Title 14

CRITICAL AREAS REGULATIONS

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Chapter 14.10

GENERAL PROVISIONS

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14.10.010 Authority. This Title is established and adopted pursuant to:

A. Environmental policies and procedures for this Title are established pursuant to RCW 43.21C, as amended and entitled the, "State Environmental Policy Act" (SEPA), and WAC 197-11, as amended and entitled, "State Environmental Policy Act Rules"; and
B. The City adopts by reference WAC 197-11-300 through WAC 197-11-800; and
C. WAC 173-22; and
D. RCW 86.16; and
E. The Growth Management Act (RCW 36.70A.060); and
F. The Tri-County Response to the 4(D) Rule-Land Management Development Regulations; and
G. RCW 36.70A.172 Critical areas – Designation and protection.

14.10.020 Repeal. The current EMC Titles 19 – Shoreline Management and 20– Critical Areas are hereby repealed in their entirety and Title 20 is replaced with this Title. Repeal of Title 20 does not affect any existing permits, land use applications or requirements, or existing enforcement actions. (§ Ord. No. 02-0200 adopted December 10, 2002, effective December 24, 2002).

14.10.025 Title. The current EMC Title 14 – Environment is hereby renamed EMC Title 20 – SEPA and the new EMC Title 14 shall be known as "Title 14 - Critical Areas" (§ Ord. No. 02-0200 adopted December 10, 2002, effective December 24, 2002).

14.10.030 Purpose. Erosion, landslide, seismic, volcanic, and flood hazard areas; streams; wetlands; fish and wildlife habitat; and aquifer recharge and (depressional) pothole areas constitute critical areas as defined by RCW 36.70A.030. All of these areas are of special concern to the people of Edgewood and the State of Washington. The purpose of this Title is to protect environmentally sensitive critical areas of Edgewood from the impacts of development and protect development from the impacts of hazard areas by establishing minimum standards for development of sites which contain or are adjacent to identified critical areas and thus promote the public health, safety, and welfare by:

A. Avoiding impacts to critical areas;
B. Mitigating unavoidable impacts by regulating development;
C. Protecting critical areas from impacts of development;
D. Protecting the public against losses from:
    1. Costs of public emergency rescue and relief operations where the causes are avoidable; and
    2. Degradation of the natural environment and the expense associated with repair or replacement;
E. Preventing adverse impacts on water availability, water quality, wetlands, and streams;
F. Protecting unique, fragile, and valuable elements of the environment, including critical fish and wildlife habitat;
G. Providing Department staff with sufficient information to adequately protect critical areas and proposed development when approving, conditioning, or denying public or private development proposals;
H. Providing the public with sufficient information and notice of potential risks associated with development in natural hazard critical areas; and
I. Implementing the goals and requirements of the Growth Management Act of 1990, the State Environmental Policy Act, the Puget Sound Water Quality Management Plan, the Pierce County Charter, the Pierce County Interim Growth Management Policies, the City of Edgewood Comprehensive Plan, and all updates and amendments, functional plans, and other land use policies formally adopted or accepted by the City of Edgewood.
J. This Title also consolidates procedures and regulations that shall promote compatibility between the natural and built environment within the City of Edgewood. Chapters within this Title detail the procedures for activities related to critical areas and natural resource lands.

14.10.040 Interpretation. In the interpretation and application of this Title, all provisions shall be:

A. Considered the minimum necessary;
B. Liberally construed to serve the purposes of this Title; and
C. Deemed neither to limit nor repeal any other powers under State statute.

14.10.050 Applicability.

A. This Title shall apply to all lands and waters within Edgewood that are designated as critical areas.
B. No development (see “Development” definition) shall hereafter be affected without full compliance with the terms of this Title.

C. When the requirements of this Title are more stringent than those of other Edgewood codes and regulations, including the Uniform Building Code, the requirements of this Title shall apply.
D. Compliance with these regulations does not remove an applicant's obligation to comply with applicable provisions of any other Federal, State, or local law or regulation.
E. Criteria for determining critical areas is contained within each Chapter of this Title.
F. When a site contains two or more critical areas, the site shall meet the minimum standards and requirements for each identified critical area as set forth in this Title.
G. Critical areas, as defined and regulated by this Title, are identified, but not limited to the following Edgewood Critical Areas Atlas Maps:
   1. Wetland Inventory Maps; and
   2. Landslide Hazard Area Maps; and
   3. Erosion Hazard Area Maps; and
   4. Seismic Hazard Area Maps; and
   5. Volcanic Hazard Area Maps; and
   6. Aquifer Recharge and Wellhead Protection Areas Maps; and
   7. Fish and Wildlife Habitat, and Stream Typing Area Maps; and
   8. Flood Hazard Area Maps; and
   9. Resource Lands Maps; and
   10. Soils Maps; and
   11. FIRM (Flood Insurance Rate Maps) Maps.
H. The exact boundary of each critical area depicted on the Critical Areas Atlas Maps is approximate and is only intended to provide an indication of the presence of a critical area on a particular site. Additional critical areas that have not been mapped may be present on a site. The actual presence of a critical area, or areas and the applicability of these regulations shall be determined based upon the classification or categorization criteria and review procedures established for each critical area. City staff and/or consultant(s) may conduct on-site inspections to assess the site in order to determine if additional studies or reports identified in this Title are necessary. An inspection report of findings shall be written after the on-site inspection and will become a part of any site development application as a future reference.
I. The Edgewood Critical Areas Atlas Maps shall be updated and maintained by the City's Department of Community Development Geospatial Information System (GIS) Division.
J. Development of the City's Critical Areas Atlas Maps were derived from the sources listed in 14.10.150 Appendix A. These sources may be updated from time to time and will result in a correlating update to the applicable Critical Areas Atlas Maps.

14.10.060 Definitions.

A. This Title shall rely on the definitions contained in EMC 18.20.040, Definitions. The City also adopts by reference the definitions stated in WAC 197-11-700 through 197-11-799 as now or hereafter amended. In addition, the definitions in 14.10.060 B below, shall also apply:
B. Additional definitions that apply to this Title are:

"Abutting" means bordering upon, to touch upon, in physical contact with. Sites are considered abutting even though the area of contact may be only a point.

"Act" see State Environmental Policy Act.

"Actions" include, as further specified below:

1. New and continuing activities (including projects and programs) entirely or partly financed, assisted, conducted, regulated, licensed, or approved by agencies;
2. New or revised agency rules, regulations, plans, policies, or procedures; and Legislative proposals. Actions fall within one of two categories:
   (1) **Project** actions - Involves a decision on a specific project, such as a construction or management activity located in a defined geographic area. Projects include and are limited to agency decisions to:
      (i) License, fund, or undertake any activity that will directly modify the environment, whether the activity will be conducted by the agency, an applicant, or under contract;
      (ii) Purchase, sell, lease, transfer, or exchange natural resources, including publicly owned land, whether or not the environment is directly modified.
   (2) **Nonproject** actions - Involve decisions on policies, plans, or programs.
      (i) The adoption or amendment of legislation, ordinances, rules, or regulations that contain standards controlling use or modification of the environment;
      (ii) The adoption or amendment of comprehensive land use plans or zoning ordinances;
      (iii) The adoption of any policy, plan, or program that will govern the development of a series of connected actions (WAC 197-11-060), but not including any policy, plan, or program for which approval must be obtained from any Federal agency prior to implementation;
      (iv) Creation of a district or annexations to any city, town or district;
      (v) Capital budgets; and
      (vi) Road, street, and highway plans.

"Actions" do not include the activities listed above when an agency is not involved, or include bringing judicial or administrative civil or criminal enforcement actions (Categorical exemptions in WAC 197-11-800 identify in more detail governmental activities that would not have any environmental impacts and for which SEPA review is not required).

"Activity" means any use conducted on a site.

"Addition" means an alteration to an existing structure that increases the floor area. There are two types of additions: additions affixed to the side of an existing structure and an upper story addition.

"Adjacent" means within 500 feet from the exterior boundaries of designated resource lands pursuant to RCW 36.70A.060.

"Addendum" means an environmental document used to provide additional information or analysis that does not substantially change the analysis of significant impacts and alternatives in the existing environmental document. The term does not include supplemental EISs. An addendum may be used at any time during the SEPA process.

"Aggrieved person" means the project sponsor, or any person affected by the proposal.

"Agricultural activities" means the production of crops and/or raising or keeping livestock, including operation and maintenance of farm and stock ponds, drainage ditches, irrigation systems, and normal operation, maintenance, and repair of existing serviceable agricultural structures, facilities, or improved areas, and the practice of aquaculture. Forest practices regulated under RCW 76.09 and WAC 222, are not included in this definition.

"Agricultural land" means land primarily devoted to the commercial production of horticultural, viticultural, floricultural, dairy, apiary, vegetable, or animal products or of berries, grain, hay, straw, turf, seed, Christmas trees not subject to the excise tax imposed by RCW

84.33.100 through 84.33.140, finfish in upland hatcheries, or livestock, and that has long-term commercial significance for agricultural production.

"Alluvial geologic unit" means geologically recent stream, lake, swamp, and beach deposits of gravel, sand, silt, and peat.

"Animal containment area" means a site where two or more animal units of large animals per acre or .75 of an animal unit of small animals per acre are kept, and where a high volume of waste material is deposited in quantities capable of impacting groundwater resources.

"Animal unit" means the equivalent of 1,000 pounds of animal.

"Applicant" means any person or entity, including an agency, applying for a license from an agency. Application means a request for a license.

"Aquifer" means a saturated geologic formation, which will yield a sufficient quantity of water to serve as a private or public water supply.

"Aquifer recharge area" means areas that have a critical recharging effect on groundwater used for potable water supplies and/or that demonstrate a high level of susceptibility or vulnerability to groundwater contamination from land use activities. Examples of aquifer recharge areas include:

1. Wellhead protection areas delineated pursuant to the Federal Safe Drinking Water Act; and
2. Other areas with a high level of susceptibility or vulnerability to contamination as demonstrated through the use of the DRASTIC (see DRASTIC) Model.

"Base flood" means the flood having a one (1%) percent chance of being equaled or exceeded in any given year, also referred to as the "100-year flood."

"Best available science" defined by WAC 365-195-905 – Criteria for determining which information is the "best available science".

"Best available technology" means the technology that provides the greatest degree of protection to the natural resource, taking into consideration processes that are developed, or could feasibly be developed given overall reasonable expenditures on research and development, and processes that are currently in use. In determining what is best available technology, the local government shall consider the effectiveness, engineering feasibility and commercial availability of the technology.

"Best management plan" means a plan developed for a property, which specifies best management practices for the control of animal wastes, stormwater runoff, and erosion.

"Buffer" means an area contiguous with a critical area that is required for the integrity, maintenance, function, and structural stability of the critical area.

"Building footprint" means the horizontal area measured within the outside of the exterior walls of the ground floor of all principal and accessory buildings on a lot.

"Cave" means a natural subterranean chamber greater than one foot in diameter and greater than three feet deep.

"City" means the City of Edgewood.

"Class" means one of the wetland classes in the United States Fish and Wildlife Service (USFWS) December 1979 publication, Classification of Wetlands and Deep Water Habitats of the United States.

"Classification" means defining value and hazard categories to which critical areas and land resource lands will be assigned.

"Clearing" means the removal of timber, brush, grass, ground cover, or other vegetative matter from a site, which exposes the earth's surface on the site.

"Cliff" means a steep vertical or overhanging face of rock or earth greater than 25 feet in height.

"Colluvium" means materials deposited by gravity at the foot of a slope (e.g. talus, soil creep,

etc.).

"Compensatory mitigation" means mitigation to compensate for loss of wetland habitat due to filling of wetlands or other regulated activities in wetlands.

"Conservation easement" means a recorded deed restriction or covenant that runs in perpetuity on a parcel of land restricting the use of the property by preventing future real estate development such as residential, industrial, or commercial use. Conservation easements may allow for continued current uses (e.g., residential, recreational, agriculture, forestry, or ranching); however, conservation easements most often restrict both the current use as well as future uses of the land to some important conservation quality such as habitat preservation, open space, or scenic views. A land trust or governmental entity that manages properties for long-term goals typically holds conservation easements.

"Contaminant" means any chemical, physical, biological, or radiological substance that does not occur naturally or occurs at concentrations and duration as to be injurious to human health or welfare or shown to be ecologically damaging.

"Council" means the Edgewood City Council.

"County" means Pierce County.

"Creation" means producing or forming a wetland through artificial means from an upland (non-wetland) site.

"Crawl space" means the shallow space beneath the bottom floor of a house with no basement; used for access and inspection of framing, electrical, plumbing, insulation, vapor barriers, or duct work. For purposes of the National Flood Insurance Program Elevation Certificate, a crawl space that has subgrade around all sides shall be considered a basement.

"Critical areas" see EMC 14.10.030.

"Critical facilities" means those facilities occupied by populations or which handle dangerous substances including but not limited to hospitals, medical facilities; structures housing, supporting, or containing toxic or explosive substances; covered public assembly structures; school buildings through secondary, including day-care centers; buildings for colleges or adult education; jails and detention facilities; and all structures with occupancy of greater than 5,000 people.

"Debris flow" means the rapid downslope movement of a viscous mass of water-saturated regolith.

"Degraded" means to have suffered a decrease in naturally occurring functions and values due to activities undertaken or managed by persons on or off a site.

"Delineation" means a wetland study conducted in accordance with the Corps of Engineers Wetlands Delineation Manual 1987 edition and corresponding guidance letters and the Washington State Wetlands Identification and Delineation Manual.

"Delineation report" means a written document prepared by a wetland specialist, which includes data sheets, findings of the delineation, and a site plan, which identifies the wetland boundaries.

"Department" means any division, subdivision, or organizational unit of the City, established by regulations, resolution or order.

"Depressional pothole" means a relatively sunken or low-lying area of the earth's surface, especially one having no natural outlet for surface drainage.

"Designation" means taking formal legislative action to adopt classifications, inventories, and regulations.

"Determination of"

1. Nonsignificance (*DNS*)
2. Significance (*DS*)

3. Mitigated Determination of Nonsignificance (*MDNS*)

"Development" means any human-induced change to improved or unimproved real property including, but not limited to, the construction of buildings or other structures, placement of manufactured home/mobile, mining, dredging, clearing, filling, grading, paving, excavation, drilling operations, or activities governed by EMC Title 16 – Subdivision Regulations.

"Development activity" means any construction, development, earth movement, clearing, or other site disturbance of the land, except as listed under exemptions.

"Director" means the City Manager or designee.

"Downed logs" means trees that have fallen or toppled which are dead or in the process of dying, and exhibit sufficient decay characteristics to enable use by fish or wildlife species as habitat. Also referred to as "large woody debris (LWD)".

"DRASTIC" is an acronym for a computer model developed by the National Water Well Association and Environmental Protection Agency used to measure aquifer susceptibility.

"Drift" means a nearly horizontal mine passageway driven on or parallel to the course of a vein or rock stratum.

"Dwelling unit" means one or more rooms designed for or occupied by one family for living or sleeping purposes and containing kitchen facilities for use solely by one family.

"Earth/earth material" means naturally occurring rock, soil, stone, sediment, or combination thereof.

"Earthflow" means a slow downslope movement in which saturated regolith sags downward in a series of irregular terraces.

"Ecotone" means a transition area between two adjacent vegetation communities.

"Encroachment" means any development or regulated activity conducted inside the boundaries of a designated critical area and/or its associated buffer.

"Engineer" as defined by RCW Chapter 18.43

"Engineering geologist" means a geologist who, by reason of his or her knowledge of engineering geology, acquired by education and practical experience, is qualified to engage in the practice of engineering geology, has met the qualifications in engineering geology established under RCW 18.220, and has been issued a license in engineering geology by the Washington State Geologist Licensing Board.

"Engineering geology" means a specialty of geology affecting the planning, design, operation, and maintenance of engineering works and other human activities where geological factors and conditions impact the public welfare or the safeguarding of life, health, property, and the environment.

"Enhancement" means actions performed to improve the condition of existing degraded wetlands and/or buffers so that the quality of wetland functions increases (e.g., increasing plant diversity, increasing wildlife habitat, installing environmentally compatible erosion controls, removing non-indigenous plant or animal species, removing fill material or solid waste).

"Environmental determination" means that the responsible official or proponent has determined whether or not there are significant adverse effects on quality of the environment and if so, can they be mitigated.

"Environmental Impact Statements (*EIS*) – Types":

1. Draft and final environmental impact statements (EISs) shall be prepared; draft and final supplemental EISs may be prepared.
2. A draft EIS (*DEIS*) allows the lead agency to consult with members of the public, affected tribes, and agencies with jurisdiction and with expertise. The lead agency shall issue a DEIS and consider comments as stated in Part Five.

3. A final EIS (*FEIS*) shall revise the DEIS as appropriate and respond to comments as required in WAC 197-11-560. An FEIS shall respond to opposing views on significant adverse environmental impacts and reasonable alternatives which the lead agency determines were not adequately discussed in the DEIS. The lead agency shall issue an FEIS as specified by WAC 197-11-460.
4. A supplemental EIS (*SEIS*) shall be prepared as an addition to either a draft or final statement if:
   (a) There are substantial changes to a proposal so that the proposal is likely to have significant adverse environmental impacts; or
   (b) There is significant new information indicating, or on, a proposal's probable significant adverse environmental impacts.
   Preparation of a SEIS shall be carried out as stated in WAC 197-11-620.

"Environmental review" means:

1. Preparation and review of an environmental checklist substantially in the form found in WAC 197-11-960 to assist in making threshold determinations for proposals, except for:
   (a) Public proposals on which the lead agency has decided to prepare its own EIS; or
   (b) Proposals on which the lead agency and applicant agree an EIS will be prepared; or
   (c) Projects which are proposed as planned actions (see subsection (2)).
2. For projects submitted as planned actions under WAC 197-11-164, a GMA city shall use the existing environmental checklist or modify the environmental checklist form to fulfill the purposes outlined in WAC 197-11-172(1), notwithstanding the requirements of WAC 197-11-906(4).
3. Agencies may use an environmental checklist whenever it would assist in their planning and decision making, but shall only require an applicant to prepare a checklist under SEPA if a checklist is required by subsection (1) of this section.
4. The lead agency shall prepare the checklist or require an applicant to prepare the checklist.
5. The items in the environmental checklist are not weighted. The mention of one or many adverse environmental impacts does not necessarily mean that the impacts are significant. Conversely, a probable significant adverse impact on the environment may result in the need for an EIS.

"Erosion" means the wearing away of the earth's surface as a result of the movement of wind, water, or ice.

"Erosion hazard areas" means those areas that because of natural characteristics, including vegetative cover, soil texture, slope, gradient, and rainfall patterns, or human-induced changes to such characteristics, are vulnerable to erosion.

"Excavation" means the mechanical removal of earth material.

"Extirpation" means the elimination of a species from a portion of its original geographic range.

"Facility" means all structures, contiguous land, appurtenances, and other improvements on the land used for recycling, reusing, reclaiming, transferring, storing, treating, disposing, or otherwise handling a hazardous substance. Use of the term "facility" includes underground and aboveground tanks and operations, which handle, use, dispose of, or store hazardous substances.

"Fill/fill material" means a deposit of earth material placed by human or mechanical means.

"Filling" means the act of placing fill/fill material on any surface, including temporary stockpiling of fill material.

"Finished floor" means the top of the next higher floor above the lowest floor. For purposes of the National Flood Insurance Program Elevation Certificate, the finished floor referenced in this regulation shall equal the top of the next higher floor.

"Fish and wildlife habitat areas" means those areas identified as being of critical importance to maintenance of fish, wildlife, and plant species, including: areas with which endangered, threatened, and sensitive species have a primary association; habitats and species of local importance; naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat; waters of the State; lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity, or private organization; State natural area preserves and natural resource conservation areas.

"Fisheries biologist" means a professional with a degree in fisheries or certification by the American Fisheries Society, or with five years professional experience as a fisheries biologist.

"Flood" or "flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland or tidal waters, and/or
2. The unusual and rapid accumulation of runoff of surface waters from any source.

"Floodfringe" means the area subject to inundation by the base flood, but outside the limits of the floodway, and which may provide needed temporary storage capacity for floodwaters.

"Flood hazard areas" means areas of flooding identified by verifiable flooded areas using:

1. Aerial photographs of the City, especially those taken in wintertime 1996 and 1997; or
2. Relevant and verifiable information from the City's Capacity Analysis Technical Review AdHoc Committee (CATRAC) draft report, 2000; or
3. Relevant and verifiable government and citizen photographs, notes, observations, etc. regarding historic ponding/flooding levels; or
4. Relevant and verifiable information available through Pierce County; or
5. Relevant and verifiable information available through the Federal Emergency Management Agency (FEMA); or
6. Areas of land located in floodplains, which are subject to a one (1%) percent or greater chance of flooding in any given year, including, but not limited to, streams, rivers, lakes, ponds, wetlands, depressional potholes and the like.

"Flood Insurance Rate Map (*FIRM*)" means the official map of a community on which the Federal Insurance Administration (FIA) Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community.

"Floodplain" means the total area subject to inundation by the base flood, including the floodfringe and the floodway areas.

"Floodway" means the channel of a river or other watercourse, and the land areas that must be reserved in order to convey and discharge the base flood without cumulatively increasing the water surface elevation by more than one foot, and those areas designated as deep and/or fast-flowing water.

"Foundation footing setback" means a typical geotechnical recommendation intended to assure that a proposed structure is protected in the event of a slope failure or sloughage. A foundation footing setback is measured horizontally from the face of the foundation footing to the face of the slope. A foundation footing setback for this purpose should not be confused with a building or construction setback from a landslide hazard area buffer. A foundation footing setback is also not a buffer (see Figure 14.10-1).

"Geological assessment" means an assessment prepared by a professional engineer licensed by the State of Washington with expertise in geotechnical engineering or prepared by a licensed

professional geologist, hydrologist, or soils scientist, as specified later in this Section, who has earned the related bachelor's degree from an accredited college or university, or equivalent educational training, and has five years experience assessing the relevant geologic hazard. A geological assessment must detail the surface and subsurface conditions of a site and delineate the areas of a property that might be subject to specified geologic hazards.

"Geologically hazardous areas" means areas that because of their susceptibility to erosion, sliding, earthquake, or other geological events are not suited to the siting of commercial, residential, or industrial development consistent with public health or safety concerns.

"Geologist" means engineering geologist, or hydro-geologist, registered in the State of Washington.

"Geotechnical professional" means a person with experience and training in analyzing, evaluating, and mitigating landslide, erosion, and/or seismic hazards. A geotechnical professional shall be licensed in the State of Washington as a geologist or professional engineer, and must have five or more years experience specializing in landslide, erosion, or seismic hazards, as applicable.

"Geotechnical report" means a report prepared by a professional engineer licensed by the State of Washington with expertise in geotechnical engineering, evaluating the site conditions and mitigating measures necessary to reduce the risks associated with development in geologically hazardous areas.

"Grading" means any excavating, filling, clearing, or creating of impervious surfaces or combination thereof.

"Ground amplification" means an increase in the intensity of earthquake-induced ground shaking which occurs at a site whereby thick deposits of unconsolidated soil or surficial geologic materials are present.

"Groundwater" means all water found beneath the ground surface, including slowly moving subsurface water present in aquifers and recharge areas.

"Group A water system" means a water system:

1. With 15 or more service connections; or
2. A system that services an average of 25 or more people per day for 60 or more days within a calendar year.

"Habitat assessment" means a report prepared by a professional wildlife biologist or fisheries biologist, which identifies the presence of fish and wildlife habitat conservation areas near the proposed development site.

"Habitat of local importance" means an area, range, or habitat within which a species has a primary association and which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term. Examples include areas of high relative density or species richness, breeding habitat, winter range, and movement corridors. These areas may also include habitats that are of limited availability or high vulnerability to alteration.

"Habitat management plan" means a report prepared by a professional wildlife biologist or fisheries biologist, which discusses and evaluates the measures necessary to maintain fish and wildlife habitat conservation areas on a proposed development site.

"Habitat Evaluation" A procedure for determining the abundance and quality of habitat features for a species or other taxonomic group (in this case, salmonid fishes) at or on a particular site or property.

"Habitat Evaluation Report Package" The combined materials that compose a report on a habitat evaluation *q. v.*, including narrative on methods and findings, as well as maps and data in tabular and graphic form.

"Hard armoring" means the use of large rock and/or human-made materials to protect property from shoreline erosion. Such techniques include cement/concrete bulkheads, steel structures, rock wall revetments, and rock gabion structures. Hard armoring typically does not utilize or integrate any of soft armoring or soil bioengineering techniques.

"Hazardous substance(s)" means any liquid, solid, gas, or sludge, including any materials, substance, product, commodity, or waste, regardless of quantity, that exhibits any of the characteristics or criteria of hazardous waste; and including waste oil and petroleum products.

"Hazardous substance processing or handling" means the use, storage, manufacture, or other land use activity involving hazardous substances, but does not include individually packaged household consumer products or quantities of hazardous substances of less than five gallons in volume per container. Hazardous substances shall not be disposed on-site unless in compliance with Dangerous Waste Regulations, WAC 173-303 and any pertinent local ordinances such as sewer discharge standards.

"Hazardous waste" means and includes all dangerous waste and extremely hazardous waste as designated pursuant to RCW 70.105 and WAC 173-303.

1. "Dangerous waste" means any discarded, useless, unwanted, or abandoned substances including but not limited to certain pesticides or any residues or containers of such substances which are disposed of in such quantity or concentrations as to pose a substantial present or potential hazard to human health, wildlife, or the environment because such wastes or constituents or combinations of such wastes:
   a.) Have short-lived, toxic properties that may cause death, injury, or illness, or have mutagenic, teratogenic, or carcinogenic properties; or
   b.) Are corrosive, explosive, flammable, or may generate pressure through decomposition or other means.
2. "Extremely hazardous waste" means any waste which:
   a.) Will persist in a hazardous form for several years or more at a disposal site and which in its persistent form presents a significant environmental hazard and may be concentrated by living organisms through a food chain or may affect the genetic make-up of humans or wildlife; and
   b.) Is disposed of at a disposal site in such quantities as would present an extreme hazard to humans or the environment.

"Hazardous waste treatment and storage facility" means a facility that treats and stores hazardous waste and is authorized pursuant to RCW 70.105 and WAC 173-303. It includes all contiguous land and structures used for recycling, reusing, reclaiming, transferring, storing, treating, or disposing of hazardous waste. Treatment includes using physical, chemical, or biological processing of hazardous wastes to make such waste non-dangerous or less dangerous and safer for transport, amenable for energy or material resource recovery. Storage includes the holding of waste for a temporary period, but not the accumulation of waste on the site of generation as long as the storage complies with applicable requirements of WAC 173-303.

1. "Onsite treatment and storage facility" means a facility that treats or stores hazardous wastes generated on the same geographically contiguous property.
2. "Offsite treatment and storage facility" means a facility that treats or stores hazardous wastes generated on property other than those on which the offsite facility is located.

"Hearing Examiner, or Examiner" see EMC 18.20.110, Hearing Examiner.

"Holocene Epoch" means that part of the geologic record that post-dates the youngest deposits

associated with the late Pleistocene Age Fraser Glaciation.

"Hydrogeologic assessment" means a report detailing the subsurface conditions, the design of a proposed land use action, and the facilities operation which indicates the susceptibility and potential for contamination of groundwater supplies.

"Hydrologically connected" means a connection between two or more surface water bodies including, but not limited to, wetlands, streams or lakes as evidenced by:

1. The presence of surface water in a perennial or intermittent stream, through a culvert or otherwise above ground;
2. The presence of contiguous hydric soil; or
3. The location of a water body within or contiguous to a one hundred-year floodplain of a wetland, stream or lake.

"Hydrologically isolated wetland" means a wetland which:

1. Is not contiguous to any 100-year floodplain of a lake, river, or stream; and
2. Has no contiguous surface hydrology, hydric soil, or hydrophytic vegetation between the wetland and any other wetland or stream system.

"Impervious surface" means a hard surface, which prevents or retards the entry of water into the soil mantle as under natural conditions prior to development, and/or a hard surface area, which causes water to run off the surface in greater quantities or at an increased rate of flow than the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, gravel parking lots, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces.

"In-kind mitigation" means to replace wetlands with substitute wetlands whose characteristics and functions and values are intended to replicate those destroyed or degraded by a regulated activity.

"Interspersion between wetland classes" means the degree to which different wetland classes are scattered among each other.

"Lahar" means a mudflow or debris flow mobilized by water, which originates on the slopes of a volcano.

"Lakes" means impoundments of open water 20 acres or larger.

"Landfill" see EMC 18.20.150, Landfill.

"Landslide" means the abrupt downslope movement of soil, rocks, or other surface matter on a site. Landslides may include but are not limited to slumps, mudflows, earthflows, rockfalls, and snow avalanches.

"Landslide hazard areas" means areas, which are potentially subject to risk of mass movement due to a combination of geologic, topographic, and hydrologic factors.

"Large animal" means an animal with an average weight of 100 pounds or more.

