



Environment

Prepared for:
The BNSF Railway Company
Seattle, WA

Prepared by:
AECOM
Seattle, WA
60136319-0640
May 3, 2010

2010 Engineering Design Report

BNSF Former Maintenance and Fueling Facility – Skykomish, Washington



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A handwritten signature in blue ink, appearing to read 'Mark B. Havighorst', written over a horizontal line.

Prepared by Mark B. Havighorst, P.E.

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Reviewed by Halah Voges, P.E.

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List of Acronyms

AMP	Air and Noise Monitoring Plan
AS	air sparging
BMP	Best Management Practice
CAO	Critical Areas Ordinance
CD	Consent Decree
CDW	construction demolition waste
CMP	Compliance Monitoring Plan
CPS	construction plans and specifications
CUL	cleanup level
CWA	Clean Water Act
DFW	Department of Fish and Wildlife
Ecology	State of Washington Department of Ecology
EDR	Engineering Design Report
EIS	Environmental Impact Statement
Facility	BNSF Railway Company's Former Maintenance and Fueling Facility
FMC	Former Maloney Creek
FMCZ	Former Maloney Creek Zone
FS	Feasibility Study
HASP	Health and Safety Plan
HCC	hydraulic control and containment
JARPA	Joint Aquatic Resource Permit Application
MTCA	Model Toxics Cleanup Act
NEDZ	Northeast Developed Zone
NPDES	National Pollutant Discharge Elimination System
NWDZ	Northwest Developed Zone
OHWM	ordinary high water mark
P.E.	Professional Engineer
PCB	polychlorinated biphenyl
PSE	Puget Sound Energy
RCW	Revised Code of Washington
RI	Remedial Investigation
RL	remediation level
ROW	right-of-way
RYZ	Railyard Zone
SDZ	South Developed Zone
SEPA	State Environmental Policy Act
SHA	soil handling area

SWPPP	Stormwater Pollution Prevention Plan
Town	Town of Skykomish
USACE	United States Army Corps of Engineers
USFS	United States Forest Service
USPS	United States Postal Service
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation

Professional Certification

This Engineering Design Report (EDR) was prepared for the Site by AECOM on behalf of the BNSF Railway Company (BNSF) pursuant to a Consent Decree (CD, State of WA v. BNSF Railway Company, King County Case No. 07-2-33672-9SEA) between BNSF and Washington State Department of Ecology. The EDR is required under the Model Toxics Control Act (MTCA; Revised Code of Washington 70.105D; Washington Administration Code 173-340) and as such was prepared under the supervision of the Professional Engineer whose seal and signature appears hereon.



Mark Havighorst, P.E.
Registered Professional Engineer
State of Washington #42644



EXPIRES 4/14/11

1.0 Introduction

This document presents the *2010 Engineering Design Report (EDR)* for the BNSF Railway Company's Former Maintenance and Fueling Facility (Facility) and surrounding area located within the Town of Skykomish (Town), Washington (site). The site location is shown on Drawing T-100 and a site plan is included as Drawing C-100.

This *2010 EDR* was prepared for the site by AECOM Environment (AECOM; formerly ENSR) on behalf of the BNSF Railway Company (BNSF). EDRs are part of the series of documents required under the Consent Decree (CD, Department of Ecology v. BNSF Railway Company, King County Superior Court Cause No. 07-2-33672-9 SEA) and the Model Toxics Control Act (MTCA; Revised Code of Washington 70.105D; Washington Administration Code (WAC)173-340) cleanup process. The major documents that define the criteria and scope of remediation activities for the site are described below.

- **Remedial Investigation and Feasibility Studies.** The *Remedial Investigation (RI)* (RETEC 1996) and the *Supplemental RI* (RETEC 2002) presented the results of investigations of the nature and extent of contamination at the site. The *Final Feasibility Study* (RETEC 1999, 2005) evaluated the extent of impacts and the feasibility of remedial alternatives for the site. BNSF completed the RI, Supplemental RI and the FSs pursuant to Agreed Order No. DE 91TC-N213.
- **Cleanup Action Plan.** The *Cleanup Action Plan for BNSF Former Maintenance and Fueling Facility, Skykomish, Washington (CAP)*, which was prepared by the Washington State Department of Ecology (Ecology), describes the cleanup action to be taken at the site. The CAP is Exhibit B of the CD and is an integral and enforceable part of the CD. Following public comment, the CAP and CD (CAP and CD; Ecology 2007a and b) were finalized on October 18, 2007 and entered into court on October 19, 2007. *Department of Ecology v. BNSF Railway Company*, King County Superior Court Cause No. 07-2-33672-9 SEA. CD/CAP amendments were approved by the Court on October 17, 2008 and May 11, 2009.
- **Environmental Impact Statement.** The *Final Environmental Impact Statement from BNSF Former Maintenance and Fueling Facility, Skykomish, Washington* (Ecology 2007c) describes the existing environmental conditions, environmental impacts, and mitigation measures associated with the proposed cleanup action.
- **Levee Zone EDR.** The *Levee Zone EDR* (RETEC 2006) describes the design, construction, and operation of cleanup actions conducted at the levee.
- **Master EDR.** The *Master EDR* (ENSR 2008a) provides an overview of cleanup activities that will be conducted in 2008 through 2011 and beyond throughout the Town.
- **2008 EDR.** The *2008 EDR* (ENSR 2008b) describes the design, construction, and operation of the cleanup actions conducted in calendar year 2008.
- **2008 CMP.** The *2008 Compliance Monitoring Plan* (ENSR 2008c) describes the compliance monitoring activities which were completed in calendar year 2008.
- **2008 Remedial Design Investigation (RDI).** The *2008 RDI* report (ENSR 2008d) describes the investigation conducted to collect data on the magnitude and extent of contamination in support of design and cleanup activities. The 2008 RDI was

performed in accordance with the RDI work plan Addenda 1 through 4 required by the CAP.

- **2008 Addendum to the RDI.** The *2008 Addendum* (AECOM 2009a) describes the additional data collected to estimate magnitude and extent of contamination in support of design and cleanup activities.
- **2009 EDR.** The *2009 EDR* (AECOM 2009b) and Addendum No. 1 (AECOM 2009c) describe the design, construction, and operation of the cleanup actions conducted in calendar year 2009. The *2009 EDR* described Former Maloney Creek Zone (FMCZ) East Wetland and South Developed Zone (SDZ) remediation activities which were originally scheduled to be completed in 2009. These activities have been re-scheduled to 2010, so that they occur concurrently with the FMCZ West Wetland remediation.
- **2009 CMP Update.** The *2009 Compliance Monitoring Plan Update* (AECOM 2009d) describes the compliance monitoring activities to be completed in calendar years 2009 and 2010 as part of remediation in the Northwest Developed Zone (NWDZ) and Northeast Developed Zone (NEDZ).
- **HCC SDR.** The *Hydraulic Control and Containment System Special Design Report* (HCC SDR; ENSR 2008e) describes the unique design, construction, and operation aspects of the HCC constructed at the north RYZ boundary.
- **FMC SDRs.** The *Former Maloney Creek East Wetlands Special Design Report* (FMC East SDR; ENSR 2008f, 2009e) and *Former Maloney Creek West Wetlands Special Design Report* (FMC West SDR; AECOM 2009d) describe the unique design, construction, and operation aspects of the Former Maloney Creek (FMC) component of the overall cleanup action to be completed in the east and West Wetlands in 2010.
- **Bridge Coordination.** The *Skykomish Bridge Coordination Report* (AECOM 2009f) provides an introduction to the design basis to begin coordination of cleanup around the south abutment of the Fifth Street Bridge with the Washington State Department of Transportation (WSDOT).

It is important to note that the *2010 EDR* includes information required by WAC 173-340-400(4)(c) and presents the design basis (30 percent design) only for the 2010 cleanup activities that were not included in the 2009 EDR. The 2010 EDR will not be revised to reflect design development as plans proceed from the 30 percent to 100 percent. Design development will be captured in draft and final construction plans and specifications (CPS), which will be submitted in accordance with the CD.

BNSF has adopted a design-build approach to completing cleanup work being performed from 2009–2011. CPS have been developed for much of the NWDZ remediation activities. Adopting the design-build approach resulted in the need to prepare an addendum to the *2009 EDR*. The addendum described a revised work schedule and additional remediation activities that were not described in the *2009 EDR*, but could be completed in 2009 or 2010, as determined by BNSF in consultation with the Contractor and Ecology. This addendum was submitted to and approved by Ecology. This *2010 EDR* describes work that will be completed in 2010 and was not described in the *2009 EDR* or addenda. This *2010 EDR* also describes work that may be completed at the levee west end in 2011. Additional cleanup activities, including remediation of School District-owned property west of 6th Street, will be described in the *2011 EDR*.

1.1 Scope

The *Master EDR*, annual EDRs, and FMC SDRs are interdependent and together provide all of the information outlined in WAC 173-340-400(a) for the work to be completed in 2010. The *Master EDR* includes background and general site-wide information that will not be included in the annual EDRs and addresses all phases of the work required by the CD through at least 2012. The *2010 EDR* includes information that is specific to 2010 remediation activities and not presented in the *Master EDR*, *2009 EDR*, or FMC SDRs. The *2010 EDR* is not intended to be a stand-alone document, but together with the FMC SDRs and *2009 EDR* provides sufficient information for the development and review of CPS and documents engineering concepts and design criteria used for design of the cleanup action activities scheduled for 2010. CPS will be submitted to Ecology separately, as specified in CD Exhibit C. Table 1-1 summarizes the scopes of the *Master EDR*, Annual EDRs, and FMC SDRs (including supporting work plans and design documents) as they pertain to the requirements of WAC 173-340-400(a).

Table 1-1 Master EDR, Annual EDRs, and FMC SDR Scopes

Information required per WAC 173-340-400(a)	Included in		
	Master EDR	Annual EDRs	FMC SDRs
<p>(i) Cleanup Action Goals</p> <p>Overall goals of the cleanup action including the all specific cleanup and performance requirements.</p> <p>Goals of the cleanup action to be implemented in the time period covered by the Annual EDR, including the cleanup and performance requirements specific to those actions.</p>	X	X	X
<p>(ii) Site Information</p> <p>General site information and a summary of information in the remedial investigation/feasibility study.</p> <p>A summary of site information pertinent to the cleanup action to be implemented in the time period covered by the Annual EDR, including an updated summary of investigation findings, as necessary to reflect the current condition within the target year work area.</p>	X	X	X
<p>(iii) Owner, Operator, Maintenance Responsibilities</p> <p>Identification of who will generally own, operate, and maintain the cleanup action during and following construction.</p>	X		
<p>(iv) Facility Maps</p> <p>Facility maps showing existing site conditions and the proposed location of the cleanup action.</p> <p>Facility maps showing updated site conditions (if necessary) and the proposed location of the cleanup action in the time period covered by the Annual EDR.</p>	X	X	X
<p>(v) Hazardous Substances Treatment and Management</p> <p>Characteristics, quantity, and locations of materials to be treated or otherwise managed, including ground water containing hazardous substances.</p> <p>Characteristics, quantity, and location of materials to be treated or otherwise managed in the time period covered by the Annual EDR, including ground water containing hazardous substances.</p>	X	X	X
<p>(vi) Schedule</p> <p>A general schedule for the overall cleanup action.</p> <p>A schedule for final design and construction for the time period covered by the Annual EDR.</p>	X	X	X
<p>(viii) Engineering Justification for Design and Operation Parameters</p> <p>A summary of the general design criteria for components of the cleanup action.</p> <p>Design criteria, assumptions, and calculations for the cleanup action components that will be conducted throughout the cleanup action (e.g. construction water treatment).</p>	X		

Information required per WAC 173-340-400(a)	Included in		
	Master EDR	Annual EDRs	FMC SDRs
Design criteria, assumptions, and detailed calculations for cleanup action components that will be completed within the time period covered by the Annual EDR.		X	X
Expected treatment, destruction, immobilization, or containment efficiencies for cleanup action components that will be conducted throughout the duration of the cleanup action (e.g. construction water treatment), and documentation on how that degree of effectiveness is determined.	X		
Expected treatment, destruction, immobilization, or containment efficiencies for the cleanup action components that will be completed within the time period covered by the Annual EDR, and documentation on how that degree of effectiveness is determined.		X	X
Demonstration that the cleanup action components that will be conducted throughout the duration of the cleanup action (e.g. construction water treatment) will achieve compliance with cleanup requirements by citing pilot or treatability test data, results from similar operations, or scientific evidence from the literature.	X		
Demonstration that the cleanup action components that will be completed within the time period covered by the Annual EDR will achieve compliance with cleanup requirements by citing pilot or treatability test data, results from similar operations, or scientific evidence from the literature.		X	X
(ix) Spill Control			
A general description of the spill control and response measures that will be implemented throughout the cleanup action.	X		
Design features for control of hazardous materials spills and accidental discharges (for example, containment structures, leak detection devices, run-on and runoff controls).		X	X
(x) Public and Worker Safety			
A general description of the public and worker safety measures that will be implemented throughout the cleanup action.	X		
A description of design features to assure long-term safety of workers and local residences (for example, hazardous substances monitoring devices, pressure valves, bypass systems, safety cutoffs).		X	X
(xi) Waste Management			
A discussion of general methods for management or disposal of any treatment residual and other waste materials containing hazardous substances generated as a result of the cleanup action.	X		
A discussion of waste management methods to be implemented during the cleanup action time period covered by the Annual EDR, if different from the general methods.		X	X

Information required per WAC 173-340-400(a)	Included in		
	Master EDR	Annual EDRs	FMC SDRs
<p>(xii) Facility-Specific Characteristics Facility-specific characteristics that may affect design, construction, or operation of the selected cleanup action, including:</p> <ul style="list-style-type: none"> • The general relationship of the proposed cleanup action to existing facility operations • Relationship of the proposed cleanup action to be implemented during the cleanup action time period covered by the Annual EDR to existing facility operations, if different from the general relationship described in the <i>Master EDR</i> • General probability of flooding, probability of seismic activity, temperature extremes, local planning and development issues • Probability of flooding, probability of seismic activity, temperature extremes, local planning and development issues during the cleanup action time period covered by the Annual EDR, if different from general conditions described in the <i>Master EDR</i>. 	X	X	X
<p>General soil characteristics and ground water system characteristics. Soil characteristics and ground water system characteristics specific to the cleanup action to be completed within time period covered by the Annual EDR, if different from general characteristics described in the <i>Master EDR</i>.</p>	X	X	X
<p>(xiii) Quality Control A general description of the overall approach to quality control. A description of construction testing that will be used to demonstrate adequate quality control within time period covered by the Annual EDR.</p>	X	X	X
<p>(xiv) Compliance Monitoring A general description of compliance monitoring that will be performed during and after construction to meet the requirements of WAC 173-340-410. A description of compliance monitoring that will be performed during and after construction activities specified in the Annual EDR to meet the requirements of WAC 173-340-410.</p>	X	X ¹	X ¹
<p>(xv) Health and Safety A general description of construction procedures proposed to assure that the safety and health requirements of WAC 173-340-810 are met. A general description of construction procedures proposed to be completed during and after construction activities specified in the Annual EDR in order to assure that the safety and health requirements of WAC 173-340-810 are met.</p>	X	X ²	X ²
<p>(xvi) SEPA Requirements Any information not provided in the remedial investigation/feasibility study needed to fulfill the applicable requirements of the State Environmental Policy Act (chapter 43.21C RCW).</p>		X	X

