RECORD OF DECISION

South Medford Interchange Project
Interstate 5 (Pacific Highway)
Medford, Oregon
Key Number 07199

U.S. Department of Transportation, Federal Highway Administration
and
Oregon Department of Transportation

June, 2004

DECISION

This Record of Decision (ROD) provides the basis for a decision by the Federal Highway Administration (FHWA) on the proposed South Medford Interchange (SMI) Project. The SMI project area is located at milepost 27 on I-5, approximately 43 kilometers (27 miles) north of the border between Oregon and California.

After consideration of each proposed alternative's impacts to the built and natural environment as well as input received from stakeholders, and with unanimous support from the Citizen's Advisory Committee, the Solution Team, and the Oregon Department of Transportation (ODOT), the FHWA selects the "Highland" Alternative for implementation.

Discussion of conceptual alternative development, narrowing of alternatives, assessment of alternative impacts, and identification of the preferred alternative can be found in the 2001 Draft Environmental Impact Statement (DEIS) and 2004 Final Environmental Impact Statement (FEIS), which are incorporated herein by reference. These documents can be viewed and/or downloaded at http://www.odot.state.or.us/region3public/smedfordinterchange/.

A brief description of the Highland Alternative, other alternatives considered, and decision criteria is included immediately below, followed by Section 4(f) Findings, Measures to Minimize Harm, and Monitoring of Mitigation and Conservation Measures. Responses to comments on the FEIS are located in Appendix A.

DESCRIPTION OF THE SELECTED (HIGHLAND) ALTERNATIVE

See Chapter 2 of the FEIS for the complete description of the Highland Alternative. The Selected (Highland) Alternative will relocate the I-5/Barnett Road interchange 580 m (1,903 feet) to the south of the existing interchange (see FEIS Figure 2-1, page 2-9). The existing Barnett Road overpass crossing I-5 will remain, but the existing I-5 on- and off-ramps will be removed. The estimated project construction cost is expected to be $52 million (refer to 2002-2005 Oregon Statewide Transportation Improvement Program at www.odot.state.or.us/stip/).

The new interchange structure will be a Single Point Urban Interchange (SPUI) design. A SPUI is similar to a typical diamond interchange except that the on- and off-ramps are controlled by a single traffic signal, which allows left turns from the ramps onto and off of the interchange, to operate concurrently. This allows more vehicles through the interchange while utilizing less right-of-way. Design modifications have been made to the SPUI ramps since the FEIS release. The ramps have been lengthened, requiring some additional fill as well as longer bridge sections and retaining walls. The ramp lengthening was needed to meet geometric requirements after considering environmental constraints, safety, and design, and will take place within the existing I-5 right-of-way.

The Highland Alternative will include new streets that will connect the interchange structure to Barnett Road at its intersection with Highland Drive and to Oregon 99 at its current intersection of Garfield Street and Belknap Road. To access the interchange, Garfield Street will be extended from the existing intersection of Oregon 99 and Belknap Road northeast approximately 740 meters (2,430 feet) to the proposed interchange overpass of I-5. Improvements will also be made to Oregon 99 between Stewart Avenue and Charlotte Anne Drive. Properties to the west and east of the Highland Drive connector and south of Larson Creek could be accessed under the bridge over Bear Creek. The Selected Alternative will include consolidating three driveway accesses into one for the motel and diner located at the southwest corner of Barnett Road and Highland Drive.

A new bridge will be constructed over Larson Creek along the Highland connector. The existing culvert in Lazy Creek will be replaced with a bridge. The existing Barnett Road Bridge across Bear Creek will be replaced with a wider bridge to accommodate additional lane requirements and sidewalks. Bridges crossing Bear Creek will span the stream as much as practicable. Roadway fill is not proposed in the floodway as designated by the Federal Emergency Management Administration (FEMA). Thirty percent of the bridges throughout the project will require piers within the floodway. Construction bridges will also likely require temporary piers in Bear Creek, which will be removed after completion of bridge construction.

The project will include two stormwater detention ponds, water quality treatment facilities, and a bioswale to manage the runoff from new surfaces as well as existing impervious surfaces in the project area. The ponds will collect and hold the stormwater runoff, provide water quality treatment benefits, and empty water into Bear Creek at two points, at a rate no faster than currently occurs. Additionally, pond design will allow infiltration of some stormwater into the ground.

Sidewalk, bicycle lane, and existing travel lane improvements along the east side of Oregon 99 will be extended from south of Garfield Street to Charlotte Anne Drive. Pedestrian access will be maintained along the east side of the highway with connections to other sidewalks west of the highway provided at Oregon 99 intersections with Garfield Avenue and Stewart Avenue. Continuous sidewalks and bicycle lanes will be constructed between Barnett Road/Stewart Avenue and Barnett Road/Ellendale Drive intersections. As a result, all new facilities will include full bicycle and pedestrian accommodations.

Directional signage will be installed at the interchange to guide traffic from the interchange towards South Gateway Center area and downtown Medford via the Garfield Street connector, and to regional medical centers on Barnett via the Highland Drive connector. To discourage interstate-related travelers from using the community's Bear Creek Park as a rest stop, the interchange signage will not include directions to the park.

The Highland Alternative will contribute to local and regional economies by providing improvements that will facilitate the movement of freight and make the interchange area more user-friendly for people seeking services in the general project area. In addition, this alternative will enhance the aesthetic quality of the interchange by providing clear roadway connections, directional signage, and landscaping.

ALTERNATIVES CONSIDERED

The primary alternatives to the proposed action included the Highland Alternative and Ellendale Alternative. The "No-Build" Alternative was also included for comparative purposes. Alternatives considered but dismissed from further evaluation are discussed in the 2001 DEIS, beginning on page 2-16.

The No-Build Alternative

The No-Build Alternative would maintain the existing interchange between I-5 and Barnett Road. Planned Transportation System Management investments would be slightly above current levels. No expansion of Transportation Demand Management programs would occur. Transit service would continue in accordance with the Regional Transportation Plan.

The No-Build Alternative would also include several other projects that have been recently developed, are currently being constructed, or are anticipated to occur, regardless of the outcome of the South Medford Interchange Project. With respect to future roadway projects, the No-Build Alternative would include projects that are in the Tier 1 project list in the *Rogue Valley Regional Transportation Plan.*

Severe congestion associated with the No-Build Alternative would result in unsafe traveling conditions and would deter travelers. Consequently, businesses and industry that are presently located in the general vicinity of the interchange (particularly those associated with regional services or that are reliant on efficient distribution of goods and services regionally) would suffer adverse economic impacts.

Highland Alternative

The Highland Alternative is discussed in the Description of the Selected Alternative section above and in the FEIS, beginning on page 2-3.

Ellendale Alternative

The Ellendale Alternative would be located approximately 950 meters (3,117 feet) to the south of the existing South Medford Interchange. Additional turn lanes would be added at several locations on existing roads. Dyer Road at Ellendale Drive would be relocated to the south. A bridge over Larson Creek would replace the existing culvert. The estimated cost range of the alternative was expected to be between $56 and $57 million. A full description of the Ellendale Alternative can be found in the 2001 DEIS, beginning on page 2-2.

Criteria Used for Determination of Selected Alternative

Project development was primarily guided by values concerning transportation utility, social issues, economics, land use, avoidance of parks and recreational impacts, and biological considerations. Alternative evaluation criteria were developed from the Purpose and Need statement as well as project goals and objectives. The evaluation criteria provided a way to define, assess, and compare options for the South Medford Interchange. The most important criteria considered during alternative selection included:

- Satisfy the transportation purpose and need for the proposed action;
- Cause the least overall harm to the natural environment, with the least adverse impacts to wetlands, riparian areas, and water quality/quantity issues;
- Cause the least overall harm to the socioeconomic environment, with the least adverse impacts to housing, minority and low income populations or communities, and businesses (including access);
- Have the least amount of impact to Section 4(f) properties;
- Require substantially fewer public funds for construction; and
- Address, through reasonable and feasible mitigation measures, public concerns regarding localized and community-wide impacts, as expressed in public comments.

A full description of the alternative development process can be found in the FEIS, beginning on page 2-1.

A primary goal of NEPA is to balance the natural environment and human welfare. Inevitably, the act of balancing impacts sometimes requires that choices be made regarding impacts to competing resources. Project evaluation criteria served as a valuable tool for comparing the relative costs and benefits of project alternatives.

Environmentally Preferrable Alternative

The Selected (Highland) Alternative is both the agency-preferred alternative and the environmentally preferable alternative because it meets the project purpose and need, and

balances overall impacts. The Highland Alternative causes the least harm to the natural and socioeconomic environment.

SECTION 4(F) FINDING

Section 4(f) properties are publicly owned parks, recreation areas, wildlife and waterfowl refuges of national, state, or local significance, and historic resources that are eligible for listing in the National Register of Historic Places or that are locally significant. Of the alternatives evaluated that are prudent and feasible, all would require the use of Section 4(f) property. Five Section 4(f) properties are located within the Highland Alternative project area. Two recreational properties (Bear Creek Park and Bear Creek Greenway) and three historical properties (Veteran's Park, Central Oregon Pacific Railroad (COPR) and the Southern Oregon Sales Buildings) would be affected. (Veteran's Park is both recreationally and historically significant.) Conversion of lands protected by Section 6(f) of the Land and Water Conservation Fund Act (LWCF) requires replacement of land or facilities with reasonably equivalent usefulness, value, and location as the property being converted.

In the Section 4(f) Evaluation, alternatives were studied to determine whether there were any feasible and prudent alternatives to avoid the use of each of the Section 4(f) resources. It was determined that none of the complete-avoidance alternatives would meet the project's purpose and need, and therefore, they would not be prudent alternatives. The Ellendale Alternative did not avoid Section 4(f) impacts; it would also have greater impacts on 4(f) resource lands than the Highland Alternative.

Overall Section 4(f) impacts under the Highland Alternative have been reduced from what was initially reported in the DEIS. These design modifications were primarily prompted by public concerns and suggestions from the Citizen Advisory Committee sub-team, which focused on bicycle and pedestrian safety issues. Implementation of minimization measures recommended in the Draft Section 4(f) Evaluation were also incorporated into the Highland Alternative design, and reported in the Final Section 4(f) Evaluation. With these refinements, total impacts to Section 4(f) lands from the Highland Alternative will require approximately 0.1 hectares (0.24 acres) less than the Ellendale Alternative.

The amount of COPR land impacted by the Highland Alternative, as reported in the DEIS, was minimized to an estimated 0.004 hectares (0.01 acres). The take of that amount of land would not affect the historic nature or continued function of the railroad. Based on refined mapping, the impacts to the Veteran's Park were found to be approximately 0.02 hectares (0.05 acres) higher, even after the minimization measures. However, the impacts to the park will be virtually the same as what was reported in the Draft Section 4(f) Evaluation. The Highland Alternative's design refinements (based on refined mapping) reduced impacts to the perimeter of Bear Creek Park, but added a very narrow strip of park land impacts along Alba Drive due to the improvements to the Barnett Road Bridge. The result was a total use of approximately 0.04 hectares (0.10 acres) of the 40.87 hectare (101 acre) park (less than 0.01 percent of the park).

Based on refined design and mapping, the total use of land in Bear Creek Greenway will increase slightly to 0.18 hectares (0.44 acres) under the Highland Alternative (compared to what was

reported in the DEIS). The Ellendale Alternative would have required approximately 0.23 hectares (0.56 acres) of Bear Creek Greenway land.

The Highland Alternative minimizes harm to 4(f) and 6(f) resources to the greatest extent possible. Where the Highland Alternative unavoidably impacts 6(f) properties, property of equivalent value and usefulness will be purchased as a replacement.

MEASURES TO MINIMIZE HARM

ODOT will design and build into the project all conservation measures and mitigation described in the 2004 FEIS, ODOT's Standard Specifications (Appendix C), and the Biological Opinion (Appendix B). All practicable measures to minimize environmental harm have been incorporated into the selected Highland Alternative for implementation.

The proposed project is located within the environmentally sensitive Bear Creek drainage basin. Consequently, the project has been planned and will be built to provide several measures to minimize adverse impacts to the stream. Key mitigation measures added to the project to reduce impacts due to selection of the Highland Alternative include:

- Proposed bridges will span Bear Creek and, therefore, minimize the number of support piers that must be constructed within the stream's two-year flood channel.
- No net new roadway fill will be added to the 100-year floodway. While bridge priers will be required to be constructed within the 100-year floodplain, no bridge piers will encroach into the environmentally sensitive 2-year flood channel.
- The Highland Alternative will result in minor impacts to wetland and riparian resources, estimated to be approximately 0.04 hectares (0.1 acres) and 0.3 hectares (0.7 acres), respectively. These impacts will be minimized by implementation of conservation measures as required by federal and state regulations protecting wetland values and sensitive species habitat.

The following measures to minimize harm are grouped by subject area.

Traffic, Transportation, and Safety

Opportunities will be explored through final design to minimize right-of-way, land use, socioeconomic, and other impacts further; for example, by using minimum roadway design standards that maintain the highway's safe and efficient operation.

To increase safety for bicyclists and pedestrians, separate and continuous bicycle lanes and pedestrian facilities would be added on both sides of Oregon 99 between the south and north termini of the project. Improvements along Oregon 99 would include relocation of power lines in a manner that would not damage the existing trees in Veteran's Park.

To increase safety and connectivity, bicycle and pedestrian facilities to be constructed adjacent to Bear Creek Park will be designed in coordination with the City of Medford and will integrate with bicycle and pedestrian facilities being developed by the City within the Park.

ODOT will continue to work with Jackson County to provide an interim multi-purpose path through the project area. This will likely involve an Interagency Agreement outlining shared uses of ODOT and County properties for a combination of multi-purpose uses such as path use and ODOT facility maintenance.

Directional signage will be installed at the interchange to guide traffic from the interchange towards South Gateway Center area and downtown Medford via the Garfield Street connector, and to regional medical centers on Barnett via the Highland Drive connector. To discourage interstate-related travelers from using the community's Bear Creek Park as a rest stop, the interchange signage will not include directions to the park.

Land Use

Future design efforts will be focused on how to avoid or minimize impacts to the wastewater pipe that parallels Bear Creek. The project team will coordinate with the Bear Creek Valley Sanitary Authority to identify special characteristics and maintenance requirements associated with this pipe.

The 1.8-ha (4.4-ac) parcel located to the southeast of the RRRink will be severed from the parent parcel and will not have legal access. The owner will be compensated for the loss of access. If it is determined that the remnant property is uneconomic to the owner, an offer will be made to acquire the remnant.

Rights-of-Way and Relocation

Applicable federal and state laws govern property acquisitions and relocation for highway projects. Relocation assistance will be provided to eligible residents and businesses that are displaced. Property acquisition, relocation assistance, and compensation procedures will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended, the Code of Federal Regulations (2002 CFR Title 46, vol. 1, Title 49, Part 24), Federal Law 91.646, and pertinent state laws, including Oregon Revised Statutes 281.045 to 281.105. A summary of ODOT's land acquisition and relocation programs can be found in Appendix F of the DEIS.

Relocation benefits are quite different for businesses than for residential occupants. Businesses may be eligible for reimbursement of moving costs, search costs and reestablishment costs. The reestablishment benefit is limited to $10,000. Also, displaced businesses may be eligible for a fixed payment in lieu of all other relocation benefits. The fixed payment is limited to $20,000.

Cultural Resources

Areas of potential concern within the project area have been surveyed and cleared of archaeological resource concerns. If any unrecorded historic or prehistoric archaeological resources are revealed during construction activities associated with the Selected Alternative, all work will cease until a qualified, professional archaeologist can ascertain the nature of the discovery. All equipment will be removed from the area of discovery to a minimum of 30 meters (98 feet) from the site, and barrier fencing installed around the discovery, until such discovery is

officially recorded and evaluated by an archaeologist. If the newly discovered resource is determined significant (eligible for listing on the National Register of Historic Places), then appropriate mitigation measures will be developed and approved by the SHPO and ODOT.

Biological Resources

Several biological conservation measures are required by ODOT's *Standard Specifications for Highway Construction*, (see Appendix C). See Appendix B for detailed conservation measures and mitigation required by the National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries) Biological Opinion (BO). The following key mitigation measures are included in the project:

- Construction of two stormwater treatment and detention facilities. These facilities would receive stormwater from new, as well as previously existing, impervious surfaces in the project area;
- Planting and maintaining new riparian vegetation; and
- Removal of undesirable, pre-existing riprap from Bear Creek in the project area.

An additional mitigation measure being undertaken by ODOT is the fencing of approximately 273 meters (895 feet) along Bear Creek near MP 23.07, south of Phoenix, Oregon. This site is upstream of the South Medford Interchange and will provide mitigation for Endangered Species Act (ESA) impacts to Southern Oregon/Northern California coho salmon and their habitat. The property is within the I-5 right-of-way, and is currently used for cattle grazing as permitted by ODOT. The grazing activity near the creek will end with the cessation of the land use permit and the construction of the fence. ODOT maintenance crews will complete fencing to restrict access of cattle. ODOT owns land on both sides of the stream in this area (about 100 acres), and plans to plant the uplands and riparian areas at a later date to further satisfy ESA and Clean Water Act Section 404 mitigation requirements.

Socioeconomics

Mitigation for socioeconomic impacts will include:

- Providing reasonable alternative access to affected properties that will have accesses closed; and
- Compensating at the appraised fair-market value for land and associated improvements that are acquired and for any damages to owners' remaining property due to the acquisition.

Mitigation for the Barnett Bridge closure will include:

- Installation of traffic signs at decision points notifying the public of the bridge closure;
- A public outreach campaign, and
- A rideshare program.

Mitigation during construction will include:

- On-site traffic management;
- Alternate routing;
- Signage; and
- Project phasing to minimize disruptions to businesses and neighborhoods.

To mitigate the reduction in access to the businesses on the south side of Barnett Road between Bear Creek and Highland Drive under the Selected Alternative, traffic signals will be retained at the intersection of Barnett Road and Alba Drive, and a U-turn for westbound traffic will be provided after the bridge is constructed.

Visual Resources

All mitigation measures to offset visual impacts that involve landscaping will take into consideration opportunities and constraints related to other factors, such as safety, water conservation, weed control, and maintenance cost concerns.

Measures will be implemented to mitigate visual impacts of slopes. Form, texture, and color contrasts in large fill slopes will be reduced to the extent practicable. Measures will include:

- Revegetating slopes with appropriate grasses, shrubs, or trees (preferably native whenever possible) to soften visual discontinuities;
- Considering soil type and depth, suitability for prevailing weather conditions, degree of slope, and safety concerns; and
- Texturing slopes by regularly serrating them with adequate soils (which also enhances revegetation) and scarification through random appearance that introduces surface variation (especially in areas near relatively natural sites, such as the floodway and Bear Creek) to improve moisture retention and revegetation potential.

To lessen the visual impacts of retaining walls and bridge/interchange structures, the project will coordinate treatment themes with the North Medford Interchange Project. It will also coordinate with Medford Urban Renewal Agency (MURA) and the Bear Creek Greenway activities, City of Medford Parks and Recreation Department, and Jackson County Roads and Parks Department for features located within parks or along the Greenway. Based on ongoing coordination regarding thematic approaches, treatments will include:

- Use of treated (painted, stained, pigmented, chemical-pressured, impressed) materials with low color contrast (to blend into the predominate surrounding environment); and
- Use of surface textures as deemed appropriate.

To buffer or screen sensitive viewers from modified and adverse visual elements, the project will limit removal of existing vegetation to the extent practicable, considering construction requirements, safety, hazard mitigation, and maintenance concerns. Vegetation screening is most effective if installed close to the viewer on property otherwise purchased for right-of-way. Specific locations will be field-verified and designed once sufficient design accuracy is achieved.

To lessen visual impacts along creeks, the project will consider the natural appearance desired for the Bear Creek Greenway. Vegetation planted along the creeks to offset visual impacts will also be consistent with the mitigation measures recommended in the Biological Resources section.

To minimize night lighting impacts, consideration will be given to using directional street lighting.

Noise

The following construction noise control measures will be included in the project specifications:

- No construction will take place within 300 meters (984 feet) of an occupied dwelling unit on Sundays or legal holidays and between the hours of 10:00 p.m. and 6:00 a.m. on other days without the approval of the Project Engineer. Some traffic control measures may not be practicable or safe to implement during daytime hours. Completing these measures may require exceptions or refinements to the limitation on hours of construction.
- Each internal combustion engine used for any purpose on the job or related to the job will be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine will be operated on the project without a muffler.
- All equipment will comply with pertinent equipment noise standards of the U.S. Environmental Protection Agency (40 CFR 204).
- No pile driving or blasting operations will be conducted within 900 meters (2,953 feet) of an occupied dwelling unit on Sundays, legal holidays, and between the hours of 8:00 p.m. and 8:00 a.m. on other days, without the approval of the Engineer.
- The noise from rock crushing or screening operations performed within 900 meters (2,952 feet) of any occupied dwelling would be mitigated by strategic placement of material stockpiles between the operation and the affected dwellings or by other means approved by the Engineer.
- Maintenance yards, batch plants, haul roads, and other construction-oriented operations will be placed in locations that will be the least disruptive to the community.
- Should a specific noise-impact complaint occur during the construction of the project, the contractor at its own expense would be required to implement one or more of the following noise mitigation measures as directed by the project manager:
    - Shut off idling equipment.
    - Reschedule nearby construction operations to avoid periods of noise annoyance identified in the complaint.
    - Notify nearby residences whenever extremely noisy work would be occurring.
    - Use portable noise screens to provide shielding for jack hammering or other similar type activities when work is close to noise-sensitive areas.
    - Construction noise limits and mitigation are a city of Medford issue to be negotiated prior to construction.

Air Quality

To minimize combustion emissions during construction, all heavy-duty equipment will be properly maintained.

Operating procedures will be incorporated into project construction to reduce potential sources of fugitive dust from the project area. These will include, but not necessarily be limited to, the following:

- Watering surfaces that might produce dust in dry weather;
- Covering piles of fill material as much as feasible;
- Restricting the size of active piles to the extent practicable;
- Preventing trucks and shovels from dumping material at excessive heights;
- Maintaining roadways;
- Maintaining low vehicle speeds;
- Washing truck wheels; and
- Using aggregate construction entrances.

Hazardous Materials

On the basis of preliminary work completed to date, additional environmental site investigation could be necessary at the Hale Property (located between I-5 and the current eastern terminus of Belknap Road, east of the Highway 99). Soil samples revealed potential subsurface contamination including petroleum compounds and pesticides. Although preliminary conclusions suggest low concentrations of contaminants, a more extended sampling and analysis program at this property will be conducted. If necessary, a remedial action plan would be developed and implemented from information collected.

Any actions taken will comply with ODOT's Hazardous Materials Procedure for Transportation Projects (ENV-16-02). ODOT's *Standard Specifications for Highway Construction* require contractors to develop and implement a Pollution Control Plan to prevent point-source pollution related to contractor operations.

Mitigation measures will include all activities necessary to comply with the Resource Conservation Recovery Act (42 U.S.C. 6901 et seq. (1976)) and the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. s/s 9601 et seq. (1980).

Hydraulics

Mitigation measures to offset adverse impacts to the floodplain and floodway are listed below. These measures will be applicable to the construction stages of the project.

- Placement of bridge piers in the designated floodway will be minimized to the extent practicable.

