons. This may be appropriate where it is not cost effective to conduct sampling to establish regional background (e.g., at a small site and/or when the state has determined the region is not a priority for state-funded actions). This is also expected to be the case for smaller project-specific dredging proposals.

The recommended statistical procedures for establishing regional background will be provided in guidance, rather than rule, as it is expected that methods could vary from site to site. Ecology intends to ensure consistency to the maximum extent possible regarding sampling and analytical methods, statistical analyses, parameters, and processes used to determine regional background

among regions through appropriate agency oversight and providing guidance in the Sediment Cleanup User's Manual II.

It is expected that regional background will decrease over time as sediment contamination caused by current and historic sources and ongoing releases are cleaned up and source control and pollution prevention programs are effectively implemented. Ecology expects that regional background will be re-sampled, as appropriate, to determine if concentrations have changed over time as funding and staff availability allows.

Issue 12-11: Use of geographic approaches, was -560(5)(d), now -560(5)(f)

- Commenters: Umatilla Tribes (347), King County (449)

Summary of Comments Received:

- Please clarify whether this is intended to allow a total watershed approach to source control.

- The land use of the drainage basin should be considered when identifying an alternate geographic approach for background.

Response:

This provision only applies to determining regional background for establishing sediment cleanup standards and is not intended to apply to source control.

Comment noted on land use to identify geographic approaches.

Issue 12-12: Compliance monitoring, was -560(6)(a), now -560(7)(a)

- Commenter: BP Cherry Point (178)

Summary of comments received:

- How will compliance monitoring be used to determine achievement of the cleanup levels, and is Ecology planning to develop statistical methodologies for these determinations?

Response:

The proposed rule language has been revised to reflect the option of using an area-weighted averaging approach, point-by-point, or a combination of both for compliance monitoring. Ecology has drafted guidance that includes details on compliance monitoring for the Sediment Cleanup Users Manual II.

Issue 12-13: Use of tissue analyses, was -560(6)(b), now -560(7)(b)

- Commenters: Boeing (149,150), Lon Kissinger (243), Dow Chemical (357), Greenbrier (371), King County (450), Port of Seattle (655), SMWG (694), Tom Newlon (729)

Summary of comments received:

- We support the use of site-specific tissue data in the remedial investigation process to identify and screen chemicals of concern through comparison to background tissue data and risk-based tissue concentrations.

- Delete "identify and screen chemicals of concern in sediment during the remedial investigation/feasibility study and to" as it is not relevant to this section.

- Tissues from species that will be included in the risk assessment should be used for screening.

- Ecology may want to identify issues to consider, including site fidelity of organisms, consumed species and preparation methods, ability of organisms to accumulate site contaminants, and availability of background data.

- While tissue analysis can, under some circumstances, provide a more direct measure of risks and risk reduction, factors other than sediments can influence tissue concentrations. Before using tissue data in this manner, a site-specific demonstration should be made that there is a strong connection between sediment and tissue concentrations at a site.

- Tissue monitoring following sediment remediation can be useful for risk communication, but should not be used to evaluate compliance with sediment standards. Many other factors can affect concentrations of chemicals in tissues and it is not clear how tissue data would be used in evaluating compliance with sediment standards. Thus, we recommend deleting "and to evaluate compliance with sediment cleanup standards."

Response:

Ecology is adopting the proposed language. Ecology believes that concentrations in tissues can provide a more direct measure of exposure to receptors (humans, fish, and higher trophic levels), although it is difficult to accurately back-calculate to sediment concentrations. Although cleanup standards must be set for sediments, tissue concentrations are useful in screening chemicals that require sediment standards, as one line of evidence in conducting risk assessments, and for monitoring the success of a remedy.

Ecology is also aware that there are confounding factors in tissue concentrations that may or may not be related to the site. Ecology is providing additional guidance on how to conduct bioaccumulation and/or tissue collection and analysis in the Sediment Cleanup User's Manual II to reduce these factors and obtain the most appropriate types of data. This information includes how to determine safe concentrations in tissues, various methods for back-calculation to sediments, and guidance on collection of site-specific organisms for tissue analysis as well as laboratory and field bioaccumulation studies.

Ecology does expect that any use of tissue data would be site-specific, and that clear links and site-specific bioaccumulation factors will need to be established for development of and comparison to risk-based sediment concentrations. Measurement of tissue concentrations after cleanup could provide a means of demonstrating that tissue concentrations were declining to risk-based or background levels. Tissue concentrations that remain high despite successful cleanup of sediments to levels that meet cleanup standards could indicate that there are additional sources in the region that require attention, but would be secondary to actual sediment concentrations in assessing compliance with sediment standards.

Chapter 13: Sediment Cleanup Standards Based on Protection of Human Health (WAC 173-204-561)

This chapter provides a summary of the rule amendments concerning establishing cleanup standards based on human health risks. The chapter summarizes the proposed amendments to the rule (Section 13.1), describes differences between the proposed and adopted amendments to the rule (Section 13.2), and responds to public comments on the proposed rule (Section 13.3).

13.1 Summary of Proposed Amendments

This proposed new section of the rule replaced the narrative standard for protection of human health in the original section -520 and applies to Part V only. Section -561 includes:

- Cleanup standards for human health protection established using the two-tiered decision-making framework in the current SMS rule.

- Risk-based cleanup levels taking into account both cancer and non-cancer risks:
  - Cleanup levels for individual carcinogens based on an incremental cancer risk of 1 in 1,000,000 (SCO) and 1 in 100,000 (CSL). Total site risks cannot exceed 1 in 100,000 (1×10^{-5}).
  - Cleanup levels based on non-cancer health risks are based on a hazard quotient of 1.0. Total site non-cancer health risks cannot exceed a hazard index of 1.0.

- A reasonable maximum exposure (RME) scenario:
  - The default RME scenario is a tribal exposure scenario.
  - Includes the flexibility to use alternate exposure scenarios.
  - Does not establish default exposure parameters (e.g., fish consumption rates).
  - Identification of several factors that should be considered when making site-specific decisions.

- Use of EPA toxicity factors.

- Potential use of fish tissue measurements to evaluate compliance with sediment cleanup standards based on human health protection.

13.2 Differences between the Proposed and Adopted Amendments

In response to comments received, the following revisions were made:

- The proposed rule language has been revised to clarify when other factors may be considered when establishing the default reasonable maximum exposure scenario in -561(2)(b)(i).

- The "size of the site relative to the fish and shellfish home range" factor has been clarified in -561(2)(b)(i)(D) to better reflect its original intent.

13.3 Responses to Comments

Issue 13-1: Area-weighted averaging

- Commenters: AECOM (2,22), BP Cherry Point (173,183), King County (381), NAVFAC (514,526)

Summary of comments received:

- The rule should recognize that standards to protect human health are usually not applied on a point-by-point basis, and should allow for area-weighted averaging.

Response:

Ecology has revised -560(7) to clarify that an area-weighted averaging approach can be used to assess compliance with sediment cleanup standards for bioaccumulative chemicals. Ecology agrees that it may be appropriate to use an area-weighted averaging approach to assess compliance with sediment cleanup standards based on human health protection and/or risks to upper trophic level species. The rationale for this decision includes the following:

- This approach is consistent with current scientific information on the behavior and movement of fish. Specifically, fish generally do not spend their time at a single sediment location. Consequently, tissue body burdens are accumulated from sediments over areas that range from less than an acre (shellfish) to several square miles.

- This approach is consistent with conceptual site models used to evaluate human health risks. These models are based on the assumption that human health risks result from the consumption of multiple fish that are collected over several years from fishing areas that range in size from several acres to several square miles.

- This approach is consistent with methods used to evaluate compliance with surface water standards, air quality standards (Federal and state Clean Air Acts), MTCA soil cleanup standards, and site-specific sediment cleanup standards (Commencement Bay Superfund Site, Bremerton Naval Shipyard, etc.) that are based on chronic exposure to hazardous substances.

Issue 13-2: Distinction between site risks and aggregate risks

- Commenters: Yakama Nation (274), Umatilla Tribes (315), NWIFC (543), CILP (684), Squaxin Island Tribe (707,708), Suquamish Tribe (740), Tulalip Tribes (775)

Summary of comments received:

- There is no discussion or provision for the aggregate risks that a person may receive through exposure to multiple sites, for example, within a usual and accustomed fishing area. This consideration should counter the use of certain exposure factors such as the fish diet fraction and site use factor. Having default values for these factors would be a minimum approach to ensuring that aggregate risk is considered.

Response:

Ecology is adopting the proposed rule language. Section -561(1) states that the SCO and CSL are used to establish sediment cleanup levels for sites and sediment cleanup units. The proposed rule is designed to prevent incremental or excess cancer/non-cancer health risks that might result from exposure to hazardous substances at the specific cleanup site. Cleanup of hazardous substances typically considers risks from the site separately from other risks incurred by the affected population (such as health risks associated with air pollution, diet, etc). Ecology acknowledges that certain communities may be disparately affected by environmental contamination from multiple sources. For the purposes of setting sediment cleanup standards that protect human health, Ecology believes the provisions for protecting human health are appropriate and protective for the majority of situations, and that the rule provides sufficient flexibility to consider special situations.

Ecology agrees that multiple cleanup sites may be located within a single usual and accustomed fishing area. Current rules (MTCA, SMS, CERCLA) do not include procedures for evaluating the cumulative or aggregate risk posed by multiple sites.

Ecology recognizes that this limitation could be exacerbated by the use of fish diet fraction and/or site use factors that are focused on small geographic areas. Ecology's rules and guidance provide several safeguards to prevent these types of problems. For example:

- A human health-based sediment cleanup standard must be established for the whole site. Ecology does not intend to approve the use of artificially small fish diet fractions or site use factors that are focused on a small percentage of the cleanup site.

- Site-specific cleanup standards will generally be based on estimates of locally or regionally harvested fish and shellfish. This is consistent with the EPA Region 10 framework document (USEPA, 2007b) and Ecology decisions at individual sites. The fish diet fraction has limited (if any) utility when site-specific fish consumption rates are based on locally or regionally harvested fish and shellfish.

- Site-specific cleanup standards can be developed using biota-sediment accumulation factors (BSAFs) that take into account fish mobility. Given the uncertainties and variations in BSAFs, the site use factor has limited (if any) utility for fish and shellfish species other than salmon.

Issue 13-3: Applicability, -561(1)

- Commenters: BP Cherry Point (171), NAVFAC (518)

Summary of Comments Received:

- This section should apply only to a subset of bioaccumulative contaminants of human health concern, and the rule should be revised to clarify this. The rule could identify a minimum set of 4–5 chemicals of primary concern in Washington, with the ability to add more if needed.

Response:

Ecology is adopting the proposed rule language. Section -561(1) defines the SCO and CSL for contaminants based on protection of human health. Ecology does not believe it is appropriate or protective to limit the applicability of the human health risk assessment to a subset of chemicals on a programmatic basis.

However, Ecology agrees that using a shorter list of representative chemicals to establish site cleanup requirements can help simplify and focus site-specific evaluations and analyses. MTCA (WAC 173-340-703) provides the option of selecting a subset of hazardous substances at the site as "indicator hazardous substances" when selecting cleanup standards and actions. CERCLA risk assessment guidance also provides the option of reducing the number of chemicals of concern based on several factors, including frequency of detection and toxicity-concentration relationships (EPA, 1989; see Chapter 5).

This approach provides the flexibility to evaluate site conditions and new scientific information on chemical toxicity without prematurely constraining site evaluations. However, Ecology has identified two main issues that must be carefully considered when implementing this approach:

- Use of a subset of hazardous substances may underestimate overall site risks because too many chemicals are left out of the evaluation. While this requires careful attention, Ecology believes that this is not a significant problem because 1) cleanup standards are based on a reasonable maximum exposure scenario and 2) Ecology's current screening procedures ensure that the most harmful site contaminants are chosen as indicator hazardous substances.

- Decisions on remedy selection, design, and compliance can be seriously impacted by the choice of indicator hazardous substances. This is particularly important when the selected remedy includes treatment technologies whose effectiveness depend upon the chemical and physical properties of site contaminants. In general, this is not a major issue for sediment cleanup actions because most remedies involve some combination of dredging/capping/off-site disposal.

Issue 13-4: Adjustments for Multiple Chemicals, -561(2)(a)(i–ii) and (3)(b)(i–ii)

- Commenters: Lon Kissinger (246), Umatilla Tribes (343, 348, 352), King County (451,452,454), Pioneer (588)

Summary of comments received:

- What happens if multiple carcinogens are present and the background concentration of a single carcinogen exceeds 1×10^{-5} risk, or when the there are multiple noncarcinogens present and the background concentration of a single noncarcinogen exceeds a hazard index (HI) of 1?

- This approach should be applied earlier in the process, such as at site identification.

- Only hazard quotients (HQs) for noncarcinogens with similar modes of action should be summed to an effect-specific HI.

- Delete the phrase "or other methods as determined by the department." This would allow the department to change risk thresholds without rulemaking.

- The upper limit on carcinogens should be based on 1×10^{-5} for individual contaminants. Adding the cumulative requirement ensures that this level will not be very different from the SCO.

- Is it enough to say that the levels should be adjusted downwards or is more guidance needed? Please clarify Ecology's approach if several contaminants do not exceed individual maxima, but pose cumulative risks.

- Recommend revising the last sentence of the carcinogen section to make the MTCA citation on adjusting CSLs more specific, or include the necessary text in the SMS.

Response:

Ecology is adopting the proposed rule language. Ecology proposed that SCOs and CSLs established for individual substances should be adjusted downward to ensure that total site risks did not exceed an incremental cancer risk of 1 in 100,000 (1×10^{-5}) and an HI of 1. Ecology's rationale for this approach includes the following:

- Multiple chemicals are present at the vast majority of sediment cleanup sites.

- The rule language is consistent with the current MTCA rule requirements for total site risk.

- The rule language complies with the legal requirement that MTCA cleanup standards be at least as stringent as cleanup standards established under CERCLA.

- The use of an HI of 1 is a health-protective approach that is implemented within an overall decision-making framework that provides the flexibility to account for real-world considerations when establishing cleanup standards. In particular, the rule includes provisions that account for the presence of background concentrations not related to site-specific releases of hazardous substances.

Specific technical and policy issues are briefly discussed below:

- Background Concentrations. The rule allows upward adjustment of the site-specific cleanup levels based on natural background (SCO) and regional background (CSL). This comparison to background should be made after determining the total site risks. This approach takes into account real-world constraints on cleanup actions, but ensures that incremental risks relative to background concentrations remain low.

- Site Identification. The total site risk requirement was originally developed to support selection of cleanup standards (the end of the cleanup decision-making process). It has not been applied to site identification and listing (the beginning of the decision-making process). Several state and federal programs do use screening levels that are based on an HQ of less than 1. These approaches are designed to address two issues: 1) exposure to more than one hazardous substance and/or 2) exposure to a hazardous substance from multiple exposure pathways. Ecology continues to believe that such an approach is not needed at this time, because site identification will be heavily influenced by background concentrations. The SMS rule and MTCA law require Ecology to periodically review and, as appropriate, revise cleanup standards requirements. Ecology will consider this issue in the future when we evaluate implementation of the revised rule.

- Common Modes of Action. Ecology agrees that HQs for noncarcinogens should only be summed to an HI of 1 if they share a common mode of action. This approach is consistent with the EPA Superfund Risk Assessment Guidance (EPA, 1989) and methods used to implement the MTCA Cleanup Regulation.

- Other Methods Approved by the Department. Ecology proposed that SCOs and CSLs be adjusted downward to account for multiple contaminants and/or exposure pathways using the MTCA methods in WAC 173-340-708 or other methods approved by the Department. Ecology included the phrase "other methods approved by the Department" to acknowledge that new scientific information may become available to support a conclusion that the effects of particular combinations of chemicals are either more or less than additive. This phrase does not provide the flexibility to use total risk limits that are different than a target cancer risk of 1×10^{-5} or an HI of 1.

- Guidance and Examples. Ecology believes the proposed rule language clearly states the requirements for adjusting individual cleanup levels based on total site risk. Ecology plans to provide additional guidance and examples to support implementation of this requirement in the Sediment Cleanup User's Manual II.

Issue 13-5: SCO and CSL for noncarcinogens, -561(2)(a)(i) and (3)(b)(i)

- Commenters: AECOM (8,46), Boeing (102), BP Cherry Point (169), Hayman Environmental (372), NAVFAC (517), Port of Seattle (646, 647, 657), WSPA (872)

Summary of comments received:

- A hazard quotient (HQ) greater than 1 should be used to set the CSL, otherwise there is no difference from the SCO (recommendations for HQ ranging from 2–10).

- The cleanup screening level for human health should be achievable, or the two-tiered process for setting cleanup standards is not useful. An HQ of 1 cannot be met at many sites.

- The text discusses HQs, yet Figure 1 shows a hazard index (HI) <1 for the CSL and HQ <1 for the SQS. An HQ should be used for both tiers. Alternatively, HI should be used for the SQS since it is more protective and HQ used for the CSL.

Response:

Ecology is adopting the proposed rule language. Ecology proposed that risk-based concentrations based on non-cancer health risks be calculated using an HQ of 1 for both the SCO and CSL. Ecology believes this approach provides a protective, predictable, and workable option for establishing sediment cleanup standards. Ecology's rationale for this approach includes the following:

- MTCA cleanup standards must be at least as stringent as cleanup standards established under the federal Superfund law. The use of an HQ of 1 is consistent with the National Contingency Plan which states that "…[f]or systemic toxicants, acceptable exposure levels shall represent concentration levels to which the human populations, including sensitive subgroups, may be exposed without adverse effect during a lifetime or part of a lifetime, incorporating an adequate margin of safety..." (40 CFR 300.430(A)(1)).

- This approach is consistent with the MTCA rule. Methods A, B and C cleanup levels for individual chemicals are all based on an HQ of 1.

- EPA and Ecology have used an HQ of 1 to establish the water quality standards, Chapter 173-201 WAC, and the National Toxics Rule (40 CFR 131.36). These regulations are legally applicable requirements for sediment cleanup actions.

- Most state environmental agencies use an HQ of 1 to establish cleanup levels based on non-cancer health risks (ATSWMO, 2006).

- This approach is consistent with state and federal health assessment procedures (e.g., ATSDR, 2005).

- The use of an HQ of 1 is a health-protective approach that is implemented within the overall SMS decision-making framework. The SMS framework provides the flexibility to account for real-world considerations when establishing cleanup standards. In particular, the SMS rule includes provisions that account for the presence of background concentrations not related to site-specific releases of hazardous substances.

Technical and policy issues related to this issue are briefly discussed below:

- Flexibility to use an HQ greater than 1. Ecology considered using an HQ greater than 1 to establish risk-based concentrations corresponding to the CSL. Three states have reported using an HQ or HI of 10 to establish cleanup standards (ATSWMO, 2006). However, Ecology concluded that using an HQ of 1 is consistent with MTCA, CERCLA, and the majority of other state programs. This approach takes into account the uncertainties in current methods for predicting non-cancer health risks (NRC, 2009) and provides a consistent set of cleanup requirements for upland sites and sediment sites.

- Figure 1 Terminology: Figure 1 was intended to be an explanatory figure and was not part of the official rule language. An HQ of 1 is used to establish both the SCO and CSL. At sites where there are multiple chemicals that have a common mode of action, the SCOs and CSLs for individual substances may need to be adjusted downward in accordance with the methods specified in the MTCA rule (WAC 173-340-708(5) and (6)).

Issue 13-6: SCOs and CSLs for carcinogens, -561(2)(a)(ii) and (3)(b)(ii)

AECOM (7,47), Boeing (102), BP Cherry Point (168), City of Seattle (266,269), King County (454), NAVFAC (517), Tom Newlon (730)

Summary of comments received:

- At these low risk levels, tissues may accumulate these levels of chemicals from the water, and sediment cleanup may have little effect. Consider streamlined approaches that default quickly to background to avoid unnecessary risk assessment efforts.

- The cleanup screening level for human health should be achievable, or the two-tiered process for setting cleanup standards is not useful. A 1×10^{-5} risk level cannot be met at many sites.

- The upper limit on the human health risk range should be 1×10^{-4} for multiple hazardous substances, consistent with CERCLA. This would allow more site-specific flexibility and a better chance of having implementable cleanup standards, as even natural background concentrations are typically in the 10^{-4} range for some common carcinogens.

- Please clarify and provide examples of how the screening levels and target risk levels would be applied.

Response:

Ecology is adopting the proposed rule language. Ecology proposed that risk-based concentrations for individual carcinogens be calculated using an incremental cancer risk of 1 in 1,000,000 (1×10^{-6}) for the SCO and 1 in 100,000 (1×10^{-5}) for the CSL. Ecology believes this approach provides a protective, predictable, and workable option for establishing sediment cleanup standards. Ecology's rationale for this decision includes the following:

- This approach meets the minimum MTCA statutory requirements and is consistent with the intent of the citizen's initiative that produced the MTCA statute.

- The proposed target cancer risk levels for the SCO and CSL are consistent with the risk management policies in the MTCA rule.

- The proposed cancer risk level for the SCO is consistent with the risk levels used to establish the water quality standards, Chapter 173-201A WAC, and the National Toxics Rule (40 CFR 131.36). These regulations are legally applicable requirements for sediment cleanup actions.

- The proposed target cancer risk levels are consistent with approaches used by other state agencies. The vast majority of states use target cancer risk level of either 1 in 1,000,000 (1×10^{-6}) or 1 in 100,000 (1×10^{-5}) to establish cleanup standards (ATSWMO, 2006). ASTSWMO found that 20 of the 34 states completing the survey establish remedial action requirements using a 1×10^{-6} cancer risk level. Twelve of the 34 states use a 1×10^{-5} risk level.

- The proposed target risk levels provide a health-protective approach that is implemented within the overall SMS decision-making framework. The SMS framework provides the flexibility to account for real-world considerations when establishing cleanup standards. In particular, the SMS rule includes provisions that account for the presence of background concentrations not related to site-specific releases of hazardous substances.

Technical and policy issues related to this issue are briefly discussed below:

- CSL Total Site Risk. Ecology considered using a total site risk level of 1 in 10,000 (1×10^{-4}) when establishing CSL requirements, because EPA uses this total site risk level when establishing cleanup standards under CERCLA. However, Ecology decided to maintain consistency with MTCA and use a total site risk of 1 in 100,000 (1×10^{-5}). This is a health-protective approach that takes into account the uncertainties surrounding the interactions between low-dose exposures to multiple chemicals and the wide variability in individual responses to chemicals and chemical mixtures. The selection of this total risk level was made in the context of other features of the rule decision framework (such as consideration of background levels and analytical limits).

- Streamlined Procedures to Account for Background Levels. Ecology acknowledges the need for streamlined procedures for reaching decisions on cleanup standards that take into account natural and regional background levels. The Sediment Cleanup Users Manual II includes optional streamlined approaches (Chapters 2 and 9) for defaulting to background both for screening purposes and to establish sediment cleanup standards.

- Achievable Levels. Ecology recognizes that the adopted rule provisions can produce very low risk-based concentrations. However, the procedures for establishing sediment cleanup standards take into account background concentrations and analytical limits. The rule also provides the flexibility to consider a wide range of factors (residual risks, costs, net environmental benefits, etc.) when selecting sediment cleanup actions.

Issue 13-7: Reasonable Maximum Exposure (RME), -561(2)(b)

- Commenters: Yakama Nation (274), Umatilla Tribes (315,317,349), King County (377, 453), NAVFAC (525), NWIFC (543,546,557,560), City of Renton (662), CILP (665,670), Spokane Tribe (706), Squaxin Island Tribe (707,708,709), Suquamish Tribe (740,742,743), Swinomish Tribe (751,762), Tulalip Tribes (774,775), WSPA (868), Weyerhaeuser (897,900)

Summary of comments received:

- RME is an important human health concept, but is not defined in this regulation. It should be defined in terms that specifically state the human health protection goal, the percentile of a specific population to be protected, etc. This will allow appropriate selection of values for the exposure parameters used to derive human health-based standards. The public should be provided an opportunity to comment on the definition of the RME.

- Incorporate assumptions and goals for protection of a certain percentile of the most vulnerable population from any state policies or regulations, whether from Washington or Oregon.

- RME is a poor substitute for having a protective fish consumption rate in the rule. The ability to adjust the fish diet fraction and site use factor, and the definitions of background proposed, just make the situation worse in terms of protecting tribal health.

- This approach differs from the benthic criteria in providing too much discretion in evaluating risks and how the standards are set. This sets up a disproportionate burden for those seeking to protect human health, straining tribal resources and those of Ecology. The proposed approach will ensure that all sites are complex and expensive and may take decades to resolve.

- At treaty times, tribal people consumed all of their fish from local waters and still continue to obtain most of their fish from local sources. Many tribal members would consume more fish and shellfish than they do at present were these resources not depleted or contaminated. Tribes are working toward a future with restored ecosystems that support fisheries resources at abundant levels with a variety of species that are safe to eat.

- Tribes have the intent, potential, and legal right to consume a mix of species of fish in the future. This restorative orientation should be the baseline for water quality and cleanup laws.

- What is the definition of "historic" here? Could usual and accustomed fishing areas be a clearer substitute for this language?

- "Historic, current, and potential future tribal use" should be revised to "current tribal use."