"License" means any form of written permission given to any person, organization, or agency to engage in any activity, as required by law or agency rule. A license includes all or part of a City permit, certificate, approval, registration, charter, or plat approvals or rezones to facilitate a particular proposal. The term does not include a license required solely for revenue purposes.

"Liquefaction" means a process by which a water-saturated granular (sandy) soil layer loses strength because of ground shaking commonly caused by an earthquake.

"Long-term commercial significance" means the growing capacity, productivity, and soil composition of land, which makes it suitable for long-term commercial production, in

consideration with the land's proximity to population areas, and the possibility of more intense uses of land.

"Lowest floor" means the lowest floor of the lowest enclosed area (including basement and crawl space). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage, in an area other than a basement area, is not considered a building's lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this Title. For purposes of the National Flood Insurance Program Elevation Certificate, the lowest floor referenced in this regulation shall equal the top of the bottom floor.

"Maintenance" those usual acts to prevent a decline, lapse, or cessation from a lawfully established condition without any expansion of or significant change from that originally established condition. For the purposes of this document, activities within landscaped areas within areas subject to native vegetation retention requirements may be considered maintenance only if they maintain or enhance the canopy and understory cover.

"Manufactured home/mobile home" means a structure, transportable in one or more sections which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities. For floodplain management purposes, the term "manufactured home/mobile home" also includes park trailers, travel trailers, and other similar vehicles placed on a site for greater than 180 consecutive days. For insurance purposes, the term "manufactured home/mobile home" does not include park trailers, travel trailers, recreational vehicles, or other similar vehicles.

"Minerals" include gravel, sand, or other resources that are extracted from the ground, and valuable metallic substances.

"Mineral resource lands" means lands primarily devoted to the extraction of minerals or which have known or potential long-term commercial significance for the extraction of minerals.

"Mitigation" means:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts;
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
5. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;
6. Monitoring the impact and taking appropriate corrective measures; and
7. Measures used in sequential order to eliminate, reduce, or compensate for adverse impacts to habitat resulting from a development proposal or alteration.

"Mudflow" means a debris flow containing an abundance of fine particles.

"Native vegetation" means a mix of plant species comprising herbs, grasses, grass-like plants, shrubs and trees indigenous to the Puget Sound region that reasonably could be expected to naturally occur on the site.

"Natural resource lands" means Agricultural and Mineral Resource Lands, which have long-term commercial significance.

"Oak woodlands" means those areas where Oregon White Oak comprises more than 20 percent of the trees in a stand, and where the stand size is one acre or greater, provided that stand size may be smaller where White Oak serves as linkages between larger stands. Trees should be greater than 15 inches in diameter at breast height and greater than 16 feet tall.

“Old growth forests” means a stand of trees generally containing mature and overmature trees in the overstory, a multi-layered canopy and trees of several age classes, and standing dead trees and down material.

“Ordinance" means the ordinance, resolution, or other procedure used by the City to adopt regulatory requirements.

“Ordinary High Water Mark (*OHWM*)” means the mark on all lakes, streams and tidal waters that will be found by examining the beds and banks and ascertaining where the presence and action of waters 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 and vegetation, as that condition exists on the effective date of this title, or as it may naturally change thereafter. In any area where the ordinary high water mark cannot be found, the ordinary high water mark shall be the line of mean higher high tide in areas adjoining saltwater, and the line of mean high water in areas adjoining freshwater.

“Out-of-kind mitigation” means to replace wetlands with substitute wetlands whose characteristics do not approximate those destroyed or degraded by a regulated activity.

“Parties of record” are those persons with legal standing with respect to an application including the applicant, property owner as identified by the records available from the Pierce County assessor's office, or any person who testified at the open record public hearing on the application and/or; Any person who submitted written comments during administrative review or has submitted written comments concerning the application at the open record public hearing, excluding persons who have only signed petitions or mechanically produced form letters.

“Permanent erosion control” means continuous on-site and off-site control measures that are needed to control conveyance and/or deposition of earth, turbidity, or pollutants after development, construction, or restoration.

“Person” see EMC 18.20.190, Person.

“Plat” means:

1. “Short subdivision” or “short plat” the division or redivision of land into four or fewer lots, tracts, parcels, sites, or divisions for the purpose of sale, lease, or transfer of ownership.
2. “Subdivision” or “formal subdivision” the division or redivision of land into five or more lots, tracts, parcels, sites, or division for the purpose of sale, lease, or transfer of ownership.

“Ponds” means naturally occurring impoundments of open water less than 20 acres in size and larger than 2,500 square feet, which maintain standing water throughout the year. Also see depressional pothole.

“Private organization” means a nonprofit corporation organized pursuant to RCW 24.03, which includes the planting of game fish among its purposes for organizing as a nonprofit corporation.

“Project permit” means any land use or environmental permit or license required from the City for a project action, including but not limited to building permits, site development permits, land use preparation permits, subdivisions, binding site plans, planned unit developments, conditional uses, shoreline substantial development permits, development plan review, site specific rezones authorized by the Comprehensive Plan; but excluding adoption or amendment of the Comprehensive Plan and development regulations, zoning of newly annexed land, area-wide rezones, and zoning map amendments except as otherwise specifically included in this subsection.

“Professional engineer” means an engineer currently licensed and registered in the State of

Washington.

"Public services" means fire protection and suppression, law enforcement, public health, education, recreation, environmental protection, and other governmental services.

"Recessional outwash geologic unit" means sand and gravel materials deposited by melt-water streams from receding glaciers.

"Reconstruction" means the rebuilding of an existing structure which has been partially or completely destroyed by any cause, such as but not limited to fire, wind, landslides, and water, without increasing the original floor area or square footage area.

"Rectification" means an action, which repairs an alteration to habitat and its functions.

"Regolith" means any body of loose, noncemented particles overlying and usually covering the bedrock.

"Regulated activities" means, but is not limited to, any of the following activities which are directly undertaken or originate in a regulated critical area or its buffer: building permit, commercial or residential; binding site plan; franchise right-of-way construction permit; site development permit; right-of-way permit; shoreline permits; short subdivision; use permits; subdivision; utility permits; or any subsequently adopted permit or required approval not expressly exempted by this Title.

"Rehabilitation" means any improvements and repairs which are made to the interior and exterior of an existing structure, but which do not result in any increase in the floor area of the structure. This is also commonly referred to as a "remodel" of an existing structure.

"Restoration" means an action which returns habitat to a state in which its stability and functions approach its unaltered state as closely as possible.

"Revised Code of Washington (*RCW*)" means all laws of a general and permanent nature heretofore or hereafter enacted by the legislature, and assign permanent numbers as provided by law to all new titles, chapters, and sections thereof.

"Riparian" means the area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. Riparian habitat begins at the ordinary high water mark and includes the entire extent of the floodplain and riparian areas of wetlands that are directly connected to the stream course.

"Seismic hazard areas" means areas subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, settlement, or soil liquefaction.

"Sensitive areas" mean agricultural lands and mineral resource lands and all associated buffers.

"Shoreline" for this Title means the line where a body of water and the shore meet or the strip of land along the shoreline. There are no waters within the City of Edgewood meeting the criteria of shorelines of statewide significance as defined by RCW 90.58.030.

"Single-family dwelling" means a detached building designed exclusively for occupancy by one family and containing one dwelling unit.

"Site" means a lot, parcel, tract, or combination of lots, parcels, or tracts on which a regulated activity is proposed.

"Slope" means an inclined earth surface, the inclination of which is expressed as the ratio of horizontal distance to vertical distance.

"Sludge" means a semisolid substance consisting of settled solids combined with varying amounts of water and dissolved materials generated from a wastewater treatment plant or system or other sources, including septage sludge, sewage sludge, and industrial sludge.

"Sludge land application site" means a site where stabilized sludge, septage, and other organic wastes are applied to the surface of the land in accordance with established agronomic rates for fertilization or soil conditioning.

"Slump" means the downward and outward movement of a mass of bedrock, colluvium, or

regolith along a distinct surface of failure.

"Small animal" means an animal with an average weight of less than 100 pounds.

"Snag-rich areas" means forested areas which contain concentrations of standing dead trees, averaging ten snags or greater per acre, and averaging greater than 15 inches in diameter at breast height.

"Special occupancy structures" means those structures that have the potential to provide capacity for large numbers of people or special groups of people or assemblies such as but not limited to schools, jails and detention facilities, and resident incapacitated patients.

"Species of local importance" means species that are of local concern due to their population status or their sensitivity to habitat manipulation.

"Soft armoring techniques" means the use of woody plants and limited structural-mechanical systems that are integrated in a structurally and environmentally sound manner to repair and protect slopes and shorelines against shallow mass wasting and surface erosion. Measures such as live stake, live fascine, brushlayer, live cribwall, vegetated geogrid, branchpacking, live slope grading, beach berms, or earthen berms are examples of soft armoring techniques. Soft armoring techniques may also be referred to as soil bioengineering methods.

"State Environmental Policy Act (*SEPA*)" means RCW 43.21C.010 to declare a State policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere; stimulate the health and welfare of man; and to enrich the understanding of the ecological systems and natural resources important to the State and nation.

"State Environmental Policy Act (SEPA Rules)" means WAC Chapter 197-11 adopted by Washington State Department of Ecology as now, or hereafter, amended.

"Stockpiling" means the placement of material with the intent to remove it later.

"Subbasin" means a drainage area which drains to marine water, lakes or the mainstem a WRIA watershed area.

"Subclass" means one of the subclasses identified in the United States Fish and Wildlife Service (USFWS) December 1979 publication, Classification of Wetlands and Deep Water Habitats of the United States.

"Substantial improvement" means any repair, reconstruction, addition, rehabilitation, or other improvement of a structure, whereby the current permit valuation for the work exceeds 50 (fifty) percent of the current permit valuation of the existing structure. The Building Official shall determine the current permit valuation based on the cost per square foot values in effect at the time of permit application. Substantial improvement shall be accumulative from the effective date of this ordinance. For purposes of this definition, substantial improvement is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either:

1. Any project for improvement of a structure to correct existing violations of State or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or
2. Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

"Substrate" means the soil, sediment, decomposing organic matter, or combination of those located on the bottom surface of a wetland.

"Talus" means a homogenous area of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft) composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine

tailings. Talus areas may be associated with cliffs.

"Ten-year time travel zone boundary" means the maximum distance around a pumping well from which a contaminant hypothetically present in groundwater could travel to the well within a ten-year time period.

"Temporary erosion control" means on-site and off-site control measures that are needed to control conveyance or deposition of earth, turbidity, or pollutants during development, construction, or restoration.

"Toe of slope" means a distinct topographic break in slope at the lower-most limit of the landslide or erosion hazard area.

"Top of slope" means a distinct topographic break in slope at the uppermost limit of the landslide or erosion hazard area.

"TPCHD" means the Tacoma-Pierce County Health Department.

"Underground storage tank" means any one or a combination of tanks (including underground pipes connected thereto) which are used to contain or dispense an accumulation of hazardous substances or hazardous wastes, and the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground.

"Urban governmental services" means those governmental services historically and typically delivered by cities, and includes storm and sanitary sewer systems, domestic water systems, street cleaning services, and other public utilities associated with urban areas and normally not associated with non-urban areas.

"Urban growth" means growth that makes intensive use of the land for the location of buildings, structures, and impermeable surfaces to such a degree as to be incompatible with the primary use of such land for the production of food, other agricultural products, or fiber, or the extraction of mineral resources. When allowed to spread over wide areas, urban growth typically requires urban governmental services. 'Characterized by urban growth' refers to land having urban growth located on it or to land located in relationship to an area with urban growth on it as to be appropriate for urban growth.

"Utility line" means pipe, conduit, cable, or other similar facility by which services are conveyed to the public or individual recipients. Such services shall include, but are not limited to, water supply, electric power, gas, communications, and sanitary sewers.

"View corridor" means an area, which affords views of lakes, mountains, or other scenic amenities normally enjoyed by residential property owners.

"Volcanic hazard areas" means those areas subject to pyroclastic flows, lava flows, and inundation by debris flows, mudflows, or related flooding resulting from geologic or volcanic events on Mount Rainier.

"Washington Administrative Code (*WAC*)" means State of Washington Administrative Code.

"Wellhead protection area" means the area within the ten-year time-of-travel zone boundary of a group A public water system well, as delineated by the water system purveyor or its designee, pursuant to WAC 246-290-135.

"Wetland" means any area, which is inundated or saturated by ground or surface water at a frequency and duration sufficient to support, and under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. For the purpose of this definition:

1. Where the vegetation has been removed or substantially altered, the presence of a wetland is determined by the presence or evidence of hydric soil, by other documentation such as aerial photographs of the previous existence of wetland vegetation or by any other manner authorized in the "Washington State Wetlands

Identification and Delineation Manual," 1997, Department of Ecology;

2. A wetland may occur along the shoreline of tidal water, a lake, a stream or in a depression in the landscape. For any wetland occurring along a shoreline, the wetland's waterward boundary is where the water's depth exceeds six and six-tenths feet below low water or, if low water cannot be determined, six and six-tenths feet below the outlet's invert elevation; and
3. Except for artificial features intentionally made for the purpose of mitigation, a wetland does not include an artificial feature made from a nonwetland area which may include, but is not limited to, a surface water conveyance for drainage or irrigation, a grass-lined swale, a canal, a flow control facility, a wastewater treatment facility, a farm pond, a wetpond, landscape amenities or a wetland made after July 1, 1990 which was unintentionally made as a result of the construction of a road, street, or highway.
4. Wetlands shall include those wetlands intentionally created from non-wetland areas, formed to mitigate conversion of wetlands.

"Wetland, isolated" means a wetland, which is not hydrologically connected, does not have permanent open water and is often of low function.

"Wetland specialist" means a person with experience and training in wetlands issues and with experience in performing a wetland delineation, analyzing wetland functions and values, analyzing wetland impacts, and recommending wetland mitigation and restoration. Qualifications include:

1. Bachelor of Science or Bachelor of Arts or equivalent degree in biology, botany, environmental studies, fisheries, soil science, wildlife, agriculture, or related field, and two years of related work experience, including a minimum of one year experience delineating wetlands using the Unified Federal Manual and preparing wetland reports and mitigation plans. Additional education may substitute for one year of related work experience; or
2. Four years of related work experience and training, with a minimum of two years experience delineating wetlands using the Unified Federal Manual and preparing wetland reports and mitigation plans. The person should be familiar with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, Corps of Engineers Wetlands Delineation Manual 1987 edition and corresponding guidance letters, Washington State Wetlands Identification and Delineation Manual, the City Site Development Regulations, and the requirements of this Title.

"Wildlife biologist" means a professional with a degree in wildlife, or certification by The Wildlife Society, or with five years professional experience as a wildlife biologist.

14.10.070 Administration.

A. **Approvals Required.** An approval must be obtained from the City when the Department determines that the site or project area is or may be located within a critical area, as set forth in each Chapter.

B. **Application Requirements.**

1. **Preliminary Review.** The provisions for conducting a preliminary review of an application is set forth in EMC 18.40.070, Process Types.
2. **Application Filing.**
   a. Applications shall be reviewed for completeness in accordance with Department submittal standards checklists and pursuant to EMC 18.40.150, Determination of Completeness.

b. Applications and associated reports shall not be submitted without an accompanying permit application for an underlying action (parent application) such as, but not limited to, a building permit, subdivision or boundary alteration action, site development application, TPCHD permit, or use permit, with the exception of applications required by the Department as a result of an enforcement action.

3. **Modifications.** The Department may request an update of any required assessment, report, delineation, etc. due to the potential for change in the existing environment that may have been caused by a natural event (e.g., seismic event, landslides, flooding, etc.) or human induced activity that degraded the existing conditions that occurred after the original document was initially submitted.

C. **Public Notice.** Public notice provisions for notice of application; public hearing, if applicable; and final decision pursuant to this Title are outlined in EMC 18.40.190, Notice of Public Hearing.

D. **Review.**

1. **Initial Review.** The Department shall conduct an initial review of any application in accordance with the provisions outlined in EMC 18.40.150, Determination of Completeness.

2. **Review Responsibilities.**
   a. The Department is responsible for administration, circulation, and review of any applications and approvals required by this Title.
   b. The Examiner shall be the decision authority for reasonable use applications.
   c. Other City or County departments and State agencies, as determined by the Department, may review an application and forward their respective recommendations to the Director or Examiner, as appropriate.

3. **Review Process.**
   a. The Department shall perform a critical area review for any building or land use application submitted for a regulated activity, including, but not limited to, those set forth in Section 14.20.020. Reviews for multiple critical areas shall occur concurrently.
   b. The Department shall, to the extent reasonable, consolidate the processing of related aspects of other Edgewood regulatory programs which affect activities in regulated critical areas, such as subdivision or site development, with the approval process established herein so as to provide a timely and coordinated review process.
   c. As part of the initial review of all development or building-related approvals or permit applications, the Department shall review the information submitted by the applicant to:
      (1) Confirm the nature and type of the critical area and evaluate any required assessments, reports, or studies;
      (2) Determine whether the development proposal is consistent with this Title;
      (3) Determine whether any proposed alterations to the site containing critical areas are necessary; and
      (4) Determine if the mitigation and monitoring plans proposed by the applicant are sufficient to protect the public health, safety, and welfare consistent with the goals, purposes, objectives, and requirements of this Title.
   d. Regulated activities subject to SEPA shall also be reviewed with consideration for impacts on critical areas as identified in this Title. Regulated activities that pose a significant adverse impact which are not addressed by the standards and criteria established in this Title (gaps), may be subject to additional mitigation measures as

determined through the SEPA process. A threshold determination issued pursuant to SEPA Title 20, may not be made prior to Departmental review of any special studies or technical reports required by this Title, except where the applicant requests a declaration of significance so that environmental review is required.

e. Critical area applications required under this Title shall be approved prior to approval of any related action (parent application) such as, but not limited to, a building permit, subdivision action, site development action, forest practice application, or use permit.

f. The requirement to submit a critical area assessment, report, etc., required under this Title, may be waived at the Department's discretion when the proposed project area for a regulated activity is located in an area that has been the subject of a previously submitted and approved assessment, report etc., if all of the following conditions have been met:

(1) The provisions of this Title have been previously addressed as part of another approval.

(2) There has been no material change in the potential impact to the critical area or required buffer since the prior review.

(3) There is no new information available that is applicable to any critical review of the site or particular critical area.

(4) The permit or approval has not expired or, if there is no expiration date, no more than five years have elapsed since the issuance of that permit or approval.

(5) Compliance with any standards or conditions placed upon the prior permit or approval has been achieved or secured.

4. **Burden of Proof.** The applicant has the burden of proving that a proposed application complies with the standards set forth in this Title.

5. **Approval.**

a. The Department may approve, approve with conditions, or deny any development proposal in order to comply with the requirements and carry out the goals, purposes, objectives, and requirements of this Title based on the Department's or Examiner's, as applicable, evaluation of the ability of any proposed mitigation measures to reduce risks associated with the critical area and compliance with required standards. Approval of a development proposal does not discharge the obligation of the applicant to comply with the provisions of this Title.

b. Applicants shall comply with the recommendations and/or mitigation measures contained in final approved assessments or reports and any Department or Examiner conditions of approval.

c. Approval of an application required under this Title must be given prior to the start of any development activity on a site.

6. **Denial.** The Department or Examiner, as applicable, shall have the authority to deny any application for development or building-related approvals or permits when the criteria established in this Title have not been met.

7. **Time Period for Final Decision.** The provisions for issuing a notice of final decision on any application filed pursuant to this Title is set forth in EMC 18.40.040, Coordination of Development Permit Procedures.

E. **Time Limitations.**

1. **Expiration of Approval.**

a. Approvals granted under this Title shall be valid for the same time period as the underlying permit (e.g., preliminary plat, site development, building permit). If the

underlying permit does not contain a specified expiration date then approvals granted under this Title shall be valid for a period of three years from the date of issue, unless a longer or shorter period is specified by the Department.

b. The approval shall be considered null and void upon expiration, unless a time extension is requested and granted as set forth in Subsection 2 below.

2. **Time Extensions.**

a. The applicant or owner(s) may request in writing a one-time, one year extension of the original approval.

b. Knowledge of the expiration date and initiation of a request for a time extension is the responsibility of the applicant or owner(s).

c. A written request for a time extension shall be filed with the Department at least 60 days prior to the expiration of the approval.

d. Upon filing of a written request for a time extension, a copy shall be sent to each party of record together with governmental departments or agencies that were involved in the original approval process. By letter, the Department shall request written comments be delivered to the Department within 30 days of the date of the letter.

e. Prior to the granting of a time extension, the Department may require a new application(s), updated study(ies), and fee(s) if:

(1) The original intent of the approval is altered or enlarged by the by the renewal;

(2) If the circumstances relevant to the review and issuance of the original approval have changed substantially; or

(3) If the applicant failed to abide by the terms of the original approval.

f. If approved, the one-year time extension shall be calculated from the date of granting said approval.

F. **Recording.**

1. **Approvals.**

a. Critical Area Regulation approvals are to be recorded on the title of the project parcel(s) at the Pierce County Auditor's Office within six months of issuance. Failure to record an approval in this timeframe may result in the project being placed into inactive status. A new application(s) and fee(s) may be required to remove the project from inactive status. Also refer to Section 14.10.110 Title and Plat Notification for additional recording requirements.

b. Recording of a wetland approval for work completed within utility line easements on lands not owned by the jurisdiction conducting the regulated activity shall be required.

2. **Right of Entry Agreement.** The City may require the applicant to record a Right of Entry Agreement, which shall be consistent with a format approved by the Department. The Right of Entry Agreement shall:

a. Allow Director or agent to access the site for purposes of inspection during the course of application review, construction, and post-construction monitoring.

b. Allow the Director or agent to enter a property to construct required improvements, mitigation measures, or monitoring that have been financially guaranteed.

c. Run with the land, and be binding on all parities having or acquiring any right, title, interest, or any part thereof of the site, including the grantor, heirs, successors, and assigns.

14.10.080 Critical Area Protective Measures.

A. **General.** All critical area tracts, conservation easements, land trust dedications, and other similarly preserved areas shall remain undeveloped in perpetuity, except as they may be allowed to be altered pursuant to each Chapter.

B. **Financial Guarantees.**

1. The City may require an applicant to submit one or more financial guarantees to the City, as set forth in each Chapter of this Title (and other Titles of Edgewood's Municipal Code as required), to guarantee any performance, mitigation, maintenance, or monitoring required as a condition of permit approval. The approval for the project will not be granted until the financial guarantee is received by the Department. Projects where the City or one of its departments is the applicant shall not be required to post a financial guarantee.
2. Financial guarantees required under this Title shall be:
   a. In addition to any other site development guarantees required for project approval.
   b. Submitted on financial guarantee forms approved by the City.
   c. In the amount of 125 percent of the estimate of the cost of mitigation or monitoring to allow for inflation and administration should the City have to complete the mitigation or monitoring, unless the provisions set forth in 14.10.080 C below are applicable.
   d. Released by the City only when the applicant's appropriate technical professional has provided written confirmation that the performance, mitigation, or monitoring requirements have been met and Department staff, or agent, inspected the site(s) for compliance.
3. Failure to complete any performance, mitigation, or monitoring may result in the forfeiture of the guarantee. Applicants who have previously defaulted will no longer be allowed to post a guarantee for improvements necessary for approval of a land use application. Applicants who have previously defaulted will be allowed to post guarantees for subsequent critical area mitigation work needed for approval of a land use application or permit, but the guarantee must be by bond and must be for two times the required amount.

C. **Title and Land Division Notification.**

1. **General.**
   a. Title and/or land division notice shall be required to be recorded with the Pierce County Auditor on each site that contains a critical area, prior to approval of any regulated activity on a site.
   b. If more than one critical area subject to the provisions of this Title exists on the site, then one notice which addresses all of the critical areas, shall be sufficient.
   c. Title and land division notifications and notes shall be approved by the Department and shall be consistent with Appendix 14.10.140 C.
2. **Title Notification.**
   a. When the City determines that activities not exempt from this Title are proposed, the property owner shall file a notice with the Pierce County Auditor. The notice shall provide a public record of the presence of a critical area and associated buffer, if applicable; the application of this Title to the property; and that limitations on actions in or affecting such critical area and associated buffer, if applicable, may exist.
   b. The notice shall be notarized and shall be recorded with the Pierce County Auditor prior to approval of any regulated use or activity for the site.

c. Notice on title is not required for utility line easements on lands not owned by the jurisdiction conducting the regulated activity (e.g., gas pipelines).

3. **Land Division Notification and Notes.** The applicant shall include notes, as referenced in 14.10.140 Appendix B, on the face of any proposed activity as defined in the EMC 16, Subdivision Regulations (i.e., final plat, binding site plan, large lot, short subdivision, boundary line adjustment, or lot combination) for projects that contain critical areas or critical area buffers. The applicant shall also clearly identify the critical area boundaries and the boundary of any associated buffers on the face of these documents.

D. **Conservation Easements.** Prior to any final critical area approval, the part of the critical area and required buffer which is located on the site shall be protected with a conservation easement or other similar permanent deed restriction. The conservation easement shall indicate allowable and prohibited uses within the critical area and required buffer.

E. **Tracts.** Prior to final approval of any subdivisions, short subdivisions, large lot divisions, or binding site plans, the part of the critical area and required buffer which is located on the site, shall be placed in a separate tract or tracts (see Figure 14.10-2). In lieu of a separate tract, an applicant may propose to establish an alternative permanent protective mechanism; however, approval of such is based upon the Department's or Hearing Examiner's, as applicable, determination that such alternative mechanism provides the same level of permanent protection as designation of a separate tract or tracts.

F. **Homeowner's Covenants.** A description of the critical area and required buffer shall be placed in any required homeowner's covenants. Such covenants shall contain a detailed description of the allowable uses within the critical area and, if applicable, associated buffer and long term management and maintenance requirements of that critical area.

G. **Identification of Critical Areas and Required Buffers on Construction Plans.** Critical areas and required buffers shall be clearly identified on all construction plans such as, but not limited to, site development plans, residential building plans, commercial building plans, forest harvest plans, etc.

H. **Markers, Fencing, and Signage.**

1. **Markers.** Prior to final approval of any critical area application, the outer edge of the critical area boundaries or, if applicable, required buffer boundaries on the site shall be flagged by the qualified professional, as outlined in each Chapter. These boundaries shall then be identified with permanent markers (rebar and cap) and flagged by a licensed surveyor, unless otherwise stated in this Title. The permanent markers shall be clearly visible, durable, and permanently affixed to the ground.

2. **Fencing.**

a. **Temporary Construction Fencing.** Temporary fencing is required when vegetation is to be retained in an undisturbed condition within the critical area and required buffer. In such cases, the applicant will be required to construct silt fencing, construction fencing, or other City approved method of temporary fencing at the edge of the critical area or, if applicable, the edge of the required buffer prior to beginning construction on the site.

b. **Permanent Fencing.** Where deemed necessary by the Department to provide protection to the critical area, the applicant will be required to construct permanent fencing along the buffer boundary.

3. **Signage.**

a. The Department shall require permanent signage to be installed at the edge of the critical area or, if applicable, the edge of the required buffer.

b. The sign shall indicate the type of critical area and if the area is to remain in a natural condition as permanent open space.
c. Exact sign locations, wording, size, and design specifications shall be established by the Department. Required signage shall be clearly visible, durable, and permanently affixed to the ground.
d. Prior to final approval of any critical area application, the applicant shall submit an affidavit of posting to the Department as proof that the required signs were posted on the site.

I. **Building Setbacks.**
1. Unless otherwise provided in this Title, buildings and other structures shall be set back a distance of 15 feet from the edge of all critical area buffers or, where no buffers are required, the edge of the critical area.
2. The following uses and activities may be allowed in the building setback area:
a. Landscaping;
b. Uncovered decks;
c. Building overhangs if such overhangs do not extend more than 18 inches into the setback area;
d. Impervious ground surfaces, such as driveways, parking lots, roads, and patios, provided that such improvements conform to the water quality standards set forth in the City's adopted Stormwater Management Manual and that construction equipment does not enter the buffer during the construction process; and
e. Clearing and grading.

14.10.085 Variances to Critical Areas.

A. **General.** Variances are pursuant to EMC 18.50.080, Variance. Conditions may be attached to a critical area(s) variance, which will serve to meet the goals, objectives, and policies of this Title.
B. **Criteria for Priority Habitat Buffer Variances.** In order to grant a priority habitat buffer variance, requirements pursuant to EMC 18.50.080, Variance, shall apply. In addition, the applicant must also demonstrate, and the Examiner must find, that the requested buffer width modification preserves adequate vegetation to:
1. Maintain proper water temperature;
2. Minimize sedimentation; and
3. Provide food and cover for listed species.
C. Should a variance be denied, the application will be reviewed as a reasonable use exception pursuant to Section 14.20.050.

14.10.090 Reconsideration and Appeal Procedures.

Procedures for appeal of an administrative decision and procedures for reconsideration or appeal of a Hearing Examiner decision issued pursuant to this Title are set forth in EMC 18.40.090, Process II, Administrative Action.