Information required per WAC 173-340-400(a)	Included in		
	Master EDR	Annual EDRs	FMC SDRs
<p>(xvii) Permitting</p> <p>Any additional information needed to address the applicable state, federal and local requirements including the substantive requirements for any exempted permits; and property access issues which need to be resolved to implement the cleanup action.</p>		X	X
<p>(xviii) Financial Assurance</p> <p>For sites requiring financial assurance and where not already incorporated into the order or decree or other previously submitted document, preliminary cost calculations and financial information describing the basis for the amount and form of financial assurance and, a draft financial assurance document.</p>	X ³		
<p>(xix) Institutional Controls</p> <p>For sites using institutional controls as part of the cleanup action and where not already incorporated into the order or decree or other previously submitted documents, copies of draft restrictive covenants and/or other draft documents establishing these institutional controls.</p>	X ³		
<p>(xx) Other</p> <p>Other information as required by the department (e.g., supplemental investigation data).</p>	X ⁴		

Notes:

1. Will be described in the Compliance Monitoring Plans
2. Will be described in the Health and Safety Plan
3. Will be submitted as separate documents, as specified in CD Exhibit C
4. Will be included, as needed, in separate documents

1.2 Overview of 2010 Cleanup Activities

Cleanup activities for 2010 include: 1) operation of treatment systems constructed in 2008/2009 and ancillary activities; 2) RYZ excavation; 3) Bridge Area remediation; 4) Levee West End excavation; 5) HCC barrier east end excavation; 6) Cascadia Inn Property remediation; 7) FMC East Wetland remediation and groundwater barrier construction¹; 8) FMC West Wetland remediation; and 9) continuation and/or completion of cleanup activities not completed in previous years, which includes work on King County Parcels 7807800675 (Community Center), 7807800660 (Opera House), and 7807800670 (Town Maintenance Building) and 6th Street right of way (ROW) described in 2009 EDR Addendum No. 1 (AECOM, 2009c). These activities will be completed in all of the six remediation zones, including the RYZ, Levee Zone, NWDZ, NEDZ, SDZ, and FMCZ. The actions for each zone

¹ The groundwater barrier will only be constructed if the "Selected Remedy" described in Section 1.2.7.1 is implemented.

are interdependent. Achieving cleanup in one zone depends not only upon the actions to be taken in that zone, but also upon the actions to be taken in other zones.

1.2.1 Treatment System Operation/Ancillary Activities

The following treatment system operation and ancillary cleanup activities are planned for the RYZ and NEDZ.

- **HCC Water Treatment System Operation:** An HCC water treatment system was constructed in 2008 to treat groundwater recovered via the HCC. The system will be operated from the Remediation Equipment Building located on the railyard in 2010 per the system *Draft Operations and Maintenance and Monitoring Manual for Hydraulic Control and Containment System* (ENSR 2008g).
- **HCC System Treated Groundwater Injection and Surface Water Discharge:** A portion of the treated groundwater from the HCC system will be re-injected on the railyard in accordance with NPDES permit WA-003212-3² (NPDES permit). The remaining portion of the treated groundwater from the HCC system will be discharged to surface water via the Town storm water system consistent with the NPDES permit.
- **Construction Water Treatment:** A temporary system will be operated in the RYZ to treat water generated from construction activities.
- **Treated Construction Water Discharge:** Treated construction water will be discharged to surface water via the Town stormwater system consistent with NPDES permit WA-003212-3.
- **Air Sparging (AS) System Operation:** In 2008/2009 an AS system, including sparging wells, underground piping, and blowers was installed to treat impacted soil and groundwater on King County tax lot 7807800085 (Joselyn property), which is located in the NEDZ. In 2010, the system will be operated from the Remediation Equipment Building, which is located on the railyard.
- **Compliance Monitoring:** The compliance monitoring activities listed below will be conducted during and after remediation activities. These activities will be described in the 2010 CMP Update.
 - Protection monitoring to confirm that human health and the environment are adequately protected during remediation activities.
 - Performance monitoring to assess whether or not the cleanup action has attained the designated Cleanup Levels (CULs), Remediation Levels (RLs), and other performance standards.
 - Confirmational monitoring to evaluate the long-term effectiveness of the remediation activities.
- **Vapor Mitigation:** Protective measures will be designed and implemented for the house located on the Joselyn property, if necessary based on the air monitoring results.

² National Pollutant Discharge Elimination System Waste Discharge Permit No. WA- 003212-3, Issued May 4, 2006; 1st Modification Date: August 15, 2006; 2nd Modification Date: June 30, 2008.

1.2.2 RYZ Excavation

The following cleanup activities are planned for the RYZ and part of King County tax lot 5061800095 (Goebel Property, aka Skykomish Library property) and the Railroad Avenue and 5th Street right of ways (ROWs).

- **Excavation:** BNSF will continue RYZ excavation of 1) soil located within 2 feet of the surface with concentrations of lead exceeding 250 mg/kg, arsenic exceeding 20 mg/kg, total PCBs exceeding 0.65 mg/kg and/or petroleum exceeding 1,870 mg/kg NWTPH-Dx (the concentration protective of soil biota); 2) soil from BNSF property within the RYZ with free product and/or petroleum concentrations exceeding 3,400 mg/kg NWTPH-Dx; and 3) soil from property within the RYZ that is not owned by BNSF (this property is located within Town ROWs and is shown on the figures, where appropriate) with soil petroleum concentrations exceeding 3,400 mg/kg NWTPH-Dx.
- **Compliance Monitoring:** The following compliance monitoring activities will be conducted during and after remediation activities. These activities will be described in the 2010 CMP Update.
 - Protection monitoring to confirm that human health and the environment are adequately protected during remediation activities.
 - Performance monitoring to assess whether or not the cleanup action has attained the designated cleanup CULs, RLs, and other performance standards.
 - Right-of-Way Restoration: Sections of the Railroad Avenue and 5th Street ROWs that are excavated as part of remediation activities will be restored to meet current applicable King County standards as adopted by the Town, or as agreed by BNSF and the Town.
- **Utilities Construction and Restoration:** Electrical and telecommunications services will be reconfigured as necessary to maintain these services to residences and businesses that remain inhabitable/operational during remediation activities. New permanent electrical, communications, and potable water utilities that are removed as part of remediation activities will be restored in-kind, or constructed as agreed by BNSF and the Town.

1.2.3 Bridge Area Excavation

The following cleanup activities are planned for the Fifth Street Bridge south abutment, which is located in the Levee Zone and NWDZ on King County tax lots 7807800480 and 7807800505 (collectively: Goranson Property), and within Town ROWs.

- **Excavation:** Sediment between the ordinary high water mark (OHWM) of the South Fork Skykomish River and up to a depth of 10 feet below the river bottom, with petroleum concentrations exceeding 40.9 mg/kg NWTPH-Dx will be excavated. Soil within a 25-foot lateral buffer zone extending outward from the OHWM and up to 10 feet below the river bottom, with petroleum concentrations exceeding 22 mg/kg NWTPH-Dx will be excavated. Soil upland of the 25-foot lateral buffer zone with petroleum concentrations exceeding 3,400 mg/kg NWTPH-Dx will also be excavated. The proposed excavation extents have been determined based on investigation results. Actual extents could vary and will be verified based on field observations and performance monitoring.

- **Compliance Monitoring:** The following compliance monitoring activities will be conducted during and after remediation activities. These activities will be described in the 2010 CMP Update.
 - Protection monitoring to confirm that human health and the environment are adequately protected during remediation activities.
 - Performance monitoring to evaluate whether or not the cleanup action has attained the designated CULs, RLs, and other performance standards.
- **River and Levee Restoration:** Excavated sections of the river and levee will be restored to meet current applicable King County and Army Corps of Engineers standards. The levee will also be restored to match to the extent practicable, the existing levee constructed in 2006.
- **Right-of-Way Restoration:** ROWs that are excavated as part of remediation activities will be restored to meet current applicable King County standards as adopted by the Town, or as agreed by BNSF and the Town.
- **Utilities Construction and Restoration:** Electrical and telecommunications services will be reconfigured as necessary to maintain these services to residences and businesses that remain inhabitable/operational during remediation activities. New permanent electrical, communications, and potable water utilities that are removed as part of remediation activities will be restored in-kind, or constructed as agreed by BNSF and the Town.

1.2.4 Levee West End Excavation

The following cleanup activities are planned for the area near the levee west end, which is located in the NWDZ, and includes parts of King County tax lots 2626119029, 2626119039, 2626119043, and 5060800060 (collectively: Shawver Property) and the West River Drive ROW. This work may be completed in 2011.

- **Building Relocation:** The shop and wood sheds on the Shawver Property will be temporarily relocated to facilitate excavation activities.
- **Excavation:** All free product and/or soil upland of the 25-foot lateral buffer zone with petroleum concentrations exceeding 3,400 mg/kg NWTPH-Dx will be excavated. The proposed excavation extents have been determined based on the results of an August 2009 investigation. Actual extents could vary and will be verified based on field observations and performance monitoring. Excavation confirmation samples will be collected immediately upland of the buffer zone boundary. Soil within the 25-foot lateral buffer zone extending outward from the OHWM and up to 10 feet below the river bottom, with petroleum concentrations exceeding 22 mg/kg NWTPH-Dx will be excavated if these buffer zone boundary confirmation samples exceed 3,400 mg/kg NWTPH-Dx. Confirmation samples will be collected at the buffer zone excavation extents. In-water excavation will occur if the buffer zone excavation extends to the OHWM and confirmation sample concentrations exceed 40.9 mg/kg. If this occurs, then sediment between the OHWM and up to a depth of 10 feet below the river bottom, with petroleum concentrations exceeding 40.9 mg/kg NWTPH-Dx will be excavated.
- **Compliance Monitoring:** The following compliance monitoring activities will be conducted during and after remediation activities. These activities will be described in the 2010 CMP Update.

- Protection monitoring to confirm that human health and the environment are adequately protected during remediation activities.
 - Performance monitoring to evaluate whether or not the cleanup action has attained the designated CULs, RLs, and other performance standards.
- **River and Levee Restoration:** Excavated sections of the river and levee will be restored to meet current applicable King County and Army Corps of Engineers (USACE) standards. The levee will also be restored to match to the extent practicable, the existing levee constructed in 2006.
- **Right-of-Way Restoration:** ROWs that are excavated as part of remediation activities will be restored to meet current applicable King County standards as adopted by the Town, or as agreed by BNSF and the Town.
- **Utilities Construction and Restoration:** Electrical and telecommunications services will be reconfigured as necessary to maintain these services to residences and businesses that remain inhabitable/operational during remediation activities. New permanent electrical, communications, and potable water utilities that are removed as part of remediation activities will be restored in-kind, or constructed as agreed by BNSF and the Town.
- **Vapor Mitigation:** It is anticipated that vapor mitigation will not be required for excavation in this area because no occupied buildings or structures will remain in place or will be built over petroleum contamination exceeding 3,400 mg/kg NWTPH-Dx.

1.2.5 HCC East End Excavation and Barrier Wall Extension

The following cleanup activities are planned for the Railroad Avenue ROW, east of the HCC barrier wall, which is located in the NEDZ.

- **Excavation:** Unanticipated petroleum hydrocarbon impacted soil was discovered east of the existing HCC barrier wall and the 2008 excavation prism during boring for installation of compliance monitoring well EW-2. The impacted soil extents in this area were further delineated during August 2009 investigation activities. Based on the investigation results 1) the volume of impacted soil with petroleum hydrocarbon concentrations exceeding 3,400 mg/kg NWTPH-Dx was found to be small (approximately 350 cubic yards); 2) the impacted soil was found to be separate and isolated from the main soil impacts that were removed in 2008.

This isolated free product and impacted soil with concentrations of petroleum hydrocarbons exceeding 3,400 mg/kg NWTPH-Dx will be excavated to the extent possible from the Railroad Avenue ROW at the east end of the HCC, using a combination of standard excavation equipment and specialized methods such as large diameter borings completed inside a casing, or shoring/trench boxes. Removal of these impacted soil zones in accordance with the intent of the CD is subject to a number of serious implementability factors that impact the feasibility of conventional excavation methods. A conventional, sloped excavation would cause distress to existing remedial systems (the nearby vault) and railroad mainline infrastructure. Specifically, the system vault would be in jeopardy of damage caused by backfill failure and the excavation slope intersects with the stress slope of the railroad mainline. Both of these conditions pose unacceptable

risks and, for this reason, a sloped excavation by itself was eliminated as a feasible remedial alternative.

- **Extension of HCC:** The excavation procedures are intended to remove impacted soil that is off railroad property and it is anticipated that some amount of soil with petroleum hydrocarbon concentrations above 3,400 mg/kg NWTPH-Dx will remain on the BNSF railroad property. A study is being completed to evaluate the need to extend the HCC barrier wall to the area to provide containment of LNAPL and groundwater with petroleum hydrocarbon concentrations exceeding 477 µg/L NWTPH-Dx from leaving the railyard. It is anticipated that this study will be completed by mid-December. Several methods will be evaluated for extension of the HCC, including backfill of large diameter borings (if used for excavation) with controlled density fill (CDF), cement-bentonite slurry, a granular mixture that includes organo-clay, or permeation grouting after removal of the impacted soil. The groundwater flow model will be updated, as necessary, to determine the length and nature of the extension and the need for additional groundwater recovery from this area. An amendment to the *HCC SDR* will be prepared to document this design work. The study results will be included in this amendment, which will be submitted to Ecology for comment in December 2009, before or together with the Draft 2010 CPS submittal.
- **Compliance Monitoring:** The following compliance monitoring activities will be conducted during and after remediation activities. These activities will be described in the 2010 CMP Update.
 - Protection monitoring to confirm that human health and the environment are adequately protected during remediation activities.
 - Performance monitoring to evaluate whether or not the cleanup action has attained the designated CULs, RLs, and other performance standards.
- **Right-of-Way Restoration:** The section of the Railroad Avenue ROW that is excavated as part of remediation activities will be restored to meet current applicable King County standards as adopted by the Town, or as agreed by BNSF and the Town.
- **Utilities Construction and Restoration:** Electrical and telecommunications services will be reconfigured as necessary to maintain these services to residences and businesses that remain inhabitable/operational during remediation activities. New permanent electrical, communications, and potable water utilities that are removed as part of remediation activities will be restored in-kind, or constructed as agreed by BNSF and the Town.

1.2.6 Cascadia Inn Property Remediation

The following cleanup activities are planned for the King County tax lots 7807800240 and 7807800251, (collectively: Cascadia Inn property) and the Railroad Avenue ROW. The Cascadia Inn building is located entirely in tax lot 7807800240. The approximate west half of the building is located in the NWDZ; the approximate east half is located in the NEDZ. Tax lot 7807800251 is located entirely in the NEDZ.