- Some fish species may have higher bioaccumulation rates and higher concentrations of toxins in their tissues. However, if they are not consumed or have low consumption rates,

they should not be used to establish human health criteria or change the state's water and sediment quality standards.

Response:

Ecology is adopting the proposed rule language. The rule language states that cleanup levels based on human health protection must be calculated using an RME scenario. Ecology's rationale for this decision includes the following:

- This approach is consistent with MTCA, which requires that cleanup standards must be based on a RME scenario and defines the RME as "the highest exposure that is reasonably expected to occur at a site under current and potential future site use."

- This approach is consistent with the National Contingency Plan, which establishes EPA requirements for cleanup standards under CERCLA and defines RME as "…the highest exposure that is reasonably expected to occur at a Superfund site..." The preamble to the federal rule (the National Oil and Hazardous Substances Pollution Contingency Plan) includes the following guidance:

  "EPA defines reasonable maximum such that only potential exposures that are likely to occur will be included the in the assessment of exposures. The Superfund program has always designed its remedies to be protective of all individuals and environmental receptors that may be exposed at a site; consequently, EPA believes it is important to include all reasonably expected exposures in its risk assessments…"

- This approach is consistent with the legal requirement that MTCA cleanup standards be at least as stringent as requirements under CERCLA.

Technical and policy issues related to this topic are briefly discussed below:

- Definition. MTCA includes a definition for "reasonable maximum exposure." Ecology elected not to repeat this definition in the SMS rule. Instead, the SMS rule states that "…in cases where a definition does not exist in this chapter, the definitions in Chapter 173-340 WAC will apply unless the context indicates otherwise..." The MTCA definition should be used when implementing -561 of the SMS rule. However, it is important to recognize that the language in -561(2)(b) includes the key elements of the MTCA definition (i.e. "…highest exposure reasonably expected to occur under current and potential future site use conditions").

- Percentiles. The RME is intended to represent a high-end (but not worst-case) estimate of individual exposures. It provides a health-protective estimate that falls within a realistic range of exposures. The RME is defined as reasonable because it is a product of several factors that are an appropriate mix of average and upper-bound estimates. RME estimates typically fall between the 90^{th} and 99.9^{th} percentile of the exposure distribution. Ecology will use this approach when establishing site-specific requirements. Ecology considered specifying a single percentile (95^{th} percentile) or a range (90^{th} to 99^{th} percentile) in the rule. However, Ecology decided that this is a risk management decision that is more

appropriately made on a site-specific basis. This approach is consistent with both MTCA and CERCLA.

- Worst Case Scenario. The RME scenario does not represent a worst-case scenario. A worst-case exposure represents an extreme set of exposure conditions, usually not observed in an actual population, which is the maximum possible exposure where everything that can plausibly happen to maximize exposure does happen. This distinction is discussed in EPA's *Guidelines for Exposure Assessment* (Federal Register Vol. 57, No. 104, May 1992, pages 22888-22938).

- Current and Potential Future Site Use. A key feature of the RME concept is that it takes into account both current and potential future site use conditions. This is important because contamination levels may have reduced the current amounts of seafood available at the cleanup site. Consumption advisories may reduce the current amounts of seafood caught and eaten from areas impacted by contaminated sites. Consequently, it is important to consider exposure scenarios and seafood consumption rates that may exist under potential future site conditions that could exist after the cleanup action is completed.

- Default Fish Consumption Rate and Site-Specific Flexibility. See Issues 13-9 and 13-10.

Issue 13-8: Default scenario, -561(2)(b)(i)

- Commenters: Yakama Nation (274), Colville Tribe (303), Umatilla Tribes (315–317), King County (453), NWIFC (543,546), CILP (670), Spokane Tribe (706), Squaxin Island Tribe (707,708), Suquamish Tribe (740,742–744), Swinomish Tribe (751), Tulalip Tribes (775), WSPA (868), Weyerhaeuser (899)

Summary of comments received:

- The default scenario reasonable maximum exposure (RME) is likely to be appropriate and protective of both tribal and non-tribal subsistence users of aquatic resources.

- Use of tribal consumption rates as the default RME seems overly protective of most consumers in Washington.

- The default scenario is appropriately based on tribal consumption, but should state that it reflects the 95th percentile of tribal consumers. This RME approach should specify consultation with tribes in developing the RME scenarios.

- The proposed approach will ensure that all sites are complex and expensive and may take decades to resolve.

- If tribal consumption rates are used, this should be considered the default scenario for Puget Sound. Outside of Puget Sound, there are many small lakes and other smaller water bodies that are not within usual and accustomed fishing areas, and it does not seem appropriate to have a tribal RME for these areas.

- What tribal RME scenario will be used for freshwater sites? For example, what default values would be used for a freshwater site on the lower Columbia River?

- Ecology should identify which areas of the Columbia River and Columbia Basin within Washington are not considered tribal usual and accustomed fishing areas.

- Is the MTCA human health risk scenario also applicable?

Response:

Ecology is adopting the proposed rule language. Ecology continues to believe that it is appropriate to use a tribal exposure scenario as the default RME scenario. Ecology's rationale for this approach includes the following:

- Statutory Requirements of MTCA. Under MTCA, cleanup standards must be at least as stringent as the cleanup standards established under the federal Superfund law. Federal cleanup standards are based on the RME concept. EPA Region 10 uses a tribal exposure scenario to establish cleanup standards at Superfund sites in Puget Sound (USEPA, 2007b).

- Usual and Accustomed (U&A) and traditional fishing areas. Washington is home to many Native Americans, including 29 federally recognized Indian tribes. Tribal U&A fishing areas are found throughout the state. Ecology has identified over 150 sediment cleanup sites in Washington. Based on information compiled by the Washington State Department of Transportation and the Governor's Office of Indian Affairs (WSDOT, 2008; GOIA, 2010), the vast majority of these cleanup sites are located in U&As or traditional fishing areas for one or more tribes.

- MTCA Science Advisory Board Advice. In 2008, Ecology asked the MTCA Science Advisory Board for advice on a site-specific fish consumption rate applicable to a cleanup action being conducted in Port Angeles Harbor. The harbor is located within the U&A fishing area for the Lower Elwha Klallam Tribe. The Board agreed with Ecology's conclusion that the recreational default fish consumption rate used in the MTCA rule does not represent an RME scenario for Native American populations who often eat higher amounts of fish and shellfish than recreational anglers (see Meeting Notes for SAB Meetings held December 14, 2007 and March 11 and June 2, 2008, http://www.ecy.wa.gov/programs/tcp/SAB/SAB_mtg_info/mtg_info.htm).

- Current Site-Specific Decisions at Sediment Cleanup Sites. The general MTCA requirements for cleanup standards (including the RME requirements) apply to soil, water, air, and sediment. Ecology currently establishes site-specific sediment cleanup requirements using an RME approach that reflects a tribal exposure scenario. Ecology has established (or is in the process of establishing) sediment cleanup requirements for a wide range of sites located in U&A fishing areas of one or more tribes. In these situations, Ecology has used a tribal exposure scenario to establish cleanup standards. Such sites include Bellingham Bay (Whatcom Waterway), Port Gamble Bay, and the former Rayonier mill site in Port Angeles.

Technical and policy issues related to this topic are briefly discussed below:

- Tribal Populations as a Small Percentage of the General Population. Fish consumption surveys conducted in the Pacific Northwest demonstrate that tribal communities generally eat larger amounts of fish and shellfish than the general population. Ecology recognizes that tribal communities represent a relatively small percentage of the total Washington population. The opening sentence in the MTCA law states "…each person has a fundamental and inalienable right to a healthful environment…" (RCW 70.105D.010(1)). Given this underlying statutory principle, Ecology does not believe that the relative sizes of different population groups alter the need to consider tribal consumption rates when establishing cleanup requirements. This is consistent with recommendations provided to the EPA by the National Environmental Justice Advisory Council, who also noted the disproportionate risks assumed by high fish-consuming populations.

- Application to Specific Sites or Geographic Areas. Ecology plans to use a tribal exposure scenario at cleanup sites located within the U&A fishing areas of one or more tribes. Ecology plans to prepare guidance that explains how different site characteristics (e.g., water body size, habitat, fish/shellfish resources) are considered when selecting the site-specific exposure parameters consistent with this scenario.

- MTCA Risk Scenario. The MTCA surface water cleanup standards are based on a recreational exposure scenario. These requirements are generally applicable to all sites in Washington. Consequently, Ecology will refer to MTCA when defining alternate exposure scenarios for sites located outside U&A fishing areas. It is important to note that MTCA also provides the flexibility to establish more stringent cleanup levels on a site-specific basis (WAC 173-340-730(1)(e)). The MTCA rule also states that surface water cleanup levels shall be established at concentrations that prevent violations of ground water, soil, sediment, or air cleanup standards.

- Conceptual Site Model: Ecology's draft guidance for evaluating and assessing the risks from exposure to contaminated sediments is based on a default exposure scenario of tribal exposure through fish and shellfish ingestion. The RME for sediment sites, while based on tribal exposures from fish and shellfish ingestion, may in some situations also include exposure from dermal contact with sediments. Ecology expects that the fish and shellfish ingestion pathways will typically dominate, but recognizes that in some situations other routes of exposure will need to be examined.

Issue 13-9: Site-specific exposure factors, -561(2)(b)(i)

- Commenters: Larry Dunn (200), Lon Kissinger (245), Yakama Nation (274), Colville Tribe (289,303), Umatilla Tribes (315), NAVFAC (525), NWIFC (543,548), NWPPA (567), CILP (670), Spokane Tribe (706), Squaxin Island Tribe (707–709), Suquamish Tribe (740,742,743), Swinomish Tribe (751), Tulalip Tribes (775), Weyerhaeuser (898)

Summary of comments received:

- Failure to adopt a default fish consumption rate and other exposure values means that numeric standards are only available for protection of benthic organisms and not human health or bioaccumulation. Because of this, there is no easy way to identify contaminated sites, provide public health information, screen remedial alternatives, evaluate the need for sediment impact and recovery zones, or monitor progress toward long-term compliance.

- The higher fish consumption rates will be weakened by all the site-specific factors that can be used to reduce them, provided both in rule and in guidance. These factors should not be used to undermine tribal exposure scenarios within a reasonable maximum exposure (RME) approach, and should be protective of treaty rights.

- Ecology should not rely on the default values for exposure parameters in most cases, but use the best available science and site-specific information to establish them and only rely on default values when necessary.

- We support the ability to make adjustments to this scenario as indicated by factors A–E.

- A and B under this section are appropriate parameters for consideration. C, D, and E are not as they are entirely subjective for most species being assessed and will likely result in cleanups that are not protective.

- Inclusion of diet fraction (C) and home range evaluations (D) in the risk assessment will almost certainly underestimate exposure and risk on a bay-wide or area-wide basis. Seafood consumption risks should be assessed over large areas in which a person might reasonably collect seafood.

- The proposed adjustments to the default scenario for evaluating human health risks will not be protective of tribal or subsistence resources users. This section should not indicate that the department shall consider these factors, as a requirement, because this will make it unlikely that the default scenario will be applied at most sites.

Response:

Ecology is adopting the proposed rule language. Ecology identified several types of information that would need to be considered when making site-specific decisions on the individual parameters used to represent the RME scenario. Ecology plans to publish procedures for implementing this provision in the Sediment Cleanup User's Manual II. The rationale for this approach includes the following:

- Variations in Exposure Conditions. There are a wide range of fish habitats and fish-consuming populations in Washington. Ecology concluded that the use of statewide default parameters would not provide the same regulatory efficiencies that are provided by statewide parameters with less geographic or individual variability (for example, drinking water ingestion rates). Ecology initially considered incorporating a statewide

default fish consumption rate, but ultimately determined that tabulated data based on geography and species consumed would provide more useful information for site-specific cleanup decisions.

- Consistency with CERCLA program. The EPA Superfund Program currently identifies default exposure and toxicity parameters in agency risk assessment guidance.

- Consultation Requirements. Site-specific tribal RMEs are determined after consultation with affected tribes. These decisions are made after consideration of current and future tribal fish and shellfish consumption and in recognition of tribal treaty reserved rights and culture.

Ecology believes that many of the issues raised are more appropriately addressed in guidance than in rule. Ecology intends to provide guidance on how to make these site-specific determinations in the Sediment Cleanup User's Manual II.

Additional technical and policy issues related to this topic are discussed in Issues 13-10 through 13-12 below.

Issue 13-10: Fish consumption rates (FCRs), -561(2)(b)(i)(B)

- Commenters: AWB (75), Boeing (108,109), Boise (159,165), Larry Dunn (201), Lon Kissinger (244), Yakama Nation (274,275,277), Colville Tribe (304), Umatilla Tribes (315,316,319,325), Greenbrier (371), Landau Assts. (490), NCASI (507,509), Nippon (542), NWIFC (543–545), NWPPA (563,568), City of Renton (663), CILP (665,666,669), Spokane Tribe (696,698), Squaxin Island Tribe (707–709), Suquamish Tribe (740,743,744), Swinomish Tribe (750), TransAlta (765), Tulalip Tribes (770,775), WSPA (868), Weyerhaeuser (901)

Summary of comments received:

- We support Ecology's decision not to include a default FCR in the rule and agree with Director Sturdevant's approach for moving forward.

- Director Sturdevant's reversal of course in not including an FCR in the SMS was unsupportable. The current default FCR in MTCA is not protective of tribal consumers and perpetuates over-exposure to toxic contaminants. An updated FCR should be included in the SMS at or above the range recommended in the Fish Consumption Rate Technical Support Document (Ecology, 2013).

- A specific FCR should be included in the rule, as the technical work has been done to support it. Lack of a default consumption rate will result in contentious cleanups and does not meet the goal of standardizing and streamlining risk assessments. The site-by-site approach will put smaller tribes and communities at a disadvantage in attempting to ensure protective standards, perpetuating environmental justice concerns.

- Columbia River Inter-Tribal Fish Commission consumption rates should be reflected in the rule and it should be explained how they relate to the language in the rule.

- How has Ecology considered EPA-approved tribal consumption rates and cumulative risk levels?
- The SMS should explicitly enable tribes to present information and data supporting higher FCRs on a site-by-site basis than those recommended in the Fish Consumption Rate Technical Support Document (Ecology, 2013). Consultation with tribes should be an important part of the site-specific reasonable maximum exposure (RME) process, including use of recent surveys identified by the tribe.

- Tribal consumption rates should be based on heritage and unsuppressed consumption rates, and should also reflect potential future consumption rates once habitat is restored and sediments cleaned up.

- Use of tribal consumption rates that reflect historic and future use is overly protective and broad. Extension of current use into future use should only be done on a site-specific basis. We recommend revisions to include more site-specific consideration of FCRs.

- We support reliance on best available science and studies with respect to FCRs.

- Adopting a higher FCR prior to having the necessary technological tools to achieve it would set a bad precedent and result in an unacceptable outcome for dischargers.

- Ecology should state that salmon consumption will not be included as part of the FCR in the default RME scenario. Most site cleanups will not significantly affect body burdens of anadromous fish. However, salmon consumption could be added on a site-specific basis if appropriate.

- Because of the popularity of salmon consumption in the state, salmon consumption rates should be established separately from those of other fish.

- Salmon must be included in the FCR, as this is a large part of our diet that is protected by treaty. Salmon encounter and acquire contaminants throughout their life histories, including in fresh and estuarine waters under the jurisdiction of Washington State. Scientific studies show that the time spent in a river or estuary as a juvenile has a strong effect on the health and survival of salmon.

Response:

Ecology is adopting the proposed rule language. The rule includes a process for establishing site-specific sediment cleanup standards protective of human health using an RME based on tribal fish and shellfish consumption reasonably expected to occur under current and potential future site use conditions. The rationale for this approach is discussed under Issues 13-6 through 13-10. The following are important considerations when selecting FCRs to support site-specific cleanup decisions:

- Scientific Basis. Ecology agrees that the FCRs used to support sediment cleanup decisions should be based on sound scientific information. Over the last two years, Ecology has reviewed national and regional studies on FCRs. Ecology has concluded

that, collectively, these studies provide technically credible estimates of FCRs for Washington State fish-consuming populations. These surveys are summarized in Table 13-1 below. Ecology will also consider additional scientific studies that are completed in the future. As stated in the adopted SMS rule, Ecology will evaluate new scientific information using the criteria specified in WAC 173-340-702(14) through (16).

- Local and/or Regional Consumption Rates. Sediment cleanup standards are designed to prevent unacceptable health risks associated with site-related exposures resulting from the release of hazardous substances. Consequently, Ecology believes that FCRs used to calculate sediment cleanup standards should be based on locally or regionally harvested fish and shellfish. This approach is consistent with the EPA Region 10 Framework (EPA, 2007b).

- Salmon. Ecology believes that salmon should be considered when calculating site-specific FCRs. Ecology's rationale for this approach includes:

    - People in the Pacific Northwest eat large amounts of salmon. Regional fish dietary surveys document that salmon are the most frequently consumed and consumed in the largest amounts of all finfish (Ecology, 2013).

    - Research and agency evaluations indicate that salmon obtain some of their body burden from local and regional sources of contamination (O'Neill et al., 1998; Puget Sound Action Team, 2007).

    - Resident populations of salmon have higher body burdens. Researchers have reported that Puget Sound salmon have higher levels of many contaminants than salmon returning to other areas.

    - Salmon have great cultural and economic importance for people living in Washington. Several people provided comments emphasizing the significance of salmon in the Pacific Northwest.

    - This approach is consistent with the approach used by the State of Oregon. The Oregon Department of Environmental Quality adopted water quality standards based on a revised FCR in 2011 that includes salmon. EPA has reviewed and approved the Oregon rule under the federal Clean Water Act.

Table 13-1. Summary of Fish Consumption Rates, All Finfish and Shellfish (g/day)

Population	Source of Fish	Number of Adults Surveyed	Mean	Percentiles		
				50th	90th	95th
General population	All sources: EPA method	2,853	56	38	128	168
	All sources: NCI method	6,465	19	13	43	57
Columbia River Tribes	All sources	464	63	41	130	194
	Columbia River	–	56	36	114	171
Tulalip Tribes	All sources	73	82	45	193	268
	Puget Sound	71	60	30	139	237
Squaxin Island Tribe	All sources	117	84	45	206	280
	Puget Sound	–	56	30	139	189
Suquamish Tribe	All sources	92	214	132	489	797
	Puget Sound	91	165	58	397	767
Asian and Pacific Islanders	All sources	202	–	74	227	286
	Locally harvested	125	–	6.5	26	59
Recreational Fishers	Marine waters, WA State	–	11-53	1.0-21	13-246	
	Freshwater, WA State	–	6.0-22	–	42-67	

Adapted from Polissar et al. (2012). Data for recreational fishers is from Table 3, Technical Issue Paper: Recreational Fish Consumption Rates (in Ecology, 2013, Supplemental Information to Support the Fish Consumption Rates Technical Support document).

Issue 13-11: Fish diet fraction, -561(2)(b)(i)(C)

- Commenters: Boeing (108), Yakama Nation (274,276), Colville Tribe (305), Umatilla Tribes (315,349), King County (377), NAVFAC (525), NWIFC (543,547), CILP (676), Spokane Tribe (696,698), Squaxin Island Tribe (707–709), Suquamish Tribe (740), Swinomish Tribe (753), Tulalip Tribes (770,775)

Summary of comments received:

- We support consideration of the percentage of the seafood diet from the vicinity of the site.

- Many tribes obtain most or all of their seafood from local waters, and should be assumed to have a diet fraction of 1. Furthermore, their rights to do so are guaranteed by treaty in perpetuity. The vicinity of the site should not be defined too narrowly. This factor should be eliminated.

- For the Yakama Nation, Ecology should assume a diet fraction of 1. Our members have been consuming fish from the Columbia River since time immemorial, and Ecology should not assume that any fraction of our diet was harvested from areas outside the reach of rulemaking.

- The fish diet fraction should be 1. The total exposure to a person must be considered from all sources. The tribe's treaty right to use a resource is not dependent on how many people could use the resource. This is especially important given the suppressed rate of consumption given current fish populations and fish advisories.

- Use of the fish diet fraction fails to consider the context of harvest at multiple sites, putting tribal members at risk. There is no justification for use of a diet fraction less than 1 in areas with historic, current, or future tribal consumption.

- If the fish diet fraction is used, the remaining portions should not be considered to be uncontaminated.

- The rule inappropriately refers to the "general vicinity of the site." Contamination from a site can affect seafood that migrates beyond the site boundaries or the vicinity of the site. These potential impacts and effects on fish consumers should be considered holistically. A fish diet fraction that does not consider these broader impacts will be underprotective.

- What if the site has no shellfish? Should we assume resources switching will occur or reduce the consumption rate?

- Can consumption rates be adjusted based on food availability?

Response:

Ecology is adopting the proposed rule language. Ecology continues to believe it is important to consider where people obtain the seafood they are eating when establishing site-specific cleanup standards. The rationale for this approach includes the following:

- This approach is consistent with the purpose behind establishing cleanup standards. Cleanup standards provide the basis for selecting cleanup actions that will prevent unacceptable risks associated with a release of hazardous substances at specific sites. Cleanup actions undertaken to prevent the transfer of contaminants from sediments to fish/shellfish will not reduce health risks associated with fish caught in other areas.

- This approach is consistent with the MTCA rule, which includes a fish diet fraction when calculating site-specific surface water cleanup standards. The fish diet fraction is defined in the MTCA rule as "...the percentage of the total finfish and/or shellfish in an individual's diet that is obtained or has the potential to be obtained from the site" (WAC 173-340-708(10)(b)).

Ecology believes that many of the issues raised are more appropriately addressed in guidance than in rule. Ecology intends to provide guidance on how to conduct these site-specific determinations in the Sediment Cleanup User's Manual II. The guidance currently includes a default fish diet fraction of 1. However, this value can be reduced based on site-specific considerations.

Ecology believes that there are several factors that must be considered when evaluating whether to use a fish diet fraction of less than 1. For example, it may be considered whether the site-specific fish consumption rate is based on the total amount of fish consumed or locally or regionally harvested amounts. In the latter situation, use of a fish diet fraction of less than 1 would not be appropriate because the source of fish and shellfish has already been taken into account when selecting the fish consumption rate. This is consistent with the EPA Region 10 framework, which does not include the fish diet fraction concept, but includes fish consumption

rates that reflect estimates of the amount of fish harvested and consumed from Puget Sound (USEPA, 2007b).

Issue 13-12: Site use factor, -561(2)(b)(i)(D)

- Commenters: Boeing (108), Larry Dunn (198,199), Lon Kissinger (206), Yakama Nation (274,277), Colville Tribe (306), Umatilla Tribes (315,350), NCASI (509), Nippon (542), NWIFC (543,548), NWPPA (567), City of Renton (661), CILP (678), Spokane Tribe (699), Squaxin Island Tribe (707–709), Suquamish Tribe (740), Swinomish Tribe (754), Tulalip Tribes (771,775)

Summary of comments received:

- We support consideration of the home range of fish and shellfish relative to the site.

- This approach fails to consider the aggregate tissue burden from more than one site, and hence the risks to consumers of fish may be substantially underestimated. There is no justification for using this factor in areas with historic, current, or future tribal consumption due to the potential for substantially exceeding cumulative risk levels in seafood.

- The relevance of this adjustment and how it will be implemented are not entirely clear. Generally we support this factor because it transparently recognizes the assumption that not all of the body burden of many organisms will be from the site. However, it would be better to use organisms that are primarily associated with the site to assess contaminant uptake by species at the site.

- Ecology too narrowly defines the area over which an organisms is "in contact" with contaminated sediments at the site. Contaminated sediments can be dispersed, resuspended, and transported to areas well beyond the site.

- Regulation of water and sediment only has the potential to affect chemical concentrations in fish and shellfish tissue if they are raised or spend significant periods of their life cycles in Washington.

- In the case of adult salmon specifically, studies have shown that they receive >90% of their body burden in the open ocean. Thus, a site use factor of 0.1 would be appropriate and conservative for freshwater or estuarine areas.

- The home range approach is completely unworkable for finfish and crab, as their home range is unknown and subjective relative to a cleanup site. There is currently no method to assess how much of what is in the organism has been acquired at the site.

- The proportion from the site should be 100% or this factor should be removed given the uncertainties in our knowledge of this factor.

- This factor appears to be a thinly disguised way of excluding salmon from consideration at a site due to an assumption that anadromous species spend little time at a particular site. However, scientific studies show that the time spent in a river or estuary as a juvenile has a strong effect on the health and survival of salmon. Some salmon spend their entire lifecycles in areas affected by a site.

- Salmon spawning and nursery areas should receive special protection.

Response:

Ecology has revised the proposed rule language to better reflect the intent of this exposure parameter to characterize the reasonable maximum exposure (RME) scenario.

Ecology recognizes uncertainties associated with estimating the home ranges for fish/shellfish and the relationships between sediment contamination and fish/shellfish tissue concentrations. Ecology will assume that non-anadromous fish and shellfish obtain 100% of their body burden from the site. This is a health-protective approach given the uncertainties in estimating home ranges and biota-sediment accumulation factors (BSAFs). This approach is also consistent with approaches used to establish surface water quality standards and cleanup levels.