14.10.100 Fees.

Fees for applications and/or review of reports, studies, or plans filed pursuant to this Title are set forth in the adopted fee schedule and as stipulated below:

A. **Fee Establishment.** The City, by resolution, shall establish fees for filing of critical area review processing and other services provided by the City as required by this Title. These fees shall be based on the anticipated sum of direct costs incurred by the City for any

individual development or action and may be established as a sliding scale that will recover all of the City costs. Basis for these fees shall include, but not be limited to, the cost of engineering and planning review time, cost of inspection time, costs for administration, and any other special costs attributable to the critical area review process.

B. **Applicant Responsibilities.** Unless otherwise indicated in this Title, the applicant shall be responsible for the initiation, preparation, submission, and expense of all required reports, assessment(s), studies, plans, reconnaissance(s), peer review(s) by qualified consultants, and other work prepared in support of or necessary to review the application.

C. **Fee Schedule**. The Director is charged with the responsibility of collecting appropriate fees charged to applicants for any permits or discretionary approval processes provided for in this Title. The amount of the fees charged shall be as established by resolution or ordinance of the City Council filed in the office of the City Clerk and may be, from time to time, changed without amendment to this Title.

D. **Payment.** Fees established in accordance with this title shall be paid upon submission of a signed application or petition for appeal, or as otherwise provided by any fee ordinance or resolution adopted by the City Council. A department of the City shall not be required to pay application fees when applying for a permit regulated under this title. Where such an application will require substantial review time or expenditures, the City Manager may, at his/her sole discretion, direct that the department initiating the permit request to reimburse the Community Development Department for some or all of costs expended for the application review.

E. **Investigation fee.** To investigate violations of this Title, all City fees associated with investigation of violations of this Title may be assessed at the adopted billable staff hour rate in addition to any required consultant costs, legal costs, and other expenses necessary complete the investigation of the violation. The payment of such investigation fees shall not exempt any person from compliance with all other provisions of this Title, nor from penalties prescribed by law.

F. **Fees for Environmental Assessments and EISs.** Environmental Assessment/Checklist fees for the construction, alteration, or repair of single or two-family dwellings may be waived when the application provides sufficient documentation showing, to the satisfaction of the City, who shall make written findings, that all of the following conditions exist:
   1. The single or two-family dwelling is intended for low-income families. Low income families are those families who meet the low-income guidelines as set forth by the City of Edgewood Community Development Department; Department of Housing and Urban Development (HUD) annual guidelines, Section 8;
   2. The construction, alteration, or repair of the single or two-family dwelling involves some volunteer labor; and
   3. The construction, alteration, or repair is being undertaken by an organization classified as a 501(c)(3) non-profit organization by the Internal Revenue Service; or
   4. The construction, alteration, or repair is being undertaken by Pierce County Department of Community Services Housing Rehabilitation or authorized agent.

14.10.110 Compliance.

A. The regulations for compliance with the provisions of this Title are set forth in EMC 18.30.040, Scope and Compliance.

B. When a critical area or its required buffer has been altered in violation of this Title, the Department shall require the property owner to bring the site into compliance. The property owner shall be required to submit the appropriate critical area application and commence a

Departmental review, as applicable for each Chapter of this Title. In addition to any required site investigation, delineations, assessments, reports, etc., the property owner shall be required to submit a restoration plan that identifies the proposed mitigation to bring the subject property into compliance with the requirements of this Title.

14.10.120 Warning and Disclaimer of Liability. The degree of protection required through application of this Title is deemed to be reasonable for regulatory purposes and is based on scientific and engineering considerations, however, natural events that may exceed the geographic boundaries regulated under this Title can and will occur (e.g., flood heights that are higher that anticipated). This Title does not mean to imply that land outside designated hazard areas or uses permitted within such areas will be free from damages. Application of this Title shall not create liability on the part of City, any officer or employee thereof, or the Federal Insurance Administration for any damages that may result from the administration of this Title or any administrative decision lawfully made hereunder.

14.10.130 Severability. If any provision of this Title or its application to any person or circumstance is held invalid, the remainder of this regulation or the application of the provision to other persons or circumstances shall not be affected.

14.10.135 Violation – Civil infraction.

A. In addition to any other sanction or penalty, or any remedial, judicial or administrative procedure available under City code or State law, violation of any provision of this Title or failure to comply with a decision of the Responsible Official, Hearing Examiner, or City Council issued pursuant to this Title constitutes a civil infraction.
B. Each day or portion thereof during which a violation occurs or exists shall be deemed a separate civil infraction. A person found to have committed a civil infraction shall be assessed a monetary penalty. The maximum penalty and the default amount for a civil infraction shall be $250.00, not including statutory assessments. In addition;
    1. The court may consider dismissing with costs only upon a showing that the violation was corrected within thirty days.
    2. Whenever a monetary penalty is imposed by a court under this Title, it is immediately payable. If the person is unable to pay at that time, the court may grant an extension. If the penalty is not paid on or before the time established for payment, the court may proceed to collect the penalty in the same manner as other civil judgments and may notify the Prosecuting Attorney of the failure to pay.
    3. Payment of a monetary penalty or performance of the required community service shall not relieve a person of the duty to correct the violation.
    4. The court may also order a person found to have committed a civil infraction to make restitution.

14.10.140 Appendices.

A. Mapping Sources.
B. Title and Plat Notification Forms.

14.10.150 Figures

Figure 14.10-1 Foundation Footing Setback.
Figure 14.10-2 Critical Area Protective Measures – Tracts.

14.10.140 Appendices.

APPENDIX A

MAPPING SOURCES. The following sources of information, or latest available version, may be used to indicate the presence of critical areas within Edgewood and provide data used in the development of the City of Edgewood Critical Area Atlas Maps:

A. The following sources identify wetlands that are depicted in the Edgewood Wetland Inventory Map and/or used as indicators of wetland presence:
   1. Soil Survey of Pierce County Area, Washington, 1979, Soil Conservation Service, United States Department of Agriculture (USDA);
   2. National Wetland Inventory Maps, U.S. Department of Interior, Fish and Wildlife Service, 1973;
   3. FEMA FIRM Maps and Flood Insurance Study Maps;
   4. Aerial photographs, Department of Natural Resources, 1985 (Assessor's Office aerials) or City acquired aerial photographs;
   5. Applicant supplied and verified data;
   6. Ongoing field investigation to categorize and delineate wetlands; and
   7. Buildable Lands Wetland Inventory, 2001.

B. The following sources identify landslide and erosion hazard areas that are depicted in the Critical Areas Landslide Hazard Area Map and Erosion Hazard Areas Map and/or used as indicators of landslide and erosion hazard area presence:
   1. Soil Survey of Pierce County Area, Washington, 1979, Soil Conservation Service, United States Department of Agriculture (USDA);
   2. Areas designated as slumps, earthflows, mudflows, lahars, or landslides on maps published by the United States Geological Survey or Washington Department of Natural Resources Division of Geology and Earth Resources;
   3. The City of Edgewood topographic data;
   4. United States Geologic Survey Quadrangle maps;
   5. Applicant supplied and verified data of active landslide areas and potentially unstable areas; and
   6. Buildable Lands Slope Data, 2001.

C. The following sources identify seismic hazard areas which are depicted in the Critical Areas Seismic Hazard Areas Map and/or used as indicators of seismic hazard area presence:
   1. Washington State Department of Natural Resources Division of Geology and Earth Resources 1-100,000 Scale Digital Geology of Washington State; and
   2. Areas designated as faults or subject to liquefaction or dynamic steelement on maps or data published by the United States Geological Survey or Washington Department of Natural Resources Division of Geology and Earth Resources.

D. The following sources identify volcanic hazard areas that are depicted in the Critical Areas Atlas-Volcanic Hazard Areas Map:
   1. “Map Showing Debris Flows and Debris Avalanches at Mount Rainier, Washington--Historical and Potential Future Inundation Areas,” Hydrogeologic Investigations Atlas HA-729, U.S. Dept. of Interior, Geologic Survey, 1995 as amended by Kevin Scott, USGS, on November 10, 1997, to be consistent with the reports listed as b. and c. below;
   2. Volcano Hazards from Mount Rainier, Washington by Hoblitt, Walder, Driedger, Scott, Pringle, and Valance, U.S. Geological Survey Open File Report 95-273, 1995;

3. Sedimentology, Behavior, and Hazards of Debris Flows at Mount Rainier, Washington, U.S. Geological Survey Professional Paper 1547, 1995; and
4. Table of Estimated Lahar Travel Times for Lahars 107 to 108 Cubic Meters in Volume (Approaching a "Case I" Lahar in Magnitude) in the Puyallup River Valley, Mount Rainier, Pierson, T.C., 1998, An empirical method for estimating travel times for wet volcanic mass flows; Bulletin of Volcanology, v. 60, p. 98-109.

E. The following sources identify fish and wildlife habitats or presence and/or are used as indicators of critical fish or wildlife presence:
   1. Water Type Reference Maps, Washington Department of Natural Resources, were used as sources to identify fish and wildlife habitat areas that are depicted in the Critical Areas Fish and Wildlife Habitat Areas-Stream Typing Map;
   2. Priority Habitats and Species Program and Priority Habitat Species Maps, Washington Department of Fish and Wildlife (WDFW);
   3. Water Resource Index Areas (WRIA), Washington Department of Fish and Wildlife; and
   4. Salmon Distribution Maps, WDFW and Washington State Conservation Commission Data, January 2000.

F. The following sources identify the aquifer recharge, pothole and wellhead protection areas that are depicted in the Critical Areas Aquifer Recharge Area-DRASTIC Zones Map and Aquifer Recharge Area:
   1. The boundaries of the two highest DRASTIC zones which are rated 180 and above on the DRASTIC index range, as identified in Map of Groundwater Pollution Potential, Edgewood, Washington, National Water Well Association, U.S. Environmental Protection Agency;
   2. Wellhead protection areas as identified by the Mountain-View/Edgewood Water Company.

G. The following sources identify flood hazard areas:
   1. The areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled "The Flood Insurance Study for Pierce County" dated August 19, 1987, with accompanying FIRMs and floodway maps and any map amendments or corrections are hereby adopted by reference and declared to be a part of this Title. The City may add or delete land from areas of special flood hazard or revise base flood elevations in accordance with federal regulations.
   2. The City's Surface Water Management Plan, 1997, or as amended thereafter.
   3. Aerial photographs of the City, especially those taken in wintertime 1996 and 1997.
   4. The City's two (2) foot elevation contour mapping performed by Nies Mapping Group Inc., 1999, or as subsequently updated.
   5. Relevant and verifiable information from the City's Capacity Analysis Technical Review AdHoc Committee draft report, 2000.
   6. Relevant and verifiable government and citizen photographs, notes, observations, etc. regarding historic ponding/flooding levels.
   7. Relevant and verifiable information available through Pierce County.
   8. Relevant and verifiable information available through FEMA.
   9. The Flood Insurance Study and Maps provide the base information used in the administration of this Title. The Flood Insurance Study is on file at the Pierce County Public Works and Utilities Department, 2401 South 35th Street, Tacoma, Washington.
   10. Where the Flood Insurance Study, FIRM, and floodway maps do not provide adequate, best, or most recent information, the City may utilize flood information that is more

restrictive or detailed than the FEMA data which can be used for identifying flood hazard areas. This information may include, but is not limited to, new and more accurate mapping or data on: channel migration, high water elevations from flood events, base flood elevations, groundwater flooding areas, potholes, maps showing increased flood inundation based on future build-out or changed hydrologic conditions, specific maps from watershed basin plans or related studies, studies by federal or state agencies, or other information deemed appropriate by the City.

14.10.140 Appendices

APPENDIX B

CRITICAL AREAS TITLE AND PLAT NOTIFICATION/PLAT NOTES

A. **Notice for Title Notification.**

1. (EXAMPLE: APPROPRIATE CRITICAL AREA FROM SECTION 14.10.030)

Tax Parcel Number:

Address:

Legal Description:

Present Owner:

NOTICE: This property contains (e.g., wetlands or wetland buffers) as defined by Title 14.10.30, Edgewood Municipal Code. The site was the subject of a development proposal for _____ application number filed on _____ (date). Restrictions on use or alteration of the site may exist due to natural conditions of the property and resulting regulations. Review of such application has provided information on the location of the (e.g., wetland or wetland buffers) and any restriction on use.

_____ _____

Date Signature of owner

Notary acknowledgment and notary seal

B. **Additional Title Notification Statements.**

1. Title notification for liquefaction and dynamic settlement hazard areas shall include a statement of the performance criteria (i.e., protection of life safety only, provision for minimal structural damage so that post-earthquake functionality is substantially unchanged, no structural damage for the design earthquake).
2. Title notification for fault rupture hazard areas shall include a statement that a fault rupture hazard area or associated buffer exists on the site. The title notification shall include a site plan of the subject property with the fault rupture hazard area and associated buffer identified.
3. Properties that contain flood hazard areas pursuant to Chapter 14.70 shall include the following statement:
   "Flood Elevation Certificates are kept on file by the Department."

C. **Notice for Plat Notification/Plat Notes.**

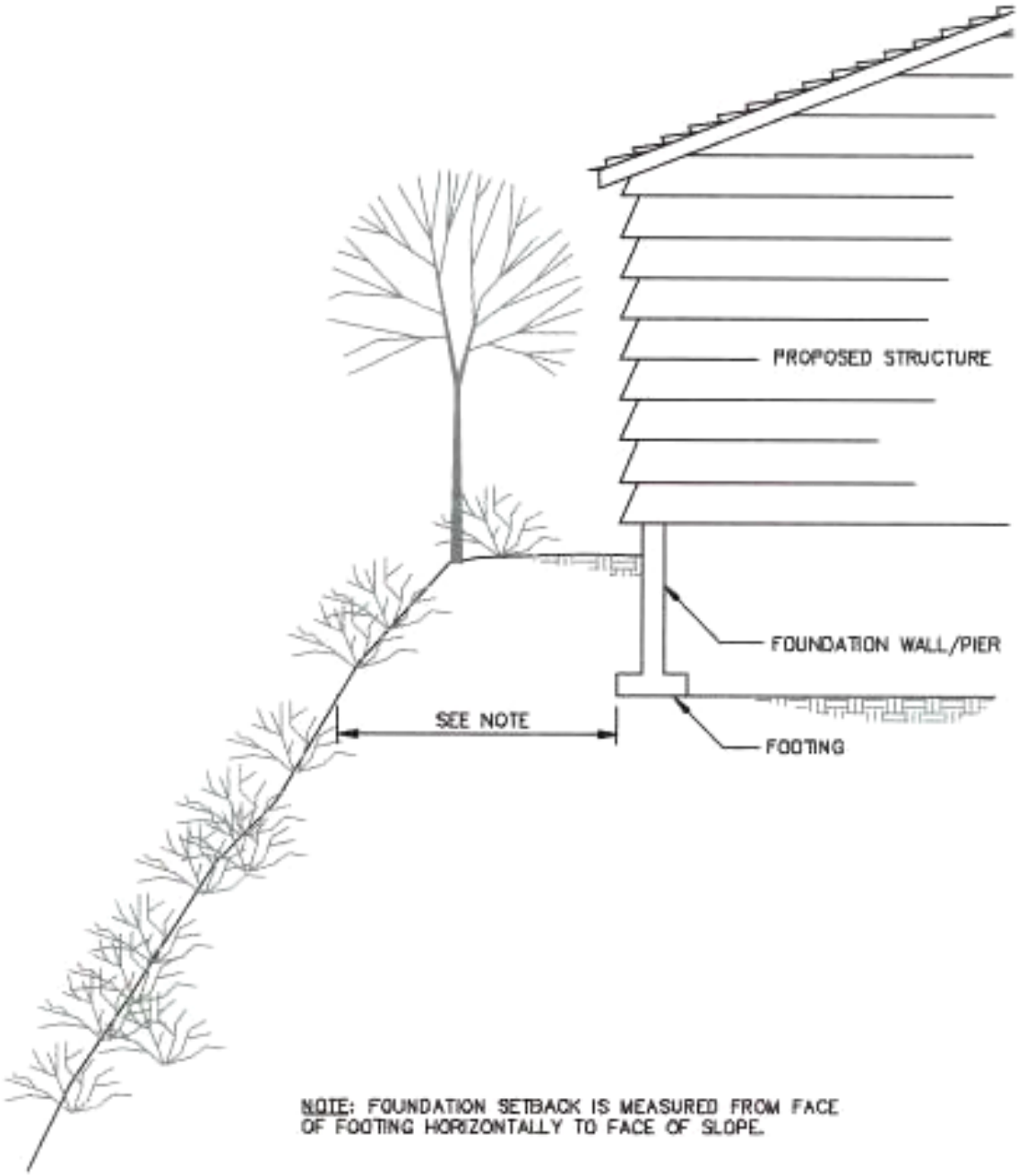
1. **General.** The following notice shall be placed on the face of the final plat, short plat, large lot, or binding site plan documents when said subdivision contains critical areas or critical area buffers:

   Notice: This site lies within a (e.g., landslide hazard area) as defined in Title 14 Edgewood Municipal Code. Restrictions on use or alteration of the site may exist due to natural conditions of the site and resulting regulation.

2. **Native/Natural Vegetation Preservation Areas.** The following notice shall be placed on the face of the final plat, short plat, large lot, or binding site plan documents when said subdivision contains critical areas or critical area buffers and when said critical areas or critical area buffers have been identified as native/natural vegetation preservation areas.

   Notice: "The *Critical Areas (e.g., Oregon White Oak Preservation Areas)* appearing on this (*final site plan/ preliminary plat/final plat/short plat/large lot/engineering drawing*) contain areas of natural/ native vegetation intended to buffer the *Critical Area* from the adverse effects of development. These *Critical Areas (e.g., Oregon White Oak Preservation Areas)* shall remain and be maintained in a natural, undeveloped, open space state. There shall be no clearing, grading, filling, or construction within the *Critical Areas (e.g., Oregon White Oak Preservation Areas)*, except as shown on plans or documents approved by the City of Edgewood and contained in the official files for this development. Each *Critical Area (e.g., Oregon White Oak Preservation Area)* shall remain undisturbed except for periodic watering and hand weeding of plants designated as noxious by the State of Washington."

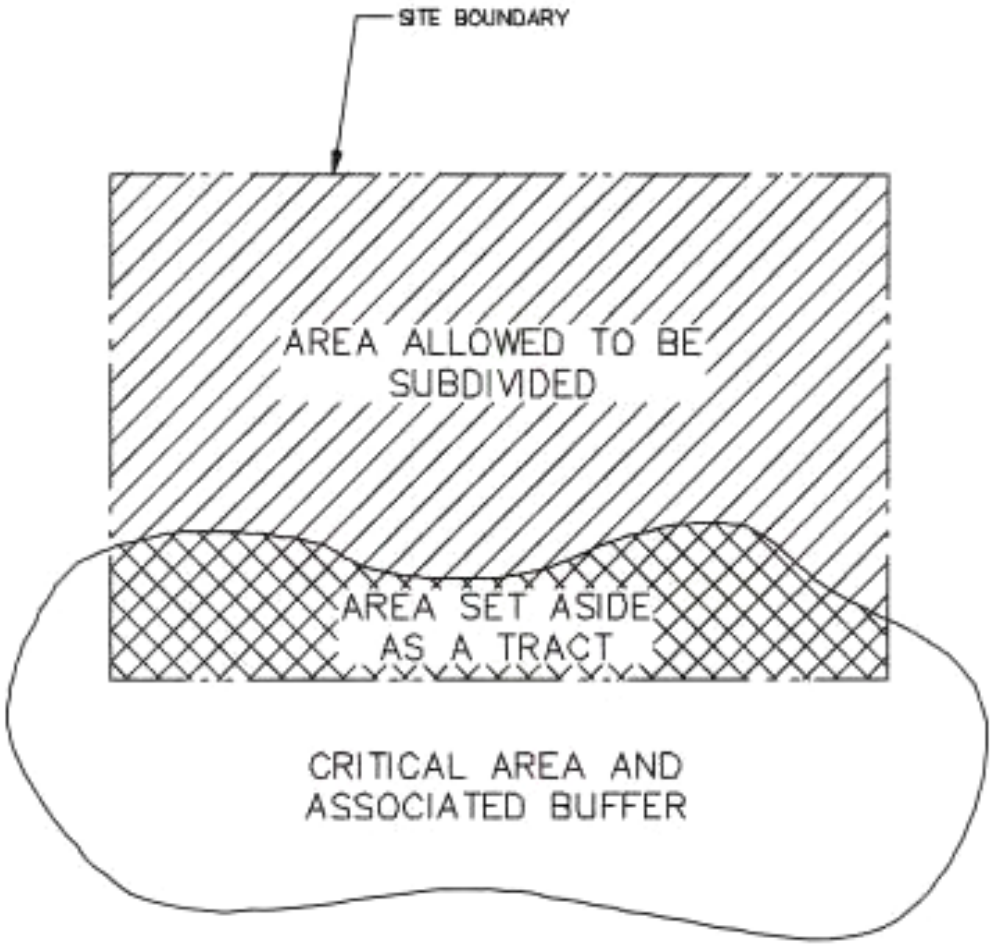
3. **Plat Notes for Flood Hazard Areas.** The following notes shall be placed on the face of any of final plat, short plat, large lot, or binding site plan documents which lie within a flood hazard area.
   a. Grading, clearing, and/or filling within the limits of the 100-year floodplain is prohibited except for water course related construction, repair, and/or maintenance work that is done by the City for management operations.
   b. If a higher frequency event occurs or if existing conditions upon which the flood hazard area boundaries were based were to change or occur differently than depicted, then the level of protection afforded by the existing levee, if applicable, and flood hazard area standards may not be adequate to prevent the subject site from flooding.
   c. All purchasers and developers (and/or their agents) of property within the subject development area and/or parcel shall take notice of the above conditions and hereby agree to defend, indemnify, and hold harmless Edgewood from any and all claims, losses, costs, liabilities, or damages of any nature imposed upon or asserted against Edgewood uprising out of or caused by the City's issuance of approval or by issuance of any other permits arising out of this approval.
   d. All occupants and/or owners of property in the subject area assume the risk of flooding which may occur and waive any claims against Edgewood arising out of damage or injury to person or property resulting therefrom.



FOUNDATION FOOTING SETBACK

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**FOUNDATION FOOTING SETBACK**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	FIGURE 14.10-1



CRITICAL AREA PROTECTIVE MEASURES-TRACTS

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**CRITICAL AREA PROTECTIVE MEASURES TRACTS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.10-2**

Chapter 14.20

USE AND ACTIVITY REGULATIONS

Sections:

14.20.010 Permitted Uses.
14.20.020 Regulated Uses and Activities.
14.20.030 Exemptions.
14.20.040 Nonconforming Uses and Structures.
14.20.050 Reasonable Use Exceptions.
14.20.060 Current Use Assessment.

14.20.010 Permitted Uses. Uses permitted on properties designated as critical areas shall be the same as those permitted in the zone classification shown in the City's Zoning Atlas unless specifically prohibited by this Title.

14.20.020 Regulated Uses and Activities.

A. Unless the requirements of this Title are met, the Department shall not grant any approval or permission to alter the condition of any land, water, or vegetation, or to construct or alter any structure or improvement regulated through the following: building permit, commercial or residential; binding site plan; franchise right-of-way construction permit; site development permit; right-of-way permit; short subdivision; large lots; use permits; subdivision; utility permits; or any subsequently adopted permit or required approval not expressly exempted by this Chapter.

B. The following activities are regulated within a critical fish and wildlife habitat area, wetland, aquifer recharge areas, landslide or erosion hazard area, flood hazard area, and/or their buffers unless exempted by Section 14.20.030:

1. Removing, excavating, disturbing, or dredging soil, sand, gravel, minerals, organic matter, or materials of any kind;
2. Dumping, discharging, or filling;
3. Draining, flooding, or disturbing the water level or water table. In addition, an activity which involves intentional draining, flooding, or disturbing the water level or water table in a wetland or stream in which the activity itself occurs outside the regulated area shall be considered a regulated activity;
4. Driving piling or placing obstructions, including placement of utilities;
5. Constructing, reconstructing, demolishing, or altering the size of any structure or infrastructure;
6. Altering the character of a regulated area by destroying or altering vegetation through clearing, harvesting, cutting, intentional burning, shading, or planting;
7. Activities which result in significant changes in water temperature or physical or chemical characteristics of wetland or stream water sources, including changes in quantity of water and pollutant level;
8. Application of pesticides, fertilizers, and/or other chemicals unless demonstrated not to be harmful to the regulated area.
9. The division or redivision of land.
10. The creation of impervious surfaces.
11. The City adopts the Forest Practice Act (RCW 76.09) by reference.

14.20.030 Exemptions. The following activities are exempt from the provisions of this Title:

A. Existing agricultural activities established prior to February 2, 1992; that after that date, do not cause permanent conversion of a critical area through actions such as filling, ditching, draining, clearing, grading, etc. provided that:
   1. Existing agricultural activities and structures shall comply with the provisions of Chapter 14.070 Flood Hazard Areas; and
   2. Determination of an agricultural exemption status is limited to the specific area(s) upon which lawfully established agricultural activities are being conducted. A determination that an activity is exempt within one portion of a property does not necessarily extend to other portions of the property.

B. Maintenance or reconstruction of existing, lawfully established public facilities provided that reconstruction does not involve expansion of the facility:
   1. Roads, paths, bicycle ways, trails, bridges, and associated storm drainage facilities or other public rights-of-way;
   2. Flood control improvements, such as, but not limited to, levees, revetments, floodwalls, regional storm drainage facilities, drainage structures, or channel capacity projects to protect public infrastructure and/or existing development, when administered by Edgewood Public Works and Utilities provided that the work shall:
      a. Not increase the height of the facility or linear length of the affected stream edge;
      b. Not expand the footprint of the facility waterward or into any landward aquatic habitat; and
      c. Use approved fish-friendly bioengineering techniques to the extent feasible.

C. Maintenance or reconstruction of existing private roads, driveways, onsite septic systems, and wells, provided that reconstruction does not involve expansion of facilities, widening, or relocation.

D. For the following utility activities, when undertaken pursuant to best management practices to avoid impacts to critical areas:
   1. Normal and routine maintenance or repair of existing utilities that does not include any expansion.
   2. Installation, replacement, operation, repair, alteration, extension, or construction of all utility lines, equipment, or appurtenances in improved City road rights-of-way.

E. Reconstruction, remodeling, or maintenance of existing single-family residential structures and accessory structures that are located outside a flood hazard area and active landslide hazard area, provided that a one-time only expansion of the building footprint does not increase by more than 25 percent and that the new construction or related activity does not further intrude into the critical area or related buffer. The exemption shall not apply to reconstruction which is proposed as a result of structural damage associated with a critical area, such as slope failure in a landslide hazard area or flooding in a flood hazard area.

F. Reconstruction, remodeling, or maintenance of structures, other than single-family structures and accessory structures that are located outside a flood hazard area or active landslide hazard area, provided that such reconstruction, remodeling, or maintenance does not increase the floor area nor extend beyond the existing ground coverage. The exemption shall not apply to reconstruction which is proposed as a result of site or structural damage associated with a critical area, such as slope failure in a landslide hazard area or flooding in a flood hazard area.

G. Site investigative work necessary for land use application submittals such as surveys, soil logs, percolation tests, and other related activities. Critical area impacts shall be minimized and disturbed areas shall be immediately restored.

H. Emergency action necessary to prevent imminent threat or danger to public health or safety, or to public or private property, or serious environmental degradation.
   1. The Department shall review all proposed emergency actions to determine the existence of the emergency and reasonableness of the proposed actions taken, however, post-emergency actions, such as submittal of permits, completion of City review, modification or removal of the emergency repair work, or mitigation shall be required by the Department.
   2. Shoreline erosion protection measures shall only be allowed as an emergency action when the owner can demonstrate that there is an imminent threat to an existing residential, commercial, industrial, or agricultural structure. The owner shall retain either City staff or an engineering geologist to conduct a site investigation and provide adequate documentation that the situation is actually an emergency. An emergency action is not warranted when the structure is located outside the active landslide or shoreline erosion hazard area.

I. Activities in artificial wetlands, except those artificial wetlands intentionally created from non-wetland sites, including but not limited to irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities; or, those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. However, wetlands may include those artificial wetlands intentionally created from non-wetland areas, created to mitigate conversion of wetlands, if permitted by the Department.

J. Activities affecting:
   1. Category III wetlands less than 2,500 square feet in size which fail to meet the definition of an Associated Wetland, and which are not part of a mosaic wetland system as set forth in Section 14.30.020 E2.
   2. Category IV wetlands less than 10,000 square feet in size and which fail to meet the definition of an Associated Wetland, and which are not part of a mosaic wetland system as set forth in Section 14.30.020 E2.
   3. Category III and IV wetlands exempted under this Section may still be regulated under the provisions of the City's adopted Stormwater Management Manual.

K. Placement of access roads, utility lines, and utility poles across a Category IV wetland and/or a buffer for a Category IV wetland if there is no reasonable alternative.