- **Excavation:** All free product and/or soil with concentrations of petroleum hydrocarbons exceeding 3,400 mg/kg will be excavated from the Cascadia Inn property. This excavation is focused on petroleum hydrocarbons comprised of approximately equal portions of diesel and Bunker C and therefore is considered to be located entirely within the NWDZ. We currently anticipate that excavation

beneath the west side/restaurant portion of the building will be facilitated by underpinning rather than relocation of part or all of the structure. The proposed excavation extents have been determined based on 2008 and August 2009 investigation results. Actual extents could vary and will be verified based on field observations and performance monitoring.

- **Containment Structures:** Excavation of impacted soil may not occur beneath part of the Cascadia Inn if underpinning or temporary relocation of the building is not feasible. Containment structures will be constructed on or near property boundaries as necessary to prevent recontamination of excavated properties. These containment structures could remain in place under the following circumstances:
 - Due to technical reasons (i.e., space constraints and adjacent building stability)
- Design of these containment structures would be addressed on a case-by-case basis in consultation with Ecology and affected property owners. The barriers will be designed to meet the performance standard of a permanent barrier if they must remain in place to prevent contaminant migration. Containment structure design for buildings to which BNSF is denied access by owners within the 2010 excavation area will be described in the 2010 EDR addenda. At this time, BNSF does not expect that any such containment structures would be required.
- **Compliance Monitoring:** The following compliance monitoring activities will be conducted during and after remediation activities. These activities will be described in the 2010 CMP Update.
 - Protection monitoring to confirm that human health and the environment are adequately protected during remediation activities.
 - Performance monitoring to evaluate whether or not the cleanup action has attained the designated CULs, RLs, and other performance standards.
- **Vapor Mitigation:** Protective measures will be designed and implemented for the Cascadia Inn building as long as it is located over petroleum contamination exceeding 3,400 mg/kg NWTPH-Dx, and if the concentration of total petroleum hydrocarbons in indoor air exceeds the CUL of 1,346 $\mu\text{g}/\text{m}^3$.
- **Right-of-Way Restoration:** ROWs that are excavated as part of remediation activities will be restored to meet current applicable King County standards as adopted by the Town, or as agreed by BNSF and the Town.
- **Utilities Construction and Restoration:** Electrical and telecommunications services will be reconfigured as necessary to maintain these services to residences and businesses that remain inhabitable/operational during remediation activities. New permanent electrical, communications, and potable water utilities that are removed as part of remediation activities will be restored in-kind, or constructed as agreed by BNSF and the Town.

1.2.7 FMC East Wetland Remediation

The FMC East Wetland cleanup area includes the FMCZ east of 5th Street and the SDZ, as well as part of the RYZ.

1.2.7.1 Selected Remedy

This approach includes the following cleanup activities, as described in the *FMC East SDR* and 2009 *EDR* Section 1.2.3.

- **Building Relocation:** The shed partially located on the BNSF property adjacent to King County parcel 5061300126 (Robinson Property) will be permanently relocated to the building owner's property. All building relocation work on the Robinson property will be contingent upon obtaining access from the owner.
- **Excavation:** All soil located within a 25-foot lateral buffer zone extending outward from the OHWM or wetland boundary at a depth less than 4 feet below the bottom of the stream channel with petroleum concentrations exceeding 22 mg/kg NWTPH-Dx, will be excavated. All soil located within a 25-foot lateral buffer zone extending outward from the OHWM or wetland boundary at a depth greater than 4 feet below the bottom of the stream channel with petroleum concentration exceeding 3,400 mg/kg NWTPH-Dx will also be excavated. The proposed excavation extents have been determined based on investigation results. Actual soil excavation extents could vary and will be verified based on field observations and performance monitoring.
- All sediment located within the OHWM or wetland boundary at a depth less than 4 feet below the bottom of the stream channel, with petroleum concentrations exceeding 40.9 mg/kg NWTPH-Dx will be excavated. This excavation will also remove dioxin/furan-impacted soil which is co-located with petroleum impacted soil. All sediment located within the OHWM or wetland boundary at a depth less than 4 feet from the bottom of the stream channel with petroleum concentrations exceeding 3,400 mg/kg NWTPH-Dx will also be excavated. Actual sediment excavation extents could vary and will be verified based on field observations and performance monitoring.
- **Restoration as On-site Wetlands in Accordance with Substantive Requirements:** Following excavation of impacted soil and sediment, the excavated creek areas and adjacent wetlands will be backfilled with appropriate clean material and restored as habitat by replanting appropriate vegetation. The restoration will be consistent with the substantive requirements of the Town's Shoreline Management Program and regulations, and with other applicable laws and regulations such as the Town's Critical Areas Ordinance (CAO) and Section 404 of the Federal Clean Water Act. Restoration is described in the *Former Maloney Creek East Wetland Restoration and Mitigation Plan*, which is Appendix F of the *FMC East SDR*.
- **Compliance Monitoring:** The following compliance monitoring activities will be conducted during and after remediation activities. These activities will be described in the 2010 CMP Update.
 - Protection monitoring to confirm that human health and the environment are adequately protected during remediation activities.
 - Performance monitoring to assess whether or not the cleanup action has attained the designated cleanup CULs, RLs, and other performance standards.
 - Confirmational monitoring to evaluate the long-term effectiveness of the remediation activities.

1.2.7.2 Alternate Remedy

BNSF, the Town and Ecology are currently discussing another option to restore the Former Maloney Creek East Wetland. This approach includes the following cleanup activities, as described in the FMC East Wetland JARPA permit application, which was submitted to The United States Army Corps of Engineers (USACE) on August 7, 2009.

- **Building Relocation:** The shed partially located on the BNSF property adjacent to King County parcel 5061300126 (Robinson Property) will be permanently relocated to the building owner's property. All building relocation on the Robinson property will be contingent upon obtaining access from the owner.
- **Excavation:** All soil located within a 25-foot lateral buffer zone extending outward from the OHWM or wetland boundary at a depth greater than 4 feet below the bottom of the stream channel with petroleum concentration exceeding 3,400 mg/kg NWTPH-Dx will also be excavated. The proposed excavation extents have been determined based on investigation results. Actual soil excavation extents could vary and will be verified based on field observations and performance monitoring.
- All sediment located within the OHWM or wetland boundary at a depth less than 4 feet from the bottom of the stream channel with petroleum concentrations exceeding 3,400 mg/kg NWTPH-Dx will also be excavated. This excavation will also remove dioxin/furan-impacted soil which is co-located with petroleum impacted soil. Actual sediment excavation extents could vary and will be verified based on field observations and performance monitoring.
- **Stormwater Control System Construction:** A storm drain will be installed to convey surface water flows from upstream road ditches through the project area for discharge to the FMC West Wetland via the existing culvert that spans beneath Old Cascade Highway.
- **Restoration as Uplands and Off-site Mitigation/Compensation:** Following excavation of impacted soil and sediment, the excavated areas and adjacent wetlands will be backfilled with appropriate clean material and restored as upland, not as a wetland, as described in Option 1. Restoration as upland would result in a loss of wetland habitat, which will be compensated for by the purchase of wetland credits from the Skykomish Habitat LLC wetland mitigation bank and potential mitigation opportunities along Maloney Creek. Non-BNSF-owned SDZ parcels within the FMC East Wetland remediation area will be restored with topsoil and installation of vegetation according to agreements with the individual property owners. The BNSF owned portions of the project area will be restored with a granular backfill cover.
- **Compliance Monitoring:** The following compliance monitoring activities will be conducted during and after remediation activities. These activities will be described in the 2010 CMP Update.
 - Protection monitoring to confirm that human health and the environment are adequately protected during remediation activities.
 - Performance monitoring to assess whether or not the cleanup action has attained the designated cleanup CULs, RLs, and other performance standards.
 - Confirmational monitoring to evaluate the long-term effectiveness of the remediation activities.

BNSF anticipates that one of the two remedies will be selected for implementation before the start of the 2010 construction season. Implementation of either option is contingent upon approval of the JARPA. Implementation of Option 2 is also contingent upon Ecology approval and coordination with the Town. An addendum to the *FMC East SDR* would be prepared and submitted to Ecology for approval if the Alternate Remedy is selected.

1.2.8 FMC West Wetland Remediation

The following cleanup activities are planned as part of the FMC West Wetland remediation and described in the *FMC West SDR*. The FMC West Wetland cleanup area includes the FMCZ west of 5th Street and parts of King County Tax lots 5061300115 and 5061300110 (King County Fire Protection District 50 Property; KCFPD 50 Property), 2626119103 (Domina Property), 2626119073 (Calderon Property), 2626119125 (Fortun Property), 262611917 (Puget Western Property), 3526119001 (US Government Property), and 2626119121 (Town Wetland Property).

- **Excavation:** All soil located within a 25-foot lateral buffer zone extending north from the OHWM or wetland boundary at a depth less than 4 feet below the bottom of the stream channel with petroleum concentrations exceeding 22 mg/kg NWTPH-Dx, will be excavated. All soil located within a 25-foot lateral buffer zone extending north from the OHWM or wetland boundary at a depth greater than 4 feet below the bottom of the stream channel with petroleum concentration exceeding 3,400 mg/kg NWTPH-Dx will also be excavated. The proposed excavation extents are based on CAP requirements, in the absence of any groundwater flow direction or groundwater and soil chemistry data. Additional investigation work in the West Wetland buffer zone (located on the north side of the wetland), including installation of several borings and monitoring wells, was performed in August 2009. A *FMC West SDR* addendum is currently being prepared to document the investigation results and any proposed changes to the excavation extents. The amendment will be submitted to Ecology approximately on the same schedule as this document. Actual soil excavation extents could vary from the planned extents, and will be verified based on field observations and performance monitoring.
- All sediment located within the OHWM or wetland boundary at a depth less than 4 feet below the bottom of the stream channel, with petroleum concentrations exceeding 40.9 mg/kg NWTPH-Dx will be excavated. This excavation will also remove dioxin/furan-impacted soil which is co-located with petroleum impacted soil. All sediment located within the OHWM or wetland boundary at a depth less than 4 feet from the bottom of the stream channel with petroleum concentrations exceeding 3,400 mg/kg NWTPH-Dx will also be excavated. The sediment excavation extents proposed in the *FMC West SDR* are based on 2007 and 2008 investigation results. Additional investigation work in the West Wetland, including biological testing, was performed in August 2009. Based on preliminary results, BNSF anticipates that the sediment excavation extents will decrease. A *FMC West SDR* amendment is currently being prepared to document the investigation results and any proposed changes to the excavation extents. The amendment will be submitted to Ecology approximately on the same schedule as this document. Actual sediment excavation extents could vary from the planned extents, and will be verified based on field observations and performance monitoring.
- **Wetlands Restoration in Accordance with Substantive Requirements:** Following excavation of impacted soil and sediment, the excavated creek areas and adjacent wetlands will be backfilled with appropriate clean material and restored as habitat by replanting appropriate vegetation. The restoration will be

consistent with the substantive requirements of the Town's Shoreline Management Program and regulations, and with other applicable laws and regulations such as the Town's CAO and Section 404 of the Federal Clean Water Act. Restoration is described in *FMC West SDR* Section 4.2.11.

- **Compliance Monitoring:** The following compliance monitoring activities will be conducted during and after remediation activities. These activities will be described in the 2010 CMP Update.
 - Protection monitoring to confirm that human health and the environment are adequately protected during remediation activities.
 - Performance monitoring to assess whether or not the cleanup action has attained the designated cleanup CULs, RLs, and other performance standards.
 - Confirmational monitoring to evaluate the long-term effectiveness of the remediation activities.

1.2.9 Associated Plans

A number of follow-on documents are necessary to complete each phase of cleanup work and required by regulation. These include EDRs, CPS, operation and maintenance plans, permits and substantive permit requirements, compliance monitoring plans; and as-built reports. The Project Document Control Matrix (see *Master EDR*: Appendix E) summarizes the plans that are associated with the cleanup. Several of these plans are referenced in the *Master EDR*.

2.0 Regulatory Framework

The regulatory framework for 2010 cleanup activities is described in *Master EDR* (ENSR 2008a), Section 2.0, *Levee Zone EDR* (RETE 2006), Section 2, and the CD, Exhibit D and E. These include 1) MTCA design requirements; 2) applicable or relevant and appropriate substantive requirements established by state, and local governments to protect public health and the environment; and 3) permitting requirements established by federal law. The regulatory framework presented in the Master EDR and Levee Zone EDR was established with the understanding that the referenced regulatory requirements and guidelines are subject to change over the anticipated duration of the remediation activities and that changing site conditions could warrant revision of this framework.

2.1 MTCA Design Requirements

No changes to applicable MTCA Design Requirements have been made since the submittal dates of the Master EDR and Levee Zone EDR, and there have been no apparent significant changes to site conditions. The MTCA regulatory framework presented in the Master EDR and Levee Zone EDR is therefore applicable to the 2010 cleanup activities.

2.2 Applicable and Relevant and Appropriate Requirements

No changes to other applicable or relevant and appropriate requirements have been made since the submittal date of the Master EDR and Levee Zone EDR. The applicable and relevant and appropriate requirements presented in the Master EDR and Levee Zone EDR are therefore applicable to the 2010 cleanup activities.

2.3 Permits

No changes to permit requirements have been made since the submittal dates of the Master EDR and Levee Zone EDR, with the exception of the NPDES permit, which was modified on June 30, 2008 to describe HCC system flow rates and change to outfall locations. The other permit requirements presented in the Master EDR and Levee Zone EDR are therefore applicable to the 2010 cleanup activities. It is important to note that in-water work for the FMC east and West Wetlands remediation, bridge excavation, and potential in-water excavation at the levee west end cannot be initiated without approval of JARPA. The permit applications have been submitted to USACE and Washington State Department of Fish and Wildlife (DFW) along with the FMC SDRs. The Bridge excavation also requires a WSDOT permit.

3.0 Design Criteria

3.1 Design Criteria Described in the Master EDR

This section lists references to the site-wide and zone-specific design requirements that were originally presented in the Master EDR, and are pertinent to 2010 site activities. These criteria are explicit goals that the remediation activities must achieve in order to be successful. The zone-specific design criteria in the Master EDR were established with the understanding that they could be revised in future annual EDRs or SDRs as the scope of work was further clarified or re-defined. The overall design criteria presented in the Master EDR therefore require no revision.

3.1.1 Site-Wide Design Requirements

Table 3-1 provides citations to the site-wide design requirements described in Master EDR Section 3.1, which are applicable to the 2010 cleanup activities.