- Roadway fill will be restricted in the designated floodway.

Because the project, along with the I-5 Bridge Replacement Project, will result in a “no rise” condition, no further mitigation measures are proposed.

Water Quality

Construction Impacts

The project will be subject to the requirements of ODOT’s National Pollutant Discharge Elimination System (NPDES) 1200-CA permit for the discharge of stormwater from construction sites, as well as ODOT’s standard specifications on erosion and pollution control (see Appendix C). The NPDES permit requires the development and implementation of an erosion and sediment control plan. The erosion and sediment control plan will be completed and approved prior to the beginning of construction. Alterations to the plan could be made during the course of the project, subject to the approval of the Engineer. At a minimum, the erosion control plan will call for the placement of features to limit the amount of water flowing across disturbed ground, barriers or settling ponds to trap eroded sediments, temporary ground cover while construction is ongoing, and permanent erosion control upon completion of the project. Periodic inspection of the construction site will be conducted to ensure that erosion and sediment controls are in place and are effective.

To minimize turbidity impacts, mitigation measures will include features such as coffer dams and in-stream silt curtains, as well as designs that avoid or minimize the number of piers in the channel. Restrictions are likely to be imposed by the regulatory agencies on the length of time that elevated turbidity would be allowed from in-stream work.

To avoid contamination by chemical pollutants, pollution control plans will specify the following:

- Construction chemicals and fuels must be stored a minimum of 46 meters (151 feet) from any potential receiving water and will be above the 10-year flood elevation.
- Storage sites must be contained to prevent groundwater, as well as surface water, contamination.
- Clean up and containment materials must be stored on site and be accessible in case of an accident.
- Equipment must be in good working order to minimize the chance of accidental leaks.
- Equipment used in water needs to be cleaned of dirt, oil and grease prior to entering the water.
- Green or curing concrete will not come in contact with streams. Water that has come in contact with curing concrete will not be discharged into streams.
- Heavy equipment working within in-stream isolation areas or over streams will be required to be diapered.

Post-Construction Impacts

Effective treatment and detention of stormwater for 140 percent of the new impervious surface area will be provided.

Mitigation for impacts to low flows is difficult. Stormwater treatment and detention facilities will be designed to incorporate or allow for subsurface infiltration.

MONITORING OF MITIGATION AND CONSERVATION MEASURES

FHWA and ODOT will comply with the NOAA Fisheries BO by ensuring the completion of a comprehensive monitoring and reporting program to confirm that the BO is meeting its objectives of minimizing take and adverse effects to designated critical habitat from permitted activities. A five-year monitoring and maintenance plan will be put in place, which will include:

- A written schedule to visit the restoration site annually for five years or longer as necessary to confirm that the performance standards are achieved. Despite the initial five-year planning period, site visits and monitoring will continue from year-to-year until the FHWA certifies that site restoration performance standards have been met.

- During each visit, inspect for and correct any factors that may prevent attainment of performance standards (e.g., low plant survival, invasive species, wildlife damage, drought).

- Keep a written record to document the date of each visit, site conditions and any corrective actions taken.

FHWA and ODOT will maintain compliance with US Army Corps of Engineers and Oregon Division of State Lands wetland permit monitoring program in accordance with the requirements that will be identified in the permits. A Water Quality Facility Maintenance Plan will be developed to ensure continued proper function of the water quality ponds.

COMMENTS ON FINAL EIS

Summaries of substantive new comments on the FEIS, and responses to those comments, can be found in Appendix A. Several comments received reiterated concerns about topics previously addressed in the FEIS. The introduction to Appendix A also includes a comprehensive summary of DEIS and FEIS coverage of potential local traffic impacts. Please also see FEIS Chapter 7 for detailed comments and responses received on the DEIS.

RECORD OF DECISION APPROVAL

Based on the systematic, interdisciplinary analysis contained in the South Medford Interchange DEIS and FEIS; careful consideration of social, economic, and environmental factors; and input received from other agencies, organizations, and the public; it is the decision of the FHWA to approve selection of the Highland Alternative as the Selected Alternative for the South Medford Interchange Project.

June 21, 2004

Date

FHWA Administrator

APPENDIX A: COMMENTS AND RESPONSES

Summaries of substantive new comments on the FEIS, and responses to those comments, can be found in this appendix. The FEIS also contains detailed comments and responses received on the DEIS.

Responses to comments are provided to three parties that sent in letters on the FEIS; the Eastside Neighborhood Association, Mr. Arnold Landau, and David Wright Tremaine LLP representing the Rogue Valley Manor, Inc.

Comments Regarding Local Traffic

Several comments on the DEIS were received regarding potential traffic impacts to neighborhoods, community features, and local street systems. These comments were primarily addressed in the FEIS Responses to Public and Agency Comments (Chapter 7), as well as through design refinements associated with CAC sub-team recommendations.

For the original analysis of potential local traffic impacts associated with project alternatives, please see DEIS Chapter 4, pages 4-1 to 4-7, pages 4-9 to 4-11, and pages 4-18 to 4-26. This information referenced in Chapter 4 is based on technical reports prepared for Traffic and Transportation, Land Use, and Socioeconomics. These reports are available by request to ODOT Environmental Services, 1158 Chemeketa St. NE, Salem, OR, (503) 986-3477.

Impacts reported in the FEIS were associated primarily with design refinements to alternatives. Where impacts as reported in the DEIS changed, the FEIS reported such changes. With respect to potential traffic-related impacts, the primary FEIS discussions of interest are on pages 3-9 to 3-10 (Traffic Impacts), pages 3-10 to 3-11 (Land Use Impacts), and pages 3-13 to 3-18 (Socioeconomic Impacts).

Chapter 7 of the FEIS (Reponses to Public and Agency Comments addressed several comments related to potential local traffic impacts. The most relevant of these are found on FEIS page 7-76 / line 275, page 7-110 / line 403, page 7-112 / line 415, and page 7-121 / line 474. Other related responses included page 7-49 / line 190, page 7-53 / line 193, page 7-54 / line 202, page 7-55 / line 203, page 7-57 / line 211, page 7-70 / line 302, page 7-76 / line 275, page 7-85 / line 296, page 7-86 / line 329, page 7-117 / line 454, and page 7-132 / line 431.

COMMENT SUMMARY	RESPONSE TO COMMENT
Category: Alternative Selection	
Concern was expressed that the Ellendale Alternative was presented by FHWA and ODOT as a "strawman" alternative in violation of a "two-build-alternative requirement".	NEPA requires that a "reasonable range" of alternatives be included in an EA or EIS analysis. As reported in the DEIS (pages 2-16 to 2-23), conceptual alternatives were developed collaboratively and gradually. Because only the Highland and Ellendale Alternatives satisfied the project's transportation Purpose and Need, the remaining conceptual alternatives were not considered "reasonable" and were dismissed from further consideration. For example, as reported in DEIS Chapter 2 (page 2-20) a community-originated concept, the South Stage Road Concept, was considered along with several other concepts, and was rejected, in major part, because it did not solve capacity problems at the existing interchange. The Solution Team recommended, and ODOT and FHWA concurred, to advance both the Highland and Ellendale Alternatives to the DEIS for more detailed analysis. Until detailed analysis was completed, there was not sufficient information to determine the preferred alternative. Please see DEIS Chapter 2 and FEIS Chapter 2 for description of alternative development process. Also see FEIS Comments and Responses on p. 7-56, line 210; p. 7-55, line 204; and p. 7-34, line 108.
Category: Flood Impacts	
Concern was expressed regarding potential flood impacts.	Please refer to FEIS Chapter 3, pages 3-29 and 3-30 regarding assessment of flood impacts resulting from fill placement and removal. Studies concluded that no substantially adverse effects to the floodway are expected, and no revision to the floodway boundary would be needed. Mitigation measures that might otherwise affect adjacent properties, such as compensatory excavation of flood storage areas, are not proposed. Also see FEIS Comments and Responses on p. 7-16, lines 36 and 39; and p. 7-17, line 40.
Category: Noise	
Concern was expressed regarding the conclusion to not build sound walls along Highland Drive.	Sound walls to mitigate the noise impact would be ineffective along Highland Drive because of the breaks that would be required due to driveway access to the street. Please see FEIS page 3-21, and line 85, page 7-26.
Concern was expressed about noise impacts to other existing and planned facilities and properties.	Please refer to the summary documentation in the DEIS and FEIS regarding the noise analysis conducted for the project with specific information regarding analysis conducted addressing specific resources, as well as the *Noise Technical Report* prepared

	for the project. Also, please refer to FEIS Chapter 7, line 89, page 7-28.
Category: Public Involvement	
Concern has been expressed about the manner in which the Citizens Advisory Committee was developed.	Please refer to DEIS Chapter 6 and FEIS Chapter 5 for summary discussion of the public involvement process for the project. The Citizens Advisory Committee (CAC) for the South Medford Interchange EIS was specifically selected to ensure that a diversity of community interests would be represented in project decision-making. Representatives from ODOT, the Rogue Valley MPO, and URS Corp. (the consultant hired by ODOT to do the EIS) met and decided on a range of interests to be represented on the CAC, and the geographic area from which to solicit membership. Areas of interest and representation that were sought out, included business/property owners, senior citizens, neighborhoods, low-income households, commuters, bike/pedestrian advocates, schools, and recreation/environmental advocates. Mailing addresses surrounding and within the project area were targeted for mail solicitation, which sought CAC representatives for the project. From this large population, a randomly selected sample size of approximately 600 households was mailed the CAC information and application. About 20 percent responded, with about half indicating interest in serving on the CAC. Representatives from ODOT, the MPO, and URS Corporation reviewed the applications in the context of interests represented and geographic distribution, and asked 19 candidates to interview. After interviews, 16 candidates were asked to serve on the CAC. All candidates accepted.
Concern was expressed over the format of public meetings.	There were several public meeting formats used during the SMI project. All appropriate public involvement procedures were followed and techniques appropriate to the venue and format were used to both inform the public about the project, and to obtain public input regarding the project. For a detailed description of the public involvement process, please see DEIS Chapter 6 and FEIS Chapter 5. For additional responses to comments regarding the extensive public involvement process, please see FEIS pages 7-58 through 7-61.
Concern was expressed regarding access to project documents and the need to use a Freedom of Information Act (FOIA) request.	To the best of FHWA's and ODOT's knowledge, no FOIA request was ever filed and documents were provided to the public, as requested, in as timely a manner as possible. Information requested from ODOT included output from a traffic model and a review copy of the draft FEIS. The traffic model data was provided after confirming that it was not proprietary. Although it is FHWA's policy not to release preliminary documents, the review copy of the FEIS was released without a FOIA request.

Category: Section 4(f) Resources	
Concern was expressed that alternatives that don't impact Section 4(f) resources were dismissed prior to rigorous evaluation. Additionally, concern was expressed that alternatives, such as the South Stage Road Concept, were dismissed prior to evaluation of Section 4(f) resources.	Alternatives are not advanced or excluded from further study based solely on impacts to Section 4(f) resources. The alternative must first meet the purpose and need for the project. Once an alternative is dismissed because it would not meet the purpose and need, further analysis of that alternative is not required under NEPA. This was the case with the South Stage Road Concept. Please also refer to FEIS pages 7-50, 7-60, and 7-105 for FHWA response to comments on the DEIS regarding South Stage Road options.
Category: Socioeconomics	
Concern was expressed about the extent to which the Preferred Alternative would potentially adversely impact neighborhood cohesion along Garfield Avenue and direct traffic through an established neighborhood.	The western terminus of the proposed Garfield Avenue extension work associated with the SMI project is at the Garfield Avenue/Oregon 99 intersection. Please refer to FEIS Chapter 3, pages 3-34 and 3-35, "Socioeconomics," which summarizes potential cohesion impacts to the area referenced by the comment. The FEIS analysis focuses not only on the effects of the Selected Alternative, but also on the cumulative effects to this area resulting from other recent and future development that might influence the social cohesion of this area, such as future industrial development and roadway systems in the vacant area west of Oregon 99 and along Garfield Avenue. The issue of traffic on Highland Avenue is also addressed in FEIS comment line 290, page 7-83. Garfield Avenue and Highland are both projected to be connectors on the Garfield/ Highland connection, which at the time was listed in the most current Regional Transportation Plan. Garfield is designated as an arterial by the City of Medford and, as such, has been planned for anticipated traffic volumes.
Concern was expressed that the improvements to Highland Drive north of Greenwood Street were advanced by the City of Medford as an independent project in order to avoid the requirements applied to state and federal road projects. Further concern was expressed about the future safety of children accessing	The City of Medford is currently addressing improvements to Highland Drive, the Highland Drive/Siskiyou Boulevard intersection, and Bear Creek Park circulation because of *existing* problems in this area that need to be addressed. This responsibility was recognized through the CAC sub-team activities described in the FEIS. As explained in FEIS Chapter 3, page 3-35, in the spirit of collaboration, ODOT worked with the CAC sub-team and the City of Medford to coordinate the two projects to improve circulation along the streets and access to the park. As discussed in line 202 FEIS, page 7-54, the Selected Alternative will improve overall access opportunities in the vicinity of the park, particularly considering the No-Build and Ellendale Alternative conditions.

Bear Creek Park, particularly the availability of only one signalized intersection accessing the park.	This project would not preclude additional crosswalk signalization by the City of Medford.
Concern was expressed regarding the estimation of effects on property values and the tax base.	While individual economic analyses are not performed for an EIS, economic impacts to the regional and local economies were analyzed.
Concern was expressed that traffic will be directed away from businesses dependant on freeway exposure.	There will be adequate, and in some cases improved, access from a safety and mobility standpoint. Reasonable access will be provided to affected properties as mitigation for altered-access impacts to businesses. Oregon law does not allow payment for loss of freeway exposure, loss of traffic, or changes in access. See discussion on DEIS page 3-17.
Concern was expressed about the right-of-way alignment and land use, particularly to planned commercial, office, hotel and parking uses.	Responses to these concerns were addressed in FEIS Chapter 7, Lines 233, 236, and 468, pages 7-65 and 7-120, respectively. Also, the DEIS and FEIS calculations of estimated right-of-way acquisition needs and land use impacts included acreage requirements associated with these impacts.
Concern was expressed about impacts to a golf range, and possible relocation of utilities serving it.	Through the final design phase of the project, reasonable efforts will be made to reduce direct and indirect impacts to individual properties, including the golf range. Property acquisition, relocation assistance and compensation procedures associated with unavoidable adverse impacts are discussed on page 5-3 and Appendix F of the DEIS. Please also refer to FEIS Chapter 7, lines 246 and 490, pages 7-66 and 7-24, respectively.
Category: Traffic	
Concern was expressed that the FEIS did not sufficiently stress the preference held by many for the South Stage Road Concept and that the transportation modeling was biased against that alternative.	FEIS Chapter 7 – Responses to Comments, provides documentation that many citizens see the South Stage Road Concept as a solution. The response to the comment summary on line 222 (page 7-60) explicitly acknowledges this. Additionally, the comment summary on line 191 (page 7-50) discloses the preference for the South Stage Road Concept as expressed in over 100 specific comments received on the DEIS and acknowledges the "considerable public support" for the concept. Several other comment summaries document further attention to the concept (e.g., pages 7-89, 7-90, 7-104, 7-105, 7-109). Many variations of the South Stage Road Concept were modeled, as described in the June 21, 2001, "Final Traffic and Transportation Technical Report" (FTTTR) for the South Medford Interchange Project. The "Round 3" modeling discussion on page 54 of that report outlines the various South Stage Road concepts that were considered, including:

	• South Stage Road extension over Interstate 5 (overpass only) continuing to North Phoenix Road. (Scenario 21) • South Stage Road extension over Interstate 5 continuing to North Phoenix Road with new interchange at South Stage Road and Interstate 5. (Scenario 22) • East Side Connector with South Stage Road interchange and extension of South Stage Road to North Phoenix Road. (Scenario 3200) Each of the above alternatives included an intermediate connection between the South Stage Road extension and Murphy Road. This was not apparent from the regional model output included in the appendix of the FTTTR since the output only showed the area proximate to the existing interchange. Regional model output includes the South Stage Road extension and Murphy Road connection for these alternatives. The scenario numbers for each alternative are provided in the list above. Concerns about the validation efforts and usefulness of the modeling have been addressed. Specific model validation statistics out of the Medford model documentation include the following: R squared of 0.85 for the region/ a slope of 0.94; and, a standard deviation of 1421.95. Industry standards and the *Travel Demand Model Development and Application Guidelines* (ODOT, June 1995) indicate that the validation is within acceptable ranges for modeling efforts associated with this type of project. All of the South Stage Road concepts analyzed failed to meet the project Purpose and Need. It is not surprising that this would be case. The major traffic flows through the existing interchange are to and from the north. Building an interchange more than a mile south of the current interchange would do very little to alleviate congestion problems which are primarily focused for traffic north of the interchange. As stated in the DEIS, there may, in the future, be reasons to build an interchange at South Stage Road. However, building at South Stage Road would not address the congestion and operational problems at the existing interchange, *and would not meet the purpose and need for the SMI Project.* See also comment lines 378 and 379, on FEIS page 7
Concern was expressed regarding the possible future expansion of the highway from four to six lanes, particularly with respect to the influence this factor had on alternative screening and	DEIS Chapter 2 (pages 2-17 to 2-23) and FEIS Chapter 2 (Pages 2-1, 2-2), contain the primary discussion of the alternative development and narrowing process. No alternatives were eliminated based on criteria related to future expansion of I-5 capacity. Many tools were used for evaluating concepts and alternatives,

selection, and design.	and for decision-making. One tool, a Value Engineering exercise, provided input to project designers, environmental specialists, and decision-makers (no member of the Value Engineering Team was a member of the Solution Team for the project). The Solution Team, ODOT, and FHWA considered this input in their screening of alternatives, and in developing refinements to the project design. This input was not the only, or even primary, factor in designing, screening, or selecting project alternatives. For example, although the Value Engineering Team noted concerns about the Couplet Alternative's ability to accommodate potential future widening of Interstate 5, the alternative was primarily eliminated from consideration as a reasonable alternative in the DEIS largely because it failed to meet the purpose of the project to improve the operation of the South Medford Interchange; especially important was the alternative's inability to solve traffic problems at the Barnett Road/Stewart Avenue intersection. Other considerations included the alternative's substantially greater adverse impacts to parkland and commercial properties, when compared to the other alternatives in the general area. In addition, the Value Engineering as well as further technical design evaluation of the project led to the refinements in the design of the Preferred Alternative, such as extending the ramp lengths, additional fill, and longer bridge sections and/or retaining walls to meet geometric requirements after considering environmental constraints, safety and design allowances, as well as the potential future improvements to I-5.
There was concern that the new interchange would fail to meet the project goals of alleviating traffic congestion at four of the intersections listed in the section "Purpose and Need" of the Draft EIS.	The transportation goals identified at the outset of the NEPA process addressed concerns about existing and future traffic conditions not only at the South Medford Interchange, but also at intersections radiating out from the interchange. These intersections were considered because they allowed consideration of public concerns about broader roadway system functionality. These goals were identified in the DEIS "Purpose and Need" (Chapter 1). As the project analysis became more detailed in accordance with customary analytical procedures and tools, it became apparent that a wide range of traffic problems stemming from the street system lying beyond the logical termini of the project were substantially affecting the ability of some of the intersections to achieve desired volume-to-capacity (v/c) or Level of Service (LOS) goals, even with the proposed interchange improvements. FHWA NEPA guidance recognizes that this might occur during the development and review of projects, and that decision-makers in such cases need to determine which goals and elements are critical to solving the fundamental problem of the project and which goals would be either "desirable" or simply "supportive" (FHWA Memorandum, 'Purpose and Need' in

	Environmental Documents," September 18, 1990). The Solution Team, ODOT, and FHWA determined that, in order for the agencies to achieve their primary transportation mandates in the project area to provide for a safe and efficient flow of goods, services and people at and through the interchange, the critical transportation problems that needed to be solved related to those goals that addressed the v/c goals for intersections directly tied to the interchange during the life of the project. For the Preferred (Highland) Alternative, for example, this includes at least the Barnett Road/Stewart Avenue and Barnett Road/Alba Drive intersections, and the other intersections involving the new connector streets where they first link to the existing street system (i.e., Highland Drive/ Barnett Road and Garfield Avenue/Oregon 99). The Preferred (Highland) Alternative achieves these goals. However, during varying durations of the life of the project, some intersections within the project study area may not achieve the desired v/c or LOS improvement goals due to cumulative local roadway system problems that in large part stem from problems beyond the project study area. As reported in the DEIS, under the Preferred Alternative, this would include the Oregon 99 /Stewart Avenue and Riverside Avenue/Barnett Road intersections. The originally desired v/c or LOS goals at these other intersections within the project study area might be achieved if roadway system improvements were implemented at these other intersections and/or at additional locations that lie beyond the logical termini of the proposed project. The Preferred Alternative would not in itself trigger the need for improvements at these other intersections (i.e., the project would have v/c or LOS as good or better than would occur under the No-Build Alternative), and would not preclude other improvements at those intersections from being implemented. It is the role of the City of Medford, Jackson County, and RVCOG to consider these other improvements in developing Transportation System Plans and Regional Transportation Plans. Elements of this issue were also discussed in FEIS Chapter 2, page 2-5, and lines 382, 387, 395, and 397 FEIS pages 7-106 and 7-108.
Category: Transportation Modeling	
Concern was expressed over the quality of the transportation model and modeling process and the possibility of unstated conditions for design in the FEIS.	FHWA, ODOT, and the RVCOG stand behind the methodology and the accuracy of the transportation modeling. The model, modeling, and review of modeling results used and followed established and customary procedures. Regional models for the project were created using an application called "EMME/2" to generate travel patterns and growth rates needed to create future intersection network volumes. Simulation models were created in the software applications SYNCHRO and SimTraffic, to produce

	Level of Service (LOS) and volume to capacity (v/c) ratios. Specific model validation statistics are consistent with what is accepted in the industry. ODOT's Transportation Planning and Analysis Unit reviewed and recommended adjustments. The modeling issue was addressed in the FEIS, Chapter 7 comment lines 383, 389, 392, 393, and 410, pages 7-106, 7-107, and 7-111; additionally, supportive discussion can be found in the FTTTR for the project. (Technical reports are available from ODOT, 1158 Chemeketa St., NE, Salem OR 97301-2528.) There are no conditions placed on design by FHWA or ODOT that were not discussed in the FEIS. One of the intents of the project is to improve conditions at the interchange for the design life of the project. This can only be done by either increasing the capacity of the existing interchange or reducing the demand on the facility. If an alternative does not reduce traffic demand at the existing interchange, then the existing interchange would have to be rebuilt to provide adequate capacity. Early on in the analysis it was shown that it was not feasible to rebuild the existing interchange in place because of the close proximity of the existing ramps to each other, the proximity of the existing interchange to the Bear Creek Greenway, and because the of the need to acquire substantial portions of a regional shopping center. Alternatives that were rejected because they do not reduce traffic at the existing interchange were rejected because they failed to meet the purpose of the project. Reasons for rejecting alternatives are discussed in the DEIS pages 2-29 and 2-20. FEIS page 2-1 provides further discussion on alternative development and screening processes.
Concerns were brought up regarding the filtering process of the transportation modeling and the reduction of traffic.	Meeting the transportation purpose of the project was a principle criterion. Given that there are substantial existing and future capacity issues at the existing interchange, any alternative that does not replace the existing interchange would have to remove enough traffic from the existing interchange to substantially improve volume-to-capacity ratios to meet standards. Alternatives that do not substantially reduce interchange volumes require the interchange to be replaced. That is the reason why traffic volume reductions were used.
Concern was expressed regarding using the year 2030 for modeling.	The methodology used for the 2030 projections is described in the DEIS page 4-1. The initial concepts and alternatives considered during the screening process were evaluated using 2020 traffic predictions. 2030 projections were used to size the two preferred alternatives to ensure design life of the facilities and to evaluate the environmental impacts of the project footprint. The 2030 land use allocation was developed in cooperation with local agencies to reflect expected future growth throughout the area.

