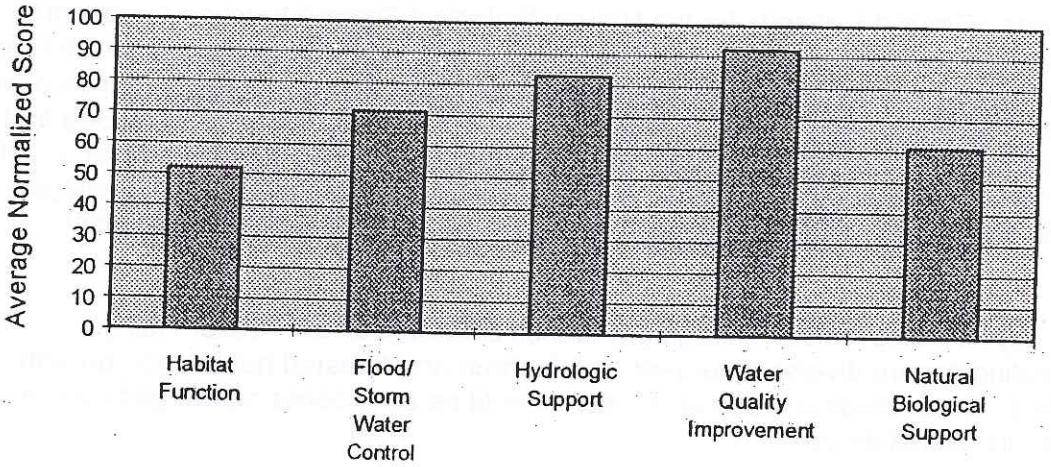
to nutrient inputs. Trash and large amounts of algae were observed in parts of the stream connecting these two water bodies.

Swamp Creek supports cutthroat trout and coho populations, but only in and downstream of Lake Stickney, which is 2.5 miles downstream of the SW Everett/Paine Field Subarea.

Swamp Creek Basin Wetlands. Figure 3.4-38 shows the average wetland assessment scores for wetlands evaluated in the Swamp Creek drainage basin.

Figure 3.4-38
Swamp Creek Drainage Basin
Average Wetland Assessment Scores



Flood/Storm Water Control and Baseflow Functions. Only a small portion of the very large Swamp Creek Basin was within the study area. Almost all of the wetlands ranked within the Group 1 category (only 4 wetlands were in Group 2 and one a Group 1) for the hydrologic support function (figure d). Relative to the other basins, Swamp Creek was one of the highest scoring wetlands for the hydrologic support function. Because the study area involves the headwaters of Swamp Creek, which is a significant fishery resource, and large areas of recreational open space are present (e.g. golf courses), there is potential to enhance the hydrologic support function for the basin. For example, it is possible that additional wetland areas could be created on the City's Walter Hall golf course as part of the overall design (e.g. as water hazard areas). Further south in the basin, high density residential and commercial development severely limit the opportunities for the restoration and creation of wetlands.

For the flood/storm water control function, the Swamp Creek Basin ranked third relative to other study area basins (figure c). The majority of the wetlands were a mix of Group 1 and 2 wetlands, with only 8 wetlands ranking as Group 3 wetlands. Again some opportunity for creating additional wetland may exist on City open space lands (e.g. Walter Hall Golf Course) which would result in an improvement of the stormwater control function for the basin. Additional wetland areas flood/storm water control function would have a very positive impact within this headwater area of the basin.

Water Quality Improvement Function. Only a small portion of the very large Swamp Creek Basin was within the study area. Over 62% of the wetlands ranked within the Group 1 category with the remaining wetlands within the Group 2 category. Relative to the other basins, Swamp Creek was one of the highest scoring basins for the water quality improvement function.

The water quality improvement function could be enhanced for Group II wetlands 5a,b,c and d and wetland SC13 by restricting the outlet and increasing flooding within the wetland. Additionally, the significant areas of recreational open space on the City's Walter Hall golf course could allow for the creation of additional wetland areas as part of the golf course overall design (e.g. as water hazard areas). Further south in the basin, high density residential and commercial development severely limit the opportunities for the restoration and creation of wetlands.

Habitat Functions. Group 1 wetlands for the Natural Biological Support function represented only 11% of the total wetlands in this basin. The Group 1 wetlands were limited to Kasch Bog (SC7) and immediately surrounding wetlands (SC9, 13 and 20). The remaining wetlands were primarily Group 3 wetlands and 5 Group 2 wetlands. For the Habitat function Kasch Bog and the adjoining SC9 and 13 ranked as Group 1 wetlands in addition to SC 29 located just south of the southern end of the study area limits. Wetlands ranking in the Group 2 and 3 category had only one to maybe two vegetation classes, highly degraded buffers and limited plant diversity.

Enhancement opportunities include enlarging wetlands SC5a,b,c on the Walter Hall golf course and creating a more diverse emergent, scrub-shrub and forested habitat portion with adequate buffers. Other areas of wetland creation should be considered on the golf course and worked into its overall design.

3.4.3 EXISTING REGULATORY FRAMEWORK

Please note that permit regulations change. Contact the appropriate agency for specific proposals.

3.4.3.1 Groundwater Regulations

While the City of Everett and other providers will supply water for industries, groundwater may be used for irrigation or industrial processes.

Snohomish County

Interim Groundwater Protection Regulations (Chapter 32.11 SCC). The Interim Groundwater Protection Regulations (SCC 32.11) require that certain land uses comply with best management practices (BMPs) and/or that hydrogeologic studies be conducted for those identified land uses which may have impacts on groundwater resources. These uses include underground storage tanks and facilities which use hazardous substances. Developments on the Paine Field properties must comply with this Ordinance as applicable.

Department of Ecology

Requirements for Obtaining New Groundwater Rights. The Washington State Department of Ecology is responsible for the allocation of groundwater rights. The following procedures are required for all potential groundwater users:

- An application must be filed with the Ground and Surface Water Section of Ecology indicating a specific amount of water requested and specific purpose.
- A public notice and comment period must occur.
- Assuming no public opposition, Ecology will issue a preliminary permit for well drilling and testing.
- Ecology will then perform a review of the investigation along with an evaluation of the following:
    - Are adequate amounts of groundwater available?
    - Will it be put to a beneficial use?
    - Is the use in the public interest?
    - Will the use be in conflict with existing uses?
- The next step in the process would be a hydrologic review performed by Ecology.
- Upon completion of a review of the hydrologic report, and a final check by Ecology, a Final Issue of Water Rights would be prepared.