Table 3-1 Master EDR Site-Wide Design Requirements Citations

2010 Site-Wide Design Requirement	<i>Master EDR Section</i>
Codes	3.1.1
Standards and Guidelines	3.1.2
Shoring and Excavation Stabilization	3.1.3
Excavation Dewatering	3.1.4
Product Recovery	3.1.5
Impacted Soil Handling and Disposal	3.1.6
Clean Overburden Handling and Onsite Reuse	3.1.7
Construction Dewatering Treatment	3.1.8
Construction Treated Water Discharge	3.1.9
Compliance Monitoring	3.1.10
Spill Control and Response	3.1.11
Building Relocation	3.1.12
Access/Haul Roads	3.1.13
Public ROW Restoration	3.1.14
Utilities Restoration	3.1.15
Cleanup Standards	3.1.16
Vapor Mitigation	3.1.17
Construction Safety	3.1.18
Traffic Routing and Pedestrian Access	3.1.19
Survey Control	3.1.20

3.1.2 2010 Cleanup Activities Zone-Specific Design Requirements

Table 3-2 provides citations to the zone-specific design requirements described in Master EDR Section 3.2 which are applicable to the 2010 cleanup activities.

Table 3-2 Master EDR Zone-Specific Design Requirements Citations

2010 Zone-Specific Design Requirement	Master EDR Section
Railyard Zone	3.2.2
RLs and CULs)	Table 3-2
HCC Water Treatment System	3.2.2.4
HCC Treated Water Disposal	3.2.2.5
Northwest Developed Zone (Bridge Area, Levee West End, and Cascadia Inn property)	3.2.4
RLs and CULs	Table 3-2
Excavation Extents	3.2.4.4
Compliance Monitoring	3.2.4.8
Northeast Developed Zone (HCC East End)	3.2.5
RLs and CULs	Table 3-2
Air Sparging System	3.2.5.3
Compliance Monitoring	3.2.5.4
Former Maloney Creek Zone	3.2.3
RLs and CULs	Table 3-2
Sediment Excavation Extents	3.2.3.2
Buffer Zone Soil Excavation Extents	3.2.3.3
Surface Water Impacts	3.2.3.4
Restoration In Accordance with the Town of Skykomish Shoreline Management Program and CWA	3.2.3.5

3.2 Supplemental 2010 Cleanup Activities Design Criteria

This section presents supplemental design criteria information with respect to the following 2010 cleanup activities:

- Construction dewatering treatment
- RYZ excavation

- Bridge Area excavation
- Levee West End excavation
- HCC East End excavation
- Cascadia Inn property remediation
- FMC West Wetland remediation
- FMC East Wetland remediation
- Utilities construction.

3.2.1 Construction Dewatering Treatment

A temporary treatment system will be constructed on a pad within a secured/isolated facility, located in the RYZ. The treatment system will remove petroleum from water generated from construction dewatering activities and rainfall runoff that contacts the impacted soil stockpile in the soil handling facility. With the exception of decontamination water, the system will treat the water to achieve required treatment levels described in the NPDES permit applicable to the system using the processes outlined in the *Operations and Maintenance Manual for Water Treatment* (ENSR 2008f) or a similar process as required by the NPDES permit. The predicted nominal capacity of the treatment system is 500 gpm, with a maximum flow of 673 gpm in the summer (June 1 through September 30) and 269 gpm in the winter (October 1 through May 30) in accordance with the NPDES permit issued for the project.

3.2.2 RYZ Excavation

The RYZ excavation will occur in much the same manner as excavation in the NEDZ and NWDZ were completed in 2008 and 2009. Full excavation dewatering is not anticipated given the extents of required removal and the generally high permeability of the sand and gravel soils being removed. Excavation below the water table will be completed in the wet and excavated materials will be allowed to drain to facilitate transfer and disposal. Some screening of the excavated soils may occur on the railyard if sufficient oversized material is encountered

3.2.2.1 Excavation Extents

The RYZ lateral excavation extents are shown on Drawing C-201 through C-205 and include the following:

- **Surface Excavation Areas.** This excavation includes two areas, based on the contaminant and CULs:
 - *Metals Hot Spots.* Metals hot spots are located on the railyard, on King County tax lot tax lot 5061880095 (Goebel property), and in the 5th Street and Railroad Avenue ROWs.
 - *Surface TPH (aka 1,870 Dig Areas).* The 1,870 dig areas are located entirely on the railyard.
- **Free Product Areas.** These areas are located in the railyard and in the Railroad Avenue ROW. Some of these areas are located in close proximity to active tracks.
- **Opportunistic Dig Area.** This area is located in the railyard area in close proximity to active tracks and north of the soil handling area (SHA).

These limits were generally developed based on the results of previous investigations and the following criteria:

- Remediation construction phasing and schedule requested by the Town
- Property boundaries determined by the 2007 survey
- Obtaining access agreements
- Maintaining a vehicle and pedestrian traffic corridor in the Railroad Avenue ROW
- Potential impacts to railyard operations
- The following RYZ RL and CULs described in the CD and *Master EDR*
 - 3,400 mg/kg NWTPH-Dx for petroleum hydrocarbons (for free product, opportunistic dig areas, and property within the RYZ which is not part of BNSF's railyard facility property)
 - 1,870 mg/kg NWTPH-Dx for petroleum hydrocarbons to a maximum depth of 2 feet bgs - established by the CAP as being protective of biota (for TPH excavation areas)
 - 250 mg/kg for lead and 20 mg/kg for arsenic to a maximum depth of 2 feet bgs (for metals hot spots).

The anticipated vertical extent of the RYZ surface excavation is 2 feet bgs, based on the CAP requirement. The total anticipated RYZ surface excavation volume is 10,400 cubic yards, including the metal and TPH (1,870 dig) excavation areas.

The anticipated maximum depth for the three free product excavations is 15 ft bgs, as shown on Drawings C-203 and C-204. The total anticipated RYZ free product excavation volume is 4,200 cubic yards. There are two potential excavation limits shown for free product removal near monitoring well 2A-W-11. The smaller limits represent the predicted known free product extents based on field observations and analysis of soil samples collected during well construction. The larger limits represent the predicted maximum free product extents. At a minimum, excavation within the smaller limits will be completed in 2010.

The maximum depths of the opportunistic dig excavation areas shown on Drawings C-205 and C-206 correspond to the depth at which soil TPH impacts are greatest. The total anticipated opportunistic dig excavation volume is 6,900 cubic yards. It is assumed that the free product and opportunistic dig areas excavation could be accommodated in a stable manner using slopes of 1.5H:1V above the groundwater table, and from 1.5H:1V up to 2.5H:1V below the groundwater table.

Boring logs which document observations during sampling and laboratory analytical results were submitted in the RDI Report (ENSR 2008d) and Addendum to the RDI (AECOM 2009a). Additional investigation was completed in July – August 2009, and additional boring logs and laboratory analytical results are included in Appendix A. The planned excavation extents have been refined based on this investigation and the refined excavation extents are reflected herein. The actual excavation extents within the 2010 remediation boundary will be determined in the field based on excavation confirmation sampling.

3.2.2.2 ROWs

The RYZ excavation extents include parts of Railroad Avenue west of 6th Street and east of 3rd Street, and part of the 5th Street ROW. The excavation west of 6th Street and in the 5th Street ROW

will be completed in order to remove soil exceeding the lead and arsenic CULs. The excavation east of 3rd Street will be completed in order to remove soil exceeding the petroleum RL. Actual excavation extents within the 2010 remediation boundary will be determined in the field based on excavation confirmation sampling. The Railroad Avenue ROW will be closed at some time during the excavation. Street traffic flow may be restricted at times to allow for removal of impacted soil. Postings of traffic flow limitations will be provided early in the process so planning can occur, and individual notifications will be made prior to full lane closures. The needs of individual residents will be accommodated as much as possible. Emergency access will be provided at all times. Traffic will be routed around the active excavation area, or excavations will be phased to facilitate access. Traffic routing and pedestrian access are discussed in more detail in Section 5.

3.2.2.3 Private Properties

The RYZ excavation extents will include part of the Goebel property. Excavation on the Goebel property will be completed to remove soil exceeding the lead and arsenic CULs. Alternative excavation extents will be evaluated if access agreements cannot be obtained to the Goebel property.

3.2.2.4 Shoring and Excavation Stabilization

No shoring or other stabilization is anticipated to be necessary to complete the RYZ excavation.

3.2.3 Bridge Excavation

The Bridge excavation extents include in-water sediments and upland soils located within the NWDZ and Levee Zone. The excavation extents include the south side of the 5th Street Bridge, parts of the 5th Street, East River Drive and West River Drive ROWs, and parts of the Goranson Property, as well as part of the existing levee.

3.2.3.1 Excavation Extents

The upland and in-water excavation limits were developed based on the results of previous investigations and the following criteria:

- Remediation construction phasing and schedule requested by the Town of Skykomish agreements
- The following RLs described in the CD and Master EDR and Levee Zone EDR:
 - 40.9 mg/kg NWTPH-Dx for sediment between the OHWM of the South Fork Skykomish River and up to a depth of 10 feet below the river bottom
 - 22 mg/kg NWTPH-Dx for soil within a 25-foot lateral buffer zone extending outward from the OHWM and up to 10 feet below the river bottom
 - 3,400 mg/kg for soil upland of the 25-foot lateral buffer zone.
- Coordination with WSDOT.

Boring logs which document observations during sampling and laboratory analytical results were submitted in the *RDI Report* (ENSR 2008d) and *Addendum to the RDI* (AECOM 2009a). The planned excavation extents are based on these investigation and WSDOT requirements. With WSDOT concurrence, the excavation extents are set back a minimum of 5 feet from the bridge abutment in order to avoid direct impacts to its structure and foundation. Therefore, no structural disturbances to the bridge are anticipated. The excavation extents dictated by this set back requirement might not include all soil and sediment exceeding the applicable RLs. The final bridge area excavation extents

within the 2010 remediation boundary will be determined in the field based on confirmation sampling. This confirmation sampling will also evaluate whether or not residual “de minimus” soil and/or sediment exceeding RLs is left behind at the abutments. Engineered backfill and/or concrete could be used to help contain residual TPH in this “de minimis” soil and/or sediment. It is anticipated that long-term compliance monitoring will be implemented to evaluate potential impacts resulting from “de minimus” soil and/or sediment. This monitoring would be described in a 2010 CMP update addendum.

If substantial (greater than “de minimus”) contamination is left in place, BNSF will work with WSDOT, King County, the Town, and Ecology to implement one or more of the following:

- **Containment.** Engineered backfill could be placed to contain residual TPH in soil and/or sediment. This backfill would be designed based on field conditions. The design would be described in an EDR addendum.
- **Institutional controls.** The following institutional controls could be implemented to limit exposure to TPH soil left in place in the bridge abutment area.
 - *Planning.* BNSF would work with WSDOT to develop a plan to limit worker exposure during future structural inspection and bridge maintenance activities. The plan would also describe provisions for future potential cleanup work, which would be completed if future bridge abutment and/or embankment work occurs in the vicinity of residual TPH.
 - *Financial assurances.* Financial liabilities for institutional control implementation would be considered in the CD-required annual financial assurance reports.
- **Restrictive covenants.** The affected landowners (Town and SkyRiver Inn) have agreed to adopt covenants if required by Ecology.

3.2.3.2 ROWs

The Bridge area excavation includes the 5th Street Bridge, which is owned by WSDOT and provides access to the Town of Skykomish via US Highway 2, and part of the 5th Street ROW. The 5th Street Bridge will be closed at some time during the excavation. The Bridge area excavation also includes parts of the East River Drive and West River Drive ROWs. Traffic flow on these streets may be restricted at times to allow for removal of impacted soil. Postings of traffic flow limitations will be provided early in the process so planning can occur, and individual notifications will be made prior to full lane closures. Individual resident’s needs will be accommodated as much as possible. Emergency access will be provided at all times. Traffic will be routed around the active excavation area, or excavations will be phased to facilitate access. Traffic routing and pedestrian access are discussed in more detail in Section 5.

3.2.3.3 Private Properties

The Bridge area excavation extents will include part of the Goranson Property. Excavation on these properties will be completed to remove existing MSE walls and soil exceeding the petroleum RL of 3,400 mg/kg NWTPH-Dx.

3.2.3.4 Excavation Dewatering

It is anticipated that some of the excavation will be completed under wet conditions, depending on the river level and excavation depth, and that some pumping of water from the excavation will be required

to create a gradient toward the excavation pit, and away from the river or surface water. The excavation water will be transferred to the construction water treatment system.

3.2.3.5 **Shoring and Excavation Stabilization**

The bridge abutment excavation extents terminate at the HDPE liner installed during the 2009 excavation (refer to Figure C-207). It is anticipated that the north and south excavation sidewalls will be sloped 1.5H:1V (horizontal to vertical) above the OHWM or river level, and 2H:1V below the OHWM or river level. Sloping/shoring requirements will be further evaluated during development of the CPS.

3.2.3.6 **Cofferdams**

Tertiary containment will be used to isolate the excavation and construction work from the river. A primary temporary river exclusion wall (cofferdam) will be placed waterward of the proposed excavated prism. The cofferdam will be placed within the south portion of the river channel, and will prevent water from entering the construction site in the event of high flows. The wall will also exclude migrating fish from entering the construction area. A second cofferdam will be located just beyond the primary cofferdam to provide secondary containment to ensure that soil, sediment and organic contaminants are not released to the river. Tertiary containment will consist of oil absorbent booms placed outside of the second cofferdam. Since a construction water treatment plant will be available on site as part of the project facilities, there will also be provisions for pumping of water as necessary (and as treatment capacity allows) in the event contaminants are released beyond the primary cofferdam. Additional contingencies could also include the placement of sorbent material between the two coffer dams.

3.2.3.7 **River Levels during Construction Months**

The anticipated river levels design criteria described in Levee EDR Section 3.2 will be used to determine the cofferdam design and to evaluate dewatering needs. The river maximum water level during the fish window is needed to select the design height of the top of the cofferdam.

3.2.3.8 **Fish Window**

Construction below the OHWM will be limited to: 1) the fish window, which varies yearly, but is approximately July 1 to August 31 and can be extended until approximately September 15; and 2) other timing restrictions that may be established by USACE, NOAA Fisheries, USFWS, or DFW. Other design criteria to minimize impacts to fish are described in Levee EDR Section 3.2.3.

3.2.3.9 **Levee Restoration**

After completion of the excavation, sediment substrate of comparable type and gradation to existing materials will be replaced. The levee repair itself is simplified by the fact that the existing levee will be replaced in-kind by using the current configuration as a guide during replacement.

The repairs will be completed in accordance with the following design criteria, which were originally described in Levee EDR Section 3.

- The river face of the levee must meet Ecology and the Town's substantive requirements for habitat and resource restoration as well as all of the Federal standards of DFW, NOAA-Fisheries, USFWS, and USACE as specified in the USACE permit and HPA that will be obtained for this work

- The levee interior will meet the existing substantive standards of King County, USACE, and the Town for flood control and public safety
- The levee crest, back-slope, home sites and public rights-of-way will meet the existing substantive standards of the Town for land use, zoning and building codes
- Native vegetation will be replanted along the face of the repaired levee section.

3.2.4 Levee West End Excavation

The Levee West End excavation will occur in much the same manner as excavation in other parts of the NWDZ was completed in 2009. Full excavation dewatering is not anticipated given the extents of required removal and the generally high permeability of the sand and gravel soils being removed. Excavation below the water table will be completed in the wet and excavated materials will be allowed to drain to facilitate transfer and disposal. Some screening of the excavated soils may occur on the railyard if sufficient oversized material is encountered.