L. Activities on improved portions of roads, rights-of-way, or easements, provided there is no expansion of ground coverage.

M. Activities in wetlands in areas managed according to a Special Area Management Plan or other plan adopted by the Department and specifically designed to protect wetland resources.

N. Removal by hand of manmade litter and control of noxious weeds that are included on the State noxious weed list (WAC 16-750) or invasive plant species as identified by the City. Control may be conducted by clipping, pulling, or digging, or by an alternative non-mechanical method upon approval of a plan by the Department.

O. Activities undertaken to comply with a United States Environmental Protection Agency superfund order, or a Washington Department of Ecology order, pursuant to the Model Toxics Control Act, including the following activities:
   1. Remediation or removal of hazardous or toxic substances;
   2. Source control; and
   3. Natural resource damage restoration.

P. Maintenance activities of landscaping and gardens in a required buffer, including but not limited to, mowing lawns, weeding, harvesting, and replanting of garden crops, pruning and planting of vegetation to maintain the condition and appearance of the site existing on February 1, 1992.
Q. Activities designed for previously approved maintenance and enhancement of critical areas and/or their associated buffers.
R. Activities undertaken on the site of an existing holding pond where the water flow and/or water table is controlled by a previously approved pump system.
S. A residential building permit for a lot which was created through a land division action subject to previous reports and assessments as required under this Title; provided that the previous reports and assessments adequately identified the impacts associated with the current development proposal.
T. Maintenance of individual cemetery plots in established and approved cemeteries.
U. Activities within a portion of a wetland buffer or fish and wildlife habitat area buffer located landward of an existing, substantially developed area, such as a paved area, dike, levee, or permanent structure which eliminates or greatly reduces the impact of the proposed activities on the wetland or fish and wildlife habitat area. The Department shall review the proposal to determine the likelihood of associated impacts.
V. Passive recreation such as hunting, hiking, fishing, and wildlife viewing that does not involve the construction of trails.
W. Enhancement actions that do not involve clearing, grading, or construction activities (e.g., revegetation with native plants and installation of nest boxes). Enhancement activity proposals shall be reviewed by the Department.
X. Maintenance or repair of existing shoreline erosion protection measures or structures provided that the repair shall not serve to expand any existing structures or increase the impacts of such structure on critical fish or wildlife habitat.
Y. In addition to the general exemptions listed in this section, the following uses or activities are exempt from the provisions of Chapter 14.50, Aquifer Recharge and Wellhead Protection Areas:
    1. Sewer lines and appurtenances;
    2. Biosolids and sludge land application sites provided that these activities comply with the requirements established in WAC 173-200, 173-216, and 173-304; and
    3. Single-family and two-family dwellings and associated accessory structures.

14.20.040 Nonconforming Uses and Structures.

An established use or existing structure located in a wetland, critical fish and wildlife habitat area, landslide or erosion hazard area, flood hazard area, and their associated buffers that was lawfully permitted prior to February 1, 1992, but which is not currently in compliance with this Title, may continue subject to the following:

A. **Nonconforming Use Expansion.** Nonconforming uses shall not be expanded or changed in any way that increases the nonconformity without a permit issued pursuant to the provisions of this Title.
B. **Nonconforming Structure Expansion.** Existing structures shall not be expanded or altered in any manner that will increase the nonconformity without a permit issued pursuant to the provisions of this Title, except as provided in Section 14.20.030 F and G.
C. **Discontinued Uses.** Activities or uses which are discontinued for 12 consecutive months shall be allowed to resume only if they are in compliance with this Title.
D. **Substantial Damage.** Nonconforming structures, except for structures located in a flood hazard area or active landslide hazard area which are damaged or destroyed by fire,

explosion, flood, or other casualty, may be restored or replaced if reconstruction is commenced within one year of such damage and is substantially completed within 18 months of the date such damage occurred. The reconstruction or restoration shall not serve to expand, enlarge, or increase the nonconformity except as allowed through the provisions in 14.20.030 F and G. Structures in a floodway or active landslide hazard area may be allowed to be restored only up to the limits of substantial improvement, as set forth in each chapter.

14.20.050 Reasonable Use Exceptions.

A. **General Requirements.**

1. If the application of this Title would deny all reasonable use of a site, development may be allowed which is consistent with the general purposes of this Title and the public interest. Nothing in this Title is intended to preclude all reasonable use of property.
2. The provisions outlined in this Section shall only be used when application of this Title would deny all reasonable use of a site.
3. Reasonable use provisions shall apply to new construction, expansions, additions, replacements, and redevelopment projects.
4. Applications for a reasonable use shall automatically constitute an application for a variance to reduce front, side, or rear yard setback requirements. The Hearing Examiner shall examine the feasibility of reducing setbacks as a method of locating a structure outside a critical area or its associated buffer prior to granting a reasonable use exception for allowing construction to occur within a critical area or its associated buffer. Reductions in setback requirements shall be given preference over granting of a reasonable use exception.
5. The creation of new lots within critical areas and their associated buffers is prohibited.
6. The proposal must comply with all provisions in Chapters 14.70 Flood Hazard Areas and 14.080 Landslide and Erosion Hazard Areas.

B. **Application Requirements.** An application for a reasonable use exception shall include the following information:

1. A description of the areas of the site that contains a critical area, buffers, or within setbacks required under this Title;
2. A description of the amount of the site that is within setbacks required by other standards of the Zoning Code;
3. A description of the proposed development, including a site plan;
4. An analysis of the impact that the amount of development described in Section 14.20.050 B3 above would have on the critical area(s);
5. An analysis of whether any other reasonable use with less impact on the critical area(s) and associated buffer(s) is possible;
6. A design of the proposal so that the amount of development proposed as reasonable use will have the least impact practicable on the critical area(s);
7. An analysis of the modifications needed to the standards of this Title to accommodate the proposed development;
8. A description of any modifications needed to the required front, side, and rear setbacks; building height; and buffer widths to provide for a reasonable use while providing greater protection to the critical area(s);
9. Such other information as the Department determines is reasonably necessary to evaluate the issue of reasonable use as it relates to the proposed development, such as

but not limited to a wetland analysis report, mitigation plan, habitat evaluation study, and/or a buffer enhancement plan.

C. **Review.**

1. **Public Hearing Required.** The Department shall set a date for a public hearing before the Hearing Examiner after all requests for additional information or plan correction, as set forth in EMC 18.40.150, have been satisfied. The public hearing shall follow the procedures set forth in Chapter 18.40.190, Notice of Public Hearing.
2. **Decision Criteria.** The Hearing Examiner may approve a reasonable use exception if the Examiner determines the following criteria are met:
    a. The proposed development is located on an existing lot of record that was created prior to the effective date of this ordinance and there is no other reasonable use or feasible alternative to the proposed development with less impact on the critical area(s) and/or associated buffers including phasing or project implementation, change in timing of activities, buffer averaging or reduction, setback variance, relocation of driveway, or placement of structure.
    b. The development cannot be located outside the critical area and/or its associated buffer due to topographic constraints of the parcel or size and/or location of the parcel in relation to the limits of the critical area and/or its associated buffer and a building setback variance or road variance has been reviewed, analyzed, and rejected as a feasible alternative.
    c. The proposed development does not pose a threat to the public health, safety, or welfare on or off the site, nor shall it damage nearby public or private property.
    d. Any alteration of the critical area(s) shall be the minimum necessary to allow for reasonable use of the property.
    e. The inability of the applicant to derive reasonable use of the property is not the result of actions by the applicant in subdividing the property or adjusting a boundary line thereby creating the undevelopable condition after February 1, 1992.
    f. The proposal mitigates the impacts on the critical area(s) to the maximum extent possible, while still allowing reasonable use of the site.
    g. The proposed activities will not jeopardize the continued existence of species listed by the State or Federal government as endangered, threatened, sensitive, or documented priority species or priority habitats.
    h. The proposed activities will not cause significant degradation of groundwater or surface water quality.
3. **Additional Decision Criteria for Wetlands and Associated Buffers.** In addition to the decision criteria listed in Subsection 2 above, a reasonable use exception for wetlands and associated buffers shall also demonstrate that the proposed activity will result in minimum feasible alteration or impairment to the wetland's functional characteristics and existing contours, vegetation, fish and wildlife resources, and hydrological conditions.
4. **Additional Decision Criteria for Critical Fish and Wildlife Habitat Areas and Associated Buffers.** In addition to the decision criteria listed in Subsection 2 above, the Hearing Examiner may approve a reasonable use exception for critical fish and wildlife habitat areas and associated buffers if the Examiner determines that the proposal complies with the mitigation measures as set forth in Section 14.40.050.
5. **Examiner's Authority.** The Examiner has the authority to approve an application for a reasonable use exception, approve with additional requirements above those specified in this Title, require modification of the proposal to comply with specified requirements

or local conditions, or deny the application if it fails to comply with the requirements of this Title.

6. **Required Written Findings and Determinations.** A reasonable use exception may be approved by the Examiner only if all of the following findings can be made regarding the proposal and are supported by the record:
   a. The granting of the proposal will not be detrimental to the public health, safety, and general welfare.
   b. The granting of the proposal will not be injurious to the property, regulated critical area(s), or improvements adjacent to and in the vicinity of the proposal.
   c. The proposal minimizes adverse environmental impacts to the maximum practicable extent and provides mitigation to offset any impacts.
   d. The granting of the proposal is consistent and compatible with the goals, objectives, and policies of the Comprehensive Plan; community plan, if applicable; and the provisions of this Title.

14.20.060 Current Use Assessment Program.

A. An owner of agricultural land, timberland, or open space desiring current use classification under RCW 84.34 may file for such current use classification with the Pierce County Assessor-Treasurer's Office.

B. The Department shall notify the Assessor-Treasurer's Office when restrictions on development occur on a particular site.

C. The Assessor-Treasurer's Office shall consider the critical areas and buffering requirements of this Title in determining the fair market value of land. Any owner of an undeveloped buffer which has been placed in a separate tract or tracts, protective easement, public or private land trust dedication, or other similarly preserved area shall have that portion of land assessed consistent with those restrictions.

Chapter 14.30

WETLANDS

Sections:

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14.30.010 Purpose.

The purpose of this Chapter is to avoid or, in appropriate circumstances, to minimize, rectify, reduce, or compensate for impacts arising from land development and other activities affecting wetlands, and to maintain and enhance the biological and physical functions and values of wetlands with respect to water quality maintenance, stormwater and floodwater storage and conveyance, fish and wildlife habitat, primary productivity, recreation, education, and historic and cultural preservation. When wetland impacts occur, mitigation will be required to achieve no net loss of wetlands in terms of acreage, function, and value.

14.30.020 Wetland Areas.

A. **General.**

1. Wetlands are those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.
2. The City will require the use of the following documents to determine the presence or absence of potential wetlands:
   a. Federal Manual for Identifying and Delineating Jurisdictional Wetlands, Corps of Engineers Wetlands Delineation Manual, 1987 Edition, and corresponding guidance letters; and

b. Washington State Wetlands Identification and Delineation Manual, March 1997 Edition (DOE Publication 96-94).

B. **Wetland Indicators.** Indicators of wetlands normally include, but are not limited to: saturated soils or standing water; water-tolerant plant species such as salmonberry, Oregon ash, Western red cedar, rushes and sedges; and dark-brown or black soil colors. Refer to the documents listed in 14.30.020 A2 for detailed wetland indicator criteria.

C. **Potential Wetland Areas.** Potential wetland areas, as depicted on the City's Critical Areas Atlas – Wetland Inventory Maps, are those areas where wetland indicators have been mapped or identified. Potential wetlands include:

1. Areas within 165 feet of: hydric soils identified on the Soil Survey of Pierce County area; wetlands identified on the National Wetland Inventory Maps or Edgewood Wetland Inventory Maps; areas of known flooding identified on the FEMA FIRM and Flood Insurance Study Maps; or any other indicators of hydrology such as Department of Natural Resource stream data.
2. Areas that possess one or a number of wetland indicators as set forth in Section 14.30.020 B and any adjacent areas within 165 feet.
3. Areas within the buffer of any wetland previously identified through the wetland review process.

D. **Wetland Categories**. Wetlands shall be classified into categories which are reflective of each wetland's function and value and unique characteristics. Wetland categories shall be based on the generalized criteria provided in 14.30.070 Appendix A and the specific criteria provided in the Edgewood Wetlands Rating form provided in 14.30.070 Appendix F. Wetlands shall be generally designated as follows:

1. **Category I Wetlands.** Category I wetlands are those regulated wetlands of exceptional resource value based on their functional value and diversity, wetland communities of infrequent occurrence, association with documented habitat for sensitive, threatened or endangered species, and other attributes which may not be adequately replicated through creation or restoration.
2. **Category II Wetlands.** Category II wetlands are those regulated wetlands of significant resource value based on their functional value and diversity, wetland communities of infrequent occurrence, and other attributes which may not be adequately replicated through creation or restoration.
3. **Category III Wetlands.** Category III wetlands are those regulated wetlands that have important resource value, principally due to vegetative diversity.
4. **Category IV Wetlands.** Category IV wetlands are those regulated wetlands of ordinary resource value based on monotypic vegetation of similar age and class, lack of special habitat features, and isolation from other aquatic systems.

E. **Wetland Delineation Criteria.**

1. **Delineating Wetlands Divided by a Manmade Feature.** When a wetland is divided by a manmade feature (e.g., a road embankment), the wetland shall be rated as if it is not divided if there is a perennial or intermittent surface water connection between the two wetlands and either of the following criteria are met:
   a. It can be demonstrated that the separate wetlands were one discrete wetland prior to construction of the manmade feature. This may be accomplished through an analysis of secondary information such as aerial photographs and soils maps; or
   b. The two separated wetlands can be shown to function as one wetland. This shall be determined based on normal conditions (i.e., in the absence of unauthorized activity,

the wetlands possess similar vegetative or wildlife assemblages or hydrologic regime).

c. Separated wetland areas may be rated jointly in the absence of a perfectly level culvert with two-way water flow.

3. **Connecting Mosaic Pattern Wetlands.** In cases where there are no surface water connections, but the wetlands are separated from each other by less than 100 feet (on average), the DOE mosaic methodology shall be used to determine the wetland boundary. The area of the wetlands must be greater than 50% of the total combined area of wetland and upland for the patchwork to be considered on a wetland. In addition, the patchwork is to be encompassed in such a manner as to minimize the amount of upland area interspersed amongst the wetland areas (see Figure 14.30-1).

14.30.030 Wetland Review Procedures.

A. **General Requirements.**

1. The City's Critical Areas Atlas – Wetland Inventory Maps provides an indication of where potential wetlands are located within the City. The actual presence or location of a potential wetland or a potential wetland that has not been mapped, but may be present on or adjacent to a site shall be determined using the procedures and criteria established in this Chapter.
2. The Department will complete a review of the City's Critical Areas Atlas –Wetland Inventory Maps and other source documents for any proposed regulated activity to determine whether the project area for a proposed single-family dwelling unit or site for all other proposed regulated activities is located within a potential wetland. Identification of a potential wetland may also occur as a result of field investigations conducted by Department staff.
3. When the Department's maps, sources, or field investigation indicate that a potential wetland is located within the project area for a proposed one family dwelling unit or within the site for all other proposed regulated activities, the Department shall require a site evaluation (field investigation) to determine whether or not a regulated wetland is present and if so, its relative location in relation to the proposed project area or site. The findings of the site evaluation shall be documented as outlined in Subsections 14.30.030 B, C, D, or E below.
4. If Department staff completes the site evaluation and determines that no regulated wetlands are present, then wetland review will be considered complete.
5. All site evaluations shall include a proposed categorization of the wetland in accordance with the guidelines set forth in Section 14.30.020 B and a calculation of the standard wetland buffer as set forth in Section 14.30.060.
6. Unless otherwise stated in this Chapter, the critical area protective measure provisions contained in Section 14.10.080 shall apply.

B. **General Wetland Review.** A general wetland review shall include the submittal of a wetland verification report, wetland delineation report, or a wetland analysis report, together with a wetland application and appropriate fees (see Figure 14.30-2).

1. **Wetland Verification Report.**
   a. A wetland verification report shall be submitted when the site evaluation determines that:
      (1) No regulated wetland is present within 165 feet of the site;
      (2) A regulated wetland is present, but its standard buffer does not extend within the site; or

(3) Wetlands are identified but are evaluated and found to be exempt as set forth in Section 14.20.030 K.

b. The wetland verification report shall include data sheets, site maps, and other field data and information necessary to confirm wetland presence or absence and category. If exempt wetlands (refer to Section 14.20.030 K) are identified, a site plan must be provided that identifies their location.

c. The wetland verification report shall identify and discuss wetland boundaries within the site as well as those that extend offsite. Offsite wetlands and associated standard buffers do not have to be marked in the field.

d. Department staff shall review the wetland verification report and either:

(1) Accept the report and approve the wetland application; or

(2) Reject the report and require the submittal of a wetland analysis report.

2. **Wetland Analysis Report.**

a. If a regulated wetland or its standard buffer extends onto the site, the Department shall require a wetland analysis report. Information required in a wetland analysis report is identified in 14.30.070 Appendix B.

b. If the Department determines that a Category I wetland is onsite which is associated with documented habitat for endangered, threatened, or sensitive species or for potentially extirpated plant species recognized by State or Federal agencies, the Department shall also require the submittal of a habitat assessment report as set forth in Chapter 14.40.

c. If the Department determines that mitigation is necessary to offset the identified impacts, the applicant shall comply with the mitigation requirements set forth in Section 14.30.050.

d. Approval of the wetland application shall be granted upon a determination that the wetland analysis report and mitigation plan, if applicable, are thorough and accurate, and meet all requirements of this Title, and that the monitoring program and contingency plan are tied to an acceptable financial guarantee as set forth in Section 14.10.080 to assure that the requirements will be followed.

3. **Time Limitations.**

a. **General.** Delineation reports and mitigation plans that have not been accepted by the City for a project are valid for a period of four (4) years unless a longer period is approved by the Department.

b. **Extensions.** A one-year extension may be approved by the Department upon written request for such extension of that delineation report or mitigation plan.

C. **Single-Family Dwelling Wetland Review.** Two alternative review procedures exist for construction of a single-family dwelling and regulated activities accessory to a single-family dwelling (see Figure 14.30-3). Both review procedures require the completion of a site evaluation as follows:

1. **Wetland Certification Process for Single-Family Dwellings (No Encroachment into a Regulated Wetland or Its Standard Buffer).**

a. Prior to issuance of a building permit, site development permit, or on-site sewage system permit, the applicant shall submit a single-family wetland certification form completed by a wetland specialist that certifies either:

(1) No regulated wetlands are present within 165 feet of the project area; or

(2) Wetlands are present within 165 feet of the project area, but all regulated activities associated with the dwelling (i.e., landscaped areas, septic facilities,

outbuildings, etc.) will occur outside of the standard buffer of the identified wetland.

b. If regulated wetland buffers extend onto the site, the wetland specialist shall place permanent, clearly visible, wetland buffer signs at the edge of the buffer. A wetland buffer sign affidavit, signed by the wetland specialist, shall be submitted to the Department as verification that the wetland buffer signs have been placed on the site.

c. A survey as outlined in Section 14.10.080 H will not be required.

d. The single-family certification form may be used only to authorize single-family dwellings and associated homesite features such as driveways, gardens, fences, wells, lawns, and on-site septic systems. It may not be used for new agricultural activities, expansion of existing agricultural activities, forest practice activities, commercial projects, land divisions, buffer width modifications (as set forth in Section 14.30.060), or violations.

e. The single-family certification process will be monitored by the Department for accuracy, and enforcement actions will be initiated should encroachment into a regulated wetland or buffer occur.

f. The applicant/property owner assumes responsibility for any and all errors of the single-family certification form and all associated mitigation imposed by the Department.

g. Single-family certification forms shall be filed with the Pierce County Auditor's Office in accordance with Sections 14.10.070 F and 14.10.110 B.

2. **Single-Family Wetland Application Process (Encroachment into the Standard Buffer of a Regulated Wetland).**

a. A wetland application and wetland delineation report shall be submitted to the Department when the single-family dwelling and associated homesite features are located within the standard buffer of a regulated wetland.

b. The applicant may retain either a wetland specialist or Department staff to delineate the limits of a regulated wetland and determine the impacts associated with the project, subject to the following:

(1) A wetland delineation report, as defined in Section 14.30.030 C3 below, shall be submitted to the Department for review; or

(2) Upon the applicant's request and payment of fees, the Department shall delineate the regulated wetland(s).

c. If the Department determines that mitigation is necessary to offset the identified impacts, the applicant shall comply with the mitigation requirements set forth in Section 14.30.050.

d. The applicant shall place permanent, clearly visible, wetland boundary buffer signs at the edge of the buffer.

e. A survey as defined in Section 14.10.080 H will not be required.

3. **Wetland Delineation Report.** The wetland delineation report shall include data sheets; scaled site maps showing the project boundary, wetland boundary, categorization of the wetland and standard buffer boundary, boundary flag location and sample plot location and designation; a vicinity map with driving instructions; and any other field data and information necessary for the Department to confirm wetland presence, location, and category.

D. **Agricultural Activity Wetland Review.** A wetland application and wetland delineation report shall be submitted to the Department when the site evaluation indicates that a

regulated wetland or its standard buffer extends into a site proposed for an agricultural activity.

1. The applicant may either retain a wetland specialist or Department staff to delineate the limits of a regulated wetland and determine the impacts associated with the project area, subject to the following:
   a. A wetland delineation report, as defined in Section 14.30.030 C3 above, shall be submitted to the Department for review; or
   b. Upon the applicant's request and payment of fees, the Department shall delineate the regulated wetland(s).
2. If the Department determines that mitigation is necessary to offset the identified impacts, the applicant shall comply with the mitigation requirements set forth in Section 14.30.050.
3. The applicant shall place permanent, clearly visible, wetland boundary buffer signs at the edge of the buffer.
4. A survey as defined in Section 14.10.080 H will not be required.
5. Agricultural activities may be initiated subject to compliance with the requirements set forth in Section 14.30.030 D1 through 4 above and the submittal of a best management plan developed by the Pierce County Conservation District or Natural Resource Conservation Service (NRCS).

E. **Forest Practice Wetland Review.**

1. All forest practice activities that are not exempt from the provision of this Title shall be reviewed pursuant to the criteria set forth in 14.30.030 B – General Wetland Review, except for Conversion Option Harvest Plan (COHP).
2. An abbreviated wetland review process may be used for COHPs as follows:
   a. If a regulated wetland or its standard buffer extends onto the site, the Department shall require the submittal of a wetland application and delineation report. At a minimum the report shall include:
      (1) A detailed description of all wetlands on, or within, 165 feet of the site, including the wetland(s) approximate size, vegetation, categorization, and hydrology source(s).
      (2) Sample data sheets for each wetland.
      (3) An accurate map delineating the boundaries of the wetland(s) and standard buffer(s) in relation to the boundaries of the site.
   b. The wetland delineation report shall be prepared, signed, and dated by a wetland specialist.
   c. The accuracy of the wetland delineation, flagging, and categorization shall be field verified by the Department.
   d. A survey as defined in Section 14.10.080 H will not be required.
3. Where an application for a development permit, other than a site development permit, has not been submitted in association with a proposed forest practice activity a deviation, from the standard wetland buffer, as set forth in Section 14.30.060 A, shall not be allowed.

14.30.040 Wetland Standards.

A. Regulated activities in wetlands and/or buffers may be allowed when the applicant demonstrates to the Department that all adverse impacts to wetlands or associated buffers will be mitigated according to Section 14.30.050.

B. The following activities may be allowed in a buffer without a complete mitigation plan if the applicant demonstrates to the Department that all adverse impacts to wetlands will be mitigated according to the provisions in Section 14.30.050. In cases that require environmental review, a threshold environmental determination may not be made until the Department is satisfied that adequate mitigation will occur. The allowed activities are as follows:
   1. One well and necessary appurtenances, including a pump and appropriately sized pump house, but not including a water storage tank (unless the water storage tank can be contained within the pump house), subject to the following conditions:
      a. The pump house is a one-story building with a ground area of less than 120 square feet; and
      b. The well is more than 75 feet deep; and
      c. For Category I and II wetlands, the minimum distance from the well and appurtenances to the wetland edge is no less than 50 percent of the buffer widths established in the table in Section 14.30.060 A; and
      d. Access to the well and pump house shall be by a pervious trail for pedestrian traffic only or, if necessary, by an unimproved access for a maintenance vehicle.
   2. Pervious trails and associated viewing platforms.
   3. The placement of utility lines which do not require excavation or utility pole installation in any part of a buffer for a Category II, III, or IV wetland. They may be placed in a buffer for a Category I wetland, provided that the minimum distance from the wetland edge is no less than 50 percent of the Category I buffer width established in the table in Section 14.30.060 A.
   4. New farm and agricultural activities may be permitted within a buffer subject to the following:
      a. Agricultural activities and structures shall comply with the provisions of Chapter 14.070 Flood Hazard Areas.
      b. The agricultural activity is in compliance with the USDA, NRCS Conservation Reserve Program farm management standards.
      c. A copy of an approved NRCS or Pierce County Conservation District farm management plan that documents compliance with the USDA, NRCS Conservation Reserve Program farm management standards has been submitted to the Department for review and approval.

C. Trimming of vegetation for purposes of providing view corridors will be allowed provided that trimming shall be limited to view corridors of a maximum 20-foot width and that benefit to fish and wildlife habitat are not reduced. Trimming shall be limited to hand pruning of branches and vegetation. Trimming shall not include felling, topping, or removal of trees.

14.30.050 Mitigation Requirements.

A. **Mitigation.** All regulated development activities in wetlands or buffers shall be mitigated according to this Title subject to the following criteria:
   1. Avoiding the impact altogether by not taking a certain action or parts of actions;
   2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to reduce impacts;
   3. The following types of mitigation (no order of preference):

a. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
b. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;
c. Compensating for the impact by replacing or providing substitute resources or environments;

4. Monitoring the impact and compensation and taking appropriate corrective measures; and
5. Mitigation for individual actions may include a combination of the above measures.

B. **Mitigation for Regulated Activities in Wetland Buffers.** Non-compensatory mitigation shall be required for all regulated activities in buffers. Specific mitigation plan requirements are provided in Section 14.30.070 Appendix C. Where environmental review is required, a threshold determination may not be made until the Department has reviewed and approved the non-compensatory mitigation plan.

C. **Mitigation for Regulated Activities in Wetlands.** Compensatory mitigation shall be required for regulated activities that result in the loss of wetland acreage. Non-compensatory mitigation shall be required for regulated activities that do not result in the loss of wetland acreage. Specific mitigation plan requirements are provided in Section 14.30.070 Appendices D and E.

1. The compensatory mitigation plan shall be completed in two phases, a conceptual phase and a detailed phase.
   a. Conceptual phase. The applicant shall submit a conceptual mitigation plan for compensatory mitigation to the Department. Where environmental review is required, the Department shall not make a threshold determination prior to Department review and approval of the conceptual mitigation plan. See 14.30.070 Appendix D for specific requirements of the conceptual mitigation plan.
   b. Detailed phase. Following the Department's approval of the conceptual mitigation plan, the applicant shall submit a detailed mitigation plan for compensatory mitigation to the Department. See 14.30.070 Appendix E for specific requirements of the detailed mitigation plan.
2. The detailed mitigation plan shall be prepared, signed, and dated by the wetland specialist to indicate that the plan is in accordance with specifications determined by the wetland specialist. A signed original mitigation plan shall be submitted to the Department.
3. Approval of the detailed mitigation plan shall be signified by a notarized memorandum of agreement signed by the applicant and Director, and recorded with the Pierce County Auditor. The agreement shall refer to all requirements for the mitigation project.
4. The mitigation project shall be completed according to a schedule agreed upon between the Department and the applicant.
5. Wetland mitigation shall occur according to the approved wetland mitigation plan and shall be consistent with provisions of this Chapter and Title.
6. The wetland specialist shall be onsite during construction and plant installation phases of all mitigation projects.
7. On completion of construction for the wetland mitigation project, the wetland specialist shall submit an as-built report to the Department for review and approval.

D. **Mitigation Banking.** (Reserved).

14.30.060 Buffer Requirements.

A. **Determining Buffer Widths.** Buffer widths shall be measured horizontally from the perpendicular line established at the wetland edge based on the following table:

Wetland Category	Standard Buffer Width
I	150 feet
II	100 feet
III	50 feet
IV	25 feet

B. **Modification of Buffer Widths.** The standard buffer widths of Section 18E.30.060 A may be modified by averaging, reducing, or increasing.