In July 1995, the City of Everett approved a consulting agreement with Robinson-Noble, Inc. to conduct a groundwater feasibility study. The study will lead to a transfer of groundwater rights to irrigate key parks and golf courses in South Everett and South Snohomish County.

3.4.3.2 Stormwater, Surfacewater, Stream and Wetland Regulations

Federal Requirements: Environmental Protection Agency (EPA)

Clean Water Act. A National Pollutant Discharge Elimination System (NPDES) permit, administered by the US Environmental Protection Agency and/or Washington State Department of Ecology will be required for clearing and grading activities if the site disturbed by land alteration activities is greater than or equal to 5 acres.

A permit for stormwater discharge to creeks may or may not be required depending upon the future use of the site.

Federal Requirements: U.S. Army Corps of Engineers

Clean Water Act - Section 404. The U.S. Army Corps of Engineers (COE) regulates the excavation and discharge of fill materials into wetlands and other waters of the US. The Nationwide Permit Program was adopted by the Corps to expedite authorization of projects that are considered by the Corps to have minimal impacts on the environment. The Nationwide Permit Program covers 37 categories of minor activities, including road crossings, utility line bedding and backfill, headwaters discharges, some fill activities in isolated wetlands, and restoration of wetlands. The applicant is required to notify the Corps for some nationwide permits.

Individual permits are required for fill of wetlands not authorized under Nationwide Permits, including:

- fill in open water and wetlands adjacent to streams/rivers/lakes located below the headwaters (the point where the mean annual flow of the stream is greater than or equal to 5 cubic feet per second); and
- fill in tidal waters or adjacent wetlands.

An alternatives analysis is required for individual permits. This analysis must show that there is no less environmentally damaging practicable alternative to the proposed excavation or filling of the wetlands. The Corps can require mitigation for wetland excavation or fill.

A Water Quality Certification from the Department of Ecology is required for all Section 404 permit activities by the COE. Some certifications have been issued under nationwide permits.

Clean Water Act. The EPA issues National Pollutant Discharge Elimination System (NPDES) permits for federal facilities.

Washington State Requirements: Department of Ecology

Clean Water Act: 401 Water Quality Certification. The Clean Water Act requires certification by states that projects will not adversely affect water quality or violate state aquatic protection laws. The Department of Ecology coordinates the comments of all state natural resource agencies for required permits.

The Department of Ecology reviews the Corps nationwide permits issued under Section 404 of the Clean Water Act and either approves the permits, denies water quality certification for permits that are determined to have the potential to cause more than minimal impact to the environment, or certifies the permits with additional State conditions. Projects that fall under nationwide permits that were approved/certified by the state do not have to obtain individual Water Quality Certifications. Individual Water Quality Certifications must be obtained for projects that fall under nationwide permits that were denied, projects that cannot meet State conditions for nationwide permits, and projects that must obtain individual Corps permits.

Federal Clean Water Act and State Water Pollution Control Act (RCW 90.48). The Department of Ecology is responsible for issuing National Pollution Discharge Elimination System (NPDES) permits for non-federal projects. Any project which disturbs five acres or more of total land area during construction, and/or which will discharge stormwater to surfacewater or to a storm sewer must apply for coverage under Washington State Department of Ecology's Baseline General Permit for Stormwater Discharges Associated with Industrial Activities. The stormwater permit is meant to reduce the release of contaminants in stormwater discharges, and requires operators of industrial facilities to develop a stormwater pollution prevention plan. Constructed facilities which discharge stormwater may also have to obtain NPDES permits.

Industries required to obtain a stormwater permit include, but are not limited to:

- Heavy manufacturing facilities that fall under specific Standard Industrial Classification (SIC) codes, including lumber and wood products; paper and allied products; chemical and allied products; metal industries; and ship and boat building and repairing.
- Mining and oil and gas facilities.

- Hazardous waste treatment, storage or disposal facilities.
- Landfills, land application sites.
- Recycling facilities.
- Transportation facilities.
- Light manufacturing facilities that fall under specific SIC codes need a permit if they have industrial activity exposed to stormwater, including food products; textile products; apparel products; furniture and fixtures; paints, varnishes, lacquers, enamels, and allied products; drugs; measuring, analyzing, and controlling equipment, etc.

Water Quality Standards for Surfacewaters of the State of Washington (WAC 173-201A). The State Water Quality Standards include criteria for surfacewater characteristics such as temperature, pH, turbidity, dissolved oxygen, and fecal coliforms levels. These criteria vary based upon the classification of the surfacewaters. All of the streams in the Subarea except Swamp Creek are classified as Class A (excellent) surfacewaters. Swamp Creek and its tributaries are Class AA (extraordinary) surfacewaters. WAC 173-201A also establishes criteria for toxic substances such as ammonia, arsenic, cadmium, chromium, copper, lead, nickel and zinc. These standards are the same for all classes of surfacewaters.

The Department of Ecology is responsible for implementation and enforcement of Water Quality Standards. WAC 173-201A requires that waste discharge permits, whether NPDES permits or otherwise, shall be conditioned so the discharges authorized will meet the water quality standards. However, the Department of Ecology can issue Short Term Water Quality Modification permits which allow the criteria to be modified on a short-term basis under specific conditions.

Sediment Management Standards, WAC 173-204. Washington state sediment quality standards provide a regulatory and management goal for the quality of sediments throughout the state. The standards provide chemical concentration criteria, biological effects criteria, human health criteria, and other toxic, radioactive, biological. or deleterious substances criteria which identify surface sediments that have no adverse effects, including no acute or chronic adverse effects on biological resources and no significant health risk to humans below which no adverse effects on biological resources are predicted.

Sediment source control standards are used as a basis for controlling the effects of point and nonpoint source discharges to sediments through the National Pollutant Discharge Elimination System (NPDES) federal permit program, and state water quality management permit programs.