3.2.4.1 Excavation Extents

The Levee West End planned excavation lateral extents are shown on Drawing C-209 and include parts of the West River Drive ROW, as well as either a portion of the Shawver property (King County tax lots 2626119029, 2626119039, 2626119043, and 5060800060). These extents were developed based on field observations and laboratory analytical results from previous investigations and the following criteria:

- Remediation construction phasing and schedule requested by the Town
- Property boundaries determined by the 2007 survey
- Maintaining a vehicle and pedestrian traffic corridor in the West River Drive ROW
- Obtaining access agreements
- The following RL and CULs described in the CD and Master EDR and Levee Zone EDR:
 - 3,400 mg/kg for soil upland of the 25-foot lateral buffer zone
 - 22 mg/kg NWTPH-Dx for soil within a 25-foot lateral buffer zone extending outward from the OHWM and up to 10 feet below the river bottom (if excavation within the buffer zone is required based on confirmation sampling completed immediately upland of the buffer)
 - 40.9 mg/kg NWTPH-Dx for sediment between the OHWM of the South Fork Skykomish River and up to a depth of 10 feet below the river bottom (if excavation below the OHWM is required based on confirmation sampling completed at the buffer zone excavation boundary)

The approximate excavation limits are shown on Drawings C-209 and C-210. These limits include a contiguous excavation in the school yard. The school yard excavation design basis will be described in an addendum. The anticipated maximum depth of the excavation to remove impacted soil exceeding the RL is 17 feet bgs. Based on these extents, it is estimated that approximately 13,800 cubic yards of soil will be excavated from the levee west end and school yard area.

Boring logs which document observations during sampling and laboratory analytical results were submitted in the RDI Report (ENSR 2008d) and Addendum to the RDI (AECOM 2009a). Additional

investigation was completed in July – August 2009, and additional boring logs and laboratory analytical results are included in Appendix A. The planned excavation extents have been refined based on this investigation and the refined excavation extents are reflected herein. The actual excavation extents within the 2010 remediation boundary will be determined in the field based on excavation confirmation sampling.

3.2.4.2 Cofferdams

A cofferdam will be used to isolate the excavation and construction work from the river. The cofferdam will be placed waterward of the proposed excavation prism to ensure that soil, sediment and organic contaminants are not released to the river.

3.2.4.3 ROWs

The West River Drive ROW could be closed at some time during the excavation. Some level of disruption and inconvenience for local residents is inevitable. Street traffic flow may be restricted at times to allow for removal of impacted soil. Postings of traffic flow limitations will be provided early in the process so planning can occur, and individual notifications will be made prior to full lane closures. Individual resident's needs will be accommodated as much as possible. Emergency access will be provided at all times. Traffic will be routed around the active excavation area, or excavations will be phased to facilitate access. Traffic routing and pedestrian access are discussed in more detail in Section 5.

3.2.4.4 Private Properties

The Levee West End excavation extents will include part of the Shawver Property. Excavation on the Shawver property will be completed to remove soil exceeding the petroleum RL. Alternative excavation extents will be evaluated if an access agreement cannot be obtained.

3.2.4.5 Shoring and Excavation Stabilization

No shoring or other stabilization is anticipated to be necessary to complete the Levee West End excavation.

3.2.5 HCC East End Excavation and Barrier Wall Extension

The original predicted lateral and vertical extents of the excavation required to construct the HCC were determined based on the design criteria for the HCC system and were shown in the 2008 CPS drawings C-202 through C-208. Pre-2009 boring data indicated that soil with petroleum hydrocarbon concentrations exceeding 3,400 mg/kg NWTPH-Dx was located only west of the east HCC vault. Confirmation sampling and observations during HCC wall construction in 2008 backup up the pre-construction excavation limits. Unanticipated petroleum hydrocarbon impacted soil was discovered east of the existing HCC wall and the 2008 excavation prism during boring for installation of a compliance monitoring well EW-2. The impacted soil extents in this area were further delineated during August 2009 investigation activities. Based on the investigation results 1) the volume of impacted soil with petroleum hydrocarbon concentrations exceeding 3,400 mg/kg NWTPH-Dx was found to be small (approximately 350 cubic yards); 2) the impacted soil was separate and isolated from the main soil impacts that were removed in 2008.

Removal of this impacted soil in accordance with the intent of the CD is subject to a number of serious implementability factors that impact the feasibility of conventional excavation methods. A conventional, sloped excavation would cause distress to existing remedial systems (the nearby vault) and railroad mainline infrastructure. Specifically, the HCC east vault would be in jeopardy of damage caused by

backfill failure and the excavation slope intersects with the stress slope of the railroad mainline. Both of these conditions pose unacceptable risks and, for this reason, a sloped excavation was eliminated as a feasible remedial alternative.

Several alternative approaches to open excavation are being evaluated to provide an overall approach that is effective, implementable, and cost effective. These alternatives include excavation with shoring utilized below a certain depth to provide the lateral support required to maintain safe operations of the mainline tracks and to minimize the potential for damage to the existing subsurface vault. Another alternative, which is considered feasible, is to utilize overlapping, large diameter drilled vertical shafts. The drilling procedure would remove impacted soil. The boring sidewall integrity would be maintained by steel casing. At the completion of each shaft, the hole would be backfilled with a structural material that meets the requirements identified in the upcoming HCC SDR amendment. Backfill could consist of a low permeability flowable fill, compacted structural fill, or stabilization aggregate or a treatment media. The shafts would be drilled in two phases. In the initial phase, every other shaft would be drilled; in the next phase, the intervening shafts would be drilled, overlapping the initial phase shafts. In this manner, a continuous, overlapping area will be constructed that will beneficially function to extend the functionality of the existing sheet pile barrier (if this is the appropriate approach determined by modeling).

3.2.5.1 Excavation Extents

The HCC East End lateral extents are shown on Drawing C-211 and include a part of the Railroad Avenue ROW. These extents were developed based on field observations and laboratory analytical results from previous investigations and the following criteria:

- Remediation construction phasing and schedule requested by the Town
- Property boundaries determined by the 2007 survey
- Maintaining a vehicle and pedestrian traffic corridor in the Railroad Avenue ROW
- Obtaining access agreements
- The following NWDZ RL described in the CD and Master EDR:
 - 3,400 mg/kg NWTPH-Dx for petroleum hydrocarbons.

The HCC East End is located in the NEDZ, but the NWDZ 3,400 mg/kg NWTPH-Dx RL is applicable to the excavation due to the motor oil:diesel fuel indicated by the laboratory analysis, which is approximately 1:1.

Boring logs which document observations during sampling and laboratory analytical results were submitted in the RDI Report (ENSR 2008d) and Addendum to the RDI (AECOM 2009a). Additional investigation was completed in July – August 2009, and additional boring logs and laboratory analytical results are included in Appendix A. The planned excavation extents have been refined based on this investigation and the refined excavation extents are reflected herein. The actual excavation extents within the 2010 remediation boundary will be determined in the field based on excavation confirmation sampling.

3.2.5.2 Barrier Wall Extension

The performance objective and design criteria for the HCC barrier wall were presented in HCC SDR (ENSR 2008d). As described in HCC SDR Section 6.2, the primary objective of the HCC is to satisfy requirements that groundwater leaving the BNSF property meets the appropriate RL. For groundwater flowing immediately north of the RYZ, the RL is 477 µg/L NWTPH-Dx and the absence of visible

sheen or free product. If it is found that this groundwater RL is not anticipated to be met at the east end of the HCC after soil exceeding 3,400 mg/kg NWTPH-Dx is excavated from Town property, the barrier wall installed in 2009 will be extended as necessary to satisfy the requirements of the CD. The HCC could be extended as an impermeable wall by backfilling the excavation with low permeability flowable fill. This approach is comparable to the permeation grouting method used in 2009 to construct portions of the HCC and is expected to result in a very low permeability barrier consistent with the objectives outlined in the CAP and HCC SDR. The design criteria for extension of the barrier wall will be described in an upcoming HCC SDR addendum.

3.2.5.3 ROWs

Traffic flow on the Railroad Avenue ROW will be limited to one lane during some of the excavation. Some level of disruption and inconvenience for local residents is inevitable. Street traffic flow may be restricted at times to allow for removal of impacted soil. Postings of traffic flow limitations will be provided early in the process so planning can occur, and individual notifications will be made prior to full lane closures. Individual resident's needs will be accommodated as much as possible. Emergency access will be provided at all times. Traffic will be routed around the active excavation area, or excavations will be phased to facilitate access. Traffic routing and pedestrian access are discussed in more detail in Section 5.

3.2.5.4 Private Properties

The HCC east end excavation will not impact any private properties.

3.2.5.5 Shoring and Excavation Stabilization

No shoring or other stabilization is anticipated to be necessary to complete the HCC East End excavation or barrier wall extension.

3.2.6 Cascadia Inn Property Remediation

The Cascadia Inn Property excavation work refers to the proposed remediation activities adjacent to and underneath the southwest portion of the Cascadia Inn. The boundary between the NWDZ and NEDZ passes through the Cascadia Inn. The southwest portion of the Inn is located within the NWDZ. Section 4 of the CAP describes the design criteria for NWDZ and NEDZ remediation activities. These design criteria have been established with the understanding that the scope of work could be further clarified or re-defined over the anticipated duration of remediation design and permitting activities.

3.2.6.1 Excavation Extents

The Cascadia Inn Property excavation lateral extents are shown on Drawing C-213 and include parts of the Railroad Avenue ROW and King County tax lots 7807800240 and 7807800251. The Cascadia Inn building is located entirely in tax lot 7807800240. The approximate west half of the building is located in the NWDZ; the approximate east half is located in the NEDZ. The excavation will be completed entirely in the NWDZ. These extents were developed based on field observations and laboratory analytical results from previous investigations and the following criteria:

- Remediation construction phasing and schedule requested by the Town
- Property boundaries determined by the 2007 survey
- Maintaining a vehicle and pedestrian traffic corridor in the Railroad Avenue ROW
- Obtaining access agreements

- The following NWDZ RL described in the CD and Master EDR:
 - 3,400 mg/kg NWTPH-Dx for petroleum hydrocarbons in the NWDZ.

The anticipated maximum depth of the excavation to remove impacted soil exceeding the RL is 18 feet bgs. Based on these extents, it is estimated that approximately 2,420 cubic yards of soil will be excavated. The excavation extents could change based on benching/sloping requirements. These requirements will be dictated in part by the selected structural stability methods (e.g., underpinning) used to support Cascadia Inn during the excavation work.

Boring logs which document observations during sampling and laboratory analytical results were submitted in the RDI Report (ENSR 2008d) and Addendum to the RDI (AECOM 2009a). Additional investigation was completed in July – August 2009, and additional boring logs and laboratory analytical results are included in Appendix A. The planned excavation extents have been refined based on this investigation and the refined excavation extents are reflected herein. The analytical results indicate that the diesel to bunker fuel ratio in TPH impacted soil located on the Cascadia Inn Property and adjacent section of the Railroad Avenue ROW is approximately 1:1, which indicates that the NWDZ RL of 3,400 mg/kg applies. The actual excavation extents within the 2010 remediation boundary will be determined in the field based on excavation confirmation sampling.

An isolated pocket of TPH-impacted soil was identified near the southeast corner of the Cascadia Inn building based on the sidewall confirmation sample CONF-C32-SIDEWALL, which was collected during the 2008 Railroad Avenue excavation. The sample TPH concentration was 16,200 mg/kg NWTPH-Dx. The sample was collected at an approximate elevation of 926 feet, which was approximately 10 feet bgs and above the groundwater table. Two angle borings, 1B-B-23A and 1B-B-23B were placed during the July-August 2009 supplemental investigation to delineate the extents of the pocket. The angle borings were located less than approximately 3 feet south of the excavation sidewall confirmation sample and advanced to depths of approximately 30 feet bgs. The boring and sidewall sample locations are shown in Addendum to the RDI Figure 6-5. No LNAPL or TPH odor was detected in the soil cuttings. Samples were collected from the borings at 1 foot intervals from 13 to 18 feet bgs. TPH concentrations in these samples were typically non-detect and/or less than 6 mg/kg NWTPH-Dx. These analytical results confirmed that the TPH impacts are isolated and do not extend beneath the Cascadia Inn building.

The isolated pocket TPH concentration exceeds the applicable RL of 3,400 mg/kg, but the pocket will not be excavated or remediated by biosparging because 1) it is located in close proximity to the Cascadia Inn; and 2) its small size means that the pocket is unlikely to significantly impact groundwater quality. A groundwater well will be constructed on the west side of the Cascadia Inn Property after the 2010 excavation is completed and monitored to evaluate potential groundwater quality impacts resulting from the TPH pocket. This monitoring will be described in the 2010 CMP Update. Additional remediation, such as excavation would be completed in future years if it becomes apparent that this action is necessary to meet the 208 µg/L NWTPH-Dx at the conditional point of compliance (CPOC) and/or 477 µg/L NWTPH-Dx in the NWDZ. This work would be described in a 2010 EDR addendum.

3.2.6.2 ROWs

The 2010 excavation extents will include parts of Railroad Avenue ROW. The sloped excavation in the Railroad Avenue will be completed in order to remove soil exceeding the petroleum RL at the edge of Railroad Avenue and the south property boundary of Cascadia Inn Property. The Railroad Avenue ROW could be closed at some time during the excavation. Some level of disruption and inconvenience for local residents is inevitable. Street traffic flow may be restricted at times to allow for

removal of impacted material. Postings of traffic flow limitations will be provided early in the process so planning can occur, and individual notifications will be made prior to full lane closures. Individual residents will need to be accommodated as much as possible. Emergency access will be provided at all times. Traffic will be routed around the excavation area, or the excavations will be phased to facilitate access.

3.2.6.3 Private Properties

The Cascadia excavation extents will include parts of King County parcels 7807800240 and 7807800251.

3.2.6.4 Shoring and Excavation Stabilization

Appropriate structural stability methods (e.g., underpinning) will be used to support Cascadia Inn during remediation work. The excavation edges will be stabilized using sloping methods. Dry side slopes are expected to stand at a stable slope of 1.5H:1V (horizontal to vertical). Excavation side slopes below water are expected to slant at about 2H:1V. During detailed design for the excavation work, sloping/shoring requirements will be further evaluated.

3.2.7 FMC East Wetland Remediation

Selected Remedy. FMC East SDR Section 4 and 2009 EDR Section 3.2.3 describe the design criteria for the selected remedy for FMC East Wetland remediation activities. These design criteria have been established with the understanding that the scope of work could be further clarified or re-defined over the anticipated duration of remediation design and permitting activities.

Alternate Remedy. The alternate remedy design criteria will be provided in FMC East SDR and Master EDR addenda, if selected.

3.2.8 FMC West Wetland Remediation

FMC West SDR Section 4 and Section 4.1.5 of the CAP describe the design criteria for FMC West Wetland remediation activities. These design criteria have been established with the understanding that the scope of work could be further clarified or re-defined over the anticipated duration of remediation design and permitting activities.

