WILDLIFE HABITAT
MANAGEMENT PLAN

for the

HENRY M. JACKSON HYDROELECTRIC PROJECT
FEDERAL ENERGY REGULATORY COMMISSION
PROJECT NUMBER 2157

APPENDIX G
WATER QUALITY CONSTRAINTS DOCUMENT

SNOHOMISH COUNTY PUBLIC UTILITY DISTRICT NO. 1

May 1988

DOCUMENT PREPARED BY

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TERRESTRIAL WILDLIFE MITIGATION PLAN

WATER QUALITY AND PUBLIC HEALTH CONSTRAINTS

HENRY M. JACKSON PROJECT - SNOHOMISH COUNTY PUD NO. 1

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SECTION I

SUMMARY AND CONCLUSIONS

1. BACKGROUND INFORMATION

The Henry M. Jackson Project (Project) in eastern Snohomish County consists of a 112 MW hydropower and water supply project on the Sultan River. It includes various water storage, diversion, power production, and conveyance systems as shown on Figure I-1. Stage I of the Project, which was constructed in 1965, consisted of a dam on the Sultan River, located at river mile 16.5, which formed Spada Lake at elevation 1,360 feet. The primary benefit of Stage I was water supply for the City of Everett. Stage II of the project was completed in 1984. It consisted of a raised dam and power intake on Spada Lake (elevation 1,450 feet); a 4-mile, 14-foot diameter tunnel; a 4-mile, 10-foot diameter pipeline; a power house (112 MW) on the Sultan River; and, a water return pipeline to Lake Chaplain and the Sultan River. The benefits of Stage II were power production, water supply and fishery enhancement.

The Snohomish Public Utility District No. 1 (District) power facilities are directly linked to the City of Everett water supply facilities at Lake Chaplain, which is Everett's primary storage reservoir. Maintenance of water quality and public health protection have been priority issues during construction and operation of the Jackson Project. Careful planning and operation have enabled the Project to meet desired water quality criteria for public water supply and fishery resources. The District and City of Everett are co-licensees on the Jackson Project. Operation and use of the Project facilities are governed by the "Amended Agreement Between Public Utility District No. 1 of Snohomish County, and the City of Everett for Multi-purpose Development of the Sultan River." As a condition of the Federal Energy Regulatory Commission (FERC) license, the District was directed to meet the requirements and regulations of other federal and state resource management agencies. Fish and wildlife agencies have required that the design and operation of the Jackson Project carefully consider those two resources. Part of the agencies' requirements address terrestrial mitigation for lands and wildlife impacted by the Project. To ensure that the Terrestrial Wildlife Mitigation Plan (Plan) was consistent with water quality regulations and public health aspects related to the City of Everett public water supply, Economic and Engineering Services, Inc. (EES) was retained to review these requirements and ensure their incorporation into the Plan.

2. PURPOSE OF CONSTRAINT DOCUMENT

The purpose of this Water Quality and Public Health Constraint (Constraint) report is three-fold:

A. The report was prepared to help the Project team identify options for developing the Plan and managing Project lands.

B. The report lists specific constraints and guidelines that must be adhered to in order to protect water quality and to meet public health requirements for the waters in Sultan Basin and Lake Chaplain.

C. The report was prepared to ensure that the requirements of the Department of Social and Health Services (DSHS) governing public water supplies were addressed and met.

3. STUDY PROCESS

The screening process used to develop specific guidelines to protect water quality and public health followed the flow chart depicted in Figure I-2.

4. IMPORTANT FINDINGS AND RECOMMENDATIONS

During review of the various regulations and agreements relating to the mitigation project, it became apparent that there were two categories of constraints relating to water quality and public health - Primary and Secondary Constraints.

The Primary Constraints have direct impact on the development of the Plan and are the following:

A. Washington Forest Practices, Rules and Regulations, published by the Washington State Forest Practices Board, October 1, 1982. These regulations address forest management and harvest practices on all non-federal lands and contain provisions to protect water quality. Because the Plan will modify and regulate forest resources, it must anticipate and address these regulations.

B. City of Everett and Snohomish County Shoreline Management Master Programs. These shoreline programs address lands within 200' of the Sultan River, Spada Lake and Lake Chaplain and regulate activities within those zones. The programs are designed to protect the land resources and water quality. Mitigation lands fall within 200' of these major surface waters; therefore, planning must incorporate shoreline programs.

The Secondary Constraints are also important, but have less direct impact on the development of the Plan. These include:

A. Rules and Regulations of the Washington State Board of Health Regarding Public Water Systems, August, 1983. These rules contain requirements for protection and operation of public water supplies. Specifically, they address watershed control programs and maintenance of source water quality. The specific programs recommended in this "Constraint" report to comply with these Rules and Regulations are based on EES's best professional judgement.

B. Amended Agreement Between Public Utility District No. 1 of Snohomish County and the City of Everett for Multi-Purpose Development of the Sultan River (District/City Agreement). The District/City Agreement addresses operation of the Henry M. Jackson Project and contains specific water quality protection requirements. Since the mitigation plans can impact water quality in Spada Lake and Lake Chaplain, the District/City Agreement must be considered in Plan development.

A summary of the regulations, guidelines, and constraints that have major impact on the Plan is presented in Table I-1.

In addition to the primary and secondary constraints discussed above, there were several other potential constraints reviewed and a description of them is contained in Sections II, III and IV. In the screening and review process, they were judged to have less impact on Plan development.

TABLE 1-1

SUMMARY TABLE
WATER QUALITY AND PUBLIC HEALTH CONSTRAINTS

Constraints	Applicability	Required Action to Protect Water Quality and Public Health	Responsibility
Primary Constraint - Washington Forest Practices - Rules and Regulations published by Washington State Forest Practices Board, Oct. 1, 1982	Will apply to all non-federal project lands, where timber harvest is proposed. Protects water quality, fishery, and wildlife. Assures restoration. Meeting Washington Forest Practices satisfies Federal Forest Practices Regulations and Washington Department of Ecology stream criteria.	1. Notify DNR of proposed forest practice and obtain approvals where necessary. 2. Road construction must meet Forest Practices Regulations. a. Minimize road locations in narrow canyons, marshes, and streamside management zones. b. Minimize stream crossings and cross at right angles. c. Do not locate roads on excessively steep slopes or slide prone areas. d. Install and space culverts based on grade of ditch. Minimum culvert size is 12 inches. e. Divert road side ditch to forest floor where slope is towards Type 1, 2, or 3 water for more than 300 feet. f. Stabilize soils exposed by road construction. g. End haul excess material where sidecast material would rest below the 25-year flood level of Type 1, 2, or 3 water or below OHWM of Type 4 stream. h. Locate toe of sidecast from landings above 50-year flood level of Type 1, 2, or 3 water or above OHWM of Type 4 water. i. Adhere to Part 5 in Forest Practices Manual for sizing permanent culverts.	District or City must notify DNR and obtain approvals. District forestry consultant must assure that proposed harvests comply with Forest Practices road construction requirements during planning phase.
		3. Road Maintenance must meet Forest Practices Regulations. a. Maintain "active roads" to standards. b. Prepare "inactive roads" before winter, rainy season. c. Abandon roads no longer planned for use.	District and City must insure roads are maintained per Forest Practices requirements during execution phase of project.

Notes: OHWM - Ordinary High Water Mark.
Streamside Management Zones - 50 feet for Type 1 and 2 streams; 25 feet for Type 3 streams.
Stream types are as defined by DNR and are shown on Figures V-1 and V-2.

TABLE I-1 continued

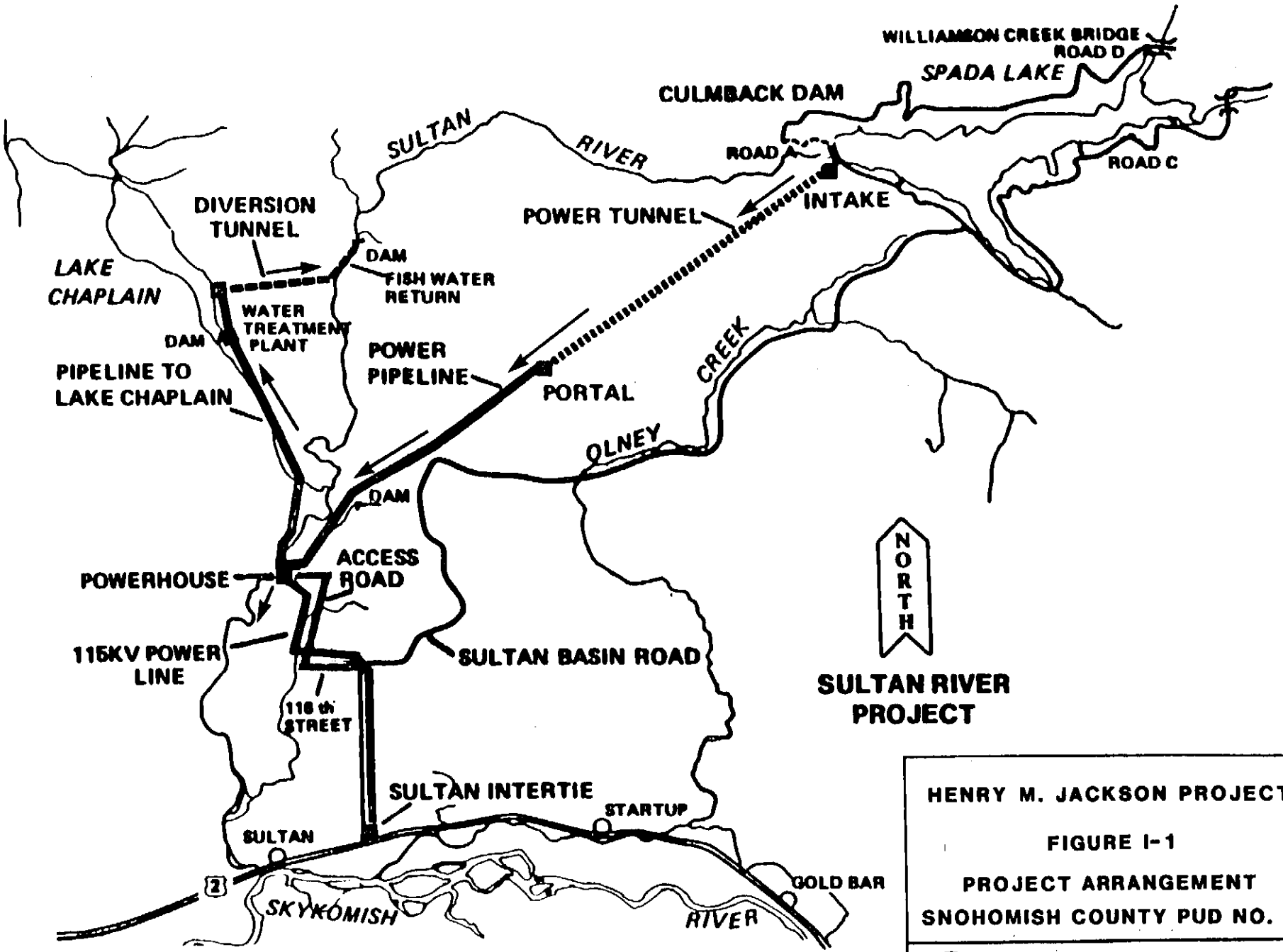
Constraints	Applicability	Required Action to Protect Water Quality and Public Health	Responsibility
		4. Grade and drain borrow pits to forest floor or through settling basins. Rehabilitate and protect spoil areas. Locate spoils where risk of soil erosion or mass movement is minimal.	District and City must adhere to Forest Practices Regulations for operation of pits during execution phase.
		5. Timber harvest must meet Forest Practices Regulations. a. Avoid disturbing brush and stumps and leave high stumps in stream side management zone. b. Meet requirements for temperature sensitive waters. c. No trees will be felled, into Type 1, 2, and 3 waters. d. No bucking or limbing of trees or portions of trees lying between banks of Type 1, 2, or 3 waters. e. Avoid falling trees into the streamside management zone. f. Do not cable yard timber across Type 1, 2, or 3 waters. g. Minimize damage to vegetation in streamside management zone. h. Yard uphill. i. Do not use tractors or wheeled skidders within streamside management zones without DNR approval. j. Locate slash piles above the 25-year flood level of Type 1 and 2 waters and above the OHWM of Type 3 and 4 waters. k. Remove slash or debris from streams per Regulations.	District forestry consultant must assure that proposed timber harvests comply with Forest Practices Regulations at planning phase. District and City must insure compliance during execution phase.