Washington State Requirements: Department of Fish and Wildlife (DFW)

Hydraulic Project Approvals. A Hydraulic Project Approval (HPA) from the State Department of Fish and Wildlife (WDFW) will be required for work in stream systems. An HPA is required for any activity within the ordinary high water line of state waters. Work occurring in wetlands that are located adjacent to marine bodies, streams, or lakes typically require an HPA. In addition, isolated wetlands with an open water component may also require an HPA in order for activities to occur within the ordinary high water mark. Any work that affects the waters or the aquatic beds will need an HPA. Many types of construction activities occurring in freshwater will require an HPA including the following:

- streambank protection,
- pile driving,
- conduit crossing,
- dredging,
- pond construction,
- log, log jam, or debris removal,
- installation or maintenance (of equipment) of water diversions.
- construction of bridges,
- channel change or realignment,
- culvert installation,
- gravel removal,
- placement of outfall structures,
- mineral prospecting; and

An HPA may also be required for discharge of stormwater to wetlands or streams. In the past, more stringent detention and water treatment requirements than the City would impose have been placed on projects as a condition of the HPA.

Local Requirements: City of Everett

Storm and Surface Water Management Regulations - General. The City of Everett is currently in the process of revising Public Works regulations related to storm and surface waters management. Both the existing and proposed regulations are discussed below. Existing regulations include the Design and Construction Standards and Specifications Manual, Drainage Basins Plans, Surfacewater System Ordinance, and Drainage Ordinance. The City is in the process of amending the City's Drainage Ordinance to add Minimum Technical Requirements and of creating a Stormwater Management Manual to comply with Puget Sound Water Quality Authority (PSWQA) and DOE requirements. It's anticipated that the amended Ordinance and manual will be adopted in February 1996.

In addition to these ordinances, the City has an Environmentally Sensitive Areas Ordinance which is contained in Chapter 37 of the Zoning Code.

Design and Construction Standards and Specifications (Existing). The current City of Everett Design and Construction Standards and Specifications provides requirements for land alterations, including erosion and sediment control, and also for storm and surfacewater management.

The Land Alteration chapter provides general protections and specific methods of control. This chapter also includes seasonal limitations on land alteration activities, criteria for development of temporary erosion and sediment control plans, and provisions for preservation of existing vegetation and for vegetation restoration.

The Storm and Surface Water section provides requirements for the submittal of drainage plans; specific requirements for areas containing environmentally sensitive areas; special requirements for high risk land uses such as fueling sites, auto repair and maintenance shops, car washes, etc.; and specific criteria for the selection, design, and maintenance of drainage facilities.

The options for stormwater treatment presented in the Design and Construction Standards and Specifications are, in order of preference:

1) An infiltration basin designed and constructed in accordance with City standards.
2) A wetpond designed and constructed in accordance with City standards.

3) A baffle-type oil/water separator followed by a vegetated swale, both designed and constructed in accordance with City standards.

The least preferred option is allowed only if the first two options are infeasible in the opinion of the Public Works Department.

Infiltration: The Design and Construction Standards and Specifications states the following with respect to infiltration of stormwater:

> Infiltration shall be provided for stormwater runoff quantity and/or quality control per the recommendations of drainage basin plans and/or SEPA conditions. Generally infiltration is not acceptable as the sole method of disposing of stormwater. It is an acceptable means of providing water quality enhancement [stormwater treatment] when specific soil and site criteria are met.
>
> Infiltration shall only be allowed as the major or sole method of stormwater disposal in areas of significant natural infiltration with soils classified as hydrologic Group A soils by the Soil Conservation Service. Many of these areas within the City of Everett are identified in the City's drainage basin plans.

Even when soil conditions are not conducive to large-scale infiltration of paved areas, infiltration of roof-top runoff (through the use of small, underground infiltration systems) is strongly encouraged. These smaller, more widely dispersed systems more closely approximate natural infiltration patterns. In addition, roof-top runoff is considered "clean" and does not require treatment prior to discharge to an infiltration system.

Drainage Basins Plans (Existing). The City of Everett drainage basin plans provide information and goals specific to each drainage basin within the City of Everett. In particular, goals for stream flow are developed, which in turn set specific stormwater detention standards for each drainage basin. Capitol improvements needed to achieve the goals are also identified.

The following are the current goals for stormwater quantity control identified in the most recent City of Everett Drainage Basin Plans:

	Design Storm	
Drainage Basin	Predevelopment	Post Development
Powder Mill	2	25
Pigeon Creek #2	2	25
Edgewater Creek	2	25
Glenwood Creek	2	25
Merrill and Ring	5	25
Narbeck Creek	5	25
Japanese Creek	10	25

Using the Powder Mill basin as an example, this means that when the 25 year storm falls on the developed site, sufficient detention must be provided so that the peak allowable stormwater release rate is equal to the current (undeveloped conditions) release rate from a 2 year storm.

The City does not have an adopted drainage basin plan for Swamp Creek.

Surfacewater System Ordinance, EMC 14.56 (Existing). This Ordinance prohibits the discharge of polluting matter into the surfacewater system. Violation of the Ordinance is a misdemeanor punishable by a fine not to exceed five thousand dollars per day or per occurrence.

In addition to fines, the Ordinance also gives the City the ability to require correction of an "unsafe condition" - which is defined as any condition "on public or private premises which may cause pollution or does or may impede the operation or functioning of the surfacewater system or which may cause damage thereto."

Polluting matter includes, but is not limited to: petroleum products including but not limited to oil, gasoline, grease, fuel oil, and heating oil; chemicals; paints; steam cleaning wastes; fresh concrete; washing of fresh concrete for cleaning and/or finishing purposes to expose aggregates; laundry wastes; soaps; pesticides, herbicides, or fertilizers within 25 feet of a surfacewater system; sanitary sewage including septic tank fluids; degreasers and/or solvents; antifreeze, transmission fluid, or other automotive products; animal carcasses; acids or alkalis; recreational vehicle wastes; dyes; any fluid with a pH less than 6.0 or greater than 8.5; and cooking wastes.

The surfacewater system is defined as the receiving bodies of water and the facilities within the City, both public and private, naturally existing and artificial, for storm and surfacewater drainage, conveyance, detention and storage, and any facilities or processes therein, both public and private, natural or artificial, which control the quantity or maintain or improve the quality of storm and surfacewaters or deter pollution. The surfacewater system includes, but is not limited to, streets, sidewalks and all public right-of-ways.