3.2.9 Utility Reconstruction

The basis of design for PSE, Verizon, and Town of Skykomish utilities is unchanged from the Master EDR. PSE, Verizon, and the Town are completing separate designs for power, telephone, and sanitary sewer, respectively. AECOM will be designing the potable water distribution system on behalf of BNSF. These designs will be incorporated into the 2010 CPS, which will be submitted to Ecology in accordance with the schedule set forth in CD Exhibit C.

4.0 Scope of Work

4.1 Site-Wide Scope of Work Described in the Master EDR

This section lists references to the elements of the site-wide scope of work that were originally presented in the Master EDR and are pertinent to 2010 site activities. The site-wide scope of work was established with the understanding that it could be further clarified or redefined over the anticipated duration of remediation activities. No changes to the scope of work have been identified since preparation of the Master EDR. Table 4-1 provides to the site-wide scope of work items described in Master EDR Section 4.1 which are applicable to the 2009 cleanup activities.

Table 4-1 Master EDR Site-Wide Scope of Work

2010 Site-Wide Scope of Work	Master EDR Section
Drawings	4.1.1
Solicitation Package and Procurement	4.1.2
Permits	4.1.3
Mobilization and Site Preparation	4.1.4
Utility Locate	4.1.4.1
Surveying	4.1.4.2
Clearing and Grubbing	4.1.4.3
Spill Response	4.1.4.4
Temporary Facilities Construction	4.1.5
Access Agreements	4.1.6
Building Relocation	4.1.7
Relocation of Landmark and Historic Buildings	4.1.7.1
Relocation of Other Buildings	4.1.7.2
Excavation	4.1.8
Product Recovery	4.1.8.1
Wildlife Exposure Mitigation	4.1.8.2
Historic Structure Monitoring	4.1.8.3
Dewatering	4.1.8.4
Transporting Excavated Soil Onsite	4.1.8.5
Stockpiling Impacted Soil	4.1.8.6
Stockpiling Clean Overburden for Potential onsite Re-Use	4.1.8.7
Excavation Performance Sampling	4.1.8.8
Stockpile Amendment	4.1.8.9
Transportation and Disposal of Impacted Soil	4.1.8.10

2010 Site-Wide Scope of Work	Master EDR Section
Backfilling	4.1.8.11
Grading and Compaction	4.1.8.12
Dust Suppression and Mitigation	4.1.8.13
Compliance Monitoring	4.1.9
Protection Monitoring	4.1.9.1
Performance Monitoring	4.1.9.2
Confirmational Monitoring	4.1.9.3
Replacement of Relocated Structures and Restoration of Remediated Properties	4.1.10
Electrical and Telecommunications Utilities Restoration	4.1.11
Stormwater Collection System Construction	4.1.13
Wastewater Collection and Treatment System Construction	4.1.14
ROW Restoration	4.1.15

4.2 2010 Scope of Work

The following description of the 2010 scope of work supplements the information provided in the Master EDR and the FMC SDRs.

4.2.1 Access Agreements

BNSF is contacting property owners to negotiate access agreements for properties where excavation is required to meet RLs and/or CULs. As described in the CAP, property access and restoration is to be conducted according to agreements made with each property owner (Section 5.4, p. 59; Section 6.1). As described in the Master EDR, property owners may elect to not relocate and have subsurface containment put in place. Property owners may also elect to receive payment in lieu of having BNSF conduct property restoration (Section 4.1.10). Properties that require access agreements for the 2010 work are as follows. King County tax lot numbers are in parentheses.

4.2.1.1 RYZ Excavation Access Agreements

Goebel Property (5061880095). Access to the Goebel Property will be necessary to complete excavation and restoration activities. Access negotiations are in progress.

4.2.1.2 Bridge Area Excavation Access Agreements

Goranson Property (7807800480, 7807800505). Access to the Goranson Property will be necessary to complete excavation and restoration activities. Access has been obtained.

4.2.1.3 Levee West End Excavation Access Agreements

Shawver Property (2626119029, 2626119039, 2626119043, and 5060800060). Access to tax lots 2626119029, 2626119039, 2626119043 will be necessary to complete excavation and restoration activities. Access to lot 5060800060 could be necessary to temporarily store relocated buildings. Access has been obtained. This work may be completed in 2011. The work will be done concurrently

with the 50 western feet of the school yard excavation, which is contingent upon obtaining access to School District property west of 6th Street (5060800005).

4.2.1.4 **Cascadia Inn Property Excavation Access Agreements**

Cascadia Inn Property (78078000240 and 7807080251). Access to the Cascadia Inn Property will be necessary to complete excavation and restoration activities. Access has been obtained.

4.2.1.5 **FMC East Wetland**

The access agreement requirements for the FMC East Wetland Option 1 are described in 2009 EDR Section 4.2.3.

4.2.1.6 **FMC West Wetland**

King County FPD 50 Property (5061300115, 5061300110). Access to KCFPD 50 Property will be necessary to complete excavation and restoration activities in the vicinity of the stormwater culvert. Access negotiations are in progress.

Domina Property (2626119103). Access to this property will be necessary to complete wetland excavation and restoration activities. Access negotiations are in progress.

Calderon Property (2626119073). Access to this property will be necessary to complete wetland excavation and restoration activities. Access negotiations are in progress.

Fortun Property (2626119125). Access to this property will be necessary to complete wetland excavation and restoration activities. Access negotiations are in progress.

Puget Western Property (2626119117). Access to this property will be necessary to complete wetland excavation and restoration activities. Access negotiations are in progress.

US Government Property (3526119001). Access to this property will be necessary to complete wetland excavation and restoration activities. Access negotiations are in progress.

Town Wetland Property (226119121). Access to this Town property will be necessary to complete excavation and restoration activities in the vicinity of the stormwater culvert. Access has been obtained.

4.2.1.7 **Town ROWs**

Access to the Town ROWs will be necessary to complete various excavation and restoration activities. This access agreement has been obtained.

As required by the CD, documentation that access agreements necessary for 2010 work have been obtained will be provided to Ecology on or before December 31, 2010.

4.2.2 **Building Relocation**

The following buildings will be temporarily relocated in 2010, contingent on obtaining property access agreements.

Levee West End Excavation. The shop and wood shed on the Shawver Property will be temporarily relocated to facilitate excavation activities. It is anticipated that these structures will be moved to other

locations on the Shawver property. These buildings are not on the National Register of Historic Places, and will therefore be moved and restored in accordance with the procedures described in Master EDR Section 4.1.7.2. Information from structural surveys will be incorporated into relocation scopes of work, plans, and specifications. Structures will be monitored in accordance with the developed guidelines during the move to the temporary storage location. No security fencing will be installed around the buildings unless they are moved to off-property locations for the duration of their storage.

4.2.3 Resident Relocation

No residents will be relocated in 2010. Some level of noise, vibration, and traffic congestion are unavoidable such that these residents could determine that the construction impacts and their unique living circumstances are such that relocation is desirable and warranted. These are properties where BNSF does not need access for purposes of completing the work. BNSF will consider these requests on a case-by-case basis in consultation with Ecology and will attempt to accommodate affected residents if, as and when necessary.

A scope of work summary, including a status summary for access agreements is provided in Table 4-2.

Table 4-2 Access Agreement and Scope of Work Summary

Parcel Number	Property Owner or Designation	2010 Scope of Work	Access Status
<i>Railyard Zone Excavation</i>			
5061800095	Goebel Property	Partial excavation	Negotiations in progress
<i>Bridge Area Excavation</i>			
7807800480, 7807800505	Goranson	Partial excavation	Access obtained
<i>Levee West End Excavation</i>			
2626119029, 2626119039, 2626119043, 5060800060	Shawver Property	Partial excavation	Access obtained
<i>Cascadia Remediation</i>			
7807800240, 7807800251	Cascadia Inn Property	Underpinning (or temporary relocation) and excavation of parcel	Access obtained
<i>FMC West Wetlands Remediation Properties</i>			
5061300115, 5061300110	King County FPD 50	Partial wetland excavation	Negotiations in progress
2626119103	Domina	Partial wetland excavation	Negotiations in progress
2626119073	Calderon	Partial wetland excavation	Negotiations in progress

Parcel Number	Property Owner or Designation	2010 Scope of Work	Access Status
2626119125	Fortun	Partial wetland excavation	Negotiations in progress
2626119117	Puget Western, Inc.	Partial wetland excavation	Negotiations in progress
3526119001	US Government	Partial wetland excavation	Negotiations in progress
2626119121	Town Property	Partial wetland excavation	Access obtained

4.2.4 Post Office Operations

United States Postal Service (USPS) operations were temporarily relocated to a building in the USFS compound in 2009. The temporary building has been equipped with all appurtenances, as designated necessary by the USPS and operated in a way that accommodates regular USPS functions. The temporary building will remain in use until the end of 2010.

4.2.5 Temporary Facilities Construction

4.2.5.1 Access and Haul Roads

The main access and haul roads that will be used during the 2010 work are 5th Street, Railroad Avenue, West River Drive, and Old Cascade Highway, as shown on Drawings C-104 through C-106. It is anticipated that trucks hauling excavated material will enter the railyard from 5th Street and exit to Old Cascade Highway after transferring material to the soil handling facility. Trucks hauling material from the FMCZ and SDZ will transfer materials to the soil handling facility using temporary haul roads constructed in the FMCZ, SDZ, and RYZ when possible. Other roads and/or alternate truck routing may be used at the discretion of the Contractor. These changes will be proposed to Town officials and emergency personnel for approval prior to implementation.

4.2.5.2 Equipment Decontamination Area

A heavy equipment and truck decontamination area will be constructed in the RYZ at appropriate locations, as recommended by the Contractor. Decontamination water will be temporarily stored on-site and taken to an off-site licensed facility for disposal or treatment.

4.2.5.3 Construction Offices

Temporary construction offices will be located on the railyard. A temporary engineering field office may be established in Maloney's General Store on Railroad Avenue.

4.2.5.4 Temporary Electric and Communications Utilities

PSE and Verizon constructed temporary bypasses for overhead electric and telecommunications wiring in 2008 and 2009. Some of these bypasses remain in place, and will be used in conjunction with other existing overhead and underground utilities to supply electric and communications services for all Skykomish residences and businesses that remain occupied during the 2010 remediation activities. Structures that are outside of the active construction zones but vacant due to relocation of residents will also continue to be serviced by all appropriate utilities.

4.2.5.5 Temporary Potable Water Utilities

Temporary potable water piping will be constructed in ROWs and/or private properties as necessary to maintain services during excavation activities.

4.2.5.6 Enclosures and Fencing

Temporary chain link fencing will be installed at the perimeter of the 2010 remediation areas, as shown on Drawings C-104 through C-107. Warning signs will be posted at every gated entrance and at approximate 50-foot intervals along the fence line to warn the public that the fenced area contains physical and chemical hazards and that access is forbidden to unauthorized personnel.

4.2.5.7 Sediment and Erosion Controls

Sediment and erosion control measures will be implemented as described in the *Stormwater Pollution Prevention Plan and Temporary Erosion and Sediment Control Measures* (SWPPP; ENSR 2008h) and 2009 SWPPP Update (SWPPP; AECOM 2009g) and as shown in Drawings C-104 through C-107

4.2.5.8 Construction Staging Areas

Construction staging areas will be established in the RYZ at the locations shown on Drawing C-200 through C-206, and at other RYZ locations as agreed to by BNSF and the Contractor, or at locations outside of the RYZ as agreed to by the Town, BNSF, and the Contractor. Staging will also occur on private properties that are in the excavation area.

4.2.5.9 Spill/Emergency Response Equipment

Spill response equipment will be located in the Contractor staging area shown in Drawing C-200 through C-206, or at a location determined by the Contractor. Spill response equipment will include oil absorbent booms and pads, as described in the Spill Response Plan (part of the SWPPP).

4.2.5.10 Construction Water Treatment System

A treatment system similar in function and performance to the one implemented for the 2008 and 2009 remediation and permitted under the existing NPDES permit will be operated during 2010 remediation activities. The water treatment system will be constructed in a lined facility located within the RYZ at the approximate location shown on Drawing C-101. Other locations on the railyard will be considered if the Contractor suggests moving the system to facilitate work activities. The treatment system will remove petroleum from water generated from construction activities, except decontamination water, and treat the water to achieve required treatment levels described in the NPDES permit. The water treatment system operation and maintenance is described in the SWPPP (ENSR 2008h), in the *Operations and Maintenance Manual for Water Treatment System* (ENSR 2008i) and the ClearWater Compliance Services (ClearWater) *Water Treatment Plan* (WTP) (ClearWater 2009), which was submitted as part of 2009 *Technical Execution Plan* (Strider, 2009)

4.2.6 RYZ/NWDZ/NEDZ Excavation

This section applies to the following

- RYZ Excavation
- Levee West End Excavation
- HCC East End Excavation
- Cascadia Inn Property Remediation.

4.2.6.1 Clearing and Grubbing

All surface objects, brush, roots, and other protruding obstructions, and all trees and stumps will be cleared and/or grubbed from the excavation limits as indicated on Drawings C-104 and C-105. The removed vegetation and debris will be recycled or disposed of at an appropriate municipal landfill.

4.2.6.2 Demolition

Asphalt roads, concrete building foundations, slabs, and walkways located within the excavation areas will be demolished and recycled or disposed of at an appropriate Construction Demolition Waste (CDW) landfill.

4.2.6.3 Extents

Excavation will include removing soil as necessary to reach the estimated areal and vertical extents of impacted soil shown on Drawings C-200 through C-206, and C-209 through C-212. Based on these extents, it is estimated that approximately 37,300 cubic yards of soil will be removed from these RYZ, NWDZ, and NEDZ excavation areas in 2010. The excavation extents as well as the clean overburden and impacted soil volumes will be refined based on the results of performance monitoring. Table 4-3 summarizes the excavation volumes for each area.

Table 4-3 Excavation Volume Summary

Excavation	Approximate Excavation Volume (cubic yards)
RYZ Excavation	
Surface Excavation (Metals Hot Spots, 1,870 mg/kg TPH)	10,400
Free Product Areas	4,200
Opportunistic Dig Areas	6,900
Levee West End Excavation (includes School Yard excavation)	13,800
HCC East End Excavation and Barrier Wall Extension	500
Cascadia Inn Property Remediation	2,500

4.2.6.4 Removing Utilities

At grade and underground stormwater and potable water utilities will be removed during the excavation activities and will be recycled or disposed of at an appropriate CDW landfill. Aboveground electrical and communications utilities will be removed as necessary to complete the excavation.

4.2.6.5 Shoring and Barriers

It is anticipated that no impacted material exceeding applicable RLs or CULs will be left in place at the completion of 2010 construction activities, and therefore no impermeable barriers will be necessary for the 2010 work. If impacted material is left in place, a temporary liner similar to the one placed at the upgradient extent of the 2006 and 2008 removals, or a sheetpile wall will be placed between the impacted material and clean backfill. Where steel sheetpiles are used for temporary shoring, the sheetpiles are considered to suffice for the barrier without special sealing of sheetpile joints. Barriers

will be placed as close to the property boundaries as possible, thus minimizing the potential need for excavation to remove impacted soils in the years following 2010.