TABLE I-1 continued

Constraints	Applicability	Required Action to Protect Water Quality and Public Health	Responsibility
		6. Application of forest chemicals must comply with Forest Practices Regulation. a. For aerial applications, leave at least 50 feet untreated on each side of all Type 1 and 2 waters and other areas of open water, such as ponds, sloughs and leave 25 feet untreated on each side of Type 3 waters. b. For ground application, leave at least 10 feet untreated on each side of every Type 1 and 2 water and each flowing Type 3 water.	District and City must ensure that chemical applications on project lands comply with Forest Practice Regulations during project execution.
Primary Constraint - Snohomish County and City of Everett Shoreline Master Programs	Shoreline Master Programs apply to those lands extending landward for 200 feet in all directions from Lake Chaplain, Spada Lake and the Sultan River. County indicates that because Jackson Project is a non-federal project, they administer project lands around Spada Lake and in County; City of Everett administers lands annexed by City around Lake Chaplain.	1. Prohibit development which would permanently strip the shoreline of vegetation cover or cause substantial landslide, erosion or sedimentation.	District must ensure Terrestrial Wildlife Mitigation Plan is consistent with this restriction.
		2. Concerning forest harvest activities: a. Keep turbid waters out of water ways. b. Avoid tractor logging on wet ground, unstable slopes and all slopes steeper than 30%. c. Do not yard through water ways.	District forestry consultant must plan timber harvest accordingly. District and City of Everett must ensure consistency during execution.
		3. Because Spada Lake is designated as a "shoreline of statewide significance", no more than 30% of merchantable trees may be harvested in any 10-year period within 200 feet of OHWM.	District forestry consultant must plan timber harvest accordingly. District and City of Everett must ensure consistency during execution.

TABLE I-1 continued

Constraints	Applicability	Required Action to Protect Water Quality and Public Health	Responsibility
Secondary Constraint - Rules and Regulations of the State Board of Health regarding Public Water Supplies	Applies to City-owned lands that drain to Lake Chaplain.	1. Submit the Terrestrial Resource Management Plan to DSHS for their review and approval.	City should submit Plan to DSHS for approval.
		2. Do not encourage wildlife such as beavers, that are known to carry Giardia, to inhabit the area of Lake Chaplain near tunnel return pipeline inlet or the south outlet towards filter plant.	District consultant must ensure that Plan is consistent with these restrictions. City and District must ensure consistency during execution.
		3. Avoid clear cut harvesting on lands located within 50 horizontal feet of Type 1 and 2 waters and within 25 of Type 3, 4, and 5 waters and all land areas exceeding 30% slope within 200 feet of the OHWM of Lake Chaplain.	
		4. Minimize new roads in the water quality protection zone as defined by No. 3 above.	
		5. Concerning logging systems, use cable systems on slopes exceeding 30% outside the 200 feet limit.	
		6. Do not harvest more than two fold the calculated annual cut in any single year and balance cut on a 10-year basis.	
		7. Do not use pesticides in Lake Chaplain Watershed.	
Secondary Constraint - Amended Agreement between PUD of Snohomish County and City of Everett for the multi-purpose development of the Sultan River.	Applies to project facilities and lands including Culmback Dam, power intake, power tunnel and pipeline, power house and water and fish return lines.	Ensure that turbidity at inlet to the filter plant remains less than 20 NTU. This can be accomplished by complying with the Forest Practices Regulations and the Shoreline Management Master Programs.	District consultant must ensure that Plan is consistent with Forest Practices and Shoreline Regulations.



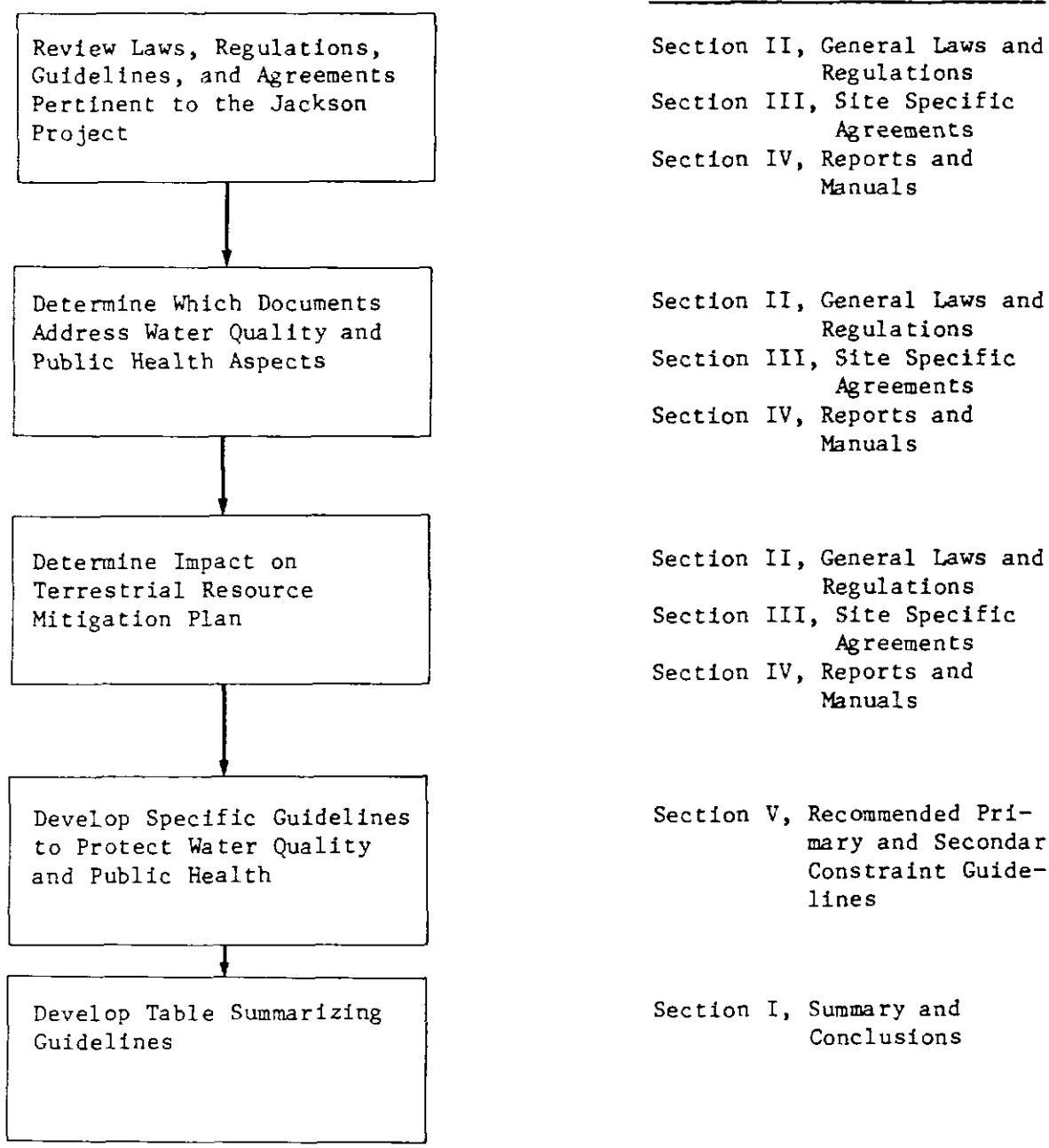
HENRY M. JACKSON PROJECT

FIGURE I-1

PROJECT ARRANGEMENT

SNOHOMISH COUNTY PUD NO. 1

ECONOMIC AND ENGINEERING SERVICES, INC.



STUDY PROCESS FLOWCHART

FIGURE I-2

SECTION II

GENERAL LAWS AND REGULATIONS

1. INTRODUCTION

This section discusses the state, county and federal laws and regulations relating to public health and water quality that potentially impact Plan development. For each subject, various statements of fact are listed; then an evaluation of the impact on Plan development is made.

2. STATE ENVIRONMENTAL POLICY ACT (SEPA) WAC 197-11

A. Statement of Facts

(1) The requirements of SEPA apply to all agencies, including special districts and local governments. When agencies take certain actions, they must follow specific procedures to assure they give appropriate consideration to environmental factors and carry out SEPA's substantive policies.

(2) SEPA's procedural provisions distinguish between actions that are likely to have "significant" environmental impacts and actions that are not. Actions likely to have significant adverse environmental impacts are analyzed in an Environmental Impact Statement (EIS).

(3) The environmental review process under SEPA generally begins with submission of a permit application to an agency. A "lead agency" has the principal responsibility for implementing SEPA procedures for a specific proposal. The SEPA rules provide direction on how the lead agency is determined for specific proposal. In the threshold determination, the lead agency decides whether a proposal is likely to have a probable significant adverse environmental impact.

B. Implications and Applicability to the Terrestrial Resource Mitigation Plan (Plan)

The District, City or County will be the "lead" agency for meeting SEPA requirements. As part of that responsibility, the District will be required to prepare an Environmental Checklist and make a threshold determination for any major action associated with the Plan. This will include Class IV Special Forest Practices, as defined by the Washington Forest Practices Rules and Regulations; developments within the Shoreline Management zones; and capital improvements costing more than $1,000.

3. FOREST PRACTICES ACT (FPA) (RCW 76.09) OF 1974, AS AMENDED IN 1975, AND ACCOMPANYING FOREST PRACTICES RULES AND REGULATIONS (WAC 222), DATED OCTOBER 1, 1982

A. Statement of Facts

(1) The forest practices regulations are promulgated by the Forest Practices Board (FPB) and administered and enforced by the Washington Department of Natural Resources (DNR).

(2) The regulations set performance standards for conducting Class I, II, III, and IV forest practices on all non-federal forest lands in Washington. Forest practices include road construction and maintenance, timber harvest, reforestation, and use of forest chemicals.

(3) The objectives of these regulations are three-fold; reforest cutover lands, protect water quality, and protect key wildlife habitat (for any threatened or endangered species).

(4) The water quality related portions of the Forest Practices Regulations are designed to protect fish spawning, rearing, migration and habitat and are jointly promulgated by the FPB and the Washington Department of Ecology (DOE), and administered and enforced by the DNR.

(5) These water quality regulations are intended to prevent adverse changes in suspended sediment, dissolved oxygen, and water temperature arising primarily from road construction, use and maintenance, and timber harvest.

(6) Water purveyors of any municipal or domestic water supply designated by DNR as an "area of water supply interest" will be notified by DNR of any Class IV forest practice application of pesticides in the watershed.

B. Implications and Applicability to the Plan

(1) The Plan will include provisions for managing the forest resources to enhance wildlife and, therefore, has water quality implications. The primary concerns are siltation, turbidity, and nutrient loading resulting from forest practices.

(2) The District and the City of Everett (City) are owners and managers of non-federal forest land. They are, therefore, required to comply with the forest practices regulations when conducting any forest practice.

(3) The District (or City) must notify the DNR of a Class II or greater forest practice, and must receive approval before

initiating any Class III or IV forest practice.

(4) The FPA constrains road construction to meet minimum standards for location, design, construction, and maintenance. Specifics include minimum requirements for ditches, relief culverts, endhaul/sidecast, and water crossing structures. Constraints are greatest where the road activity (or a road related landslide) would impact a Type 1, 2, or 3 Water, as defined by the DNR stream type maps, or impact a public improvement.

(5) The FPA constrains timber harvest to meet minimum standards of harvest planning, logging systems, felling and bucking, and post harvest site preparation. Constraints are meant to protect water quality, streamside management zones, future productivity, and wildlife habitat. Restrictions are greatest where the activity would impact a Type 1, 2, or 3 Water. The streamside management zone extends 50 feet on each side for Type 1 and 2 Waters and 25 feet for Type 3 Waters.

(6) Timber harvest is also constrained within the streamside management zone of a Type 1, 2, or 3 temperature-sensitive water. Shade requirements may affect allowable timber harvest.

(7) The FPA constrains the use of chemicals in forest management in order to protect public health, soils, wildlife, and aquatic habitat. Restrictions are greatest where chemicals might enter a Type 1, 2, or 3 Water.

4. FOREST PROTECTION ACT (RCW 76.04.370) OF 1971

A. Statement of Facts

(1) DNR promulgates rules and regulations (WAC 332-24-360 through 332-24-412) regulating and defining areas of extreme fire hazard measures for abatement, isolation, or reduction.

(2) Extreme fire hazard requiring abatement (WAC 332-24-380) is required within 100 feet of any State or Federal highway, county road, or railroad; within 100 feet of any road generally open to and frequently used by the public during periods of fire danger; and within 200 to 500 feet of certain structures and facilities.

(3) Extreme fire hazard requiring isolation or reduction (WAC 332-24-385) is required on unisolated compartments of 800 acres or more, regardless of ownership or logging pattern, and averaging nine tons per acre of slash or greater, with individual pieces averaging three inches or less in diameter. The age or origin of woody material on the ground can vary from 5 to 20 years depending on percent volume composed of Douglas fir or Cedar.

B. Implications and Applicability to Mitigation Lands

(1) From a water quality aspect, fire control is important in managing forest lands because erosion and sedimentation are potentially increased on burned over lands.

(2) Since the City and District own key watershed lands in the Sultan Basin and at Lake Chaplain, fire control is important because of its relationship to water quality.

5. SHORELINE MANAGEMENT MASTER PROGRAMS

A. Statement of Facts

(1) The Snohomish County Shoreline Management Master Program governs activities on the shorelines within 200 feet of the ordinary high water mark of Spada Lake and the Sultan River. Even though the lands surrounding Spada Lake are under federal ownership, the County considers Spada Lake within its jurisdiction because it is a non-federal project located on federal lands.