Water Quality Management Program. The City of Everett monitors water quality in most streams in the City. The monitoring, one component of the Surfacewater Management Program, is funded through a surfacewater assessment on utility bills, with the total city-wide budget of about $1 million. Within the Subarea, dry weather baseflow water quality data is collected for Japanese, Edgewater, Narbeck, Merrill and Ring, and Swamp Creeks. Both dry weather baseflow and storm flow water quality data is collected for Powder Mill, Glenwood and Pigeon Creek #2. The stormflow data is collected with automatic water sampling equipment. Samples are collected near the outflows of all streams within the study area into Port Gardner Bay, except that samples for Swamp Creek are collected at the outflow of a regional detention pond at 108th and Evergreen Way. Staff collects and preserves samples, and analysis of the samples is completed in a City lab. Data from the Fall of 1990 to Spring of 1992 was used for this document to summarize existing water quality in the Subarea. This data is available for review in the Planning Department.

In addition to water quality monitoring, the City has begun to sample benthic invertebrates (primarily fly larvae attached to rocks on the stream bottom) in the streams. The quantity and type (pollution tolerant or not) of benthic invertebrates living in a stream is a good indicator of the water quality in the stream. Data on these sampling efforts will be available in the future.

Drainage Ordinance, EMC 14.28 (Existing). The stated purpose of this Ordinance is "to promote sound development guidelines and construction procedures which respect and preserve the City's watercourses; to minimize water quality degradation and control sedimentation of creeks, streams, ponds, lakes, and other water bodies; to protect property owners adjacent to developing and developed land from increased runoff rates which could cause erosion of abutting property; to protect downstream owners; to preserve and enhance the suitability of waters for contact recreation and fishing; to preserve and enhance the aesthetic quality of the waters; to maintain and protect valuable groundwater resources; to minimize adverse effects of alterations in groundwater quantities, locations, and flow patterns; to ensure safety of City roads and right-of-way; and to decrease drainage related damage to public and private property."

The Drainage Ordinance applies to any developers performing clearing or logging operations in excess of five thousand square feet of area, or developing on slopes in excess of 15% projects, or obtaining a Public Works permit. A Public Works permit is required for all work within the public right-of-way and City utility easements, and for all sewer, water, and drainage improvements, including fill and excavation, parking lot construction and/or paving on private property.

The Ordinance requires:

- The development of drainage plans and the submittal of drainage calculations.
- Receiving and discharging surfacewater at the natural locations.
- Restriction of stormwater discharges to levels specified in the drainage plans.
- Provision of adequate measures for control of stormwater per the procedures manual (Design and Construction Standards and Specifications).

The City also inspects private stormwater systems on developments with on-site detention and runoff treatment facilities, including detention ponds, swales, and underground vaults through authority provided in the Drainage Ordinance. City staff can require property owners to correct violations, and property owners can be fined up to $5,000 per occurrence for clean-up costs per EMC 14.56.

Minimum Technical Requirements Ordinance and Stormwater Management Manual (Proposed). The Puget Sound Water Quality Management Plan (PSWQMP) requires that the City adopt a Minimum Technical Requirements Ordinance and a Stormwater Management Manual that is technically equivalent to the Department of Ecology's Stormwater Management Manual for the Puget Sound.

It is anticipated that a new Minimum Technical Requirements Ordinance will be approved by City Council in early 1996. This Ordinance will set forth new, minimum technical requirements for storm and surfacewater management for redevelopment and new development within the City of Everett.

The City of Everett's Stormwater Management Manual will implement the City's new Ordinance and will provide criteria for the selection, design, and construction of Best Management Practices for stormwater management, pollutant source control, and erosion and sediment control. It is anticipated that the manual will replace the land alteration and storm and surface water sections of the City of Everett Design and Construction Standards and Specifications.

General Proposed Requirements. The draft requirements of the proposed Ordinance are summarized in Table 3.4-3. The plans and requirements referenced in the table will be described in detail in the Stormwater Management Manual. Specific BMPs and their design standards will also be contained in the manual. At this time, a draft Stormwater Manual has been developed. Information from the draft manual, regarding required plans and types of BMPs, has been included in this section for reference.

Stormwater Site Plans are comprehensive reports which contain all technical information and analysis necessary to evaluate the temporary erosion and sediment control facilities, source control BMPs, and runoff control facilities required or proposed for a site. The Stormwater Site Plan must be stamped and dated by a professional civil engineer licensed in the State of Washington.

A Stormwater Site Plan will generally include the following sections:

- Project Overview
- Preliminary Conditions Summary
- Off-Site Analysis
- Proposed Erosion and Sediment Control Plan
- Proposed Drainage Plan
- Proposed Source Control Plan
- Analysis and design of all BMPs proposed and/or required.
- Special Reports and Studies
- Basin and Community Planning Areas
- Other Permits
- Miscellaneous Forms and Worksheets
- Maintenance and Operations Requirements

A Small Parcel Erosion and Sediment Control Plan will illustrate the BMPs and strategies for controlling erosion and sediment on a small parcel during construction.

A Large Parcel Erosion and Sediment Control Plan will illustrate the BMPs and strategies for controlling erosion and sediment on a construction site. It is a component of the Stormwater Site Plan, which includes the design and analysis of the erosion and sediment control BMPs.

A Drainage Plan will illustrate the BMPs and strategies for controlling runoff on a development or redevelopment site. It is a component of the Stormwater Site Plan, which includes the design and analysis of the runoff control BMPs.

Requirements for Runoff Control BMPs. Runoff control BMPs include infiltration, runoff treatment, streambank erosion control, and streambank stabilization BMPs.

- *Infiltration BMPs:* In the draft Stormwater Manual, infiltration BMPs have the highest priority for both runoff treatment and streambank erosion control, provided proper conditions exist for their use.