Ecology also recognizes that some species of salmon and other anadromous species spend considerable portions of their lives in the open ocean and can obtain much of their body burden of bioaccumulative chemicals outside of Washington waters. Hope (2012) recently evaluated the implications of including salmon in the fish consumption rate used to establish Oregon's water quality standards. The paper estimated that implementation of Oregon's water quality standards would not significantly impact the levels of bioaccumulative chemicals in salmon because many species of salmon spend considerable portions of their life cycle outside Oregon waters. However, the paper also showed that some species of salmon obtained a substantial amount of their body burden from Puget Sound waters or contaminated estuaries draining to Puget Sound.

Ecology plans to consider information on salmon life strategies when calculating site-specific cleanup standards. Ecology does not envision that this provision will be implemented in a precise mathematical fashion. Ecology plans to use a qualitative weight-of-evidence approach when evaluating how salmon are included when calculating a site-specific fish consumption rate. This approach provides a flexible way to take into account the complex life cycle of anadromous fish (salmon) while accounting for the diversity of aquatic habitats and the large range of possible chemical contaminants in sediments. This approach is also consistent with advice from the MTCA Science Advisory Board.

Finally, this approach is consistent with the purpose behind establishing cleanup standards. Cleanup standards provide the basis for selecting cleanup actions that will prevent unacceptable risks associated with a release of hazardous substances at particular sites. Cleanup actions undertaken to prevent the transfer of contaminants from sediments to fish/shellfish will not reduce health risks associated with chemicals that are accumulated in the open ocean.

Issue 13-13: Alternate exposure scenario, -561(2)(b)(ii)

- Commenters: Yakama Nation (274), Umatilla Tribes (315,351), King County (377,453), NWIFC (543,546), Pioneer (587), CILP (670), Spokane Tribe (706), Squaxin Island Tribe (707,708), Suquamish Tribe (740), Swinomish Tribe (752), Tulalip Tribes (775)

Summary of comments received:

- It appears that it will be difficult to use alternative scenarios based on the way this section is currently worded.

- This section does not mention tribes. Any site throughout any tribal usual and accustomed (U&A) area must have a reasonable maximum exposure (RME) based on tribal exposure scenarios. We should not have to fight for a tribal RME and appropriate levels of cleanup at every site.

- Please clarify whether this is related to some of the above criteria.

- The CSL should be based on alternative RMEs such as recreational or otherwise allow some flexibility so that the range is meaningful.

- If tribal consumption rates are used, this should be considered the default scenario for Puget Sound. Outside of Puget Sound, there are many small lakes and other smaller water bodies that are not within U&A fishing areas, and it does not seem appropriate to have a tribal RME for these areas.

- It is not clear how this part would be used to modify the RME. Can you please clarify the intent of this language? It should not be left entirely to guidance. This would effectively apply consumption rates in the technical support document to much of the state.

- Recommend revising the citations to MTCA to be more specific. Those sections contain many provisions that do not apply to SMS. Otherwise this reference should be deleted and the necessary text included in the SMS.

Response:

Ecology is adopting the proposed rule language. The rule provides the flexibility for Ecology to approve alternate RME scenarios. Ecology continues to believe that it is important to provide some flexibility for defining the RME scenario. The rationale for this decision includes the following:

- This approach is consistent with MTCA, which provides the flexibility to use alternate exposure scenarios. For example, the MTCA surface water standards are based on a recreational exposure scenario. However, the rule provides the flexibility to establish more stringent cleanup levels based on other exposure scenarios.

- This approach is consistent with (although more constrained than) the approach used at federal Superfund sites. Under the National Contingency Plan, EPA makes site-specific decisions on the appropriate RME scenario.

- Ecology views this provision as a narrow exception to the default scenario given the locations of current sediment cleanup sites. However, Ecology concluded that it is important to provide some flexibility to address future sites not located in U&A fishing areas.

Technical and policy issues related to this topic are briefly discussed below:

- Intent. Ecology views the option for using an alternative exposure scenario as a narrow exception to the default scenario given the locations of current sediment cleanup sites. It is possible that future cleanup sites may be located outside U&A fishing areas. In those instances, the MTCA exposure scenario would be generally applicable.

- Relationship to Criteria in Subsection (2)(b)(i). Ecology identified five factors that should be considered when selecting exposure parameters used to characterize the tribal RME scenario. Ecology does not believe these criteria are relevant to the decision on whether to use an RME scenario based on tribal exposure scenario at a particular site. Ecology will base that decision on whether the sediment cleanup site is located in the U&A fishing area for one or more tribes.

- MTCA Citations. Ecology has revised the rule to clarify the cross-references to MTCA. The proposed rule referenced two MTCA sections (WAC 173-340-708 and WAC 173-340-702(14–16)) that provide general criteria applicable to this decision. Ecology agrees that the reference to Section 708 was very broad. Subsections 708(3) (Reasonable maximum exposure) and 708(10) (Exposure parameters) are the two subsections that are relevant to this determination.

- Tribal Consultation. Ecology will continue to consult with tribes during the cleanup process. Section 131(5) of the rule includes provisions for appropriate consultation with affected tribes when conducting a cleanup. Ecology has engaged in consultation and coordination with affected tribes in the past and will continue to do so.

Chapter 14: Sediment Cleanup Standards Based on Protection of the Benthic Community in Marine and Low-Salinity Environments (WAC 173-204-562)

This chapter provides a summary of the rule amendments concerning establishing cleanup standards based on benthic community risks in marine environments. The chapter summarizes the proposed amendments to the rule (Section 14.1), describes differences between the proposed and adopted amendments to the rule (Section 14.2), and responds to public comments on the proposed rule (Section 14.3).

14.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included:

- Re-titling the section to: "**Sediment cleanup standards based on protection of the benthic community in marine and low salinity sediment.**"
- The original cleanup screening levels criteria section in WAC 173-204-520 was moved to this new WAC 173-204-562 for consistency.
- Tables V and VI, biological criteria and tests, were added.
- Removed the human health narrative and replaced with the new section WAC 173-204-561.
- The numeric and biological numeric criteria were not changed.

14.2 Differences between the Proposed and Adopted Amendments

The following revisions between the proposed and adopted rule amendments were made to clarify and remove inconsistencies between the text and tables in the rule in response to public comment:

- The titles and legends of Tables IV, V, and VI were clarified and corrected.
- Table numbers IV, V and VI were changed to III, IV, and V respectively.
- The benthic abundance criteria were removed from the text in -562(3)(b) and added to Table IV to be consistent with the other biological criteria that are in tabular format.
- The benthic abundance performance standards were added to the legend of Table IV to be consistent with -563.
- A performance standard for the larval tests was added to Table IV.

- The equations for the biological criteria in Table IV were updated to commonly used terminology.

The following revisions between the proposed and adopted rule amendments were made based on internal review to clarify and remove inconsistencies between the text and tables in the rule or to be consistent with -563 provisions:

- To reflect current policy and be consistent with -563, the confirmatory designation provision was clarified in -562(3)(c)(i) to state that any person may perform biological testing to confirm toxicity.

- The "other toxic, radioactive, biological, and deleterious substances" provision in -562(4) was revised to clarify how to assess toxicity and to include chemicals not in Table V to clarify the intent, reflect current policy, and be consistent with -563.

14.3 Responses to Comments

Issue 14-1: Low-salinity sediments

- Commenters: City of Seattle (267), WSPA (873)

Summary of comments received:

- The title of this section includes low-salinity sediments but the section only covers marine sediment. At a minimum, a narrative discussion should be included.

Response:

The low-salinity section was located in -562(2)(e), but was under the heading of the marine standards. This section has now been renumbered to -562(5), at the same level as the marine standards and located at the end of this section of the rule.

Issue 14-2: Marine sediment chemical criteria, -562(2)

- Commenter: King County (383,455)

Summary of comments received:

- The marine standards for Puget Sound have now been applied to all marine waters. Has the appropriateness of these apparent effects thresholds (AETs) been demonstrated for other areas?

Response:

Ecology believes it is technically and scientifically reasonable to apply the AET marine criteria to all marine areas of Washington State. Over the last 20 years, these marine criteria have been

widely used from the Canadian border to coastal areas of Washington and Oregon in both cleanup and dredging programs. These marine areas are similar in terms of their benthic communities and use the same test species for monitoring.

Issue 14-3: Cleanup screening levels, -562(2)(b)

- Commenter: King County (456)

Summary of comments received:

- The second and third sentences regarding minor adverse effects contradict each other. Please clarify the language to meet the original intent of the rule.

Response:

Ecology is adopting the proposed rule language. The second sentence states that minor adverse effects can be considered to occur at chemical concentrations between the SCO and the CSL. The third sentence indicates that the CSL is the upper bound of allowable minor adverse effects, above which stations clusters of potential concern and cleanup sites may be identified. The two sentences are consistent with one another.

Issue 14-4: Organic carbon normalization, was -562(2)(h), now -562(2)(g)

- Commenter: King County (457)

Summary of comments received:

- The equation presented here is unnecessarily complicated. A much simpler equation is ppb OC = (ppb dry weight / ppm TOC) × 1000.

Response:

Ecology is adopting the proposed rule language. Normally, total organic carbon is presented in units of percent. Therefore, the equation in the rule is applicable.

Issue 14-5: Table IV, now Table III

- Commenters: BP Cherry Point (188), Umatilla Tribes (355), King County (380)

Summary of comments received:

- What is the purpose of the chemical criteria if a site-specific evaluation is needed? Just to screen sites or identify site units?

- It would be helpful to have a comparison to regional background for these tables. Also it would be useful to have a comparison of the marine and freshwater criteria and why they are different.

- Incorporate the recommendations of the Sediment Phthalate Work Group in setting benthic triggers for cleanup.

Response:

Ecology is retaining the existing chemical criteria. These chemical criteria can be used as stand-alone criteria for site or site unit identification, site evaluation, and as cleanup standards. The bioassay criteria override and/or site-specific evaluations may be performed by the potentially liable person or required by Ecology.

Regional background has not been determined. However, once determined, this information will be included in the Sediment Cleanup Users Manual II. A description of the differences between the freshwater and marine standards and the reasons for them is included in the Executive Summary of the technical background document for the freshwater criteria (Ecology, 2011).

The Sediment Phthalate Work Group recommended key considerations for phthalates in urban areas, particularly noting their recontamination potential in sediments due to their pervasive presence and transport through stormwater. The rule revisions include provisions to help manage these types of contaminants and sources during cleanup. For example, the concepts of regional background and site units and a greater emphasis on long-term source control to reach lower sediment quality goals have been added to the rule.

Issue 14-6: Benthic infauna abundance, was -562(3)(b)(ii)(C), now Table IV

- Commenter: USACE-NWD (785)

Summary of comments received:

- We recommend that a more robust endpoint be developed for benthic infaunal abundance, based on the following reports that were developed to refine the endpoint: PTI (1993), Weston (1995), SEA (1996), SEA and Weston (1999), and SEA and MER (2000).

Response:

Currently, Ecology is retaining the existing benthic criteria. Updates to the benthic criteria will be considered through the Sediment Management Annual Review Meeting process.

Issue 14-7: Table V, now Table IV

- Commenters: Boeing (127), King County (459,460,462), NAVFAC (538), Pioneer (589), USACE-NWD (788,789), WSPA (875–877)

Summary of comments received:

- The text and tables are inconsistent in the mathematical definition of p values. The p value should be ≤ x. The dot after the p does not make sense.

- Ecology has required permittees and potentially liable persons to use SEDQUAL and now MyEIM statistical software for many years. These tools provide for more appropriate statistical tests depending on normality. The rule should be rewritten to account for these statistical tools and nonparametric testing where appropriate.

- The p value for the larval test is set to 0.1, higher than those for the other tests. This results in a slightly higher likelihood that larval effects will be determined under the revised rule. This discrepancy should be explained.

- The inequalities shown for the CSLs for the bivalve/echinoderm abnormality/mortality tests should be changed from > to <.

- Recommend establishing a performance standard for the reference sediment in the bivalve/echinoderm abnormality/mortality bioassay. The Dredged Material Management Program requires that normal survivorship be at least 65% of the seawater control at the end of the test.

- No endpoint is shown for benthic infaunal abundance, which is described in the text. On the other hand, Microtox is shown in the table but is not defined in the text.

- Add text and/or notes to define acronyms and more clearly document calculations and comparisons.

- The SCOs and CSLs listed in the table are not actually SCOs and CSLs but rather the method used to assess an exceedance of these levels for each biological test.

Response:

Table IV and associated rule language has been revised as follows:

- The mathematical symbols for the p values in the proposed rule could not be accurately viewed due to formatting problems and have been corrected.
- Missing endpoints and reference performance standards have been added to Table IV.
- The larval test inequality has been corrected.
- The text refers to Table IV rather than repeating the test information.
- Outdated statistical language has been removed.
- Explanatory notes have been added to Table IV to assist the reader.

Due to greater variability in these tests, the p value for the larval tests was increased to 0.1 to provide equivalent power to the other tests. Because the power to detect a difference is approximately the same, the chance of designating a sample as an exceedance is also approximately the same as for the other tests. This change was made through the Sediment Management Annual Review Meeting process in 1994.

Issue 14-8: Table VI, now Table V

- Commenter: King County (461)

Summary of comments received:

- The Neanthes 28-day growth test should be the 20-day growth test.

Response:

The table has been revised.

Issue 14-9: Bioassay override, -562(3)(c)(i)

- Commenters: BP Cherry Point (189), King County (458), Waterkeepers (846)

Summary of comments received:

- Why have a bioassay override if most cleanup drivers will be based on human health?

- We do not believe the bioassay override is appropriate or protective of human health or biota. Bioassays are not protective of the wide array of organisms in Puget Sound. While these tests did inform development of the SCO and CSL values, these are just averages and will not be predictive at every site. With two inexact measures, neither should be used to override the other.

- Bioassays should only be conducted as a confirmatory test if sediments fail the chemical criteria. Therefore this section should read "designation of marine sediment which fails the chemical criteria…"

- We assume a bioassay override is still available to the potentially liable persons?

Response:

Ecology is retaining the bioassay override. There are deleterious substances that can cause adverse effects to the benthic community, such as wood waste, for which bioassays are typically used to assess toxicity. Even though bioaccumulative chemicals may also be present at a cleanup site, multiple lines of evidence must be used to determine cleanup standards and remedial alternatives designed to protect the specific species or receptors at risk.

The rule language has been revised to clarify the intent of the rule, that Ecology or any other party may conduct bioassay testing to override the chemistry results.

The bioassay override can only be used to override the chemical criteria for protection of the benthic community. Evaluation of bioaccumulative chemicals is still required for protection of fish, human health, and wildlife. See -561 and -564 and the Sediment Cleanup User's Manual II Chapters 1 and 7.

Chapter 15: Sediment Cleanup Standards Based on Protection of the Benthic Community in Freshwater Sediments (WAC 173-204-563)

This chapter provides a summary of the rule amendments concerning establishing cleanup standards based on benthic community risks in freshwater environments. The chapter summarizes the proposed amendments to the rule (Section 15.1), describes differences between the proposed and adopted amendments to the rule (Section 15.2), and responds to public comments on the proposed rule (Section 15.3).

In early 2002, Ecology began a project to identify, update, and ultimately select freshwater sediment chemical criteria for protection of the benthic community for use in Ecology's cleanup and dredged material management programs. This effort was completed in July 2003 (Ecology, 2002, 2003), and included compilation of freshwater sediment data in western Washington and Oregon, identification of existing freshwater guidelines in North America, an assessment of their reliability in predicting benthic community effects in Washington State under the "no adverse effects" and "minor adverse effects" narrative standards of the SMS rule, and a decision to calculate criteria with greater reliability than existing guidelines using the Floating Percentile Model (FPM). The criteria were considered interim because there were not enough data to include chronic endpoints or geographic coverage of the east side of the state (Ecology, 2003).

In 2007, the Regional Sediment Evaluation Team (RSET) decided to update Ecology's interim freshwater criteria for inclusion in the Sediment Evaluation Framework (SEF) for Oregon, Washington, and Idaho (RSET, 2009) and future updates to the SMS rule. The SEF is used to evaluate dredging projects in marine waters and freshwater areas of these three states, and RSET includes several federal and state agencies responsible for these regulatory functions.
In 2009, Ecology began the rulemaking process to update the Sediment Management Standards (SMS) to adopt freshwater sediment chemical and biological criteria for protection of the benthic community. The technical background report for the criteria can be found at https://fortress.wa.gov/ecy/publications/summarypages/1109054.html (Ecology, 2011). Additional technical analyses conducted after this report to evaluate the criteria can be found in Appendix E of this document.

15.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included:

- This new section replaced the freshwater narrative standard in Part V only. Narrative standards in Parts III and IV remain.

- Language was added to include numeric biological and chemical cleanup criteria consistent with the current marine benthic criteria framework in the new section -562.

- These criteria were developed to be protective of the benthic community and do not include bioaccumulative effects to human or ecological receptors.

15.2 Differences between the Proposed and Adopted Amendments

The following revisions were made in response to comments received to clarify and remove inconsistencies between the text and tables:

- Dry weight normalization was clarified in the text in -56392)(g) and Table VI.
- The benzofluoranthenes criterion was clarified in -563(2)(i).
- The explanation of ">" (greater than) values in -563(2)(n) was revised to clarify that the CSL is not known but concentrations above the SCO are at the minor adverse effects level.
- Language was revised in -563(2)(o) to better define what types of freshwater environments may require alternate technical methods to be used and what types of alternate methods shall be used.
- The CSL criterion for endrin ketone was changed from 0 to >8.5 to differentiate this level from the SCO and for consistency with the technical report. The proposed rule language had a typographical error.
- The titles and legends of Tables VI, VII, and VIII were clarified and corrected.
- The equations for the biological criteria in Table VIII were updated to commonly used terminology.

The following revisions were made for clarity and consistency based on internal review:

- Table numbers VII, VIII, and IX have renumbered to VI, VII, and VIII, respectively.
- The confirmatory designation provision was clarified to state that any person may perform biological testing to confirm toxicity to reflect current policy and be consistent with -562.
- The "other toxic, radioactive, biological and deleterious substances" provision was revised to clarify how to assess toxicity and include chemicals not listed in Table VI to clarify the intent, reflect current policy, and be consistent with -562.

15.3 Responses to Comments

Issue 15-1: Freshwater standards, -563

- Commenters: AECOM (50), Boeing (113), Yakama Nation (281), USACE-NWD (776,777), WSPA (870)

Summary of comments received:

- We support the proposed SCO and CSL values and rule revisions.
- We agree that it is important to streamline and standardize the management of freshwater sediments.
- Having default freshwater standards is important to ensure that site assessments and cleanups are conducted effectively and efficiently.
- The freshwater criteria should be used, along with adequate confirmatory procedures, to identify cleanup sites.
- The Corps co-chairs the Regional Sediment Evaluation Team (RSET), and is very interested in the development of screening levels for freshwater sediments. Upon completion of SMS rulemaking, RSET is considering incorporating these values into the Sediment Evaluation Framework for the Pacific Northwest, used in Oregon, Washington, and Idaho to evaluate the suitability of sediments for dredging. The more robust dataset gathered for these values have greatly improved the standards and the public and peer review processes strengthen their validity.

Response:

Comments noted.

Issue 15-2: Chemical criteria, -563(2)

- Commenters: Boeing (114), Yakama Nation (281), Colville Tribe (285,288,296,299,300,302), USDOI (795,798), WSWRA (835)

Summary of comments received:

- The Floating Percentile Model (FPM) values do not adequately reflect no adverse effects and minor adverse effects. The values should be revised to be consistent with this narrative intent.
- The FPM values have high levels of false positives for individual chemicals. Therefore, application of the criteria is highly uncertain and may result in heavy reliance on bioassays.
- Equilibrium partitioning values were not considered in developing the chemical criteria.
- The FPM values do not predict as many toxic samples as other, more conservative approaches to interpreting biological data and therefore are not reliable.

- Several of the FPM values are more than a factor of 3 higher than Threshold Effects Concentrations (TECs) and Probable Effects Concentrations (PECs), including As, Cu, Pb, Zn, total PAHs, DDTs, and endrin, and therefore are not accurate.

- There are fewer values than in MacDonald et al. (2000).

- The FPM values should be replaced with those of the Colville Tribe (for the SCO) and MacDonald et al. (2000) (for the CSL).

- The data set used to derive the freshwater values for metals is disproportionately influenced by data from the Upper Columbia River site, which itself is influenced by slag. This exerts a confounding effect on the resulting sediment standards. As a result, the proposed standards are underprotective for metals found in slag, will harm human health and the environment, and will have a disproportionate adverse impact on tribal members.

- We are concerned about whether appropriate data and approaches have been used for the east side of the state.

- The current and proposed sediment quality values may not be directly applicable to irrigation districts in central and eastern Washington because they were derived from highly contaminated areas in urban and industrial locations.

- Please provide the results of the peer review comments and Ecology's responses to the comments.

Response:

Ecology is adopting the proposed freshwater benthic criteria. The "no adverse effects" and "minor adverse effects" narrative intent of the rule used to establish biological and chemical criteria have been consistently applied in the state's sediment management, cleanup, and dredged material management programs since the 1991 adoption of the rule. For example, the marine benthic numeric criteria were established using this narrative intent and have been successfully implemented for cleanup, source control, and dredge material management. In general, the narrative intent was designed to protect the structure and function of the benthic community and the services the benthic community provides within the ecosystem. This narrative intent was intentionally not designed to protect individual benthic organisms or individual benthic species. The freshwater biological and chemical criteria were developed to be conceptually consistent with this narrative intent and the marine benthic criteria. See the responses to Issues 15-11 and 15-15 for more discussion of the narrative intent with respect to the biological benthic criteria.

The reliability of the adopted chemical criteria has been extensively evaluated and is documented in Ecology (2011). Overall reliability in predicting toxicity or non-toxicity is approximately 80%. This is higher than that of other available freshwater benthic chemical criteria sets, which have overall reliabilities ranging from 20–60% (Ecology, 2002, 2003, 2011). While criteria for individual chemicals may still result in false positives at some sites, this information is readily accessible and provides more definitive information on when a bioassay override may be appropriate or cost-effective.

All existing freshwater benthic chemical criteria sets, including equilibrium partitioning and TECs/PECs, were thoroughly assessed using sediment data from Washington and Oregon prior to making the decision to develop a new method, the FPM (Ecology, 2002). These results were reconfirmed following development of the final criteria (Ecology, 2011). One of the conclusions of this review was that the TEC/PEC chemical criteria had a high number of false positives (>90%) and consistently predicted toxicity that was not confirmed by bioassays. Many of the TEC/PEC values are near background concentrations, and would result in over 80% of the freshwater sediments in the state being designated as toxic (Ecology, 2011). However, biological toxicity test results indicate that only 10–12% of these sediments are actually toxic. Thus, more conservative chemical criteria to identify sites for cleanup, establish cleanup standards, or manage dredged material are not necessarily more accurate, protective, or implementable.

The FPM approach was developed to retain the same level of protectiveness as other values while minimizing the number of false positives. The adopted criteria are regulatory values intended as site identification and cleanup standards rather than as screening levels, and therefore must meet MTCA and APA requirements to be both protective and the least burdensome alternative. To achieve a greater degree of accuracy and reduce false positives, some of the criteria are more than 3-fold different from the TECs/PECs. The resulting criteria are equally protective of the benthic community while greatly reducing the burden on the State and the regulated community by reducing incorrect predictions of toxicity.

A variety of different ways of handling the data and developing chemical criteria were tested prior to finalizing the adopted chemical criteria. Among these approaches was summing certain classes of compounds rather than assessing their toxicity individually. Summing classes of chemicals (e.g., polynuclear aromatic hydrocarbons) provided more accurate predictions of toxicity than setting standards for individual chemicals in the group, because the toxicity of these chemicals is additive (Ecology, 2011). Therefore, although the TECs/PECs may have criteria for more individual chemicals, the adopted criteria include a larger number of chemicals within the sums and also include more chemical classes.

Similarly, we tested whether the chemical criteria would be more reliable if the data set was divided into regions of the state, for example, east and west of the Cascades. The results of this analysis showed that the criteria were more reliable if all areas were addressed in a combined manner (Ecology, 2011).

The FPM model was specifically designed to address the variations in metals bioavailability that occur in freshwater environments, and to develop criteria that are not impacted by high-concentration, low-toxicity data such as may be found in mining wastes. These anomalous data are disregarded by the model algorithm regardless of how many such data there may be within the data set. However, the adopted rule and the Sediment Cleanup User's Manual II contain alternative approaches for assessing these types of sites, including biological testing and development of site-specific chemical criteria. See the response to Issue 15-7 for more detail.

The peer review comments, along with Ecology's responses, can be found in Ecology (2012). Additional analyses of the freshwater chemical and biological criteria conducted to evaluate these comments can be found in Appendix E.

Issue 15-3: Cleanup screening levels, -563(2)(b)

- Commenter: King County (456)

Summary of comments received:

- The second and third sentences regarding minor adverse effects contradict each other. Please clarify the language to meet the original intent of the rule.

Response:

Please see response to Issue 14-3.

Issue 15-4: Benzofluoranthenes, was -563(2)(h), now -563(2)(i)

- Commenter: King County (463)

Summary of comments received:

- This section double-counts individual benzofluoranthenes.

Response:

The rule language has been clarified to indicate that "total benzofluoranthenes" represents the sum of the b, j, and k isomers, regardless of how they are reported.