Concern was expressed over why only 'committed' projects, or projects with funding, were used in the traffic analysis.	In accordance with recent FHWA and EPA guidance concerning air quality conformity and federal transportation projects, only the committed (also known as "Tier 1") projects in the regional transportation plan were used in the Round 2 and Round 3 modeling of the analysis. This guidance is related to a federal court decision that prohibits non-committed (Tier 2) projects from being considered as part of the 20- and 30-year traffic analyses. Tier 1 projects have "committed" funding, while Tier 2 projects have no identified funding source. Tier 1 projects alone were not sufficient for reducing traffic within the project area enough to meet the purpose and need of the project.
Concern was expressed whether the Garfield/Highland connection was or was not included in the modeling.	The connection between Highland and Garfield was not included in the aforementioned model runs and was erroneously included in the Alternative figures provided in the DEIS. The Garfield-Highland Connector was modeled in earlier rounds and, based on the analysis, not brought forward.
Concern was expressed that an interchange at South Stage Road was removed from the Regional Transportation Plan (RTP) in response to the SMI traffic study.	The South Stage Interchange was included in the 1995 RTP as a Tier 2 project, not a Tier 1 project. As noted in Appendix F of the current RTP, the South Stage Road Interchange project was not included in the updated RTP because, "DLCD raised the issue that the easterly portion of the project was located outside of Medford's UGB, and therefore required a goal exception. Modeling results showed that this project is not needed, at this time, to address level of service problems."
Category: Visual Resources	
Concern was expressed about the visual impacts of the Preferred Alternative.	General visual impacts were visually presented in DEIS simulations (DEIS page 4-41). Specific impacts to existing properties and planned development were addressed on DEIS pages 4-35 and 4-36. The project may or may not affect views from potential future development by placing structures near planned facilities that may or may not be developed as currently planned, from the local permitting perspective. The potential range of visual effects of the project is not reasonably expected to preclude approved use types on subject properties, particularly considering the infrastructure improvements already included in locally approved planning documents. The project will incorporate aesthetic mitigation measures to minimize impacts to existing adjacent uses and to the general types of uses allowed on currently vacant properties that are adjacent to the roadway improvements. Aesthetic mitigation discussed in the FEIS, pages 4-3 and 4-4, includes reducing the visual impacts of fill slopes by revegetating and texturing slopes where possible and reducing the impact of retaining walls with surface texturing and low-contrast materials.

APPENDIX B: BIOLOGICAL OPINION

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2002/01268

March 16, 2004

Mr. Fred P. Patron
Senior Transportation Planning Engineer
Federal Highway Administration, Oregon Division
530 Center Street NE
Salem, Oregon 97301

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on the Effects of the South Medford Interchange Improvement Project and Bear Creek/Highway 1 (I-5) North and Southbound Bridges Replacement Project, Jackson County, Oregon

Dear Mr. Patron:

Enclosed is a biological opinion (Opinion) pursuant to section 7 of the Endangered Species Act (ESA) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries), on the effects of funding the proposed South Medford Interchange Improvement Project and Bear Creek/Highway 1 (I-5) Northbound and Southbound Bridges Replacement Project, Jackson County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Southern Oregon/Northern California Coast coho salmon, or destroy or adversely modify their designated critical habitat. As required by section 7 of the ESA, NOAA Fisheries includes reasonable and prudent measures with nondiscretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the potential for incidental take associated with this action.

This document also serves as consultation on essential fish habitats (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects to EFH. Section 305(b)(4)(B) of the MSA requires Federal agencies to provide a detailed written response to NOAA Fisheries within 30-days after receiving these recommendations. If the response is inconsistent with the recommendations, the action agency must explain why the recommendations will not be followed, including the justification for any disagreements over the effects of the action and the recommendations.

If you have any questions regarding this consultation, please contact Jim Collins of my staff in the Oregon State Habitat Office at 541.957.3389.

Sincerely,

for Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: Molly Cary, ODOT
Ken Cannon, ODOT
Debbie Timms, ODOT
Greg Holthoff, ODOT
Randy Reeve, ODFW

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

South Medford Interchange Improvement Project and
Bear Creek/Highway 1 (I-5) North and Southbound Bridges Replacement Project,
Jackson County, Oregon

Agency: Federal Highway Administration

Consultation Conducted By: NOAA's National Marine Fisheries Service, Northwest Region

Date Issued: March 16, 2004

Issued by: _____
D. Robert Lohn
Regional Administrator

Refer to: **2002/01268**

TABLE OF CONTENTS

1. INTRODUCTION . . . 1
   1.1 Consultation History . . . 1
   1.2 Proposed Action . . . 1
      1.2.1 South Medford Interchange Improvement Project . . . 2
         1.2.1.1 Garfield Street Bridge over I-5 . . . 3
         1.2.1.2 New Interchange Ramps . . . 3
         1.2.1.3 Highland Drive Extension Bridge over Bear Creek . . . 4
         1.2.1.4 Highland Drive Extension Bridge over Larson Creek . . . 5
         1.2.1.5 Lazy Creek Bridge . . . 5
         1.2.1.6 Barnett Road Bridge . . . 6
         1.2.1.7 Temporary Work Bridges and Access Roads . . . 8
         1.2.1.8 New Impervious Surfaces and Stormwater Management . . . 8
      1.2.2 Bear Creek I-5 Bridges Project . . . 9
         1.2.2.1 Temporary Detour and Work Bridges . . . 10
         1.2.2.2 Bridge Demolition . . . 10
         1.2.2.3 Bear Creek I-5 Bridges . . . 11
         1.2.2.4 New Impervious Surfaces and Stormwater Management . . . 11

2. ENDANGERED SPECIES ACT . . . 11
   2.1 Biological Opinion . . . 11
      2.1.1 Biological Information . . . 11
      2.1.2 Evaluating Proposed Actions . . . 12
         2.1.2.1 Biological Requirements . . . 12
         2.1.2.2 Environmental Baseline . . . 13
      2.1.3 Analysis of Effects . . . 14
         2.1.3.1 Effects of the Proposed Action . . . 14
         2.1.3.2 Effects on Critical Habitat . . . 17
         2.1.3.3 Cumulative Effects . . . 18
      2.1.4 Conclusion . . . 18
      2.1.5 Reinitiation of Consultation . . . 19
   2.2 Incidental Take Statement . . . 19
      2.2.1 Amount or Extent of the Take . . . 19
      2.2.2 Reasonable and Prudent Measures . . . 20
      2.2.3 Terms and Conditions . . . 21

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT . . . 33
   3.1 Background . . . 33
   3.2 Identification of EFH . . . 34
   3.3 Proposed Action . . . 35
   3.4 Effects of Proposed Action . . . 35
   3.5 Conclusion . . . 35
   3.6 EFH Conservation Recommendations . . . 35

3.7 Statutory Response Requirement 36
3.8 Supplemental Consultation 36

4. LITERATURE CITED 37

1. INTRODUCTION

1.1 Consultation History

On October 28, 2002, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a biological assessment (BA) and a request from the Federal Highway Administration (FHWA) for Endangered Species Act (ESA) section 7 formal consultation for funding the South Medford Interchange Improvement (SMI) Project and Bear Creek/Highway 1 (I-5) Northbound and Southbound Bridges Replacement Project. During initial review of the BA, NOAA Fisheries concluded that additional project information was needed to complete consultation. On November 12, 2003, NOAA Fisheries received an updated BA. This biological opinion (Opinion) is based on the information presented in the BA, site visits, and discussions with the applicant. The project area is near the city of Medford, Oregon, along Highway 1 (I-5) at road mile 27.

The FHWA has determined that Southern Oregon/Northern California Coast (SONC) coho salmon (*Oncorhynchus kisutch*) occur within the project area. The SONC coho salmon were listed as threatened under the ESA on May 6, 1997 (62 FR 24588), critical habitat was designated on May 5,1999 (64 FR 24049), and interim protective regulations were issued under section 4(d) of the ESA on July 18, 1997 (62 FR 38479). Critical habitat is designated to include all river reaches accessible to listed coho salmon between Cape Blanco, Oregon, and Punta Gorda, California. Excluded are areas above specific dams or above longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for at least several hundred years). The FHWA, using methods described in *Making ESA Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996), determined that the proposed action is likely to adversely affect SONC coho salmon.

This Opinion is based on the information presented in the BA and developed through correspondence to obtain additional information and clarity. The objective of this Opinion is to determine whether the Oregon Department of Transportation's (ODOT) proposed actions to improve the South Medford Interchange and replace two Interstate 5 (I-5) bridges over Bear Creek are likely to jeopardize the continued existence of SONC coho salmon, or destroy or adversely modify critical habitat. This consultation is undertaken under section 7(a)(2) of the ESA, and its implementing regulations, 50 CFR Part 402.

1.2 Proposed Action

The proposed action is described in two segments. The South Medford Interchange Improvement Project (SMI) and the Bear Creek I-5 Bridges Project are described separately in the proposed action. These two projects are batched together because they are proposed by the same action agency and are within the same action area.

1.2.1 South Medford Interchange Improvement Project

The existing South Medford Interchange is at the Barnett Road Interchange at Exit 27 on I-5 in the City of Medford, Oregon (the City), and serves as one of two points of access between the City and the highway. The facility serves as the south gateway to the City, and it is a key link to future expansion of the City's economic base. Its importance has led to increased use, which has resulted in unacceptable levels of congestion.

The proposed SMI project will involve the construction of a new interchange approximately 1,903 feet south of the existing Barnett Road interchange. The existing Barnett Road overpass of I-5 will be retained, although the existing interchange would be decommissioned and its ramps to I-5 removed. The new interchange will involve a Single Point Urban Interchange (SPUI) bridging of I-5. This type of interchange would concentrate all of the turning movements associated with the facility on the structure rather than distributing them at separate intersections associated with off-ramps and on-ramps or at merging lanes, as are commonly seen along the highway.

To access the interchange, Garfield Street will be extended from the existing intersection of Highway 99 (Hwy 99) and Belknap Road northwest approximately 2,430 feet to the proposed interchange overpass of I-5. Referred to as the Garfield Street Extension, this new roadway will include four lanes with a raised median and exclusive turn lanes at intersections. From Hwy 99, the Garfield Street Extension will extend approximately 0.46 miles northeast to the proposed interchange. From the proposed interchange structure, Highland Drive will be extended approximately 0.26 miles to Barnett Road. The Highland Drive Extension will require new bridge crossings of Bear Creek and Larson Creek. A 6-foot sidewalk and 6-foot bike lane/shoulder are proposed for both sides of the Garfield Street and Highland Extensions. The sidewalks across all bridges will be 7 feet wide.

In addition to the Garfield Street and Highland Drive Extensions, the existing alignment for Center Drive in the southern portion of the project area will be relocated to provide safe and functional spacing between intersections along Garfield Street. The current alignment of Center Drive is too close to the existing Hwy 99 and Belknap Avenue intersection to provide adequate vehicle function. Portions of Center Drive will be modified to provide access to existing development. Credit Union Drive will be modified to reconnect to either Center Drive or an internal access road.

Improvements to Hwy 99 are proposed from the existing Hwy 99/Stewart Avenue intersection south to Charlotte Anne Road, which is approximately 1,230 feet south of the existing Hwy 99/Belknap Road intersection. These improvements include an additional northbound (NB) left turn lane on the south leg of the Stewart/Hwy 99 intersection and an additional southbound (SB) left turn lane on the north leg of the Belknap/Hwy 99 intersection. The turn lane improvements will widen the highway on both sides.

New off-ramps and on-ramps will be constructed to connect with the interchange overpass. A new SB on-ramp to I-5 and a new NB off-ramp from I-5 will be constructed over Bear Creek.

Environmental impacts associated with the SMI project are being evaluated through the National Environmental Policy Act (NEPA) process. A Draft Environmental Impact Statement (DEIS) was completed and distributed for comment in December 2001. The Final Environmental Impact Statement (FEIS) is presently being refined.

Construction of the proposed project will require the installation or replacement of eight bridges within the project area, including four new crossings of Bear Creek or its tributaries. New bridge construction will include the main Garfield Street/Highland Avenue Extension overpass of I-5, a new SB on-ramp to I-5 bridging Bear Creek, a new NB off-ramp from I-5 bridging Bear Creek, and a new NB on-ramp to I-5. The new SB off-ramp from I-5 will be constructed on raised fill. Other new bridges include a new bridge over Bear Creek and Larson Creek in the northern portion of the project area for the Highland Drive Extension. The existing Barnett Road Bridge over Bear Creek and the existing Highland Drive box culvert on Lazy Creek will be replaced.

With the exception of the Lazy Creek crossing, all of the bridges will be constructed with precast concrete beams and cast-in-place concrete decks. The new bridge over Lazy Creek will be a single-span, cast-in-place concrete slab. Foundations for the bridges are all expected to be constructed using drilled shafts and/or steel piles. Three of the 26 new permanent bents will be constructed below the ordinary high water mark (OHWM), while two existing bents and one box culvert will be removed from below the OHWM. In addition, 18 temporary bridge bents will be constructed below the OHWM. Some riprap will be required for scour protection on several of the bridge structures.

1.2.1.1 Garfield Street Bridge over I-5

The proposed bridge carrying Garfield Street over I-5 will form the center of the new interchange. All of the new interchange ramps will be aligned to meet at the top of this bridge. The proposed Garfield Street Bridge will be a single-span, precast-prestressed bridge structure, approximately 136 feet long and 263 feet wide. The top of the proposed bridge structure will be 25 feet above the existing travel lanes of I-5. Retaining walls will be constructed on both the NB and SB approaches of the bridge to allow the ramps to remain as close as possible to I-5, thereby minimizing the overall project footprint, reducing the span length, eliminating the need for a mid-span support, and facilitating this specific type of interchange geometry. The bridge bents and retaining walls will be installed approximately 328 feet from the OHWM of Bear Creek. This phase of the project will take place outside of designated critical habitat.

1.2.1.2 New Interchange Ramps

The new interchange will be constructed approximately 400 feet northwest of where Bear Creek passes under I-5. Construction of the new interchange will require the construction of two off-ramps and two on-ramps to provide full access to I-5. Due to the proposed height of the

interchange and the proximity to Bear Creek, three of the four proposed ramps will be supported by bridge structures. Two of the ramps, the SB on-ramp to I-5 and the NB off-ramp from I-5, will require new bridge crossings of Bear Creek.

The proposed SB on-ramp to I-5 and the proposed NB off-ramp from I-5 will extend southeast from the proposed interchange along the I-5 alignment, crossing over Bear Creek. The proposed ramp bridges will be constructed outside of the existing bridges that carry I-5 over Bear Creek.

Garfield Street Ramp to I-5 SB

The proposed Garfield Street Ramp to I-5 SB over Bear Creek will be a four-span, precast-prestressed bridge structure approximately 417 feet in length. The width of the ramp will taper from 38 feet at its northern end to 33.5 feet at its southern end. The bottom of the bridge will be approximately 13 feet above the OHWM. The proposed ramp will have five bents. One bent, consisting of three drilled shafts, will be constructed below the OHWM of Bear Creek for a total stream bottom disturbance area of approximately 21 square feet. The other four bents for the ramp will be below the 100-year flood elevation of Bear Creek. Two of these bents will be within 6.5 feet of the OHWM.

I-5 NB Ramp to Highland Drive over Bear Creek

The proposed I-5 NB Ramp to Highland Drive over Bear Creek will be a three-span, precast-prestressed bridge structure approximately 361 feet in length. The width of the ramp will vary from 27.6 feet at its southern end (as it exits I-5) to 40.7 feet at its northern end (on the interchange pedestal). The bottom of the bridge will be a minimum of approximately 16 feet above the OHWM. The proposed ramp will have four bents. Two bridge bents will be constructed below the OHWM of Bear Creek, consisting of three drilled shaft piers each, for a total stream bottom disturbance area of 41 feet.[2] The other two bents will be below the 100-year flood elevation of Bear Creek approximately 43 and 62 feet away from the OHWM.

Highland Drive Ramp to I-5 NB

The proposed Highland Drive Ramp to I-5 NB will be a four-span, precast-prestressed bridge structure approximately 604 feet in length. From the interchange pedestal, the width of the ramp bridge will taper from 37 feet to approximately 27 feet at its northern end as it meets the grade for I-5. The proposed ramp will have five bents. None of the bents will be constructed within the OHWM of Bear Creek, although all five bents will be below the 100-year flood elevation of Bear Creek.

1.2.1.3 Highland Drive Extension Bridge over Bear Creek

The proposed Highland Drive Extension will cross over Bear Creek approximately 230 feet north of the proposed interchange pedestal over I-5. The proposed Highland Drive Extension Bridge over Bear Creek will be a three-span, precast-prestressed bridge structure approximately 420 feet long and 144 feet wide. The bottom of the bridge will be a minimum of approximately 26 feet above the OHWM.

The proposed bridge will have a slight curve to the northwest and will consist of four bents. No bents are proposed below the OHWM of Bear Creek. Bent 3 will be at the top of the east bank of Bear Creek and Bent 4 will be halfway between the channel of Bear Creek and the main interchange pedestal over I-5. All four bents of the bridge will be below the 100-year flood elevation of Bear Creek. There should be no in-water work associated with this phase of the project.

1.2.1.4 Highland Drive Extension Bridge over Larson Creek

The proposed Highland Drive Extension Bridge over Larson Creek will be a single-span, precast-prestressed bridge structure approximately 102 feet long and 144 feet wide. The bottom of the bridge will be a minimum of approximately 10 feet above the OHWM. The proposed bridge will consist of two concrete bents. Neither bent will be constructed below the OHWM of Larson Creek, but both will be below the 100-year flood elevation. Both bents will be approximately 23 feet from the OHWM.

The proposed crossing of Larson Creek is a vacant lot with a heavily degraded riparian zone that is sparsely vegetated. There will be relatively little vegetation clearing required during this phase of the project. The proposed bridge will fully span Larson Creek so there will be a minimal amount of in-water work associated with this phase of the project.

1.2.1.5 Lazy Creek Bridge

In the northeastern portion of the project, Lazy Creek flows under Highland Drive through a large concrete box culvert approximately 77 feet long and 15 feet wide. The box culvert was constructed in 1962, and presently constricts the flow in Lazy Creek. During the proposed construction, the existing box culvert will be removed and replaced with a new single-span bridge. The proposed bridge will be approximately 79 feet wide and 33 feet long. The bottom of the bridge will be a minimum of approximately 3 feet above the OHWM. The end bents will be approximately 7 feet outside of the OHWM of Lazy Creek. Removal of the box culvert will remove approximately 785 cubic yards (yd^3) of existing concrete from the OHWM of Lazy Creek.

During bridge construction, streamflow in Lazy Creek will be diverted from the active work area by either temporary piping or sandbag diversions. All bridge construction activities will be constructed from the adjacent roadways. The existing box culvert will likely remain in place during the construction of the new bridge piers, allowing the stream to pass through the active work area undisturbed. Once the bridge piers are completed, the stream will be diverted through piping or sandbags to one side of the culvert and the box culvert will be removed. The removal of the box culvert will be accomplished within two days. Once the box culvert is removed and the disturbed section of the stream channel has been graded and restored, the diversion pipe or sandbags will be removed and streamflow will be re-introduced into the channel.

1.2.1.6 Barnett Road Bridge

The existing Barnett Road Bridge over Bear Creek is a three-span, reinforced concrete deck girder bridge with cantilevered ends. The bridge was constructed in 1948, and widened in 1967. The existing bridge structure is approximately 166 feet long and 61 feet wide. The bridge has two concrete bents that are below the OHWM of Bear Creek. The middle two bent foundations are spread footings set on sandstone bedrock. The end bents of the bridge are outside the OHWM, but below the 100-year flood elevation of Bear Creek.

The proposed replacement bridge will be a single-span structure approximately 170.6 feet long and 98.4 feet wide. The bridge will have two drilled shaft end bents, both of which would be constructed near the top of the existing banks approximately 26 feet outside of the OHWM of Bear Creek, but within the 100-year flood elevation. The bottom of the bridge will be a minimum of approximately 8 feet above the OHWM. The proposed bridge surface will be elevated approximately 6.6 feet above the existing bridge elevation, and a retaining wall will be constructed from the northeast corner of the bridge along the north side of Barnett Road to prevent fill material from encroaching into the adjacent Bear Creek Park as a result of the raised grade of the roadway. The retaining wall will be approximately 6.6 feet in height and will be approximately 79 feet from the OHWM of Bear Creek along Barnett Road to the east of the new bridge. A second retaining wall will be constructed from the northwestern corner of the bridge, running north along the east side of Alba Drive, approximately 39 feet from the OHWM of Bear Creek. Both retaining walls will be used to retain fill from moving onto the adjacent properties.

<u>Demolition of Existing Bridge</u>
The replacement of the Barnett Road Bridge will be one of the last elements of the proposed SMI project to be constructed. To maintain traffic flow in the project area, the majority of the new interchange will be constructed and operational before the Barnett Road Bridge is replaced. During bridge replacement, the bridge will be closed to traffic.

After the bridge is closed, the demolition work on the existing bridge will begin. Appropriate containment measures will be installed to prevent demolition debris or associated waste from entering Bear Creek. The Contractor will begin demolition by removing the bridge deck, beams, and the bridge bents. The bents will either be cut flush to bedrock, or if in an area of alluvial material, cut 2 feet below the stream bottom and backfilled with substrate similar to that existing around the bent.

The two existing bents within the channel will require in-water work isolation. The in-water work area for each bent will be completely isolated from streamflow through the use of sandbags or some other form of diversion structure. The potential disturbance to the creek channel will be limited to the existing footing and surrounding work area of each bent.

<u>Construct New Bridge</u>
The first step in construction of the proposed new bridge will be to excavate the area for the new end bents and wingwalls. This excavation area will be protected with appropriate erosion

control measures. Drilled shafts or steel piles will be installed to bedrock, and the concrete for the pile caps will be poured on top of the piles. The wingwalls will then be constructed and the area behind the wingwalls will be back-filled. Containment measures will be implemented to ensure all "green" concrete is contained within the work area.

Due to the length of the proposed single-span structure, temporary bents will be installed in the channel of Bear Creek to support the bridge beams until the structure has cured and stabilized. The temporary bent structures will be installed in close proximity to the existing bent locations, and the work area for each temporary bent will be isolated from streamflow by an appropriate temporary containment or diversion structure. It is expected that two temporary bents will be installed below the OHWM of Bear Creek. The temporary bents will consist of a maximum of 40 steel pipe piles approximately 16 to 24 inches in diameter supporting a lattice of steel cross beams and longitudinal beams.

Depending on the substrate, the steel pipe piles will either be drilled into place, or placed on spread footings. If the substrate is soft enough, the temporary steel pipe piles for the temporary Barnett Road bridge bents may be drilled into place. Drilling shafts will require that either each shaft location be isolated from flowing water or the entire bent area be isolated.