1. **Buffer Averaging.** Buffer width averaging may be allowed only where the applicant demonstrates all of the following:
   a. Buffer encroachment is unavoidable.
   b. A habitat assessment has been submitted which demonstrates that no documented habitat for endangered, threatened, or sensitive plant, fish, or animal species, or for potentially extirpated plant species recognized by State or Federal agencies exists; or
   c. For wetlands and/or required buffers associated with documented habitat for endangered, threatened, or sensitive plant, fish, or wildlife species, or for potentially extirpated plant species recognized by State or Federal agencies, a habitat assessment report has been submitted that demonstrates that the buffer reduction will not result in an adverse impact to the species of study.
   d. The wetland contains variations in sensitivity due to existing physical characteristics.
   e. Width averaging will not adversely impact the wetland or critical fish or wildlife habitat.
   f. The total buffer area after averaging is no less than the buffer area prior to averaging (see Figure 14.30-4).
   g. The minimum buffer width will not be less than 50 percent of the widths established in Subsection A.
   h. The averaging is accomplished within the project boundaries.
2. **Buffer Width Reductions.** Buffer width reduction to a maximum of 25 percent may be allowed when the applicant demonstrates the following circumstances:
   a. Buffer encroachment is unavoidable; and
   b. A habitat assessment has been submitted which demonstrates that no documented habitat for endangered, threatened, or sensitive plant, fish, or animal species, or for potentially extirpated plant species recognized by State or Federal agencies exists; or
   c. A habitat assessment report has been submitted that demonstrates that the buffer reduction will not result in an adverse impact to the species of study for wetlands and/or required buffers associated with documented habitat for endangered, threatened, or sensitive plant, fish or wildlife species or for potentially extirpated plant species recognized by State or Federal agencies.
   d. The applicant demonstrates one or more of the following conditions:
      (1) The proposed buffer area is extensively vegetated, has less than 20 percent slopes, and the reduction will not result in adverse impacts to the wetland; or

(2) The project includes a buffer enhancement plan as part of the mitigation required by Section 14.30.050. The buffer enhancement plan shall use plant species which are native, non-invasive to the project area and shall substantiate that an enhanced buffer will improve the functional attributes of the buffer to provide additional protection for wetland functional values; or

(3) The acreage included in the buffer would substantially exceed the size of the wetland and the reduction will not result in adverse impacts to the wetland.

3. **Buffer Increases.** The Department may require increased buffer width(s) when any of the following are identified:
   a. A larger buffer is necessary to maintain viable populations of existing species;
   b. The wetland is used by, or associated with, species listed by the Federal government or the State as endangered, threatened, sensitive, or as documented priority species or habitats, or essential or outstanding potential sites such as heron rookeries or raptor nesting areas;
   c. The adjacent land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse wetland impacts;
   d. The adjacent land has minimal vegetative cover, or slopes greater than 20 percent.

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A. Wetland Categories.
B. Information to be Included in a Wetland Analysis Report.
C. Mitigation Plan for Regulated Activities in Buffers.
D. Compensatory Mitigation Plan for Regulated Activities in Wetlands, Conceptual Phase.
E. Compensatory Mitigation Plan for Regulated Activities in Wetlands, Detailed Phase.
F. Edgewood Wetlands Rating Form.

14.30.080 Figures.

Figure 14.30-1 Connecting Mosaic Pattern Wetlands.
Figure 14.30-2 General Wetland Review.
Figure 14.30-3 One-Family Wetland Review.
Figure 14.30-4 Wetland Buffer Averaging.

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APPENDIX A
WETLAND CATEGORIES

Wetland categories shall be designated according to the following generalized criteria:

A. **Category I:** Wetlands that contain any of the following:
   1. Documented habitat for endangered or threatened plant, fish, or animal species or for potentially extirpated plant species recognized by State or Federal agencies;
   2. Wetlands associated with documented habitat for endangered, threatened, sensitive plant, fish, or animal species or for potentially extirpated plant species recognized by State or Federal agencies;
   3. High quality native wetland communities, including documented Natural Heritage wetland sites and sites which qualify as a Natural Heritage wetland;
   4. High quality, regionally rare wetland communities with irreplaceable ecological functions, including sphagnum bogs and fens, estuarine wetlands, mature forested wetlands, or snag-rich areas;
   5. Wetlands of exceptional local significance, as designated by separate Edgewood Ordinance.

B. **Category II:** Regulated wetlands that do not contain features outlined in Category I with any of the following:
   1. Documented habitats for sensitive plants or fish species recognized by Federal or State agencies;
   2. Documented priority habitats and species recognized by State agencies;
   3. Regionally rare wetland communities which are not high quality, but which have irreplaceable ecological functions, including sphagnum bogs and fens, estuarine wetlands, or mature forested wetlands;
   4. Wetland types with significant functions which may not be adequately replicated through creation or restoration. These wetlands may be demonstrated by any of the following characteristics:
      a. Peat or muck systems;
      b. Forested wetlands that have three canopy layers; or
      c. Significant spring fed systems;
   5. Wetlands with significant habitat value based on diversity and size including wetlands:
      a. Ten acres or greater in size with two or more wetland classes together with an open water class at any time during a normal year;
      b. Ten acres or greater in size, with three or more wetland classes and five or more subclasses of vegetation in a dispersed pattern;
      c. Five acres or greater in size, with 40-60% open water at any time during a normal year, and two or more subclasses of vegetation in a dispersed pattern;
   6. Regulated wetlands that are associated with either year-round or intermittent salmonid fish-bearing waters;
   7. Wetlands with significant use by fish and wildlife.

C. **Category III:** Regulated wetlands that do not contain features outlined in Category I, II, or IV wetlands that are not part of a mosaic wetland.

D. **Category IV:** Regulated wetlands that do not meet the criteria of a Category I, II, or III wetland that are:
   1. Hydrologically isolated;
   2. Less than or equal to one acre in size;

3. Have only one wetland class and one dominant plant species (i.e., displaying monotypic vegetation); and
4. Not part of a mosaic wetland.

E. The Category of a wetland shall not be changed to recognize illegal modifications to the wetland.

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APPENDIX B

INFORMATION TO BE INCLUDED IN A WETLAND ANALYSIS REPORT

A wetland analysis report shall include the following:

A. Vicinity map and detailed driving instructions to the site;

B. A site map setting forth all of the following:
   1. Surveyed wetland boundaries based upon a delineation by a wetlands specialist;
   2. Wetlands and buffers offsite, within 165 feet of the site boundaries, are also to be discussed and shown in as much detail as possible;
   3. Site boundary property lines and roads;
   4. A north arrow and scale;
   5. Internal property lines, rights-of-way, easements, etc.;
   6. Existing physical features of the site including buildings, fences, and other structures, roads, parking lots, utilities, water bodies, etc.;
   7. Contours at the smallest readily available intervals, preferably at two-foot intervals;
   8. Hydrologic mapping showing patterns of surface water movement and known subsurface water movement into, through, and out of the site area; and
   9. Location of all test holes and vegetation sample sites, and wetland boundary flags numbered to correspond with flagging in the field and field data sheets.

C. A report which includes the following:
   1. Location information (legal description, parcel number, and address);
   2. Delineation analysis results. The wetland boundaries on the site established by the delineation shall be staked and flagged in the field. If the wetland extends outside the site, the delineation report shall discuss all wetland areas within 150 feet of the site, but need only delineate those wetland boundaries within the site;
   3. General site conditions including topography, acreage, and surface areas of all wetlands identified in the City's Wetland Atlas and water bodies within one-quarter mile of the subject wetland(s);
   4. Hydrological analysis, including topography of existing surface and known significant sub-surface flows into and out of the subject wetland(s); and
   5. Discussion of the values of existing wetlands, including vegetative, faunal, and hydrologic conditions and the presence of threatened, endangered, candidate, sensitive or monitor species;

D. A summary of the proposed activity and potential direct or indirect impacts to the wetland(s) including stormwater-related impacts to wetland hydrology;

E. Recommended wetland category, including rationale for the recommendation;

F. Recommended buffer boundaries, including rationale for boundary locations;

G. Proposed on-site residential density transfer from wetlands and/or buffers to upland areas;

H. Site plan of proposed activity, including location of all parcels, tracts, easements, roads, structures, and other modifications to the existing site. The location of all wetlands and buffers shall be identified on the site plan.

I. The wetland analysis report shall be signed and dated by the wetland specialist.

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APPENDIX C

MITIGATION PLAN FOR REGULATED ACTIVITIES IN BUFFERS

A. A mitigation plan for regulated activities in buffers shall be prepared, signed, and dated by a wetland specialist and shall contain the following:
   1. General goals of the mitigation plan including a discussion of the function and values of impact and enhancement areas;
   2. Approximated site topography before and after alteration;
   3. Location of proposed mitigation area (include a north arrow and scale);
   4. General hydrologic patterns on the site before and after construction;
   5. General plant selection and justification, planting instructions, and approximate planting sequencing and schedule;
   6. A maintenance plan;
   7. A monitoring and contingency plan. Monitoring is to occur for a minimum of five years.
   8. Estimated costs for the installation, maintenance, and monitoring phases of the project. Separate estimates shall be prepared for the installation phase and monitoring and maintenance phase of the project; and
   9. Address and phone number of person(s) or organization(s) responsible for the monitoring requirements.

B. Upon Department review and approval of this plan, it shall become the detailed plan.

C. Where environmental review is required, a threshold determination may not be made prior to submittal of a plan which meets Department approval.

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APPENDIX D

COMPENSATORY MITIGATION PLAN FOR REGULATED ACTIVITIES IN WETLANDS - CONCEPTUAL PHASE

A. The conceptual phase of a mitigation plan for regulated activities in wetlands shall be prepared, signed, and dated by a wetland specialist and shall include the following:
   1. General goals of the compensatory mitigation plan, including an overall goal of no net loss of wetland function, value, and acreage;
   2. Mitigation projects that involve Category I wetlands associated with documented habitat for endangered or threatened plant, fish, or animal species or for potentially extirpated plant species recognized by State or Federal agencies must also demonstrate a net benefit to the conservation of the affected species;
   3. Site topography before and after construction;
   4. Location of proposed wetland mitigation area;
   5. General hydrologic patterns on the site before and after construction;
   6. Field data confirming the presence of adequate hydrology to support the existing and created wetland area(s). At a minimum, the following information shall be included:
      a. Seasonal (growing season) water level;
      b. Sources of water (if the water source is adjacent to a stream or river then no instream structures will be allowed that restrict fish migration or access);
      c. Pre- and post-development inflow and outflow volumes and velocity and frequency of flooding;
      d. Groundwater and surface water table. (Guidelines for Developing Freshwater Wetlands Mitigation Plans and Proposals 1994, COE, EPA, DOE, USFWS, & WDFW);
   7. Nature of mitigation, including wetland types (in-kind and out-of-kind), general plant selection and justification, approximate project sequencing and schedule, and approximate size of the new wetland buffer. A discussion of the function and values of both the impact and creation areas is also to be provided;
   8. A conceptual maintenance plan; and
   9. Conceptual monitoring and contingency plan.

B. Once the Department approves the conceptual mitigation plan, a detailed mitigation plan shall be submitted. Due to the complex nature of creating and restoring wetlands, very detailed plans are needed (see 14.30.110 Appendix E for further information on detailed mitigation plans).

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APPENDIX E

COMPENSATORY MITIGATION PLAN FOR REGULATED ACTIVITIES IN WETLANDS - DETAILED PHASE

I. OUTLINE OF DETAILED MITIGATION PLAN

A. The detailed mitigation plan shall contain the following:
   1. Site specific, quantifiable criteria for evaluating whether or not the goals for the proposed compensation are being met. Such criteria shall include the establishment of viable plant communities, hydric soil formation, and establishment of wetland hydrology, and may include water quality standards, species abundance and diversity targets, habitat diversity indices, or other ecological, geological, or hydrological criteria (see Subsection III. below for specific performance standards).
   2. Pre-development analysis of the proposed compensation area including:
      a. Existing vegetation community analysis;
      b. Hydrological analysis that demonstrates the project will not adversely impact existing wetland and buffer areas and ensures adequate hydrology for any created wetland areas (see Subsection V for specific requirements);
      c. Onsite soils analysis data and, where appropriate, Natural Resources Conservation Service Mapping;
      d. Detailed description of flora and fauna existing on the site; and
      e. Description of existing site conditions in relation to historic conditions for those sites which have been recently altered or degraded.
   3. Proposed post-development conditions within existing wetland and buffer areas and mitigation areas, including:
      a. Relationship of the project to the watershed and existing water bodies;
      b. Topography, using one-foot contour intervals;
      c. Hydrologic analysis (see Subsection V for specific requirements);
      d. Grading, filling, and excavation, including a description of imported soils;
      e. Irrigation requirements;
      f. Erosion control measures during construction; and
      g. Aerial coverage of planted areas to open water areas (if any open water is to be present.
   4. Detailed site diagrams, to-scale construction drawings with cross-section data, topographic maps showing slope percentage and final grade elevations, and any other drawings appropriate to show construction techniques or anticipated final outcome. The plan shall provide for elevations which are appropriate for the desired habitat type(s). The construction drawings must include a note that requires the contractor to refer to the approved mitigation plan.
   5. Planting plan prepared by a wetland specialist that shall include the following:
      a. Soils and substrate characteristics;
      b. Specification of substrate stockpiling techniques;
      c. Planting instructions, including species, stock type and size, density or spacing of plants, and water and nutrient requirements; and

d. Specification of where plant materials will be procured. Documentation shall be provided which guarantees plant materials are to be procured from licensed regional nurseries or from wetlands on site which are part of the mitigation plan.

6. Schedule showing dates for beginning and completing the mitigation project, including a sequence of construction activities.
7. Monitoring and maintenance plan which includes the following:
   a. Specification of procedures for monitoring and site maintenance; and
   b. Schedule for submitting monitoring reports.
8. Detailed contingency plan, consistent with Subsection IV below.
9. Detailed budget for implementing the mitigation plan, including construction, monitoring, maintenance, and contingency phases.
10. Financial guarantee for the work to be performed as planned and approved. Separate guarantee estimates shall be prepared for the installation phase and monitoring and maintenance phase of the project.
11. Address and phone number of the person or organization responsible for monitoring requirements.

II. LOCATION CRITERIA

In cases in which it is determined that compensatory mitigation is appropriate, the following shall apply:

A. Compensatory mitigation shall be provided on-site, except where the applicant demonstrates that on-site mitigation is not scientifically feasible or practical due to physical features of the site.

B. When compensatory mitigation cannot be provided on-site, it shall be provided in the immediate vicinity of and within the same watershed as the regulated activity.

III. MITIGATION PERFORMANCE STANDARDS

A. When regulated activities occur in wetlands, the applicant shall restore, create, or enhance equivalent areas of wetlands. Equivalent areas shall be determined according to acreage, functional value, type, location, time factors, and projected success. No overall net losses shall occur in wetland acreage, functions and/or values, and any restored, created, or enhanced wetland shall be as persistent as the wetland it replaces.

B. When an applicant proposes to alter or eliminate wetland, the applicant shall replace acreage at the following ratios:

Category I: 3:1 (acreage replacement: acreage lost)

Category II and III:

Forested Class:	2:1
Scrub/Shrub Class:	1.5:1
Emergent Class:	1.5:1
Open Water:	1:1

Category IV: 1:1

C. Ratios provided are for proposed projects with on-site, in-kind replacement which occurs prior to regulated activities on the site. The Department may increase the ratios under the following circumstances:

1. Uncertainty as to the probable success of the proposed restoration or creation; or
2. Significant period of time between destruction and replication of wetland functions; or

3. Projected losses in wetland functions and value; or
4. Off-site and/or out-of-kind compensation.

D. The Department may allow enhancement of existing or created wetland area(s) as a means of reducing the standard acreage replacement ratio if the applicant demonstrates that no net loss of wetland function or value will result provided that:
   1. Enhancement mitigation ratios shall be no less than twice the standard creation ratio of the impacted wetland.
   2. The applicant may be required to complete an analysis of the impact and mitigation areas in support of the acreage replacement ratio reduction. An example of an acceptable analysis methodology is the Washington State Department of Ecology Wetland Function Assessment Methodology (Ecology Publication # 99-116) however, other methodologies may be proposed.
   3. The County will not allow the acreage replacement ratio to be reduced to less than 1:1 except as described in III-E below.

E. In the case of Category II, III, and IV wetlands, the replacement ratio may be decreased to a ratio of less than 1:1 if, following a public hearing, the Hearing Examiner determines the following:
   1. A replacement ratio of greater than 1:1 is either not feasible on-site or would be likely to result in substantial degradation of other natural features; and
   2. The mitigation plan shows that a net increase in wetland functional values will result from the mitigation; and
   3. The mitigation is completed, and then monitored by the Department for one year prior to the issuance of permits. If after one year of monitoring, the Department is not satisfied that the anticipated final outcome of the mitigation plan will be met, modifications to the mitigation plan and further monitoring may be required. When the Department is satisfied that the mitigation will be successful, permits pending will be issued.

F. In-kind compensation shall be provided except where the applicant demonstrates that:
   1. Greater functional and habitat values can be achieved through out-of-kind mitigation; and
   2. The wetland system is already significantly degraded; or
   3. Problems such as the presence of exotic vegetation and changes in watershed hydrology make implementation of in-kind compensation infeasible; or
   4. Out-of-kind replacement will best meet identified regional goals (e.g., replacement of historically diminished wetland types).

G. Design requirements for the mitigation plan shall, at a minimum, include the following:
   1. Use only indigenous native plants (not introduced or exotic species);
   2. Use plants appropriate to the depth of water at which they will be planted;
   3. Use plants that originate and are available from local sources;
   4. Use plant species high in food and cover value for fish and wildlife;
   5. Plant mostly perennial species;
   6. Avoid committing significant areas of site to species that have questionable potential for successful establishment;
   7. Water depth is not to exceed 6.5 feet (2 meters);
   8. The grade or slope that water flows through the wetland is not to exceed six percent;
   9. Slopes within the wetland and buffer should not be steeper than 3:1 (horizontal to vertical);
   10. Planting densities and placement of plants shall be shown on the design plans;

11. The wetland should not contain more than 60 percent open water as measured at the seasonal high water mark;
12. Stockpiling shall be confined to upland areas and contract specifications should limit stockpile duration to less than four weeks. Erosion control measures shall be in effect at the stockpiling location;
13. Planting instructions shall describe proper placement, diversity, and spacing of seeds, tubers, bulbs, rhizomes, sprigs, plugs, cuttings, and transplanted stock;
14. Apply controlled release fertilizer at the time of planting and afterward only as plant conditions warrant (determined during the monitoring process), and only to the extent that the release would be conducted in an environmentally sound manner;
15. Install an irrigation system, as necessary, until plants are established.

H. Mitigation projects are unique and performance standards will differ based upon the goals and objectives of the project. However, performance standards pertaining to water regime, vegetative structure and establishment, and hydric soil formation are to be established for all mitigation projects, as defined below:
   1. The mitigation wetland must meet the technical criteria for wetland hydrology, seasonal inundation, and/or saturation to the surface for a consecutive number of days greater than or equal to 12.5 percent of the growing season. Areas that are seasonally inundated and/or saturated to the surface for a consecutive number of days between 5 percent and 12.5 percent of the growing season may also be wetlands. Hydrology may be monitored through the use of one or a combination of the following: groundwater wells, piezometers, crest gauges, hand-dug soil pits, staff gauges, and continuous recording flow meters.
   2. At a minimum, vegetative success equals the establishment of a multi-species, mixed canopy community comprised of emergent, scrub-shrub, and tree species. Yearly standards pertaining to survival and aerial coverage shall also be established for each vegetative stratum.
   3. Hydric soil characteristics shall be monitored through the use of one or a combination of the following: Munsell soil color, pH, particle size, redox potential, organic content, microbial activity, time and duration of saturation or ponding, and alkalinity.

IV. MONITORING PROGRAM AND CONTINGENCY PLAN

A. A contingency plan shall be established for compensation in the event the mitigation project is inadequate or fails. The contingency plan is to provide specific corrective measures for such common mitigation plan failings as plant mortality, vandalism, damage due to wildlife grazing, grading errors, and hydro-regime problems. A financial guarantee on a form acceptable to the City is required for the duration of the monitoring period and the guarantee plus any accrued interest will be released by the City when the required mitigation and monitoring are completed. To determine the amount of the financial guarantee, an estimate shall be submitted to the City detailing the work to be accomplished and the cost thereof. The estimate shall be based on current costs. The City will review the estimate and, if acceptable, will establish the financial guarantee at 125 percent of the estimate to allow for inflation and administration expenses should the City have to complete the project.

B. Requirements of the monitoring program are as follows:
   1. Scientific procedures are to be used for establishing the success or failure of the project.

2. Monitoring reports prepared by a wetland specialist are to be submitted for Department review. Monitoring reports shall include discussions of wildlife utilization of the site, vegetation establishment, water quality, water flow, stormwater storage and conveyance, and existing or potential degradation, according to the following schedule:
    a. At completion of construction of mitigation project (as-built report);
    b. Thirty days after completion;
    c. Early in the first growing season after construction;
    d. End of the first growing season after construction;
    e. Twice the second year; and
    f. Annually after the second year.
3. Monitor for a period of time appropriate to the nature of the project (single-family versus commercial) and the complexity of the mitigation project. The majority of monitoring programs will last a minimum of five years.
4. The City will require a Right of Entry Form, as set forth in Appendix 14.10.140 C, be recorded that allows City staff access to the mitigation area through completion of the monitoring program.
5. Correct for failures in the mitigation project.
6. Replace dead or undesirable vegetation with appropriate plantings.
7. Repair damages caused by erosion, settling, or other geomorphological processes.
8. If necessary, redesign mitigation project and implement the new design.
9. Correction procedures shall be approved by a wetland specialist and the Department Director or designee.

V. HYDROLOGY MONITORING GUIDELINES

A. Applicants are required to ensure that the proposed development does not result in adverse impacts to regulated wetland and/or buffers. To achieve this, an applicant must provide detailed hydrologic calculations, completed by a licensed Civil Engineer or hydrologist which shows the project will either:
    1. Match the predevelopment contributing basin flow quantities and durations; or
    2. That any identified changes will not adversely impact the wetland or wetland buffer.
B. The existing hydroperiod of the onsite wetland(s) shall be established through direct monitoring or computer estimation. Monitoring may be accomplished by the use of a continuous recording level gage or a combination of a crest stage and staff gage. Computer estimation may be either a time series model (for Category I and II wetlands) or a single-event model (for Category III and IV wetlands).
C. Additional guidance in the design of a project's stormwater plan can be found in the Puget Sound Wetlands and Stormwater Management Research Program and in the "Wetland Hydrology Management Guidelines" included as Appendix A of the document entitled "Sensitive Areas Mitigation Guidelines" prepared by King County Department of Development and Environmental Services.

14.30.070 Appendices.

APPENDIX F
EDGEWOOD WETLANDS RATING FORM*
OFFICE DATA SECTION

Background Information:

Name of Rater: _____ Affiliation: _____ Date: _____

Application No./Case No.: _____ Project Name: _____

Project Location: _____ Parcel No.(s): _____

Property Owner Name: _____

Property Owner Address:_____

Location: ___ ¼ Section of ___ ¼ Section, of Section ___, Township ___, Range ____, W.M., Edgewood, WA

SOURCE OF INFORMATION: (Check all sources that apply.)

Site Visit: _____ USGS Topo Map: _____ NWI Map: _____ Aerial Photo: _____ Soil Survey: _____

Edgewood Inventory: _____ Edgewood Drainage Map: _____ Other: _____

When the Office and/or Field Data Forms are completed enter category here: _____

ANSWER ALL QUESTIONS BELOW. If the source agency identifies the wetland as satisfying any of the questions below, circle the category in "CATEGORY" column.	**DATA SOURCE**	**CATEGORY** (the highest qualifies)
Does the wetland contain federal- or state-listed threatened or endangered plant species; or, is the wetland a historic location of a plant species potentially extirpated from Washington?	DNR (Natural Heritage) U.S. Fish & Wildlife Service	Yes: Category I No: Next Question
Is the wetland associated with documented habitat for endangered or threatened plant, fish, or animal species or for potentially extirpated plant species recognized by State or Federal agencies?	Wash. Dept. of Wildlife Wash. Dept. of Fisheries U.S. Fish & Wildlife Service	Yes: Category I No: Next Question
Is the wetland already on record with the Washington Natural Heritage Program as a high quality native wetland?	DNR (Natural Heritage)	Yes: Category I No: Next Question
Is the wetland documented as a Category I Wetland of Local Significance? (None currently designated.)	Local Government	Yes: Category I No: Next Question
Does the wetland contain sensitive plant species recognized by federal or state agencies?	DNR (Natural Heritage) U.S. Fish & Wildlife Service	Yes: Category II No: Next Question

Does the wetland contain documented habitats of sensitive fish species recognized by federal or state agencies?	Wash. Dept. of Wildlife Wash. Dept. of Fisheries U.S. Fish & Wildlife Service	Yes: Category II No: Next Question
Does the wetland contain priority species or habitats documented by Washington Department of Wildlife's Priority Habitats and Species Program?	Wash. Dept. of Wildlife	Yes: Category II No: Next Question
Is the wetland documented as a Category II Wetland of Local Significance? (None currently designated.)	Local Government	Yes: Category II No: Go to Wetlands Rating Field Data Form
Is the wetland documented as a Category III Wetland of Local Significance? (None currently designated.)	Local Government	Yes: Category III No: Go to Wetlands Rating Field Data Form

*Adapted from Washington State Wetlands Rating System for Western Washington, Second Edition, August 1993 (publ. #93-74), developed by the Washington State Department of Ecology.

EDGEWOOD WETLANDS RATING FORM

FIELD DATA SECTION

Background Information:

Name of Rater: _____ Affiliation: _____ Date of Field Visit: _____

Application No./Case No.: _____ Project Name: _____

Project Location: _____ Parcel No.: _____

Property Owner Name: _____

Property Owner Address:_____

Location: ___ ¼ Section of ___ ¼ Section, of Section _____, Township ____, Range ____, W.M., Edgewood, WA

SOURCE OF INFORMATION: (Check all sources that apply).

Site Visit: _____ USGS Topo Map: _____ NWI Map: _____ Aerial Photo: _____ Soil Survey: _____

Edgewood Inventory: _____ Edgewood Drainage Map: _____ Other: _____

WHEN THE FIELD DATA FORM IS COMPLETE ENTER CATEGORY HERE: _____

	Circle Answers
Q.1. High Quality Natural Heritage Wetland Answer this question if you have adequate information or experience to do so. If not, find someone with the expertise to answer the questions. Then, if the answer to questions 1a, 1b, and 1c are all NO, contact the Natural Heritage Program of DNR to determine if it qualifies as a Natural Heritage wetland.	
1a. Human-Caused Disturbances Is there significant evidence of human-caused changes to topography or hydrology of the wetland ? Significant changes <u>could</u> include clearing, grading, filling, logging of the wetland or its immediate buffer, culverting, ditching, dredging, diking, or drainage of the wetland. Briefly describe the changes, their date of occurrence, and your information source(s): _____ _____ _____	Yes: Go to Q.3 No: Go to 1b.
1b. Are there populations of non-native plants which are currently present and appear to be invading native populations? Briefly describe any non-native plant populations and information source(s): _____ _____ _____	Yes: Go to Q.3 No: Go to 1c.
1c. Is there significant evidence of human-caused disturbance of the water quality of the system? Degradation of water quality could be evidenced by culverts entering the system, direct road/parking lot runoff, evidence of historic dumping of wastes, oily sheens, extreme eutrophic conditions, livestock use, or dead fish, etc. Briefly describe: _____ _____ _____	Yes: Go to Q.3 No: Possible Category I
Q.2. Regionally Rare Native Wetland Communities Edgewood has not yet developed any methodology for identifying regionally rare native wetland communities.	