(2) The Spada Lake shoreline is considered a "shoreline of state-wide significance" because the lake is more than 1,000 acres in surface area. This designation causes more constraints to apply to Spada Lake and its shorelines than the standard regulations which apply to all shorelines. The Sultan River is not considered a "shoreline of state-wide significance."

(3) The Spada Lake and the Sultan River shorelines are designated as "Conservancy" according to the Snohomish County Shoreline Management Master Program.

(4) The City of Everett Shoreline Management Master Program covers shorelines within 200 feet of Lake Chaplain and the City administers the shorelines program on these lands. Because Lake Chaplain is less than 1,000 acres surface area, it is not a "shoreline of state-wide significance."

(5) The Lake Chaplain shoreline is designated as a "Conservancy" according to the City's Shoreline Management Master Program.

B. Implications and Applicability to the Plan

(1) The County and City's Shoreline Master Programs have direct impact on the type and intensity of activities anticipated by the Plan within 200 feet of the ordinary high water marks of regulated waters.

(2) Forest management practices are considered a compatible use activity in the "Conservancy" environment. The management policies associated with the "Conservancy" environment are contained in Appendix A. In addition, the policies and regulations that apply to "Forest Management Practices" within the Conservancy Environment are contained in Appendix B.

(3) The Forest Management practices concerning yarding indicate that such practices should "avoid tractor logging on wet ground, unstable slopes, and on all slopes steeper than 30 percent. In addition, it indicates that there shall be no yarding through waterways.

(4) The designation of Spada Lake as a "shoreline of state-wide significance", means that the shoreline at Spada Lake should be managed to:

- o recognize and protect the state-wide interests over local interest,
- o preserve the natural character of the shoreline,
- o result in long-term over short-term benefit,
- o protect the resources and ecology of the shorelines, and
- o increase public access to publicly-owned areas of the shorelines and increase recreational opportunities for the public on the shorelines.

(5) Concerning forest management practices within 200 feet of a "shoreline of state-wide significance", RCW 90.58.150 Selective Commercial Timber Cutting, states: "With respect to timber situated within two hundred feet abutting landward of the ordinary high-water mark within shorelines of state-wide significance, the department or local government shall allow only selective commercial timber cutting, so that no more than thirty percent of the merchantable trees may be harvested in any 10-year period of time: Provided, that other timber harvesting methods may be permitted in those limited instances where the topography, soil conditions or silviculture practices necessary for regeneration render selective logging ecologically detrimental: Provided further, that clear cutting of timber which is solely incidental to the preparation of land for other uses authorized by this chapter may be permitted (1971 ex.s.c 286 15)."

6. HYDRAULIC CODE RULES, ADOPTED AND ADMINISTERED BY THE WASHINGTON DEPARTMENTS OF FISHERIES AND GAME (1984); RCW 75.20, WAC 220-110

A. Statement of Facts

(1) Hydraulic code regulations govern activities within the ordinary high water marks of "waters of the State," which include virtually all permanent and seasonal rivers, streams, and lakes in Washington. The code concerns itself primarily with the protection of fish life.

(2) Hydraulic code rules establish regulations for the construction of any form of hydraulic project or other work that will use, divert, obstruct, or change the natural flow or bed of any river or stream, or that will utilize any of the salt or fresh waters of the state, or materials from the stream beds. They establish procedures for obtaining hydraulic project approval (HPA). The hydraulic code incorporates criteria the departments have developed for the protection of fish life, which are used for project review and conditioning hydraulic project approval.

B. Implications and Applicability to the Plan

The activities resulting from the Plan must conform with the regulations set forth in WAC 220-110. Activities resulting from the Plan which will require an HPA include: bank protection, channel changes, channel realignment, culvert installation, bypass culvert or flume, log and log jam removal, pond construction, water diversions, and dredging. Hydraulic project approvals will be needed by the District and issued by the Departments of Fisheries and Game on a case-by-case basis as the projects are proposed. Applications for a forest practice, which are submitted to DNR, are forwarded to the Department of Fisheries or Game for review and issuance of an HPA, if needed.

7. RULES AND REGULATIONS OF THE STATE BOARD OF HEALTH REGARDING PUBLIC WATER SYSTEMS, REVISED AUGUST 1983, PUBLIC WATER SUPPLIES, WAC 248-54

A. Statement of Facts

(1) These Regulations addressing public water supplies, were established by the Washington State Board of Health and are administered by the Washington State Department of Social and Health Services (DSHS).

(2) The Regulations contain maximum contaminant levels (MCLs) for water quality that relate to health. These are termed primary standards and all water systems must meet these standards.

(3) The Regulations also address "watershed control" and a watershed control program, as follows:

248-54-125 Source Protection

Adequate watershed control consistent with treatment provided shall be demonstrated and documented for all surface water sources pursuant to WAC 248-54-225. A DSHS guideline regarding watershed control is available to assist utilities in this regard.

248-54-225 Watershed Control

All public water systems utilizing surface water shall adequately exercise surveillance over conditions affecting source water quality.

(4) The MCL for turbidity is 1 nephelometric turbidity unit (NTU), but 5 NTU may be allowed under certain approved conditions. Notification of customers concerning non-compliance is required by the Regulations.

B. Implications and Applicability to the City of Everett

(1) The City of Everett operates a Class I water system and must comply with these Regulations.

(2) The City recently constructed a water filtration plant at Lake Chaplain to meet State Board of Health requirements. Control of activities that impact siltation, turbidity, and bacteriological quality are still required because they impact the effectiveness and cost of filter plant operation.

(3) The Plan can potentially impact siltation, turbidity, and bacteriological quality in the Sultan Basin and the Lake Chaplain watershed. Thus, the Plan can impact the raw water quality used by the City.

(4) The Plan for watershed areas must conform to the program listed in WAC 248-54-225, and, because of its potential impact on raw water quality and control in the watershed areas, the DSHS should review and approve the Plan.

8. FEDERAL SAFE DRINKING WATER ACT (1974), PL-93-523. INTERIM, REVISED, AND PROPOSED PRIMARY DRINKING WATER STANDARDS

A. Statement of Facts

(1) The Safe Drinking Water Act was established to ensure water supplies nation-wide met minimum standards for purity.

(2) In Washington, DSHS applied for and was given "primacy" to adminster and enforce the Regulations pursuant to this Act.

(3) U.S. Environmental Protection Agency (EPA) is charged with regulating contaminants that "may" adversely affect the consumers' health; thus, the Act is broad and far reaching.

(4) The EPA may set standards, where feasible, or may require "treatment techniques" where standards and monitoring are not deemed feasible. An example where monitoring may not be routinely feasible is in the area of Giardia, a cyst carried by animals that causes disease in man.

(5) The Amendments to the Safe Drinking Water Act, passed in June 1986, indicate that filtration of all surface water sources will be mandated. This thrust is based on recent giardiasis outbreaks throughout the country and the demonstrated efficiency of filtration at removing Giardia cysts. The definition of filtration will likely include proper use of coagulants in the treatment process to ensure efficient operation.

B. Implications and Applicability to the Plan

(1) The Plan can impact the numbers of wildlife in the watersheds and the proximity of wildlife to water sources. Thus, Giardia, carried by these animals is a concern.

(2) The City has a well designed and well operated filtration plant. Continuing the present mode of operation will enable Everett to meet anticipated EPA regulations. Therefore, implications are important but not great, assuming Everett continues its present mode of operation.

9. WASHINGTON STATE WATER POLLUTION CONTROL LAWS (RCW 90.48)

A. Statement of Facts

(1) Chapter 173-201 WAC establishes water quality standards and penalties for violation of same, for surface waters pursuant to the provisions of RCW 90.48.

(2) Compliance with forest practices regulations (WAC 222) will achieve compliance with water pollution control laws (WAC 173-201-035(5), RCW 90.48.420, and RCW 90.48.425).

(3) The Forest Practices Act (RCW 76.09) and Forest Practices Regulations (WAC 222) relating to water quality protection shall be used to satisfy the planning and program requirements of Section 208, 209, and 305 of the Federal Water Pollution Control Act (PL 92-217). This is regarding silvicultural

activities, unless it is determined by the DOE that extraordinary conditions exist which make forest practice regulations unsuitable to satisfy such federal requirements.

B. Implications and Applicability to the Plan

(1) The Sultan River and tributaries from Chaplain Creek (river mile 5.9) to headwaters are classified as "AA" indicating a very high water quality. There is a special condition above the Everett diversion dam (river mile 9.4) indicating that no waste discharge is permitted. Downstream from Chaplain Creek, the Sultan River is classified as an "A".

(2) The Forest Practice Regulations are designed to meet specific water pollution control laws (RCW 90.48 and PL 92-217), but not necessarily the Federal Safe Drinking Water Act (PL 93-523) or the Rules and Regulations of the State Board of Health regarding Public Water Systems, Revised August 1983, Public Water Supplies, WAC 248-54. Because the drinking water requirements are more stringent than the water pollution control laws, the forest practices regulations may not be effective in protecting drinking water.

(3) The Safe Drinking Water Act and State drinking water regulations apply above Everett's water intake and the State surface water quality standards apply both above and below the intake. Forest practices and other activities conducted in the Sultan Basin above the water intake and at Lake Chaplain within the watershed will be more constrained than activities outside the watershed areas.

SECTION III

SITE SPECIFIC AGREEMENTS

1. INTRODUCTION

This section discusses site specific agreements that pertain to potential mitigation lands. The agreements involve the resource management agencies, the landowners and facility operators.

2. DEPARTMENT OF NATURAL RESOURCES (DNR) - FIRE PROTECTION PROGRAM

A. Statement of Fact

Through RCW 76.04.515, DNR receives $0.27/acre annually from large forest land owners who desire to participate in the program. The money is placed into the "landowner contingency forest fire suppression fund account" and is used to fight fires on lands owned by participating agencies.

B. Implications and Applicability to the Plan

(1) Fire protection is an important aspect of watershed management, particularly as it relates to timber revenue and maintenance of water quality.

(2) Lands purchased by the District or the City as part of the Plan would probably incur this additional cost to address fire suppression.

3. AMENDED AGREEMENT BETWEEN THE PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH COUNTY AND THE CITY OF EVERETT FOR MULTI-PURPOSE DEVELOPMENT OF THE SULTAN RIVER

A. Statement of Facts

(1) The amended Agreement indicates water quality has precedence over other considerations. It also indicates that the City and District will cooperate fully to maintain water quality and meet appropriate state and federal drinking water quality standards.

(2) The amended Agreement states: "Section 3. Costs of Operation and Maintenance of Permanent Emergency Treatment Facility and Filtration Plant. After construction and commencement of operation of the filtration plant, the District, for the first 2 years, will pay all incremental costs expended for the operation of the permanent emergency treatment facility or the

filtration plant which are required by turbidities at the filtration plant in excess of 5 NTU. For the next 3 years, the District will pay the incremental costs required by operation of either the filtration plant or the permanent emergency treatment facility because of waters then in excess of 20 NTU, as measured at the filtration plant.

"Thereafter the District will pay all incremental costs of maintenance and operation of the permanent emergency treatment facility or the filtration plant if the same is operated to treat turbidities in excess of 20 NTU at the filtration plant, if and only in the event that said turbidities are caused by recreational activities, fish and wildlife mitigation, and/or flood control operation related to FERC license requirements."

B. Implications for the Plan

After 5 years of project operation, the District is obligated to pay all incremental costs for treatment if the turbidity exceeds 20 NTU and if it is caused by mitigation for wildlife related to FERC license requirements. Thus, forest management practices resulting from the Plan should ensure that turbidity is not increased above 20 NTU at the filter plant intake.

4. AGREEMENT BETWEEN THE CITY OF EVERETT AND WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

A. Statement of Fact

(1) The Agreement relates to sharing and review of information, plans, sales, forest practices, and other timber sales occurring on State lands managed by DNR in the Sultan Basin.

(2) The Agreement provides for cooperation between the City and DNR on harvest activities, and outlines methods for resolving disputes.

B. Implications for the Plan

There appears to be only minor and indirect impacts on the Plan.

5. MEMORANDUM OF UNDERSTANDING BETWEEN THE U.S. FOREST SERVICES, AND THE CITY OF EVERETT, SEPTEMBER 1955

A. Statement of Facts

The Memorandum of Understanding addresses forest harvest, controlled recreation, and control of fire within the Sultan Basin.

β. Implications for the Plan

The implications of the Memo of Understanding to the water quality aspects of the Plan are indirect and minor. Therefore, no further consideration is needed.

SECTION IV

REPORTS AND MANUALS

1. INTRODUCTION

This section describes the Forest Plan which is being developed by the U.S. Forest Service (USFS) for the Mt. Baker-Snoqualmie National Forest.

2. FOREST PLAN - U.S. FOREST SERVICE

A. Statement of Facts

(1) The USFS is currently preparing a Forest Plan for the Mt. Baker - Snoqualmie National Forest that will address the USFS lands in the Sultan Basin (16,779 acres). The Draft Environmental Impact Statement (EIS) for the Forest Plan was scheduled to be made public on October 15, 1986; however, recent conversations with Forest Service personnel indicate that it will likely be put off until 1987.