If the spread footing method of temporary bent construction is chosen, the spread footings will be constructed individually around each pile. A section of corrugated pipe or other material will be placed vertically on the stream bottom, the steel pipe pile placed vertically into the section of pipe, and concrete will be poured into the pipe and allowed to cure. When the concrete is cured, the in-water work area containment could be removed if needed. The steel pipe piles will be removed by pulling them out with a crane that may be equipped with a vibratory device to remove piles that have been drilled into place.

Once the temporary bents are in place, the precast beams will be placed onto the pile caps at the end bents and onto the temporary bents and tied together. Falsework to support the deck and mid-span diaphragm will be constructed and supported on the pre-cast beams. The bridge deck will then be constructed and poured. As needed, new utilities will be mounted or relocated onto the bridge deck. A new stormwater pipe will be placed underneath the bridge deck, between the beams, to carry stormwater to the proposed water quality treatment facility/detention basin just southeast of the bridge.

The construction activity will then move back to the bridge ends. The end panels will be constructed and finally the bridge rails will be constructed and poured. Roadway paving at each end of the bridge will be flared to match the existing roadway width to the new bridge width.

Once the completed bridge has been allowed to cure to specifications, the temporary bents will be completely removed. Any shallow excavations in the areas of the temporary bents will be backfilled with native gravel material from the Bear Creek channel stockpiled from previous excavations. All disturbed soils will be graded and stabilized with native seed and plantings.

Any remaining blackberry thickets will be removed and the disturbed areas will be stabilized with a native seed mix.

During construction, approximately 10 trees with diameters at breast height ranging from 4 to 18 inches will be removed from the north side of the bridge. No tree removal is proposed for the south side of the bridge.

1.2.1.7 Temporary Work Bridges and Access Roads

Three temporary work bridges will be constructed across Bear Creek to facilitate construction of the proposed interchange. The longest of the proposed temporary work bridges will cross Bear Creek at two locations within the southeastern quadrant of the proposed interchange. This temporary structure will be constructed across Bear Creek along the north side of the proposed NB Ramp to the Highland Drive crossing over Bear Creek, to the northeastern corner of the interchange pedestal. The temporary bridge will then angle east along the south side of the proposed Highland Drive Extension Bridge and cross over Bear Creek. The northern terminus of the bridge will potentially connect with Dyer Road, and the southeastern terminus will connect with the roadway embankment along the NB lanes of I-5. The second temporary work bridge over Bear Creek will be constructed along the south side of the proposed Garfield Street Ramp to I-5 SB. This bridge will be accessed from the open fields on the west side of Bear Creek. The third temporary work bridge will be constructed over Larson Creek on the west side of the proposed Highland Drive Bridge over Larson Creek.

Construction of the temporary work bridges will likely occur before the earlier phases of construction. The proposed temporary work bridges will be constructed of steel pipe piles supporting a lattice of steel cross beams and longitudinal beams that are topped with a sealed wood deck. The work bridges will likely be composed of pre-constructed panels or spans a minimum of approximately 40 feet in length. The panels will be arranged in a manner to minimize the number of piles within the OHWM. Assuming minimum spans of 40 feet, it is estimated that 104 piles will be installed below the OHWM. In those areas of the channel where bedrock is shallow or exposed, the steel piles will need to be anchored on small concrete spread footings or drilled into the stream bottom. The width of the temporary work bridges will vary from 20 to 33 feet. Construction of the temporary work bridges will occur during the in-water work period, June 15 to September 15. It is anticipated that 18 in-water work isolation areas will have to be constructed to facilitate the installation of the temporary pipe piles used to construct the temporary bridges.

1.2.1.8 New Impervious Surfaces and Stormwater Management

The proposed project will result in a net increase of approximately 16.3 acres of impervious surface. A total of approximately 35 acres of impervious surface will be treated by the project, while removing approximately 4.9 acres of previously existing impervious surface. The majority of the impervious surfaces that will be created during the project will result from construction of the Garfield Street Extension from Highway 99 to the I-5 interchange and construction of the

Highland Drive Extension from the interchange north to the Barnett Road intersection. Construction of the interchange ramps and the widening of Highland Drive will also add net new impervious surfaces. The removal of existing impervious surfaces would largely occur as the result of abandoning the existing Barnett Road interchange. All of the existing on- and off-ramps to I-5 at this interchange would be decommissioned, removed, and restored to more natural conditions, although a proposed water quality treatment/detention facility will be in the southeast quadrant of the existing interchange. A small portion at the southern end of Center Drive will be removed when it is realigned to meet the Garfield Street Extension.

Stormwater from the project area will be treated by two proposed water quality treatment and detention facilities and one water quality swale. The water quality treatment and detention facilities and the water quality swale will treat the majority of stormwater runoff generated by impervious surfaces within the project area. The detention basins and the water quality swale will treat runoff from approximately half of the existing impervious surfaces within the project area, which is estimated at 18.8 acres. Stormwater leaving these existing impervious surfaces is currently being discharged into Bear Creek without prior treatment.

The first water treatment and detention facilities will be near the southeastern corner of the existing bridge carrying I-5 over Bear Creek and be approximately 26,909 square feet (ft^2) in size. The second facility will be in the northern portion of project in the southeast quadrant of the existing intersection of I-5 and Barnett Road and will be 41,979 ft^2. This facility will be west of Bear Creek in the area where the existing NB off-ramp and on-ramp to I-5 will be abandoned.

In addition to the two water quality treatment and detention facilities, ODOT is proposing to construct a grassed water quality swale along the east side of the NB lanes of I-5 on the south side of Bear Creek. This water quality swale will collect and treat stormwater originating from the proposed NB off-ramp and SB on-ramp south of Bear Creek and portions of existing I-5 south of the existing I-5 bridges. The swale will be approximately 360 feet long and 5 feet wide, with a slope of 0.5% to 0.75%. Both water quality treatment and detention facility, as well as the vegetated swale, will have energy dissipating outfall pads above the OHWM of Bear Creek. Each outfall pad will be constructed of approximately 100 $yd^3$of class 50 riprap.

Due to topography, the stormwater from the section of Highway 99 north of the Garfield Street will not be directed to the proposed southern detention basin for treatment. Instead, stormwater will continue to drain along existing contours to an unnamed tributary of Bear Creek that is piped northeast under existing commercial development and Barnett Road to Bear Creek. This section of Highway 99 accounts for approximately 0.6 acres of new impervious surface, although the majority of this area is highly compacted dirt and rock.

1.2.2 Bear Creek I-5 Bridges Project

The Bear Creek I-5 North and Southbound Bridges Replacement project proposes to demolish and reconstruct the existing I-5 bridges over Bear Creek in Medford, Oregon. These bridges are near MP 27.09 on I-5, approximately 2,203 feet south of the existing Barnett Road Interchange,

and are within the southern portion of the SMI project area. Although the SMI project is considered by ODOT to be a separate project from the replacement of the existing I-5 bridges, the proposed SB on-ramp and NB off-ramp bridges for the SMI project would be constructed immediately beside the existing I-5 bridges to be replaced.

The existing NB I-5 bridge over Bear Creek is a six-span structure, approximately 327 feet long and 35.2 feet wide. The existing SB I-5 bridge is a five-span structure, approximately 312 feet long and 35.2 feet wide. Both bridges consist of a cast-in-place reinforced concrete deck that provides two lanes of vehicle travel. Stormwater runoff is discharged directly into Bear Creek and the adjacent floodplain by a series of scuppers. There is no detention or treatment of stormwater from the bridge decks or approaches. The NB I-5 bridge has one bent at the edge of the OHWM of Bear Creek and is usually within flowing water most of the year. The other six bents are all within the 100-year flood elevation. The SB I-5 bridge also has one bent below the OHWM of Bear Creek. The other five bents are also all within the 100-year flood elevation. The north and south end bents for both bridges are protected by large volumes of riprap that are keyed into a toe trench.

1.2.2.1 Temporary Detour and Work Bridges

Sequencing of the proposed I-5 bridge replacement process will be initiated by the construction of a temporary detour structure west of the existing SB I-5 bridge. Construction of the temporary detour structure will require the placement of temporary bridge bents within the Bear Creek channel. Next, a temporary work bridge will be constructed between the existing NB and SB I-5 bridges. The temporary work bridge will be approximately 345 feet long and 20 to 33 feet wide. This bridge will be accessed from the median of I-5. This action will also require temporary bridge bents and in-water work within Bear Creek. Between the detour and temporary work bridges, approximately 11 bents supported by 44 steel pipes will be installed below the OHWM. Due to the shallow nature of the bedrock, the temporary pile will either be attached to temporary spread footings or placed in drilled holes.

1.2.2.2 Bridge Demolition

The Contractor will likely remove the existing bridge in pieces that are as large as possible. A crane will be attached to a section of the deck and that section will be cut free from the structure, then lifted to a staging area to be in the median at the south end of the bridge. The bridge section may be cut with a concrete saw or by hoe ram. If a hoe ram is used to break up the concrete, then the internal rebar will be cut afterwards with a torch or by another method. All debris will be contained and prevented from entering the waterway below.

Two bents will be removed from below the OHWM of Bear Creek during the demolition of the NB and SB bridges. The bents will either be cut flush to bedrock, or if in an area of alluvial material, cut at least 2 feet below the stream bottom and backfilled with substrate similar to that which exists around the bent. Given their location in or beside the Bear Creek channel, the work

area for each bent to be removed from the OHWM will require in-water work isolation. The in-water work area for each bent will be completely isolated from the active flowing stream.

1.2.2.3 Bear Creek I-5 Bridges

The proposed Bear Creek I-5 NB replacement bridge will be a four-span bridge, approximately 351 feet long and 55 feet wide. The bottom of the bridge will be a minimum of approximately 11 feet above the OHWM. The bridge will consist of three multi-column interior drilled shaft bents to support the bridge deck, all of which will be above the OHWM for Bear Creek. The proposed NB bridge will be slightly wider than the proposed SB bridge to accommodate the existing condition of two NB travel lanes with standard shoulder widths, and to allow for the potential future re-alignment of the NB I-5 travel lanes.

The proposed Bear Creek I-5 SB replacement bridge will be a three-span structure approximately 315 feet long and 47 feet wide. The bottom of the bridge will be a minimum of approximately 8 feet above the OHWM. Two of the proposed multi-column bents will be below the OHWM for a total stream bottom disturbance area of approximately 92 ft^2. Similar to the NB bridge, all of the bridge bents will be constructed on drilled shafts.

Riprap will be required at both end bents to protect the bridge bents and adjacent fill slope from scour. Approximately 8,622 yd^3 of riprap would be removed from the banks around the existing bridges. Approximately 104 yd^3 of riprap would be required at both end bents of the new bridges to protect the bridge bents and adjacent fill slope from scour. This will result in a net decrease of 8,518 yd^3.

1.2.2.4 New Impervious Surfaces and Stormwater Management

The stormwater from the existing bridges is discharged directly into Bear Creek without prior treatment or detention. The stormwater originating from the bridges over the north half of Bear Creek will be conveyed to the southern water quality treatment and detention facility, while stormwater from the southern half of the bridges will be routed to the water quality swale.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

The action area is defined by NOAA Fisheries regulations (50 CFR 402) as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” The action area is Bear Creek from work area downstream to the Rogue River. In addition the action area also includes both Lazy and Larson Creek, which are tributaries of Bear

Creek. The action area extends up Lazy Creek from the mouth to Highland Drive, and Larson Creek from the mouth to the Highland Drive extension.

Essential habitat features for salmonids are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. The proposed action may affect the essential habitat features of water quality, riparian vegetation and substrate. Bear Creek within the action area serves as a migration, rearing and potentially spawning area for SONC coho salmon. Lazy and Larson Creek within the action area serves as a migration and rearing area for SONC coho salmon.

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402. NOAA Fisheries must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of: (1) Defining the biological requirements and current status of the listed species; and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action.

For the proposed action, NOAA Fisheries' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. NOAA Fisheries' analysis considers the extent to which the proposed action impairs the function of essential elements necessary for migration, spawning, and rearing of SONC coho salmon under the existing environmental baseline.

2.1.2.1 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmonids is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species, taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for the listed species to survive and recover to a naturally-reproducing population level, at which time protection under the ESA

would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful rearing and migration. The current status of the listed species, based upon their risk of extinction, has not significantly improved since the species were listed.

2.1.2.2 Environmental Baseline

In step two of NOAA Fisheries' analysis, we evaluate the relevance of the environmental baseline in the action area. Regulations implementing section 7 of the ESA (50 CFR 402.02) define the environmental baseline as the past and present effects of all Federal, state, or private actions and other human activities in the action area. The environmental baseline also includes the anticipated effects of all proposed Federal projects in the action area that have undergone section 7 consultation, and the effects of state and private actions that are contemporaneous with the consultation in progress.

Land uses in the action area include rural, residential, agricultural, commercial, and industrial. Riparian areas and stream channels in the action area have been damaged by development activities related to these land uses. The current range-wide status of the identified evolutionarily significant unit may be found in Nickelson *et al.* (1992) and Weitkamp *et al.* (1995). The identified action will occur within the range of SONC coho salmon. The action area is the area directly and indirectly affected by the action. The direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect effects may occur throughout the watershed where actions described in this Opinion lead to additional activities or affect ecological functions contributing to stream degradation. For the purposes of this Opinion, the action area is the channel and adjacent riparian area 500 feet upstream from the project site and downstream to the confluence with the Rogue River. Temporary indirect impacts (disruption of primary productivity and food resources) and potential direct affects (sediment, pollutant discharge and hydraulics) to Bear Creek will be caused by the in-water work and general riparian and bank disturbance within the project area.

The dominant land use in the Bear Creek watershed is private agriculture and urban development. Bear Creek is water-deficient, primarily due to the seasonal pattern of rainfall and the demand for water for urban and irrigation use. There are six reservoirs in use in the Bear Creek basin. Scattered temporary push-up dams are constructed during the irrigation season, increasing water diversion and disrupting fish movement and other ecological processes. Various water quality monitoring within Bear Creek by Oregon's Department of Environmental Quality shows degraded water quality regarding temperatures, biological oxygen demand, dissolved oxygen, ammonia, sediment and pH levels.

Based on the best available information regarding the current status of SONC coho salmon range-wide, the population status, trends, genetics, and the poor environmental baseline conditions within the action area, NOAA Fisheries concludes that the biological requirements of SONC coho salmon are not currently being met. Degraded habitat, resulting from agricultural practices, forestry practices, road building, and residential construction, indicate many aquatic habitat indicators are not properly functioning within Bear Creek. Actions that do not maintain or restore properly functioning aquatic habitat conditions would be likely to jeopardize the continued existence of SONC coho salmon.

2.1.3 Analysis of Effects

Analysis of effects includes assessing direct, indirect, beneficial, and cumulative effects. Temporary indirect effects (disruption of primary productivity and food resources) and potential direct affects (sediment, pollutant discharge and changes in hydraulics) to Bear Creek will be caused by the in-water work and general riparian and bank disturbance within the project area. An additional direct effect to SONC coho salmon juveniles may occur from the capture, handling, and relocation of individuals during the in-water work. Beneficial effects may include the removal of concrete and riprap from the stream.

2.1.3.1 Effects of the Proposed Action

Creeks and rivers are dynamic systems that naturally alter their courses in response to many physical processes. Roadways and other structures constructed along waterways are subject to flooding and undercutting as a result of these natural changes in the stream course. Structural hardening of embankments is the traditional means of protecting these structures along waterways. Hardened embankments simplify stream channels, alter hydraulic processes, and prevent natural channel adjustments (Spence *et al.* 1996). Moreover, embankment hardening may shift the erosion point either upstream or downstream of the project and accelerate stream velocity. As amplified erosive forces attack different locations and landowners respond with more bank hardening, the river eventually attains a continuous fixed alignment lacking habitat complexity (COE 1977).

Fish habitats are enhanced by diversity of habitats at the land-water interface and adjacent bank (COE 1977). Streamside vegetation provides shade that reduces water temperature and stabilizes streambanks. Overhanging branches provide cover from predators. Insects and other invertebrates that fall from overhanging branches may be preyed on by fish, or provide food sources for other prey organisms. Immersed vegetation, logs, and root wads provide points of attachment for aquatic prey organisms, shelter from swift currents during high flows, retain bed load sediment, create pools, and reduce flow velocity.

The combination of channel confinement, ground water alteration, riparian degradation and the legacy of large woody material removal within the system and specifically at roadway crossings has simplified the habitat within the action area and retarded the formation and maintenance of complex fish habitat within the project reach.

Sedimentation

Potential impacts to listed salmonids from the proposed action include both direct and indirect effects. Potential direct effects include mortality from exposure to suspended sediments (turbidity) and contaminants resulting from ground disturbance and general construction activities. Potential indirect effects include behavioral changes resulting from elevated turbidity level (Berg and Northcote 1985, Whitman *et al.* 1982), during riverbank habitat alterations.

Suspended sediment and turbidity influences on fish reported in the literature range from beneficial to detrimental. Elevated total suspended solids (TSS) levels have been reported to enhance cover conditions, reduce piscivorous bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish is the frequency and the duration of the exposure, not just the TSS concentration.

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potentially positive reported effect is providing refuge and cover from predation (Gregory and Levings 1998).

Fish that remain in turbid waters (elevated TSS concentration), experience a reduction in predation from piscivorous fish and birds (Gregory and Levings 1998). In systems with intense predation pressure, this provides a beneficial trade off (*e.g.*, enhanced survival) to the cost of potential physical effects (*e.g.*, reduced growth). Turbidity levels of about 23 Nephalometric Turbidity Units (NTU) have been found to minimize bird and fish predation risks (Gregory 1993). Exposure duration is a critical determinant of the occurrence and importance of physical or behavioral effects. Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids may be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, research shows that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Turbidity, at moderate levels, has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile fish, and may also interfere with feeding (Spence *et al.* 1996). Newly-emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine, redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser

1991). Because the potential for turbidity should be localized and brief, the probability of direct mortality is negligible.

To minimize the potential for increased turbidity and disturbance of fish, most in-water work will occur during the preferred in-water work timing guideline. During this window, streamflows are typically low, fish presence is reduced, and rainfall is minimal. Erosion and sediment control devices will be deployed within 100 feet of all waterways and will stay in place until the project area is stabilized.

Chemical Contamination

As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation of back-hoes, excavators, and other equipment requires the use of fuel, lubricants, *etc.*, which, if spilled into the channel of a waterbody or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain poly-cyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985). Similarly, exposure to herbicides can have lethal and sublethal effects on salmonids, aquatic invertebrates, aquatic vegetation, and target and non-target riparian vegetation (Spence *et al.* 1996). Exposure to water contaminated with runoff contacting green concrete and the associated changes in water chemistry also can have lethal and sublethal effects on salmonids, aquatic invertebrates, aquatic vegetation, and target and non-target riparian vegetation.

To minimize the potential for chemical contamination and disturbance of fish, most in-water work would be completed during the recommended in-water work period. During this window, streamflow is typically low, fish presence is reduced, and rainfall is minimal. In-water work area isolation would allow the work to occur in the dry, thereby reducing indirect (chemical contaminants) from entering the actively flowing water and direct impacts to fish. Staging areas would be in areas that have already been previously disturbed. Equipment and vehicle staging and storage will be at least 150 feet from the regulated work area. Fuels and other hazardous materials will be at least 300 feet away from the regulated work area.

Stream Hydraulics

The placement of drilled shaft bridge piers and riprap placement below the OHWM of Bear Creek would typically result in simplification of habitat and increased stream velocities under and along the structure and hard points. Due to the removal of approximately 8,518 yd^2 of riprap around the existing Bear Creek I-5 bridges, which has degraded stream hydraulics and is devoid of functional riparian vegetation, aquatic and riparian habitat is expected to improve. Since increased habitat complexity and bankline function are expected, no long-term adverse affect is likely to occur to stream hydraulics as a result of the proposed action.

Riparian Vegetation

The removal of some, mostly non-native invasive species of riparian vegetation, such as Himalayan blackberries and some native riparian vegetation, will result in the short-term

potential for exposed soils and increased sediment transport to Bear Creek. However, during construction, extensive erosion control measures and the proposed riparian plantings will result in long-term beneficial effects to the Bear Creek riparian corridor. Riparian plantings will provide erosion control, bank stabilization, shading, allochthonous inputs, and increase the potential for insect production.

Hydrologic Stormwater Effects

The potential exists for reduced evapotransporation and infiltration opportunities resulting in an increase in the magnitude and duration of peak discharge and decreased summer base flow from the proposed 16.3 acres of new impervious surface (Booth and Jackson 1997). The proposed stormwater treatment and detention basins, vegetated swale, and riparian plantings are designed to provide detention and treatment for a total of 35 acres of impervious surface within the project area. The proposed detention and treatment facilities are designed so that the post-project stormwater flows from the project area will not exceed peak pre-construction flow rates for the 2, 10 and 50-year storm events. In addition to detention, the stormwater facilities are designed to remove approximately 90% of the total suspended solids.

The proposed stormwater measures will help to attenuate peak flows through filtration, infiltration, and evapotransporation of stormwater runoff from new and existing impervious surfaces. The proposed stormwater runoff treatment measures, coupled with the avoidance and minimization of potential stormwater effects along Bear Creek will offset any potential adverse effects to Bear Creek's annual hydrograph from the proposed action, therefore meeting NOAA Fisheries, Northwest Region, Habitat Conservation Division Stormwater Guidance.

Work Area Isolation

Temporary and permanent bridge bent construction and removal will likely require work area isolation from the flowing water. Fish removal activities would be in accordance with NOAA Fisheries fish handling guidelines (NOAA Fisheries 2000). Any listed fish removed from the isolated work areas would experience high stress with the possibility of up to a 5% delayed mortality rate depending on rescue method. Work area isolation can result in a loss of aquatic invertebrates due to dewatering areas within the wetted channel. In addition, sediment laden water created within isolated work areas could escape, resulting in impacts to the aquatic environment downstream of the project site.

2.1.3.2 Effects on Critical Habitat

NOAA Fisheries designates critical habitat based on physical and biological features that are essential to the listed species. Essential features for designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage. Effects on critical habitat from the proposed action are included in the effects description above in section 2.1.3.1 of this Opinion.

2.1.3.3 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation". The action area has been defined as the streambed and streambank of Bear and Coleman Creeks, extending upstream to the project disturbance limits, and downstream one mile below the project disturbance limits. Many actions occur within the action area of the Bear Creek watershed.

Non-federal activities within the action area are expected to increase with a projected 40% increase in human population over the next 25 years in Jackson County (U.S. Census Bureau, 2002). Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, but at increasingly higher levels as population density increases. NOAA Fisheries assumes that future FHWA transportation projects in the Bear Creek watershed will be reviewed through separate section 7 consultation processes and therefore are not considered cumulative effects.