4.2.6.6 **Barrier Wall Extension**

The barrier wall extension design will be described in an upcoming HCC SDR addendum.

4.2.6.7 **Backfilling**

Excavations will be backfilled with both clean overburden material and imported aggregate material. Topsoil will be placed on residential properties and on Town properties that will be restored with landscaping.

Clean Overburden Material

Overburden material with petroleum concentrations less than 3,400 mg/kg NWTPH-Dx may be used as backfill on-site as outlined in Section 6.4 of the CAP. Overburden material will be used for either stabilization or structural fill as long as it meets the gradation requirements outlined below. Soil within two feet of final grade must meet the petroleum cleanup level of 1,870 mg/kg NWTPH-Dx. No soil with arsenic concentrations exceeding 20 mg/kg, lead concentrations exceeding 250 mg/kg, PCB concentrations exceeding 0.65 mg/kg, or dioxin/furan concentrations exceeding 6.67 ng/kg Total Toxicity Equivalent Concentration will be used as backfill on the site.

Imported Aggregate Material

Excavations will also be backfilled with imported aggregate material that is suitable for placement and compaction under the site conditions. The South Fork Skykomish River will be visually monitored daily to demonstrate that backfilling activities do not result in exceedances of water quality standards in surface water. If turbidity is detected visually, turbidity measurements will be taken upstream and downstream of the release to determine if the water exceeds water quality criteria. This monitoring will be described in more detail in the 2010 CMP Update. The Contractor will be responsible for preventing and responding to turbidity exceedances. The Contractor's Technical Execution Plan will describe a prevention and response strategy. This strategy could include 1) controlled backfilling with low permeability fill or backfilling in smaller lifts; 2) localized excavation dewatering; 3) installation of temporary barriers, such as steel plates, to reduce mobilization of fine-grained soils; and/or 4) other measures as deemed appropriate by the Contractor and approved by the Engineer. The CPS will require the Contractor to have the equipment necessary to implement the strategy onsite during excavation.

Given that the excavations will not be fully dewatered, backfill placed below the water table will need to be relatively clean (little to no fines) granular material that goes in place relatively compact, and is relatively easy to compact in a thick layer when compaction equipment is placed on the fill once it extends above the water surface elevation. The water surface elevation is anticipated to change throughout the construction season as the water table drops into summer. Given that the material will be placed below the water table, compaction testing below standing water will not be possible. A large compaction effort will be required on the fill at the point where it protrudes above the water level. Material placed below the water table (stabilization aggregate) is to conform to the grain size specification listed in Table 4-4.

Table 4-4 Stabilization Aggregate Grain-Size Requirements

Sieve Size	Percent Passing
2 ½ square	100
2 square	65-100
¾ square	40-80
U.S. No. 4	5 (max.)
U.S. No. 100	0-2
% Fracture	75 (min.)

Backfill placed above the stabilization aggregate is called structural fill, and it will conform to the grain size requirements listed in Table 4-5.

Table 4-5 Structural Fill Grain-Size Requirements

U.S Standard Sieve Size	Allowable Percent Passing
5-inch square	100
2-inch square	75-100
No. 4	50-80
No. 40	30 max.
No. 200	15 max.
Sand Equivalent	50 min.

All percentages are by weight. Note that the quantity of fines (material passing the No. 200 sieve) may be decreased to a maximum of 5 percent if the fill is to be placed during wet weather conditions.

Prior to importing material to the site, the Contractor will be required to provide lab analyses indicating that imported structural fill does not contain potential contaminants with concentrations greater than those shown in Table 4-6.

Table 4-6 Chemical Criteria for Backfill

Substance	Maximum Concentration
Arsenic	20 mg/kg
Cadmium	2 mg/kg
Chromium VI	19 mg/kg
Chromium III	2,000 mg/kg
Lead	250 mg/kg
Mercury	2 mg/kg
NWTPH-Dx	1,870 mg/kg

Topsoil

Topsoil will be placed in residential yards and public parks up to one (1) foot thick. Topsoil must meet the requirements listed in Table 4-7.

Table 4-7 Topsoil Requirements

Parameter	Requirements
Sieve Analysis	Screened using sieve no finer than 7/16" and no greater than 3/4"
pH	5.5-7.5
Electrical Conductivity	< 3.0 mhos/cm
Carbon to Nitrogen Ratio	< 15:1
Process to Further Reduce Pathogens Certified for Hot Composting at Compost Facility as outlined in WAC 173-350-220	Yes
Manufactured Inerts	< 1 percent
Sharps	0
Arsenic	≤ 20 mg/kg
Cadmium	≤ 10 mg/kg
Copper	≤ 750 mg/kg
Lead	≤ 150 mg/kg
Mercury	≤ 8 mg/kg
Molybdenum ¹	≤ 9 mg/kg
Nickel	< 210 mg/kg
Selenium ¹	≤ 18 mg/kg
Zinc	≤ 1400 mg/kg
NWTPH-Dx	≤ 1,870 mg/kg

Notes:

¹ If required under WAC 173-350-220

4.2.6.8 Grading

Excavated areas will be restored to their original grade or to a suitable grade to facilitate stormwater control, as agreed to by BNSF, the Town, and property owners (where applicable). Grading plans will be presented as part of subsequent design plans. Structural fill will be placed in lifts and compacted to a minimum density of 95 percent of the maximum proctor density as determined by ASTM D-1557, Modified Proctor.

4.2.7 Bridge Excavation

The Bridge remediation excavation scope of work is described in the JARPA Part 6 for the Bridge Work and includes in-water and upland areas.

4.2.7.1 **Clearing and Grubbing**

Minimal clearing and grubbing is anticipated to be required for performing the Bridge work. All surface objects, brush, roots, and other protruding obstructions, and all trees and stumps will be cleared and/or grubbed from the excavation limits as indicated on Drawings C-207 and C-208. The removed vegetation and debris will be recycled or disposed of at an appropriate municipal landfill.

4.2.7.2 **Demolition**

Asphalt roads, concrete building foundations, slabs, and walkways located within the excavation areas will be demolished and recycled or disposed of at an appropriate CDW landfill. The bridge abutment will be left in tact. The excavation will occur at minimum setback of 5 feet from the bridge abutment in order to avoid direct impacts to its structure and foundation.

4.2.7.3 **Extents**

Excavation will include removing soil and sediment as necessary to reach the estimated areal and vertical extents of impacted soil shown on Drawings C-207 through C-208. Based on these extents, it is estimated that approximately 12,100 cubic yards of impacted soil and 1,400 cubic yards of impacted river sediment will be removed in 2010. The excavation extents and impacted soil and sediment volumes will be refined based on the results of performance monitoring.

4.2.7.4 **Removing Utilities**

A water line is attached under the pier of the bridge and will be temporarily relocated and then restored after project completion. Electrical utilities to the west of the bridge will also be temporarily relocated and then restored after project completion.

4.2.7.5 **Shoring and Barriers**

The excavation near the bridge will occur at minimum setback of 5 feet from the bridge abutment in order to avoid direct impacts to its structure and foundation. Therefore, no structural disturbances to the bridge are anticipated in association with the remediation work. The excavation slopes along the east and west edges of excavation are designed to terminate at the 2009 excavation side slopes. The other excavation walls will be stabilized using sloping methods. Dry side slopes are expected to stand at a stable slope of 1.5H:1V (horizontal to vertical). Excavation side slopes below water are expected to slant at about 2H:1V. During detailed design for the excavation work, sloping/shoring requirements will be further evaluated.

4.2.7.6 **Backfilling**

Upland areas will be backfilled in accordance with the criteria described in Section 4.2.7.6. Backfilling of excavated in-water areas are described in Part 7 of the JARPA and summarized as follows.

Stabilization aggregate topped with structural fill will be used to restore built areas, such as paved roadways. Stabilization aggregate and structural fill, topped with 4' of armor rock will be used as backfill within the excavation area between the bridge abutment and pier. Specifications for in-river backfill will be similar to that used and approved by WDFW during the interim remediation and clean-up work completed along the levee in 2006 and 2007. A rounded sand and gravel with less than 5 percent fines was used to backfill the river from the base of excavation to approximately 18 inches below the final riverbed. The final surface riverbed fill material backfill consisted of washed gravel mixed with cobble. A minimum 1 foot thickness of riverbed material fill will be placed over the armor rock layer. An organic compost amended silt loam, approximately 1' in depth, will be used as a top soil

on the restored levee areas that are to be planted with upland native vegetation. All clean backfill will be acquired from an approved source.

Low-permeability backfill, such as organoclay, could be used in the near vicinity of the bridge abutment and south excavation limits to prevent migration of residual de minimus DNAPL into the Skykomish River.

4.2.7.7 **Grading**

Excavated areas within the bridge excavation work will be graded to generally match the pre-excavation conditions.

4.2.8 **FMC East Wetland Remediation Excavation**

The FMC East wetland Option 1 remediation excavation scope of work is described in the FMC East SDR Section 4, the *FMCZ East Wetland Restoration Plan*, which is *FMC East SDR Appendix A*, and the 2009 EDR Section 4. The applicable sections are described in this section. The FMC East wetland Option 2 remediation excavation scope of work will be described in an SDR addendum if this option is selected.

4.2.8.1 **Clearing and Grubbing**

Clearing and grubbing and other site preparation for the FMC East Wetland remediation is described in FMC East SDR Section 4.1.3 and in FMC East SDR Appendix A Sections 3.1 through and 3.3.

4.2.8.2 **Demolition**

The barn on BNSF property identified as King County lot 5061300165, as well as building foundations, slabs, and walkways within the SDZ and RYZ Excavation area will be demolished and recycled or disposed of at an appropriate CDW landfill.

4.2.8.3 **Extents**

Excavation extents are described in FMC SDR Section 4.2.3 and in FMCZ East Wetland Restoration Plan Section 3.3.

4.2.8.4 **Removing Utilities**

Utilities impacts are described in FMC SDR Section 4.1.15.

4.2.8.5 **Shoring and Barriers**

Shoring and excavation stabilization for the FMC East Wetland remediation are described in FMC SDR Section 4.1.4 and FMCZ East Wetland Restoration Plan Sections 3.1 through and 3.3.

4.2.8.6 **Backfilling**

Backfilling of excavated areas is described in the FMCZ East Wetland Restoration Plan Section 3.3.

4.2.8.7 **Grading**

Grading of excavated areas is described in the FMCZ East Wetland Restoration Plan Section 3.3.

4.2.9 FMC West Wetland Remediation Excavation

The FMC West Wetland remediation excavation scope of work is described in the FMC West Wetland SDR Section 4.

4.2.9.1 Clearing and Grubbing

Clearing and grubbing for the FMC West Wetland remediation is described in FMC West Wetland SDR Section 4.2.4.2.

4.2.9.2 Fish and Wildlife Mitigation

Site preparation particular to the FMC West Wetland remediation, including but not limited to fish and wildlife exposure mitigation, is described in the FMC West Wetland SDR Section 4.2.4.3.

4.2.9.3 Demolition

Demolition for the FMC West Wetland remediation is described in FMC West Wetland SDR Section 4.2.5.1. It is anticipated that no demolition of structures will be required for FMC West Wetland remediation.

4.2.9.4 Extents

Excavation extents are described in FMC West Wetland SDR Section 4.2.9.

4.2.9.5 Removing Utilities

Utilities impacts are described in FMC West Wetland SDR Section 4.2.4.1.

4.2.9.6 Shoring and Barriers

Shoring and excavation stabilization for the FMC West Wetland remediation are described in FMC West Wetland SDR Section 4.2.9.1.

4.2.9.7 Excavation Dewatering

Excavation dewatering for the FMC West Wetland remediation are described in FMC West Wetland SDR Section 4.2.9.2

4.2.9.8 Surface Water Impacts

Prevention of surface water impacts are described in FMC West Wetland SDR Section 4.2.9.4.

4.2.9.9 Backfilling

Backfilling of excavated areas is described in the FMC West Wetland SDR Section 4.2.10.2 and 4.2.10.3.

4.2.9.10 Grading

Grading of excavated areas is described in the FMC West Wetland SDR Section 4.2.10.4.

4.2.9.11 Wetland Restoration and Mitigation

Wetland restoration is described in the FMC West Wetland SDR Section 4.2.11.

4.2.10 Stormwater Collection System Construction

Stormwater that normally flows from the East wetland into the West wetland will be temporarily diverted around the West wetland during West wetland remediation. Cofferdams will be installed both upstream and downstream of the West wetland excavation prism to isolate the work area from existing surface water flow paths. A temporary breach of the existing berm that separates Maloney Creek from the West wetland will be constructed just upstream of the upper cofferdam. The berm breach will divert clean surface water flow from the undisturbed upstream portion of the West wetland into Maloney Creek. The excavated area with cofferdams will act as a bowl to contain any precipitation caused erosion at the edges of the excavation prism. Biodegradable erosion control matting will be installed as needed to provide temporary erosion control to those portions of the restoration site that will be subjected to more rapidly flowing water after site restoration is complete. Those areas of the restoration that will be subjected to permanent rapidly flowing water will be reinforced with habitat-appropriate erosion-resistant natural materials, such as river rock. Erosion-control fencing will be used to isolate construction access to the work area from adjacent wetlands and properties. Cofferdams and other erosion control measures will be removed at the end of the fish window. Construction access to the West wetland will be rocked if necessary to prevent tracking of soil onto local roadways.

4.2.11 Wastewater Collection and Treatment System Construction

Sanitary sewer infrastructure for the community collection system will be installed at the Shawver and Scisco properties, and in the excavated sections of the West Street ROWs. Infrastructure may include the tanks, piping, pumps, vaults, and electrical appurtenances. These systems are designed by the Town. Construction details will be included in subsequent design plans.

4.2.12 ROW Restoration

Town roads within the 2010 excavation area, as shown in the 2010 Conceptual Restoration Plan (Appendix B), will be restored to King County road standards, as adopted by the Town. Restoration will include backfilling and grading roadways, placing base material, asphalt paving, and installing curbs and gutters at select locations. The approximate locations of sidewalks, utilities, curbs, and gutters have been determined based on the locations of existing curbs and gutters. As was the case with the 2008 and 2009 restoration work, the actual locations of sidewalks, utilities, curbs, and gutters will be determined based on Town comments and by agreement between the Town and BNSF and between the Town and affected landowners. Revised locations and construction details will be provided in 2010 construction plans, which will be submitted to Ecology in accordance with the schedule set forth in CD Exhibit C.

4.2.13 Electrical and Telecommunications Utilities Restoration

BNSF is responsible for replacing utilities to their current or equivalent configuration (i.e., above ground) in accordance with applicable codes. The Town has entered into Schedule 74 agreement with PSE for the conversion of overhead electrical utilities located within the 2010 remediation area and in additional areas. The conversion will include installing underground wiring and pad-mounted transformers in place of pole mounted equipment, installing wiring from transformers to residential meters, and providing stub-ups or junction boxes for connection to street lights and other appurtenances installed as part of the restoration. Per the agreement terms, 60 percent of design and construction costs to complete this scope of work will be paid for by PSE. Payment for the remaining 40 percent will be the responsibility of the Town. Per agreement with the Town, BNSF will also convert select aboveground telecommunications utilities within the electrical utility conversion area to underground. Design drawings for the conversion scope of work will be prepared by PSE and Verizon and incorporated into final BNSF plans.