  Sufficient organic content to remove pollutants must be present for soils to provide runoff treatment. These soils have fairly low percolation rates that generally make them

Table 3.4-3
Draft Requirements in Minimum Technical Requirements Ordinance

Type of Development	SPESCP	SSP W/SPESCP AND DP	SSP W/LPESCP AND DP	SOURCE CONTROL	RUNOFF TREATMENT	STREAMBANK EROSION CONTROL
Individual, detached, single family residences and duplexes	X					
Creation or addition of less than 5,000 square feet of impervious surface	X					
Land disturbing activities of less than one acre	X					
Land disturbing activities of one acre or greater			X	X		X
Creation or addition of 5,000 square feet or more of impervious surface along with land disturbing activities of less than one acre		X		X		X
Creation or addition of 5,000 square feet or more of impervious surface along with land disturbing activities of one acre or greater			X	X		X
Creation or addition of 5,000 square feet or more of paved surface				X	X	X

Note:

SPESCP = Small Parcel Erosion and Sediment Control Plan
LPESCP = Large Parcel Erosion and Sediment Control Plan
SSP = Stormwater Site Plan
DP = Drainage Plan

infeasible for infiltrating the large volumes of runoff required for streambank erosion control. Coarser soils can provide streambank erosion control, but generally do not provide adequate treatment of runoff.

The use of coarser soils for infiltrating runoff is allowable to meet streambank erosion control objectives, but runoff treatment must precede discharge to these soils in order to protect groundwater quality.

- *Runoff Treatment BMPs:* Per the City's draft Minimum Technical Requirements, all projects that create 5,000 square feet or more of new pavement must provide treatment of stormwater runoff. Additional criteria apply to redevelopment projects.

  Runoff treatment BMPs are designed to reduce the concentration of pollutants in stormwater runoff. The design goal is to provide effective treatment of at least 90 percent of the runoff generated by development. To achieve this goal, runoff treatment BMPs are sized to treat the 6-month, 24-hour design storm (also referred to as the water quality design storm, or the runoff treatment design storm).

  Categories of runoff treatment BMPs include primary treatment, pretreatment, and oil/water separation. Primary treatment BMPs provide the majority of treatment. Pretreatment BMPs are used to protect certain primary treatment BMPs from suspended solids. Oil/water separation BMPs remove heavier concentrations of oil found in runoff from certain land uses. See the following page for a listing of runoff treatment BMPs.

  In general, the following land uses must provide baffle-type (API) or coalescing plate (CP) oil/water separators in addition to other runoff treatment facilities:

  Industrial machinery and equipment
  Trucks and trailer, aircraft parts and aerospace, and railroad equipment
  Log storage and sorting yards
  Airfields and aircraft maintenance
  Fleet vehicle yards
  Railroads
  Gas stations
  Retail/wholesale vehicle and equipment dealers
  Vehicle maintenance and repair
  Construction businesses (paving, heavy equipment storage and maintenance, storage of petroleum products)

- *Streambank Erosion Control BMPs:* Streambank erosion control (SBEC) BMPs are designed to prevent or control the excessive erosion that typically occurs due to increases in peak flow rates and increases in the frequency and duration of high flow conditions from urbanizing watersheds. Streambank erosion control requires attenuation of stormwater flows through the use of stormwater infiltration and/or stormwater detention.

  Streambank erosion control will most likely be required for attenuation of runoff flows when stormwater discharges are made either directly or indirectly (through a conveyance system) into a stream. Requirement of streambank erosion control is <u>not</u> proposed when there is a direct discharge to the Snohomish River, Silver Lake, or Port Gardener Bay.

Streambank Erosion Control BMPs must be designed to meet the following requirements:

- The peak discharge rate for the 2-year, 24-hour storm shall not exceed 50% of the peak runoff rate for the same storm and existing site conditions, and

- The peak stormwater discharge rates for the 10-year and 100-year, 24-hour storms shall not exceed the peak runoff rate for the same storm and existing site conditions.

(See the impact section of this DEIS for an analysis of how the new standards will affect stream flows.)

- *Streambank Stabilization Measures:* In cases where a streambank erosion problem already exists, streambank stabilization measures may be required. The selection and design of these BMPs will be made on a case-by-case basis.

- *Selection of Runoff Treatment and Streambank Erosion Control BMPs:* The order of preference for runoff treatment and streambank erosion control is shown below. A lower preference BMP may only be used if all higher preference BMPs are infeasible in the opinion of the Public Works Department.

Runoff Treatment BMPs

1. Infiltration Basin
2. Wetpond
   Constructed Wetland
3. Emergent Swale
   Grass Swale
   Sand Filtration Basin

Streambank Erosion Control BMPs

1. Infiltration Basin
2. Wetpond
   Constructed Wetland
   Extended Detention Dry Pond
   Wetvault/Tank
   Extended Detention Dry Vault/Tank

Infiltration BMPs are preferred for both runoff treatment and streambank erosion control. Before any other BMPs may be selected, it must be shown that infiltration is not feasible. The Stormwater Manual will provide detailed information regarding the feasibility of infiltration systems.

In general, where soil conditions are suitable, required setbacks can be met, and slope stability is not an issue, roof downspout infiltration systems will be required for disposal of roof-top runoff.

In general, a wetpond or constructed wetland will be required for runoff treatment if infiltration is not feasible. In some limited cases, a wetpond or constructed wetland will not be feasible. This situation is most common on redevelopment sites with existing storm systems and

extensive impervious surfaces. In these cases, a biofiltration swale or a sand filtration system may be utilized to treat stormwater runoff.

If infiltration BMPs are not feasible for streambank erosion control, any of the other detention-type BMPs listed in the table may be used instead.

Any number of factors may make one BMP preferable over another on any given site. In cases where both runoff treatment and streambank erosion control are required, a BMP that meets both objectives may be most cost-effective.

Different BMPs have different recommended drainage areas, which may affect their suitability for a particular site. On large sites, multiple facilities may be designed and constructed to avoid exceeding maximum recommended drainage areas for specific BMPS.

Environmentally Sensitive Areas (ESA) Ordinance, Chapter 37 of the Zoning Code (Existing). This Ordinance was adopted by the City per Growth Management Act requirements. It establishes regulations for the protection of environmentally sensitive areas. No development permit may be issued, no subdivision of land may be approved, nor may any use be established on any lot which contains, adjoins, or is in close proximity to an environmentally sensitive area until approvals required by this Ordinance have been granted by the City. This Ordinance applies to the following environmentally sensitive features: areas of flood hazard[5]; wetlands; streams; geologically hazardous areas; seismic hazard areas; fish and wildlife conservation areas; slopes of 25% or greater associated or in conjunction with one or more of the previously listed sensitive areas; and groundwater discharge areas.