2.1.4 Conclusion

NOAA Fisheries has determined that, when the effects of the FHWA's proposed actions are added to the environmental baseline and cumulative effects occurring in the action area, they are not likely to jeopardize the continued existence of SONC coho salmon, or cause adverse modification or destruction of designated critical habitat. These conclusions were based on the following considerations: (1) All in-water work and other construction activities within the OHWM of Bear, Lazy and Larson Creek will take place according to recommended in-water work timelines or during approved exceptions, to protect fish and wildlife resources; (2) to the greatest extent possible, all sediment-laden water and water contaminated by contact with green concrete or other construction-related contaminants will be contained and treated before contact with flowing waters; (3) any riparian trees removed as a result of the proposed action will be retained within the riparian area, and where feasible, the rootwads will remain attached and the trees will be placed partially into the channel of Bear Creek; (4) work area isolation, where necessary, including use of NOAA Fisheries' guidelines for proper fish handling (NMFS 2000) and other conservation measures will be in place to avoid or minimize adverse affects to water quality; (5) riparian vegetation cleared for access and construction and scour protection measures will be more than offset by the native riparian plantings; (6) stormwater generated from new impervious surfaces will not result in long-term adverse effects to Bear Creek; (7) bridge piers, and scour protection measures will not result in long-term adverse effects to Bear Creek hydraulics; and (8) removal of 8,518 yd^2 of riprap from the Bear Creek channel will result in beneficial responses in the stream channel flow dynamics and riparian vegetation conditions. Therefore, the proposed action is not expected to prevent or delay the achievement of properly functioning habitat conditions in the action area.

2.1.5 Reinitiation of Consultation

Consultation must be reinitiated if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded; (2) new information reveals that effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). In instances where the amount or extent of authorized incidental take is exceeded, any operations causing such take must cease pending reinitiation of consultation.

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

An incidental take statement specifies the impact of any incidental taking of threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the actions covered by this Opinion are reasonably certain to result in incidental take of SONC coho salmon because of potential adverse effects from increased sediment levels, chemical contamination, instream riprap placement and the potential for direct incidental take during in-water work. Handling of juvenile coho salmon during the work isolation process may result in incidental take of individuals if adequate water quality allows juvenile salmonids to be present during the construction period. NOAA Fisheries anticipates up to 50 individuals will be captured and three juvenile coho salmon will die as a result of the fish rescue, salvage and relocation activities covered by this Opinion. The potential adverse effects of the other project components on population levels are largely unquantifiable,

but small because habitat value in the action area is low, and NOAA Fisheries does not expect them to be measurable in the long term. The extent of authorized take is limited to SONC coho salmon in Bear, Larson, or Lazy Creeks and is limited to that caused by the proposed action within the action area.

2.2.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The FHWA has the continuing duty to regulate the activities covered in this incidental take statement. If the FHWA fails to require ODOT to adhere to the terms and conditions of the incidental take statement through enforceable terms added to the document authorizing this action, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

The South Medford Interchange Improvement and Bear Creek I-5 Bridges Replacement Project includes a set of "conservation measures" designed to minimize take of ESA-listed species. These are described on pages 90 to 100 of the November 2003 BA. Specific measures for in-water and bank work, clearing and grubbing, bridge construction, stormwater management, erosion control, hazardous materials, and site-specific conservation and habitat remediation measures are also included.

NOAA Fisheries believes that the following reasonable and prudent measures, along with the conservation measures described in the BA, are necessary and appropriate to minimize the likelihood of take of ESA-listed fish resulting from implementation of this Opinion. These reasonable and prudent measures would also minimize adverse effects to designated critical habitat.

The FHWA shall:

1. Ensure completion of a comprehensive monitoring and reporting program to confirm this Opinion is meeting its objective of minimizing take from permitted activities.

2. Avoid or minimize incidental take from construction-related activities by applying permit conditions that require construction, operation and maintenance actions with minimum harm to aquatic and riparian systems.

3. Minimize the likelihood of incidental take from in-water work by ensuring that in-water work areas are isolated from flowing water.

4. Minimize the amount and extent of take from loss of instream habitat by implementing measures to minimize impacts to riparian and instream habitat, or where impacts are unavoidable, to replace or restore lost riparian and instream functions.

5. Minimize the amount and extent of take from stormwater impacts and altered stream hydraulics by implementing measures to treat and detain water and limit fill within the 100-year floodplain.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity.

1. To implement reasonable and prudent measure #1 (monitoring), the FHWA shall ensure that:

   a. Salvage notice. The following notice is included as a permit condition.

      > NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Roseburg Field Office of NOAA Fisheries Law Enforcement at 541.957.3388. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

   b. Written planning requirements. Before beginning any work below bankfull elevation,[1] the permittee will provide a copy of the written plans for site restoration, compensatory mitigation, pollution and erosion control, bridge demolition and stormwater management, to the Oregon Office of NOAA Fisheries at the following address. Plan requirements are described below.

      Director, Oregon State Habitat Office
      Habitat Conservation Division
      National Marine Fisheries Service
      Attn: 2002/01268
      525 NE Oregon Street
      Portland, OR 97232

[1] 'Bankfull elevation' means the bank height inundated by a 1.5 to 2-year average recurrence interval and may be estimated by morphological features such average bank height, scour lines and vegetation limits.

c. Implementation monitoring report required. The permittee submits an implementation monitoring report to the FHWA and to NOAA Fisheries, at the address below, within 120 days of completing all in-water work. The monitoring report will describe the permittee's success meeting his or her permit conditions.

d. Implementation monitoring report contents. Each monitoring report will include the following information.

i. Project identification

(1) Permittee name, permit number, and project name.

(2) Project location, including any compensatory mitigation site(s), by 5th field HUC and by latitude and longitude as determined from the appropriate USGS 7-minute quadrangle map.

(3) FHWA contact person.

(4) Starting and ending dates for work completed.

ii. Habitat conditions. Photos of habitat conditions at the project and any compensation site or sites, before, during, and after project completion.[2]

(1) Include general views and close-ups showing details of the project and project area, including pre and post construction.

(2) Label each photo with date, time, project name, photographer's name, and a comment about the subject.

iii. Site restoration and compensatory mitigation.

(1) The name and address of the party(s) responsible for meeting each component of the site restoration and compensatory mitigation plan.

(2) Performance standards for determining compliance.

(3) Any other pertinent requirements such as financial assurances, real estate assurances, monitoring programs, and the provisions for short and long-term maintenance of the restoration or mitigation site.

(4) Planting composition and density.

(5) A plan to inspect and, if necessary, replace failed plantings for five years.

(6) A provision for FHWA certification that all action necessary to carry out each component of the restoration or mitigation plan is completed, and that the performance standards are achieved.

iv. Project data.

(1) Work cessation. Dates work ceased due to high flows, if any.

(2) Fish screen. Evidence of compliance with NOAA Fisheries' fish screen criteria.

[2] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

(3) Pollution control. A summary of pollution and erosion control inspections, including any erosion control failure, contaminant release, and correction effort.

(4) Pilings.
   (a) Number and type of pilings removed, including the number of pilings (if any) that broke during removal.
   (b) Number, type, and diameter of any pilings installed (*e.g.*, untreated wood, treated wood, hollow steel).
   (c) Description of how pilings were installed and any sound attenuation measures used.

(5) Site preparation.
   (a) Total cleared area – riparian and upland.
   (b) Total new impervious area.

(6) Isolation of in-water work area, capture and release.
   (a) Supervisory fish biologist – name and address.
   (b) Methods of work area isolation and take minimization.
   (c) Stream conditions before, during and within one week after completion of work area isolation.
   (d) Means of fish capture.
   (e) Number of fish captured by species.
   (f) Release site and condition of all fish released.
   (g) Any incidence of observed injury or mortality of listed species.

(7) Road construction, repairs and improvements. The justification for any new permanent road crossing design (*i.e.*, road realignment, full-span bridge, streambed simulation, or no-slope design culvert).

(8) Site restoration. Photo or other documentation that site restoration performance standards were met.

(9) Compensatory mitigation. The same elements apply as for monitoring site restoration.

e. Annual report on site restoration and compensatory mitigation monitoring. In addition to the 120-day implementation report, the permittee will submit an annual report to the FHWA and NOAA Fisheries by December 31 that includes the date of each visit to a restoration site or mitigation site, site conditions on that date, and any corrective action taken as a result of that visit. Reporting will continue from year to year until the FHWA certifies that site restoration or compensatory mitigation performance standards have been met.

f. Post construction impacts. The FHWA/ODOT shall assess the project's impacts, temporary and permanent, and compare them to the impacts assessed in the 2003 BA. This written assessment will be provided to NOAA Fisheries for review. If the actual impacts exceed those outlined in the BA then the FHWA/ODOT will provide additional mitigation to offset those impacts.

g. Reinitiation contact. To reinitiate consultation, contact the Oregon State Habitat Officeof NOAA Fisheries, at the address above.

2. To implement reasonable and prudent measure #2 (construction-related activities), the FHWA shall:

   a. Minimum area. Confine construction impacts to the minimum area necessary to complete the project.
   b. Preconstruction meeting. ODOT will arrange a pre-construction meeting with NOAA Fisheries and the contractor before commencement of project activities.
   c. Preconstruction activity. Complete the following actions before significant[3] alteration of the project area.
      i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary. Survey and mark the OHWM at the project site before commencement of work.
      ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.
         (1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[4]).
         (2) An oil-absorbing, floating boom whenever surface water is present.
      iii. Temporary erosion controls. All temporary erosion controls will be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.
   d. Site preparation. Conserve native materials for site restoration.
      i. If possible, leave native materials where they are found.
      ii. If materials are moved, damaged, or destroyed, replace them with a functional equivalent during site restoration.
      iii. Stockpile any large wood,[5] native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.
   e. Earthwork. Complete earthwork (including drilling, excavation, dredging, filling and compacting) as quickly as possible.
      i. Site stabilization. Stabilize all disturbed areas, including obliteration of temporary roads, following any break in work unless construction will resume within four days.

---

[3] 'Significant' means an effect can be meaningfully measured, detected or evaluated.

[4] When available, certified weed-free straw or hay bales will be used to prevent introduction of noxious weeds.

[5] For purposes of this Opinion only, 'large wood' means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull channel width of the stream in which the wood occurs. See, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

ii. Source of materials. Obtain boulders, rock, woody materials and other natural construction materials used for the project outside the riparian area.

f. Cessation of work. Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

g. Timing of in-water work. Complete all work below the OHWM between June 15 and September 15, unless otherwise approved in writing by NOAA Fisheries. ODOT shall notify NOAA Fisheries at least one week before the start of work below the OHWM.

h. Fish screens. Install, operate and maintain a fish screen according to NOAA Fisheries' fish screen criteria[6] on each water intake used for project construction, including pumps used to isolate an in-water work area. Screens for water diversions or intakes that will be used for irrigation, municipal or industrial purposes, or any use besides project construction are not authorized.

i. Fish passage. Provide passage for any adult or juvenile salmonid species present in the project area during construction, unless otherwise approved in writing by NOAA Fisheries, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.

j. Pollution and Erosion Control Plan. Prepare and carry out a written pollution and erosion control plan to prevent pollution caused by surveying or construction operations. Submit a copy of the written plan to the FHWA and to the Oregon State Habitat Office of NOAA Fisheries, at the address above, before beginning work below bankfull elevation.

i. Plan Contents. The pollution and erosion control plan will contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

(1) The name and address of the party(s) responsible for accomplishment of the pollution and erosion control plan.

(2) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, drilling sites, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations, staging areas, and roads being decommissioned.

(3) Practices to confine, remove, and dispose of excess concrete, cement, grout, and other mortars or bonding agents, including measures for washout facilities.

---

[6] National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile Fish Screen Criteria for Pump Intakes* (May 9, 1996) (guidelines and criteria for migrant fish passage facilities, and new pump intakes and existing inadequate pump intake screens) (http://www.nwr.noaa.gov/1hydrop/hydroweb/ferc.htm).

(4) A description of any regulated or hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

(5) A spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

(6) Practices to prevent construction debris from dropping into any stream or waterbody, and to remove any material that does drop with minimum disturbance to the streambed and water quality.

ii. Inspection of erosion controls. During construction, monitor instream turbidity and inspect all erosion controls daily during the rainy season and weekly during the dry season, or more often as necessary, to ensure the erosion controls are working adequately.[7]

(1) If monitoring or inspection shows that the erosion controls are ineffective, mobilize work crews immediately to make repairs, install replacements, or install additional controls as necessary.

(2) Remove sediment from erosion controls once it has reached 1/3 of the exposed height of the control.

k. Construction discharge water. Treat all discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) as follows.

i. Water quality. Design, build, and maintain facilities to collect and treat all construction discharge water, including any contaminated water produced by drilling, using the best available technology applicable to site conditions. Provide treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals, and other pollutants likely to be present.

ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities may not exceed 4 feet per second, and the maximum size of any aperture may not exceed one inch.

iii. Pollutants. Do not allow pollutants including green concrete, contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours to contact any wetland or the OHWM.

l. Piling removal. If a temporary or permanent piling will be removed, the following conditions apply.

i. Dislodge the piling with a vibratory hammer.

ii. Once loose, place the piling onto an appropriate dry storage site.

iii. Fill the holes left by each piling with clean, native sediments.

---

[7] 'Working adequately' means that project activities do not increase ambient stream turbidity by more than 10% above background 100 feet below the discharge, when measured relative to a control point immediately upstream of the turbidity causing activity.

m. Temporary access roads. All temporary access roads will be constructed as follows.

i. Existing ways. Use existing roadways and travel paths whenever possible, unless construction of a new way would result in less habitat take.

ii. Steep slopes. Temporary roads built mid-slope or on slopes steeper than 30% are not authorized.

iii. Minimizing soil disturbance and compaction. Minimize soil disturbance and compaction whenever a new temporary road is necessary within 150 feet[8] of a stream, waterbody, or wetland by clearing vegetation to ground level and placing clean gravel over geotextile fabric, unless otherwise approved in writing by NOAA Fisheries.

iv. Temporary stream crossings.

(1) Minimize the number of temporary stream crossings.

(2) Design temporary road crossings as follows.

(a) Survey and map any potential spawning habitat within 300 feet downstream of a proposed crossing.

(b) Do not place a stream crossing at known or suspected spawning areas, or within 300 feet upstream of such areas if spawning areas may be affected.

(c) Design the crossing to provide for foreseeable risks (*e.g.*, flooding and associated bedload and debris, to prevent the diversion of streamflow out of the channel and down the road if the crossing fails).

(d) Vehicles and machinery will cross riparian areas and streams at right angles to the main channel wherever possible.

v. Obliteration. When the project is complete, obliterate all temporary access roads that will not be in footprint of a new bridge or other permanent structure, stabilize the soil, and revegetate the site. Abandon and restore temporary roads in wet or flooded areas by the end of the in-water work period.

n. Bridge Demolition. A bridge demolition plan must be approved by NOAA Fisheries before removal of the existing structures.

o. Bridge Containment. The work bridges will have containment measures in place that minimizes any potential of petrochemicals or hazardous materials from entering the river.

i. The decking of the work bridge shall be constructed to self-contain petrochemicals and hazardous materials.

---

[8] Distances from a stream or waterbody are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. 'Channel migration zone' means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years (*e.g.*, alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams).

ii. The work bridges and the containment structure will be maintained to preserve containment integrity throughout the term of the project.

p. Heavy Equipment. Restrict use of heavy equipment as follows.

i. Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (*e.g.*, minimally-sized, low ground pressure equipment).

ii. Vehicle and material staging. Store construction materials, and fuel, operate, maintain and store vehicles as follows.

(1) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on site.

(2) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area placed 150 feet or more from any stream, waterbody, or wetland, unless otherwise approved in writing by NOAA Fisheries, except as stated below.

(a) Fuel storage locations within 150 feet of the OHWM shall have containment measures in place that meet or exceed 100% containment.

(b) No auxiliary fuel tanks are stored within 150 feet of the OHWM.

(3) No hazardous materials will be stored on the work bridge.

(4) Hazardous materials stored within 150 feet of the OHWM shall have containment measures in place that meet or exceed 100% containment.

(5) Inspect all vehicles operated within 150 feet of any stream, waterbody, or wetland daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request by FHWA or NOAA Fisheries.

(6) Before operations begin and as often as necessary during operation, steam-clean all equipment that will be used below bankfull elevation until all visible external oil, grease, mud, and other visible contaminates are removed.

(7) Diaper all stationary power equipment (*e.g.*, generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody or wetland to prevent leaks, unless suitable containment is provided to prevent potential spills from entering any stream or waterbody.

q. Site restoration. Prepare and carry out a written site restoration plan as necessary to ensure that all streambanks, soils, and vegetation disturbed by the project are cleaned up and restored as follows. Submit a copy of the written site restoration plan to the FHWA and to the Oregon State Habitat Office of NOAA Fisheries, at the address above, before beginning work below bankfull elevation.

i. General considerations.

(1) Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (*e.g.*, large woody debris), channel conditions, flows, watershed conditions, and other ecosystem processes that form and maintain productive fish habitats.

(2) Streambank shaping. Restore damaged streambanks to a natural slope, pattern, and profile suitable for establishment of permanent woody vegetation, unless precluded by pre-project conditions (*e.g.*, a natural rock wall).

(3) Revegetation. Replant area requiring revegetation before the first April 15 following construction. Use a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs, and trees. Noxious or invasive species may not be used.

(4) Pesticides. Take of ESA-listed species caused by any aspect of pesticide use is not included in the exemption to the ESA take prohibitions provided by this incidental take statement. Pesticide use must be evaluated in an individual consultation, although mechanical or other methods may be used to control weeds and unwanted vegetation.

(5) Fertilizer. Do not apply surface fertilizer within 50 feet of any stream channel.

(6) Fencing. Install fencing as necessary to prevent access to revegetated sites by livestock or unauthorized persons.

ii. Plan contents. Include each of the following elements.

(1) Baseline information. This information may be obtained from existing sources (*e.g.*, land use plans, watershed analyses, subbasin plans), where available.

(a) A functional assessment of adverse effects, *i.e.*, the location, extent, and function of the riparian and aquatic resources that will be adversely affected by construction and operation of the project.

(b) The location and extent of resources surrounding the restoration site, including historic and existing conditions.

(2) Goals and objectives. Restoration goals and objectives that describe the extent of site restoration necessary to offset adverse effects of the project, by aquatic resource type.

(3) Performance standards. Use these standards to help design the site restoration plan and to assess whether the restoration goal is met. While no single criterion is sufficient to measure success, the intent is that these features should be present within reasonable limits of natural and management variation.

(a) Bare soil spaces are small and well-dispersed.

(b) Soil movement, such as active rills or gullies and soil deposition around plants or in small basins, is absent or slight and local.
(c) If areas with past erosion are present, they are completely stabilized and healed.
(d) Plant litter is well-distributed and effective in protecting the soil with few or no litter dams present.
(e) Native woody and herbaceous vegetation, and germination microsites, are present and well-distributed across the site.
(f) Vegetation structure is resulting in rooting throughout the available soil profile.
(g) Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy, and dominant over undesired competing vegetation.
(h) High-impact conditions confined to small areas necessary access or other special management situations.
(i) Streambanks have less than 5% exposed soils with margins anchored by deeply-rooted vegetation or coarse-grained alluvial debris.
(j) Few upland plants are in valley bottom locations, and a continuous corridor of shrubs and trees provide shade for the entire streambank.

(4) Work plan. Include a written work plan as part of the site restoration plan with sufficient detail to include a description of the following elements, as applicable.
(a) Boundaries for the restoration area.
(b) Restoration methods, timing, and sequence.
(c) Water supply source, if necessary.
(d) Woody native vegetation appropriate to the restoration site.[9] This must be a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs, and trees. This may include allowances for natural regeneration from an existing seed bank or planting.
(e) A plan to control exotic invasive vegetation.
(f) Elevation(s) and slope(s) of the restoration area to ensure they conform with required elevation and hydrologic requirements of target plant species.
(g) Geomorphology and habitat features of stream or other open water.
(h) Site management and maintenance requirements.

(5) Five-year monitoring and maintenance plan.

[9] Use references sites to select vegetation for the mitigation site whenever feasible. Historic reconstruction, vegetation models, or other ecologically-based methods may also be used as appropriate.

(a) A written schedule to visit the restoration site annually for five years or longer as necessary to confirm that the performance standards are achieved. Despite the initial five-year planning period, site visits and monitoring will continue from year-to-year until the FHWA certifies that site restoration performance standards have been met.

(b) During each visit, inspect for and correct any factors that may prevent attainment of performance standards (*e.g.*, low plant survival, invasive species, wildlife damage, drought).

(c) Keep a written record to document the date of each visit, site conditions and any corrective actions taken.

3. To implement reasonable and prudent measure #3 (isolation of in-water work area) the FHWA shall ensure that:

a. Work area isolation. During in-water work (work within the OHWM), if the project involves either significant channel disturbance or use of equipment within the wetted channel, ensure that the work area is well isolated from the active flowing stream within a coffer dam (constructed of sand bags, sheet pilings, inflatable bags, *etc.*) or similar structure, to minimize the potential for sediment entrainment. Furthermore, no ground- or substrate-disturbing action will occur within the OHWM 150 feet upstream of potential spawning habitat as measured at the thalweg without isolation of the work area from flowing waters. After the coffer dam is in place, any fish trapped in the isolation pool will be removed by a permitted ODOT and/or ODFW biologist before de-watering, using ODFW-approved methods.

i. Coffer dams. All coffer dams will be of sufficient height to not be inundated during high flows.

ii. Water intake structures. Any water intake structure authorized under this Opinion must have a fish screen installed, and operated and maintained in accordance with NOAA Fisheries' fish screen criteria.

(1) Water pumped from the work isolation area will be discharged into an upland area providing over-ground flow before returning to the creek. Discharge will occur so that it does not cause erosion.

(2) Discharges into potential fish spawning areas or areas with submerged vegetation are prohibited.

iii. Work Area Isolation. A work area isolation plan must be approved by NOAA Fisheries before in-water work.

iv. Fish Salvage. Before and intermittently during pumping to isolate an in-water work area, attempt to capture and release fish from the isolated area using trapping, seining, electrofishing, or other methods as are prudent to minimize risk of injury.

(1) The entire capture and release operation must be conducted or supervised by a fishery biologist experienced with work area

isolation and competent to ensure the safe handling of all ESA-listed fish.

(2) Do not use electrofishing if water temperatures exceed 18ºC.

(3) If electrofishing equipment is used to capture fish, comply with NOAA Fisheries' electrofishing guidelines.[10]

(4) Handle ESA-listed fish with extreme care, keeping fish in water to the maximum extent possible during seining and transfer procedures to prevent the added stress of out-of-water handling.

(5) Transport fish in aerated buckets or tanks.

(6) Release fish into a safe release site as quickly as possible, and as near as possible to capture sites.

(7) Do not transfer ESA-listed fish to anyone except NOAA Fisheries personnel, unless otherwise approved in writing by NOAA Fisheries.

(8) Obtain all other Federal, state, and local permits necessary to conduct the capture and release activity.

(9) Allow NOAA Fisheries or its designated representative to accompany the capture team during the capture and release activity, and to inspect the team's capture and release records and facilities.

4. To implement reasonable and prudent measure #4 (minimize loss of instream habitat), FHWA shall ensure that:

a. The distance between existing bridge approach fill and the 100-year floodplain or OHWM (whichever is closer to the existing fill) will not be reduced.

b. The amount of fill within the floodplain will be minimized.

c. Boundaries of the clearing limits associated with site access and construction will be flagged to prevent ground disturbance of riparian vegetation, wetlands, and other sensitive sites beyond the flagged boundary.

d. During excavation, native streambed material will be stockpiled out of the two-year floodplain for later use in back-filling the trenches used to construct coffer dams.

e. During project design ODOT will work to minimize the amount of riprap used. Where riprap is necessary, only clean, non-erodible, upland angular rock of sufficient size for long-term armoring will be employed. Riprap will not be "end-dumped" within the wetted channel.

f. Alteration or disturbance of streambanks and existing riparian vegetation will be minimized. Where bank work is necessary, bank protection material shall be placed to maintain normal waterway configuration whenever possible.