(2) "Working documents" available on the Forest Plan indicate the USFS is evaluating three management strategies for lands in the Sultan Basin (Management Area 22).

Alternative A - The long-term objective is to exchange National Forest lands to some other ownership, either private, state, or municipal. The USFS would relinquish all rights except those necessary to administer the Federal Power Withdrawal (FERC Project No. 2157). Management emphasis is to produce high quality water and hydropower with emphasis on improving water quality.

Alternative B - The long-term objective is to change National Forest lands to some other ownership, either private, state, or municipal. The National Forest would relinquish all rights except those necessary to administer the Federal Power Withdrawal (FERC Project No. 2157). Management emphasis is on maintaining current high quality water and producing moderate levels of fish and wildlife habitat, recreation use, and timber products. Watershed values shall be protected beyond legal limits.

Alternative C - National Forest land will be retained in this strategy. Management emphasis is on meeting Washington State minimum legal standards for water quality and producing high output levels of wildlife and fisheries habitat, recreation

use, and timber products.

B. Implications for the Plan

The implications of the selected Forest Plan to both the District and the City are significant because the Forest Plan relates to land exchange programs, maintenance of water quality, recreational use, and wildlife and fishery habitat improvement projects, with emphasis on riparian habitat. Presumably, if the federal lands surrounding the Spada Lake were in private, local, or State ownership, they would be eligible as mitigation lands.

The selected Forest Plan and the Terrestrial Wildlife Mitigation Plan should complement each other if either is to be successful.

SECTION V

RECOMMENDED PRIMARY AND SECONDARY CONSTRAINT GUIDELINES

1. GENERAL

Based on the review of laws, rules, regulations, and reports; there are two categories of constraints - primary and secondary. Primary constraints have direct impact on the Terrestrial Wildlife Mitigation Plan (Plan) and its implementation. They include the Washington Forest Practices Rules and Regulations, published by the Washington State Forest Practices Board and the Snohomish County and City of Everett Shoreline Management Master Programs. Secondary constraints have a lesser or indirect impact. They include the Rules and Regulations of the State Board of Health Regarding Public Water Systems and the Amended Agreement between the Public Utility District No. 1 of Snohomish County (District) and the City of Everett (City) for Multi-purpose Development of the Sultan River. The details of how these primary and secondary constraints impact the Plan are described below. Other constraints previously discussed do not warrant detailed consideration.

2. PRIMARY CONSTRAINT - WASHINGTON FOREST PRACTICES, RULES AND REGULATIONS PUBLISHED BY THE WASHINGTON STATE FOREST PRACTICES BOARD, OCTOBER 1, 1982

The forest practices planned as part of the Plan must comply with these regulations as they relate to water quality protection. The regulations apply to all project lands.

Pertinent definitions from the Regulations are listed below:

WAC 222-16-10 General Definitions.

(13) "Erodible Soils" means those soils exposed or displaced by a forest practice operation, that would be readily moved by water.

(30) "Ordinary High-Water Mark" means the mark on the shores of all waters, which will be found by examining the beds and banks and ascertaining where the presence and action of water are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation: Provided, that in any area where the ordinary high-water mark cannot be found,... the ordinary high-water mark adjoining freshwater shall be the line of mean high-water.

(43) "Shorelines of the State" means all of the water areas of the state, including reservoirs, and their associated wetlands together with the lands underlying them, except:

(a) Shorelines on segments of streams upstream of a point where the mean annual flow is 20 cubic feet per second or less and the wetlands associated with such upstream segments; and

(b) Shorelines on lakes less than 20 acres in size and wetlands associated with such small lakes.

(48) "Streamside Management Zone" means a specified area alongside natural waters where specific attention must be given to the measures that can be taken to protect water quality. These zones shall be measured from the ordinary high-water mark of the body of water and measure:

(a) Fifty feet in width on each side of a Type 1 and 2 Water.

(b) Twenty-five feet in width on each side of a Type 3 Water.

WAC 222-16-020 Water Categories. The following types of water are used in these regulations, the system for typing the waters is as set forth in WAC 222-16-030 Water Typing System.

(1) "Type 1 Water" means all waters, within their ordinary high water mark, as inventoried as "shorelines of the state" under chapter 90.58 RCW.

(2) "Type 2 Water" shall mean segments of natural water which are not classified as Type 1 Water and have a high use and are important from a water quality standpoint for:

(a) Domestic water supplies,
(b) Public recreation,
(c) Fish spawning, rearing, or migration or wildlife uses; or
(d) Are highly significant to protect water quality.

(3) "Type 3 Water" shall mean segments of natural waters which are not classified as Type 1 or 2 Water and have a moderate to slight use and are moderately important from a water quality standpoint for:

(a) Domestic use,
(b) Public recreation,
(c) Fish spawning, rearing, or migration or wildlife uses; or
(d) Have moderate value to protect water quality.

(4) "Type 4 Water" shall mean segments of natural waters which are not classified as Type 1, 2, or 3. Their significance lies in their

influence on water quality downstream in Type 1, 2 and 3 Waters. These may be perennial or intermittent.

(5) "Type 5 Water" means all other waters, in natural water courses, including streams with or without a well-defined channel, areas of perennial or intermittent seepage, ponds, and natural sinks. Drainage ways having short periods of spring runoff are considered to be Type 5 Waters. (Order 263, Section 222-16-020, filed 6/16/76.)

Certain forest practices including the following activities require compliance with State Environmental Protection Agency (SEPA) by completing an Environmental Checklist and determining the need for an Environmental Impact Statement (EIS).

"(1) (e) Construction of roads, landings, rock quarries, gravel pits, borrow pits, and spoil disposal areas when conducted on excessively steep slopes or slide prone areas as defined in WAC 222-24-020(6) when such slopes or slide prone areas occur on an uninterrupted slope within 1,000 feet above a Type 1, 2, 3, or 4 Water where there is potential for a substantial debris flow or debris torrent to cause significant impact to fisheries habitat or public capital improvements".

In addition, the portions of the Regulations that address road construction and maintenance and timber harvesting and that relate directly to erosion and water quality are contained in Appendix C. They indicate that road locations should fit the topography, should not be located in sensitive areas such as stream management zones or on slide prone areas, and should cross streams at right angles.

Culvert spacings along roads are determined by the road grade and minimum sizings are established. Where road side ditches slope toward a Type 1, 2, or 3 Water for more than 300' and would enter the stream directly, they should be diverted to the forest floor more than 50' from the stream.

Spoil and other debris shall be deposited above the 25-year flood level of Type 1, 2, or 3 Waters. Landings involving sidecast or fill shall be located where the toe of the sidecast or fill does not lie below the 50-year flood level of a Type 1, 2, or 3 Water or the ordinary high-water mark of a Type 4 Water.

Gravel and borrow pit development and spoil disposal areas are carefully regulated. They are to be located above the 25-year flood level, at a location where the risk of soil erosion and mass soil movement is minimal. In addition, spoils shall be placed to allow drainage without additional water ponding.

During timber harvest activities, stream bank integrity shall be maintained in streamside management zones along all Type 1, 2 and 3

Waters. Trees should not be felled into Type 1, 2, or 3 Waters except in certain instances defined by the regulations. Bucking and limbing shall not be done on trees lying between the banks of Type 1, 2, or 3 Waters. Trees near streamside management zones should not be felled into the zones.

Timber is not allowed to be cable yarded across Type 1, 2, or 3 Waters except in certain instances as defined by the Regulations. Uphill yarding is preferred to minimize downhill movement of slash and soils. Logging in streamside management zones is permitted provided that tractors and wheeled skidders may not be used within the zone, unless approved by the Department of Natural Resources (DNR). In addition, tractors and wheeled skidders shall not be used on exposed erodible soils, when soil moisture content is so high that unreasonable rutting, or stream, lake, or pond siltation would result.

The larger streams and water bodies on the project are typed by the DNR as follows:

Water	Type
Spada Lake	2
Lake Chaplain	1
Chaplain Creek	3
Sultan River	2
North Fork Sultan	2
South Fork Sultan	2
Gilbert Creek	3
Williamson Creek	2

These stream types and others are shown on Figures V-1 and V-2.

3. PRIMARY CONSTRAINT - SNOHOMISH COUNTY AND CITY OF EVERETT SHORELINE MASTER PROGRAMS

The Snohomish County Shoreline Management Master Program applies to Spada Lake and the Sultan River. The City's Shoreline Management Master Program applies to Lake Chaplain and mitigation areas annexed by the City. In areas that are annexed by the City but are not contiguous with the City proper, the City uses the County's program. Thus, the same program applies to all project waters but is administered by a different agency depending on the location. The Shoreline Management Master Program applies to those lands extending landward for 200 feet in all directions, as measured on a horizontal plane from the ordinary high water mark associated with the streams and lakes which are covered by the Shoreline Management Act. This includes Lake Chaplain, Spada Lake, and the Sultan River.

Lake Chaplain, Spada Lake, and the Sultan River are designated as "Conservancy" by the City and Snohomish County. The management policies indicate that uses proposed should:

"7. Encourage the sustained yield management of natural resources and aquaculture crops within Conservancy Environments.

"8. Prohibit development which would be hazardous to public health and safety, or which significantly interferes with natural processes.

"10. Allow beach enrichment projects when it can be shown that other portions of the shoreline will not be adversely affected.

"11. Prohibit development which would permanently strip the shoreline of vegetative cover or cause substantial landslide, erosion, sedimentation, or impairment of fish and aquatic life."

Forest Management Practices are allowed in the "Conservancy Zone." The road building and maintenance practices covered by the Shoreline regulations are much the same as those contained in the Washington Forest Practices Rules and Regulations, discussed earlier. Concerning timber harvest techniques related to the water quality, the Shoreline regulations indicate that:

"9. Yarding of logs shall be conducted so as to prevent soil disturbance and other water pollution hazards along skid trails, on landings, and over the watershed in general:

"a. Tractor skid trails shall be located carefully and drained adequately so that muddy and turbid waters will be kept out of waterways. Keep all tractor skid trails out of waterways and off banks. Use temporary log or metal culverts wherever such trails must cross a waterway, and keep the number of such crossings to as few as possible;

"b. Avoid tractor yarding on wet ground, unstable slopes and on all slopes steeper than thirty percent (30%); there shall be no yarding through waterways;

"c. There shall be no cable yarding through waterways. When yarding across waterways is unavoidable, do it by lifting the logs over such waterways rather than dragging them through the waterways."

Spada Lake is designated as a "shoreline of state-wide significance." A special provision (RCW 90.58.150) applies within 200 feet of the ordinary high-water mark that allows only "selective commercial timber cutting, so that no more than 30 percent of the merchantable trees may be harvested in any 10-year period of time: ...."

4. SECONDARY CONSTRAINT - RULES AND REGULATIONS OF THE STATE BOARD OF HEALTH REGARDING PUBLIC WATER SUPPLIES

These State Regulations do not contain specifics that relate to "watershed control" and "source protection" but are general in nature. The burden is on the water utility to develop a watershed management plan for review and approval by the Department of Social and Health Services (DSHS). To protect water quality in Lake Chaplain and to meet the water and public health regulations, the plans and activities in the Lake Chaplain watershed were developed based on the best professional judgement of EES and should conform to the following guidelines:

A. Do not encourage wildlife such as beaver, that are known to carry Giardia, to inhabit the area of Lake Chaplain near the inlets or outlets as shown on Figure V-1.

B. Do not use pesticides in the Lake Chaplain watershed.

C. Establish a water quality protection zone that includes areas located within:

(1) Fifty horizontal feet abutting landward of the ordinary high water mark of any Type 1 or 2 Water as defined by DNR stream type maps.

(2) Twenty-five horizontal feet abutting landward of the ordinary high-water mark of any Type 3, 4, or 5 Water as defined by DNR stream type maps.

(3) Areas exceeding 30 percent slope within 200 feet of the ordinary high-water mark of Lake Chaplain.

Remove the areas in the water quality protection zone from the harvestable land base.

D. Meet requirements of the Washington Forest Practices Rules and Regulations for road construction. Minimize construction of new roads in the water quality protection zone.

E. Concerning logging systems, tractor logging may be used on slopes less than 30 percent outside the water quality protection zone where soils are gravelly and not prone to compaction. Cable yarding will be used on slopes greater than 30 percent and particularly on soils with high moisture content and prone to compaction. High lead yarding will be used where the terrain is appropriate and the planned road system will allow for the usual 800 feet to 1,000 feet yarding distances. Skyline yarding will be used where the terrain does not allow for high lead yarding or where the distance between planned roads is greater than 1,000 feet.

F. In developing a sustained yield harvest program, do not harvest more than about two-fold the calculated annual cut in any single year, with cut balanced on a 10-year basis.

5. **SECONDARY CONSTRAINT - AMENDED AGREEMENT BETWEEN PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH COUNTY AND THE CITY OF EVERETT FOR MULTI-PURPOSE DEVELOPMENT OF THE SULTAN RIVER**

Practices resulting from the Plan should not cause turbidity at the filter plant inlet to exceed 20 NTU or the District is required to offset incremental costs required to treat the turbidity in excess of 20 NTU. This applies to both Spada Lake and Lake Chaplain areas. Compliance with the Washington Forest Practices Rules and Regulations and the County's and City's Shoreline Management Master Program should enable the 20 NTU requirement to be met.