Q.3. Irreplaceable Ecological Functions	No to all: go to Q.4
Does the wetland:	
▪ have at least ½ acre of contiguous peat wetland;	Yes: go to 3a.
▪ or, have a forested component > one acre in size;	Yes: go to 3b.
▪ or, have characteristics of an estuarine system;	Yes: go to 3c.
▪ or, have eel grass, floating or nonfloating kelp beds;	Yes: go to 3d.
▪ or, have spring fed hydrology?	Yes: go to 3e.
3a. Peat Wetlands	
3a1. Does at least ½ acre of the contiguous peat wetland have < 25% areal cover of any combination of species from Table 1 in the List of Invasive/Exotic Species, and have < 80% areal cover of *Spiraea douglasii*?	Yes: Category I No: go to Q.4
3b. Forested Wetlands	
3b1. Is the forested wetland a monotypic stand of red alder or black cottonwood with an average dbh of less than 8 inches?	Yes: Category III No: go to 3b2.
3b2. Is the average age of dominant trees in the forested wetland > 80 years?	Yes: Category I No: go to 3b3.
3b3. Is the average age of dominant trees in the forested wetland 50 to 80 years, AND is the structural diversity high, as characterized by a multi-layer community of trees > 50 feet tall, trees 20 to 49 feet tall, shrubs, and herbaceous ground cover?	Yes: go to 3b4. No: go to 3b5.
3b4. Is > 50% (areal cover) of the dominant plants in one or more layers (canopy, young trees, shrubs, and herbs) invasive/exotic plant species from the Table 1 list?	Yes: Category II No: Category I
3b5. Does the forested wetland contain three canopy layers (trees over 20 feet tall, shrubs or saplings, and herbaceous ground covers)?	Yes: Category II No: go to Q.5
3c. Estuarine Wetlands	
3c1. Is the wetland listed as National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park, or Educational, Environmental or Scientific Reserves designated under WAC332-30-151?	Yes: Category I No: go to 3c2
3c2. Is the wetland > 5 acres?	
▪ or, is the wetland 1 to 5 acres;	Yes: Category I
▪ or, is the wetland < 1 acre?	Yes: go to 3c3.
3c3. Does the wetland meet at least 3 of the following 4 criteria:	Yes: go to 3c4.
▪ minimum existing evidence of recent (since 1992) human-related disturbance such as diking, ditching, filling, cultivation, grazing, or the presence of non-native plant species (see guidance for definition);	Yes: Category I No: Category II
▪ surface water connection with tidal saltwater or tidal freshwater;	
▪ at least 75% of the wetland has a 100-foot buffer of ungrazed pasture, open water, shrub, or forest;	Yes: Category II
▪ have at least 3 of the following features: low marsh, high marsh, tidal channels, lagoon(s), woody debris, or contiguous freshwater wetland?	No: Category III

3d. Eelgrass and Kelp Beds	
3d1. Are eelgrass beds present?	Yes: Category I No: go to 3d2.
3d2. Are there floating or non-floating kelp bed(s) present with greater than 50% macro algal cover in the month of August or September?	Yes: Category I No: Category II
3e. Significant Spring Fed Wetland Systems	
3e1. Is the spring fed wetland system at least ½ acre in size?	Yes: Category II No: go to Q.4.
Q.4. Category II and IV Wetlands	
4a. Is the wetland associated with year-round or intermittent salmonid fish bearing waters? Briefly describe source of information: _____ _____ _____	Yes: Category II No: go to 4b.
4b. Is the wetland less than or equal to 1 acre in size, hydrologically isolated, and comprised of one wetland class that is dominated by one plant species (monotypic vegetation)? • Monotypic vegetation is defined as greater than 80% areal cover by one plant species. • Hydrologically isolated wetland means a wetland which is not contiguous to any 100-year flood plain of any water type; and, has no contiguous surface hydrology, hydric soil, or hydrophytic vegetation between the wetland and any other wetland or stream system.	Yes: Category IV No: go to Q.5.
Q.5. Wetlands with significant habitat value based on the following specific diversity and size criteria.	
5a. Is the wetland 10 acres or greater in size and have 2 or more wetland classes, together with open water, at any time during the normal year?	Yes: Category II No: go to 5b.
5b. Is the wetland 10 acres or greater in size, have 3 or more wetland classes, and 5 or more subclasses of vegetation in a dispersion pattern?	Yes: Category II No: go to 5c.
5c. Is the wetland 5 acres or greater in size, 40 to 60% open water at any time during a normal year, and 2 or more subclasses of vegetation in a dispersed pattern?	Yes: Category II No: go to Q.6.

Q.6. Wetlands with significant habitat value based on the following specific diversity and size criteria and significant use by fish and wildlife. Answer all questions and enter data requested:		**Circle Scores That Qualify**
6a. Total Wetland Area Estimate area, select from choices in the near right column, and score in the far right column: Enter acreage of wetland (including estimate of offsite acreage) here: _____ acres source: _____	Acres > 20.00 10 - 19.99 5 - 9.99 1 - 4.99 0.1 - 0.99 < 0.1	 Yes = 6 Yes = 5 Yes = 4 Yes = 3 Yes = 2 Yes = 1

6b. Wetland Community Types (include observations of offsite wetland area)

Circle the wetland community types below that qualify:

Open Water: If the area of open water is > ½ acre, or > 10% of the total wetland area.
Source: _____
Aquatic Beds: If the area of aquatic beds are > 10% of the open water area, or > ½ acre.

Emergent: If the area of emergent community type is > ½ acre, or > 10% of the total wetland area.

Scrub-Shrub: If the area of scrub-shrub community type is > ½ acre, or 10% of the total wetland area.

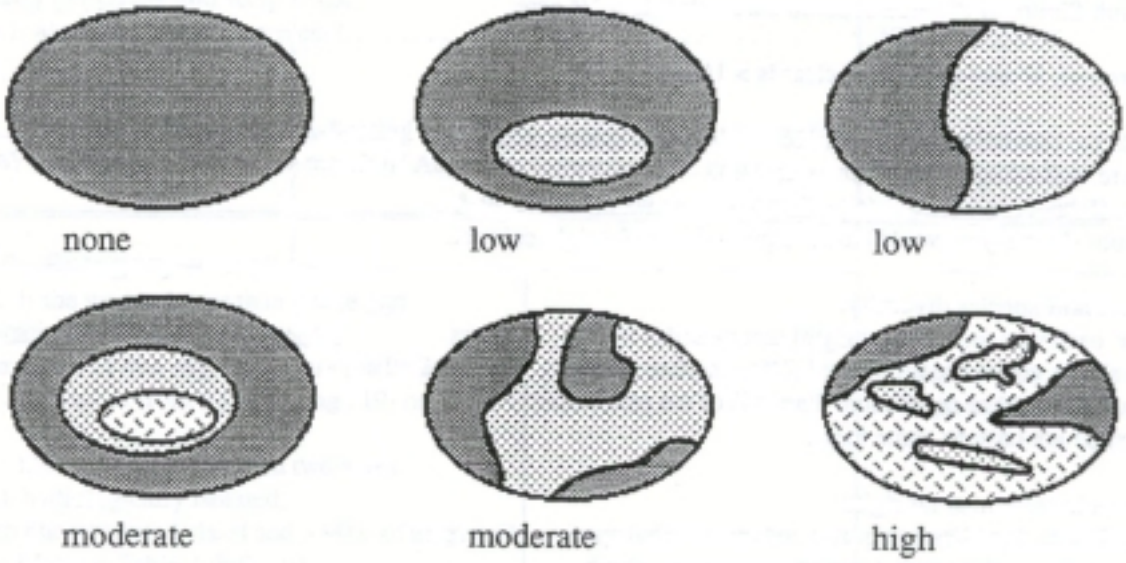
Forested: If the area of forested community type is > ½ acre, or 10% of the total wetland area.

Add the number of wetland community types above that qualify, and then score according to the columns at right. e.g., If there are 4 community types (aquatic beds, open water, emergent, and scrub-shrub), you would circle 7 points in the far right column.	# of Community Types 1. 2. 3. 4. 5.	 Yes = 1 Yes = 3 Yes = 5 Yes = 7 Yes = 10
6c. Plant Species Diversity (include observations of offsite wetland area) For all wetland community types (at right) that qualify in 6b. above, count the number of different plant species you can find. You do not have to name them. Score in column at far right: e.g., If a wetland has aquatic bed community type with 3 species, an emergent community type with 4 species, and a scrub-shrub community type with 2 species you would circle 2, 2, and 1 in the far column.	# of Community Type Species Aquatic Bed 1 - 2 " " 3 " " >3 Emergent 1 - 2 " 3 - 4 " >4 Scrub-Shrub 1 - 2 " " 3 - 4 " " >4 Forested 1 - 2 " 3 - 4 " >4	 Yes = 1 Yes = 2 Yes = 3 Yes = 1 Yes = 2 Yes = 3 Yes = 1 Yes = 2 Yes = 3 Yes = 1 Yes = 2 Yes = 3

6d. Structural Diversity (include observations of offsite wetland area)

If the wetland has a forested community type, add 1 point for each of the following:

trees > 50 feet tall	Yes = 1
trees 20 feet to 49 feet tall	Yes = 1
shrubs/saplings	Yes = 1
herbaceous ground cover	Yes = 1

6e. Decide from the diagrams below whether <u>interspersion between wetland community types</u> is high, moderate, low, or none?  	High = 3 Moderate = 2 Low = 1 None = 0
6f. Habitat Features (include observations of offsite wetland areas) Answer questions below, circle features that apply, and score to right: Is there evidence of current use by beavers? Is a heron rookery located within 300 feet? Are raptor nest(s) located within 300 feet? Are there at least 3 standing dead trees (snags) per acre? Are any of these standing dead trees (snags) > 10 inches in diameter? Are there any other perches (wires, poles, or posts)? Are there at least 3 downed logs at least 10' in length with a diameter >6" per acre (include observations of offsite wetland areas)?	 Yes = 3 Yes = 2 Yes = 1 Yes = 1 Yes = 1 Yes = 1 Yes = 1
6g. Connection to streams Is the wetland connected at any time of the year via surface water to a seasonal stream? The connection could be during flood events, via a natural or manmade channel, culvert, or an area of open water.	Yes = 1

6h. Adjacent Land-Uses and Buffers			
Step 1	**Step 2**	**Step 3**	
Estimate (to the nearest 5 %) the percent of each land use or buffer type (below) that adjoins the wetland boundary. Then multiply the percent(s) by the factor(s) below and enter result in column to right:	Multiply result(s) of step 1: by 1, if buffer width is 25 - 50 feet; by 2, if buffer width is 50 - 100 feet; by 3, if buffer width is > 100 feet. Enter results below and add subscores:	Score points according to table below: Buffer Total:	
roads, buildings, or parking lots: % _____ x 0 =	_____ x _____ = _____	900 - 1,200	Yes = 4
lawn, grazed pasture, vineyards, or annual crops: % _____ x 1 =	_____ x _____ = _____	600 - 899	Yes = 3
ungrazed grassland or orchards: % _____ x 2 =	_____ x _____ = _____	300 - 599	Yes = 2
open water or native grasslands: % _____ x 3 =	_____ x _____ = _____	100 - 299	Yes = 1
forest or shrub: % _____ x 4 =	_____ x _____ = _____		
	Add buffer total: _____		

6i. Connection to other habitat areas:	
Is there a riparian corridor to other wetlands within 0.25 of a mile; or, a corridor > 100 feet wide with good forest or shrub cover to any other habitat area[(1)]?	Yes = 5
Is there a narrow corridor < 100 feet wide with good cover; or, a wide corridor > 100 feet wide with low cover to any other habitat area?	Yes = 3
Is there a narrow corridor < 100 feet wide with low cover; or, a significant habitat area within 0.25 mile but no corridor?	Yes = 1
Is the wetland and buffer completely isolated by development and or cultivated agricultural land?	Yes = 0

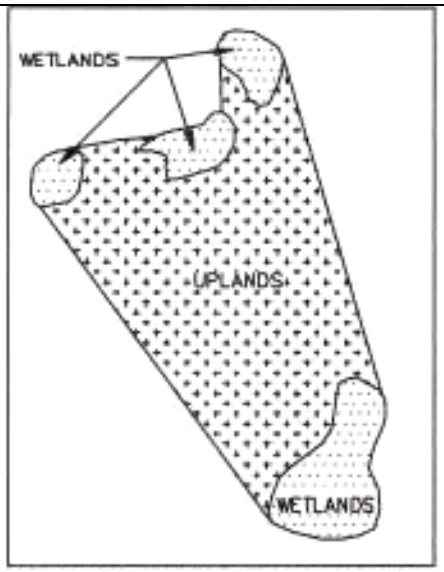
Add the scores circled (for Q.6a. - Q.6i. above) to get a total:	Total = _____
Is the total greater than or equal to 22 points:	Yes: Category II No: Category III

(1) "For purposes of this rating form the term "Habitat area" means any forested, shrub, and herbaceous areas that could be used by wildlife species that use wetlands to provide a part of their life cycle needs.

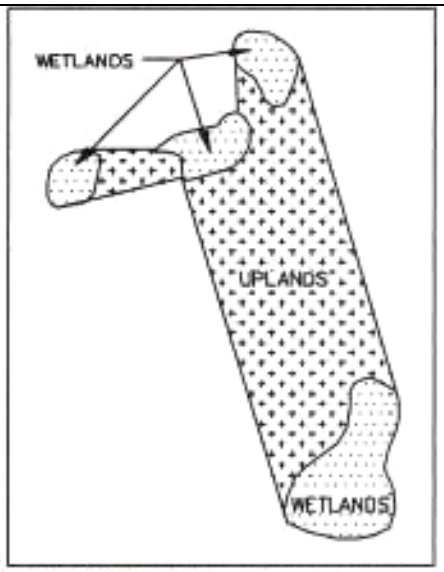
TABLE 1

List of invasive/exotic plant species for Question 3a1 (peat wetlands), question 3b3 (forested wetlands), and question 4b (Category IV wetlands). This list is provided for use with the field data form.

Scientific Name	**Common Name**
Agropyron repens	Quackgrass
Alopecurus pratensis, A. aequalis	Meadow foxtail
Arctium minus	Burdock
Bromlus tectorum, B. rigidus, B. brizaeformis, B. secalinus, B. japonicus, B. mollis, B. commutatus, B. inermis, B. erectus	Bromes
Cenchrus longispinu	Sandbur
Centaurea solstitiallis, C. repens, C. cyanus, C. maculosa, C. diffusas	Knapweeds
Cirsium vulgare, C. arvense	Thistle
Cynosurus cristatus, C. echinatus	Dogtail
Cytisus scoparius	Scotch broom
Dactylis glomerata	Orchard grass
Dipsacus sylvestris	Teasel
Digitaria sanguinalis	Crab grass
Echinochloa crusgalli	Barnyard grass
Elaeagnus augustifolia	Russian olive
Euphorbia peplus, E. esula	Spurge
Festuca arundinacea, F. pratensis	Fescue
Holcus lanatus, H. mollis	Velvet grass
Hirdeum jubatum	Foxtail barley
Hypericum perforatum	St. John's wort
Juncus effusus	Soft rush
Lolium perenne, L. multiflorum, L. temulentum	Ryegrass
Lotus corniculatus	Birdsfoot trefoil
Lythrum salicaria	Purple loosestrife
Matricaria matricarioides	Pineapple weed
Medicago sativa	Alfalfa
Melilotus alba, M. officinalis	Sweet clover
Phalaris arundinacea	Reed canary grass
Phleum pratense	Timothy
Phragmites communis	Reed
Poa compressa, P. palustris, P. pratensis	Bluegrass
Polygonum aviculare, P. convolvulus, P. cuspidatum, P. lapathifolium, P. persicaria	Knotweeds
Ranunculus repens	Buttercup
Rubus discolor, R. laciniatus, r. vestitus, R. macrophyllus	Non-native blackberry
Salsola kali	Russian thistle
Sataria viridis	Green bristlegrass
Sisymbrium altissimum, S. loeselii, S. officinale	Tumblemustards
Tanactum vulgare	Tansy
Trifolium dubium, T. patense, T. repens, T. arvense, T. subterraneum, T. hybridum	Clovers
Cultivated species:	Wheat, Corn, Barley, Rye, etc.

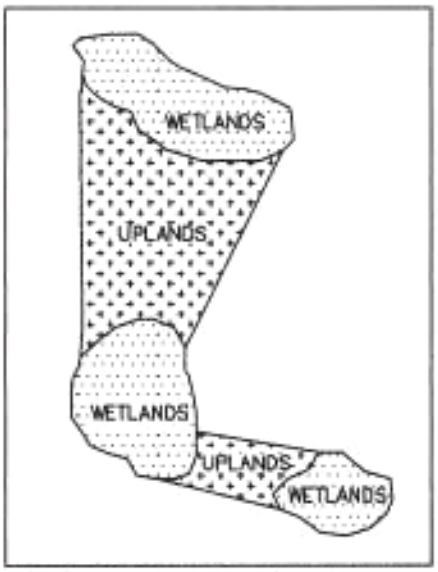


UNACCEPTABLE METHOD OF CONNECTING MOSAIC PATTERN WETLANDS



ACCEPTABLE METHOD OF CONNECTING MOSAIC PATTERN WETLANDS

EXAMPLE ONE



UNACCEPTABLE METHOD OF CONNECTING MOSAIC PATTERN WETLANDS

ACCEPTABLE METHOD OF CONNECTING MOSAIC PATTERN WETLANDS

EXAMPLE TWO

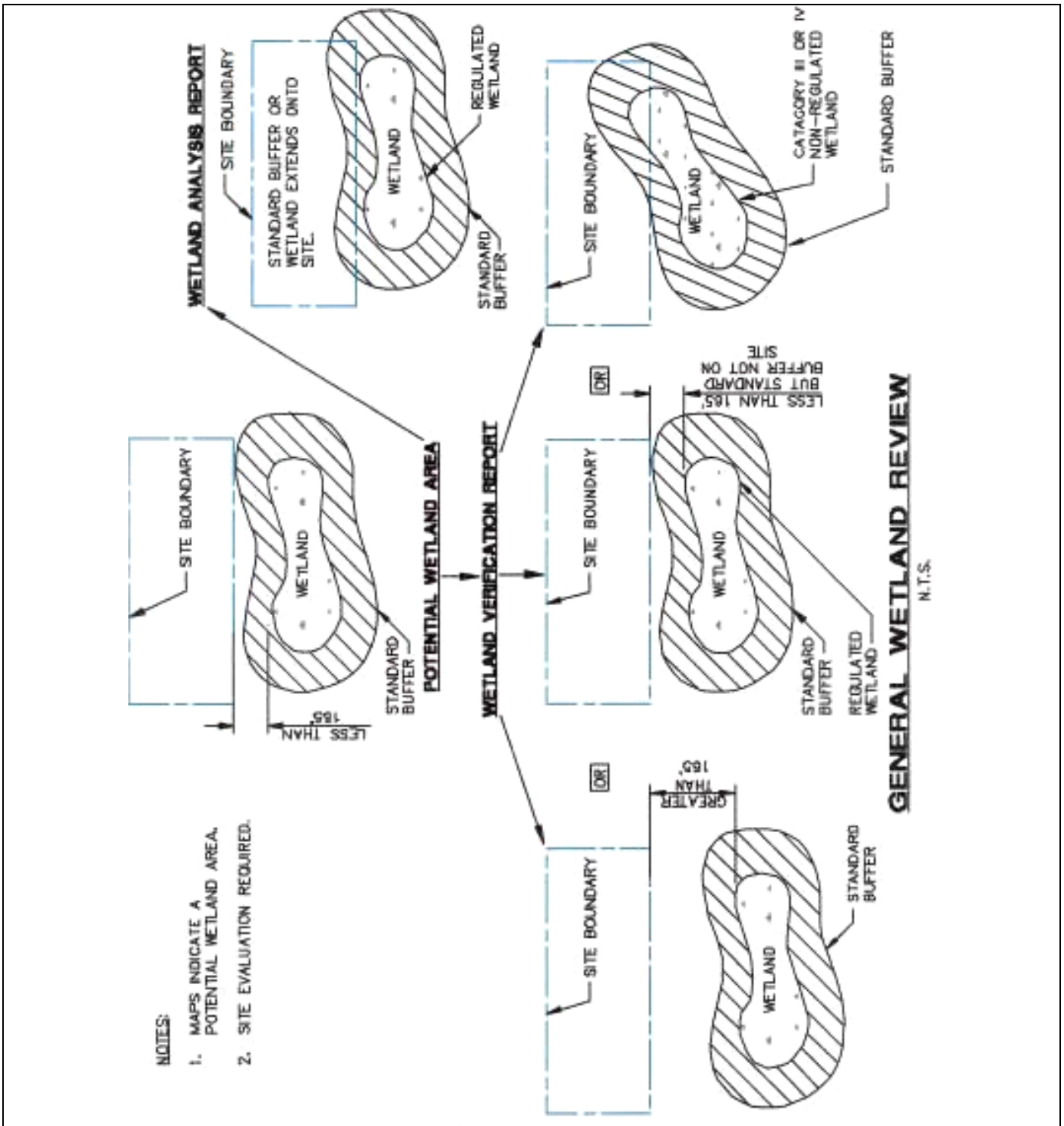
CONNECTING MOSAIC PATTERN WETLANDS

N.T.S.

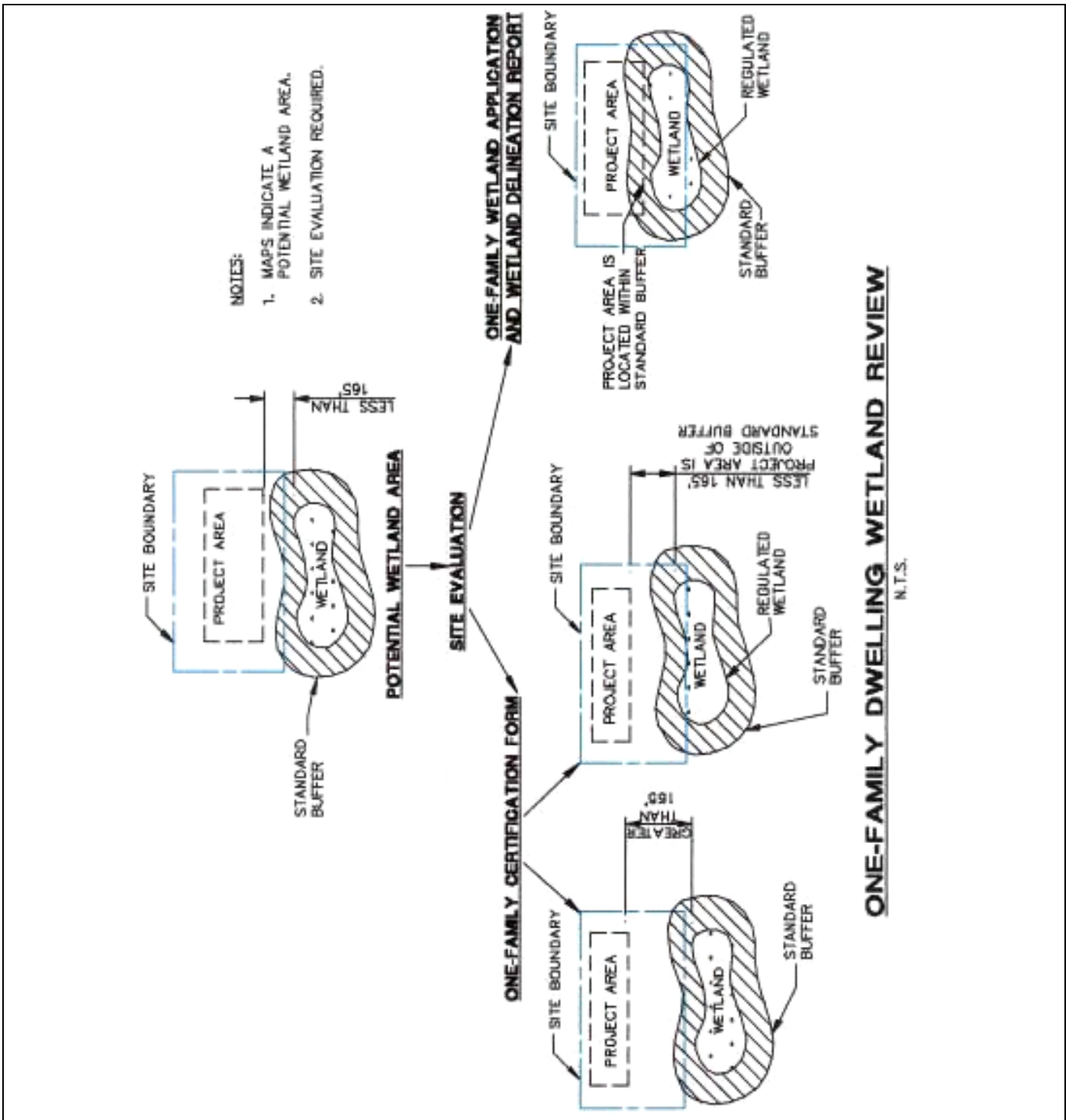
City of Edgewood
Community Development Department
2221 Meridian Avenue East
Edgewood, WA 98371 (253) 952-3299

CONNECTING MOSAIC PATTERN WETLANDS

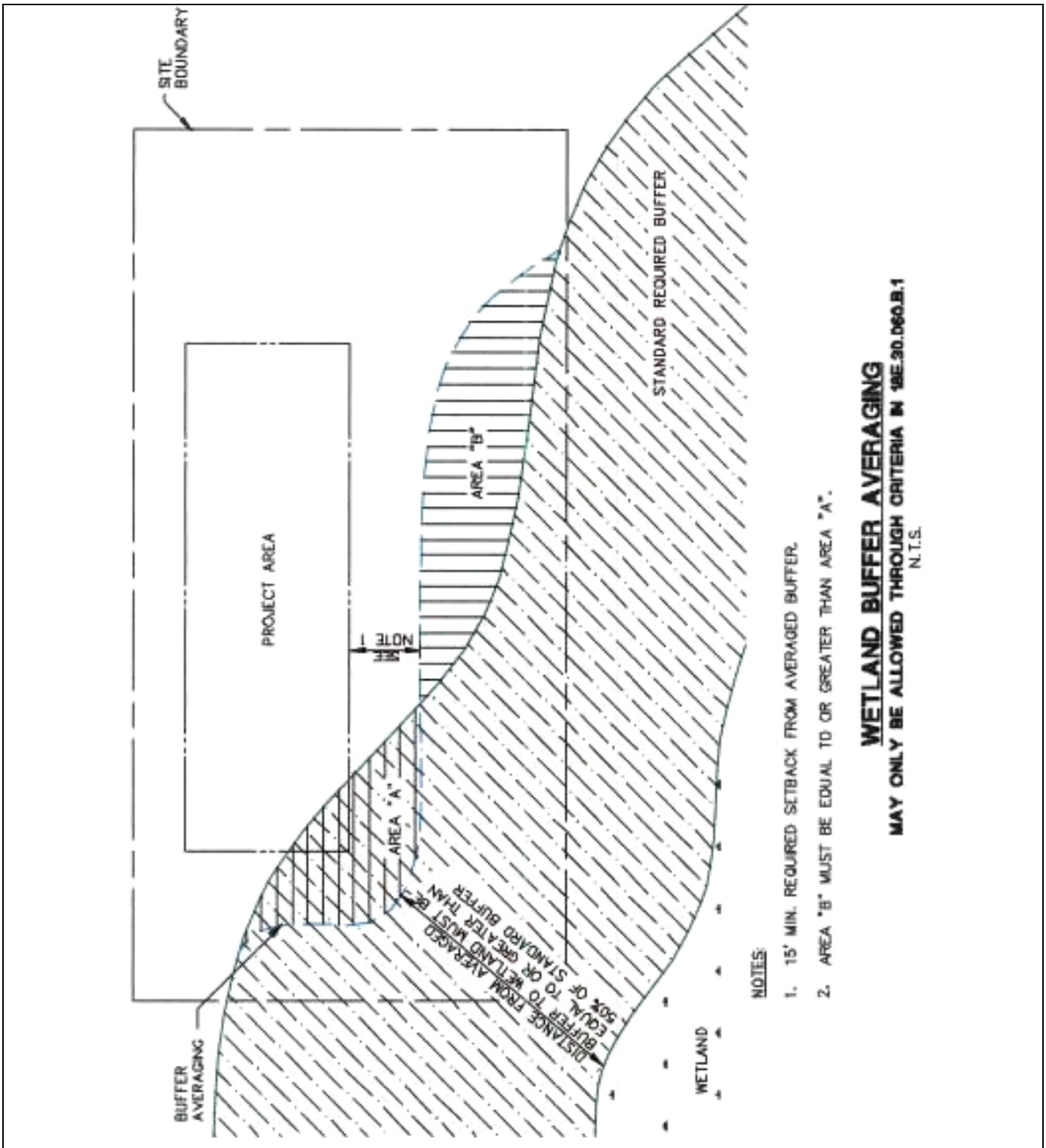
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	FIGURE 14.30-1



City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**GENERAL WETLAND REVIEW**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.30-2**



City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**SINGLE-FAMILY DWELLING WETLAND REVIEW**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.30-3**



City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**	**WETLAND BUFFER AVERAGING**		
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.30-4**

Chapter 14.40

CRITICAL FISH AND WILDLIFE HABITAT AREAS

Sections:

14.40.010 Purpose.
14.40.020 Critical Fish and Wildlife Species and Habitat Areas.
14.40.030 Critical Fish and Wildlife Habitat Area Review Procedures.
14.40.040 Critical Fish and Wildlife Habitat Area Standards.
14.40.050 Mitigation Requirements.
14.40.060 Buffer Requirements.
14.40.070 Appendices.
A. Habitat Assessment Letters.
B. Habitat Assessment Studies.
C. Habitat Assessment Reports.
14.40.080 Figures.
14.40-1 Habitats of Local Importance Priority Oregon White Oak Woodlands.
14.40-2 Examples of Potential Critical Fish and Wildlife Habitat Areas.
14.40-3 Critical Fish and Wildlife Habitat Area Review Procedures.
14.40-4 Riparian Buffer Extension Adjacent to Wetland.
14.40-5 Riparian Buffer Extension Landslide Hazard Buffer Area.

14.40.010 Purpose.

Many land use activities can impact the habitats of fish and wildlife. Special care must be taken in the management of lands that support critical fish and wildlife species to ensure that development occurs in a manner that is sensitive to their habitat needs. The purpose of this Chapter is to identify critical fish and wildlife species and habitats and establish habitat protection procedures and mitigation measures that are designed to minimize any negative impacts associated with new development or regulated activities.