Issue 15-5: DDT isomers, was -563(2)(i), now -563(2)(j)

- Commenter: King County (464)

Summary of comments received:

- Why are the o,p′ isomers of the DDTs included here? These are usually not analyzed separately and to do so would increase the cost. The p,p′ isomers are much more abundant. The o,p′ isomers should be removed from the list.

Response:

Ecology is adopting the proposed rule language. The o,p' isomers are on the list because they were included in the data set and detected at more than the minimum number of stations used to develop the criteria. If the two are present in the data set, they should be added together.

Appropriate use of the freshwater chemical criteria requires that a minimum data set of metals and organics be collected. The current list in the rule includes both the standard suite of chemicals and some chemicals, such as pesticides and butyltins, that were associated with toxicity in the state-wide data set but may not be found at all sites or in all regions. Some

chemicals are also included that are non-standard analytes, because they were present in the data set and associated with toxicity.

Guidance on the minimum suite of analytes as well as additional analytes that will be appropriate under certain situations will be included in the Sediment Cleanup User's Manual II. Additional chemicals beyond the standard suite of analytes may not need to be analyzed at every site. The presence or absence of existing data and the conceptual site model will determine which of these additional analytes should be included.

Issue 15-6: PCB Aroclors, was -563(2)(l), now -563(2)(m)

- Commenter: King County (465)

Summary of comments received:

- Why is Aroclor 1268 included in total PCBs? This is not part of the standard EPA 8082A method or on EPA's list of common priority pollutants. King County currently does not analyze for it. It should be removed from the list.

Response:

Ecology is adopting the proposed rule language. This Aroclor was included because it was detected more than the minimum number of times in the data set used to derive the criteria. Total PCBs is intended to include all of the PCBs analyzed at the site, but does not require that all PCBs listed be analyzed if existing data and/or the conceptual site model establish that an Aroclor is not present at the site. See response to Issue 15-5 for further detail.

Issue 15-7: Sites where chemical criteria may not be applicable, was -563(2)(n), now -563(2)(o)

- Commenters: King County (466), USACE-NWD (790), WSWRA (835,837–839)

Summary of comments received:

- Please modify this section to state, "bioassays may be conducted to evaluate benthic toxicity." There may be no need to do this added testing if other chemicals exceed the criteria indicating the potential for toxicity.

- Do not assume that the proposed sediment quality values or the Threshold Effects Concentrations (TECs)/Probable Effects Concentrations (PECs) are applicable to sediments in irrigation districts. Instead, that evaluation should be done on a site-by-site basis, considering water chemistry, regional background levels, and historic and current discharges. Existing data do not show elevations above sediment quality guidelines or World Health Organization fish tissue limits.

- Water chemistry such as hardness varies significantly among irrigation districts. Thus, the unique water chemistry should be considered when considering the risks associated with copper in sediments. A method such as the biotic ligand model may be more appropriate for this purpose.

- Data for the proposed freshwater sediment criteria were collected in the most impacted areas of the state, including Puget Sound and the Columbia River, where they pose the highest risks to human health and the environment. While some samples were collected in eastern Washington, none were collected in irrigation districts in central Washington. Additional sampling is needed in central Washington before establishing benthic criteria for this area.

- Revise "affects" to "effects."

Response:

Ecology is adopting the proposed language. The bioassay override would not need to be applied if the other chemistry data at the site indicate the potential for benthic toxicity and all parties agree. Ecology's analysis has shown that the adopted chemical criteria are more predictive of benthic community toxicity than values such as the TEC/PECs. However, the predictive ability of the adopted chemical criteria in certain freshwater environments, such as mining impacted sediment, is not as optimal as Ecology would prefer for regulatory purposes. Ecology has decided to take a conservative approach for certain types of freshwater environments, detailed in -563(2)(o) and (p), and default to confirmational bioassays for these types of environments.

Irrigation canals may be one example of the type of unusual freshwater sediment environments referred to in -563(2)(o) regarding alternate technical methods, and a site-specific approach could be appropriate under these circumstances. The approach would depend on the degree to which the canal is habitat for species addressed by the rule, its connectedness to other water bodies, and the site-specific water and sediment chemistry referred to in the comments.

A number of options for alternate technical methods are provided in -563(2)(o) for site-specific evaluations and development of site-specific sediment standards, with the requirement that alternate methods meet the provisions in -563(3). See Issue 15-11 for further detail on alternate methods and the provisions in -563(3). Additional information will be provided in the Sediment Cleanup User's Manual II.

The section containing the word "affects" has been removed.

Issue 15-8: Table VII – general, now Table VI

- Commenters: Boeing (116,117), BP Cherry Point (188), Umatilla Tribes (355), Landau Assts. (499), Pioneer (590), USDOI (796)

Summary of comments received:

- What is the purpose of the chemical criteria if a site-specific evaluation is needed? Just to screen sites or identify site units?

- It would be helpful to have a comparison to regional background for these tables. Also it would be useful to have a comparison of the marine and freshwater criteria and why they are different, and why some of the freshwater criteria are different from the MacDonald (2000) values. Perhaps a supporting technical toxicology document would be helpful.

- Seven of the chemicals have undefined freshwater CSLs, and concentrations above the "greater than" values listed in the table will require bioassay testing to make SMS compliance decisions. This could result in greater costs or greater uncertainties at sites. These chemicals should be further investigated and CSLs established.

- In some cases, the reference performance standards shown in Table VIII were used to evaluate test acceptability for development of numeric criteria. However, neither ASTM (2012) nor USEPA (2000) contains performance criteria for reference standards. Therefore, it is unclear what performance standards were used in calculating the numeric standards.

- For consistency with the marine standards, the freshwater standards should also be organic carbon normalized for nonpolar chemicals. Both marine and freshwater standards should use the same normalization.

- A definition of dry weight normalized should be provided. Add text and/or notes to define acronyms and more clearly document calculations and comparisons.

Response:

Ecology is adopting the proposed freshwater benthic chemical criteria. These chemical criteria can be used as stand-alone criteria for site or site unit identification, site evaluation, and as cleanup standards. The bioassay criteria override and/or site-specific evaluations may be performed by the potentially liable person or required by Ecology.

Regional background has not been determined. However, once determined, this information will be included in the Sediment Cleanup Users Manual II. A description of the differences between the freshwater and marine standards and the reasons for them is included in the Executive Summary of the technical background document for the freshwater criteria (Ecology, 2011). This report also compares the performance of the freshwater criteria to that of the Threshold Effects Concentrations (TECs)/Probable Effects Concentrations (PECs) (MacDonald, 2000).

Chemicals with "greater than" values were not associated with toxicity above minor adverse effects up to the highest concentration measured in the data set. In these cases, the CSL is unknown, but is higher than the concentration shown. Therefore, it can be assumed that concentrations below the "greater than" values do not exceed the CSL. This rule language has been clarified. While it is true that bioassays would be required to assess toxicity above these levels, concentrations higher than these have not been measured in Washington or Oregon in the

last 10 years. Ecology considers it unlikely that this situation could arise at more than a very few sites. Because higher values have not been measured, it is not possible to develop CSLs for these chemicals.

Test samples were not compared to reference samples at any station, even if reference samples were included in the data set. Therefore, the reference sample performance standards in Table VII were not used in developing the freshwater criteria. Regardless of the original study methodology, the treatment of all data in the combined data set was standardized, including quality assurance/quality control methods, blank-correction, summing, comparison to control samples, etc.

Organic-carbon normalization of the freshwater criteria was evaluated for the interim criteria (Ecology, 2003) and for the final criteria (Ecology, 2011) using side-by-side comparisons of the reliability and predictiveness of dry weight normalization vs. organic carbon normalization. There was no improvement due to organic carbon normalization, so this approach has not been adopted. Although the marine benthic criteria are organic carbon normalized, neither the dredged material guidelines for the region or other sediment quality guidelines in use in North America are, so the current method is more consistent with these other approaches. References to normalization in Table VI have been removed.

Issue 15-9: Table VII – removal of or changes to individual chemical criteria, now Table VI

- Commenters: Boeing (120–123), Colville Tribe (285,300,301), King County (380,467,468), USDOI (799), Waterkeepers (845), WSPA (880)

Summary of comments received:

- We request the removal of butyltins, as they are not typically detected or analyzed in freshwater sediments, or at least all of those other than the most toxic tributyltin. We think it is likely that the data sets for these chemicals were relatively small. Does Ecology know that the other butyltins contributed to toxicity? Please clarify that butyltins do not have to be analyzed for in all water bodies unless there is reason to believe that there is a source.

- We request the removal of sulfides and ammonia. These chemicals form as the result of geochemical conditions that do not typically have anthropogenic sources.

- We request the removal of total petroleum hydrocarbons (TPH). These mixtures can have widely ranging chemical composition and toxicities. Effects from TPH are already captured in the total polynuclear aromatic hydrocarbon (PAH) criteria.

- Incorporate the findings of the Sediment Phthalate Work Group in setting benthic criteria for phthalates.

- Why is endrin ketone included, when it is not included in any monitoring program? The CSL value of 0 should be corrected to a value higher than the SCO.

- The silver SCO should be changed from 0.57 to 0.58 mg/kg, consistent with the Floating Percentile Model (FPM) technical support document (Ecology, 2011).

- The order of magnitude difference between Ecology's proposed values and the Colville Tribe's sediment quality values for copper, lead, and zinc is unacceptable and will undermine the Tribe's standards. The reason for these discrepancies appears to be inclusion of data from Lake Roosevelt that are disproportionately affected by metals in slag, biasing the results of the FPM. Such elevated criteria for copper, lead, and zinc obviate the value of the bioassay override, because these levels will not be exceeded at most sites. These proposed criteria may undermine the natural resource damage assessment process for the Upper Columbia River site. Therefore, the copper, lead, and zinc values should be revised to be consistent with those proposed by the Colville Tribe, or removed from the criteria set.

- We are concerned that the levels for copper, lead, and zinc are too high and would prefer that they be set similar to the threshold effects concentrations (TECs). Ecology should provide evidence as to why these values should be higher in Washington. The high level for copper is especially concerning given its toxicity to salmon and other fish.

- CSL values should be lower than concentrations observed to cause toxicity in spiked sediment bioassay tests to meet the narrative intent of the rule. Based on a literature review, the CSL for copper is above lethal concentration $(LC)_{50}$ concentrations reported for spiked sediment bioassays.

Response:

Ecology is adopting the proposed freshwater benthic chemical criteria. See the response to Issue 15-5 for a discussion of when individual chemicals would need to be analyzed. All of the chemicals on the list were detected frequently enough to exceed the threshold for inclusion and were associated with toxicity in the data set. However, different chemicals may be prevalent in different regions of the state (e.g., butyltins in areas with boatyards and shipyards, pesticides in agricultural areas). For a discussion of phthalates, see the response to Issue 14-5.

Sulfides and ammonia may be elevated due to natural conditions, but not often to these levels. These compounds have been demonstrated to be toxic at marine sites due to site-related organic wastes (e.g., wood waste) and are known to cause toxicity in bioassay tests. As with metals and many other contaminants, the site manager will need to determine whether these chemicals are elevated due to natural or site-related sources.

The Regional Sediment Evaluation Team (RSET) agencies extensively analyzed the best method of representing petroleum toxicity in the freshwater criteria, including individual PAHs, various sums of PAHs, molecular weight-normalized petroleum fractions, and TPH. Each option was tested for reliability and predictiveness, and RSET, along with several other federal and state natural resource agencies, also held a workshop to review the latest research on petroleum toxicity (Ecology, 2011). The outcome of this work clearly indicated that PAHs alone do not adequately represent petroleum toxicity to benthic organisms, and that aliphatic components make a strong contribution. The only measure of bulk petroleum for which data are currently available is TPH. Side-by-side reliability testing showed that the TPH measure was more reliable

in predicting toxicity than any of the PAH measures, despite the lack of TPH data for many sites (Ecology, 2011). Therefore, it has been retained in the adopted criteria.

The CSL value of "0" for endrin ketone was a typographical error, and has been corrected to ">8.5," consistent with the technical report (Ecology, 2011). The proposed silver SCO criterion was the same as in the technical report, but may have been slightly different from the draft 2010 version of the technical report due to a minor rounding error. Therefore, the proposed silver SCO criterion was adopted.

The copper, lead, and zinc criteria were not affected by data from Lake Roosevelt (see Appendix E), which represent a fairly small proportion of the data set. See the response to Issue 15-2 for further discussion of metals bioavailability issues. Instead, the difference between the adopted criteria and the TECs/PECs is related to the type of model used to derive the values. The TECs, on which the Confederated Tribes of the Colville Reservation standards are based, are calculated using a univariate method. This approach assigns toxicity to one chemical at a time, while multiple chemicals may actually be associated with toxicity. This results in very low values that are highly conservative and frequently predict toxicity when it is not actually present. The FPM can be run in a similar manner for one chemical at a time, and when run that way, similar values are obtained (see Appendix E).

However, the FPM model was designed as a multivariate model. In other words, it models the toxicity of chemicals to the benthic community as chemicals actually occur in the environment, in mixtures. The model finds the most predictive combination of chemical criteria that accurately represents the measured toxicity. As a result of this more optimized approach, some chemical criteria may be higher and some may be lower than when each chemical is addressed in isolation. Some metals that were previously assigned low criteria using a univariate approach may not actually be significantly related to benthic toxicity in sediments, accounting for the high frequency of incorrect predictions.

Although the individual chemical criteria may differ, Ecology's evaluations indicate that the overall criteria set results in similar identification of cleanup sites as other criteria sets, while avoiding identifying areas as toxic that are not actually toxic (see Appendix E). While the criteria for copper, lead, and zinc are higher, criteria for other metals are equally low or lower, and these other metals may be responsible for the observed toxicity.

Ecology considers spiked single-chemical sediment bioassays to be less reliable than bioassays conducted on field sediments for predicting toxicity at sites. In these bioassays, chemicals are "spiked" into sediments in a much more bioavailable, soluble form than chemicals present in field sediments. Consequently, the chemicals may not have time to fully equilibrate with sediment and organic matter within the relatively short timeframe of the test. Chemicals in the environment may be present in a variety of forms, some of which are highly insoluble and present in very low concentrations in porewater. In addition, "aging" of contaminants in sediments may render them less soluble over time, as they bind more strongly to organic matter, clay, iron, or sulfides. These processes cannot be reasonably simulated in a relatively short-term laboratory test, as they may take years. Therefore, Ecology prefers to rely on data from bioassays using field sediments for developing benthic chemical criteria.

The chemical criteria were developed to be protective of the benthic community, not higher trophic levels or humans. For example, the value for copper is not intended to be protective of

fish, as there are other sections of the rule that are protective of these receptors (-561, human health and -564, higher trophic levels). The benthic criteria are only one part of the overall risk framework in -560 through -564.

In addition, Ecology has revised the rule to clearly include tribal standards as applicable or relevant and appropriate requirements (ARARs), which would be considered where applicable. Therefore, Ecology does not believe that adoption of statewide criteria undermines or interferes with adoption or implementation of applicable laws. Ecology has and will continue to work closely with affected tribes on a government-to-government basis on individual sites.

Issue 15-10: Bioassay override, -563(3)(c)(i)

- Commenters: BP Cherry Point (189), King County (458)

Summary of comments received:

- Why have a bioassay override if most cleanup drivers will be based on human health?

- Bioassays should only be conducted as a confirmatory test if sediments fail the chemical criteria. Therefore this section should read "designation of marine sediment which fails the chemical criteria…"

- We assume a bioassay override is still available to the potentially liable persons?

Response:

Please see the response to Issue 14-9.

Issue 15-11: Suite of required bioassays, -563(3)(d)

- Commenters: Boeing (125,126), Colville Tribe (298), Pioneer (591), USDOI (797)

Summary of comments received:

- Short-term acute tests do not provide an adequate basis for establishing numeric criteria.

- Chronic bioassays do not necessarily provide greater protection due to confounding factors and greater variability in response. Side-by-side acute and chronic studies have shown similar results. These tests should be listed as optional, rather than required.

- Given the requirements in this section, there are only two possible combinations of tests available. These should be stated for clarity and the limitations acknowledged.

- The text states that three endpoints should be used, yet only two are shown in Tables VII and VIII (mortality and growth). Please revise or clarify.

- Biomass should be considered for derivation of numeric criteria, rather than the separate growth and mortality endpoints, because it integrates the two and provides an indication of the food resources available to fish and wildlife. Biomass is also a more sensitive endpoint than survival.

- Reproductive endpoints should be included, as standard methods are available and these chronic endpoints may be more sensitive. While data are not available yet to calculate numeric chemical criteria based on these endpoints, an adjustment factor could be used to protect against adverse reproductive effects.

- More sensitive species, such as mussels and other molluscs, should be included for biological testing and calculation of numeric chemical criteria. This would help ensure that threatened and endangered benthic species are protected.

Response:

Ecology has adopted the proposed freshwater biological criteria. The objectives for developing the suite of bioassays were: 1) to exhibit similar sensitivity to contaminants as the overall benthic community and 2) to choose from a group of well-established bioassays that are accepted and widely used for evaluating the quality of sediments. At this time, the midge and amphipod tests are the most well developed sediment tests with EPA and ASTM protocols. Tests using other species were considered but are not commonly run by labs in the region, were only available for a limited seasonal window, or did not have fully developed and approved protocols.

Ecology agrees it would be preferable to have more species and we recognize that advances are being made using alternate species such as freshwater mussels. The rule includes provisions for the use of alternate tests or methods on a case-by-case basis (subject to Ecology approval) in -130(4), -563(2)(o), and -563(3)(f–g), and adoption of new tests and protocols in rule and guidance to reflect latest science in -130(7–8), conducted through the annual Sediment Management Annual Review Meeting public review process. This approach has been used extensively by Washington State and federal cleanup and dredged material programs to add species and improve methods for the marine bioassays, chemical analyses, and biological and chemical quality assurance and interpretive guidelines, and will continue with the freshwater tests and criteria.

To address the reliance on fewer species, the freshwater bioassay suite includes requirements to use both species, three separate endpoints, at least one chronic test (long-term relative to the organism's life history), and one sublethal endpoint. Ecology agrees that the term "endpoint" was not sufficiently clear in the proposed rule. The term includes both the test duration (acute and chronic) and the metric measured at termination (growth or mortality). The seven tests identified in Table VII represent seven separate endpoints, and three are chosen for the suite. The subset of five bioassay endpoints used for the development of the freshwater chemical criteria represent the most sensitive and frequently run tests that met the highest level of quality assurance.

Ecology is taking the steps necessary to evaluate the sensitivity of the biomass endpoint and is considering developing interpretive criteria for guidance. Ecology considered other chronic bioassays that included reproductive endpoints. However, the high variability and cost, due to the

length of the test and the high numbers of replicates required, was problematic. Therefore, full life history tests with reproductive endpoints were not included in the rule, but may be considered in the future if these challenges are resolved.

Issue 15-12: Bioassay performance standards, -563(3)(e)

- Commenter: King County (469)

Summary of comments received:

- There should not be broad clauses allow performance standards to be changed without public scrutiny and comment. Please clarify specific conditions and criteria under which Ecology would approve a different performance standard.

Response:

The rule includes provisions for the use of alternate tests or methods on a case-by-case basis (subject to Ecology approval) and the adoption of new tests and protocols in rule and guidance to reflect latest science. Section -130(8) requires public notice of and involvement in changes based on latest scientific knowledge. Ecology uses the Sediment Management Annual Review Meeting process to make any changes to test protocols, performance standards, and interpretive criteria. This process includes advance notice of proposed changes to protocols, presentation at public meetings, and opportunity for oral and written comment.

Issue 15-13: Water quality analyses, -563(3)(f)

- Commenters: Boeing (128), WSWRA (837)

Summary of comments received:

- The overlying water analyses listed here are not required for marine bioassays, and it is not clear how the data would be used. This requirement should be deleted or a justification for it provided.

- Water chemistry such as hardness varies significantly among irrigation districts. Thus, the unique water chemistry should be considered when considering the risks associated with copper in sediments.

Response:

Ecology is adopting the proposed rule language. Unlike marine waters, which are heavily buffered, freshwater systems may have large variations in water chemistry. These variations impact bioavailability of metals and other contaminants. Ecology believes this information will be valuable in interpreting toxicity tests. The data are inexpensive to obtain and can be measured onsite.

Issue 15-14: Other toxic, radioactive, biological, or deleterious substances criteria, -563(4)

- Commenter: King County (470)

Summary of comments received:

- The criteria here are functionally the same as those for the SQS. This is not appropriate and is inconsistent with the other criteria. There should be a difference between the SQS and CSL for each endpoint.

Response:

This section of the rule states that these substances must be at or below levels corresponding to minor adverse effects. This includes the entire range between the CSL and the SCO. The cleanup standard for such substances would be set somewhere in this range consistent with the framework for establishing site-specific sediment cleanup standards in section -560(2).

Issue 15-15: Table VIII, now Table VII

- Commenters: AWB (87), Boeing (124,127), Colville Tribe (297), Greenbrier (371), Pioneer (592), USACE-NWD (791), USDOI (796), WSPA (869,871,876,878,879)

Summary of comments received:

- The tables in this section and in the text and tables of -562 are inconsistent in the mathematical definition of p values. The p value should be $\leq$ x. The text and table should clarify that a statistical test is required in addition to the thresholds shown.

- Toxicity test results and thresholds for mortality should be control-normalized. The method used results in fewer samples being designated as toxic samples.

- Test acceptability criteria established in ASTM (2012) and EPA (2000) for control samples should be used.

- For clarity and consistency, the reference performance standards for the *Chironomus* 10-day and 20-day growth tests should be changed from RF/CF to MIG_R/MIG_C.

- The no adverse effects thresholds for the SCO and the minor adverse effects thresholds for the CSL are too high. Ecology has not demonstrated that the level of effects established for the growth tests for the SCO represent no adverse effects.

- To be consistent with the no adverse effect levels, bioassay hit definitions for the SCO should be based either on the reference envelope approach or statistical difference from control, rather than a statistical difference plus a threshold effect.

- Alternative SCO and CSL interpretive endpoints suggested by the Colville Tribe should be used.

- The table header states that comparisons can be made to reference sediments, but only shows the comparison to control in the table. Both should be shown to ensure that the option is available, or the reference column should be removed to avoid confusion. The preference should be to compare to reference sediments, following EPA guidance for reference sediment selection.

- Reference sediment criteria should not be based on bioassay performance, but rather on the factors listed in the EPA guidance.

- Ecology should identify reference sites for sediment bioassays. If reference sites are not available, Ecology should allow more flexibility in decision-making or postpone the biological criteria. Alternative confirmatory approaches for the chemical criteria could be used in the meantime.

- Add text and/or notes to define acronyms and more clearly document calculations and comparisons.

- The SCOs and CSLs listed in the table are not actually SCOs and CSLs but rather the method used to assess an exceedance of these levels for each biological test.

Response:

Table VII has been revised to a more commonly used format for performance standards and interpretive criteria. Table VII includes interpretive criteria based on comparison to control, but allows the use of an Ecology-approved reference sample. In this case, the results for the reference are substituted for the control using the same equations. The performance standards for reference samples in Table VII are used to assess whether a particular reference sample performed acceptably in a laboratory batch. Neither Ecology nor the Regional Sediment Evaluation Team have been able to establish appropriate freshwater reference areas for Washington and Oregon, due to the many differences between freshwater systems and variability within systems. Guidance on how to establish a reference area on a case-by-case basis is provided in the Sediment Cleanup User's Manual II.

Control performance standards in Table VII are based on ASTM and EPA recommendations for test acceptability (see the Sediment Cleanup User's Manual II for the latest ASTM and EPA protocols used). As a relatively new test, a review of regional laboratory data was conducted to establish the 32% control mortality for the *Chironomus* 20-day test (Ecology, 2002).

The interpretation of the no adverse effects (SCO) and minor adverse effects (CSL) levels for the freshwater criteria are consistent with the marine criteria framework in the original rule. The interpretive criteria for the no adverse effects level and minor adverse effect level were established at effects levels that are biologically relevant and protective of the integrity and functions of the benthic invertebrate community and are not intended to be protective of individual aquatic animals or species. The no adverse effects level may result in some effects to the most sensitive species but still protects the majority of invertebrates responsible for the

functions and integrity of the benthic community. This is different from the commonly used terms, "no effects level" or "no observable effects levels", which can represent the absence of toxicity or absence of effects to the benthic community. With respect to biological relevance, the thresholds used to identify sediments with no adverse effects are based on minimum detectable differences (MDDs) between test and control samples. The MDD is the smallest difference that can consistently be detected between a test and control sample in standard commercial laboratory practice. The SCO interpretive criteria range from 15–25% difference from control, consistent with the current marine criteria and other regulatory programs used in Minnesota, British Columbia, and Ontario (MPCA, 2007; MESL, 2003; OME, 2008). The CSL thresholds used to identify sediments with "minor adverse effects" represent the MDD plus 10–15% difference (depending on the species and endpoint).

Biological thresholds derived using the reference envelope approach were evaluated, but appear to be site- and endpoint-specific, and were not clearly more or less protective than the adopted criteria (see Appendix E). In Ecology's view, this method is better suited for use at larger sites to develop site-specific chemical criteria, where a suitable reference area can be found. The adopted rule contains provisions for use of this and other methods for developing site-specific chemical criteria.