LAKE CHAPLAIN TRACT

LAKE CHAPLAIN

SHORELINE MANAGEMENT ZONE

Shoreline Management Zone extends 200 feet horizontal from shoreline.

LOST LAKE TRACT

TUNNEL PORTAL

PIPELINE RIGHT-OF-WAY

POWERHOUSE SITE

TRANSMISSION LINE RIGHT-OF-WAY

WEDGE SHAPED PARCEL

PROJECT FACILITY LANDS TRACT

VICINITY MAP

LEGEND

- All-Weather Road
- Dirt Road or Unmaintained Gravel Road
- Tract Boundary
- (35) Section Number
- 4 DNR Stream Type Do Not Encourage Wildlife Here

NORTH

0 1000 2000 3000
SCALE IN FEET

HENRY M. JACKSON PROJECT FERC NO. 2157
PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH COUNTY AND THE CITY OF EVERETT, WASHINGTON

WILDLIFE HABITAT MANAGEMENT PLAN

FIGURE V-1 Water Quality Constraints for the Lake Chaplain Tract

WILLIAMSON CREEK TRACT

CULMBACK DAM

SPADA LAKE

NOTE:
Shoreline Management Zone extends 200 feet horizontal from shoreline.

SPADA LAKE TRACT

VICINITY MAP

LEGEND

- All-Weather Road
- Dirt Road or Unmaintained Gravel Road
- Tract Boundary
- (35) Section Number
- 4 DNR Stream Type

NORTH

0 1000 2000 3000
SCALE IN FEET

HENRY M. JACKSON PROJECT FERC NO. 2157
PUBLIC UTILITY DISTRICT NO. 1 OF SNOHOMISH COUNTY
AND THE CITY OF EVERETT, WASHINGTON

WILDLIFE HABITAT MANAGEMENT PLAN

FIGURE V-2 Water Quality Constraints for the Spada Lake and Williamson Creek Tracts

APPENDIX A

EXTRACT FROM SNOHOMISH COUNTY SHORELINE MANAGEMENT MASTER PROGRAM

MANAGEMENT POLICIES ASSOCIATED WITH CONSERVANCY ENVIRONMENT

CONSERVANCY ENVIRONMENT

Statement of Intent

The objective in designating a Conservancy Environment is to protect, conserve, enhance and manage existing natural resource areas and valuable historic and cultural areas. This should be done in a manner that will insure recreational benefits to the public, or achieve sustained resource utilization without substantial adverse modification of shorelines or topography.

Designation Criteria

The Conservancy Environment should be applied to those areas which would most benefit the public by having their existing character maintained, but which are able to accept a limited level of development or resource utilization. Areas to be designated in the Conservancy Environment should possess one or more of the following criteria:

1. Areas which could satisfy the present or future recreation needs of the County's residents.

2. Areas possessing biophysical limitations too severe to allow them to develop to the extent provided in the Rural, Urban and Suburban Environments. Such limitations could include:

   a. Areas of steep slopes, presenting erosion and slide hazards;

   b. Areas prone to flooding including the 100-year flood plain;

   c. Areas of unstable streambank configuration;

   d. Areas with soils that have poor drainage.

3. Areas containing resources which lend themselves to management on a sustained-yield basis.

4. Areas possessing valuable natural resources or features, whose optimum use precludes more than an extremely low overall density of people, structures or livestock.

5. Areas possessing valuable natural resources or features which would tolerate only minimal changes in topography or the land/water interface.

6. Areas where more intensive development or use would be hazardous to public health and safety, or would result in interference with natural processes causing significant detriment to other resources.

7. Areas possessing aesthetic or recreational qualities of such high local or statewide significance that extensive modification or use would adversely affect such qualities.

8. Areas located in the floodway zones, and in many instances, the boulder zones of the County's river systems.

9. Areas which are free from extensive development, and can serve as needed open space by maintaining their existing character.

Management Policies

1. Give preference to those uses which do not permanently deplete the physical and biological resources of the Conservancy Environment.

2. Give priority to activities and uses of a nonpermanent or farming nature which do not substantially degrade the existing character of the Conservancy Environment.

3. Encourage the following types of uses to be predominant in a Conservancy Environment: outdoor recreation activities, timber harvesting on a sustained yield basis, aquaculture, and compatible agricultural uses.

4. Maintain the Conservancy Environment by encouraging recreational activities which will not be detrimental to the shoreline character or the forces which created and maintain the shoreline area.

5. Restrict new development to those which are compatible with the natural and biological limitations of the land and water and will not require extensive alteration of the land-water interface.

6. Discourage commercial and industrial uses other than aquaculture, commercial forestry, lumber mills and extraction of renewable sand, gravel and mineral resources.

7. Encourage the sustained yield management of natural resources and aquaculture crops within Conservancy Environments.

8. Prohibit development which would be hazardous to public health and safety, or which significantly interferes with natural processes.

9. Strictly regulate residential development, to maintain an overall density of less than one dwelling unit per two acres of land.

10. Allow beach enrichment projects when it can be shown that other portions of the shoreline will not be adversely affected.

11. Prohibit development which would permanently strip the shoreline of vegetative cover or cause substantial landslide, erosion, sedimentation or impairment of fish and aquatic life.

12. Minimize the construction of structural flood control works in this environment.

13. Prohibit the construction of flood control works or streambank stabilization projects which would contribute to destructive streamway channelization or substantial modification of existing shoreline character except for streamway rehabilitation projects.

14. Encourage streamway rehabilitation projects which will restore or enhance the natural streamway character.

15. Require that new developments be designed to preclude the need to provide them with structural flood control protection.

APPENDIX B

EXTRACT FROM SNOHOMISH COUNTY
SHORELINE MANAGEMENT MASTER PROGRAM

FOREST MANAGEMENT PRACTICES ALLOWED IN CONSERVANCY ENVIRONMENT

FOREST MANAGEMENT PRACTICES

INTRODUCTION

Forest management practices are those methods used for the protection, production and harvesting of timber. Trees along a body of water provide shade which insulates the waters from detrimental temperature change and dissolved oxygen release. A stable water temperature and dissolved oxygen level provide a healthy environment for fish and other more delicate forms of aquatic life. Poor logging practices on shorelines alter this balance as well as result in slash and debris accumulation and may increase the suspended sediment load and the turbidity of the water. Enforcement of effective forest management practices is of high importance within Snohomish County because commercial forestry constitutes the greatest single use of County shoreline areas.

POLICIES

1. Require forest land owners to conduct harvesting practices, including road construction and debris disposal, so as to minimize visual impact on views and viewpoints in shoreline areas of the County.

2. Require that logging within all shoreline areas be conducted to ensure adequate protection to fish populations, water quality and stream banks.

3. Ensure that timber harvesting on shorelines of state-wide significance does not exceed the limitations established in RCW 90.58.150.

4. Require proper road, bridge and drainage design, location, construction and maintenance practices to prevent development which would adversely affect shoreline resources.

5. Require that all forest management practices in shorelines of the County be conducted to maintain the applicable State Water Quality Standards currently in effect.

6. Require that logging and thinning operations be so conducted to prevent the accumulation of slash and other debris in waterways of shorelines of the County.

7. Ensure that adequate measures are taken in the process of timber harvesting to prevent substantial sediment, runoff and erosion on sloped areas.

8. Require erosion control measures and replanting where necessary to provide stability on areas of steep slope which have been disturbed by road construction or logging.

9. Require reforestation.

10. In addition to the exceptions provided for under the Act, allow harvesting of timber within shorelines of state-wide significance when an act of nature has caused or will cause destruction of the timber in the immediate future.

11. Require, where applicable, that a detailed reclamation plan be submitted as a part of any permit required under the Shoreline Management Act.

12. Require all forest management practices in shorelines of the County be conducted to maintain Department of Ecology administered state water quality standards for streams, lakes and rivers.

13. Encourage the development of information, techniques and regional rules and regulations regarding forest management practices.

14. Policies relating to timber harvesting apply also to those directly related practices such as road construction and debris removal.

REGULATIONS

General

1. The following regulations on forest management practices shall constitute interim regulations to be superseded by the appropriate regulations developed under the Forest Practices Act of 1974 PROVIDED that where such regulations do not address a subject covered by these regulations, these regulations shall remain in force.

2. Applications for permits shall demonstrate compliance with these regulations and shall include, where applicable, a reclamation plan for the area of operations.

Road Systems

3. Roads shall be located on stable soils and constructed in such a manner as to minimize the risk of material entering waterways:

   a. Roads shall be fitted to the topography so that a minimum alteration of natural features will be necessary;

   b. Avoid steep, narrow canyons; slide areas; slumps; marshes; wet meadows; or natural drainage channels. Utilize all available topographic surveys, soils and geologic data to assist in selecting locations which avoid steep and/or unstable areas;

   c. Where possible, locate roads far enough away from waterways to leave buffer zones;

d. Minimize the number of waterway crossings and avoid unnecessary duplication of road systems by making use of existing roads where practical. Where roads traverse land in another ownership, but still adequately serve the operation, attempt to negotiate with the owner for use before resorting to location of new roads;

e. Avoid sidehill cuts and fills that endanger stream channels.

4. Roads shall be designed so as to:

a. Balance cuts and fills or provide waste and borrow areas which minimize damage to soil and water;

b. Roads and waterway crossings shall be no wider than necessary to accommodate the anticipated use;

c. Cut and fill slopes shall be designed at the normal angle of repose or less;

d. Design culvert installations to prevent erosion of the fill;

e. Specifications for bridges, culverts, and other waterway crossing devices shall take into account flood frequency and flood debris hazards. No such structure shall be constructed which encroaches on the stream channel or which would serve to back up flood waters;

f. Drain roads by outsloping, crowning, water-bars, and through grade changes wherever possible;

g. Road drainage (whether from culverts, cross drainage or ditches) shall be directed onto the forest floor, preferably on benches so that sediment can settle out befofe drainage water reaches any waterway;

h. All roads, bridges, culverts and other related development shall be designed in accordance with State Department of Fisheries and Game regulations and requirements.

5. Roads shall be constructed in such a manner as to prevent the entry of construction or waste material to waterways:

a. Excess material shall be deposited in stable locations outside the hydraulic floodway;

b. Drainage ways shall be cleared of all debris generated during road construction and/or maintenance which potentially interferes with drainage or water quality;

c. Where roadside material is potentially unstable or erodable, it shall be stabilized by seeding, compacting, riprapping, benching, or other suitable means;

d. In the construction of road fills, properly compact the material to reduce the entry of water and to minimize the settling of fill material;

e. Waterway crossings either temporary or permanent shall be constructed to result in minimum disturbance to banks and existing channels. Remove temporary crossings and abutment fills promptly after use, where applicable. Abandoned road ends shall be water barred;

f. Activity in waterways shall only be permitted in compliance with state hydraulics permits (normally restricted to summer seasons);

g. Drainage structures shall be installed as soon as feasible during the pioneer stage of road construction. Uncompleted road grades subject to washing before grading shall be adequately cross-drained;

h. Road and bridge construction shall be carried out in that time of year which will prevent serious soil erosion or, when this is not practical, measures to prevent erosion shall be taken;

i. Quarry drainage shall provide for adequate protection against sediment entering into the waterways;

j. Road rock and gravel shall be obtained from dry quarries wherever possible. Use of gravels from waterways shall be discouraged.

6. Road maintenance shall be sufficient to insure the proper function system throughout the lifetime of the road:

a. Culvert inlets, outlets, ditches and trash racks shall be cleaned before and during the runoff periods to diminish danger of clogging and the possibility of washouts and overflows;

b. When it is the intention of the landowner to discontinue active use of the road, the road shall be left in such a state as to provide for adequate drainage and soil stability without continuous active maintenance;

c. Winterize roads by water barring, surface crowning, or out sloping prior to the runoff periods;

d. Mechanical equipment shall be preferred over herbicides for roadside brush control; if herbicides are used, they shall be applied so that chemicals do not enter streams.

Timber Harvesting

7. The size, shape and location of logging areas shall be based on an analysis of such things as topography, timber type, forest regeneration, logging economics, fire control, wildlife production, soil protection, property lines; aesthetic appeal and water quality maintenance:

a. Landings within designated wetlands shall be avoided whenever possible. When necessary within these wetlands, landings shall be located of firm ground above the high water level of any waterway; unstable areas or excessive excavation shall be avoided;

b. Land areas permanently unsuited for the production of wood fiber, such as lakes, bogs, springs or swamps shall be maintained in their natural state;

c. The operator must provide for soil stabilization and water quality maintenance by vegetation along waterways by one or more of the following:

i. Leave non-merchantable or low-value trees, shrubs, grasses, rocks, wherever they afford shade over a waterway or maintain the integrity of the soil near such a waterway;

ii. Where insufficient non-merchantable tree species exist to maintain an effective buffer zone, a fringe of undisturbed merchantable trees may be required. This requirement may be waived if an acceptable harvest plan, such as staggered cuttings, or other means is developed which will not result in a significant decrease of water quality or remove a substantial amount of cover necessary for wildlife;

iii. Plan the removal of timber from the buffer strip in such a way that shading and filtering effects are not destroyed;

iv. Where it is impractical to leave buffer strips of timber to shade a waterway, a plan to re-establish cover must be submitted and approved.