---

[10] National Marine Fisheries Service, *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

g. Measures will be taken to prevent any debris from falling within the boundaries of the OHWM. Any material that falls within this area will be removed in a manner that has a minimum impact to the riparian area, streambed, and water quality.

5. To implement reasonable and prudent measure # 5 (new impervious surface and stormwater management), the FHWA shall ensure that:

   a. All stormwater runoff from any road or bridge built pursuant to a permit issued under this Opinion must be managed to ensure that it will not result in a change in the existing hydraulic conditions or an increase of pollutants to the receiving water.
   b. Any project that will produce new surfaces or land use conversions that retard the entry of water into the soil must control the quantity and quality of the resulting stormwater runoff for the life of the project.
   c. Stormwater must be infiltrated or dispersed onsite to the maximum extent possible without causing flooding or erosion impacts.
   d. When stormwater runoff must be discharged into a freshwater system, the following requirements apply.
      i. The area must be drained by a conveyance system comprised entirely of manufactured elements (*e.g.*, pipes, ditches, outfall protection) that extends to the OHWM of the receiving water.
      ii. Any erodible elements of this system must be adequately stabilized to prevent erosion.
      iii. Surface water from the area must not be diverted from or increased to an existing wetland, stream, or near-shore habitat sufficient to cause a significant adverse effect.
      iv. Runoff treatment facilities must be designed, built and maintained to collect runoff from the project site using the best available technology applicable to the site conditions. Treatment must be provided to remove debris, nutrients, sediment, petroleum hydrocarbons, metals, and other pollutants likely to be present.

3. MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

3.1 Background

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance essential fish habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).

- NOAA Fisheries must provide conservation recommendations for any Federal or state action that would adversely affect EFH (§305(b)(4)(A)).

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific, or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for Federally-managed fisheries within the waters of Washington, Oregon, and California. Designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line, and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km) (PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to

salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable artificial barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border (PFMC 1999).

Detailed descriptions and identifications of EFH are contained in the fishery management plans for groundfish (PFMC 1998a), coastal pelagic species (PFMC 1998b), and Pacific salmon (PFMC 1999). Casillas *et al.* (1998) provides additional detail on the groundfish EFH habitat complexes. Assessment of the potential adverse effects to these species' EFH from the proposed action is based, in part, on these descriptions and on information provided by the Corps.

3.3 Proposed Action

The proposed action is detailed above in section 1.2 of this document. For the purposes of this EFH consultation, the action area is defined as the streambeds, streambanks and riparian corridors of Bear, Larson, and Lazy Creeks, extending to the upstream project disturbance limits and downstream to the confluence of the Rogue River. This area has been designated as EFH for various life stages of chinook salmon and coho salmon.

3.4 Effects of Proposed Action

As described in detail in section 2.1.3 of this document, the proposed activities may result in short-term adverse effects to water quality (sediment, chemical contamination, riparian vegetation removal). NOAA Fisheries expects short-term adverse effects from increases in turbidity and the potential for chemical contamination within the action area. NOAA Fisheries expects long-term beneficial effects from decreased constriction, improved hydraulic conditions and riparian function of Bear, Larson, and Lazy Creeks as a result of the proposed projects.

3.5 Conclusion

The proposed action will adversely affect the EFH for chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the FHWA, all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2.2 and 2.2.3, respectively, are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

3.7 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.8 Supplemental Consultation

The FHWA must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Bell, M.C. 1991. Fisheries handbook of Engineering requirements and biological criteria. Fish Passage Development and Evaluation Program. U.S. Army Corps of Engineers. North Pacific Division.

Berg, L. and T.G. Northcote. 1985. Changes In Territorial, Gill-Flaring, and Feeding Behavior in Juvenile Coho Salmon (Oncorhynchus kisutch) Following Short-Term Pulses of Suspended Sediment. Canadian Journal of Fisheries and Aquatic Sciences 42: 1410-1417.

Bjornn, T.C., and D.W. Reiser. 1991. Habitat requirements of salmonids in streams. Pages 83-138 *in* W.R. Meehan, ed. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19:83-138.

Booth, D. K., and C. R. Jackson. 1997. Urbanization of Aquatic Systems – Degration Tresholds, Stormwater Detention, and the Limits of Mitigation. Journal of the American Water Resources Association 22(5).

DEQ. 1999. 303(d) List of Water Quality Limited Water Bodies, EPA-approved list. http://www.deq.state.or.us/wq/303dlist/303dpage.htm

DeVore, P. W., L. T. Brooke, and W. A. Swenson. 1980. "The Effects of Red Clay Turbidity and Sedimentation on Aquatic Life In the Nemadji River System. Impact of Nonpoint Pollution Control on Western Lake Superior." S. C. Andrews, R. G. Christensen, and C. D. Wilson. Washington, D.C., U.S. Environmental Protection Agency. EPA Report 905/9-79-002-B.

Gregory, R. S. 1988. Effects of Turbidity on benthic foraging and predation risk in juvenile chinook salmon. Pages 64-73 *In:* C. A. Simenstad (ed.) Effects of dredging on anadromous Pacific coast fishes. Washington Sea Grant Program. Washington State University. Seattle, Washington.

Gregory, R. S., and C. D. Levings. 1998. "Turbidity Reduces Predation on Migrating Juvenile Pacific Salmon." Transactions of the American Fisheries Society 127: 275-285.

Lloyd, D. S. 1987. Turbidity as a Water Quality Standard for Salmonid Habitats in Alaska. North American Journal of Fisheries Management 7:34-45.

Neff, J.M. 1985. Polycyclic aromatic hydrocarbons. *In*: Fundamentals of aquatic toxicology, G.M. Rand and S.R. Petrocelli, pp. 416-454. Hemisphere Publishing, Washington, D.C.

Nickelson, T.E., J. W. Nicholas, A.M. McGie, R.B. Lindsay, D.L. Bottom, R.J. Kaiser, and S.E. Jacobs. 1992. Status of anadromous salmonids in Oregon coastal basins. Unpublished manuscript. Oregon Department of Fish and Wildlife, Research and Development Section, Corvallis, and Ocean Salmon Management, Newport. 83 pages.

NOAA Fisheries (National Marine Fisheries Service). 2000. Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act. 2000. Protected Resources Division, Portland, Oregon, 5 pp.

NOAA Fisheries (National Marine Fisheries Service). 1996. Making Endangered Species Act determinations of effect for individual and grouped actions at the watershed scale. Habitat Conservation Program, Portland, Oregon, 32 p.

Oregon Department of Fish and Wildlife. 2000. Oregon Guidelines for Timing of In-water Work to Protect Fish and Wildlife Resources. Portland, Oregon.

PFMC (Pacific Fishery Management Council). 1998a. Final Environmental Assessment/Regulatory Review for Amendment 11 to the Pacific Coast Groundfish Fishery Management Plan. October 1998.

PFMC (Pacific Fishery Management Council). 1998b. The Coastal Pelagic Species Fishery Management Plan: Amendment 8. Portland, Oregon.

PFMC (Pacific Fishery Management Council). 1999. Amendment 14 to the Pacific Coast Salmon Plan. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon. Portland, Oregon.

Redding, J. M., C. B. Schreck, and F. H. Everest. 1987. "Physiological Effects on Coho Salmon and Steelhead of Exposure to Suspended Solids." Transactions of the American Fisheries Society 116: 737-744.

Scannell, P.O. 1988. Effects of Elevated Sediment Levels from Placer Mining on Survival and Behavior of Immature Arctic Grayling. Alaska Cooperative Fishery Unit, University of Alaska. Unit Contribution 27.

Servizi, J. A., and Martens, D. W. 1991. "Effects of Temperature, Season, and Fish Size on Acute Lethality of Suspended Sediments to Coho Salmon". Canadian Journal of Fisheries and Aquatic Sciences 49:1389-1395.

Spence, B. C., G. A. Lomnicky, R. M. Hughes, and R. P. Novitzki. 1996. An ecosystem approach to salmonid conservation. ManTech Environmental Research Services, Inc., Corvallis, Oregon, to National Marine Fisheries Service, Habitat Conservation Division, Portland, Oregon (Project TR-4501-96-6057).

Stadler, John. 2003. NOAA Fisheries. Personal communication. Phone conference, June 4, 2003

USACE (United States Army Corps of Engineers). 1977. Nehalem Wetlands Review: A Comprehensive Assessment of the Nehalem Bay and River (Oregon). U.S. Army Engineer District, Portland, Oregon. [Page count unknown].

U.S. Census Bureau. Website accessed December 19, 2002. http://quickfacts.census.gov/qfd/states/41/41029.html

Weitkamp, L.A., T.C. Wainwright, G.J. Bryant, G.B. Milner, D.J. Teel, R.G. Kope, and R.S. Waples. 1995. Status review of coho salmon from Washington, Oregon and California. National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, Washington.

APPENDIX C: ODOT STANDARD SPECIFICATIONS

Section 00280 - Erosion and Sediment Control

Description

00280.00 Scope - This work consists of installing, maintaining, and removing temporary erosion and sediment control devices such as berms, dikes, swales, check dams, sediment traps, sediment basins, matting, mulching, slope drains, sediment fences, sediment barriers, construction accesses, and other structural or nonstructural erosion and sediment control devices. Typical work areas include medians, interchanges, cut and fill slopes, areas disturbed by Project construction, material sources, and disposal sites.

The work described in these Specifications and shown on the plans is the Erosion and Sediment Control Plan (ESCP) and is the minimum requirement for wet weather site conditions.

Coordinate all temporary erosion control features with all permanent erosion control features, if applicable, to the extent practicable to assure economical, effective, and continuous erosion control throughout the construction and post-construction period.

00280.01 National Pollutant Discharge Elimination System - The Agency's ESCP's are developed to comply with Federal, State, and local laws, rules and regulations, and the National Pollutant Discharge Elimination System (NPDES) General Construction Permit for erosion prevention and sediment control for on-site construction activities. A copy of the Permit is available from the Agency. Erosion and sediment control features, other than those shown on the plans, may be required depending on the Contractor's methods of operation and schedule.

00280.02 Agency Controlled Lands Erosion and Sediment Control Plan - For work on all Agency-controlled lands, submit signed copies of the following for review and approval ten days before the preconstruction conference:

- A Contractor developed ESCP that incorporates the Agency's ESCP and all proposed modifications to it
- Implementation schedules for the ESCP

The Contractor may submit the ESCP that is included in the Project plans. To assist in the preparation or modification of the ESCP, refer to the Agency's Erosion and Sediment Control Manual.

For each phase of the scheduled work indicate on the ESCP how the proposed erosion and sediment control devices will divert flows, store flows, limit runoff from exposed areas, stabilize exposed soil, and filter sediment.

Include the following information in the implementation schedules, if applicable:

- A list of emergency on site stockpiled materials
- Clearing and grubbing for perimeter controls
- Installing perimeter controls
- Construction phasing
- Clearing and grubbing, grading, and trenching for activities other than perimeter controls
- Grading related to the Project
- Temporary stabilizing exposed soil surfaces
- Final grading, landscaping, and stabilization
- Work on or at bridges and other watercourse structures
- Isolating work area from surface water during in-water work
- Installing and removing utilities
- Work required in wetlands

- Monitoring rainfall
- Inspecting controls
- Installing, maintaining, monitoring, and removing temporary controls
- Installing and maintaining permanent controls
- Disposing of waste materials
- Haul road and borrow pit controls
- Additional controls for wet season work and temporary work suspensions

The ESCP and the implementation schedules shall be prepared by an individual who is knowledgeable in erosion and sediment control.

Keep a copy of the approved ESCP on site during all construction activities. During inactive periods longer than 7 calendar days, the ESCP may be on-site or retained by the Agency.

Do not begin work until the ESCP and the implementation schedules are approved.

Update the ESCP and schedules as needed for unexpected storm events or for other reasons to ensure that sediment-laden water does not leave the construction site. Add approved changes to the ESCP and schedules as soon as possible after changes have been implemented, but no later then 24 hours after implementation.

00280.03 Non-Agency Controlled Lands Erosion and Sediment Control Plan - For work on all non-Agency controlled lands, submit signed copies of the following for review ten days before the preconstruction conference:

- A Contractor developed ESCP
- A description of the methods to be used for the ESCP

Describe the following:

- Clearing and grubbing
- Installing perimeter controls
- Construction phasing
- Grading
- Temporary stabilizing exposed soil surfaces
- Final grading, landscaping, and stabilization
- Inspecting controls
- Installing, maintaining, monitoring, and removing temporary controls
- Installing and maintaining permanent controls
- Disposing of waste materials
- Haul road and borrow pit controls
- Additional control for wet season work and temporary work suspensions
- Methods of diverting flows, storing flows, limiting runoff from exposed areas, stabilizing exposed soil, and filtering sediment

The ESCP and methods of operation shall be prepared by an individual who is knowledgeable in erosion and sediment control.

Also, furnish the following:

- Signed, written letter from the property owner that allows the Contractor access to the property. Include a statement in the letter that holds the Agency harmless for all consequences related to the Contractor's use of the property.

- Signed agreement with the property owner detailing the Contractor's operation and use of the property.
- Copies of permits or proof that permits are not required from all pertinent federal, State, county, city, and local agencies.

If the Contractor's operations requires work on non-Agency controlled lands that were not presented at the preconstruction conference, or if changes to the Contractor's submitted ESCP are necessary, submit a new or revised ESCP to the Agency for review.

00280.04 Erosion and Sediment Control Manager (ESCM) - Designate and provide a representative, experienced in all disciplines of highway construction, as the Erosion and Sediment Control Manager (ESCM). The ESCM is responsible for assuring the duties described in 00280.61 are done and has the authority to immediately mobilize necessary personnel to correct and modify erosion prevention and sediment control devices as required. Provide the ESCM's name and working phone number ten days before the preconstruction conference. Provide written changes in the appointment of this individual during the term of the Contract.

Materials

00280.10 General - Provide materials meeting the following requirements. The Contractor may submit a request for proposed alternate materials by following the requirements of 00140.70.

(a) Biofilter Bags - Provide minimum size 460 mm x 150 mm x 760 mm (18" x 6" x 30") plastic mesh bags with 13 mm (1/2 inch) openings filled with approximately 20 kg (45 pounds) of clean, 100% recycled wood-product waste.

(b) Check Dams - Provide check dam material meeting the following requirements:

- **Aggregate** - Aggregate with maximum size between 150 mm (6 inches) and 75 mm (3 inches) meeting the requirements of 00330.16.

- **Straw Bales** - Standard rectangular straw bales meeting the requirements of 00280.10(n).

- **Biofilter Bags** - Biofilter bags meeting the requirements of 00280.10(a).

- **Sand Bags** - Sand bags meeting the requirements of 00280.10(l).

- **Stakes** - Stakes meeting the requirements of 00280.10(n).

- **Prefabricated** - Prefabricated check dam system meeting the manufacturers recommendations.

(c) Construction Entrances - Provide construction entrance material meeting the following requirements:

- **Aggregate** - Aggregate with a maximum size between 150 mm (6 inches) and 75 mm (3 inches) meeting the requirements of 00330.16.

- **Geotextile** - Subgrade geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).

(d) Diversion Dike/Swale - Provide diversion dike/swale material meeting the following requirements:

- **Aggregate** - Aggregate with maximum size between 100 mm (4 inches) and 25 mm (1 inch) meeting the requirements of 00330.16.

- **Seeding** - Temporary seeding meeting the requirements of 01030.13.

(e) Temporary Drainage Curbs - Provide temporary drainage curb material as follows:

- **Type 1** - Concrete drainage curb meeting the requirements of 00480.11.

- **Type 2** - Asphalt concrete drainage curb meeting the requirements of 00480.12.

- **Type 3** - Sand bags meeting the requirements of 00280.10(l).

(f) Dust Control - For dust control, use water at an application rate determined by the Engineer or use liquid stabilizer emulsion or dry powder tackifier according to the following:

- **Liquid Stabilizer Emulsion** - Provide a tackifier base material of liquid and polyvinyl acetate polymers with emulsion resins containing not less than 55 % total solids by mass (weight). Do not use tackifiers that contain polyacrylates or polyvinyl acrylics.

- **Dry Powder Tackifier** - Provide a tackifier base consisting of one or more active hydrocolloids from natural plant sources which hydrates in water and blends with other slurry materials, and upon application and drying tacks the slurry particles to the soil surface, and exhibits no growth or germination inhibiting factors. Provide stabilizing emulsion in a dry powder form that may be remulsifiable and consists of a processed organic adhesive derivative of one of the following:

  - Gumbinder derived from guar (Cyamopsis tetragonoloba)
  - Gumbinder derived from plantian (Plantago insularis)

Use nontoxic dust control materials that do not have an adverse effect on soil structure or establishment and growth of vegetation.

(g) Flow Spreader - Provide aggregate for flow spreaders with a maximum size between 150 mm (6 inches) and 75 mm (3 inches) meeting the requirements of 00330.16.

(h) Inlet Protection - Provide inlet protection materials meeting the following requirements:

- **Wire Mesh** - Provide wire mesh materials as follows:

  - **Type 1 Inlet Protection** - Wire mesh meeting the requirements of 00280.10(o).

  - **Type 2 Inlet Protection** - 1 mm diameter (19 gage) steel-wire mesh with 10 mm x 10 mm (3/8" x 3/8") openings.

- **Geotextile** - Type 1 sediment fence geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).

- **Aggregate** - Aggregate with maximum size between 100 mm (4 inches) and 25 mm (1 inch) meeting the requirements of 00330.16.

- **Stakes** - Stakes meeting the following requirements:

  - **Type 1 Inlet Protection** - Use commercial grade metal posts with a mass (weight) of at least 2 kg/m (1.35 pounds/foot).

  - **Type 4 Inlet Protection** - Use minimum 25 mm x 50 mm x 450 mm (1" x 2" x 18") wooden posts.

- **Biofilter Bags** - Biofilter bags meeting the requirements of 00280.10(a).

- **Prefabricated Filter Inserts** - Provide prefabricated filter inserts manufactured specifically for collecting sediment in drainage inlets and listed on the QPL. Include handles and/or fasteners sufficient to keep the insert from falling into the inlet during maintenance and removal of the insert from the inlet.

- **Concrete Masonry Units** - Provide nominal 200 mm x 200 mm x 400 mm (8" x 8" x 16"), 13 kg (29 pound) concrete building blocks with two 140 mm x 140 mm (5 1/2" x 5 1/2") openings and 25 mm (1 inch) minimum outer wall thickness.

- **Sod** - Provide grass sod grown on agricultural land that is cultivated specifically for turf sod meeting the following requirements:

  - Free of weeds, diseases, nematodes, and insects
  - Mature and not less than 10 months old
  - Machine cut to a uniform thickness of 16 mm (5/8 inch) or more, excluding top growth and thatch
  - Broken pieces and torn or uneven ends will not be accepted

- **Reinforcing Steel** - Provide commercial grade reinforcing steel.

(i) Matting - Provide matting material that conforms to the Texas DOT/TTI Hydraulics and Erosion Control Laboratory requirements and meets the following performance criteria categories:

- **Type A** - Slope protection mat for clay soil slopes 1V:3H or flatter.

- **Type B** - Slope protection mat for sandy soil slopes 1V:3H or flatter.

- **Type C** - Slope protection mat for clay soil slopes steeper than 1V:3H.

- **Type D** - Slope protection mat for sandy soil slopes steeper than 1V:3H.

- **Type E** - Flexible channel liner for shear stress from 0 to 96 Pa (0 to 2 pounds/square foot).

- **Type F** - Flexible channel liner for shear stress from 0 to 192 Pa (0 to 4 pounds/square foot).

- **Type G** - Flexible channel liner for shear stress from 0 to 287 Pa (0 to 6 pounds/square foot).

- **Type H** - Flexible channel liner for shear stress from 0 to 383 Pa (0 to 8 pounds/square foot).

Provide check slot material and fasteners as follows:

- **Check Slot:**

  - **Channel Application** - Compacted class 25 (50) riprap meeting the requirements of Section 00390.

  - **Slope Application** - Compacted native material.

- **Fasteners** - Use U-shaped wire staples or heavy duty pins as follows:

  - **Staples** - 2 mm diameter (14 gage) steel wire staples. 25 mm (1 inch) "U" width with a length of 150 mm (6 inches) minimum for cohesive soils and 200 mm (8 inches) minimum for non-cohesive soils.

  - **Pins** - 4.75 mm (3/16 inch) diameter steel pin with a 50 mm (2 inch) diameter steel washer secured at the head of the pin with a length of 450 mm (18 inches) minimum for cohesive soils and 600 mm (24 inches) minimum for non-cohesive soils.

Provide the manufacturer's material and installation specifications to the Agency prior to installation.

(j) Temporary Mulch - Provide mulch material conforming to 01030.15(b) and tackifier material conforming to 001030.16.

(k) Plastic Sheeting - Provide plastic sheeting slope protection, anchoring system, and toe protection according to the following:

- **Plastic Sheeting** - Minimum 0.15 mm (6 mil) thick polyethylene plastic sheeting.

- **Anchoring System** - Anchor system consisting of minimum 30 kg (65 pounds), non-puncture type anchor weights with cords or ropes of adequate strength to support the weights on the slope or new or used chain link fence conforming to 03010.30.

- **Stakes** - Commercial grade metal posts with a mass of at least 2 kg/m (1.35 pounds/foot).

- **Rock** - Class 25 (50) riprap conforming to Section 00390.

(l) Sand Bags - Provide 610 mm x 300 mm x 150 mm (24" x 12" x 6") durable, weather-resistant, tightly woven bags sufficient to prevent leakage of filler material. Fill bags with at least 34 kg (75 pounds) of firmly packed fine pcc aggregate 9.75 mm - 0 (3/8" - 0) or round 9.5 mm - 4.75 mm (3/8" - 3/16") pea gravel.

(m) Temporary Scour Holes - Provide class 50 (100) riprap for temporary scour holes conforming to Section 00390.

(n) Sediment Barriers - Provide sediment barriers and sediment barrier materials meeting the following requirements:

- **Straw Bales** - Provide standard 20 - 30 kg (45 - 65 pound) rectangular straw bales that are wire-bound or string-tied. Straw material shall meet the requirements of 01030.15(b).

- **Biofilter Bags** - Biofilter bags meeting the requirements of 00280.10(a).

- **Wattles** - Provide wattles made of straw meeting the requirements of 01030.15(b) except use only rice or coconut straw material. Wrap the straw, to a minimum density of 44 kg/m^3 (2.75 pounds/cubic foot), in tubular plastic netting meeting the following requirements:

  - 200 mm (8 inch) to 260 mm (10 inch) diameter size
  - Minimum strand thickness of 0.08 mm (0.003 inch)
  - Knot thickness of 1.4 mm (1/16 inch)
  - Mass of 33 g/m (Weight of 0.35 ounces/foot) (plus or minus 10%)
  - Made from 85% high density polyethylene, 14% ethyl vinyl acetate, and 1% color for UV inhibition

- **Sand Bags** - Sand bags meeting the requirements of 00280.10(l).