4.2.14 Replacement of Relocated Structures and Restoration of Remediated Properties

Replacement of relocated structures and restoration of remediated properties will be completed at the conclusion of excavation activities as outlined in Master EDR Section 4.1.10 and as described above in Section 4.2.2 for specific properties.

5.0 Construction Sequencing and Phasing

Construction sequencing and phasing will generally be determined by the General Contractor subject to approval by the P.E. of record (Engineer). Certain restrictions on the work are anticipated including the following.

- Resident access must generally be maintained at all times to all occupied houses. No occupied house can be fully blocked off from all access for any significant period of time. Vehicle access may be restricted to single traffic lanes, or closed in some short-term periods of time (less than one week), and pedestrian access may be guided through active construction zones for safety reasons.
- Emergency access must be maintained at all times to occupied houses.
- Access for firefighting equipment must be maintained to all remaining structures and to houses that are temporarily stored in staging areas.
- FMC East and West Wetland in-water (i.e., inside the wetland delineation boundary) construction activities must be completed within the fish window established under the JARPA permit, approximately July 1 through August 31.
 - Bridge excavation in-water construction activities must be completed within the fish window established under the JARPA permit, approximately July 1 through August 31.

These excavation and remediation activities are largely independent and could be conducted concurrently, or separately, as determined by the Contractor. Some sequencing is time critical or affects pedestrian and vehicle access throughout the Town. The sequencing described below is specific to each excavation/remediation area. It is not intended to be all inclusive, but instead is intended to present the basic components of construction. The sequencing was developed based on the stated restrictions and could be utilized by the Contractor as they develop their approach to the work. However, any suggested work approach will need to follow the restrictions previously stated to be considered a viable approach to the work.

5.1 RYZ Excavation

Excavations on the railyard property will be completed at appropriate times and coordinated with other construction activities. Much of the excavation area is located within the existing SHA. It is anticipated that excavation within the SHA will be conducted in multiple stages, and/or after the completion of off-railyard excavations that require the use of the SHA. The soil excavated from the SHA will be directly placed into rail-cars and will be transported off-site. It is anticipated that the off-railyard excavations will be completed using the approach described below.

- Complete all preparation work within the off-railyard excavation areas
- Prepare to divert traffic on the Railroad Avenue and 5th Street ROWs
- Complete the excavations
- Backfill the excavation area and establish a new driving surface on Railroad Avenue
- Open Railroad Avenue to traffic.

5.2 Bridge Area Excavation

It is anticipated that the bridge area excavation will be completed in one continuous phase.

- Complete all preparation work within the excavation area.
- Close the 5th Street ROW and bridge.
- Divert bridge traffic. Westbound Highway 2 traffic will be diverted approximately 3.2 miles on Old Cascade Highway. Eastbound Highway 2 traffic will be diverted approximately 1.2 miles east on Old Cascade Highway.
- Construct shoring and complete the excavation.
- Backfill the excavation area and establish a new driving surface on 5th Street.
- Open the 5th Street ROW and bridge to traffic

5.3 Levee West End Excavation

It is anticipated that the levee west end excavation will be completed in one continuous phase, and concurrently with the 50 western feet of the schoolyard excavation in 2010 or 2011. The work will be coordinated with the School Building excavation to allow for access to the occupied properties west of 6th Street.

- Complete all preparation work within the excavation area.
- Construct a temporary road on the BNSF-owned parcel (tax lot 5060800070, aka Lyderson Property)
- Close the West River Drive ROW to traffic, while maintaining at least one open traffic lane on Railroad Avenue west of 6th Street. This will give residents access to occupied properties west of the School.
- Construct and complete the excavation.
- Backfill the excavation area and establish a new driving surface on the West River Drive ROW.

5.4 HCC East End Excavation and Barrier Wall Extension

It is anticipated that the HCC east end excavation and barrier wall extension will be completed in a single phase, concurrent with the RYZ excavation in Railroad Avenue east of 3rd Street.

- Complete all preparation work within the excavation area
- Close the south side of the Railroad Avenue ROW located within the excavation extents to traffic, while maintaining one-way traffic on the north side of Railroad Avenue
- Removal all soil exceeding the RL from the NEDZ
- Backfill the excavation area, in conjunction with extension of the HCC barrier, and establish a new driving surface on Railroad Avenue.

5.5 Cascadia Inn Property Excavation

It is anticipated that the Cascadia Inn Property excavation will be completed in one continuous phase, and concurrently with the RYZ excavation in Railroad Avenue east of 3rd Street.

- Complete all preparation work within the excavation area
- Close the north side of the Railroad Avenue ROW located within the excavation extents to traffic, while maintaining one-way (or two-way traffic) on the south side of Railroad Avenue
- Construct shoring and complete the excavation
- Backfill the excavation area and establish a new driving surface on Railroad Avenue.

5.6 FMC East and West Wetland Remediation

It is anticipated that the East and West Wetland remediation will be completed in one continuous phase. The following more detailed description is not intended to be all inclusive, but instead is intended to present the basic components of construction. This phasing is applicable to either FMC East Wetland remediation option.

- Complete all preparation work.
- Prepare the Robinson shed for moving. This includes relocation of residents and building contents, installation of support beams, disconnection of all utilities, and securing structures so that they are ready to move.
- Move the Robinson shed to a location on the Robinson property.
- Construct shoring (if necessary) and complete the excavation.
- Backfill the excavation area.
- Complete restoration activities.

5.7 Traffic Routing and Pedestrian Access

Construction will impact West River Drive, East River Drive, Railroad Avenue, 5th Street, and 6th Street. Some disruption to daily traffic patterns will therefore be unavoidable and some level of disruption and inconvenience for local residents is inevitable.

Vehicle access will be maintained at all times for all occupied residential structures through Town. Postings of road closures will be provided early in the process so planning can occur, and individual notifications will be made prior to full lane closures. Resident's needs will be accommodated as much as possible. Signage related to the project will be that typical of a road construction project with traffic routing and authorized personnel access.

Proposed traffic routing and pedestrian access during 2010 remediation activities is shown on Drawings C-104 through C-106 and on FMC West SDR Figure C-104. These drawings will be submitted for review by all affected agencies and persons, including the fire department, the police department (county and state), residents, and the school. These drawings will be submitted to the Contractor during the bidding process, with the understanding that they will need to evaluate the drawings based on the restrictions presented in this EDR, and either accept the proposed traffic routing and pedestrian access as a viable method, or develop an alternative method that meets all

requirements for approval by the Engineer. If the Contractor requests revisions to traffic routing to accommodate their construction schedule and approach, the revisions will be reviewed by the Engineer and transmitted to the Town, Ecology, and local fire and emergency personnel.

6.0 Construction Quality Assurance

Construction quality assurance (CQA) includes practices to demonstrate that construction activities are completed in accordance with CPS and the regulatory framework described in this EDR. The goals of this section are to:

- Describe the quality program to be implemented
- Describe guidelines for inspection and documentation of construction activities
- Provide reasonable assurance that the completed work will meet the CPS requirements
- Describe how any unexpected changes or conditions that could affect the construction quality will be detected, documented, and addressed during construction.

6.1 Quality Assurance Structure

The quality of construction activities will be demonstrated through an integrated system of quality assurance performed by the Engineer and quality control provided by the Contractor.

6.2 Construction Quality Assurance Responsibilities

6.2.1 BNSF

BNSF is responsible for implementing the remediation activities in accordance with the CD and for ensuring that its Contractor performs construction in accordance with the CD, Master EDR, 2009 EDR, FMC West SDR, FMC East SDR, and CPS. BNSF is responsible for verifying that the Engineer it has retained effectively implements and manages the scope of work detailed in this 2010 EDR.

6.2.2 Engineer

The Engineer is responsible for providing design and engineering services in connection with the project. The Engineer is responsible for implementation of this CQA program. The Engineer will manage Contractors on behalf of BNSF and serve as the primary point of contact with the Contractor for all communications. The Engineer provides submittal review and resolution of design issues as they arise during construction. The Engineer will provide QA through daily monitoring and as-needed inspections to verify the effectiveness of the Contractor's QC program and assure that the quality and CPS are met. The Engineer will assure that the Contractor's QC is working effectively and that the resultant construction complies with the quality requirements. The Engineer is also responsible for formal communications with and submittals to Ecology.

6.2.3 Contractors

The Contractor is retained by BNSF to provide the labor, materials, and equipment required to complete the scope of work detailed in the CPS. Contractors are responsible for quality control and completing the necessary inspections and tests to demonstrate that their work complies with the CPS and the regulatory framework described in this EDR.

6.3 Quality Assurance Monitoring Structure

Quality assurance monitoring includes the following:

- Submittals review
- Protection monitoring
- Inspection and verification
- Construction deficiencies
- Documentation
- Ecology approvals
- QA/QC changes
- Completion reporting.

This section describes these monitoring practices in detail.

6.3.1 Submittals

Contractors will submit one copy of all testing results, quality control reports, other quality control documentation, and Daily Construction Reports to the Engineer. The Engineer will administer and control the processing of Contractor submittals. After being reviewed for completeness, submittal documents will be transmitted to the relevant project staff for review and verification for compliance with contract requirements. The submittal's disposition will be noted on the submittal, which will be signed, dated, and returned to the Contractor. If required, the Contractor will revise the submittal, incorporating the comments and will resubmit it for review and verification for compliance. Submittals will be logged and copies will be retained in the project files.

6.3.2 Protection Monitoring

The protection monitoring requirements applicable to the 2010 EDR scope of work include air and noise monitoring, as described in the 2009 AMP, and worker and public health and safety requirements, as described in the HASP. The Engineer will perform QA oversight of Contractor compliance and related work-area protection monitoring.

6.3.3 Inspection and Verification Activities

6.3.3.1 QC Inspection

The Contractor will perform QC inspections as necessary to control the Project work to the extent necessary to achieve specified quality and ensure conformance with the CPS and Contract Documents.

The Contractor will document inspections in daily reports. The reports will identify inspections conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective action taken or proposed.

6.3.3.2 QC Testing

The Contractor will perform QC testing necessary to control the Project work to the extent necessary to achieve specified quality and ensure conformance with the CPS and Contract Documents. The

Contractor will document QC testing in daily reports. The Contractor will review test results on a daily basis and identify any non-conforming test results for discussion and resolution with the Engineer.

6.3.3.3 QA Testing

QA testing will be completed to verify the adequacy and effectiveness of the Contractor QC testing. QA testing may be performed by the Engineer, on an as-needed basis. In lieu of performing independent tests the Engineer may choose to witness QC testing or conduct tests on split samples from QC testing. Additional testing may be needed to validate the results when QA and QC test results do not compare or have wide variances. The Engineer will document QA testing in daily reports. The Engineer will review QA tests and maintain files for all field QA testing.

Construction Acceptance Criteria

Construction acceptance criteria for materials qualifications, inspection, and testing are established in the CPS. The criteria for materials and equipment have been set by the Engineer in accordance with the applicable codes and standards, and by manufacturers' recommendations. Contractor submittals will document conformance with the acceptance criteria.

Compliance with Handling, Storage, Packaging, Preservation, and Delivery Requirements

The Engineer will inspect the Contractor activities to demonstrate technical compliance in identification, handling, storage, packaging, preservation, and delivery of materials, parts, assemblies, and end products. Related quality records and documents will be maintained by the Contractor.

6.3.3.4 Material Identification and Traceability

The Engineer will monitor the Contractor to demonstrate that identification and traceability requirements are met. Products and materials shall be traced from receipt through all project stages to installation. Documentation such as project control checklists, material receipts, material tracking forms, procedures, sample and test documentation, and reports will be maintained by the Contractor to demonstrate that the applicable material item traceability is maintained. Product identification and traceability requirements are defined in the CPS.

6.3.4 Construction Deficiencies

A deficiency occurs when a material, performed work, or installation does not meet the plans and/or specifications for the project. When material, performed work, or installation is found deficient, the Contractor will demonstrate that the non-conforming material, work, or installation is identified and controlled to prevent unintended use or delivery.

6.3.4.1 Deficiency Notification

The Contractor will notify the Engineer of any minor deficiencies (items that do not require significant rework or repair work to correct, and will not result in significant deviations from required quality standard if corrected immediately) and major deficiencies (major deviations from the CPS and/or accepted standard of quality) immediately upon detection and note the deficiency in daily reports.

6.3.4.2 Deficiency Correction

Minor deficiencies can be corrected on the spot by agreement between the Contractor and the Engineer. Correction of major deficiencies could include removal and replacement of deficient work using methods approved by the Engineer. Deficiency correction will be documented in daily reports.

6.3.4.3 Deficiency Prevention

The Contractor will take preventive actions as necessary to eliminate the causes of potential deficiencies to prevent their occurrence. The Engineer will have the authority to improve the project's work processes to eliminate the causes of potential non-conformities.

6.3.5 Documentation

6.3.5.1 Daily Construction Report

The Contractor will prepare daily construction reports, which will include a summary of the Contractor daily construction activities.

6.3.5.2 Inspection and Testing Reporting Forms

The Contractor and the Engineer will prepare inspection and testing reporting forms. These forms will vary depending on inspection or test type.

6.3.5.3 Record Drawings

The Contractor will submit draft record drawings to the Engineer for review. The Engineer will prepare draft and final record drawings. The Engineer, working with the Contractor, will be responsible for assuring that red-line record drawings are maintained throughout the construction process. These red-line record drawings will be used to update the design drawings to as-built status at the completion of the work.

6.3.5.4 Preparation of As-Built Drawings

The Engineer, working with the Contractor, will be responsible for red-lining construction drawings in the field as preparation for as-built drawings. The as-built drawings will record approved actual field conditions upon completion of the work. The original design drawings will be marked up by the Contractor as the project progresses to indicate as-built conditions. Where there was a change to a specified material, dimension, location, or other feature, the as-built drawing will indicate the work performed.

6.3.5.5 Record Maintenance

The Engineer will maintain copies of all quality-related documentation on site. The Contractor will provide electronic or paper copies (suitable for scanning) of QC documentation. The Contractor will maintain all original QC records onsite until the project is completed.

6.3.6 Field Changes

The Engineer or Contractor may propose changes to the QC/QA procedures if it becomes apparent that the procedures or controls are inadequate to support work being produced in conformance with the CPS or are deemed to be more excessive than required to support work being produced.

6.3.7 Completion Reporting

Upon completion of remedial activities, the Engineer will submit a final as-built report. The report will include as-built drawings, work accomplished, materials used, inspections and tests conducted, results of inspections and tests, nature of defects found (if any), and corrective actions taken.

7.0 References

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Appendix A

2009 Supplementary Investigation Summary

Attachment A-1

Data Tables

Attachment A-2

Laboratory Reports

Please note: Laboratory and data validation reports are provided on the attached CD.

Attachment A-3

Boring Logs

Appendix B

2010 Conceptual Restoration Plan