8. Falling and bucking of logs shall be conducted so as to prevent soil disturbance and other water quality hazards along skid trails on landings, and over the watershed in general:

a. Trees shall be felled, bucked and limbed so that the tree or any part thereof, will not fall into or across any waterway

b. If debris should enter the waterway(s) as a result of this project, such debris shall be removed concurrently with the yarding operation and before removal of equipment from the project site. Removal of debris shall be accomplished in such a manner that natural stream bed conditions and stream bank vegetation are disturbed as little as possible.

9. Yarding of logs shall be conducted so as to prevent soil disturbances and other water pollution hazards along skid trails, on landings, and over the watershed in general:

a. Tractor skid trails shall be located carefully and drained adequately so that muddy and turbid waters will be kept out of waterways. Keep all tractor skid trails out of waterways and off banks. Use temporary log or metal culverts wherever such trails must cross a waterway, and keep the number of such crossings to as few as possible;

b. Avoid tractor yarding on wet ground, unstable slopes and on all slopes steeper than thirty percent (30%); there shall be no yarding through waterways;

c. There shall be no cable yarding through waterways. When yarding across waterways is unavoidable, do it by lifting the logs over such waterways rather than dragging them through the waterways.

10. Clean-up measures at the logging site shall be conducted as an integral part of the logging operation:

a. Waste resulting from logging operations, such as crankcase oil, filters, grease and oil containers, machine parts, old wire rope and used tractor tracks, shall be disposed of off-site immediately following termination of harvesting operations. At no time shall such materials be placed in waterways;

b. Drainage on landings, tractor skid trails and fire trails, shall be re-established after use to minimize soil instability and erosion. Cross drains, dips, water bars or other water diversions shall be utilized where appropriate.

c. Potentially unstable or erodable exposed soils shall be stabilized by seeding with grass species or other suitable means. Consideration shall be given to game forage plants suitable to the area.

d. All potentially waterborne woody logging debris four inches (4") or more in diameter and eight feet (8') or more in length resulting from this project shall be relocated outside the hydraulic floodway.

Slash Disposal

11. In those areas where slash treatment is necessary for protection or regeneration, methods including, but not limited to the following, shall be used:

    a. Scattering of slash accumulations;
    b. Piling or windrowing of slash;
    c. Mechanized chopping or compaction of slashing;
    d. Controlled burning.

12. Unstable slash accumulations shall be treated to prevent their entry into waterways.

13. Streamside buffer strips shall be protected from fire damage where slash is disposed of by burning.

Reforestation

14. All clearcut areas shall be planted or seeded within eighteen months of logging to produce at least 300 well distributed seedlings per acre.

15. If necessary and practical, additional planting or seeding shall be performed annually until at least 300 well distributed seedlings per acre have been established.

16. Reforestation shall be of a commercial tree species genetically suited to the site.

Natural Environment

1. Harvesting of timber shall be permitted in the Natural Environment only where it is necessary to:

    a. Control a fire or prevent an epidemic of insect or disease infestations throughout the designated areas and to adjoining areas when no other means of control will work;

    b. Clean up and restore an area devastated by disaster, such as epidemic wind throw, fire, insect attack or disease.

2. No road construction shall be permitted, except that which is absolutely necessary to cope with emergency situations described in 1.a. and 1.b. above.

3. Reforestation or restoration of devastated areas shall be accomplished as soon after the salvage or clean up as is possible.

Conservancy Environment

1. Forest Management Practices shall be permitted in the Conservancy Environment subject to the General Regulations.

Rural Environment

1. Forest Management Practices shall be permitted in the Rural Environment subject to the General Regulations.

Suburban Environment

1. Forest Management Practices are permitted in the Suburban Environment only upon the issuance of a conditional use permit.

Urban Environment

1. Forest Management Practices are permitted in the Urban Environment only upon the issuance of a conditional use permit.

APPENDIX C

EXTRACTS FROM THE WASHINGTON FOREST PRACTICES

RULES AND REGULATIONS, OCTOBER 1982

Note: The asterisk (*) marked next to the regulations means the regulation pertains to water quality protection. Pursuant to RCW 76.09.040 they will also be adopted by the Department of Ecology and can be amended only by agreement between the Forest Practices Board and the Department of Ecology.

WAC 222-20-110 Notice of forest practices to cities and towns. The department shall establish and update every 5 years a register listing all incorporated cities and towns which have filed a written request for inclusion on such register. The department shall provide to those listed on the register, copies of all applications and notifications for forest practices on lands within the legal boundaries of the city or town. [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-20-110, filed 8/3/82, effective 10/1/82.]

Chapter 222-24 WAC
ROAD CONSTRUCTION AND MAINTENANCE

WAC

Reviser's note: For an explanation of the regulations marked with an asterisk (*), see WAC 222-12-010.

WAC 222-24-010 Policy. A well designed, located, constructed, and maintained system of forest roads is essential to forest management. This section covers the location, design, construction, maintenance and abandonment of forest roads, bridges; stream crossings, quarries, borrow pits, and disposal sites used for forest road construction. (NOTE: OTHER LAWS AND REGULATIONS AND/OR PERMIT REQUIREMENTS MAY APPLY. SEE CHAPTER 222-50 WAC.) [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-24-010, filed 8/3/82, effective 10/1/82; Order 263, § 222-24-010, filed 6/16/76.]

WAC 222-24-020 Road location. (1) **Fit the road** to the topography so that a minimum of alterations to the natural features will occur.

*(2) **Minimize road locations** in narrow canyons, marshes, wet meadows, natural drainage channels, in streamside management zones and nesting sites of key wildlife habitats.

*(3) **Minimize the number of stream crossings.**

*(4) **Whenever practical,** cross streams at right angles to the main channel.

(5) **Avoid duplicative roads** by keeping the total amount of construction to a minimum. Use existing roads whenever practical and avoid isolating patches of timber which, when removed, may require unnecessary road construction.

(6) **Where feasible, do not locate roads on excessively steep or unstable slopes or known slide prone areas as determined by the department.** The department shall determine whether slopes are unstable using available soils information, or from evidence of geologically recent slumps or slides, or where the natural slope exceeds the angle of repose for the particular soil types present, or where springs or seeps may indicate unstable conditions are present in or above the construction site.

Essential road construction will be accomplished by end hauling, over hauling, or other special road construction techniques unless the department determines there is potential for damage to public resources under WAC 222-16-050(1)(e). [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-24-020, filed 8/3/82, effective 10/1/82; Order 263, § 222-24-020, filed 6/16/76.]

WAC 222-24-025 Road design. (1) **Use the minimum design standard that produces a road sufficient to carry the anticipated traffic load with reasonable safety.**

(2) **Subgrade width should average not more than** 32 feet for double lane roads and 20 feet for single lane roads, exclusive of ditches, plus any additional width necessary for safe operations on curves and turnouts.

(3) **Balance excavation and embankments** so that as much of the excavated material as is practical will be deposited in the roadway fill sections. Where full bench construction is necessary, design suitable embankments so that the excavated material may be end hauled to appropriate deposit areas.

(4) **Design or construct cut and fill slopes** to the normal angle of repose for the materials involved, or at a lesser angle whenever practical.

*(5) **All roads should be outsloped or ditched** on the uphill side and appropriate surface drainage should be provided by the use of adequate cross drains, ditches, relief culverts, water bars, or diversion ditches.

*(6) **Cross drains, relief culverts, and diversion ditches** should not discharge onto erodible soils, or over fill slopes unless adequate outfall protection is provided.

*(7) **Install cross drains, culverts, or diversion ditches** on all forest roads to minimize erosion of the road bed, cut bank and fill slope. **These drainage structures shall be installed at all low points in the road gradient and spaced no wider than as follows:**

Grade	Distance Westside	Distance Eastside
0 to 7%	1,000 ft.	1,500 ft.
8% to 15%	800 ft.	1,000 ft.
over 15%	600 ft.	800 ft.

The department may require more frequent culvert spacing or other drainage improvements where site specific evidence of soil instability makes additional culverts necessary to minimize erosion of the road bed, ditches, cut bank and fill slope or to avoid unreasonable risk to public resources. See Part 5, Table 2 in the Forest Practices Board Manual for "Additional Culvert Spacing Recommendations." On request of the applicant, the department may approve less frequent drainage spacing where parent material (e.g. rock, gravel) or topography justify.

***(8) Relief culverts installed on forest roads shall meet the following minimum specifications:**

(a) Be at least 12 inches in diameter or equivalent.

(b) Be installed sloping toward the outside edge of the road at a minimum gradient of 3 percent.

***(9) Ditch diversion. Where roadside ditches slope toward a Type 1, 2, or 3 Water for more than 300 feet** and otherwise would discharge into the stream, divert the ditchwater onto the forest floor by relief culvert or other means at the first practical point more than 50 feet from the stream. [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-24-025, filed 8/3/82, effective 10/1/82.]

WAC 222-24-030 Road construction. (1) **Right-of-way timber.** Merchantable right-of-way timber shall be removed or decked in suitable locations where the decks will not be covered by fill material or act as support for the fill or embankment.

***(2) Debris burial.**

(a) **In permanent road construction, do not bury:**

(i) Loose stumps, logs or chunks containing more than 5 cubic feet in the load-bearing portion of the road, except as puncheon across swampy ground or for culvert protection.

(ii) Any significant amount of organic debris within the top 2 feet of the load bearing portion of the road, except as puncheon across swampy ground or for culvert protection.

(iii) Excessive accumulation of debris or slash in any part of the load bearing portion of the road fill, except as puncheon across swampy ground or for culvert protection.

(b) **In the cases where temporary roads are being constructed across known areas of unstable soils and where possible construction failure would directly impact waters, the requirements in (a), (i), (ii) and (iii) of this subsection shall apply. A temporary road is a roadway which has been opened for the purpose of the forest practice operation in question, and thereafter will be an inactive or abandoned road.**

(3) **Compact fills.** During road construction, fills or embankments shall be built up by layering. Each layer shall be compacted by operating the tractor or other construction equipment over the entire surface of the layer. Chemical compacting agents may be used in accordance with WAC 222-38-020.

***(4) Stabilize soils.** When soil, exposed by road construction, appears to be unstable or erodible and is so located that slides, slips, slumps, or washing may reasonably be expected to cause damage to a public resource, then such exposed soil areas shall be seeded with grass, clover, or other ground cover, or be treated by other means acceptable to the department.

***(5) Channel clearance.** Clear stream channel of all debris and slash generated during operations prior to the removal of equipment from the vicinity, or the winter season, whichever is first.

***(6) Drainage.**

(a) **All required ditches, culverts, cross drains, drainage dips, water bars, and diversion ditches shall be installed concurrently with the construction of the roadway.**

(b) Uncompleted road construction to be left over the winter season or other extended periods of time shall be drained by outsloping or cross draining. Water bars and/or dispersion ditches may also be used to minimize eroding of the construction area and stream siltation.

* **(7) Moisture conditions.** Construction should be accomplished when moisture and soil conditions are least likely to result in excessive erosion and/or soil movement.

* **(8) End haul/sidecasts. End haul or overhaul construction is required where** significant amounts of sidecast material would rest below the 25-year flood level of a Type 1, 2 or 3 Water, below the ordinary high water mark of Type 4 Water, or where there is a potential for massive soil failure from overloading on unstable slopes or for damage to the public resources as determined by the department.

* **(9) Waste disposal.** When spoil, waste and/or other debris is generated during construction, this material may be deposited or wasted in suitable areas or locations and be governed by the following:

(a) **Spoil or other debris shall be deposited above the 25-year flood level of Type 1, 2 or 3 Waters.**

(b) **Spoil or other debris shall be deposited above the ordinary high-water channel of Type 4 Waters and not in a location from which it will reasonably be expected to enter those waters.**

(c) When the spoil or other debris is deposited in appropriate location, embankments so formed shall be compacted by layering as in subsection (3) of this section, or so stabilized that the risk of its later entering streams is minimal. [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-24-030, filed 8/3/82, effective 10/1/82; Order 263, § 222-24-030, filed 6/16/76.]

WAC 222-24-035 Landing location and construction. *(1) Landing location:

(a) Locate landings on firm ground above the ordinary high-water mark of any stream. Avoid excessive excavation.

(b) **Landings involving sidecast or fill shall be located where the toe of the sidecast or fill does not lie below the 50-year flood level of a Type 1, 2 or 3 Water or below the ordinary high-water mark of a Type 4 Water .**

(2) **Landing construction.**

(a) Landings requiring sidecast or fill shall be no larger than reasonably necessary for safe operation of the equipment expected to be used.

(b) Where the average general slopes exceed 65 percent, fill material used in construction of landings shall be free from loose stumps and excessive accumulations of slash and shall be mechanically compacted where necessary and practical in layers by tractor to prevent soil erosion and mass soil movement. Chemical compacting agents may be used in accordance with **WAC 222-38-020.** [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-24-035, filed 8/3/82, effective 10/1/82.]