Test interpretation criteria for mortality endpoints were not control-normalized, as Ecology chose subtraction-based interpretive endpoints consistent with the marine biological criteria and those used by regional dredging programs. This interpretation method has been used widely on a national scale and regionally, as demonstrated by EPA's use in the 2004 Sediment Report to Congress (USEPA, 2004) and at sites in the Pacific northwest (e.g., upper Columbia River and Portland Harbor; MESL, 2012; Windward, 2011). Side-by-side evaluations of control-normalized and subtraction-based endpoints for the mortality tests included in the rule indicated that differences between the two methods were 0–3%, well within the variability and uncertainty of these tests (see Appendix E).

Chapter 16: Sediment Cleanup Standards Based on Protection of Higher Trophic Level Species (WAC 173-204-564)

This chapter provides a summary of the rule amendments concerning standards for higher trophic level species (fish, mammals, and birds). The chapter summarizes the proposed amendments to the rule (Section 16.1), describes differences between the proposed and adopted amendments to the rule (Section 16.2), and responds to public comments on the proposed rule (Section 16.3).

16.1 Summary of Proposed Amendments

This proposed new rule section was added to address risks to higher trophic levels species from sediment contamination. It includes a general process for identifying bioaccumulative chemicals and describes when an ecological risk assessment is necessary.

16.2 Differences between the Proposed and Adopted Amendments

The following revision was made to clarify and meet the intent of the rule language:

- The rule language was revised to clarify that sediment cleanup levels must be established at the "no adverse effects" level in -564(2) to be consistent with the intent of the proposed rule language.

The following revisions were made in response to public comment:

- The language that specified what "no adverse effects" meant for endangered or protected species was removed.

- Language was added regarding coordination with state and federal agencies as appropriate in -564(2)(d) to acknowledge the role of other agencies in the cleanup process such as consultation with appropriate agencies for endangered or protected species.

16.3 Responses to Comments

Issue 16-1: Requirements, -564(2)

- Commenters: AECOM (2,22), Boeing (144,147), BP Cherry Point (183), City of Seattle (268,269), Colville Tribe (290,307), King County (379,381,471), Pioneer (593), USACE-NWD (792), USDOI (800), WSPA (881)

Summary of Comments Received:

- The proposed ecological bioaccumulation narrative is difficult to understand and cannot be effectively implemented.

- It is not clear why both SCOs and CSLs are set at minor adverse effect levels. Levels for ecological risk should be set at no adverse effects rather than minor adverse effects. The standards should not allow significant disruption of behavior for threatened and endangered species or impairment of reproduction, growth, or survival for other species. The narrative should provide a basis for protecting species rather than allowing harm to them.

- While we understand the purpose of this section, much more clarity is needed in terms of how this evaluation is conducted and deterministic criteria. The proposed rule is vague in terms of scope and level of effort, and could be cost-prohibitive for smaller sites.

- It may be overly burdensome to require an ecological risk assessment (ERA) at every site. Ecology should modify the last sentence of this paragraph to give the site manager flexibility to determine whether an ERA is needed, particularly at smaller sites. Streamlined approaches for bioaccumulative chemicals that default to background concentrations where appropriate should be provided. Incorporate work already completed by others to provide default assessments of which chemicals present risks to higher trophic levels.

- The rule should recognize that standards to protect higher trophic level species are usually not applied on a point-by-point basis, and should allow for area-weighted averaging.

- The first "not" should be deleted from the first sentence to remove the double negative.

Response:

The proposed rule language has been revised to clarify the intent to establish sediment cleanup levels at the no adverse effects level. The language did not state that sediment cleanup levels were to be established at the minor adverse effects level, but Ecology agrees the language was unclear.

Ecology has issued draft guidance in the Sediment Cleanup Users Manual II to provide information on how to screen sites, identify bioaccumulative chemicals of concern, and identify species of concern to clarify how to implement this section. Protective tissue levels based on the latest available science are also provided for fish, birds, and aquatic mammals along with a discussion of methods for back-calculating from tissue concentrations in fish and shellfish to sediments.

Issue 16-2: Species evaluated, -564(2)(b)

- Commenter: King County (472)

Summary of comments received:

- The method for determining which species to evaluate should follow general EPA guidance on ecological receptor selection, including:
    - Potential for direct or indirect exposure to sediment-associated chemicals
    - Human and ecological significance
    - Site use, including historic species that may have been extirpated by site contamination
    - Sensitivity to chemicals at the site
    - Susceptibility to biomagnification (higher trophic level species)

Response:

Guidance on selection of ecological receptors associated with typical aquatic ecosystems in the Pacific Northwest can be found in the Sediment Evaluation Framework, Chapter 8, and associated appendices (RSET, 2009). EPA guidance may also be used where appropriate.

Issue 16-3: Effects that impair higher trophic levels, -564(2)(c)(i)

- Commenters: Boeing (145), King County (473), USACE-NWD (793), USDOI (800)

Summary of comments received:

- Behavioral endpoints should not be specified in the rule for Endangered Species Act species. It is unlikely that dietary toxicity thresholds are available for these endpoints for many chemicals.

- How are these endpoints defined? How is significant defined? Is this based on laboratory tests? Please clarify the regulatory endpoints.

- Why would significant disruption be required for a threatened or endangered species, but only impairment for other species? What is the difference between significant disruption and impairment?

Response:

The proposed rule language in this section has been revised to remove language on how to determine minor adverse effects for Endangered Species Act species. This language was taken from the Endangered Species Act, but upon consideration of public comments, Ecology determined it was not appropriate to incorporate into a state rule.

Issue 16-4: Population-level effects, -564(2)(c)(ii)

- Commenter: Boeing (146)

Summary of comments received:

- The types of information discussed here would typically be addressed through population modeling. Such modeling should not be required for most ERAs, although these factors could qualitatively be addressed through selection of receptors of concern. The rule should be revised to make this clear.

Response:

Ecology is adopting the proposed rule language, which does not require population modeling to be conducted. Instead, site-specific evaluations must be conducted to determine the appropriate level and type of risk assessment.

Issue 16-5: Potential for bioaccumulation, -564(2)(c)(iii)

- Commenters: Boeing (148), Boise (166), Umatilla Tribes (318), King County (475), Landau Assts. (500), NCASI (508,510), Nippon (542), NWPPA (569), Weyerhaeuser (902)

Summary of comments received:

- The octanol-water partitioning coefficient (K_{ow}) threshold used to identify bioaccumulative chemicals should be revised to be consistent with the Persistent, Bioaccumulative, and Toxic (PBT) rule, i.e., log $K_{ow} > 5$. This was a deliberative, consensus-based process considering best available science.

- No justification for the log K_{ow} value of 3.5 has been provided and this expansion of what constitutes a bioaccumulative chemical seems arbitrary. Therefore, it should be deleted from the rule.

- The proposed definition does not require evidence that a chemical actually bioaccumulates (e.g., is not subject to biotransformation) and could include chemicals that have modeled rather than measured K_{ow}s.

- Include a discussion of bioconcentration factors and bioaccumulation factors from sediment to various higher trophic levels.

Response:

Ecology has adopted the proposed rule language. This provision includes factors to consider as part of the risk assessment to determine the bioaccumulation potential of a chemical. Other factors, such as latest science or site-specific data, may also be used to identify bioaccumulative chemicals. The proposed rule includes the PBT rule requirements for consistency with current practice and the Dredged Material Management Program Bioaccumulative Contaminants of Concern List policy introduced at the 2006 Sediment Management Annual Review Meeting (DMMP, 2007), including the log K_{ow} factor of 3.5. However, other factors, such as frequency of detection in sediments and tissues and use of the chemical in the state, are also considered.

Issue 16-6: Contaminants with minor adverse effects, -564(2)(c)(iv)

- Commenters: King County (476), Pioneer (594)

Summary of comments received:

- How can a party determine this? Please remove it from the rule or provide criteria and procedures for making this determination.

Response:

The proposed rule language has been revised by eliminating the reference to minor adverse effects to Endangered Species Act listed species. The language regarding identifying chemicals of concern that are known or suspected to cause minor adverse or adverse effects will remain. Ecology will allow the use of existing criteria and latest science to make this determination.

This page is intentionally blank.

Chapter 17: Selection of Cleanup Actions (WAC 173-204-570)

This chapter provides a summary of the rule amendments concerning remedy selection. The chapter summarizes the proposed amendments to the rule (Section 17.1), describes differences between the proposed and adopted amendments to the rule (Section 17.2), and responds to public comments on the proposed rule (Section 17.3).

17.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included:

- Re-titling this section to "**Selection of cleanup actions.**"
- This section was revised to focus on the requirements that must be met to evaluate alternatives and select a preferred remedy. The MTCA "permanent to the maximum extent practicable" provision was added.
- Cleanup action decision language was moved to the new section -580.
- Remedial investigation/feasibility study content language was moved to section -550.
- The terminology was revised to harmonize with MTCA.
- MTCA remedy selection requirements were added to the current SMS requirements.
- The MTCA "disproportionate cost" and SMS "cost-effectiveness" terms and concepts were integrated.
- The SMS "cost, technical feasibility, and net environmental effects" provision for determining sediment cleanup standards and remedy selection were integrated with the MTCA remedy selection provisions. Establishing a cleanup standard between the two tiers was based on "technical possibility" and "adverse environmental impacts."
- Clarified that Ecology may determine that a potentially liable person has met their cleanup obligations at a site when the cleanup standards have been met.
- Changed the section number from -580 to -570.

17.2 Differences between the Proposed and Adopted Amendments

In response to comments received, the following revisions were made:

- Section -570(3) Minimum requirement for sediment cleanup actions:
    - Shortened language stating a preference for alternatives with a shorter restoration time frame.
    - Clarified language regarding discharges and source control.

- Changed language on passive cleanup actions from "not rely primarily" to "not rely exclusively" on monitored natural recovery and institutional controls and monitoring.
- Added consideration of land use classifications.
- Added language to clarify public participation requirements.
- Clarified periodic review requirements.

- Section -570(4) Using permanent solutions to the maximum extent practicable:
  - Clarified the requirements for assessing whether a cleanup action is permanent to the maximum extent practicable, consistent with MTCA requirements.
  - Specified the requirements and preferred cleanup technologies for assessing long-term effectiveness.

- Section -570(5) Providing a reasonable restoration time frame:
  - Added a presumption that a reasonable restoration time frame is met if cleanup standards are met within 10 years of completion of construction of the active components of a cleanup action. This was changed from the "start" of construction.
  - Clarified when a sediment recovery zone is required to be issued by the department.
  - Added that preference shall be given to alternatives that achieve sediment cleanup standards at the site or sediment cleanup unit more quickly.
  - Added consideration of land use classifications.
  - Added source control effectiveness.

17.3 Responses to Comments

Issue 17-1: Interim vs. final cleanups, -570

- Commenters: AECOM (12), BP Cherry Point (174–176)

Summary of comments received:

- The current rule does not provide for interim actions.

- Under MTCA, a cleanup is considered interim until cleanup standards are met. It may be impossible for the SCO to ever be met in many urban sediment environments, and therefore sites may remain in interim status indefinitely.

- Institutional controls should be allowed as part of reaching a final cleanup if the remedy is permanent to the maximum extent practicable, even if it is unlikely that cleanup standards will be met.

Response:

Interim actions are authorized under the MTCA rule (WAC 173-340-430) and may continue to be used to address contaminated sediment. Ecology has revised the definition of "cleanup action" in -505 to clarify when a remedial action taken at a site or sediment cleanup unit is considered an interim action, as opposed to a cleanup action. To be considered a cleanup action, a remedial action must comply with sediment cleanup standards and other applicable laws.

Ecology acknowledges that sediment cleanups in urban areas are particularly challenging. Ecology has added significant new tools to the rule, such as sediment cleanup units, to encourage expedited cleanup and to help potentially liable persons manage their liability. Ecology has also changed the role of sediment cleanup standards. Under the adopted rule, sediment cleanup standards, not the SCO, define the scope of the remedial action and the obligations of a potentially liable person within a site. As specified in -560(2), sediment cleanup levels may be set above the SCO, but no higher than the CSL, if achieving the SCO is not technically possible or results in net adverse environmental impacts. See Chapter 12 for further detail on establishment of sediment cleanup standards.

Institutional controls, with constraints, are allowed as a component of cleanup actions. Institutional controls may be used, for example, during a cleanup action to prevent exposure to sediments that do not yet meet sediment cleanup standards (e.g., fish advisories) or to maintain the integrity of a cleanup action that has already achieved sediment cleanup standards (e.g., limits on activities that might disturb a cap). However, cleanup actions must still comply with sediment cleanup standards and other applicable laws. To comply with cleanup standards, cleanup actions must achieve sediment cleanup levels at the applicable points of compliance. Therefore, institutional controls cannot be used, by themselves, to achieve sediment cleanup standards. In addition, use of these controls in an aquatic environment is more difficult than in upland settings, especially where impacts to treaty rights or navigational constraints must be considered. See Issue 17-8 for further detail on institutional controls and other passive cleanup actions.

Issue 17-2: Selection of alternatives, -570

- Commenter: Pioneer (595)

Summary of comments received:

- Recommend revising/reorganizing this section to present the entire process for evaluating remedial alternatives in the feasibility study. The current text is confusing and many key concepts in the remedy selection process are incorporated only by reference.

- Recommend reorganizing this section consistent with EPA's nine remedy selection criteria, including threshold, balancing, and modifying categories.

Response:

Ecology is adopting the proposed rule. Ecology acknowledges that the rule could be re-organized in a variety of ways. The rule presents the feasibility study process and submittal requirements in -550 with the majority of the remedy selection criteria presented in -570.

EPA's nine remedy selection criteria were considered during the original MTCA rulemaking in 1991 and subsequent revisions. Appropriate parts of these criteria were incorporated into the MTCA rule, which are now referenced in the SMS rule. Ecology decided not to revisit this decision based, in part, on SMS advisory committee feedback that the MTCA disproportionate-cost process works well for sediment sites and a desire to maintain consistency between both rules.

Issue 17-3: Remedial action levels, -570

- Commenter: AECOM (21)

Summary of comments received:

- The rule should define and include a remedial action level (RAL) above which active cleanup would take place.

Response:

Ecology is adopting the proposed rule. The "remediation level" concept in the MTCA rule is applicable to sediment cleanups. The term is defined in WAC 173-340-200 and its use is further explained WAC 173-340-355. Ecology considered including the concept in the revised rule, but decided that doing so would be duplicative and unnecessary.

A cleanup action will often involve a combination of components such as dredging or capping of some contamination and monitored natural recovery of the remainder. Remediation levels are used to distinguish where and what range of concentrations within a site or sediment cleanup unit cleanup action components will be used. Remediation levels are not the same as cleanup levels, which specify the concentration above which some type of remediation is necessary.

Issue 17-4: Cleanup timeframes, -570

- Commenter: King County (477)

Summary of comments received:

- A number of items have been removed from this section that would assist in determining cleanup timeframes and evaluating alternatives. Many of these were appropriate and useful and should be retained. In particular, when cleanups are attempting to achieve natural or regional background, such timeframes would appear necessary.

Response:

Ecology has adopted the proposed rule language. Most of these factors were incorporated by reference into the disproportionate cost analysis and -590 for clarity.

Issue 17-5: Protection of human health and the environment, -570(3)(a)

- Commenter: Lon Kissinger (247)

Summary of comments received:

- Determination of whether this criterion is met will not be possible if the feasibility study does not include an assessment of protection of human health and the environment for each alternative. The requirements in this section and the contents of the feasibility study should be cross-referenced to ensure compatibility.

Response:

Ecology is adopting the proposed rule language. The feasibility study requirements in -550 require an alternatives evaluation, including protection of human health and the environment, using the remedy selection criteria in -570.

Issue 17-6: Reasonable restoration time frame, -570(3)(e)

- Commenters: AECOM (17,55), Anchor QEA (68), AWB (78,88), Boeing (106), BP Cherry Point (186), Dow Chemical (357), Georgia-Pacific (364), Greenbrier (371), King County (478), Landau Assts. (501), NAVFAC (530), Nippon (541), Port of Olympia (616), SMWG (691), Tom Newlon (732), WPPA (811,815), Waterkeepers (855)

Summary of comments received:

- Compliance monitoring should begin at the end of active construction rather than at the beginning.

- Different timeframes may need to be established for biological and human health endpoints, especially for cleanup levels based on background.

- A reasonable restoration timeframe would be 5 years or less, if measured from the start of the cleanup action. An additional important timeline is from when the site is identified to when it is cleaned up. Please provide timelines for each step associated with cleanup, from discovery to final cleanup.

- The restoration time frame should not be included as a minimum requirement, as it is already provided for in -570(5).

- Why is it necessary to state a predetermined timeframe? Why not let the evaluation determine what is appropriate? A better cleanup solution may result with fewer impacts on human health and the environment.

Response:

Ecology has revised the proposed rule language. The timeframe has been revised to 10 years after completion of construction of the active components of the cleanup action (rather than the start of the cleanup action). In addition, this provision has been moved to subsection (5). Clarifying when the 10-year timeframe applies will speed up remedy decisions and cleanups.

The original rule had a 10-year restoration timeframe requirement, but it was ambiguous regarding whether it applied to the entire cleanup or just the timeframe after completion of construction. The adopted rule clarifies this requirement.

It would be preferable to establish a timeframe for each step in the cleanup process. However, these timeframes are largely driven by the availability of resources and constraints such as fish windows. Ecology believes that setting specific deadlines or shortening this presumptive timeframe is unlikely to speed up cleanups.

Issue 17-7: Sediment recovery zones, -570(3)(g)

- Commenter: NAVFAC (530)

Summary of comments received:

- Will sediment recovery zones be applied at larger (bay-wide) scales where there are not identified sources but sediment concentrations are above natural background levels?

Response:

A sediment recovery zone will extend over the area of the site or sediment cleanup unit where the site-specific sediment cleanup standards cannot be achieved within the 10-year timeframe. This could extend over a substantial part of a bay depending on site-specific circumstances. For more on sediment recovery zones, see Issue 17-14 and Chapter 19.

Issue 17-8: Preference for active cleanup, -570(3)(h)

- Commenters: Anchor QEA (72), AWB (89), Boeing (105), City of Seattle (270), Dow Chemical (357), Georgia-Pacific (368), Greenbrier (371), King County (479), Landau Assts. (502), NAVFAC (530), Nippon (541), Pioneer (596), Port of Olympia (617,618), Port of Port Angeles (628,642), Port of Seattle (653,658), SMWG (687), Tom Newlon (733), WPPA (816), Weyerhaeuser (903)

Summary of comments received:

- This language is problematic because it establishes active cleanup as a presumptive remedy at all sites, which does not recognize the unique challenges of sediment cleanup sites. This section should be removed.

- An alternative to "technically possible" that could be included is a "technical impracticability waiver." That approach would provide the level of finality needed for liability allocation and insurance claims to proceed.

- How do you determine whether and where a technology is technically possible, especially dredging?

- Recommend revising "technically possible" to "technically practicable" or retaining consideration of net environmental benefits, cost, and technical feasibility.

- Suggest revising "primarily" to "exclusively," and "…where a more permanent cleanup action that provides for greater net environmental benefit can practicably be implemented."

- This requirement is especially concerning when combined with the very low cleanup levels for bioaccumulative chemicals being proposed in the rule, which will lead to very large cleanup sites throughout most of the state, regardless of net environmental benefit, source control, etc. This section should be deleted.

- This provision should be removed because it significantly limits the range of cleanup alternatives that can be developed and unnecessarily restricts the use of monitored natural recovery. Permanent to the maximum extent practicable is already addressed in WAC 173-204-570(4). Monitored natural recovery should be allowed to be considered whenever it is determined to be the best solution during the alternatives evaluation.

- Monitored natural recovery can be an effective and permanent solution, and supports Ecology's stated goal of avoiding high-cost/low-value cleanups.

- The first sentence should be deleted, as it may be inconsistent with the disproportionate cost analysis. Alternatively, retain only institutional controls in this section.

- What institutional controls did Ecology have in mind that have a "demonstrated ability to control exposures and ensure the integrity of the cleanup action"? In our experience, there are few effective institutional controls for sediment cleanups.

Response:

The proposed rule language has been revised in -570(3)(h) by:

- Clarifying that the requirement applies only to the site as a whole, not to a sediment cleanup unit within the site.
- Revising "primarily" to "exclusively."

This provision is intended to limit the extent that cost may be considered when selecting cleanup actions under -570(3)(d) and (4). This provision is similar to provisions in the MTCA rule (WAC 173-340-360(2)(e) and (2)(g)).

Ecology is not aware of any department-approved sediment site cleanup that includes only passive cleanup actions. All sediment cleanups have involved some active cleanup actions such as aggressive source control, capping, and/or dredging. Sediment sites with monitored natural recovery require institutional controls to limit exposures during recovery. Such controls are difficult to effectively implement. For these reasons, Ecology maintains that cleanups should not rely exclusively on passive cleanup actions unless it is technically impossible to implement active cleanup actions.

These provisions are intended to create a bias towards active cleanup actions consistent with MTCA. Ecology's experience is that the disproportionate-cost analysis can easily be biased towards minimal-cost passive actions such as monitored natural recovery and institutional controls due to the difficulty of quantifying benefits. The rule language is intended to "put a thumb on the scale" when weighing the costs and benefits of cleanup actions to tip the decision to more active cleanups that restore sites sooner. Ecology believes this approach is consistent with the requirements that cleanup actions be "permanent to the maximum extent practicable" and have a "reasonable restoration timeframe" to minimize the burden on future generations.

Issue 17-9: Landowner and public review, -570(3)(i)

- Commenters: DNR (830), Waterkeepers (850)

Summary of comments received:

- Where sediment recovery zones or institutional controls affect state-owned aquatic lands, DNR and/or port districts with Port Management Agreements may require land use authorizations and covenants for such cleanup actions.

- Mention of public comment and review is made, but no specifics are given. This section should be linked back to the section -550 public participation plan requirements.

Response:

Comment acknowledged regarding the role of DNR and/or Port Districts at sediment sites with sediment recovery zones and institutional controls. Authorizations of institutional controls will depend on the nature of the controls and not all controls will require landowner approval (e.g., fish advisories).

The proposed rule language has been revised to include a cross-reference to the requirements for the public participation plan.

Issue 17-10: Monitoring, -570(3)(j)

- Commenters: AECOM (15,25), King County (480)

Summary of comments received:

- Monitoring should be sufficiently flexible that occasional random exceedances do not trigger additional cleanup actions.

- Use a modification of MTCA's three-part rule for compliance monitoring for sediments.

- The second sentence is unclear and it is not apparent whether it would provide any useful guidance during remedy selection.

Response:

The proposed rule language in -560(7) has been revised to provide compliance monitoring flexibility based on receptors and exposure pathways. Ecology considered the MTCA three-part rule as a possible provision for sediment cleanup, but determined that a more flexible approach was necessary.

Ecology has retained the provision in -570(3)(j), which states a preference for alternatives with a greater ability to be monitored. However, this provision has been revised to eliminate redundancy (e.g., institutional controls are a form of cleanup action). Ecology maintains that the ability to monitor the effectiveness of a remedy should be a factor considered when selecting the remedy.

Issue 17-11: Using permanent solutions to the maximum extent practicable, -570(4)

- Commenters: AECOM (26,54,56–59), AWB (77), Greenbrier (371), Pioneer (597), Port of Olympia (619), Tom Newlon (731,734,735)

Summary of comments received:

- Integrate the SMS net environmental benefit/cost analysis with the MTCA disproportionate cost analysis (DCA) for evaluating remedial alternatives.

- The reference to MTCA should be removed and the relevant factors explicitly included here. The MTCA citation includes text that is not relevant to sediment cleanups.

- This is the step of the process in which the guidance indicates that cost can be considered. However, there is no reference to cost in the text of the rule, just a reference to MTCA. There is confusion as to whether the MTCA DCA is required by SMS. We would prefer a more explicit reference to cost analysis in the rule, especially if this is the only place where it can be considered.

- The MTCA requirement of using permanent solutions to the maximum extent practicable does not easily translate into sediments. As written, the section would unnecessarily constrain Ecology and at times will provide no incremental environmental improvement

for much greater expenditure. Unlike upland cleanups, attempting to permanently remove sediments can cause substantial harm.

- Because a truly permanent solution will often not be possible, the regulations should provide all parties a great deal of flexibility to meet this requirement. The final sentence of the first paragraph should read, "However, when assessing the relative degree of long-term effectiveness of cleanup action alternatives, each alternative should be analyzed based on site-specific factors to determine which will provide greater permanence" and the subsequent hierarchy should be deleted.

- Permanent to the maximum extent practicable should not be a minimum requirement, as that would result in only one possible cleanup alternative. It should be considered one of the evaluation criteria.

- Ecology should ensure that the criteria listed in WAC 173-340-360 are not redundant with the minimum requirements listed in -570(3). They are either minimum requirements or evaluation criteria.

Response:

Ecology is adopting the proposed rule language. The remedy selection criteria in -570 are intended to stand alone and be separate from the criteria in the MTCA rule (WAC 173-340-360). However, for the purposes of determining whether a cleanup action uses permanent solutions to the maximum extent practicable, -570(4) incorporates by reference the DCA in the MTCA rule (WAC 173-340-360(3)).

The MTCA law requires that Ecology "give preference to permanent solutions to the maximum extent practicable" (RCW 70.105D.030(1)(b)). Ecology cannot eliminate this statutory requirement through rule-making. Furthermore, Ecology believes the DCA in the MTCA rule has worked well to select cleanup actions that are both protective and cost-effective.