Generally, the Ordinance requires that streams and wetlands be preserved/protected and that buffers be provided around the streams and wetlands. When a wetland or stream is known to be on-site, or may be on a site, the applicant is required to hire an expert qualified in wetlands/streams to delineate the boundary of the wetland/stream and to categorize the stream/wetland per Chapter 37 standards. The required buffer width is based upon the category of wetland/stream and ranges from 25 to 100 feet for wetlands and 10 to 100 feet for streams. Where steep slopes are adjacent to streams and wetlands, the required buffer extends 25 feet beyond the top of slope.

Some wetlands are exempt from regulation. These include:

- Category III wetlands less than 500 square feet having only one wetland class, which is not forested and which is hydrologically isolated.
- Category IV wetlands less than 8,000 square feet in area.

The Ordinance allows the modification of wetlands, streams, and their buffers in some instances, provided that mitigation is provided. Chapter 37 includes wetland and stream impact mitigation goals and preservation/alteration thresholds, and mitigation replacement ratios for wetlands that are altered. If modification of wetlands, streams or buffers are proposed, additional studies must be submitted by the wetland/stream experts. Monitoring of stream and wetland mitigation, preparation of contingency plans, and performance bonding is also required. Permanent protection of ESAs is required with permanent fencing required along the edge of the ESA, signs posted on the fence, and recording ESA covenants for

[5] There are no areas of flood hazard in the study area.

wetlands. Additional conditions may be placed on projects by the Planning Director when the proposal includes modification of wetlands, streams, or their buffers.

Local Requirements: Snohomish County

Critical Areas Ordinance (Title 32.10 SCC, Ordinance No. 94-108, as amended). This Ordinance designates critical areas by definition (including streams and wetlands) and regulates development activities in these critical areas. The Ordinance was adopted pursuant to the Growth Management Act, Chapter 16.70 RCW. Generally, the Ordinance requires that wetlands and streams be protected and that buffers be provided adjacent to these areas.

Under this Ordinance, streams are classified based on the water typing criteria in WAC 222-16-030. Stream buffers in urban areas range from 10 feet to 100 feet, depending upon the category of stream. The Ordinance defines four categories of wetlands. The wetland buffers for urban wetlands falling within these categories range from 0 to 75 feet.

Wetlands exempt from regulation include:

- non-riparian Category 2 and 3 wetlands less than 5,000 feet in size, and
- non-riparian Category 4 wetlands less than 10,000 square feet in size.

When a wetland or stream is located on a site, a study must be submitted that delineates the edge of wetlands; describes and categorizes the wetland, stream; describes observed or reported wildlife in the area; and provides a mitigation plan. Mitigation must be provided for loss of area or functional values of wetlands at a ratio of one to one. Off-site mitigation is permitted in some situations, but it must occur within the same sub-drainage basin as the project impact.

Snohomish County is under an order from the Growth Management Hearing Board to revise the Ordinance to bring it into compliance with the Growth Management Act. Revisions are expected to be adopted in May, 1996. The Board directed the County to protect Category 4 wetlands with buffers and to eliminate the prior outright exemptions for delineation and protection of critical areas.

Snohomish County Drainage Ordinance (Title 24 SCC). Snohomish County's Drainage Ordinance states that design storm peak discharge from a subject property may not be increased from conditions existing prior to the proposed development, and that surfacewater discharge rates must be maintained at or below the existing storm discharge rates.

Anadramous fish bearing streams are classified as critical areas under the Drainage Ordinance (both Swamp Creek and Japanese Creek are therefore critical areas). Developments within 200 feet of these critical areas are required to complete detailed drainage plans using standards approved by the Planning and Development Services (PDS) Director. The Department of Ecology detention standard is used by the Washington Department of Fish and Wildlife for these areas based upon an agreement between Snohomish County and the Department of Fish and Wildlife. This standard is the same as that which will be adopted by the City of Everett in their new stormwater standards:

- The peak discharge rate for the 2-year, 24-hour storm shall not exceed 50% of the peak runoff rate for the same storm and existing site conditions, and

- The peak stormwater discharge rates for the 10-year and 100-year, 24-hour storms shall not exceed the peak runoff rate for the same storm and existing site conditions.

The detention standard has been placed on projects through the County's SEPA substantive authority.

The County may add a water quality element to Title 24 later this year or as part of the Critical Areas Ordinance Amendments.

3.4.3.3 Plants and Animals Regulations

Special status species are native species that have been accorded special legal or management protection because of concern for their continued existence. There are several categories of protection at both federal and state levels, depending on the magnitude of threat to continued existence and existing knowledge of population levels.

Federal Regulations: US Fish and Wildlife Service (USFWS)

Endangered Species Act. The USFWS administers the federal Endangered Species Act (ESA). The ESA was passed in 1973 and has since been amended and reauthorized. The ESA provides a process for listing species as either threatened or endangered and methods for protecting listed species.

The ESA defines as "endangered" any plant or animal species that is in danger of extinction throughout all or a significant portion of its range. A "threatened" species is a species that is likely to become endangered in the foreseeable future. Additional species of concern are divided into four categories: 1) proposed for listing as endangered or threatened, 2) Candidate Category 1 (enough data are on file to support a listing), 3) Candidate Category 2 (information indicates proposal to list is appropriate, but current data are insufficient to support a listing), and 4) Candidate Category 3 (species that were once considered for listing but are no longer under consideration).

Washington State Regulations: Department of Natural Resources (DNR)

Natural Heritage Program. Through the Natural Heritage Program, the DNR lists native plants whose further existence in the State is of concern. Plants are listed as endangered, threatened, or sensitive[6]. DNR does not have specific regulations that apply to listed plants. Rather DNR reviews and comments on projects that may impact any listed plant under the State Environmental Policy Act (SEPA). The DNR also has developed the Natural Heritage Plan, which establishes methods of protection and priorities for listed species.

The Natural Heritage Program maintains a database of known occurrences of special status plants in Washington. The database information is not derived from systematic surveys of all

[6] "Endangered" plants are in danger of becoming extinct or extirpated in Washington within the near future if causes of decline continue. "Threatened" plants are likely to become endangered in the near future if causes of decline continue. "Sensitive" plants are declining or vulnerable and could become endangered or threatened without active management or removal of threats.

areas for special status plants; rather the data are from small surveys and data collected incidental to other field work. Thus, not all existing locations of special status plants are in the database.