WAC 222-24-040 Water crossing structures. *(1) Bridge construction.

(a) Bridges are required for new crossings of any Type 1 or 2 Waters regularly used for recreational boating.

(b) Permanent bridges shall not constrict clearly defined channels and shall be designed to pass the 50-year flood level or the road shall be constructed to provide erosion protection from the 50-year flood waters which exceed the water-carrying capacity of the drainage structure.

(c) One end of each new permanent log or wood bridge shall be tied or firmly anchored if any of the bridge structure is within 10 vertical feet of the 50-year flood level.

(d) Excavation for bridges, placement of sills or abutments, and the placement of stringers or girders shall be accomplished from outside the ordinary high-water mark of all waters, **except** when such operations are authorized by a hydraulics permit or hydraulics agreement.

(e) Earth embankments constructed for use as bridge approaches shall be protected from erosion by high water. Some examples of protection are: Planted or seeded ground cover, bulkheads, rock riprap, or retaining walls.

(f) When earthen materials are used for bridge surfacing, curbs of sufficient size shall be installed to be above the surface material and prevent such surface material from falling into the stream bed.

***(2) Culvert installation: All permanent culverts installed in forest roads shall be of a size that is adequate to carry the 50-year flood or the road shall be constructed to provide erosion protection from the 50-year flood waters which exceed the water-carrying capacity of the drainage structure.** Refer to Part 5 "Recommended Culvert Sizes" in the Forest Practices Board Manual for the size of permanent culverts recommended for use in forest roads. **If the department determines that because of unstable slopes the culvert size shown on that table is inadequate to protect public resources, it may require culvert sizes in accordance with the nomograph (chart) contained in Part 5 of the Forest Practices Board Manual or with other generally accepted engineering principles.**

(a) No permanent culverts shall be installed that are smaller than:

(i) 24 inches in diameter or the equivalent for anadromous fish streams.

(ii) 18 inches or the equivalent for the resident game fish streams.

(iii) 12 inches or the equivalent for all other water crossings.

(b) The alignment and slope of the culvert shall parallel the natural flow of the stream whenever possible.

(c) When fish life is present, construct the bottom of the culvert at or below the natural stream bed at the inlet and outlet.

(d) Terminate culverts on materials that will not readily erode, such as riprap, the original stream bed (if stable), or other suitable materials.

(e) If water is diverted from its natural channel, return this water to its natural stream bed via culvert, flume, spillway, or the equivalent.

(f) When flumes, downspouts, downfall culverts, etc., are used to protect fill slopes or to return water to its natural courses, the discharge point must be protected from erosion by: (i) Reducing

the velocity of the water, (ii) use of rock spillways, (iii) riprap, (iv) splash plates.

(g) Stream beds shall be cleared for a distance of 50 feet upstream from the culvert inlet of such slash or debris that reasonably may be expected to plug the culvert.

(h) The entrance of all culverts should have adequate catch basins and headwalls to minimize the possibility of erosion or fill failure.

***(3) Culverts in anadromous fish streams. In addition to the requirements of subsection (2) of this section, in streams used by *anadromous* fish:**

(a) Culverts shall be either open bottomed or have the bottom covered with gravel and installed at least 6 inches below the natural stream bed at the inlet and outlet.

(b) Closed bottom culverts shall not slope more than 1/2 percent; except as provided in (e) of this subsection; open bottom culverts shall not slope more than the natural slope of the stream bed.

(c) Where multiple culverts are used, one culvert shall be at least 6 inches lower than the other(s).

(d) Culverts shall be set to retain normal stream water depth throughout the culvert length. A downstream control may be required to create pooled water back into the culvert and to insure downstream stream bed stability.

(e) Closed bottom culverts, set at existing stream gradients between 1/2 percent and 3 percent slope shall be designed with baffles for water velocity control, or have an approved designed fishway.

(f) The department, after consultation with the departments of fisheries and game, shall impose any necessary limitations on the time of year in which such culverts may be installed to prevent interference with migration or spawning of anadromous fish.

(g) Any of the requirements in (a) through (f) of this subsection may be superseded by a hydraulics project approval.

***(4) Temporary water crossings.**

(a) Temporary bridges and culverts, adequate to carry the highest anticipated flow in lieu of carrying the 50-year flood, may be used:

(i) **In the westside region if installed** after June 1 and removed by September 30 of the same year.

(ii) **In the eastside region if installed** after the spring runoff and removed prior to the snow buildup which could feed a heavy runoff.

(iii) **At other times, when** the department and applicant can agree to specific dates of installation and removal.

(b) Temporary bridges and culverts shall be promptly removed upon completion of use, and the approaches to the crossing shall be water barred and stabilized at the time of the crossing removal.

(5) **Properly prepared and maintained fords** may be used during periods of low water providing a hydraulics permit is acquired. [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-24-040, filed 8/3/82, effective 10/1/82; Order 263, § 222-24-040, filed 6/16/76.]

WAC 222-24-050 Road maintenance. *(1) Active roads. An active road is a forest road being actively used for hauling of logs, pulpwood, chips, or other major forest products or rock and other road building materials. To the extent necessary to prevent damage to public resources, the following maintenance shall be conducted on such roads:

(a) Culverts and ditches shall be kept functional.

(b) Road surface shall be maintained as necessary to minimize erosion of the subgrade.

(c) During and on completion of operations, road surface shall be crowned, outsloped, or water barred and berms removed from the outside edge except those intentionally constructed for protection of fills.

***(2) Inactive roads. An inactive road is a forest road the use of which for commercial hauling is discontinued for 1 or more logging seasons, and the forest landowner desires continuation of access for fire control, forest management activities, Christmas tree growing operations, occasional or incidental use for minor forest products harvesting or similar activities on such inactive roads:**

(a) Before the first winter rainy season following termination of active use, nonfunctional ditches and culverts shall be cleared and the road surface shall be crowned, outsloped, water barred or otherwise left in a condition not conducive to accelerated erosion; and

(b) Thereafter, except as provided in (c) of this subsection, the landowner shall clear or repair ditches or culverts which he knows or should know to be nonfunctional and causing or likely to cause material damage to a public resource.

(c) The landowner shall not be liable for penalties or monetary damages, under the act, for damage occurring from a condition brought about by public use, unless he fails to make repairs as directed by a notice to comply.

***(3) Additional culverts/maintenance. If the department determines based on physical evidence that the above maintenance has been or will be inadequate to protect public resources and that additional measures will provide adequate protection it shall require the landowner or operator to either elect to:**

(a) Install additional or larger culverts or other drainage improvements as deemed necessary by the department; or

(b) Agree to an additional road maintenance program. Such improvements in drainage or maintenance may be required only after a field inspection and opportunity for an informal conference.

*(4) **Abandoned roads. An abandoned road is a forest road which the forest landowner does not intend to be used again for commercial hauling of forest products.** No subsequent maintenance of an abandoned road is required after the following procedures are completed:

(a) Roads are outsloped, water barred, or otherwise left in a condition suitable to control erosion; and

(b) Ditches are cleaned; and

(c) The road is blocked to vehicular traffic or is posted "closed."

(d) The department may request the removal of bridges and culverts on Type 1, 2, 3 and 4 Waters, except where the owner elects to maintain the drainage structures.

* (5) **Brush control. Chemical control of roadside brush shall not be done where chemicals will directly enter any Type 1, 2, or 3 or flowing Type 4 Water. Refer to WAC 222-38-020 for additional information.**

* (6) **Road surface treatment.**

(a) Apply oil to the road surface only when the temperature is above 55 degrees F and during the season when there is a minimal chance of rain for the next 48 hours.

(b) Water the road surface prior to application of oil to assist in penetration.

(c) Construct a temporary berm along the road shoulder wherever needed to control runoff of the applied chemical.

(d) Take extreme care to avoid excess application of road chemicals. Shut off the flow at all bridges.

(e) When cleaning out chemical storage tanks or the application equipment tanks used for storage and application of road treatment materials, dispose of the rinse water fluids on the road surface or in a place safe from potential contamination of water.

(f) The use of dry road chemicals shall be in compliance with WAC 222-38-020. [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-24-050, filed 8/3/82, effective 10/1/82; Order 263, § 222-24-050, filed 6/16/76.]

WAC 222-24-060 Rock quarries, gravel pits, borrow pits, and spoil disposal areas. Not covered by the Surface Mine Reclamation Act of 1971 (chapter 78.44 RCW).

*(1) **Location of pits.** Except as approved by the department, rock quarries and gravel pits opened after January 1, 1975 shall be located above the 25-year flood level.

*(2) **Location of spoil disposal areas.** Except as approved by the department, spoil disposal areas shall be located:

(a) Above the 25-year flood level.

(b) Where the final slope after disposal will be no steeper than 1 1/2:1.

(c) Where practical, on areas having low potential timber productivity.

(d) Where the risk of soil erosion and mass soil movement is minimal.

(e) All spoils shall be placed to allow drainage without additional water ponding.

*(3) **Pit drainage.** During construction and use of rock quarries, gravel pits, or borrow pits, runoff water shall be either diverted onto the forest floor or be passed through one or more settling basins as approved by the department.

(4) **Rehabilitation required.** All rock quarries, gravel pits, spoil disposal areas and borrow pits used after January 1, 1975 shall be reclaimed within 2 years from the time the rock or gravel source is either exhausted or abandoned.

(5) **Rehabilitation standards.** Where rehabilitation is required:

(a) Remove all deleterious material that has potential for damaging the public resource, the soil productivity, or that would prevent reforestation of an otherwise plantable area.

(b) Grade slopes to less than the angle of repose unless otherwise approved.

(c) Reforest in accordance with chapter 222-34 WAC to the extent practical.

(d) Seed unreforested exposed erodible soils with grass, clover or other ground cover.

*(6) **Major spoil disposal operations.** Where a spoil disposal operation involves more than 1,000 cubic yards of spoils:

(a) The spoils shall be placed to provide drainage onto the forest floor without water ponding within the disposal area;

(b) The site shall be reforested in accordance with chapter 222-34 WAC to the extent practical; and

(c) If significant erosion of the spoils develops, the eroding areas shall be water barred and any unreforested areas shall be matted, mulched, or seeded with grass or ground cover. [Order 263, § 222-24-060, filed 6/16/76.]

Chapter 222-30 WAC
TIMBER HARVESTING

WAC

Reviser's note: For an explanation of the regulations marked with an asterisk (*), see WAC 222-12-010.

WAC 222-30-010 Policy—Timber harvesting. This section covers all removal of timber from forest lands in commercial operations, commercial thinning, salvage of timber, relogging merchantable material left after prior harvests, post harvest cleanup, and clearing of merchantable timber from lands being converted to other uses. **It does not cover removal of incidental vegetation or removal of firewood for personal use.** To the extent practical the department shall coordinate the activities on a multiple disciplinary planning approach. (NOTE: OTHER LAWS AND REGULATIONS AND/OR PERMIT REQUIREMENTS MAY APPLY. SEE CHAPTER 222-50 WAC.) [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-30-010, filed 8/3/82, effective 10/1/82; Order 263, § 222-30-010, filed 6/16/76.]

WAC 222-30-020 Harvest unit planning and design. (1) **Logging system. The logging system should be appropriate for the terrain, soils, and timber type so yarding or skidding can be economically accomplished in compliance with these regulations.**

***(2) Landing locations.**

(a) Locate landings on firm ground above the ordinary high-water mark of any stream. Avoid excessive excavation.

(b) **Landings involving sidecast or fill shall be located where the toe of the sidecast or fill does not lie below the 50-year flood level of a Type 1, 2 or 3 Water or below the ordinary high-water mark of a Type 4 Water.**

(3) **Landing construction.**

(a) Landings requiring sidecast or fill shall be no larger than reasonably necessary for safe operation of the equipment expected to be used.

(b) Where the average general slopes exceed 65 percent, fill material used in construction of landings shall be free of loose stumps and excessive accumulations of slash and shall be mechanically compacted where necessary and practical in layers by tractor to prevent soil erosion and mass soil movement. Chemical compacting agents may be used in accordance with WAC **222-38-020** .

*(c) Truck roads, skid or fire trails shall be outsloped or cross drained uphill of landings and the water diverted onto the forest floor away from the toe of any landing fill.

(d) Landings shall be sloped to minimize accumulation of water on the landing.

***(e) Excavation material shall not be sidecast where there is high potential for material to enter below the ordinary high-water mark of any stream or the 50-year flood level of Type 1, 2 or 3 Water.**

***(4) Streamside management zone.** Harvest units shall be designed so that felling, bucking, yarding or skidding, and reforestation can be accomplished in accordance with these regulations, including those regulations relating to stream bank integrity and temperature control. Where the need for additional actions or restrictions adjacent to waters not covered by the following become evident, WAC **222-12-050** and **222-12-060** may apply.

(5) **Future productivity. Harvesting shall leave the land in a condition conducive to future timber production except:**

(a) To the degree required for streamside management zones; or

(b) Where the lands are being converted to another use or classified urban lands as specified in **WAC 222-34-050** .