Ecology considered duplicating the DCA provisions of the MTCA rule in the SMS rule, but ultimately chose to incorporate the DCA by reference, with the exception of the hierarchy of cleanup action components in WAC 173-340-360(3)(f)(iv). There was a concern that restating the DCA in both rules could lead to inconsistencies if either rule is revised in the future.

Issue 17-12: Hierarchy of cleanup alternatives, -570(4)(b)

- Commenters: AECOM (4), Boeing (95,104), BP Cherry Point (190), City of Seattle (271,272), Dow Chemical (357), Greenbrier (371), King County (481), Landau Assts. (503), NAVFAC (511,529), Pioneer (598), Port of Olympia (620), SMWG (688), USACE-NWD (794), WPPA (817)

Summary of comments received:

- There should not be preferred technologies stated in the rule. Selection of a remedy should be based on all of the SMS criteria and be site-specific in nature. Any hierarchy

for remedial alternatives is inconsistent with EPA guidance for sediment cleanups, which states that there is no preferred technology for cleanup of contaminated sediments. Sediment cleanups are very site-specific, and often most alternatives will be equally protective, while some are much more costly and impracticable than others. The hierarchy should be removed.

- Detailed and thoughtful guidance on site-specific alternative selection would be preferable to a hierarchy in the rule. Alternatively, a list of site-specific factors to consider could be included in the rule. These factors could include:
    - Degree of certainty that the alternative will be successful.
    - Potential for recontamination from non-site sources.
    - Site hydrodynamics.
    - Sediment transport.
    - Depth of contamination.
    - Depth of bioturbation.

- The MTCA hierarchy works well and it is unclear why Ecology felt it was important to develop a sediment-specific hierarchy. The policy choices inherent in this list are different. We recommend Ecology reference the MTCA list so that the priorities will be consistent with other media and allow the evaluation process to determine the best solution for each situation.

- Source control will be equally important regardless of the remedy, and should not be included in the hierarchy. Putting it at the top implies that an alternative with substantial source control but no active cleanup would rank higher than dredging, for example.

- Including source control here implies that it is subject to the MTCA/SMS decision process and that a Cleanup Action Plan would specify source control measures. Yet, there is no guidance on how to evaluate source control alternatives. SMS is not the appropriate mechanism for defining source control actions. Eliminate source control here and add in the expectations that source control would be conducted outside the remedial investigation/feasibility study process.

- The bias toward dredging should be removed from the rule. Dredging can result in significant risks, including increases in exposure to aquatic life and seafood consumers.

- It is not clear why dredging and disposal at an open-water disposal site would be an option for sediment cleanup, unless there is incidental dredging and disposal of cleanup material associated with a cleanup action.

- Beneficial reuse is not a permanence criterion and should be eliminated. Most materials dredged for cleanup will not be suitable for beneficial reuse without treatment and will have residuals associated with treatment that should be evaluated elsewhere in the hierarchy.

Response:

Ecology has revised the proposed rule language to clarify the intent of the hierarchy provision in -570(4), which is to assess long-term effectiveness.

The MTCA rule (WAC173-340-360(3)(f)) has a disproportion cost analysis (DCA) process for determining when a cleanup action uses permanent solutions to the maximum extent practicable and lists seven criteria that must be used to evaluate and compare each cleanup action alternative when conducting this analysis. The seven criteria are: protectiveness, permanence, cost, effectiveness over the long term, management of short-term risks, technical and administrative implementability, and consideration of public concerns.

Section -570(4) references the DCA in the MTCA rule, including the seven criteria mentioned above. With respect to the fourth criterion in the DCA (long-term effectiveness), the MTCA rule provides a hierarchical list of cleanup action components in WAC 173-340-360(3)(f)(iv) that may be used as guide when assessing the relative degree of long-term effectiveness. That list is:

- Reuse or recycling.
- Destruction or detoxification.
- Immobilization or solidification.
- On-site or off-site disposal in an engineered, lined, and monitored facility.
- On-site isolation or containment with attendant engineering controls.
- Institutional controls and monitoring.

In the revised rule, Ecology decided to replace this more generic list with a more specific list applicable to sediments. Ecology made this decision based on a review of sediment cleanup plans approved to date. That review showed that a different set of technologies is typically used to achieve long-term effectiveness of sediment cleanups than the generic list in the MTCA rule. This list has been retained and the introductory paragraph revised to parallel language in the MTCA rule that clarifies its role as a guide in assessing the long-term effectiveness criterion during the remedy selection process.

While an important criterion, long-term effectiveness is not intended to overshadow other criteria. This list is intended to convey that active cleanup actions are expected to be more effective over the long term at many sites, for example, when contaminants are destroyed or removed from the aquatic environment.

Source control has been, and will continue to be, an integral part of sediment cleanup. Examples include cutting off the flow of contaminated groundwater and surface water from upland disposal sites, cleaning out stormwater catch basins and pipes, and identifying and reducing stormwater sources of sediment contamination. Ecology's expectation regarding control of sources of recontamination is stated in -500(4)(b).

While the use of open-water disposal has become more difficult due to the presence of low levels of persistent and bioaccumulative chemicals, it will continue to be an option for routine maintenance and navigation dredging with incidental contamination and disposal of some sediments with wood waste.

Ecology agrees that beneficial reuse options are limited. However, there is detailed guidance on beneficial reuse options prepared by the federal government and it has been used at some sites in Puget Sound. This technology has been retained in the rule.

Issue 17-13: Restoration timeframe factors, was -570(5)(a), now -570(5)(c)

- Commenters: Lon Kissinger (248), King County (482), DNR (831)

Summary of comments received:

- Consider adding implementation of source control and background concentrations.

- This list should include the impacts of construction itself on the environment in selection of an alternative and a restoration timeframe.

- Any cleanup actions will be subject to existing land use authorizations.

Response:

Ecology has revised the proposed rule language in -570(5)(c) to include the likely effectiveness of source control measures in reducing the restoration timeframe as a factor to consider when evaluating reasonable restoration time frame.

The impacts of construction are already built into the disproportionate cost analysis required under -570(4).

The aquatic state land classification has been added as a factor to consider when evaluating reasonable restoration time frame.

Issue 17-14: Relationship to sediment recovery zones (SRZs), -570(5)(b)

- Commenters: Anchor QEA (73), AWB (78,90), Boeing (106), Georgia-Pacific (369), Greenbrier (371), King County (483), Landau Assts. (504), Nippon (541), Pioneer (599,600), Port of Port Angeles (643), Port of Seattle (651), WPPA (811), Waterkeepers (861)

Summary of comments received:

- This section should be deleted, because SRZs are unworkable.

- Should the first sentence read "the department may authorize restoration time frames longer than ten years…"?

- How is "cannot practicably achieve" defined? Cleanups of more than 10 years are significant, and thus this phrase should not be ambiguous.

- Change the restoration timeframe to 10 years after the completion of active cleanup.

Response:

SRZs were required under the original rule and have been retained in the adopted rule. The original rule required an SRZ if a cleanup action failed to achieve SQS after completion of construction. The proposed rule required an SRZ if a cleanup action failed to achieve sediment cleanup standards within 10 years after the start of the action.

Ecology has revised the proposed rule. First, the rule has been changed to require an SRZ only if a cleanup action cannot achieve sediment cleanup standards within 10 years "after the completion of construction of the active components of the cleanup action" (rather than "after the start of the cleanup action"). Second, the rule language has been changed to clarify that the analysis used to determine the need for and extent of an SRZ is part of the remedy selection analysis in -570, not a separate analysis. Discussion of this analysis has been removed from this provision and clarified in -590.

However, Ecology has not changed the requirement for an SRZ from "shall" to "may." Such changes would make an SRZ optional at the discretion of Ecology. Ecology believes this would be inappropriate because these areas are contaminated above sediment cleanup standards and thus should have a higher level of scrutiny and regular review.

For more detail on SRZs, see Chapter 19.

Issue 17-15: Sediment recovery zones (SRZs), -570(5)(b)

- Commenters: Anchor QEA (64), City of Seattle (273), Georgia-Pacific (360), Landau Assts. (505), Port of Port Angeles (627), Port of Seattle (651), Tom Newlon (736), WPPA (811)

Summary of comments received:

- The requirement for SRZs at any site that cannot meet the cleanup standards within 10 years is highly problematic. This provision of the existing SMS regulations has proven unworkable, and would be required far more often with the lower cleanup standards in the proposed rule. SRZs should be entirely removed from the rule.

- We support SRZs for sites that cannot meet the cleanup standards within 10 years.

- Requiring a restoration timeframe of 10 years after the start of the cleanup would be problematic, especially if 1) the cleanup takes more than 10 years, 2) it is a large site with several different cleanup actions, 3) source control is not yet in place for all or part of a site, or 4) cleanups are conducted under Federal authority. The restoration timeframe should start at the end of active cleanup.

Response:

See responses to Issue 17-14.

This page is intentionally blank.

Chapter 18: Cleanup Action Decisions (WAC 173-204-575)

This chapter provides a summary of the rule amendments concerning cleanup action decisions following remedy selection. The chapter summarizes the proposed amendments to the rule (Section 18.1), describes differences between the proposed and adopted amendments to the rule (Section 18.2), and responds to public comments on the proposed rule (Section 18.3).

18.1 Summary of Proposed Amendments

The proposed rule amendments in this new section of the rule included:

- Adding this new section to separate the cleanup action decision from development of the remedial investigation and feasibility and the remedy selection process.
- Revising the terminology to harmonize with MTCA.
- Adding MTCA requirements to the SMS requirements for cleanup action decisions.

18.2 Differences between the Proposed and Adopted Amendments

To ensure clarity and consistency the following revisions were made:

- The MTCA law was specified as the administrative authority.
- Terminology was changed from "cleanup action" to "remedial action" and from "chapter" to "part."
- Ecology's expectations were clarified for when other authorities are used to conduct cleanup.
- The section number -580 was changed to section number -575.

18.3 Responses to Comments

Issue 18-1: Purpose, -580(1), now -575(1)

- Commenter: Lon Kissinger (249)

Summary of comments received:

- The contents of the remedial investigation and feasibility study reports need to be reviewed to make sure that they can support the cleanup action decision.

Response:

The proposed rule language has been revised to ensure that adequate information is provided to support cleanup action decisions.

Chapter 19: Sediment Recovery Zones (WAC 173-204-590)

This chapter provides a summary of the rule amendments concerning sediment recovery zones (SRZs). The chapter summarizes the proposed amendments to the rule (Section 19.1), describes differences between the proposed and adopted amendments to the rule (Section 19.2), and responds to public comments on the proposed rule (Section 19.3).

19.1 Summary of Proposed Amendments

The proposed rule amendments in this section of the rule included:

- New language was added to clarify requirements for establishing, approving, and maintaining an SRZ.
- Requirements were added to be more consistent with -415, Sediment impact zones.
- Requirements for an SRZ were changed. If the site does not meet the cleanup standard (which can be above the SCO) within 10 years, an SRZ may be issued and renewed every 10 years.

19.2 Differences between the Proposed and Adopted Amendments

In response to comments received, and to ensure clarity and consistency based on internal review, the following revisions were made:

- Clarified when an SRZ is required to be issued by Ecology.
- Additions to -590(2) General requirements:
  - Indicated where the SRZ requirements are described.
  - Stated when and how adjustments or extensions can be made to the SRZ.
- Additions to -590(3) Criteria:
  - Added human health effects as factors to consider.
  - Added future uses and land use classifications as factors to consider.
- Additions to -590(4), Duration:
  - Clarified that the potentially liable person must submit an application for an extension.
  - Added automatic enforceability when an SRZ is expiring.
- Added clarification of types of monitoring.
- Included affected tribes in public involvement.

19.3 Responses to Comments

Issue 19-1: Sediment recovery zones (SRZs), -590

- Commenters: Anchor QEA (64,74), AWB (91), Boeing (129), Georgia-Pacific (370), Greenbrier (371), Nippon (541), Port of Port Angeles (627,644), Port of Seattle (659), Tom Newlon (736,739), WPPA (811,818), Waterkeepers (856)

Summary of comments received:

- The requirement for SRZs at any site that cannot meet the cleanup standards within 10 years is highly problematic. This provision of the existing SMS regulations has proven unworkable, and would be required far more often with the lower cleanup standards in the proposed rule. SRZs should be entirely removed from the rule.

- SRZs should not be required for every cleanup that will not be able to meet sediment cleanup standards over time. Once a cleanup of a unit or site has been addressed and facility specific source control conducted, the remaining contamination should be addressed through the Clean Water Act. Otherwise, potentially liable persons will not be willing to do cleanups that would subject them to greater monitoring requirements than they would have had if they had not conducted the cleanup.

- The inclusion of SRZs in the rule is a positive step, but its context should be better defined.

- We do not think that authorizing SRZs is in the public interest compared to reducing contaminants below the cleanup standards.

- The timeframe should be 10 years after the completion of active cleanup.

Response:

SRZs were required under the original rule and have been retained in the adopted rule. The original rule required an SRZ if a cleanup action failed to achieve the SQS after completion of construction. The proposed rule required an SRZ if a cleanup action failed to achieve sediment cleanup standards within 10 years after the start of the cleanup action.

Ecology has revised the proposed rule. First, the rule has been changed to require an SRZ only if a cleanup action cannot achieve sediment cleanup standards within 10 years "after the completion of construction of the active components of the cleanup action" (rather than "after the start of the cleanup action"). Second, the rule language has been changed to clarify that the analysis used to determine the need for and extent of an SRZ is part of the remedy selection analysis in -570, not a separate analysis.

However, Ecology has not changed the requirement for an SRZ from "shall" to "may." Such a change would make an SRZ optional at the discretion of Ecology. Ecology believes this would

be inappropriate because these areas are contaminated above cleanup standards and thus should have a higher level of scrutiny and regular review.

For further discussion, see Issue 17-14.

Issue 19-2: Applicability, -590(1)

- Commenters: AECOM (35,60), BP Cherry Point (187)

Summary of comments received:

- It is unclear whether a sediment recovery zone (SRZ) can be applied to a small site or site unit, or is intended to address large areas of low-level contamination within a baywide site.

- Clarify that concentrations within the SRZ are above the SCO but below the cleanup standard.

Response:

An SRZ could apply to a small site or site unit, as well as a larger baywide or watershed-wide site. Under the original rule, cleanup actions were required to achieve SQS and SRZs were required if contaminant concentrations exceeded the SQS. Under the adopted rule, cleanup actions are required to achieve sediment cleanup standards, not SCOs. As discussed under Chapter 12, sediment cleanup levels may be established above the SCO, but no higher than the CSL, if certain conditions exist. SRZs are only required if contaminant concentrations exceed sediment cleanup levels at the applicable points of compliance. SRZs are not required where contaminant concentrations are below sediment cleanup levels, even if the concentrations are above the SCOs.

Issue 19-3: Restoration timeframe, was -590(1) and (2)(b), now -590(1) and (2)(f)

- Commenters: AECOM (17,38,51), Boeing (106,130), BP Cherry Point (186), Port of Olympia (621,622)

Summary of comments received:

- The restoration timeframe of 10 years should begin at the end of active construction rather than at the beginning.

- It is unclear when the determination will be made that cleanup standards cannot be met within 10 years.

Response:

Ecology has revised the proposed rule as follows:

- To require a sediment recovery zone (SRZ) only if a cleanup action cannot achieve sediment cleanup standards within 10 years after the completion of construction of the active components of the cleanup action (rather than after the start of the cleanup action).

- To clarify that the analysis required to determine the need for and extent of a sediment recovery zone is the remedy selection analysis in -570, not a separate analysis.

- To clarify that the determination of when a sediment recovery zone is necessary could be made either during the remedy selection process or later during a periodic or other review of performance monitoring data.

For further discussion, see Issues 17-14, 19-1, and 19-2.

Issue 19-4: Substitute for active cleanup actions, was -590(2)(a), now -590(2)(e)

- Commenter: Waterkeepers (862)

Summary of comments received:

- "Practicable" should be clearly defined when applied to cleanups of this length.

Response:

Ecology is adopting the proposed rule language in -590(2)(e). This provision makes clear that the practicability analysis is the analysis required under -570 for selecting cleanup actions, and not a separate analysis. That analysis is specifically set forth in -570(4).

Issue 19-5: Chemical concentrations, was -590(2)(c), now -590(2)(g)

- Commenters: King County (484), WSPA (866)

Summary of comments received:

- Requiring concentrations to be as close as practicable to the SCO will be difficult, and will almost always require cleanup to achieve, contrary to the purpose of a sediment recovery zone (SRZ). We suggest identifying the purpose of the SRZ, but not a standard that will be difficult to meet.

- We support this definition of the SRZ, which references the sediment cleanup standards rather than the SCOs.

Response:

Ecology has revised the rule language in -590(2)(g) to clarify that the practicability analysis referred to in that provision is the analysis required under -570 for selecting cleanup actions, and not a separate analysis. That analysis is specifically set forth in -570(4).

Issue 19-6: Best management practices, was -590(2)(d), now deleted and replaced with -590(2)(h)

- Commenters: Boeing (156), Tom Newlon (737)

Summary of comments received:

- This section should be deleted, as these discharges are regulated by the Clean Water Act, not MTCA. Dischargers should not be subjected to separate duplicative and possibly varying requirements under different regulations.

- Edit to replace "resulting in diffuse, nonpoint" to "related to regulated."

Response:

Under MTCA, Ecology has the authority to require additional source control as part of a cleanup action if such controls are necessary to comply with sediment cleanup standards. Ecology has retained that authority in the adopted rule. Source control has been, and will continue to be, an integral part of the cleanup of contaminated sediment sites. Examples include preventing the flow of contaminated groundwater and surface water from upland disposal sites or releases to sediment, cleaning out stormwater catch basins and pipes, and identifying and reducing stormwater sources of sediment contamination. See also responses to Issues 6-5 and 6-20.

Ecology has revised the proposed rule language by deleting this provision and replacing it with the following provision in -590(2)(h) to reflect that different requirements may apply to different types of discharges: "Appropriate source control measures shall be implemented to minimize contaminant loading to the sediment recovery zone from ongoing discharges."

Issue 19-7: Relationship with a final cleanup, was -590(2)(e), now -590(2)(a–d)

- Commenter: Boeing (131)

Summary of comments received:

- Ecology should clarify in this section that a sediment recovery zone (SRZ) can be part of either a final or an interim cleanup action plan.

Response:

Interim actions under the MTCA rule (WAC 173-340-430) are applicable to sediment cleanup. Ecology has revised the definition of "cleanup action" in -505 to clarify when a remedial action taken at a site or sediment cleanup unit is considered an interim action, as opposed to a cleanup action. To be considered a cleanup action, a remedial action must comply with sediment cleanup standards and other applicable laws. For more discussion of interim actions, see Issues 6-17 and 17-1.

Ecology agrees that an SRZ could be applied as part of an interim action, as well as a cleanup action. Since interim actions are authorized under the MTCA rule, Ecology has determined that no changes to the SMS rule are necessary to require SRZs as part of an interim action.

Issue 19-8: Criteria, -590(3)

- Commenter: Tom Newlon (738)

Summary of comments received:

- These requirements are too prescriptive, as they are based on the idea that sediments will generally recover within 10 years. In many urban areas, regional background concentrations will not be attainable for the foreseeable future. Thus, sediment recovery zones (SRZs) should not be required for areas with very long recovery timeframes. At a minimum, the follow sections (4) and (5) should be made more general.

Response:

The proposed rule language has been revised to include provisions for renewal of SRZs to clarify the process (see response to Issue 19-10).

Ecology acknowledges that sediment cleanup in urban areas will be challenging. To address this challenge, Ecology revised the original rule requirement that SRZs be established if cleanup standards could not be met immediately after construction to 10 years after completion of construction of the active components of the cleanup action.

The requirements in subsections (4) and (5) are the original rule requirements and are already quite general. It is not clear from the comment how the criteria should be altered further.

Issue 19-9: Reducing the size and concentrations in a sediment recovery zone (SRZ), -590(3)(c)

- Commenter: King County (485)

Summary of comments received:

- Please reword this, as further limiting the size and concentrations in an SRZ would eliminate many SRZs. Active cleanup would be required to achieve this goal as stated, when the remedy selection process has already determined that this is the appropriate alternative.

Response:

Ecology has revised the rule language to clarify that:

- The practicability analysis referred to in the provision is the analysis required under -570 for selecting cleanup actions, and not a separate analysis. That analysis is specifically set forth in -570(4).

- Human health effects, in addition to biological effects, need to be addressed in this analysis.

This statement is not intended to imply that a separate, more restrictive analysis needs to be conducted in addition to the remedy selection process.

Issue 19-10: Duration, -590(4)

- Commenters: AECOM (61), King County (486,487), Waterkeepers (857)

Summary of comments received:

- Allowing only 10 years makes this essentially the same as monitored natural recovery, whereas a sediment recovery zone (SRZ) would be for longer than 10 years. Add a provision that the SRZ would be evaluated at 10 years to make sure recovery is on target, and allow the original application for an SRZ to be for up to 20 years.

- It is unclear whether SRZs can be authorized for only 20 years or whether they can be reauthorized indefinitely in 10-year increments. When natural background is the target, it may not be possible to achieve it in 20 years. What happens then if SRZs are only allowed for 20 years?

- SRZ durations should not be limited to 10 years, as many sites will require longer than this to recover.

- Authorization and renewal only every 10 years is too long and unacceptable. Review should occur every 5 years with a maximum length of 20 years.

Response:

Ecology has revised the rule language as follows:

- To provide that SRZs are only required as part of a cleanup action if sediment cleanup standards cannot be achieved within 10 years after the completion of construction of the active components of the cleanup action.

- To clarify that SRZs may initially be authorized by Ecology for up to 10 years, and may be reauthorized by Ecology in increments not to exceed 10 years. There is no limit to the number of reauthorizations.

- To clarify the process for reauthorizing SRZs. When a potentially liable person has made a timely and sufficient application, as specified in the authorizing document, the expiring authorization remains in effect and enforceable until Ecology either denies the

application or reauthorizes the SRZ. This provision is similar to provision in WAC 173-220-180 for National Pollution Discharge Elimination System permits.

Ecology has also revised the rule language in -590(2)(c) to clarify that any changes to the SRZ (such as duration or boundary) made during the renewal or periodic review processes are subject to public review and comment.

Issue 19-11: Operational terms and conditions, -590(5)

- Commenter: King County (488)

Summary of comments received:

- These terms and conditions are very open-ended and provide no regulatory certainty. This will lead to implementation challenges and inconsistencies in application of the rules. For example, tissue should be monitored at a regional scale consistent with the home range of the organism. Most sediment recovery zones (SRZs) will be smaller than that. Many of these conditions would need to be part of the discharge permit if the SRZ was associated with a point source.

Response:

The operational terms and conditions are based on language in -590(5) of the original rule. Some of these provisions may be addressed in a discharge permit. However, discharge permits tend to focus on effluent monitoring and, to a lesser extent, water quality monitoring in the vicinity of the discharge. These provisions are intended to address wider sediment, water quality, and biological monitoring related to a site or cleanup unit. And in many cases, the cleanup is the result of historic contamination that would not necessarily be addressed through a current discharge permit.

Ecology acknowledges that it has considerable discretion in implementation of this subsection, but notes that conditions vary enough from site to site that such discretion is needed.

Issue 19-12: Trespass not authorized, -590(6)

- Commenter: DNR (832)

Summary of comments received:

- DNR is concerned that a permit authorizing sediment recovery zones (SRZs) issued by Ecology may conflict with the legislative land classifications under which DNR manages state-owned aquatic lands and resources, as well as use authorizations issued by DNR. Ecology and DNR should coordinate to resolve any potential conflicts.

Response:

Ecology has revised the rule language by adding state land classifications under Chapter 332-30 WAC as a criterion Ecology must consider when authorizing, extending, or changing an SRZ.

Issue 19-13: Public involvement, -590(7)

- Commenter: Pioneer (601)

Summary of comments received:

Please define "potentially affected landowner." Does this include landowners with impacted sediments and/or adjacent landowners?

Response:

Potentially affected landowners in the context of this provision are intended to include those landowners whose properties are potentially affected by the sediment recovery zone (SRZ). This would be determined on a site-specific basis and includes owners of properties within the SRZ and other properties where contaminated sediment from the SRZ may migrate. Ecology has revised the rule language in -590(7) to also require notice to affected tribes.

This page is intentionally blank.

Chapter 20: Part VI. Sampling and Testing Plans/Recordkeeping (WAC 173-204-590)

20.1 Summary of Proposed Amendments

Part VI of the SMS was not proposed for amendment as part of this rulemaking effort. However, comments were received on Part VI. Although these comments are out of scope of the current rule amendment process, they are summarized below.

20.2 Differences between the Proposed and Adopted Amendments

Because Part VI of the rule was not proposed for amendment, there are no differences between the proposed and adopted amendments.

20.3 Responses to Comments

Issue 20-1: Data quality objectives

- Commenter: Lon Kissinger (250)

Summary of comments received:

- Data quality objectives for sampling should be specified along with an analysis of how the proposed samples satisfy the data quality objectives. Where is this included in the rule?

Response:

Section -600 includes requirements for sampling and analyses in general, and this is further detailed in the Sediment Cleanup Users Manual II.

This page is intentionally blank.