No threatened, endangered, or other special status plant species are known to occur in the SW Everett/Paine Field Subarea (DNR, 1994).

Washington State Regulations: Department of Fish and Wildlife

The Washington Department of Fish and Wildlife publishes a list of Species of Special Concern (SSC) annually. This list includes native Washington species considered Endangered, Threatened, Sensitive, Candidate and Monitor[7]. Endangered, Threatened, and Sensitive species are legally established in Washington Administrative Codes. Candidate and Monitor species are established by WDFW policy. There are currently 24 Endangered, 8 Threatened, 1 Sensitive, 56 Candidate and 149 Monitor species on the SSC list.

The WDFW also publishes a Priority Habitats and Species (PHS) list. The PHS list is a catalog of habitats and species considered to be priorities for conservation and management. Priority species require protective measures for their perpetuation due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. Priority species include all State Endangered, Threatened, Sensitive, and Candidate species; animal aggregations considered vulnerable, and those species of recreational, commercial, or tribal importance that are also vulnerable. Priority habitats are those habitat types or elements with unique or significant value to a diverse assemblage of species.

The PHS program maintains a database of priority species and habitats in Washington. The database contains both location and use information. The PHS database information is not derived from systematic surveys of all areas for special status wildlife; rather the data are from small surveys and data collected incidental to other field work. Thus, not all existing locations of special status animals are in the database.

The only endangered species protected by State law is the Bald Eagle. If human activities threaten to alter eagle habitat near a nest or communal roosting site, a cooperative site management plan must be developed under the Washington State Bald Eagle Protection Rules (WAC 232-12-292). The management plans are prepared by the Department of Fish and Wildlife. For all species other than eagles, the Department of Fish and Wildlife comments on SEPA reviews for individual projects to recommend appropriate protection mechanisms.

Deleterious Exotic Wildlife (WAC 232-12-017). The WDFW also regulates deleterious exotic wildlife. In most cases, it is unlawful to import into the State, hold, possess, propagate, offer for sale, sell, transfer, or release live specimens of deleterious exotic wildlife. Species that are designated as deleterious exotic wildlife include walking catfish, piranha, African clawed frogs, and mute swans.

[7] "Endangered" species are in danger of extinction throughout all or a significant portion of their range in Washington. "Threatened" species are those that are likely to become endangered in Washington in the foreseeable future. "Sensitive" species are those that are vulnerable or declining and may become endangered or threatened in Washington. "Candidate" species are being reviewed for listing as endangered, threatened, or sensitive. "Monitor" species are those about which the WDFW is concerned, for a variety of reasons; therefore, the WDFW monitors their status.

Local Regulations: City of Everett

Environmentally Sensitive Areas Ordinance (Chapter 37 of the Zoning Code. The City's Environmentally Sensitive Areas Ordinance defines fish and wildlife conservation areas and requires that Habitat Management Plans be prepared for developments that may affect these areas. The required content of habitat management plans varies, depending upon the resource involved, but in general must include actions necessary to maintain and enhance the resource present. Fish and Wildlife conservation areas include:

- Habitats of Primary Association: A critical component(s) of the habitats of federally or state listed endangered, threatened, candidate, sensitive, priority and monitored wildlife or plant species, which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term. These include winter ranges, migration ranges, breeding sites, nesting sites, regular large concentrations, communal roosts, roosting sites, staging areas, and priority habitats listed by the Washington State Department of Wildlife.
- Riparian Corridors
- Continuous Vegetative Corridors Linking Watersheds
- Significant Biological Areas: Those within the study area include plant associations of infrequent occurrence, Bomarc Bog (Kasch Park bog), yew groves, Narbeck Swamp.

Local Regulations: Snohomish County

Critical Areas Regulations (Chapter 32.10 SCC, Ordinance 94-108 as amended). The County's Critical Areas Regulations define "fish and wildlife habitat"[8] as streams and wetlands regulated under the Ordinance, areas with which critical species listed as endangered or threatened under federal law have a primary association, and saltwater-related habitat. The Ordinance requires that habitat management plans be prepared for areas with which critical species listed as endangered or threatened under federal laws have a primary association and for saltwater-related habitat. It is intended that the buffers to the streams and wetlands assist in providing a riparian conservation area for the various species.

3.4.4 IMPACTS OF DEVELOPMENT

The SW Everett/Paine Field Subarea and the surrounding study area are expected to experience continued and intensified urbanization under any of the growth projections. Zoning will accommodate both heavy and light industrial development within the SW Everett/Paine Field Subarea. Increased development will continue to affect vegetation, streams, wetlands, and wildlife. Urbanization can result in the following:

- Removal of upland vegetation, and resulting increase in storm runoff volumes and decrease in base flows in streams.
- Physical encroachment into streams, wetlands, priority habitats, and their buffers.

[8] This language will be amended to read "fish and wildlife habitat conservation areas" per the Growth Management Hearings Board decision.

- Increased impervious area and resulting increase in storm runoff volumes and decrease in base flows.
- Alteration of hydrologic regimes in individual wetlands, streams and subbasin drainages.
- Soil erosion during and after land clearing.
- Increased silt and nutrient loading in streams and wetlands.
- Alteration of stream courses.
- Decreased water quality from leaking sewage systems, and from surface flow off roads and industrial areas into streams and wetlands.
- Increasing isolation and fragmentation of wildlife habitat, reduction in wildlife present, and the increasing presence of species adaptable to "urban" settings.

3.4.4.1 Stormwater Impacts to Streams from Development

Increased impervious surfaces from developments (buildings, paving, etc.) result in increases in stormwater runoff volumes and stream flows. The City's current Drainage Ordinance and Drainage Basin Plans require that developments provide on-site infiltration and/or detention of stormwater as discussed in the section on existing regulations (Section 3.4.3.2). Peak stormwater flows and volumes at buildout of the Subarea will change over that forecast in the Drainage Basin Plans due to:

- new information regarding the feasibility of regional detention facilities proposed in the Drainage Basin Plans, and
- requirements to adopt new State standards for stormwater detention. (These standards are also discussed in Section 3.4.3.2.)