(6) **Wildlife habitat.** This section is designed to encourage timber harvest practices that would protect wildlife habitats, provided, that such action shall not unreasonably restrict landowners action without compensation.

(a) The applicant should make every reasonable effort to cooperate with the department of game to identify key wildlife habitats as defined by the board. Where these habitats are known to the applicant, they shall be identified in the application or notification.

(b) Where a key wildlife habitat has been identified the applicant shall consider reasonable means of protection thereof as part of the proposed harvesting operation.

(c) Harvesting methods and patterns in established big game winter ranges should be designed to insure adequate access routes and escape cover where practical.

(i) Where practical, cutting units should be designed to conform with topographical features.

(ii) Where practical on established big game winter ranges, cutting units should be dispersed over the area to provide cover, access for wildlife, and to increase edge effect.

(d) In areas where this will not create a significant fire or safety hazard nor conflict with achieving conformance with the limitation of or performance with the provisions of chapter 76.04 RCW (snag falling law) and chapter 49.17 RCW (safety), **a reasonable number of snags will be left to protect habitat for cavity nesting wildlife.** [Order 263, § 222-30-020, filed 6/16/76.]

WAC 222-30-030 Stream bank integrity. * In the streamside management zone along all Type 1, 2 and 3 Waters, use reasonable care to:

(1) **Avoid disturbing brush** and similar understory vegetation;

(2) **Avoid disturbing stumps** and root systems;

(3) **Leave high stumps** where necessary to prevent felled and bucked timber from entering the water.

The streamside management zone is measured from the ordinary high-water on both sides of the water and is 50 feet in width for Type 1 and 2 Waters and 25 feet for Type 3 Water. [Order 263, § 222-30-030, filed 6/16/76.]

WAC 222-30-040 Temperature control. *(1) Determination of temperature sensitivity for Type 1, 2 and 3 Waters shall be based upon field data or upon criteria set forth in WAC 222-16-040. Any designation as to whether or not waters are temperature sensitive shall be made by the department prior to the deadline for approval or disapproval of the application for harvest.

***(2) Shade requirements.** Within the streamside management zone along those Type 1, 2 and 3 Waters designated as temperature sensitive, unless a waiver is granted by the department under subsection (3) of this section, **the operator shall:**

(a) Leave all nonmerchantable vegetation which provides mid-summer and mid-day shade of the water surface; and

(b) Leave sufficient merchantable timber, if any, necessary to retain 50 percent of the summer mid-day shade of the water surface, provided that the department shall require leaving 75 percent of the shade where it determines that the mean of the maximum summer daily ambient water temperatures, for a 7-day period, exceeds 60 degrees before logging. (See the Forest Practices Board Manual Part 2 for methods of shade determination.)

***(3) Waivers.** The department may waive or modify the shade requirements where the applicant:

(a) Shows a high probability of windthrow and agrees to replant the streamside management zone within the first planting season after harvest; or

(b) Agrees to a staggered setting program producing equal or greater temperature control; or

(c) Provides alternative means of stream temperature control satisfactory to the department. [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-30-040, filed 8/3/82, effective 10/1/82; Order 263, § 222-30-040, filed 6/16/76.]

WAC 222-30-050 Felling and bucking. *(1) Felling into stream.

(a) No trees will be felled into Type 1, 2 and 3 Waters, except trees which cannot practically and safely be felled outside the stream, lake or pond using techniques in general use and these trees must then be removed promptly.

(b) Trees may be felled into Type 4 Water if logs are removed as soon thereafter as practical.

***(2) Bucking in streams.**

(a) No bucking or limbing shall be done on trees or portions thereof lying between the banks of Type 1, 2 or 3 Water, except as necessary to remove the timber from the stream, lake or pond.

(b) Where bucking or limbing is done between the banks of a Type 4 Water, care shall be taken to minimize accumulation of slash in the stream, lake or pond.

***(3) Felling in streamside management zones.**

(a) Individual trees within a streamside management zone otherwise restricted from cutting may be harvested if reasonably expected to fall into the stream, lake or pond from natural causes.

(b) Care shall be taken to fall any trees cut within the streamside management zone in a manner to prevent damage to the stream, lake or pond and streamside management zone.

***(4) Felling near streamside management zone and setting boundaries.** Reasonable care shall be taken to avoid felling trees into streamside management zones and areas outside the harvest unit.

(5) Felling in selective and partial cuts. Reasonable care shall be taken to fall trees in directions that minimize damage to residual trees. [Statutory Authority: RCW 76.09.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-30-050, filed 8/3/82, effective 10/1/82; Order 263, § 222-30-050, filed 6/16/76.]

WAC 222-30-060 Cable yarding. *(1) Type 1, 2 and 3 Water. No timber shall be cable yarded in or across a Type 1, 2 or 3 Water except where:

(a) The logs will not materially damage the stream bed, banks or streamside management zone; or

(b) Necessary to remove trees from the stream; or

(c) Part of a stream clearance and improvement project approved by the departments of fisheries or game; or

(d) Approved by the department.

*(2) **Deadfalls. Any logs which are firmly embedded** in the bed of a Type 1, 2 or 3 Water shall not be removed or unnecessarily disturbed without approval of the departments of fisheries and game.

* (3) **Yarding in streamside management zone.** Where timber is yarded from or across a streamside management zone, reasonable care shall be taken to minimize damage to the vegetation providing shade to the stream. Where practical and consistent with good safety practices, logs shall be yarded in the direction in which they lie until clear of the streamside management zone.

(4) **Direction of yarding.**

(a) Uphill yarding is preferred.

(b) Where downhill yarding is used, reasonable care shall be taken to lift the leading end of the log to minimize downhill movement of slash and soils.

*(c) When yarding parallel to a Type 1, 2 or 3 Water channel below the 25-year flood level, reasonable care shall be taken to minimize rutting and to prevent logs from rolling into the stream, lake or pond or streamside management zone. [Statutory Authority: RCW 76.09.040 and 76.09.050. 82 16 077 (Resolution No. 82-1), § 222 30 060, filed 8/3/82, effective 10/1/82; Order 263, § 222-30-060, filed 6/16/76.]

WAC 222-30-070 Tractor and wheeled skidding systems. *(1) Streams.

(a) **Tractor and wheeled skidders shall not be used in Type 1, 2 *or 3 Water, except with the approval of the department.***

(b) Skidding across any flowing Type 4 Water shall be minimized and when done, temporary stream crossings shall be used, if necessary, to maintain stream bed integrity.

(c) Whenever skidding in or across any type water, the direction of log movement between stream banks shall be as close to right angles to the stream channel as is practical.

*(2) **Streamside management zone.** (a) **Logging will be permitted within the zone, provided that tractors and wheeled skidders may *not be used within the zone unless approved by the department.***

(b) Where skidding in or through the streamside management zone is necessary, the number of skidding routes through the management zone shall be minimized.

(c) Logs shall be skidded in the direction in which they lie until clear of the streamside management zone, to the extent practical and consistent with good safety practices.

(3) **Deadfalls. Any logs which are firmly embedded** in the bed of a Type 1, 2 or 3 Water shall not be removed or unnecessarily disturbed without approval of the departments of fisheries and game.

*(4) **Moisture conditions. Tractor *and wheeled skidders shall not* be used on exposed erodible soils when** soil moisture content is so high that unreasonable rutting, or stream, lake or pond siltation would result.

(5) **Protection of residual timber.** Reasonable care shall be taken to minimize damage from skidding to the stems and root systems of residual timber and to young reproduction.

*(6) **Skid trail construction.**

(a) Skid trails shall be kept to the minimum feasible width.

(b) Reasonable care shall be taken to minimize *the amount of* sidecast required and shall only be permitted above the 50-year flood level.

(c) Skid trails shall be outsloped where practical, but be insloped where necessary to prevent logs from sliding or rolling downhill off the skid trail.

*(7) **Skid trail maintenance. Upon completion of use and termination of seasonal use,** skid trails on slopes in exposed soils shall be water barred where necessary to prevent soil erosion.

*(8) **Slope restrictions. Tractor and wheeled skidders shall not be used on slopes where** in the opinion of the department this method of operation would cause unnecessary or material damage to a public resource. [Statutory Authority: RCW 76.09.040 and 76.09-.050. 82-16-077 (Resolution No. 82-1), § 222-30-070, filed 8/3/82, effective 10/1/82; Order 263, § 222-30-070, filed 6/16/76.]

WAC 222-30-080 Landing cleanup. Except as approved by the department, the following rules shall be met within 60 days after completion of hauling logs from any landing, or as soon thereafter as practical.

*(1) **Drainage.**

(a) Clean any ditches and culverts obstructed by dirt or debris during operation(s).

(b) Establish a slope that will prevent water from accumulating on the landing or running from the landing down any erodible fill.

*(2) **Other erosion control measures.**

(a) Cut slopes shall be cut back to an angle expected to remain stable.

(b) Where exposed soil is unstable or erodible and may be reasonably expected to cause damage to a public resource, it shall be seeded with grass, clover or ground cover or compacted, riprapped, water barred, benched or mulched, or be treated by other means approved by the department.

(3) **Cleanup.**

(a) Slash accumulations which would prevent reforestation of otherwise plantable fills, sidecast or cut slopes of landings shall be disposed of or be piled on the landing floor for future disposal.

(b) Slash shall not be buried in any filled portion of the landing *in connection with landing cleanup operations.*

(c) All cables, machine parts and other inorganic debris resulting from harvest operation(s) shall be removed at the time of landing cleanup. [Order 263, § 222-30-080, filed 6/16/76.]

WAC 222-30-090 Post-harvest site preparation. Unless the *application or notification indicates that the landowner or forest* landowner specifically agrees to assume responsibility for compliance with this section, **the operator** shall leave the site in a condition suitable for reforestation following any clear cutting, or any partial cutting west of the summit of the Cascades where 80 percent or more of the cubic volume is removed within any 5 consecutive years unless the department determines that the live trees remaining will reasonably utilize the timber growing capacity of the soils. **Lands being converted to another use or classified as urban development lands under WAC 222-34-050 are exempt.**

(1) **The following site preparation is required when necessary to establish a condition suitable for reforestation:**

(a) Cutting, slashing, or other treatment of all noncommercial tree species, other competing vegetation, and nonmerchantable size trees commonly known as "whips" which will not reasonably utilize the growing capacity of the soil except in the streamside management zone; or

(b) Pile or windrow slash; or

(c) Mechanically scatter slash; or

(d) Leave the cutover area in a condition for controlled broadcast burning, and subsequently burn.

(2) **Streamside management zones may require special treatment to establish conditions suitable for reforestation.** [Statutory *Authority*: RCW 76.09.040 *and* 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-30-090, filed 8/3/82, effective 10/1/82; Order 263, § 222-30-090, filed 6/16/76.]

WAC 222-30-100 Slash disposal. (1) **Slash disposal techniques:**

(a) **Except on sites where** *the department determines that a* particular method would cause unreasonable risk to public resources, any conventional method of slash disposal may be used, such as: Controlled broadcast burning; pile or windrow and burn; pile or windrow without burning; *mechanical scatter and compaction*; scarification; chip, mulch or lop and scatter; burying; and physical removal from the forest lands.

(b) **All slash burning requires a burning permit** from the department which provides for compliance with the smoke management plan and reasonable care to prevent damage to streamside management zones, soil, residual timber, public resources, and other property.

*(c) **Location of slash piles.** Except where burning will be completed before the next ordinary high-water season, slash shall not be piled or windrowed below the 25-year flood level of any Type 1 or 2 Water, or below the ordinary high-water mark of any Type 3 or 4 Water, or in locations from which it could be expected to enter any stream, lake or pond.

(2) **Slash disposal is required** when abatement of extreme fire hazard is required by law (see *WAC 332-24-360*).

(3) **Slash disposal is required** where the forest landowner has applied for and been granted an extension of time for reforestation on the grounds that slash disposal is necessary or desirable before reforestation.

***(4) Removing slash and debris from streams.**

(a) "Slash" or "debris" which can reasonably be expected to cause significant damage to the public resource shall be removed *from Type 1, 2 or 3 Waters, to above the 25-year flood level* and left in a location or manner minimizing risk of re-entry into the stream, lake or pond and if substantial accumulations of slash exist below the 25-year flood level of Type 1 or 2 Waters, slash disposal is required.

(b) "Slash" and "debris" shall be removed from below the ordinary high-water mark of Type 4 Waters, when *the department* issues written notice for removal of the slash or debris because of potential damage to public resources. See Part 6 of the Forest Practices Board Manual for "Guidelines for Clearing Slash and Debris from Type 4 Waters."

***(5) Fire trails.**

(a) Construct dips, water bars, cross drainage and ditches as needed to control erosion.

(b) Reasonable care shall be taken to minimize excavation during fire trail construction and sidecast shall only be permitted above the 50-year flood level. [Statutory Authority: RCW 76.09-.040 and 76.09.050. 82-16-077 (Resolution No. 82-1), § 222-30-100, filed 8/3/82, effective 10/1/82; Order 263, § 222-30-100, filed 6/16/76.]