14.40.020 Critical Fish and Wildlife Species and Habitat Areas.

A. **General.** Critical fish and wildlife habitat areas are those areas that support critical fish and wildlife species, typically identified either by known point locations of specific species (such as a nest or den) or by habitat areas or both.

B. **Federally and State Listed Species and their Associated Habitats.** Areas which have a primary association with Federally- or State-listed endangered, threatened, or sensitive species of fish or wildlife (specified in 50 CFR 17.11, 50 CFR 17.12, WAC 232-12-011, and WAC 232-12-014) and which if altered may reduce the likelihood that the species will survive and reproduce over the long term. The list of endangered, threatened, or sensitive species is maintained and located at http://www.wa.gov/wdfw/wlm/diversty/soc/soc.htm.

C. **Species of Local Importance.** In addition to Federally- and State-listed species, the following fish and wildlife species and their associated habitat areas shall be regulated under this Chapter:

Fish. Coho salmon, pink salmon, chum salmon, sockeye salmon, cutthroat trout, steelhead.
Birds. Herons.

D. **Habitats of Local Importance.**

1. Areas with which State-listed monitor or candidate fish or wildlife species or Federally-listed candidate fish or wildlife species have a primary association (habitat areas and

point locations), as specified in Washington Department of Wildlife Policies 4802 and 4803, and which if altered may reduce the likelihood that the species will survive and reproduce over the long term. The list of endangered, threatened, or sensitive species is maintained and located at http://www.wa.gov/wdfw/wlm/diversty/soc/soc.htm.

2. Documented habitat areas or potential habitat areas and point locations for fish and wildlife species. These areas include specific habitat types, which are infrequent in occurrence in Edgewood and may provide specific habitats with which endangered, threatened, sensitive, candidate, or monitor fish and wildlife species have a primary association, such as breeding habitat, winter range, and movement corridors. These areas include the following:
    a. Oregon white oak trees and woodlands. Oregon white oak woodlands, stands, and individual trees meeting the following criteria shall be considered priority habitat and shall be subject to protection under the provisions of this Chapter:
        (1) Priority Oregon White Oak Woodlands. Stands of Oregon white oak or oak/conifer associations where the stand is at least one acre in size and the canopy coverage of the oak component of the stand is greater than or equal to twenty-five percent (see Figure 14.40-1).
        (2) Significant Oaks and Stands. Single oaks, or stands of oaks smaller than one acre in size, when any of the following criteria are met:
            (a) Individual trees having a diameter at breast height of 20 inches or more; or
            (b) Oregon white oak stands in which the oak trees have an average diameter at breast height of 15 inches or more regardless of stand size.
    b. Old growth/mature forests.
    c. Caves.
    d. Cliffs.
    e. Snag-rich areas and logs.
    f. Waters of the State and/or natural waters and adjacent shoreline areas (200 feet landward measured from the ordinary high water mark) including:
        (1) All water bodies classified by the Washington Department of Natural Resources (DNR) water typing classification system as detailed in WAC 222-16-030 & 031.
        (2) All waters that support critical fish or wildlife species (i.e., areas that have connectivity to fish bearing waters and may potentially provide habitat given no natural barriers to fish passage).
        (3) Ponds and their submerged aquatic beds.
    f. Wetlands (refer to Chapter 14.30).
    g. Heron rookeries.

E. **Potential Critical Fish and Wildlife Habitat Areas.** Potential critical fish and wildlife habitat areas, as depicted on the Critical Areas Atlas-Critical Fish and Wildlife Habitat Area Maps, are those areas where the suspected presence of critical fish or wildlife species is sufficient to require critical fish or wildlife habitat area review (see Figure 14.40-2). Potential critical fish and wildlife habitat areas are determined using the following criteria:

1. A habitat area identified on one of the maps listed in 14.10.140 - Appendix A. (includes but is not limited to breeding habitat, winter ranges, movement corridors, oak woodlands, streams, ponds, etc., as outlined in Section 14.40.020 A-D above) plus the adjacent 200 feet surrounding the habitat area.

2. A point location identified on one of the maps listed in 14.10.140 Appendix A (including but not limited to nests, dens, rookeries, etc.) plus the adjacent 800 feet surrounding the point location.

14.40.030 Critical Fish and Wildlife Habitat Area Review Procedures.

A. **General Requirements.**

1. The City's Critical Areas Atlas-Critical Fish and Wildlife Habitat Area Maps provide an indication of where potential critical fish and wildlife habitat areas are located within the City. The presence or location of a potential critical fish or wildlife species, habitat area, or point location that has not been mapped, but that may be present on or adjacent to a site, shall be determined using the procedures and criteria established in this Chapter.
2. The Department will complete a review of the Critical Areas Atlas - Critical Fish and Wildlife Habitat Area Maps and other source documents for any proposed regulated activity to determine whether the site for the regulated activity is located within a potential critical fish or wildlife habitat. Identification of a potential critical fish or wildlife habitat area may also occur as a result of field investigation conducted by Department or Washington Department of Fish and Wildlife (WDFW) staff.
3. When the Department's maps, sources, or field investigation indicates that the site for a proposed regulated activity is located within a potential critical fish or wildlife habitat area, the Department shall require the submittal of a critical fish and wildlife application and habitat assessment to determine the presence or absence of critical fish or wildlife species or habitat. The habitat assessment shall be documented as set forth in Subsection 14.40.030 B, below (see Figure 14.40-3).
4. The requirement to conduct a habitat assessment may be waived by the Department when the Department determines that no other critical fish and wildlife species and habitats, as set forth in Section 14.40.020, are present. The applicant shall be required to comply with the standards set forth in Section 14.40.040 C.
5. Projects undergoing review for critical fish and wildlife habitat areas shall be routed to tribal agencies with jurisdiction for review. Tribes will have an opportunity to provide specific habitat information on proposed development sites. If necessary, the Department will seek additional assistance from the Washington Department of Fish and Wildlife and similar appropriate State and Federal agencies.
6. Approval of a critical fish and wildlife application shall be granted upon a determination that the habitat assessment and mitigation plan, if applicable, are thorough and accurate and meet all requirements of this Title.
7. If application of the standards contained in this Chapter would deny all reasonable use of a site, the applicant may pursue a Reasonable Use Exception as set forth in Section 14.20.050.
8. Unless otherwise stated in this Chapter, the critical area protective measure provisions contained in Section 14.10.080 shall apply.

B. **Habitat Assessment.** A habitat assessment is a site investigation process to evaluate the presence or absence of a potential critical fish or wildlife species or habitat affecting a subject property.

1. The applicant may select either a fish or wildlife biologist, as applicable, or Department staff to conduct a habitat assessment to determine whether or not a critical fish or wildlife habitat area, point location, and any associated buffer are located on the site for a proposed development as outlined below:

a. Applicants for single-family dwellings or agricultural activities may retain Department staff to complete the habitat assessment as follows:
   (1) Requests for Department staff to conduct a habitat assessment shall be accompanied with a critical fish and wildlife habitat area application and associated fee(s).
   (2) If Department staff conducts the habitat assessment and determines that no critical fish or wildlife habitat areas, point locations, or associated buffers are present on the site, then the critical fish and wildlife habitat area review will be considered complete.
   (3) If Department staff conducts the habitat assessment and determines that critical fish or wildlife habitat areas, point locations, or associated buffers are present on the site, then the applicant shall be required to submit a habitat assessment study or a habitat assessment report as outlined in Subsection 14.40.030 B(1)b. This requirement may be waived if the applicant agrees to comply with the standards set forth in Section 14.40.040 and the critical area protective measures set forth in Section 14.10.080.

b. If a fish or wildlife biologist conducts the habitat assessment, then the following documentation shall be submitted to the Department:
   (1) The habitat assessment shall be submitted in the form of a habitat assessment letter when the fish or wildlife biologist completes the field investigation and determines that a critical fish or wildlife habitat area, point location, or associated buffer is not located on the site. The habitat assessment letter shall meet the requirements contained in 14.40.070 Appendix A (see Figure 14.40-3).
   (2) The habitat assessment shall be submitted in the form of a habitat assessment study when the fish or wildlife biologist completes the field investigation and determines a critical fish or wildlife habitat area, point location, or associated buffer is located on the site and when the proposed regulated activity complies with the standards set forth in Section 14.40.040 and the buffer requirements as set forth in Section 14.40.060. The habitat assessment study shall meet the requirements contained in 14.40.070 Appendix B (see Figure 14.40-3).
   (3) The habitat assessment shall be submitted in the form of a habitat assessment report when the fish or wildlife biologist completes the field investigation and determines a critical fish or wildlife habitat area, point location, or associated buffer is located on the site and when the proposed development activity does not or cannot comply with the standards set forth in Section 14.40.040 and the buffer requirements as set forth in Section 14.40.060. The habitat assessment report shall meet the requirements contained in 14.40.070 Appendix C (see Figure 14.40-3).
   (4) Habitat assessments shall be submitted to the Department for review and approval together with a critical fish and wildlife habitat area application and associated fee(s).
   (5) Habitat assessments shall be prepared, signed, and dated by a fisheries or wildlife biologist (as defined in Section 14.10.060), as applicable to the particular species or habitat type.
   (6) Habitat assessment reports shall address the mitigation requirements set forth in Section 14.40.050.

2. All habitat assessments submitted under the requirements of this Chapter shall, at a minimum, include the following:
    a. The parcel number of the subject property.
    b. The site address of the subject property, if one has been assigned by the City.
    c. The date and time when the site evaluation for the habitat assessment was conducted and the date when the habitat assessment was prepared.
    d. The credentials of the fish or wildlife biologist who prepared the habitat assessment.
    e. The mailing address and phone number of the property owner and the fish or wildlife biologist that prepared the habitat assessment.
    f. A detailed description of the vegetation on and adjacent to the site.
    g. Identification and a detailed description of any critical fish or wildlife species or habitats, as set forth in Section 14.40.020, on or adjacent to the site and the distance of such habitats or species in relation to the site. Describe efforts to determine the status of any critical species in the project area, including information on survey methods, timing, and results of surveys for species or suitable habitat identification.
    h. Include any information received from biologists with special expertise on the species or habitat type, such as WDFW, Tribal, USFS, or other local, regional, federal, and university fish, wildlife and habitat biologists and plant ecologists. Include any such conversations in the habitat assessment and cite as personal communication.
    i. A map showing the location of the site, including written directions.
    j. The Department may also require that the applicant request a separate evaluation of the site by WDFW staff to confirm the findings of the habitat assessment.
3. Hold harmless clauses, disclaimers, and limitations are not allowed within a habitat assessment letter.
4. The Department shall review the habitat assessment and either:
    a. Accept the habitat assessment and approve the critical fish and wildlife application; or
    b. Reject the habitat assessment and notify the applicant in writing of the reasons why the habitat assessment was rejected.

14.40.040 Critical Fish and Wildlife Habitat Area Standards.

A. **General.**

1. Activities permitted under this section shall comply with the provisions of all other Chapters contained in this Title.
2. All proposed regulated activities shall comply with the buffer requirements contained in Section 14.40.060.
3. If the Department determines that mitigation is necessary to offset the identified impacts from a proposed development, the applicant shall comply with the mitigation requirements set forth in Section 14.40.050.
4. Unless otherwise allowed in this Chapter, all regulated activities shall be located outside critical fish and wildlife habitat areas and associated buffers.
5. A proposed regulated activity may be allowed within a critical fish or wildlife habitat area or required buffer when located on an existing lot of record that was created prior to the effective date of this ordinance subject to the following conditions:
    a. Applicants shall demonstrate there are no other feasible alternatives that would allow the proposed development to occur completely outside the critical fish or wildlife habitat area or the required associated buffer.

b. The development cannot be located outside the critical fish or wildlife habitat area or required buffer due to topographic constraints of the parcel or size and/or location of the parcel in relation to the limits of the critical fish or wildlife habitat area or required buffer.
c. If applicable, a building setback variance has been reviewed, analyzed, and rejected as a feasible alternative to encroachment into the critical fish or wildlife habitat area or associated buffer.
d. The proposed project complies with the standards set forth in this Section and has demonstrated through the submittal of a habitat assessment report that adequate mitigation as outlined in Section 14.40.050 has been provided.

B. **Riparian Areas, Ponds, and Associated Buffers.** The following specific regulated activities may occur within a riparian area, pond, or associated buffer subject to the following standards:

1. **Clearing and Grading.** When clearing and grading is permitted as part of an authorized regulated activity or as otherwise allowed in these standards, the following shall apply:
   a. Grading is allowed only during the dry season, which is typically regarded as beginning on May 1st and ending on October 1st of each year, the Department may extend or shorten the dry season on a case-by-case basis, determined on actual weather conditions.
   b. Filling or modification of a wetland or wetland buffer is permitted only if it is conducted as part of an approved wetland permit issued by the Department.
   c. The soil duff layer shall remain undisturbed to the maximum extent possible. Where feasible, any soil disturbed shall be redistributed to other areas of the project site.
   d. The moisture-holding capacity of the topsoil layer shall be maintained by minimizing soil compaction or reestablishing natural soil structure and infiltrative capacity on all areas of the site that impervious surfaces do not cover.
   e. Erosion and sediment control that meets or exceeds the standards set forth in the Edgewood Stormwater Management Manual shall be provided.
2. **Vegetation Removal, Disturbance, and Introduction.** Limited vegetation removal shall be allowed subject to the following standards:
   a. Hazard trees may be cut provided that:
      (1) The applicant submits a report from a certified arborist, licensed architect, or professional forester that documents the hazard and provides a replanting schedule for the replacement trees and receives written approval from the City authorizing the tree removal;
      (2) Tree cutting shall be limited to limbing and crown thinning, unless otherwise justified by the landowner's expert. Where limbing or crown thinning is not sufficient to address the hazard, trees should be topped to remove the hazard rather than cut at or near the base of the tree. All vegetation cuttings (tree stems, branches, tops, etc.) shall be left within the critical area or buffer unless removal is warranted due to the potential for disease transmittal to other healthy vegetation;
      (3) The landowner shall replace any trees that are felled or topped with new trees at a ratio of two replacement trees for each tree felled or topped. Tree species that are native and indigenous to the site shall be used;

(4) Hazard trees determined to pose an imminent threat or danger to public health or safety, or to public or private property, or serious environmental degradation may be removed or topped by the landowner prior to receiving written approval from the Department, provided that within 14 days following such action, the landowner shall submit the necessary report and replanting schedule demonstrating compliance with 14.40.040 B2a(1) through (3) above.

b. Trimming of vegetation for purposes of providing view corridors will be allowed provided that trimming shall be limited to view corridors of 20 feet in width or less, that no more than 30% of the live crown is removed, and that benefits to fish and wildlife habitat are not reduced. Trimming shall be limited to hand pruning of branches and vegetation. Trimming shall not include felling, topping, or removal of trees.

c. Limited vegetation and tree removal subject to the conditions contained in an approval for a regulated activity.

d. Introduced vegetation shall be limited to species that are native and historically indigenous to the site.

3. **Fencing.** Fencing shall be placed in such as manner as to maintain wildlife movement corridors and not create any fish passage blockages. The Department shall approve the location, type, and height of any proposed fencing.

4. **Shoreline Erosion Control Measures.** New or replacement shoreline erosion control measures shall be subject to the following standards:

a. The proposal complies with the provisions set forth in Chapter 14.110.

b. The applicant has submitted a habitat assessment report, as set forth in Section 14.40.030.

c. The habitat assessment report demonstrates the following:

(1) Natural shoreline processes will be maintained. The project will not result in increased beach erosion or alterations to, or loss of, shoreline substrate within 1/4 mile of the site.

(2) The shoreline erosion control measure will not adversely impact critical fish or wildlife habitat areas or associated wetlands.

(3) Adequate mitigation measures, as set forth in Section 14.40.050, are provided that ensure no net loss of intertidal or riparian habitat or function occurs as a result of the proposed shoreline erosion control measure.

(4) No alteration of intertidal migration corridors occurs as a result of the proposed shoreline erosion control measure.

5. **Streambank Stabilization.** Streambank stabilization to protect new structures from future channel migration is not permitted except when such stabilization is achieved through bioengineering or soft armoring techniques. Streambank stabilization shall comply with the provisions set forth in Chapter 14.70.

6. **Launching Ramps - Public or Private.** Launching ramps may be allowed when the applicant has submitted a habitat assessment report as set forth in Section 14.40.030 that has demonstrated the following:

a. The project will not result in increased beach erosion or alterations to, or loss of, shoreline substrate within 1/4 mile of the site.

b. The ramp will not adversely impact critical fish or wildlife habitat areas or associated wetlands.

c. Adequate mitigation measures, as set forth in Section 14.40.050, are provided that ensure no net loss of intertidal or riparian habitat or function occurs as a result of

the ramp.

d. No alteration of intertidal migration corridors as a result of the ramp.

7. **Docks.** Repair and maintenance of an existing dock or pier shall be permitted subject to the following:
   a. There is no increase in the use of materials creating shade for predator species;
   b. There is no expansion in overwater coverage;
   c. There is no new spanning of waters between 3 and 13 feet deep;
   d. There is no increase in the size and number of pilings; and
   e. There is no use of toxic materials (such as creosote) that come in contact with the water.
8. **Roads, Trails, Bridges, and Rights-of-Way.** Construction of trails, roadways, and minor road bridging (less than or equal to 30 feet wide) may be allowed subject to the following standards:
   a. There is no other feasible alternative route with less impact on the environment.
   b. The crossing allows for uninterrupted downstream movement of wood and gravel.
   c. Mitigation, pursuant to Section 14.40.050, for impacts is provided.
   d. Road bridges are designed according to the WDFW Habitat and Lands Environmental Division's Fish Passage Design at Road Culverts, March, 1999 and the NMFS Guidelines for Salmonid Passage at Stream Crossings, 2000.
   e. Trails and associated viewing platforms shall be made of pervious materials.
9. **Utility Facilities.**
   a. Installation of a utility is permitted if constructed in an existing, improved roadway, driveable surface or shoulder, subject to compliance with Pierce County road maintenance Best Management Practices (BMPs).
   b. New utility lines and facilities are permitted to cross watercourses if they comply with the following standards:
      (1) Avoid critical fish and wildlife habitat areas to the maximum extent possible.
      (2) Cross at an angle greater than sixty degrees to the centerline of the channel in streams or perpendicular to the channel centerline whenever boring under the channel is not feasible.
      (3) Crossings are contained within the footprint of an existing road or utility crossing where possible.
      (4) Avoid paralleling the stream or following a down-valley course near the channel.
      (5) Do not increase or decrease the natural rate of shore migration or channel migration.
      (6) Bore beneath the scour depth and hyporheic zone of the water body and Channel Migration Zone (CMZ) where feasible.
10. **Public Flood Protection Measures.** New public flood protection measures and expansion of existing ones may be approved, subject to the Department's review and approval of a habitat assessment report or the approval of a Federal Biological Assessment.
11. **Instream Structures.** A new instream structure (e.g., such as, but not limited to, high flow bypass, sediment ponds, instream ponds, retention and detention facilities, tide gates, dams, weirs, etc.) shall be allowed only as part of an approved mitigation or restoration project or watershed basin plan approved by the City and upon acquisition of any required State or Federal permits. The structure shall be designed to avoid modifying flows and water quality in ways that may adversely affect critical fish

species. Proposals for placement of water quality, water quantity, or other instruments or structures within a stream to gather data, or as a mitigation measure, shall be exempt from the provisions of this Title upon review and approval by the Department.

12. **Stormwater Conveyance Facilities.** Conveyance structures whose sole purpose is to convey stormwater already treated for quality, or water bypassed around water quality treatment facilities pursuant to an approved stormwater plan, may be constructed subject to the following standards:
    a. No other feasible alternatives with less impact exist;
    b. Mitigation for impacts is provided;
    c. Stormwater conveyance facilities shall incorporate fish habitat features;
    d. Vegetation shall be maintained and, if necessary, added adjacent to all open channels and ponds in order to retard erosion, filter out sediments, and shade the water.
13. **On-site Sewage Systems and Wells.**
    a. New on-site sewage systems and individual wells are permitted if accessory to an approved structure.
    b. Repairs to failing on-site sewage systems associated with an existing structure shall be accomplished by utilizing one of the following methods that result in the least impact:
        (1) Connection to an available public sewer system;
        (2) Replacement with a new on-site sewage system located in a portion of the site that has already been disturbed by development and is located landward as far as possible, provided the proposed sewage system is in compliance with the provisions in Chapter 14.70; or
        (3) Repair to the existing on-site septic system.
14. **New Agricultural Activities.** New agricultural activities are permitted subject to the following:
    a. Agricultural activities and structures shall comply with the provisions of Chapter 14.070 Flood Hazard Areas.
    b. The agricultural activity is in compliance with the USDA, NRCS Conservation Reserve Program farm management standards.
    c. A copy of an approved NRCS or Pierce County Conservation District farm management plan that documents compliance with the USDA, NRCS Conservation Reserve Program farm management standards has been submitted to the Department for review and approval.
15. **Structures and Landscaped Areas.** New construction, redevelopment, or additions or expansions of existing structures or reconstruction of damaged structures may be permitted subject to the following:
    a. Maximum disturbance (including the principal structure, accessory structures, and related appurtenances such as landscaped areas, wells, onsite septic systems, etc.) within the habitat area and/or associated buffer shall be:
        (1) 2,500 square feet if the area of the lot within the buffer is 5,000 square feet or less;
        (2) 5,000 square feet if the area of the lot within the buffer is 10,000 square feet or greater;
        (3) 50 percent of the area of the lot if the area within the buffer is between 5,001 and 9,999 square feet; and
        (4) Expansions and redevelopment projects shall be limited to the lesser of 1,000

additional square feet of disturbance area or the same area and disturbance criteria that would have been permitted if the site were undeveloped.

b. Development is prohibited within 50 feet of any waterbody, watercourse, as measured landward from the ordinary high water mark.

c. Development is prohibited within any side channel, oxbow, spring, or other type of off-channel habitat including connectable relic channels or oxbows.

d. The area not disturbed by development shall be managed for native or approved vegetation and planted with native or approved vegetation where necessary following adopted guidelines to reestablish natural forested conditions (example: WDFW's Restoring the Watershed, A Citizen's Guide to Riparian Restoration in Western Washington).

e. The proposal complies with the standards set forth in Chapter 14.70, Flood Hazard Areas.

f. The expansion of existing multi-family structures and the conversion of lots from single-family to multi-family use is prohibited.

16. **Alteration of Watercourses.** Alteration of watercourses shall comply with the standards set forth in Section 14.70.040 D.

B. **Oregon White Oak Trees and Woodlands.**

1. **Habitat Protection.** Oak woodlands, stands, and individual trees meeting the criteria set forth in Section 14.40.020 D. shall be protected as follows:

a. **Priority Oregon White Oak Woodlands.**

(1) Priority Oregon white oak woodlands shall be protected through inclusion within a conservation tract meeting the requirements set forth in Section 14.40.060. The tract shall extend a minimum of 5 feet beyond the outermost dripline of the trees within the woodland.

(2) A minimum of 80% of the Oregon white oak trees on site having a diameter at breast height of six inches or larger shall be preserved within the conservation tract.

(3) The conservation tract shall be maintained in an undisturbed state except for periodic watering, grass mowing of not more than four times per year, and hand removal of noxious or invasive plants, including conifer seedlings and saplings.

(4) No clearing, grading, filling, or construction of any kind shall occur within the conservation tract.

(5) Use of pesticides, herbicides, rodenticides, fungicides, or fertilizers in the conservation tract shall be prohibited.

(6) All oak snags within the conservation tract shall be retained.

(7) Downed or felled oak trees within the conservation tract shall be retained, provided that such trees may be selectively cut to further enhance habitat value.

b. **Significant Oaks and Stands.**

(1) Significant Oaks. Seventy percent of all Oregon white oaks having a diameter at breast height of 20 inches or greater shall be preserved.

(2) Significant Oak Stands. A minimum of 50% of the Oregon white oak trees within the stand shall be preserved.

(3) Downed or felled oak trees and snags within significant oak stands shall be retained when located within a tract of land separate from individually owned lots.

(4) Trees may be located within individually owned lots or a separate tract(s) at the discretion of the developer.

2. **Protection of Trees during Construction.** Trees conserved pursuant to this Chapter shall be protected before and during site development and construction through adherence to the following requirements:
   a. A tree protection area shall be designed to protect each tree or tree stand during site development and construction. Tree protection areas may vary widely in shape, but must extend a minimum of five feet beyond the existing tree canopy area along the outer edge of the dripline of the tree(s), unless otherwise approved by the Department.
   b. Tree protection areas shall be added and clearly labeled on all applicable site development and construction drawings submitted to the Department.
   c. Temporary construction fencing at least three feet tall shall be erected around the perimeter of the tree protection areas prior to the initiation of any clearing or grading. The fencing shall be posted with signage clearly identifying the tree protection area. The fencing shall remain in place through site development and construction.
   d. No clearing, grading, filling, or other development activities shall occur within the tree protection area, except where approved in advance by the Department and shown on the approved plans for the proposal.
   e. No vehicles, construction materials, fuel, or other materials shall be placed in tree protection areas. Movement of any vehicles within tree protection areas shall be prohibited.
   f. No nails, rope, cable, signs, or fencing shall be attached to any tree proposed for retention.
   g. The Department may approve the use of alternate tree protection techniques if an equal or greater level of protection will be provided.

C. **Standards for Other Critical Habitat Areas.** Standards for critical habitat areas not listed Subsections 14.40.030 A and B above shall be determined on a case by case basis, based upon the needs of specific species or habitat area of study. The Department will coordinate with the WDFW in these instances to determine appropriate standards and development a habitat management plan.

14.40.050 Mitigation Requirements.

A. All regulated development activities in critical fish and/or wildlife habitat areas and associated buffers shall be mitigated in the following order:
   1. Avoiding the impact altogether by not taking a certain action or parts of actions.
   2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to reduce impacts.
   3. The following types of mitigation (no order of preference):
      a. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
      b. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
      c. Compensating for the impact by replacing or providing substitute resources or environments.

4. Monitoring the impact and compensation and taking appropriate corrective measures. Monitoring reports are to be submitted to the Department for a period of time, and upon a schedule, appropriate for the species or habitat of concern.
5. Mitigation for individual actions may include a combination of the above measures.

B. Specific mitigation elements are to be discussed within a habitat assessment report, as defined in 14.40.070 Appendix C. The habitat assessment report is to provide specific recommendations to reduce, eliminate, or mitigate for the adverse effects of the proposed activity. Potential measures include timing restrictions for all or some of the activities; clearing limitations; avoidance of specific areas; special construction techniques; Hydraulic Project Approval (HPA) conditions; planting with native vegetation; habitat enhancement (i.e., fish passage barrier removal); best management practices; etc. If applicable, append a copy of the HPA, specifications for BMPs, or other documentation to support the implementation of the conservation measure.

C. The Department may require an enhancement plan that provides mitigation for the impacts associated with any encroachment into the habitat area or associated buffer or a request for buffer averaging/reduction as set forth in Section 14.40.060 C. The enhancement plan shall use native plant species that are indigenous to the project area and shall substantiate that an enhanced habitat area and/or buffer will improve the functional attributes of the affected area to provide additional protection for critical fish or wildlife habitat, wetlands, landslide hazard areas, or adjacent properties that may be affected by the proposal. At a minimum, the enhancement plan shall include detailed information on the following:
   1. Type of species proposed.
   2. Exact location of proposed enhancement area.
   3. Timing and schedule of planting.
   4. Schedule for monitoring and maintenance and any financial guarantees for these as required in Section 14.10.080.
   5. Name, address, and telephone number of the person(s) responsible for the enhancement project.
   6. Any additional information required by the Department.

D. Mitigation of alterations to habitat areas shall achieve equivalent or greater biological functions and shall include mitigation for adverse impacts upstream and downstream of the development proposal site. Mitigation shall address each function affected by the alteration to achieve functional equivalency or improvement on a per function basis.

E. In cases in which it is determined that aquatic habitat mitigation is appropriate, the following shall apply:
   1. Mitigation shall be provided on-site, except where the applicant demonstrates that on-site mitigation is not scientifically feasible or practical due to physical features of the site or where it can be demonstrated that greater functional and habitat values can be achieved through offsite mitigation; and
   2. When mitigation cannot be provided on-site, it shall be provided in the immediate vicinity of and within the same watershed as the regulated activity.

14.40.060 Buffer Requirements.

A. **Buffer Delineation.** Buffers shall be required as set forth for each habitat type. The required buffers shall be delineated, both on a site plan or plat, and on the property prior to approval of any regulated activity.

B. **Buffer Widths.**

1. **Riparian Areas and Ponds.**
   a. Riparian areas (streams, and creeks), and ponds shall be managed through the use of buffers. Buffers shall be based upon the water type classification of the water body as established by the Department of Natural Resources Stream Typing Classification System. Refer to Table 14.40.060 for the water types and the associated buffer requirements.
   b. The required riparian buffer width is measured from the edge of the ordinary high water mark
   c. The required pond buffer width is measured from the edge of the ordinary high water mark (OHWM).
   d. The required buffer shall be extended to include any adjacent regulated wetland(s), landslide hazard areas and/or erosion hazard areas and required buffers (see Figures 14.40-4 and 14.40-5).
2. **Buffers for Other Critical Habitat Areas.** Appropriate buffers for critical habitat areas not listed in Table 14.40.060 shall be determined on a case by case basis, based upon the needs of specific species or habitat area of study. The Department will coordinate with the WDFW in these instances to determine an appropriate buffer width.