The Public Works Department modeled the impacts of buildout development in the Subarea on stormwater flows and volumes based upon use of the new State standards for detention. The EPA's Stormwater Management Model (SWMM) was used for modeling purposes. The model uses information on storm events provided by the National Weather Service and was calibrated to existing stream flows in the early 1980s as part of the City's drainage basins study. Table 3.4-4 shows existing conditions for the 2 year and 10 year design storms and conditions at buildout in the Subarea for the 2 year and 10 year design storms. Theoretically, two year storms occur once every 2 years and ten year storms occur once every 10 years, so 2 year storms occur much more frequently than 10 year storms.

In general, the model shows that stream peak flows at buildout will decrease in a 2 year storm and slightly increase or stay the same in a 10 year storm. An exception is Merrill and Ring Creek where peak flows will increase in a 2 year storm and significantly increase in a 10 year storm. This is due to increased overflows at a regional detention pond at Merrill Creek Parkway from increased stormwater volumes in the study area. Flows will also significantly increase in Edgewater, due to increased overflows from a regional detention facility located north of the study area.

Table 3.4-4
Existing Stormwater Conditions & Stormwater Conditions at Buildout in the Subarea Based upon Use of New Stormwater Standards [1, 2]

	2 Year Design Storm-Existing			2 Year Design Storm at Buildout in the Subarea		
Stream	Peak Flow (CFS)	Peak Stream Velocity (FPS)	Run-Off Volume (Ac-Ft)	Peak Flow (CFS)	Peak Stream Velocity (FPS)	Run-Off Volume (Ac-Ft)
Japanese	40.0	7.5	5.1	29.0	7.0	24.2
Edgewater	6.5	4.1	2.0	5.5	4.0	7.1
Powder Mill	60.6	9.4	73.1	54.6	9.2	99.7
Narbeck	15.4	6.4	14.3	10.7	5.7	23.1
Merrill-Ring	5.0	2.9	6.9	13.0	3.9	13.2
Glenwood	13.5	3.9	3.4	12.3	3.7	6.6
Pigeon Creek #2	43.0	6.7	15.1	39.0	6.7	22.5
Swamp Creek	56.9	4.5	36.5	52.0	4.4	47.0

	10 Year Design Storm-Existing			10 Year Design Storm at Buildout in the Subarea		
Stream	Peak Flow (CFS)	Peak Stream Velocity (FPS)	Run-Off Volume (Ac-Ft)	Peak Flow (CFS)	Peak Stream Velocity (FPS)	Run-Off Volume (Ac-Ft)
Japanese	62.6	8.5	48.4	69.1	8.6	101.8
Edgewater	22.0	6.1	5.2	39.3	7.3	17.2
Powder Mill	88.5	10.6	110.6	88.5	10.6	143.9
Narbeck	37.3	9.2	22.7	37.3	9.2	36.7
Merrill-Ring	24.0	5.0	8.5	61.0	6.7	32.5
Glenwood	34.7	6.2	7.4	34.7	6.2	23.1
Pigeon Creek #2	64.0	6.9	29.6	64.0	6.9	45.0
Swamp Creek	137.5	5.3	57.4	137.5	5.3	74.0

1. The results of the model refer to conditions at the mouth of the stream where it enters Port Gardner Bay, except for Swamp Creek. Swamp Creek results are for stream conditions at 119th St. SW near Hwy 99.

2. Assumptions used in modeling included: Taking out ESAs and using 86% impervious surface in the remaining industrial/commercial areas. No increase in impervious surface was assumed for areas outside the subarea; and only existing regional detention facilities were assumed.

Run-off volumes will increase significantly for both the 2 year and 10 year storms due to the increase in impervious surfaces. The required on-site detention facilities provided with development will hold the increased run-off and release it over a period of time. So while peak flows may decrease or stay the same, the duration of the flow will be much longer.

Erosion of the streams in the study area due to stormwater flows occurred prior to urbanization due to the soil types and naturally steep gradients, and will continue to occur after development of the Subarea. Table 3.4-5 provides information on the non-erodible flow criteria for the streams, which is the flow below which erosion of the stream channel and bank should not occur. Note that the non-erodible flow criteria was exceeded in most streams approximately every 5 years prior to urbanization, so erosion was a naturally occurring event. The last column of Table 3.4-5 summarizes whether or not the non-erodible flow criteria will be exceeded in a 2 year storm. Although the non-erodible flow criteria may be exceeded in a 2 year storm, it is important to note that flows in a 2 year storm at buildout will generally be less than in an existing 2 year storm.

Column 6 of Table 3.4-5 provides the peak stormwater flows projected in the City's Drainage Basins Plans from buildout of the entire drainage basins, including the areas outside of the Subarea, based upon use of current detention standards. Some of the Drainage Basin Plans included the construction of regional detention ponds or other facilities to mitigate stormwater impacts, and the flows shown assume that these facilities have been constructed. A discussion of those facilities is included in column 6. Some of the proposed facilities have been constructed, and some are unlikely to ever be constructed - mainly due to high costs or impacts to wetlands.

Column 7 of Table 3.4-5 provides the peak stormwater flows projected based upon use of the new state stormwater standards (same information as Table 3.4-4). Modeling assumed that only existing regional detention facilities were constructed. When regional detention facilities have not yet been constructed and are still feasible, they are identified in column 6. Construction of regional facilities will mitigate impacts of development beyond that projected in the stormwater model results for buildout.

Regional facilities that have not yet been constructed and are still planned include:

- Regional detention pond located south of Westridge Mobile Home Park. (Merrill and Ring Creek)
- Parallel culverts at Veralene Way to decrease flooding. This will allow more stormwater to pass through the area, so may result in a slight increase in flows. (Merrill and Ring Creek)
- Regional detention pond on the Associated Sand and Gravel property. (Pigeon Creek #2)

It is important to note that the Drainage Basin Plan for Pigeon Creek #2 assumes that all of the flows for the west branch of Pigeon Creek #2 will continue to be fully infiltrated on the groundwater recharge area of Associated Sand and Gravel's property located south of Sievers Duecy Blvd. This will likely impact the amount of developable area on that site beyond what is shown on the environmentally sensitive areas maps.