Chapter 21: Coordination and Process Issues

This chapter provides responses to public comments on coordination and process issues raised during the public comment period.

21.1 Responses to Comments

Issue 21-1: Coordination and consultation with tribes

- Commenters: Yakama Nation (282), Colville Tribe (294,313), Umatilla Tribes (315,316), NWIFC (560), Squaxin Island (707), Suquamish Tribe (740), Tulalip Tribes (775)

Summary of comments received:

- The SMS amendments are primarily oriented at cleaning up existing contamination. Tribes remain concerned about prevention of future pollution of fish and shellfish through water quality standards. The tribes are prepared to work with Ecology on completion of cleanup and water quality standards on a government-to-government basis to protect tribal rights and the health of future generations.

- The types of adjustments upward from the SCO described in the rule have been used as a basis for inaction at many sites nationally. This has real implications for tribes and individuals that depend on these resources. Therefore, there must be an opportunity for meaningful consultation with affected tribes before cleanup standards are adjusted upward.

- The State of Washington must work with the Yakama Nation as co-managers of fisheries and aquatic resources in all of its usual and accustomed fishing areas in Washington. Washington has an obligation to work with the Yakama Nation to preserve and protect the habitat needed by these resources, as required by the Treaty of 1855 and recent court cases. In particular, Ecology should clarify its commitment to working with the Yakama Nation Columbia River Basin sediment cleanup.

- Include feasibility study criteria that would result in tribal, state, federal, non-governmental, and non-profit investments into restoration of resources impacted by sediment contamination, including water quality, habitat restoration, and fisheries restoration for portions of the Columbia in Washington.

Response:

For this rule making, Ecology has engaged in government-to-government consultation as well as less formal technical and policy meetings with individual tribes and the Northwest Indian Fisheries Commission. In addition, Ecology has ensured that multiple tribes were participatory members of the three rule advisory groups.

The water quality standards updates are not part of this rulemaking. However, Ecology remains committed to working with affected tribes on those rule-related issues.

Section -130(5) of the current and revised rule requires appropriate consultation with affected tribes. Ecology has engaged in consultation with affected tribes for many sediment cleanups in the state and will continue to do so for future cleanup work. For example, the tribes have been closely involved with Ecology during the cleanup work being conducted in Port Gamble and Port Angeles.

Ecology is unable to revise the rule to include feasibility study criteria that would require action from an entity other than the potentially liable person or require funding other entities. However, Ecology considers a variety of restoration opportunities when approving a cleanup on a site-specific basis and will continue to do so.

Issue 21-2: Coordination with other state and federal agencies

- Commenters: Umatilla Tribes (326), USDOI (803), DNR (833)

Summary of comments received:

- The revised SMS propose land use controls for cleanup actions that could conflict with existing state aquatic land use laws as well as existing site use authorizations. DNR recommends that Ecology and DNR update the 1992 Memorandum of Understanding between the two agencies to resolve any such potential or actual conflicts. Areas of coordination could include information sharing, baywide planning, source control, sediment impact zones, sediment recovery zones, and liability.

- Please explain how Ecology will apply the SMS to shared boundary waters such as the Columbia River between Washington and Oregon.

- Appropriate consultation with affected federal agencies and the public should be conducted prior to adjusting cleanup standards upward from the SCO.

Response:

Ecology has revised the rule language to ensure that land use laws and rules are appropriately considered when making decisions on institutional controls or cleanup remedies.

Ecology works cooperatively with the state of Oregon when making dredge material management decisions for the Columbia River through the Regional Sediment Evaluation Team. In addition, Ecology will consult with the Oregon Department of Environmental Quality when conducting cleanups in the Columbia River that may impact Oregon.

All cleanup decision documents, for example the remedial investigation/feasibility study and cleanup action plans, are submitted for formal public comment and all comments are considered before final decisions are made. In addition, Ecology consults with the appropriate state and

federal resource agencies such as the Washington Department of Fish and Wildlife and U.S. Fish and Wildlife, during the cleanup process to ensure compliance with applicable laws.

Issue 21-3: Coordination with private tideland owners

- Commenter: Tori Hansen (251–253)

Summary of comments received:

- Acknowledge that over 70% of Washington's tidelands are owned by private citizens, who are the primary stewards of the majority of the state's beaches and tidelands.

- Provide ongoing information and solutions to all tideland property owners, including citizen stewards who are responsible for the health and safety of Washington tidelands.

- Provide citizens access to shoreline restoration information, essential best management practices, stewardship strategies, toolboxes and funding options for restoration, preservation, and enhancement of shorelines, shellfish, and nearshore ecosystems.

Response:

Ecology will ensure coordination with all landowners when any cleanup actions may impact their property.

Issue 21-4: Sediment Cleanup Advisory Committee process

- Commenters: Anchor QEA (63), Georgia-Pacific (359), Nippon (541), Port of Port Angeles (626), Sediment Cleanup Advisory Committee Members (686)

Summary of comments received:

- Ecology put a great deal of effort into public outreach and working with stakeholders to address difficult issues and find workable solutions. Based on materials available in late 2011, it appeared Ecology was on the right path.

- However, since that time, it appears that major changes have been made to the draft rule as represented in the proposed rule language that were not discussed and are not as practicable as the approach that Ecology had developed with the Sediment Cleanup Advisory Committee. New draft language needs to be proposed to address these issues.

- For example, the committee held a consensus view that there was no presumptive sediment remedy, including a requirement for active cleanup, for any contaminated sediment site, regardless of the contaminant or risk level. Careful site-specific evaluations should always be conducted. Yet, Ecology included a requirement for active cleanup whenever technically possible in the rule.

- The committee also recommended that Ecology not require that cleanup standards be met within 10 years of beginning active cleanup (a change from the current approach), yet the current draft rule language proposes that approach.

- We recall the committee's recommendation that a sediment recovery zone requirement would stymie cleanup, as this element of the SMS regulations had proven unworkable. Yet, Ecology included that provision as well.

- There have also been substantial changes since the workgroup process to align SMS more closely with MTCA, including points of compliances, cleanup levels vs. cleanup standards, etc. However, many of these aspects of MTCA do not translate well to SMS where there are fewer remedial options and far fewer institutional controls available.

- Most importantly, the draft rule eliminates consideration of cost in determining the cleanup level. We left the Advisory Committee process believing that Ecology understood the importance of maintaining flexibility, and are disappointed that that flexibility appears to have been removed.

Response:

Ecology agrees that the proposed rule language submitted for formal public comment was different from the informal draft submitted to the advisory group for review and comment. Comments received on the informal draft were thoughtful and represented very divergent opinions and interests. Ecology incorporated changes to develop the proposed rule language by seriously considering all comments from the advisory group on the informal draft. As a result, the proposed rule language was appropriately different and substantially improved.

In response to concerns that the rule does not reflect the consensus views of the advisory group, Ecology has reviewed the advisory group meeting notes and materials from 2009 through 2011. While there were a number of advisory group members that held similar opinions on the issues of presumptive remedy, use of cost to establish cleanup standards, and removal of the sediment recovery zone requirements, these views were not shared by all committee members.

Ecology has revised the proposed rule language in -570 regarding when the 10-year timeframe would start. The informal draft included -590, which establishes requirements for issuing sediment recovery zones. This section has been revised in response to comments. See responses in Chapters 17 and 19 for details on restoration timeframes and sediment recovery zones.

One important reason for this rulemaking was to harmonize the SMS and MTCA rules where appropriate. Ecology agrees there are a number of concepts and requirements in MTCA that do not translate well to sediment cleanup, and considered this carefully with the proposed rule language. Ecology heard from the advisory group that similar terminology was an important issue to reduce ambiguity. The concepts of cleanup levels and points of compliance were included in the original SMS rule, but not specifically defined or labeled as such.

See the response to Issue 12-C regarding consideration of cost when establishing a cleanup level.

Issue 21-5: Future development of background concentrations

- Commenter: NAVFAC (528)

Summary of comments received:

- This process of developing background concentrations should be transparent and peer-reviewed.

- Who will be financially and technical responsible for developing background concentrations?

- What is the projected timeline for determining natural and regional background? How Ecology handle schedule impacts on sites in embayments where background has not yet been determined?

- If a potentially responsible person must assume the responsibility for developing background concentrations, how will Ecology ensure consistency between projects?

Response:

When background is established for a cleanup site, it will be included in the Remedial Investigation/Feasibility Study and Cleanup Action Plan that will be submitted for formal public comment.

Ecology is responsible for determining background and approving any technical work related to establishment of background. Ecology has committed to working toward establish background concentrations in a select number of embayments in Puget Sound this fiscal year. Ecology plans to continue this work if funding and staff are available. Ecology retains the authority to require potentially liable persons to fund the cost of establishing background as appropriate.

Issue 21-6: Rule amendment process

- Commenters: City of Seattle (254,257), Colville Tribe (283), King County (373), NAVFAC (515,525), Port of Port Angeles (624), Port of Seattle (645)

Summary of comments received:

- Given the substantial changes that have been made since the Sediment Advisory Group process, our significant comments and those of other commenters, we request that the draft rule language be rereleased for review and comment prior to adoption.

- Ecology should engage in more collaborative dialogue before finalizing any SMS rule revisions to incorporate solutions into the rule that reduce the substantial implementation challenges.

- There are still key technical details being worked out, such as how regional background will be calculated and fish consumption rates. It is difficult to know the impact of these rule revisions without this information. Additional case studies would be useful in this evaluation. We recommend the rule not be promulgated without completing these processes.

- The Colville Tribe has been working with Ecology for two years regarding significant technical issues. We have urged Ecology to use fundamentally different assumptions and criteria in formulating the SMS. These technical issues have not yet been resolved, and we are deeply concerned about moving forward with this rule in the absence of that resolution. The Tribe cannot support this rule without the significant changes presented in our comments.

Response:

Ecology agrees that the proposed rule language submitted for formal public comment was different from the informal draft submitted to the advisory group for review and comment. Ecology expected the proposed rule language to be different as a result of the diverse comments received.

Ecology believes that substantial and collaborative dialogue has been conducted during this rulemaking. This has included a two-year advisory group process that involved three different committees with members having diverse interests, experience, and opinions and an informal public comment period on draft rule language. While Ecology agrees that more dialogue and outreach can be beneficial, Ecology believes the rulemaking public process was productive and resulted in greatly improved proposed rule language.

Ecology agrees that more information can be useful in making decisions during rulemaking, such as the evaluations conducted in the Environmental Impact Statement and Cost Benefit Analysis. These analyses included case studies with scenarios of different fish consumption rates and regional background calculations. Ecology believes this is sufficient to make appropriate decisions on rule language.

See the responses to comments in Chapter 15 for discussion of the Colville Tribes' technical and policy comments on freshwater standards.

Issue 21-7: Periodic review and consultation

- Commenters: Yakama Nation (274), Umatilla Tribes (315), NWIFC (543,559), CILP (683), Squaxin Island Tribe (707,708), Suquamish Tribe (740), Swinomish Tribe (764), Tulalip Tribes (775)

Summary of comments received:

- The SMS should contain specific periodic review and consultation requirements with timelines to include evaluation and effectiveness of the rule and review of new technologies.

- While MTCA seems to indicate that periodic review of standards set by practical quantitation limits would be necessary, these appear to be dependent on Ecology resources. Also, there is no mechanism for periodic review of standards set by regional background concentrations, which also leave contaminants at levels that are not protective of human health and the environment.

Response:

The original and adopted rule contains provisions in -130(6) through -130(8) for Ecology to conduct an annual review of the rule provisions and consider new or additional scientific information and applicable laws when making any revisions. Ecology satisfies this requirement by engaging in the Sediment Management Annual Review Meeting to update protocols and guidance related to the rule and cleanup.

The commenter is correct that periodic review of sites that have standards established at the practical quantitation limit is necessary under MTCA. However, neither the SMS nor MTCA rule requires periodic review for sites with standards established at background. The consent decree and cleanup action plan will include appropriate review and monitoring to ensure success of the remedy and protection of human health and the environment.

Issue 21-8: EPA review of the SMS as water quality standards

- Commenters: Yakama Nation (274), Umatilla Tribes (315), NWIFC (543,554,562), NWPPA (566), CILP (685), Spokane Tribe (705), Squaxin Island Tribe (707,708), Suquamish Tribe (740,741), Swinomish Tribe (761), Tulalip Tribes (775)

Summary of comments received:

- The SMS are water quality standards, and thus revisions to them must be harmonized with existing and pending water quality regulations and reviewed by EPA. Both Ecology and EPA have acknowledged this in previous regulatory statements. Both MTCA and the Clean Water Act should be considered applicable.

- The SMS should be revised as needed to receive EPA approval to ensure protection of human health, avoid undermining designated uses of water bodies, and remain consistent with state and federal clean water regulations.

- The selected reasonable maximum exposure scenario, background definitions, and use of the practical quantitation limit as a cleanup standard are not consistent with the water quality regulations, which would result in disapproval by EPA. These provisions should be modified or eliminated as necessary.

- Ecology's apparent attempt to avoid EPA involvement sidelines a federal trustee with the obligation to protect tribal rights and resources. This approach is not in the spirit of the Centennial Accord.

- The Northwest Indian Fisheries Commission and tribes have submitted comments to EPA urging them to use their nondiscretionary authority to review the SMS as water quality standards. These comments are incorporated by reference.

- Ecology should not take any action that would subject the amendments to Part V to EPA review and approval as water quality standards. This would prejudice the ongoing effort to establish human health water quality criteria under the state Water Quality Standards.

- If Ecology determines that the amendments constitute a water quality implementation tool, then a Small Business Economic Impact Statement and Preliminary Cost-Benefit Analysis and Least Burdensome Alternatives Analysis must be prepared to assess the additional implications of their use in water quality programs.

Response:

Ecology has revised the rule language to clarify that Part V is promulgated under the MTCA law. The rule clearly states that Part V shall not be used in Ecology's implementation of federal Clean Water Act requirements. Ecology does not consider Part V to be a water quality implementation tool.

In November 1991, the EPA approved the SMS rule in its entirety as federal water quality standards. After careful review during the current rulemaking, Ecology has determined that Part V provisions, and the use of Part V, do not meet the definition of water quality standards because Part V:

1) Applies only to cleanup of contaminated sites under the MTCA law.
2) Does not define or revise the designated use of a water body.
3) Does not establish water quality criteria or alter the level of protection afforded by water quality criteria.
4) Does not establish or alter antidegradation policies.

Under the MTCA law and SMS rule, any cleanup action must comply with applicable state and federal laws, which include state water quality standards.

Several commenters have requested that the rule revisions be submitted to EPA for review for federal approval as water quality standards. While Ecology has determined that Part V provisions are not water quality standards subject to EPA review and approval, Ecology has worked closely with EPA for two years regarding the SMS rule revisions, listened to their comments, and revised the rule language accordingly. Ecology plans to inform EPA of the rule revision, and will request that EPA withdraw its former approval of Part V as water quality standards after the rule has been adopted.

Issue 21-9: Dredging programs

- Commenter: USACE-NWD (779)

Summary of comments received:

- Provide additional clarification on how the state envisions using the different standards and screening levels for cleanup actions and decisions when evaluating dredged material associated with navigation or other purposes and permit actions.

Response:

The SMS rule revisions and associated cleanup standards apply only to cleanup, which includes site identification, actions, and decisions. Dredging project assessments that include sediment data above the marine benthic CSLs will be referred to the Toxics Cleanup Program for further evaluation under the SMS Part V cleanup provisions. Dredging projects are not allowed to dispose of material exceeding the marine SCOs (benthic chemistry with bioassay override) in-water. Sediment exposed by dredging must be below the marine CSLs (the area may be dredged but post-dredge cover or other management options would be required), and sediments exposed by dredging above the SCOs but below the CSLs may remain in place if cleaner than the previous surface material (see http://www.nws.usace.army.mil/Portals/27/docs/civilworks/dredging/Updates/2008-Post-Dredge%20Sediment%20Surfaces-final.pdf). The various dredging programs may also choose to use the freshwater benthic criteria for evaluating dredged material via existing regional interagency processes and incorporation into guidance (for example, the Regional Sediment Evaluation Team process and the Sediment Evaluation Framework).

Issue 21-10: Other environmental regulations

- Commenters: BP Cherry Point (179,182), NAVFAC (534,535)

Summary of comments received:

- Does Ecology anticipate changes to other environmental regulations to bring them into support and compliance with the new rules?

- How will the rule changes affect upland cleanup standards and site closures?

Response:

Changes to other environmental regulations are not needed to support or comply with the adopted rule. However, discussions are currently underway on the appropriate fish consumption rate needed to protect high fish-consuming populations in Washington State under WAC 173-201A. Once a default fish consumption rate is developed, Ecology will work to ensure consistency with applicable laws regarding fish consumption rates.

As an applicable state law, this rule must already be complied with at upland cleanup sites and site closures under the Resource Conservation and Recovery Act. This will not change under the adopted rule.

This page is intentionally blank.

Chapter 22: Supporting Documents

This chapter provides responses to public comments on documents prepared to support rule adoption and implementation. The Environmental Impact Statement, Small Business Economic Impact Statement, and Cost-Benefit and Least Burdensome Alternatives Analysis were draft documents subject to public comment at the same time as the proposed rule amendments. The comments to these documents and Ecology's responses are provided in sections 22.1, 22.2, and 22.3 below.

The draft Sediment Cleanup User's Manual II was made available during the public comment period for informational purposes and was not proposed for formal public comment. However, Ecology welcomed suggestions and comments, which are summarized in Section 22.4 below.

22.1 Responses to Comments – Environmental Impact Statement

Issue 22-1: Environmental Impact Statement (EIS) process and comments

- Commenter: Colville Tribe (284)

Summary of comments received:

- The EIS is fundamentally flawed and should be reissued for public comment. It is not clear how an EIS can adequately address public concerns regarding adverse impacts and reasonable mitigation measures if it is issued prior to public comment. The Tribe has offered important comments on cleanup levels that should be considered in the EIS. Ecology inappropriately limited the range of alternatives considered and may have minimized assessment of environmental impacts by not considering these comments in developing the EIS.

Response:

The State Environmental Policy Act (SEPA), WAC 179-11-408, requires the lead agency (Ecology in this case) to give public notice and circulate a Scoping Notice for public comment for 21 days. A Scoping Notice and a Determination of Significance for the proposed rule revisions EIS was published in the SEPA register on May 14, 2012 and letters were sent to stakeholders and tribes announcing the notice. After receiving and reviewing comments, Ecology completed a draft EIS issued for public comment concurrent with the proposed rule language and accompanying documentation. Ecology believes all SEPA requirements giving the public the time and opportunity to comment on the EIS were met.

Issue 22-2: Cleanup delays

- Commenters: Yakama Nation (274), Umatilla Tribes (315), NWIFC (543), CILP (666), Squaxin Island Tribe (707,708), Suquamish Tribe (740), Tulalip Tribes (775)

Summary of comments received:

- The Environmental Impact Statement (EIS) envisions relatively rapid cleanups. However, failure to specify the fish consumption rate and other technical factors in the rule encourages contention around these values and requires added time and effort to determine the relevant exposure parameters. Meanwhile, those who consume fish from the site will continue to be harmed.

Response:

The draft EIS includes analyses of alternatives with different fish consumption rate scenarios based on actual cleanup sites and tribal fish consumption rates used at these sites. This was done to understand the potential impacts of each alternative. Ecology agrees that, for some cleanup sites, lack of a default fish consumption rate may result in increased effort to determine an appropriately protective reasonable maximum exposure scenario that includes a tribal fish consumption rate. However, Ecology has a history of making these determinations at cleanup sites in consultation with affected tribes, which is reflected in the draft EIS alternatives.

Issue 22-3: Cleanup area

- Commenters: Yakama Nation (274), Umatilla Tribes (315), NWIFC (543), CILP (667,677,679), Squaxin Island Tribe (707,708), Suquamish Tribe (740), Tulalip Tribes (775)

Summary of comments received:

- The case studies presented in the Environmental Impact Statement (EIS) demonstrate that Ecology's proposed approach would always require less area to be cleaned up and would provide a lower level of protection than using a human health risk-based approach. Furthermore, other rule concepts, such as fish diet fraction and site use factor, can be combined to further reduce the scope of cleanup. It is unclear, given this, how the draft EIS could have given Ecology's proposed approach a higher score for "impacts to human health and the environment from residual contamination" than the human health risk-based approach.

- The reduction in cleanup area under Ecology's approach is compounded by the use of a fish diet fraction and site use factor, when the smaller the area, the more likely it is that a potentially liable person will argue for a smaller diet fraction or site use factor.

Response:

Ecology considered the alternative of limiting sediment cleanup decisions for bioaccumulative contaminants, including establishing cleanup standards and identifying cleanup sites, to using only human health risk-based criteria. This alternative included the assumption that the MTCA criteria for addressing human health risks and background chemical concentrations did not legally apply to the SMS rule or sediment cleanup.

The draft EIS analysis showed that risk-based concentrations protective of human health are frequently below MTCA natural background by at least an order of magnitude. Under this alternative, the technical feasibility of attaining and maintaining cleanup standards at these low levels is low and the cost of actively remediating sites significantly larger than if bounded by MTCA natural background levels. The uncertainty in the environmental and human health benefits is also high due to the inherent uncertainties in risk calculations. Therefore, limiting cleanup decisions to use of the risk-based criteria alone did not meet the goals and objectives of the rulemaking.

Under the adopted rule, the initial identification of a site based on human health is similar to the process in the MTCA rule, which serves as the baseline alternative for the EIS. However, site-specific cleanup standards are used to determine the size of a site for remediation, rather than the SCO as in the baseline alternative. Therefore, site boundaries for remediation may be smaller under the adopted alternative than under the baseline alternative.

The default exposure parameters (such as fish diet fraction and site use factor) are 1, based on a tribal fish consumption scenario. Consequently, Ecology does not anticipate that the rule amendments will significantly increase or decrease the average size of sites initially identified. However, the size of the site required to be further investigated and remediated may be smaller under the adopted alternative than under the baseline alternative, depending on the site-specific cleanup standards.

The size of individual sites may increase or decrease depending on site location and the contaminants of concern. However, the size of the site required to be remediated, as well as investigation and the long-term monitoring costs may be lower under the adopted alternative than under the baseline alternative. This is due to the two-tier framework in the adopted rule that clarifies how to identify site and site unit boundaries for active remediation.

Although the EIS compares various alternatives for identifying and cleaning up sites based on human health, future site boundaries are expected to be much larger than those that have historically been based primarily on benthic toxicity due to the greater emphasis placed on human health and upper trophic levels in the adopted rule revisions.

Issue 22-4: Alternatives for freshwater criteria

- Commenter: WSWRA (836)

Summary of comments received:

- Under the no action alternative, sediments may be compared to the MacDonald et al. (2000) values. These values (Threshold Effects Concentrations and Probable Effects Concentrations) have limitations when evaluating the potential for benthic impacts at freshwater sites in irrigation districts. They incorporate mixture effects with chemicals (e.g., polychlorinated biphenyls, polybrominated diphenyl ethers) that are not likely present in irrigation canals.

Response:

Ecology acknowledges the limitations of using chemical criteria to evaluate the potential impact on the benthic community at freshwater sites due to the diverse nature of these environments. Alternative 1 (No Action) includes the option of using other chemical criteria for cleanup. However, the preferred alternative includes the adopted freshwater chemical and biological criteria. This option allows the use of biological criteria to evaluate the impact to the benthic community at sites such as irrigation districts. The freshwater chemical criteria were established using a multivariate model that includes analyses of multiple chemicals within a sample. However, these proposed chemical criteria may be used at sites where only a subset of chemicals are present.

Issue 22-5: Scoring of alternatives and evaluation of impacts

- Commenters: Boeing (157), DNR (827)

Summary of comments received:

- There should be a clearer connection between the discussion of impacts and the scoring of alternatives. There is no discussion of the relative magnitude of benefits and impacts, or net environmental impact.

- The Environmental Impact Statement (EIS) does not adequately address impacts to state-owned aquatic lands.

Response:

Ecology has finalized the EIS with the scoring and impacts analyses as written in the draft EIS. Ecology agrees that it is difficult to clearly communicate alternatives analyses, but believes the draft EIS includes the environmental impact analyses required under the State Environmental Policy Act.

Ecology acknowledges DNR's statutory authority and the importance of incorporating present and proposed land uses when approving a cleanup remedy. The EIS does not specifically address potential impacts to state-owned aquatic lands, but the alternatives include sites that are, at least in part, on state-owned aquatic lands.

22.2 Responses to Comments – Small Business Economic Impact Statement

No comments were received on this document.

22.3 Responses to Comments – Preliminary Cost-Benefit and Least Burdensome Alternatives Analysis

Issue 22-6: General

- Commenters: NAVFAC (537), Port of Port Angeles (623), Port of Seattle (660), City of Renton (664), WPPA (809), Weyerhaeuser (905)

Summary of comments received:

- We believe the costs will be much higher than are presented here, due to some of the changes Ecology has proposed.

- The cost estimates are overly optimistic and simplistic, and do not capture the real impacts on the business community, ports, and local governments.

- We believe an accurate cost evaluation cannot be conducted until the unknowns associated with this rule (fish consumption, natural and regional background, coordination with other regulations) have been fully identified and resolved. We would like to see these cost impacts evaluated in compliance with the State Environmental Policy Act (SEPA).