- **Brush Barrier** - Provide maximum 150 mm (6 inch) diameter woody debris brush or topsoil strippings for brush barriers. Provide type 1 sediment fence geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).

- **Filter Berm and Rock Filter** - Provide aggregate with maximum size between 100 mm (4 inches) and 25 mm (1 inch) meeting the requirements of 00330.16. Provide subgrade geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).

- **Prefabricated Barrier System** - Provide prefabricated barriers manufactured specifically for temporarily obstructing the flow of sediment-laden water and listed on the QPL.

- **Stakes** - Provide the following size stakes:

  - Biofilter Bags - Use minimum 25 mm x 50 mm x 450 mm (1" x 2" x 18") wood posts
  - Brush Barrier - Use minimum 25 mm x 50 mm x 450 mm (1" x 2" x 18") wood posts
  - Straw Bales - Use minimum 38 mm x 38 mm x 900 mm (1 1/2" x 1 1/2" x 36") wood posts
  - Wattle - Use minimum 25 mm x 25 mm x 600 mm (1" x 1" x 24") wood posts

(o) Sediment Fence - Provide the following materials for sediment fences:

- **Geotextile** - Sediment fence geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).

- **Posts** - Posts meeting the following requirements:

  - **Supported Sediment Fence** - Commercial grade metal posts with a mass of at least 2 kg/m (1.35 pounds/foot).

  - **Unsupported Sediment Fence** - 38 mm x 38 mm x 1200 mm (1 1/2" x 1 1/2" x 48") minimum wooden posts.

- **Wire Mesh** - Galvanized wire mesh with 50x50 - MW3.2xMW3.2 (2x2 - W0.5xW0.5) or 102x50 - MW3.2xMW3.2 (4x2 - W0.5xW0.5) openings or horizontal and vertical self supporting, prior to fastening to posts, mesh with a minimum tensile strength of 485 MPa (70 ksi) meeting the requirements of ASTM A 82.

(p) Sediment Mat - Provide sediment mats from the QPL.

(q) Temporary Sediment Trap - Provide the following materials for sediment traps:

- **Geotextile** - Type 2 drainage geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).

- **Aggregate Base** - 37.5 mm - 0 (1 1/2" - 0), 25 mm - 0 (1" - 0), or 19 mm - 0 (3/4" - 0) aggregate for aggregate base meeting the requirements of Section 00641.

- **Aggregate** - Aggregate with maximum size between 150 mm (6 inches) and 75 mm (3 inches) meeting the requirements of 00330.16.

(r) Temporary Slope Drains - Provide either plastic pipe meeting the requirements of Section 02410 or metal pipe meeting the requirements of Section 02420. If the contributing area is not established, use 300 mm (12 inch) diameter.

(s) Slope Berms - Provide earthwork materials for slope berms according to 00330.41 or stone embankment material with the maximum size between 100 mm (4 inches) and 25 mm (1 inch) meeting the requirements of 00330.16.

(t) Tire Wash Facility - Provide the following materials for tire wash facilities:

- **Aggregate** - 37.5 mm - 0 (1 1/2" - 0), 25.0 mm - 0 (1" - 0), or 19.0 mm - 0 (3/4" - 0) aggregate base material meeting the requirements of Section 00641.
- **Reinforcing Steel** - Reinforcing steel meeting the requirements of 02510.10.
- **Geotextile** - Subgrade geotextile meeting the requirements of Section 02320. Provide "Level B" documentation according to 02320.10(c).
- **Concrete** - Commercial grade concrete meeting the requirements of Section 00440.

(u) Chemical Soil Stabilization - Provide a liquid stabilizing emulsion meeting the requirements of 00280.10(f).

Construction

00280.40 Installation - Install erosion and sediment control devices as shown and according to the Agency's Erosion and Sediment Control Manual. Install erosion and sediment control devices before performing clearing, grading, or other land alteration activities. Ensure that sediment laden water does not leave the Project boundaries, enter drainage systems or waterways, or violate applicable water standards.

00280.41 Work Restrictions - The following work restrictions apply:

(a) Disturbance Limits - Flag all construction site-clearing limits. Do not disturb areas outside the flagging limits. Maintain the flagging during Project construction.

(b) Perimeter Controls - Perimeter controls include interceptor ditches, berms in fill areas, and sediment fences or straw bales along the banks of existing streams and toes of slopes. Install all appropriate perimeter controls before beginning major site grubbing operation.

Install all erosion and sediment control features for soil disturbing activities that are within 90 meters (300 feet) horizontal distance of the two-year flood elevation before beginning work.

(c) Wet Season Work and Temporary Work Suspension - Wet season work is defined as work between October 1 and May 30. Before working during the wet season and before temporary work suspension for winter, meet with the Agency to review and update the ESCP and to develop a schedule to ensure that appropriate controls are implemented and maintained during the wet season work and work suspension periods.

During wet season work, stabilize soil stockpiles at the end of each workday by diverting flows, placing covers, or installing sediment barriers at the stockpiles. Also, limit excavation and bare ground activities to only that which is required for immediate operations.

(d) Disturbance Restrictions - If soil erosion and sediment resulting from construction activities is not effectively controlled, the Agency will limit the amount of disturbed areas to that which can be effectively

controlled. Incorporate erosion and sediment control measures into the Project at the earliest practicable time. Install all erosion and sediment control devices according to the approved implementation schedule and these Specifications. If the Contractor fails to control erosion, the Agency will stop all construction work according to 00180.70.

00280.42 Stabilization - Stabilize soil areas as follows:

(a) Soil Exposure Limitations - Stabilize all soils which are exposed and disturbed during construction related activities according to the following:

- **Statewide (Entire Year)** - Stabilize within seven days of exposure, all areas within 30 meters (100 feet) of waterways, wetlands, or other sensitive areas using methods that do not rely solely upon germination to control erosion.

- **West of the Cascades (Entire Year)** - Stabilize all other areas within 14 days of exposure.

- **East of the Cascades (October 1 through April 30)** - Stabilize all other areas within 14 days of exposure.

- **East of the Cascades (May 1 through September 30)** - Stabilize slope and embankment construction in stages based on site conditions, weather, and as determined by the Agency.

(b) Temporary Stabilization - Protect from erosion the surface area of exposed soils caused by construction activities. Temporary stabilize exposed soil surfaces not at finish grade at all times and soil surfaces at finish grade when working outside the permanent seeding dates. Provide the following until permanent stabilization measures are implemented:

- Schedule temporary stabilization on an 14 day basis, or more frequent, if needed or directed
- Implement at a minimum, appropriate temporary stabilization measures according to the schedule. Temporary stabilization includes, chemical soil tackifiers, temporary seeding, temporary mulching, erosion control matting, plastic sheeting, preparing seed bed, fertilizing, watering, and adding soil amendments.
- Document implemented measures on the ESCP

Active work areas scheduled for re-disturbance before the next scheduled temporary stabilization period may be left unstabilized if approved by the Agency.

(c) Permanent Stabilization - Permanently stabilize exposed soil surfaces at finished grade. Permanent stabilization methods include, but are not limited to, seeding, mulching, riprap protection, and bio-engineered slope stabilization. Permanent stabilization includes stabilization of temporary structures such as detours, stockpiles, and staged earthwork. Immediately perform permanent stabilization at each completed excavation and embankment area except for areas that are scheduled to be redisturbed.

If areas that have been seeded and are not sufficiently stabilized by an established stand of vegetation according to 01030.60, or the soil surface is not protected with sufficient temporary stabilization measures by November 1 of each year, do the following:

- Take measures necessary to redirect the flows away from the disturbed areas
- Re-grade disturbed areas to finished grade
- Apply permanent seeding at the original specified rate
- Apply temporary mulching or matting

If areas to be stabilized, prior to re-grading, are too steep or lack access for effective straw mulch application, apply, upon approval, other effective measures such as chemical soil stabilizers.

Incorporate permanent erosion control features into the Project at the earliest practicable time. Use temporary erosion control features for the following situations:

- To correct conditions that occur during construction activities that were not foreseen during the design stage of the Project
- That are needed prior to installing permanent erosion control features
- To temporarily control erosion that develops during normal construction activities

Where erosion will be a problem and if construction permits, construct permanent erosion control features immediately after clearing and grubbing and grading operations are complete. If permanent erosion control features cannot be constructed furnish and install temporary erosion control features.

00280.43 Area Preparation - Prepare areas according to 01040.48(d).

Track all fill slopes at finished grades steeper than 1V:3H and flatter than 1V:1.5H so that track impressions run parallel to slope contours. Maintain at least 35 mm (1 3/8 inch) tall track grousers.

00280.46 Application - Install erosion and sediment control devices as shown and according to the following:

(a) Biofilter Bags - Place and arrange biofilter bags as shown or directed.

(b) Check Dams - Construct check dams as shown or as directed.

Type 1: Aggregate - Place aggregate in the ditch section with the center low point below the outside edge.

Type 2: Straw Bales - Place aggregate in ditch section and extend check dam with straw bales sufficient to direct flow over aggregate weir.

Type 3: Biofilter Bags - Place aggregate in ditch section and extend check dam with biofilter bags sufficient to direct flow over aggregate weir. Aggregate weir may be replaced with additional biofilter bags if approved.

Type 4: Sand Bags - Place aggregate in ditch section and extend check dam with sand bags sufficient to direct flow over aggregate weir. Aggregate weir may be replaced with additional sand bags if approved.

Type 5: Pre-fabricated Check Dam System - Install pre-fabricated check dam systems according to the plans, Special Provisions, and the manufacturer's recommendations. Field fabricated systems are not allowed.

(c) Construction Entrances - Construct construction entrances at each access point between the construction site and all public or private roads or other paved surfaces.

When construction entrances are in use and mud and dirt tracking is evident, take additional steps to eliminate tracking by hosing off tires before vehicles leave the site, or by modifying construction techniques or work operation. Perform tire washing on gravel pads. Use silt-trapping structures to collect and drain wash water before it leaves the construction site.

(d) Diversion Dike/Swale - Construct diversion dikes and swales above the cut slope to divert runoff from undisturbed areas away from disturbed slope areas. Convey runoff to an undisturbed area and discharge in a nonerosive manner.

Construct diversion dikes and swales at the toe of fill slopes to divert and convey sediment-laden water to a sediment control facility. Compact dike material according to the MFTP.

Immediately after completing constructing diversion dikes and swales place temporary seed and mulch according to Section 01030, or place erosion matting and seed as directed.

(e) Temporary Drainage Curbs - Construct temporary drainage curbs as shown or directed.

(f) Dust Control - Apply appropriate dust (wind erosion) control according to the following:

- **Water** - Apply water according to Section 00340.
- **Liquid Stabilizer Emulsions** - Dilute liquid stabilizer with water at a ratio of 30:1 then apply at a rate of 270 L/ha (29 gallons/acre) unless the manufacturer recommends a greater rate of application.
- **Dry Powder Tackifier** - Apply at a rate of 157 kg/ha (140 pounds/acre) unless the manufacturer recommends a greater rate of application.

(g) Flow Spreader - A flow spreader is a 300 mm (12 inch) to 450 mm (18 inch) high berm of aggregate that is at a uniform grade throughout its length. Place the flow spreader to receive channeled runoff so that the water is uniformly dispersed along the length of the spreader. Discharge water into a stabilized area at nonerosive velocities.

(h) Inlet Protection - Construct inlet protection that directs flows through the control and into the inlet. Select materials from alternatives shown on the plans or Special Provisions.

Type 1 - Install supported sediment fence around the perimeter of the inlet according to 00280.46(n).

Type 2 - Place wire mesh over the inlet grate. Place sediment fence geotextile over the wire mesh and perimeter area near the inlet. Install aggregate over the geotextile fabric.

Type 3 - Install pre-fabricated inserts according to the plans, Special Provisions, and manufacturer's recommendations. Field fabricated inserts are not allowed.

Type 4 - Install biofilter bags according to the plans.

Type 5 - Install concrete masonry units around the perimeter of the inlet. Place sediment fence geotextile around the outside perimeter, up the outside face, and on the top of masonry units. Place aggregate over the geotextile fabric and flush with the top of masonry units.

Type 6 - Within 36 hours of harvest, install sod around the perimeter of the inlet.

(i) Matting - Insure that the matting is installed according to the plans, these Specifications, or the manufacturer's recommendations, whichever is more stringent.

(1) Area Preparation - Remove all materials (vegetation, rocks, wood, etc.) larger than 50 mm (2 inches) in size. Smooth the surface and remove undulations sufficient to allow the matting to be placed in complete contact with the soil.

(2) Seeding - Apply seeding over the same area where matting is required according to one of the following:

a. Seeding Prior to Mat Installation - Apply according to Section 01030. This method is preferred.

b. Seeding After Mat Installation - This method is allowed only if specified in the Special Provisions or approved. Apply according to Section 01030 at double the application rate for seed.

c. Single Application - Mat and Seed:

- **Hydraulically Applied Mat** - Apply seed at double the rate specified in Section 01030. Thoroughly mix seed, fertilizer, and mat material.

- **Manually Applied (Pre-seeded) Mat** - Pre-seed the mat at double the rate specified with the seed mix specified in Section 01030.

(3) Mat Placement - Apply matting loosely so it is in complete contact with the soil to prevent erosion occurring beneath it. Apply mat and fasteners as shown. Construct check slots on all channel applications and on slope applications when shown or specified.

(j) Temporary Mulch - Evenly apply dry mulch and tackifier material according to these Specifications. In areas not accessible to heavy equipment, mulch by hand or by other approved methods. Areas not prepared according to 01040.48(d) will require greater rates of application at the Contractor's expense. Tack mulch material in place mechanically or with hydraulically applied tackifier to form a cohesive surface cover that is resistant to displacement by wind and water.

(1) Dry Mulch - Apply straw mulch on slopes 1V:1.5H or flatter. Spread straw mulch by hand or blower. Place approximately 50 mm (2 inch) deep, in loose condition, at a rate between 4.5 to 6.7 Mg/ha (2 to 3 tons/acre) of dry mulch. Place straw mulch so that it is loose enough for sunlight to penetrate and air to circulate, but dense enough to shade the ground, reduce water evaporation, and materially reduce soil erosion. Anchor using hydraulically applied tackifier, crimping disc, or sheep's-foot roller approved by the Agency or methods specified in the Special Provisions.

Provide blower equipment that uses air pressure with an adjustable spout that uniformly applies dry mulch at constantly measured rates. Apply the materials using a sweeping, horizontal motion of the nozzle.

(2) Tacking - Straw mulch may be tackified using hydraulically applied tacking agents or mechanical methods at the following rates of application:

a. Hydraulically Applied Tacking Agents:

- **Liquid Stabilizer Emulsions** - Dilute liquid stabilizer with water at a ratio of 30:1 then apply at a rate of 270 L/ha (29 gallons/acre) unless the manufacture recommends a greater rate of application.

- **Dry Powder Tackifier** - Apply at 90 kg/ha (80 pounds/acre) with 880 kg (1,940 pounds) of hydromulch fiber unless the manufacturer recommends a greater rate of application.

b. Mechanical Methods - Straw mulch may be mechanically tackified using a crimping disk or sheep's-foot roller.

- **Crimping disc** - A heavy disk with flat, scalloped discs approximately 6 mm (1/4 inch) thick, having dull edges and spaced no more than 230 mm (9 inches) apart.

- **Sheep's-Foot Roller** - Modified sheep's-foot roller equipped with straight studs, made of approximately 20 mm (3/4 inch) steel plate, placed approximately 200 mm (8 inches) apart and staggered. Ensure that the studs are not less than 150 mm (6 inches) long nor more than 150 mm (6 inches) wide, and rounded to prevent withdrawing the straw from the soil. Use a roller with enough mass to incorporate the straw sufficiently into the soil providing a uniform surface cover.

(k) Plastic Sheeting - Place plastic sheeting on disturbed, temporary slopes where immediate protection is required and mulching or other methods of soil stabilization are not feasible. Temporary slopes include vertical excavations for retaining walls and other temporary soil excavations and embankments related to structural work.

Cover exposed soils with plastic sheeting and secure it tightly in place using an anchoring system of sand bags, chain link fence, or other approved methods. Do not allow the anchoring system to puncture the plastic sheeting. Trench plastic sheeting at the top of slope and secure adequately to maintain cover during reasonably expected conditions in the area. Direct water away from areas above the plastic sheeting to prevent erosion from undermining the plastic sheeting.

Control drainage from areas covered by the plastic sheeting so that the discharge occurs onto the toe protection.

(l) Temporary Scour Holes - Construct temporary scour holes at the outfall ends of temporary slope drains or as shown.

(m) Sediment Barriers:

Type 1: Straw Bales - Place and arrange straw bales as shown or directed.

Type 2: Biofilter Bags - Place and arrange biofilter bags as shown or directed.

Type 3: Wattles - Place and arrange wattles as shown or directed.

Type 4: Sand Bags - Place and arrange sand bags as shown or directed.

Type 5: Brush Barrier - Place and arrange brush barriers as shown or directed. Place woody debris or topsoil strippings in a linear pile.

Type 6: Filter Berm - Place and arrange filter berms as shown or directed. Place rock in an evenly spread, trapezoidal berm.

Type 7: Pre-fabricated Barrier System - Install pre-fabricated barrier systems according to the plans, Special Provisions, and manufacturer's recommendations. Field fabricated systems are not allowed.

(n) Sediment Fence - Construct supported (mesh and metal posts) and unsupported (no mesh) as follows:

- When installing geotextile and mesh, or geotextile alone, use a continuous roll of geotextile cut to the length of the barrier to avoid joints
- Manufacturer's factory seams are acceptable. Field sewn seams are not acceptable.
- Drive posts into undisturbed soil as shown.
- Securely fasten the geotextile (and mesh) to the upslope side of the posts. Securely fasten each end of the geotextile (and mesh) to the end posts.
- Use stitched loops over posts for unsupported silt fence
- Excavate a trench on the upslope side of the fence and place geotextile to the bottom of the trench. Backfill the trench with native material and compact.
- Attach the supported sediment geotextile to the wire mesh
- Install the manufactured silt fence system according to the plans, Special Provisions, and manufacturer's recommendations. Connect end of rolls as shown.

(o) Sediment Mat - Place sediment mats a minimum of 6 m (20 feet) downstream of work areas. Install mats individually or in groups on the stream bottom. Remove the mats not later than 48 hours after stream activities are complete. Remove them from the Project site, or if approved, place them on the stream bank and cover with permanent seeding.

(p) Temporary Sediment Trap - The trap may be formed by constructing a berm or by partial or complete excavation. Direct the discharge flow to a stabilized conveyance outlet or level spreader.

(q) Temporary Slope Drains - Construct watertight slope drains and extend as the embankment height increases. Construct temporary slope berms at the top of embankment slopes to direct water into the drains until permanent drainage structures are completed.

(r) Temporary Stabilization - Surfaces which require temporary stabilization include, but are not limited to:

- Exposed soil surfaces not at finished grade
- Exposed soil surfaces at finished grade when outside permanent seeding dates
- Stockpiles of exposed soils

Temporary stabilization methods include chemical soil stabilization, permanent seeding with temporary mulching, temporary mulching, matting, bark mulch and other temporary cover and stabilization measures. Prepare soil surfaces as specified for the appropriate method used.

If seed of any kind is applied and has not achieved 70% density of the surrounding existing grass areas prior to the end of the permanent seeding dates, then apply additional temporary stabilization measures, other than seeding.

(s) Slope Berm - Construct a 0.5 m (18 inch) minimum high berm of compacted material at the top of embankments during construction to direct water away from exposed slopes.

(t) Tire Wash Facility - Excavate the area for installation of the tire wash facility. Install subgrade geotextile, aggregate base coarse, reinforced concrete, and water as shown.

(u) Chemical Soil Stabilization - Hydraulically apply a liquid stabilization emulsion chemical soil stabilizer at the following rates unless the manufacturer recommends a greater rate of application:

- **Long Term Control of Exposed Soil Surfaces** - 325 L/ha (35 gallons/acre). Dilute the emulsion with water at the rate of one part emulsion to 20 parts water.

- **Steep Slopes with Raveling Small Rock** - 435 L/ha (45 gallons/acre). Dilute the emulsion with water at the rate of one part emulsion to 10 parts water.

00280.47 Work Quality - Protect areas according to 01030.49.

00280.48 Emergency Materials - Provide, stockpile, and protect emergency materials on-site for unknown weather or erosion conditions. A list of emergency materials will be listed in the Special Provisions. Replenish emergency materials as they are used.

The emergency materials are in addition to the other erosion control materials required to implement and maintain the ESCP.

Remove all unused emergency materials from the Project site at the completion of the Project.

Maintenance

00280.60 General - Maintain installed erosion and sediment control devices in good working order at all times. Keep the devices in place until the Agency issues notification of acceptance of stabilization. All maintenance and repairs are at the Contractor's expense.

00280.61 Erosion and Sediment Control Manager - The ESCM's duties include:

- Manage and insure proper implementation of the ESCP
- Accompany the Agency's representative to the field to review the ESCP before beginning construction activities
- Monitor rainfall on and in the vicinity of the Project site
- Monitor receiving streams in the vicinity of the Project site
- Weekly inspect erosion and sediment control features on active construction sites
- Every two weeks inspect erosion and sediment control features on inactive sites
- Inspect erosion and sediment control features on all inactive and active sites at least daily during rainy periods when 15 mm (5/8 inch) or more of rain has fallen within a 24 hour period
- Mobilize crews to make immediate repairs to the control devices or to install additional control devices during working and non-working hours
- Record actions taken to clean up significant amounts of sediment
- Complete the Erosion Control Monitoring form
- Update the ESCP monthly and within 24 hours after changes are implemented
- Prepare a contingency plan in preparation for emergencies and the rainy season
- Accompany the Agency's representative on inspections and, if requested, on inspections made by the regulating agency representatives

00280.62 Ineffective Controls - If a control feature does not function effectively, immediately repair, replace, or provide additional devices. Devices repaired, replaced, or added due to improper installation, insufficient maintenance, or damage from Contractor operations will be at the Contractor expense.

00280.63 Monitoring - Monitoring consists of the following:

(a) Rainfall - Furnish and install a rain gauge at the Project site. Notify the Agency if 15 mm (5/8 inch) or more of rainfall occurs within a 24 hour period. As soon as practicable, but not later than 24 hours, after 15 mm (5/8 inch) or more of rainfall occurs, including weekends and holidays, inspect the entire Project to determine the condition of all erosion and pollution control devices.

(b) Receiving Stream - Observe and record color and turbidity or clarity within 10 m (30 feet) upstream and downstream of locations where surface waters from the construction site enter the receiving stream. Note whether sheen and floating matter are present or absent. Describe any apparent color and the clarity of the discharge, and any observable difference in comparison with the receiving stream.

(c) Monitoring Form - Complete the Erosion Control Monitoring form after each inspection, observation of the receiving stream erosion control facility modification, or maintenance action. Submit the forms to the Agency weekly for active sites and every two weeks for inactive sites.

00280.64 Sediment Removal - Remove sediment and upgrade or repair the devices as needed as soon as practicable, but not later than two days after the surrounding exposed ground has dried sufficiently to prevent further damage from equipment needed for repair operations. If rainfall continues over a 24 hour period, or other circumstances that preclude equipment operation in the area, hand carry and install additional sediment control devices with best management practices and approved by the Agency.