- The effect of the regulatory requirements on employment, the economy, and the cost to citizens, businesses, cities, counties, and special purpose districts deserved equal consideration to the other factors in the rule.

- We remain concerned about provisions in the draft rule that may inevitably make cleanups impossibly expensive, while at the same time cost considerations have been removed from rule language. This approach creates a rule that is theoretically beneficial but fundamentally unworkable, meaning that many projects will not begin or progress. Disincentivizing cleanup projects in this way will result in reduced environmental benefits.

- The cost-benefit analysis (CBA) does not address a key issue – whether human health risks will be substantially reduced by the proposed rule once implemented. This is the primary goal that the rule was developed to support, and should be a primary focus of the CBA.

- The presentation of costs is confusing. In some cases there may be an extra "thousand," such as in "$60,387 thousand" or "$373,296 thousand."

Response:

Ecology included both optimistic and pessimistic scenarios in the CBA. Ecology has updated and reorganized the document to better communicate these ranges and uncertainty.

Ecology believes that the collective rule revisions, relative to the original rule (or baseline), provide incentives for potentially liable persons to conduct cleanup expeditiously, establish implementable and protective standards, and provide a clarified and predictable cleanup framework, thereby reducing risk to human health and the environment for both the short and long term.

Ecology is not required to do an economic analysis under SEPA for rulemaking. Rather, Ecology is required to perform a CBA and Least Burdensome Alternative Analysis under the APA (Chapter 34.05 RCW), and a Small Business Economic Impact Analysis under the Regulatory Fairness Act (Chapter 19.85 RCW). Establishment of a default fish consumption rate is no longer an element of this rulemaking, but is being addressed in the rulemaking under WAC 173-201A for the Surface Water Quality Standards and Implementation Tools. Only the costs and benefits of the changes made to the SMS are assessed (all else equal) for this rulemaking. Under the WAC 173-201A rulemaking, Ecology will address costs and benefits of any overlapping standards or implementation issues that arise. Ecology encourages public participation in the rulemaking process on fish consumption rates, water quality standards, and implementation issues. For background concentrations that are unknown, Ecology has updated the CBA to reflect costs associated with determining background concentrations.

While the original rule had a provision to allow consideration of cost when establishing cleanup standards, it did not contain a clear and predictable process for implementing this provision. The revised rule provides a clarified process that Ecology believes will result in a more implementable cleanup process and more consistent cleanup decisions. For further detail regarding the disproportionate cost analysis and selection of cleanup standards and remedies, see Issues 11-11, 12-C, 17-11, and 17-12.

Ecology expects the rule revisions to result in different impacts over time because of existing background sediment concentrations. The CBA was conducted using a 20-year timeframe and Ecology expects the rule revisions to have the described impacts within this timeframe, while background concentrations exceed human health-based concentrations. As cleanup and source control is conducted, Ecology expects background levels to decrease over time, thereby reducing risks to human health and the environment. The goal of the rule is to reduce and ultimately eliminate significant health threats to humans from sediment contamination, but Ecology cannot eliminate risks to human health. Establishing strictly health-based cleanup levels, without defaulting to background, is not likely to occur within the 20-year timeframe of the CBA and is therefore not discussed.

The text with values such as “$60,387 thousand” was intended to be “$60,387.” These errors have been corrected in the final document by deleting the extra "thousand" as appropriate.

Issue 22-7: Baseline scenario

- Commenters: BP Cherry Point (191), NAVFAC (536)

Summary of comments received:

- The cost-benefit analysis (CBA) compared differences between the SCO and CSL levels of cleanup, but did not provide a baseline for comparison that represented the rule as is, without addition of human health and numeric freshwater standards.

Response:

The CBA includes comparison between the baseline (that includes interpretation of the SMS narrative standard on human health, which is to use the MTCA provisions for human health) and the revised rule that includes criteria for freshwater (Section 3.6) and human health based standards (Sections 3.5 and Appendix A). Ecology has added a new analysis using a different baseline that includes the marine benthic criteria.

Issue 22-8: Sediment sampling and analysis costs

- Commenter: Weyerhaeuser (905)

Summary of comments received:

- Sampling and analysis costs appear to have been significantly underestimated, with implications in a number of areas of the document. A recent cost estimate for one of our projects by a qualified consultant suggested costs per sample 3–6 times those assumed here, including all elements required by Ecology.

Response:

Ecology has revised the document to clarify the scope of the sampling costs. Ecology agrees the entire cost of sampling, which includes vessel mobilization, report writing, equipment, materials etc., are greater than stated in this CBA. Ecology's analysis only included additional laboratory analytical costs by presuming sampling is already occurring (e.g., the equipment is already in use for sampling under the baseline, but more samples and/or more analysis is required under the revised rule). Ecology has updated the final CBA to reflect the possibility of new sites incurring this entire package of characterization costs, while existing sites incur the smaller incremental costs of additional samples.

Issue 22-9: Freshwater standards

- Commenter: Boeing (115,134,138)

Summary of comments received:

- The potential impact of using the Floating Percentile Model (FPM) to derive the freshwater criteria should be realistically examined through the use of a case study example.

- The likelihood of additional freshwater sites being identified and the associated costs of addressing these sites should be examined. The assumption of the report that the number or size of freshwater sites may be reduced by having chemical criteria may be incorrect. Some chemicals do not have chemical criteria necessitating bioassays, and others such as butyltins were not previously analyzed.

Response:

Ecology has included an analysis of using the adopted freshwater benthic criteria, developed using the FPM, compared to other benthic criteria and the baseline in Section 3.6. In addition, the Environmental Impact Statement has a series of case studies comparing the FPM freshwater benthic criteria to other freshwater benthic values and the baseline.

Ecology agrees that addressing the potential number of new sites identified under the rule revisions is important and this is presented in Section 3.11. A case study was developed for Puget Sound under both the original (-510, -530, -540) and proposed rule (-510 through -530) framework for identifying cleanup sites that included the marine benthic criteria, natural and regional background, and human health risk-based values. In the Puget Sound case study, as well as the embayment-specific case studies included in Section 3.4 and Appendix A, the CSL, used to identify cleanup sites, defaulted to background rather than the benthic criteria. Ecology presumes these marine case studies are generally representative of freshwater cleanup sites.

Ecology does not believe that the number of freshwater cleanup sites would significantly change due to the adoption of freshwater chemical and biological benthic criteria. Under the original rule, freshwater sites were generally identified using bioassays, due to lack of adopted benthic chemical criteria. The adopted freshwater biological criteria reflect the biological tests and criteria historically used to make this determination, and the adopted freshwater chemical criteria were developed to predict these biological test results as accurately as possible. Under the adopted rule, confirmational bioassays will still be an option for identifying cleanup sites. In addition, identification of many, if not most, freshwater and marine sites will henceforth be driven by the presence of bioaccumulative chemicals and protection of human health and higher trophic levels.

Ecology did not conduct a freshwater-specific case study to assess identification of cleanup sites due to the lack of adequate data necessary to determine natural and regional background. Ecology has, however, used available data to address this issue to the extent possible in the final CBA, and has included the costs of gathering the necessary data in its assessment.

Issue 22-10: Regional background

- Commenters: Boeing (132,140), Colville Tribe (311), Weyerhaeuser (905)

Summary of comments received:

- The process time and investigative costs needed to determine regional background should be more realistically assessed, as well as how this will be funded. Is it certain that Ecology will sponsor and pay for establishment of natural and regional background values?

- There is an error in the Dredged Material Management Program example presented in Section 3.9.1, which used an incorrect regional background value for dioxin toxic equivalency quotient. This may have affected the results of the analysis.

- The regional background concentration calculated for an urban embayment is more than 10 times higher than the background concentration calculated for a rural embayment, even though both are in Puget Sound. It is not apparent why there would be such a difference other than demographics, which is not an appropriate basis for estimating background concentrations.

Response:

Ecology has added estimated costs for establishing regional background levels to the analysis.

Ecology plans to conduct the work to establish regional background in a select number of bays in Puget Sound. In addition, at the direction of Ecology, a potentially liable person may be required to compile and collect data to be used by Ecology in setting regional background for a site. This process will be collaborative and transparent and Ecology anticipates providing opportunity for stakeholders to review and comment on sampling plans and results. As the work is conducted, Ecology will incorporate the results in the Sediment Cleanup Users Manual II as case studies to provide methodological and protocol recommendations.

Ecology intends to ensure consistency regarding sampling and analytical methods, statistical analyses, parameters, and processes used to determine regional background among regions through appropriate agency oversight and providing guidance in the Sediment Cleanup User's Manual II.

The regional background value used in the dredged material analysis in Section 3.9.1 was correct, but the referenced Section 3.5.1.2 was incorrect. The correct reference should have been Section 3.11.1, consistent with the Puget Sound-wide regional background value.

Regional background values are expected to differ based on geographic areas or embayments because the values are influenced by diffuse sources of contaminants. See Issues 12-10A through C for further detail on establishing regional background.

Issue 22-11: Source control

- Commenters: Boeing (133), City of Renton (654)

Summary of comments received:

- The scope and duration of source control by all affected parties as an element of the remedy should be more realistically assessed.

- The change in water and sediment quality standards could result in more streams being listed on EPA's 303(d) list of impaired water bodies and addition Total Maximum Daily Load (TMDL) plans.

Response:

Ecology's preliminary CBA included cost estimates associated with increased monitoring that would likely be required under the proposed rule for sites that would be identified under both the baseline and adopted rule language. Ecology has reorganized the document to better reflect expectations on the number of sites and their associated costs for characterization, cleanup, and source control.

The current 303(d) sediment listing Policy 1-11 allows sediment listings to be moved from Category 5 (the 303(d) list) to Category 4B (the approved TMDL/Cleanup Plan list) once a Cleanup Action Plan or Record of Decision is final. However, Ecology plans to update Policy 1-11 before the effective date of the rule to reflect the revisions to Part V of the rule, which states that Part V may not be used for federal Cleanup Water Act purposes. The current Policy 1-11 will not apply once the adopted rule is in effect. Any changes to water quality standards under the RCW 90.48 are not within the scope of this rulemaking.

Issue 22-12: Removal of cost from selection of cleanup standard

- Commenter: Boeing (135,139)

Summary of comments received:

- More realistically evaluate the potential for selection of remedies with disproportionate costs and limited risk reduction as a result of this rule change. Removal of costs when setting cleanup standards and selecting cleanup actions was not addressed in this report.

- This is particularly of concern when combined with the inclusion of bioaccumulation-based standards in the rule, which may drive standards down to background, and the uncertainty in whether regional background will actually be higher than natural background.

Response:

The analysis included case studies with cleanup standards based on a range of concentrations for regional background and a range of human health risk-based standards based on different fish consumption rates. Chapter 3 included a Puget Sound-wide analysis as well as case studies for select embayments. Appendix A included an analysis of risk-based standards for representative bioaccumulative chemicals and how they compare to background and the practical quantitation limit to establish cleanup standards.

Ecology chose to conduct the analysis of establishing cleanup standards by using a range of concentrations and varying remedies. The analysis did not specifically include the removal of cost in establishing cleanup standards because the original rule did not have a clear process for how to use cost in this process. Ecology believes that the removal of cost provides more clarity to the process for establishing cleanup standards and, considered collectively with other rule changes, provides more flexibility for establishing cleanup standards and remedy selection. For further detail regarding removal of cost when establishing cleanup standards, see Issue 12-C. For

further detail regarding disproportionate cost analysis and remedy selection, see Issues 11-11, 12-C, 17-11, and 17-12.

Issue 22-13: Remediation and settlement benefits

- Commenter: Boeing (136)

Summary of comments received:

- The report concludes that as a result of the rule changes, remediation and settlement of site cleanups will be expedited. We believe this is unlikely, given the new freshwater standards, human health standards, higher trophic level standards, ambiguity in how background concentrations will be set, and removal of cost in setting the cleanup standard.

Response:

Comment noted. Please see Issue 22-6 for further response.

Issue 22-14: Site boundaries

- Commenter: Boeing (137)

Summary of comments received:

- The report assumes that site boundaries will be reduced, leading to lower costs, based on a comparison of natural and regional background. However, it is not clear that in most cases, natural and regional background will be different. The costs associated with calculating background are also uncertain. Additional clarification and case studies are needed.

Response:

Ecology agrees there are areas in the state where regional and natural background are similar and, in these cases, the costs will not be significantly different related to background considerations. Ecology conducted the economic analysis for cases where there would be a significant difference between regional and natural background. Ecology has added estimated costs for establishing regional background levels to the CBA. Please see Issues 12-4 and 12-10A through C for further responses regarding establishing background.

Issue 22-15: Dredging costs

- Commenter: USACE-NWD (780–782)

Summary of comments received:

- Is the cost of analysis for all proposed dredging costs over 20 years $373,289 thousand, or just $373,289? The latter value was used in another document. What is meant by this value – a total cost for 20 years of projects, an average cost, or? Is this just for analysis, or for dredging and disposal?

Response:

The $373,296 value is the expected average cost total across all projects for 20 years. Ecology has clarified the language in the document to reflect this, while retaining the 20-year context, because all Ecology economic analyses look ahead 20 years. The costs referenced are for the change in sampling cost. Ecology does not expect a significant change in the degree of remediation.

22.4 Sediment Cleanup User's Manual

Issue 22-16: Suggestions for the Sediment Cleanup User's Manual

- Commenters: AECOM (23), Boeing (98,101,118,145,158), Larry Dunn (194), Lon Kissinger (202–204), City of Seattle (255), Yakama Nation (274), Umatilla Tribes (315,353,354,356), King County (379,474), Landau Assts. (506), NAVFAC (528), NWIFC (543,561), Port of Port Angeles (631,635), Port of Seattle (656), CILP (665,671,675,677,679), Spokane Tribe (704,706), Squaxin Island Tribe (707,708), Suquamish Tribe (740), Swinomish Tribe (752,754,760), Tulalip Tribes (775), USACE-NWD (784), DNR (826), Weyerhaeuser (904)

Summary of Comments Received:

- Please clarify in the introduction that this is only guidance, not regulations, and that Ecology staff will consider other scientifically credible or site-specific information.

- Please clarify the point of compliance in different situations and for different endpoints.

- Differing chemical thresholds for marine and freshwater sediments could result in recontamination downstream if freshwater criteria are higher than marine criteria. Provide guidance on how this situation will be handled in estuarine systems, perhaps through a case study.

- When organic carbon normalizing, there should be a stated range outside of which it would be prudent to use dry weight normalization instead.

- Please clarify how Ecology could consider stream health (such as the Index of Biological Integrity) when evaluating and testing toxicity, and what watershed methods are included.

- Ecology should develop detailed guidance for ecological risk assessments for higher trophic level species.

- Please provide guidance on use of bioaccumulation factors and bioconcentration factors.

- Guidance on tissue sampling should be developed to account for site-specific variability, sampling and analytical methods, etc.

- The guidance manual should emphasize the ability to consider site-specific factors in developing a reasonable maximum exposure scenario (RME) for human health-based standards. Contaminated sites vary considerably across the state, and one default scenario will not be appropriate for all.

- Ecology should develop an issue paper with default sediment cleanup values based on human health risk for polychlorinated biphenyls (PCBs), carcinogenic polynuclear aromatic hydrocarbons (cPAHs), arsenic, and dioxins/furans.

- The guidance manual suggests that RME is appropriately composed of a mix of high-end and average or median exposure values. However, tribal exposures are exposures to actual people with high-end exposure values across the board, and with hopes for unsuppressed, restored consumption possibilities in the future. These exposures should be considered the RME.

- The default RME mix of high-end and median exposure values will result in overly conservative estimates of risk and cleanup levels.

- The guidance manual provides too many site-specific factors that can be used to lower tribal fish consumption rates, reducing protectiveness and increasing the contentious nature of cleanup decisions.

- The guidance appears to allow reduction in consumption rates based on specific species currently present or absent, or currently consumed, particularly salmon. However, tribal treaty rights are not species-specific, and they are free to obtain seafood resources from any mix of species desired or envisioned based on habitat restoration in the future.

- Provide additional case studies for calculation of regional background concentrations. The calculation process should be transparent and peer-reviewed, including treatment of data and any outliers.

- Guidance on appropriate practical quantitation limits (PQLs) for bioaccumulative chemicals should be set to avoid the need to establish PQLs as cleanup standards.

- The problem with using the PQL is compounded by selection of a median PQL as the cleanup standard, removing incentives for improvement and permitting cleanup standards to lag behind what is technically achievable at the cost of human health. The lowest PQL should be used.

- The toxic equivalence quotient (TEQ) methodology should not be applied in determining a PQL-based cleanup standard. These values have a high degree of uncertainty and are not intended to be used for abiotic matrices outside a risk assessment context. Instead, congener-specific values should be used.

- Dioxin-like PCBs, polybrominated diphenyl ethers (PBDEs), and dioxins/furans should be added together in the TEQ methodology to reflect the latest information.

- The guidance manual should include a case study of site units, including all the details of implementation, dealing with recontamination, liability, etc. The case study should involve stakeholders.

- Guidance should be provided on evaluating impacts to state-owned aquatic lands.

- Include a definition of monitored natural recovery.

- Incorporate flexibility into the selection of cleanup standards and alternatives to allow monitored natural recovery at sites where appropriate.

- Incorporate guidance for whether more frequent monitoring should be required at sites where capping was conducted than at sites that were dredged.

- Ecology should have made the guidance available at the same time as the rule, since it contains detail on many important topics. If complete guidance is not available, Ecology should provide an outline and a timeline for guidance development.

- This document should have a formal public review process, as it is an important guidance document for implementing key concepts in the rule.

Response:

Ecology greatly appreciates all of the comments and suggestions received on the draft Sediment Cleanup User's Manual II. Ecology intends to update the Manual in the months following signing of the rule and to release another version along with the rule when it becomes effective. All of these comments and suggestions will be reviewed during that process along with updating sections of the Manual needed to interpret and implement the adopted rule. Like the previous Sediment Cleanup User's Manual and Sampling and Analysis Plan Appendix, the Manual will be a living document that will be revised over time as needed to incorporate the latest science and policy. Ecology will continue to participate in the Sediment Management Annual Review Meeting process to ensure appropriate public comment and review of significant changes over time.

Chapter 23: References

ASTM. 2012. Standard Test Methods for Measuring the Toxicity of Sediment-Associated Contaminants with Freshwater Invertebrates. ASTM E1706-05. American Society for Testing and Materials.

ATSDR. 2005. Public Health Assessment Guidance Manual (Update). U.S. Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry.

ATSWMO. 2006. Report of State Action Levels. Association of State and Territorial Solid Waste Management Officials. Prepared by the CERCLA Training and Technology Transfer (T3) Focus Group, Washington DC.

DMMP. 2007. The Technical Basis for Revisions to the Dredged Management Program's Bioaccumulative Contaminants of Concern List. Prepared for the Agencies of the Dredged Material Management Program by Erika Hoffman, USEPA Region 10.

Ecology. 1991. Responsiveness Summary on the Amendments to the Model Toxics Control Act Cleanup Regulation, Chapter 173-340, February, 1991. http://www.ecy.wa.gov/programs/tcp/regs/historical_mtca.htm

Ecology. 2002. Development of Freshwater Sediment Quality Values for Use in Washington State. Phase I Report. Prepared by SAIC, Bothell, WA and Avocet Consulting, Kenmore, WA for the Washington Department of Ecology. September 2002, Publication no. 02-09-050.

Ecology. 2003. Development of Freshwater Sediment Quality Values for Use in Washington State. Phase II Report. Prepared by Avocet Consulting, Kenmore, WA for the Washington Department of Ecology. September 2003, Publication no. 03-09-088.

Ecology. 2011. Development of Benthic SQVs for Freshwater Sediments in Washington, Oregon, and Idaho. Prepared by Avocet Consulting, Olympia, WA for the Washington Department of Ecology and the Regional Sediment Evaluation Team. November, 2011, Publication no. 11-09-054.

Ecology. 2012. Peer Review Responsiveness Summary: Development of Benthic SQVs for Freshwater Sediments in Washington, Oregon, and Idaho. Washington Department of Ecology, Toxics Cleanup Program. Publication No. 12-09-238.

Ecology. 2013. Fish Consumption Rates, Technical Support Document, Version 2.0. A Review of Data and Information about Fish Consumption in Washington. Washington State Department of Ecology, Toxics Cleanup Program. January 2013. Publication No. 12-09-058.

GOIA. 2010. Tribal Map http://www.goia.wa.gov/tribal_gov/documents/WAStateTribalMap.pdf at Governors Office of Indian Affairs: http://www.goia.wa.gov/. Accessed July 2010.

Hope BK. 2012. Acquisition of polychlorinated biphenyls (PCBs) by Pacific Chinook salmon: An exploration of various exposure scenarios. Integrated Environmental Assessment and Management 8(3):553–662.

MacDonald DD, Ingersoll CG, Berger TA. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Archives of Environmental Contamination and Toxicology 39:20–31.

MESL. 2003. Development and Applications of Sediment Quality Criteria for Managing Contaminated Sediment in British Columbia. Submitted to British Columbia Ministry ofWater, Land, and Air Protection.

MESL. 2012. Evaluation and Interpretation of the Sediment Chemistry and Sediment Toxicity Data for the Upper Columbia River. Prepared for Washington Department of Ecology, Toxics Cleanup Program, Eastern Region, Spokane, WA.

MPCA. 2007. Guidance for the Use and Application of Sediment Quality Targets for the Protection of Sediment-Dwelling Organisms in Minnesota. Minnesota Pollution Control Agency.

NRC. 2009. Science and Decisions: Advancing Risk Assessment. National Research Council Committee on Improving Risk Analysis Approaches Used by the U.S. EPA. National Academy Press, Washington DC.

OME. 2008. Guidelines for Identifying, Assessing, and Managing Contaminated Sediments in Ontario: An Integrated Approach. Ontario Ministry of the Environment.

O'Neill SM, West JE, Hoeman JC. 1998. Spatial Trends in the Concentration of Polychlorinated Biphenyls (PCBs) in Chinook (*Oncorhynchus tshawytscha*) and Coho Salmon (*O. kisutch*) in Puget Sound and Factors Affecting PCB Accumulation: Results from the Puget Sound Ambient Monitoring Program. Puget Sound Research '98 Proceedings, Seattle, Washington, Volume 1, pp. 312–328.

Polissar NL, Neradilek M, Aravkin AY, Danahar P, Kalat J. 2012. Statistical Analysis of National and Washington State Fish Consumption Data. Draft. Prepared for the Washington State Department of Ecology by The Mountain-Whisper-Light Statistics, Seattle, WA.

PTI. 1993. Recommendations for Assessing Adverse Benthic Effects in Puget Sound. Prepared for the Washington Department of Ecology by PTI Environmental Services.

Puget Sound Action Team. 2007. 2007 Puget Sound Update, Ninth Report of the Puget Sound Assessment and Monitoring Program. Puget Sound Action Team, Olympia, Washington.

Revised Code of Washington (RCW), Chapter 34.05. Administrative Procedure Act.

RSET. 2009. Sediment Evaluation Framework for the Pacific Northwest. Regional Sediment Evaluation Team, Portland, OR.

SEA. 1996. Development of Reference Value Ranges for Benthic Infauna Assessment Endpoints in Puget Sound. Prepared for the Washington Department of Ecology by Striplin Environmental Associates.

SEA and MER. 2000. Peer Review of Ecology's Proposed Benthic Assessment Methods and Endpoints for Use in Regulatory Decision, Responsiveness Summary. Prepared for the Washington State Department of Ecology by Striplin Environmental Associates and MER Consulting, Inc.

SEA and Weston. 1999. Puget Sound Reference Value Project, Task 3: Development of Benthic Effects Sediment Quality Standards. Prepared for the Washington Department of Ecology by Striplin Environmental Associates and Roy F. Weston, Inc.

USEPA. 1989. Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A). Interim Final. EPA/540/1-89/002.

USEPA. 2000. Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates, 2nd ed. EPA/600-R-99/064. U.S. Environmental Protection Agency, Office of Research and Development and Office of Science and Technology.

USEPA. 2004. The Incidence and Severity of Sediment Contamination in Surface Waters of the United States. National Sediment Quality Survey: Second Edition (Updated). EPA 823-R-04-007. Office of Science and Technology, Washington DC.

USEPA. 2007a. Identifying, Planning, and Financing Beneficial Use Projects Using Dredged Material - Beneficial Use Planning Manual. EPA842-B-07-001, October 2007. U.S. Environmental Protection Agency.

USEPA. 2007b. Region 10 Framework for Selecting and Using Tribal Fish and Shellfish Consumption Rates for Risk-Based Decision Making at CERCLA and RCRA Cleanup Sites in Puget Sound and the Strait of Georgia. August 2007. U.S. Environmental Protection Agency, Seattle, WA.

Weston. 1995. Task 3 Report: Evaluation and Recommendation of Revised SMS Benthic Infaunal Sediment Standards. Prepared for the Washington Department of Ecology by Roy F. Weston, Inc.

Windward. 2011. Portland Harbor RI/FS. Appendix G. Ecological Risk Assessment. Draft Final Report. Prepared by Windward Environmental for the Lower Willamette Group.

WSDOT. 2008. Model Comprehensive Tribal Consultation Process for the National Environmental Policy Act (NEPA), Appendix B: Summaries of Usual and Accustomed Areas. Prepared by the Washington Attorney General's Office for the Washington State Department of Transportation, Olympia, WA.