(a) Catch Basins - Maintain catch basin inserts and other forms of inlet protection by removing trapped sediment when storage capacity has been reduced by 50%.

(b) Sediment Controls - Remove sediment from sediment fences, sediment barriers, check dams, and sediment traps once it has reached one third of the exposed height of the device or storage depth. Replace aggregate and rock filter material with new aggregate material when the sediment reduces the filtering capacity of the device by one half. Replace biofilter bags with clean, washed bags when removing sediment from them. Wash bags in an approved sediment control area.

(c) Paved Areas - Keep all paved areas clean for the duration of the Project. Use cleaning methods that do not transport sediment-laden water to receiving streams.

(d) Construction Entrances - Add and remove aggregate or other specified material as needed to maintain the proper function of the construction entrances.

(e) Permanent Stabilization - Restabilize within two calendar days of disturbance all areas disturbed by the Contractor's operations or other causes including wind, water, and vandalism.

(f) Straw Bales - Replace straw bales when they become non-functional or, at a minimum, on an annual basis or at the beginning of each construction season as appropriate.

Finishing and Clean Up

00280.70 Removal - Within 30 days of the notification of acceptance of permanent stabilization, remove temporary erosion and sediment control devices and materials from the area. Remove accumulated sediment before removing the devices and materials. Immediately shape and permanently stabilize areas affected by the removal process. All temporary erosion and sediment control features that are not incorporated into the permanent work remain the property of the Contractor. Do not remove temporary erosion and sediment control devices before permanent stabilization is accepted.

00280.71 Sediment Disposal - Re-grade removed sediment into slopes or remove and dispose of off-site according to all federal, state, and local laws and ordinances. Do not flush sediment-laden water into drainage systems.

Measurement

00280.80 Lump Sum Basis - No separate measurement will be made for lump sum items.

00280.81 Unit Basis - Unit basis items will be measured on a unit basis, per each, by actual count of each device or location where the device is constructed or placed and accepted.

00280.82 Length Basis - Length basis items will be measured by the meter (foot) along the line and grade of the item or device constructed or placed and accepted.

- Flow spreaders and diversion dike/swale will be measured along the long axis
- Sediment barrier, when measured on the length basis, will be measured along the long axis of the barrier regardless of type
- Temporary slope drains will be measured from the beginning of the metal end pieces to the end of the drain. Measurement will be made when each installation is at its maximum length.

00280.83 Area Basis - Area basis items will be measured on the ground surface by the meter (foot), and computed to the m^2 (square foot) or ha (acre) unit as applicable.

00280.85 Limitations - The quantities of emergency materials listed in 00280.48 of the Special Provisions are included in the pay item quantities listed in bid schedule.

Payment

00280.90 General - The accepted quantities of erosion and sediment control devices will be paid for at the Contract unit price per unit of measure for the following items:

Pay Item	Unit of Measurement
Erosion Control	Lump Sum
Check Dams	Each
Construction Entrances	Each
Inlet Protection	Each
Temporary Scour Holes	Each
Temporary Sediment Traps	Each
Tire Wash Facility	Each
Biofilter Bags	Each or m (Foot)
Sand Bags	Each or m (Foot)
Sediment Barrier	Each or m (Foot)
Diversion Dike/Swale	m (Foot)
Temporary Drainage Curbs	m (Foot)
Flow Spreader	m (Foot)
Sediment Fence, Supported	m (Foot)
Sediment Fence, Unsupported	m (Foot)
Temporary Slope Drains	m (Foot)
Plastic Sheeting	m^2 (Square Foot)
Sediment Mat	m^2 (Square Foot)
Chemical Soil Stabilization	m^2 or ha (Square Foot or Acre)
Matting	m^2 or ha (Square Foot or Acre)
Temporary Mulching	m^2 or ha (Square Foot or Acre)

"Erosion Control" includes the following:

- Developing, revising, and documenting the ESCP
- Mobilization
- Monitoring activities
- Furnishing, stockpiling, protecting, restocking, and removing emergency materials
- Preparing Project for winter shut-down
- Inspecting, maintaining, and removing erosion control devices
- Restoring all disturbed ground and work areas

If "Erosion Control" is not listed as a pay item, it is Incidental work for which no separate payment will be made.

Emergency materials that are incorporated into the Project will be paid for under the appropriate pay item.

"Plastic Sheeting" includes the costs for protecting exposed slopes with plastic sheets, anchoring devices, and toe protection maintenance.

"Matting" includes the costs for preparing the slope surface and stabilizing exposed soil with erosion mat material.

Biofilter bags and sand bags used in constructing check dams or sediment barriers will not be separately paid for. Biofilter bags and sediment fence used in constructing inlet protection will not be separately paid for. Payment for these items will be included in payment made for the items "Check Dams", Sediment Barriers", and "Inlet Protection" as applicable.

No separate or additional payment will be made for the following:

- Removing and disposing of sediment build up behind sediment fences and sediment barriers
- Removing and reinstalling required appurtenances to modify temporary slope drains as the embankment slopes are changed
- Constructing and removing temporary slope berms
- Applying dust control
- Erosion control for work outside the construction limits including but not limited to borrow pits, haul roads, disposal sites, and equipment storage sites

Payment will be payment in full for furnishing and placing all materials, performing all work, and furnishing all equipment, labor, and incidentals necessary to complete the work as specified.

00280.91 Lump Sum Progress Payments - The amount paid for lump sum items in the Contract progress payment will be based on the percent of the original Contract amount that is earned from other Contract items, not including advances on materials, and as follows:

- 50% upon initial installation of erosion items
- An additional 25% when 50% of the original Contract amount is earned
- The remaining 25% when the Project is complete and all temporary erosion control devices are removed from the Project site

Section 00290 - Environmental Protection

Description

00290.00 Scope - This Section describes the Contractor's duties and obligations with respect to protection of the waters, air, wildlife and other environmental resources of the State.

Comply with all applicable federal, State and local environmental , health, safety and other laws, acts, statutes, regulations, administrative rules, ordinances, orders and permits, as they may be amended from time to time (referred to in this Section as "Laws"). Comply with all applicable Laws, whether or not specifically referenced in this Section or elsewhere in the Contract.

The following federal, State and local agencies are known to have enacted ordinances and regulations relating to environmental pollution and the preservation of natural resources that may affect the performance of the Contract:

Federal Agencies:

Agriculture, Department of
- Forest Service
- Soil Conservation Service

Army, Department of the
- Corps of Engineers

Commerce, Department of
- National Marine Fisheries Service

Defense, Department of

Energy, Department of

Environmental Protection Agency

Federal Energy Regulatory Commission

Health and Human Services, Department of

Housing and Urban Development, Department of

Interior, Department of
- Heritage, Conservation, and Recreation Service
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Mines
- Bureau of Reclamation,
- Geological Survey
- Minerals Management Service
- Office of Surface Mining, Reclamation, and Enforcement
- U.S. Fish and Wildlife Service

Labor, Department of
- Mine Safety and Health Administration
- Occupational Safety and Health Administration

Transportation, Department of
- Coast Guard
- Federal Highway Administration

Water Resources Council

State of Oregon Agencies:

Administrative Services, Department of

Agriculture, Department of
- Natural Resources Division
  - Soil and Water Conservation District

Columbia River Gorge Commission

Consumer and Business Services, Department of
- Insurance Division
- Oregon Occupational Safety and Health Division

Energy, Office of

Environmental Quality, Department of

Fish and Wildlife, Department of

Forestry, Department of

Geology and Mineral Industries, Department of

Human Resources, Department of

Labor and Industries, Bureau of

Land Conservation and Development Department

Parks and Recreation, Department of

State Lands, Division of

Water Resources Department

Local Agencies:

City Councils

County Courts

County Commissioners, Boards of

Design Commissions

Historical Preservation Commissions

Planning Commissions

Port Districts

Special Districts

Oregon Tribal Governments

If any provision of these Specifications appears to conflict with one or more Laws, the more stringent requirement shall apply, unless the Engineer directs otherwise in situations where these Specifications are more stringent.

Comply with any additional requirements or Laws imposed by any agency or governmental unit having authority to enforce the Endangered Species Act (ESA) and other Laws.

No condition of the Contract releases the Contractor from any responsibility or requirement under any environmental or other Law.

00290.20 Hazardous Waste and Hazardous Substances - Comply with all applicable federal, State and local laws and regulations as they pertain to the storage, handling, management, transportation, disposal and documentation of:

- Hazardous substances (as defined in ORS 465.200)
- Oil and hazardous materials (as defined in OAR 340-108-0002)
- Hazardous waste (as defined in 40 CFR 261 and OAR 340-101-0033)
- Solid waste (as defined in 40 CFR 258, ORS 459 and OAR 340)

For the purposes of this Section, the term "hazardous substances" includes oil and hazardous materials. Additional requirements, if any, concerning hazardous materials on the Project will be included in the Special Provisions.

(a) Hazardous Substance Registration - Register all hazardous substance storage with the Oregon State Fire Marshal, as required by OAR 837-085 to -090, and provide copies of that registration to the Engineer within 14 days of registration.

(b) Worker Right-to-Know Documentation - Have on the Project Site Material Safety Data Sheets (MSDS) for all hazardous substances stored or used on-site, readily available to employees and inspectors at all times. Comply with all federal and State Laws for employee right-to-know in association with the use and storage of hazardous substances on-site.

(c) Fuel Storage - Any fuel to be stored on-site shall be stored in compliance the Uniform Fire Code, NFPA standards, and all other applicable Laws.

(d) Solid Waste Disposal:

(1) General - Prepare a hazardous waste determination for all waste generated at the Project Site, in accordance with 40 CFR 262.11 and OAR 340-102-0011. Determine whether the waste is classified as hazardous waste, as defined in 40 CFR 261 and OAR 340-101-0033, as follows:

- Determine whether the waste is excluded from regulation under 40 CFR 261.4
- Determine whether the waste is listed in Subpart D of 40 CFR 261.4
- Determine whether the waste meets the characteristics set forth in Subpart C of 40 CFR 261.4
- Determine whether the waste is otherwise excluded as a hazardous waste in 40 CFR 261, 264, 265, 266, 268, or 273.

- Determine whether the waste is an "Additional" hazardous waste pursuant to OAR 340-101-0033

For waste classified as hazardous, follow the procedures set forth in 00290.20(e).

Except as provided in (b) below, dispose of non-hazardous solid waste generated at the Project Site at a permitted landfill, in accordance with 40 CFR 258, ORS 459.205 through 459.350, OAR 340-093, and all other applicable Laws. Exceptions to this requirement are noted below:

(2) Inert Material - Handle inert material, as defined in OAR 340-093-0030, according to 00330.41. Inert materials include weathered, consolidated asphalt paving, concrete (including embedded re-bar), clean soil, rock and brick.

(e) Hazardous Waste Management - For all waste streams classified as hazardous waste under 00290.20(d), use an EPA ID number obtained by the Agency for waste characterization and disposal. Conduct all additional testing necessary to characterize the waste for disposal purposes.

(f) Hazardous Substance Transportation - All employees involved in the transportation or preparation for transportation of hazardous substances and hazardous wastes must have received training under the provisions of 49 CFR 100 through 185, in addition to having all necessary permits and licenses for hazardous substance/waste transportation. All hazardous waste must be shipped under a hazardous waste manifest. All hazardous substance and hazardous waste shipments shall be appropriately packaged and labeled, and the vehicles placarded in accordance with 49 CFR 100 through 185. Submit copies of the completed manifests and documentation to the Engineer within 14 days of the hazardous substance/waste leaving the site.

(g) Used Oil - Store used oil in compliance with 00290.20(c), 00290.30 and all other applicable Laws. Used oil may be transported off-site for recycling or for use as fuel as set forth in 40 CFR 261 and 279, and OAR 340-111. The used oil transporter must be registered with the DEQ for this activity unless the Contractor self-transports less than 208 L (55 gallons) at any time to a used oil collection center within the State.

(h) Unexpected Contamination - If, during construction, unanticipated hazardous substances are discovered that threaten the health and safety of workers, the public, or the environment, do the following:

- Immediately remove all affected employees and secure the area to prevent access.
- Notify the Engineer immediately and provide written notification within 24 hours, setting forth a description of the incident.

The Engineer will attempt to resolve the unanticipated situation expeditiously according to 00140.40. Delays to work due to the discovery of unexpected contamination will be considered for exclusion from Contract time according to 00180.50(e).

(i) Spills and Releases - In the event of a spill or release of hazardous substance or hazardous waste, do the following:

- Immediately commence response actions as set forth in the PCP, SPCC and/or Contingency Plan, as appropriate. If any of the provisions set forth in these plans conflict, the actions providing the greatest protection of public health and safety and the environment shall be implemented.

- Immediately notify the Engineer and provide written notification within 24 hours, setting forth a description of the incident.

- If the quantity released exceeds the minimum for a reportable quantity pursuant to 40 CFR 302.4 or OAR 340-108-0010, immediately notify DEQ via the Oregon Emergency Response System (OERS). OERS can be reached at 1-800-452-0311 or (503) 378-4124.

- If the release impacts or threatens to impact any surface water body, or exceeds the quantity listed in 40 CFR 302.4 and OAR 340-108-0010(1)(d), immediately notify the EPA and the USCG through the National Response Center. The National Response Center can be reached at 1-800-424-8802.

- Conduct cleanup of the released material in compliance with OAR 340-108 and all other applicable Laws.

- Provide a written spill report to the Engineer within 48 hours of completing initial cleanup activities. If spill cleanup is not completed within seven days, provide an interim spill report to the Engineer within seven days of the incident. Include, at a minimum, the type of material and quantity released, a description of how the release occurred, containment and cleanup methods employed, disposal location for cleanup materials (include disposal receipts), any EPA, DEQ, OERS and/or Oregon State Fire Marshal incident identification numbers issued, and a description of how similar incidents will be prevented in the future.

00290.29 Health and Safety - Comply with all applicable health and safety Laws as they pertain to the hazardous substances and wastes used, stored and/or generated on the Project Site including, but not limited to, 29 CFR 1910, ORS 654, and OAR 437. If any of these requirements are in conflict, the more stringent requirements shall apply.

00290.30 Pollution Control - Prevent, control and abate pollution of the environment as required by the Contract and all applicable Laws. Perform changes or alterations of work required by new or amended environmental pollution Laws, not contemplated at the time of bid preparation, according to 00140.50 and ORS 279.318.

(a) Water Pollution Control Measures - Prevent, control and abate pollution of state waters as required by the Contract and local, state and federal regulations and requirements. Be fully informed of the NPDES Storm Water General Conditions, and conduct construction operations accordingly. Meet or exceed the DEQ requirements for the NPDES General Permit 1200-CA. A copy of the permit is available from the Engineer. Maintain a copy of the General Conditions at the Project Site. The criminal penalty for the conviction of a violation of this permit is a fine of not more than $25,000 and each calendar day of violation constitutes a separate offense. DEQ may also impose civil penalties up to $10,000 per calendar day for violation of the terms or conditions of the General Conditions.

(1) Minimum Required Measures - As a minimum, take the following measures:

- Allow no pollutant of any kind (e.g., petroleum products or fresh concrete) to come in contact with an active flowing stream.

- Promptly correct or repair operational procedures, leaks, or equipment problems that may cause pollution at the Project Site. If soils or other media become contaminated as a result of operational procedures or equipment problems, remove and dispose of them according to applicable Laws and Subsection 00290.20(i).

- Dispose of material waste according to 00290.20(d) and (e). Do not bury, dump or discharge material wastes or unused materials at the Project Site, except as provided in 00310.43.

- Limit water leakage from trucks carrying saturated soils to less than 4 L/hr (1 gallon per hour) before allowing them to leave the Project Site.

- Comply with the erosion and sediment control requirements of Section 00280.

Additional measures applicable to the Project will be included in the Special Provisions.

Any penalties assessed against the Agency because of the Contractor's willful or negligent violation of the terms of the General Conditions will be withheld from the progress or final payments according to 00195.50(e).

(2) Permitted Work Areas - Work within permitted work areas shall be performed only within the permitted in-water work period(s), unless otherwise approved. Equipment shall not enter the permitted work area except as allowed in permits issued for the Project.

(b) Pollution Control Plan (PCP) - Develop and submit a PCP to prevent point-source pollution related to Contractor operations for approval 10 days before the pre-construction conference. Maintain a copy of the PCP on the Project Site at all times during construction activities, readily available to employees and inspectors. Ensure that all employees comply with the provisions of the PCP. The PCP shall satisfy all pertinent requirements of all applicable Laws including, but not limited to, the requirements of the Uniform Fire Code and National Fire Protection Association (NFPA) Standards, and shall include the following:

- Methods for confining, removing, and disposing of excess concrete, cement and other mortars.
- Measures for containing fluids and debris from washout facilities.
- Identify hazardous products or materials to be used. Include how they will be handled, monitored, inventoried, and stored as well as spill prevention practices to be followed.
- A spill containment and control plan that includes: notification procedures; specific clean up and disposal instructions for different products; quick response containment and clean up measures which will be available on site; proposed methods for disposal of spilled materials; and employee training for spill containment.
- Measures to be used to reduce and recycle hazardous and non-hazardous waste generated from the Project, including types of materials, estimated quantity, storage methods, and disposal methods.
- Vehicle and equipment maintenance procedures and associated pollution prevention practices.
- Off-site vehicle tracking and dust prevention measures.
- A map showing the locations of proposed hazardous substance storage, spill response equipment, communications equipment, fire suppression equipment and the on-site copy of the PCP.

A "Pollution Control Plan Contractor Packet" is available from the Project Manager.

(c) Air Pollution Control Measures - Control or abate air pollution to safeguard the State's air resources in compliance with ORS 468 and 468A, OAR 340-014 and 340-200 through -268, and all other applicable Laws.

(d) Noise Control - Comply with ORS 467, OAR 340-035, all other applicable Laws and the following construction noise abatement measures:

- Perform no construction within 300 m (1,000 feet) of an occupied dwelling unit on Sundays, legal holidays, or between the hours of 10:00 p.m. and 6:00 a.m. on other days, without the approval of the Engineer.

- Use equipment with sound control devices no less effective than those provided on the original equipment. Equipment with unmuffled exhausts is prohibited.

- Use equipment complying with pertinent equipment noise standards of the EPA.

- Perform no pile driving or blasting operations within 900 m (3,000 feet) of an occupied dwelling unit on Sundays, legal holidays, or between the hours of 8:00 p.m. and 8:00 a.m. on other days, without the approval of the Engineer.

- Mitigate the noise from rock crushing or screening operations performed within 900 m (3,000 feet) of any occupied dwelling by placing material stockpiles between the operation and the affected dwelling, or by other means approved by the Engineer.

Should a specific noise impact complaint occur during the construction of the Project, one or more of the following noise mitigation measures may be required at the Contractor's expense, as directed by the Engineer:

- Locate stationary construction equipment as far from nearby noise sensitive properties as feasible.

- Shut off idling equipment.

- Reschedule construction operations to avoid periods of noise annoyance identified in the complaint.

- Notify nearby residents whenever extremely noisy work will be occurring.

- Install temporary or portable acoustic barriers around stationary construction noise sources.

- Operate electric-powered equipment using line voltage power or solar power.

00290.31 Protection of Fish, Wildlife, and Plants:

(a) General - Comply with the Laws of the Oregon Department of Fish and Wildlife, National Marine Fisheries Service and U.S. Fish and Wildlife Service, and the rules and practices developed through the Oregon Plan for Salmon and Watersheds. Conduct operations to avoid any hazard to the safety and propagation of fish and shellfish in waters of the state.

(b) Prohibited Operations - Except where authorized by the Contract and by permit, do not:

- Blast underwater
- Use water jetting
- Release petroleum products or chemicals in the water
- Disturb spawning beds
- Obstruct stream channels
- Cause silting or sedimentation of water

- Use treated timbers within the permitted work area
- Impede adult and juvenile fish passage, including intermittent streams

The permitted work area, if any, will be defined by Special Provision for the Project.

00290.40 Protection of Forests - Obtain necessary permits according to ORS 477.625 and ORS 527.670, and comply with the Laws of any authority having jurisdiction for protection of forests.

00290.41 Protection of Wetlands:

(a) General - Comply with, and require that all the Contractor's employees, agents, and subcontractors comply with the Clean Water Act Section 404 (33 U.S.C. 1344); Federal Rivers and Harbors Act of 1899, Section 10 (33 U.S.C. 403 et seq.); Oregon Removal-Fill law (ORS 196.800 -.990); Oregon Removal and Filling in Scenic Waterways law (ORS 390.805 -.925), and other applicable Laws governing preservation of wetland resources. For the purposes of this Section, "wetland" or "wetlands" will be understood to include wetlands as defined in 00110.20, as well as other jurisdictional waters of the U.S. and/or the State.

(b) Identification of Wetlands - Wetlands known to be on the Project Site will be shown on the Plans. Wetlands to be permanently filled or excavated, or that will be temporarily impacted, will be identified. Wetlands to be protected will be shown as "no work zones". Further information may be provided in the Special Provisions.

Comply with Clean Water Act Section 404 permits issued by the U.S. Army Corps of Engineers, and Fill/Removal permits issued by DSL, which allow specified quantities of fill and excavation only within specifically identified areas of wetlands.

00290.50 Protection of Cultural Resources - Comply with all Laws governing preservation of cultural resources. Cultural resources may include, but are not limited to, dwellings, bridges, trails, fossils, and artifacts.

If cultural resources are encountered on the Project area or in material sources, and their disposition is not addressed in the Special Provisions:

- Immediately discontinue operations or move to another area of the Project Site or material source
- Protect the cultural resource from disturbance or damage
- Notify the Engineer

The Engineer will:

- Arrange for immediate investigation
- Arrange for disposition of the cultural resources. The Engineer may direct the Contractor to perform salvage operations as Extra Work
- Notify the Contractor when to begin or resume construction operations in the affected area

00290.51 Protection of Sensitive Cultural Sites - Act in compliance with, and require that all the Contractor's employees, agents, and subcontractors on the Project Site for any purpose comply with, all Laws applicable to the preservation and protection of sensitive cultural sites. The existence of any sensitive cultural sites affecting the Project, and the mandatory preservation and protection measures applicable to such sites, are determined in accordance with the Laws including, but not limited to, the National Historic Preservation Act (NHPA) of 1966, Section 106, codified in 36 CFR Part 800 (Protection of Historic Properties), ORS 97.740 to 97.760 and 97.990(5) and (6) (Indian Graves and

Protected Objects), ORS 358.905 to 358.955 (Archaeological Objects and Sites) and ORS 390.235 to 390.240 (Archaeological Sites and Historical Material). If sensitive cultural sites are known to be on the Project, further information will be provided in the Special Provisions.

Measurement

00290.80 General - There will be no separate measurement of work performed under this Section.

Payment

00290.90 Lump Sum Basis - The Contractor's Pollution Control Plan, submitted according to 00290.30(b), will be paid for at the Contract lump sum amount for the pay item "Pollution Control Plan". Payment also includes all work, materials, equipment, labor and incidentals required to comply with the Pollution Control Plan and these Specifications, if not covered by other Pay Items in the Schedule of Items.

00290.91 Contractor Responsible for Fines Resulting from Violations - If the Agency incurs any fine as a result of the Contractor's violation of any permit condition or requirement, the cost of such fine will be withheld from amounts due the Contractor.