TABLE 14.40.060 Buffer Requirements		
Water Type[1]	**Water Body Criteria**	**Buffer Width[2]**
Type S	All waters within their ordinary high water marks, inventoried as "shorelines of statewide significance or shorelines of the state" under Chapter 90.58 RCW and related rules (currently Type 1 waters under state DNR rules).	150 feet landward from the OHWM
Type F1	All segments of natural waters (other than Type S waters) within the bankfull widths of defined channels or within lakes, ponds, or impoundments which provide habitat for or support any portion of the lifecycle of a critical fish species. These areas shall include: • Waters that are diverted for domestic use by more than 10 residential or camping units or by a public accommodation facility licensed to serve more than 10 persons, where such diversion is determined by DNR to be a valid appropriation of water and the only practical water source for such users; such waters shall be considered to be Type F waters upstream from the point of such diversion for 1,500 feet or until the drainage area is reduced by 50 percent, whichever is less; or • Waters that are within a federal, state, local, or private campground having more than 10 camping units provided that the water shall not be considered to enter a campground until it reaches the boundary of the park lands available for public use and comes within 100 feet of a camping unit, trail or other park improvement. • Waters that are diverted for use by federal, state, tribal, or private fish hatcheries. Such waters shall be considered to be Type F waters upstream from the point of diversion for 1,500 feet and tributaries if highly significant for protection of downstream water quality.	150 feet landward from the OHWM
Type F2	Type F1 stream adjacent to a landslide hazard area as set forth in Chapter 14.80.	150 feet landward from the OHWM or the minimum buffer distance required in Chapter 14.80, whichever is greatest
Type N1	All segments of natural waters within the bankfull widths of defined channels that are not Type S or F1 or 2 waters but are located within ¼ mile of the confluence with a Type S or F1 or 2 or are perennial streams or are physically connected by an above-ground channel system to downstream waters such that water or sediment initially delivered to such waters will eventually be delivered to a Type S or F1 or 2 water.	115 feet landward from the OHWM
Type N2	Seasonal non-fish bearing natural waters within bankfull width of defined channels that are not Type S or F1 or 2 waters and are located more than ¼ mile upstream from the confluence with a Type S or F1 or 2 water.	65 feet landward from the OHWM
Type N3	Lakes or ponds that do not support any critical fish or wildlife species	35 feet landward from the OHWM

[1] Water types are based upon the criteria established in WAC 222-16-030 and 031. Water types are mapped in the City's Critical Areas Atlas: Fish and Wildlife Habitat Areas-Stream Typing Maps and Fish and Wildlife Habitat Areas-Critical Fish Presence Maps.

[2] There may be wetlands associated with ponds or streams that are regulated and which may have a required buffer greater than those listed in Table 14.40.060, e.g., an urban lake with no buffer requirement may have associated wetlands with 50-150 foot buffers.

C. **Modification to Buffer Width Requirements.** The standard buffer widths of Subsection 14.40.060 B may be modified by averaging, reducing, or increasing as follows:

1. **Buffer Averaging.** Buffer width averaging may be proposed through submittal of a habitat assessment report. Buffer width averaging shall be allowed only when the applicant demonstrates all of the following:
   a. Buffer encroachment is unavoidable.
   b. The habitat area contains variations in sensitivity (both geological and biological) due to existing site characteristics.
   c. Buffer averaging will not adversely impact the structure and function of the habitat area.
   d. The buffer averaging is not inconsistent with other buffer requirements set forth under this Title (e.g., wetlands, landslide hazard areas, etc.).
   e. The buffer averaging will not increase the risk of slope failure or downslope stormwater drainage impacts.
   f. The total buffer area after averaging is no less than the buffer area prior to the averaging.
   g. The minimum buffer width after averaging will not be less than 50% of the widths established in Subsection 14.40.060 B.
   h. The averaging is accomplished within the project boundaries.
2. **Buffer Width Reductions.** A buffer width reduction may be proposed through submittal of a habitat assessment report. Buffer reductions of up to a maximum of 25% may be allowed when the applicant demonstrates the following circumstances:
   a. Buffer encroachment is unavoidable.
   b. The buffer reduction will not result in an adverse impact to the species of study, any associated wetlands, or landslide hazard areas.
   c. The buffer reduction will not increase the risk of slope failure or downslope stormwater drainage impacts.
   d. The encroachment does not occur within landslide hazard area buffer or into the buffer of any associated wetlands.
   e. The proposed buffer area is extensively vegetated, has less than 20% slopes, and the reduction will not result in adverse impact to the structure and function of the habitat area.
   f. The acreage included in the buffer would substantially exceed the size of the habitat area.
   g. The minimum buffer width will not be less than 75% of the total required width.
3. **Buffer Width Increases.** The Department may require an increased buffer width when a larger buffer is necessary, based on site conditions, to protect habitat area functions and values. This determination shall be reasonably related to protection of the functions and values of the regulated habitat area. Such determination shall demonstrate any of the following:
   a. A larger buffer is necessary to maintain viable populations of existing species or protect the existing functions of the habitat area;
   b. The adjacent land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse habitat impacts; or
   c. The adjacent land has minimal vegetative cover or slopes greater than 20%.
   d. The habitat area is in an area of high tree blow down potential. In these cases the habitat area may be expanded an additional 50 feet on the windward side.

4. Where an application for a development permit, other than a site development permit, has not been submitted in association with a proposed forest practice activity, a deviation from the standard buffer, as set forth in 14.40.060 C1 and 2, shall not be allowed.

14.40.070 Appendices.

A. Habitat Assessment Letters.
B. Habitat Assessment Studies.
C. Habitat Assessment Reports.

14.40.080 Figures.

14.40-1 Local Importance Priority Oregon White Oak Woodlands.
14.40-2 Examples of Potential Critical Fish and Wildlife Habitat Areas.
14.40-3 Critical Fish and Wildlife Habitat Area Review Procedures.
14.40-4 Riparian Buffer Extension Adjacent to Wetland.
14.40-5 Riparian Buffer Extension Landslide Hazard Buffer Area.

14.40.070 Appendices.

APPENDIX A

HABITAT ASSESSMENT LETTERS

A. The habitat assessment letter shall, at a minimum, include the following:
   1. The information required in Section 14.40.030 B2.
   2. Documentation that the potential habitat is not present. Discuss the habitat features or types that are available as compared to the habitat features that define the potential habitat. Describe why potential restoration measures would not be feasible.
   3. Documentation that potential species are not present. Note: a determination that a species is lacking based upon limited field investigation, occurring at an inappropriate time of the year for the species of study will not be acceptable. In such cases, the City will require separate confirmation of absence provided by the Washington Department of Fish and Wildlife.

B. Hold harmless clauses, disclaimers, and limitations are not allowed within a habitat assessment letter.

14.40.070 Appendices.

APPENDIX B

HABITAT ASSESSMENT STUDIES

A. The habitat assessment study shall, at a minimum, include the following:
   1. The information required in Section 14.40.030 B2.
   2. Identify the presence of the habitat area or species on the site.
   3. Identify and discuss how the project complies with the standards set forth in Section 14.40.040.
   4. Provide a detailed description of the proposed project. At a minimum, the following items should be included:
      a. A legal description (Section, Township, Range) and vicinity map that clearly show the site and project area in relation to nearby waterbodies, sensitive habitats, etc.
      b. A site plan of the habitat area and associated buffer in relation to the proposed project area.
      c. Photographs, especially color copies, are useful to orient the reviewer to the project area. A combination of aerial or orthophotos and snapshots are ideal.
   5. Describe the environmental baseline (current or pre-project) condition of the habitat and the project area. The baseline description should address all pertinent habitat parameters for the species.
   6. Describe in detail the type and scope of development activity proposed:
      a. Describe the overall purpose of the project and a brief summary of project objectives.
      b. List all proposed project related construction activities and types of equipment. Provide a chronology of activities, timing of construction, hours of operation, phasing.
      c. Provide to-scale plans that show where work is proposed relative to habitat areas and buffers.
      d. Quantify areas of vegetation removal, include clearing and grubbing, vegetation type.
      e. Describe proposed grading and filling or other earthwork, include specific BMPs for erosion, sedimentation, stormwater, and spill control. If appropriate, append the Temporary Erosion Sediment Control (TESC) Plan, Spill Control Plan, BMP specifications, etc.
      f. Provide stormwater treatment information including:
         (1) Amount of new impervious surface;
         (2) Percent of surface and type of treatment for new and existing impervious surface;
         (3) Specify BMPs to treat for quality and quantity; and
         (4) Identify the receiving area /waterbody for each BMP, including overflow channels.

B. Hold harmless clauses, disclaimers, and limitations are not allowed within a habitat assessment study.

14.40.070 Appendices.

APPENDIX C

HABITAT ASSESSMENT REPORTS

A. The applicant is advised to refer to the following guidance documents during the course of the habitat assessment report (HAR) preparation:
   1. Washington Department of Fish and Wildlife Priority Habitat and Species Management Recommendations, May 1991 (or as hereafter amended), and supplemental documents including but not limited to:
      a. Priority Habitats and Species List;
      b. Management Recommendations for Washington's Priority Habitats: Oregon White Oak Woodlands;
      c. Management Recommendations for Washington's Priority Habitats: Volume I Invertebrates; and
      d. Management Recommendations for Washington's Priority Habitats: Volume III Amphibians and Reptiles.
   2. Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale (NMFS 1996).
   3. A Guide to Biological Assessments (NMFS revised March 23, 1999).
   4. Biological Assessment Preparation and Review (USFWS March 1999).
   5. NMFS Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant Indicators.
   6. Stream Survey Report Criteria, King County Department of Development and Environmental Services.

B. The following information must be included in every habitat assessment report:
   1. **Project Description.** Describe in detail the type and scope of action proposed.
      a. Describe the overall purpose of the project and a brief summary of project objectives.
      b. List all proposed project related construction activities and types of equipment.
      c. Provide to-scale plans that show where work is proposed relative to sensitive areas and/or habitat.
      d. Quantify areas of vegetation removal, include clearing and grubbing, vegetation type, replanting plans.
      e. Provide a chronology of activities, timing of construction, phasing.
      f. Describe proposed grading and filling or other earthwork, include specific BMPs for erosion, sedimentation, stormwater, and spill control. If appropriate, append the Spill Control Plan, BMP specifications, etc.
      g. Provide stormwater treatment information including:
         (1) Amount of new impervious surface;
         (2) Percent of surface and type of treatment for new and existing impervious surface;
         (3) Specify BMPs to treat for quality and quantity;
         (4) Identify the receiving area /waterbody for each BMP, including overflow channels.
      h. Describe proposed in-water work (below OHWM or extreme high tide) and work over waterbodies, and potential for impacts to riparian or aquatic vegetation. Include

conditions and work windows as described in the WDFW HPA. State clearly if the project does not include any in-water or over water work.

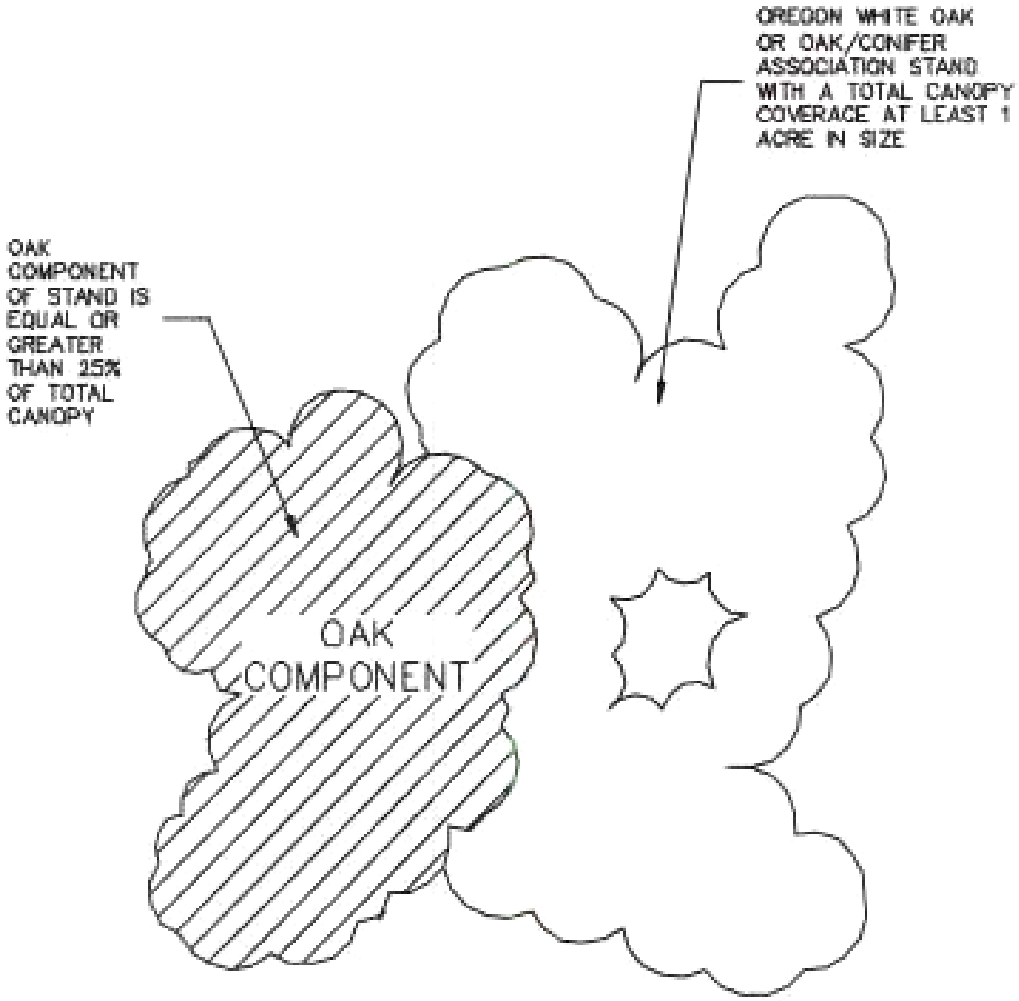
2. **Description of the Project Area.** The following items should be addressed as appropriate:
   a. Provide a legal description (Section, Township, Range) and vicinity map that clearly shows the project in relation to nearby waterbodies, sensitive habitats, etc.
   b. Date of field review(s) of project, credentials of personnel involved, and results of visit(s).
   c. Describe the environmental baseline (current or pre-project) condition of the habitat and the project area. The baseline description should address all pertinent habitat parameters for the species.
   d. Describe the project setting in terms of physiographic region, general topography, dominant habitat and vegetation type(s), aquatic resources, land use patterns, and existing disturbance levels from human activities, roadways, etc.
   e. Include information about past and present activities in the area that relate to the species or its habitat and/or the proposed action. This could include information on adjacent development projects, past consultations with State or Federal agencies, previously established conservation measures, or species management plans.
3. **Critical Fish and Wildlife Species and Habitat Occurrence.** The HAR must be based on current site-specific information about the species and its life history. Cite any relevant scientific literature or research findings. At a minimum, the following items should be addressed:
   a. Cite species listings provided by NMFS, WDFW, and/or USFWS. Append a copy of the listing to the report. Species listings should be updated every six months.
      (1) Identify any State listed, Federal or State proposed species (and candidate or species of concern if appropriate), and designated or proposed critical habitat that are known or have the potential to occur on site or in the vicinity of the project area.
      (2) Identify fish by Ecologically Significant Unit (ESU).
   b. Describe the species, its habitat requirements and ecology in general, and relate that to the local populations. A lengthy life history is not required, but enough information should be provided to adequately explain the potential impacts.
   c. Describe the potential suitable habitat for the species found on site or in the project vicinity and how local populations use it. Discuss the local status of the species as appropriate. Determine the likely level and type of use of the area by each species.
4. **Analysis of Effects on Listed and Proposed Species and Designated and Proposed Critical Habitat.** The HAR should provide a thorough analysis of, and a separate section addressing the potential direct, indirect, interrelated and interdependent, and cumulative effects of the action on the species and its habitat within the project area. The following items should be addressed:
   a. Define the project area (area of potential impacts, both indirect and direct). The area of impact is usually larger than the project area or project vicinity (i.e., the river upstream and downstream from a bridge project, waterbodies receiving stormwater).
   b. Describe how the environmental baseline (current or pre-project condition of the habitat in the project area) will be degraded, maintained or improved (restored). If appropriate, append the completed NMFS Checklist for Documenting Environmental Baseline and Effects of Proposed Action(s) on Relevant Indicators.

c. Direct Effects: Describe and analyze the effects of the action that would directly affect the species. Include actions that would potentially remove or destroy habitat, displace or otherwise influence the species, either positively (beneficial effects) or negatively (adverse effects).
d. Describe potential for impacts from disturbance (i.e., noise above ambient levels, sudden loud noises, increased human activity), from construction and continuing operation. Construction impacts would be considered a direct effect whereas operation noise impacts could be considered indirect effects as they occur later in time.
e. Indirect Effects: Describe any potential indirect impacts (those that occur later in time) such as impacts to future food resources or foraging areas, and impacts from increased long-term human access.
f. Interrelated/Interdependent Effects: Describe and analyze any potential effects from interdependent actions (actions that have no independent utility apart from the primary action) and interrelated actions (actions associated with the primary action and dependent upon that action for their justification) on the species or habitat that would not occur if not for the proposed action. Examples of these two effects include site clearing activities associated with new home construction (an interdependent effect), and increases in light, noise, and glare that occur as a result of land division (an inter-related effect).
g. Cumulative Effects: Identify to the extent possible those cumulative effects within the project area that are reasonably certain to occur.
h. If species-specific recovery plans or management plans have been established by the U.S. Fish and Wildlife Service, WDFW, or National Marine Fisheries Service, address the project in terms of compliance and recommendations.
i. For proposed species, analyze the potential for the project to jeopardize the continued existence of the species.
j. The HAR must contain a distinct statement of the overall effect of the project on each species. It must also provide supporting evidence to justify the effect determination (for listed species) or jeopardy call (for proposed species). The determination must be consistent throughout and worded correctly. See NMFS or USFWS Guidance for specific wording for each status.

5. **Recommended Conservation Measures.** The HAR should describe components of the project that may benefit or promote the recovery of listed species and are included as an integral part of the proposed project. These conservation (or mitigation) measures serve to minimize or compensate for project effects on the species under review. The following items should be addressed:
   a. Provide specific recommendations, as appropriate, to reduce or eliminate the adverse effects of the proposed activity. Potential measures include: timing restrictions for all or some of the activities; clearing limitations; avoidance of specific areas; special construction techniques; HPA conditions; replanting with native vegetation; potential of habitat enhancement (i.e., fish passage barrier removal); best management practices, etc.
   b. If applicable, append a copy of the HPA, specifications for BMPs, or other documentation to support the implementation of the conservation measure.
   c. Include a description of proposed monitoring of the species, its habitat, and mitigation effectiveness.

6. **Conclusions and Effect Determinations.**
    a. Summarize the proposed project and objectives, and restate the listed species that may occur near the project and the expected level of use.
    b. State what conclusions regarding potential impacts to the species discussed can be supported from the information presented in the report. The following items should be addressed:
        (1) A determination of effect must be made for each identified critical fish and wildlife species or habitat area. For each, only one of the following determinations of effect is acceptable:
            (a) No Effect: The appropriate finding to make when the direct or indirect impacts of a project will have no affect of any kind, negative or beneficial, upon a species or habitat area;
            (b) May Affect, Not Likely to Adversely Affect: The appropriate finding to make when the direct or indirect effects of a project are insignificant, discountable, or beneficial; or
            (c) Likely to Adversely Affect: The appropriate finding to make when the direct or indirect effects of a project may adversely impact a species or habitat area and the effects are not insignificant.
        (2) Determinations of "no effect" or "may affect, not likely to adversely affect" may not be based upon the argument that species will be displaced to other suitable habitat or that (based upon a limited number of surveys) species are not known to occur. The failure to provide site-specific surveys at the appropriate time of the year for the species of study will result in the Department assuming a worst-case scenario in regards to project-related impacts.
    c. For any proposed species or proposed critical habitat discussed, the conclusions should indicate whether the proposed project is likely to jeopardize the continued existence of the species (as in the entire species, not individual(s)), or adversely modify the proposed critical habitat.
7. **References and Appendices.** Refer to all appropriate project documents, particularly if the assessment depends upon information located elsewhere (e.g., in an EIS). Applicants may consider providing the Department with copies of pertinent documents along with the HAR. At a minimum, the following items should be addressed:
    a. Provide citations for other information referred to in the HAR, such as current literature and personal contacts used in the assessment. Include name, affiliation, and date.
    b. Include as appropriate any photographs, survey methods, protocols, and results. Do not provide specific information regarding the exact location of State- or Federally-listed species within the HAR document. Federal and State restrictions exist regarding the release of such information.

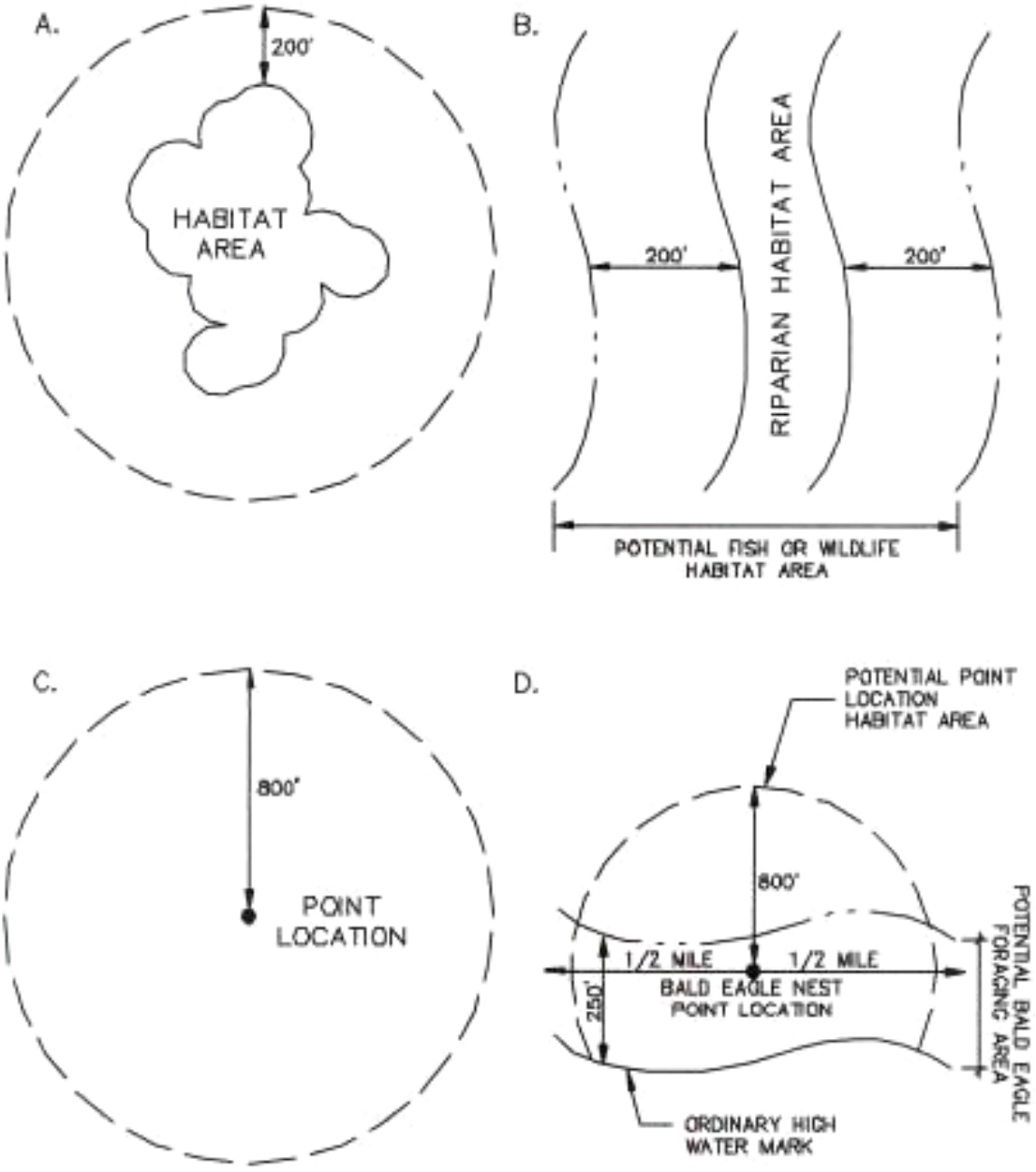
C. Hold harmless clauses, disclaimers, and limitations are not allowed within a habitat assessment report.



HABITATS OF LOCAL IMPORTANCE
PRIORITY OREGON WHITE OAK WOODLANDS

N.T.S.

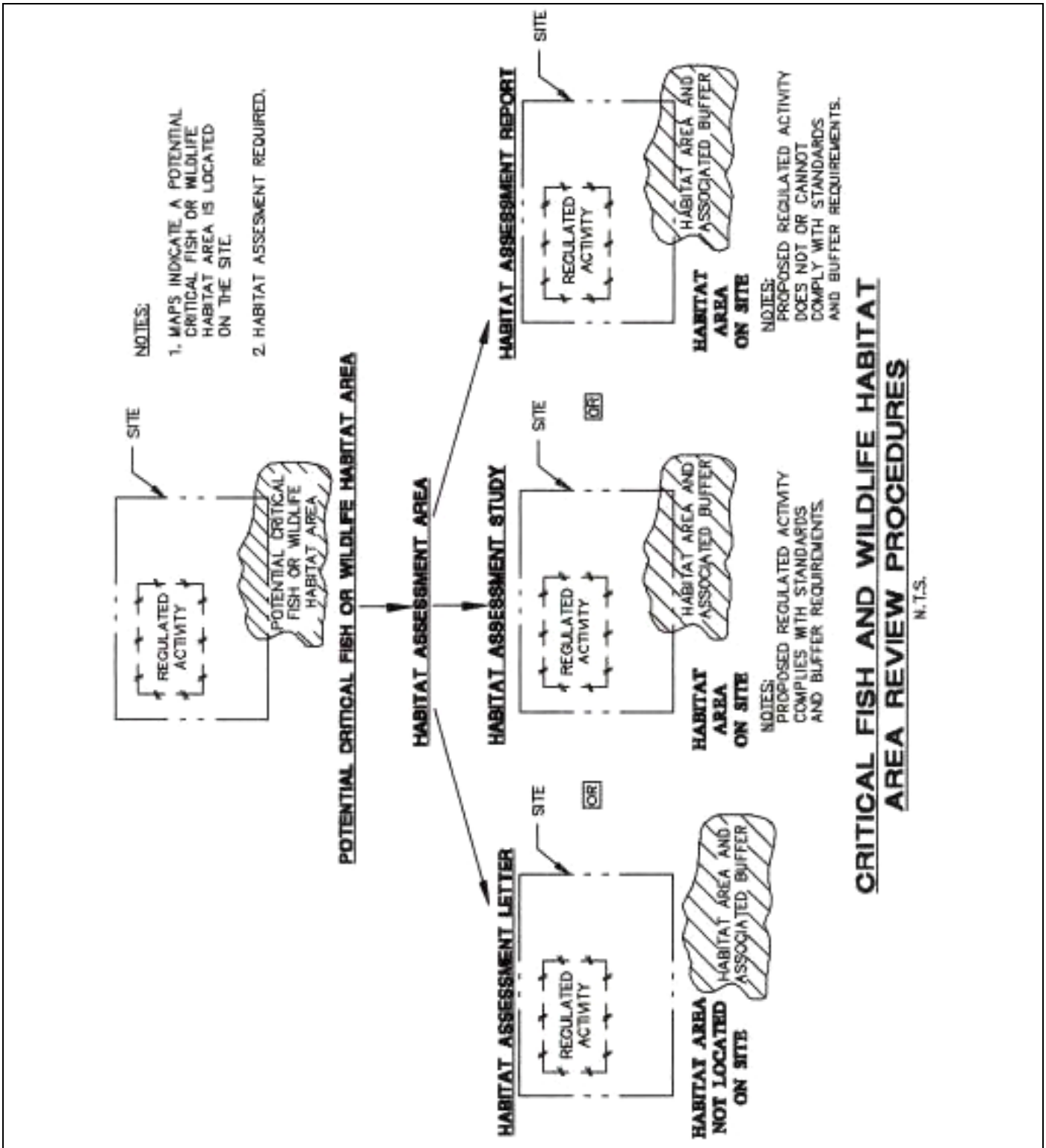
City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**HABITATS OF LOCAL IMPORTANCE** **PRIORITY OREGON WHITE OAK WOODLANDS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.40-1**



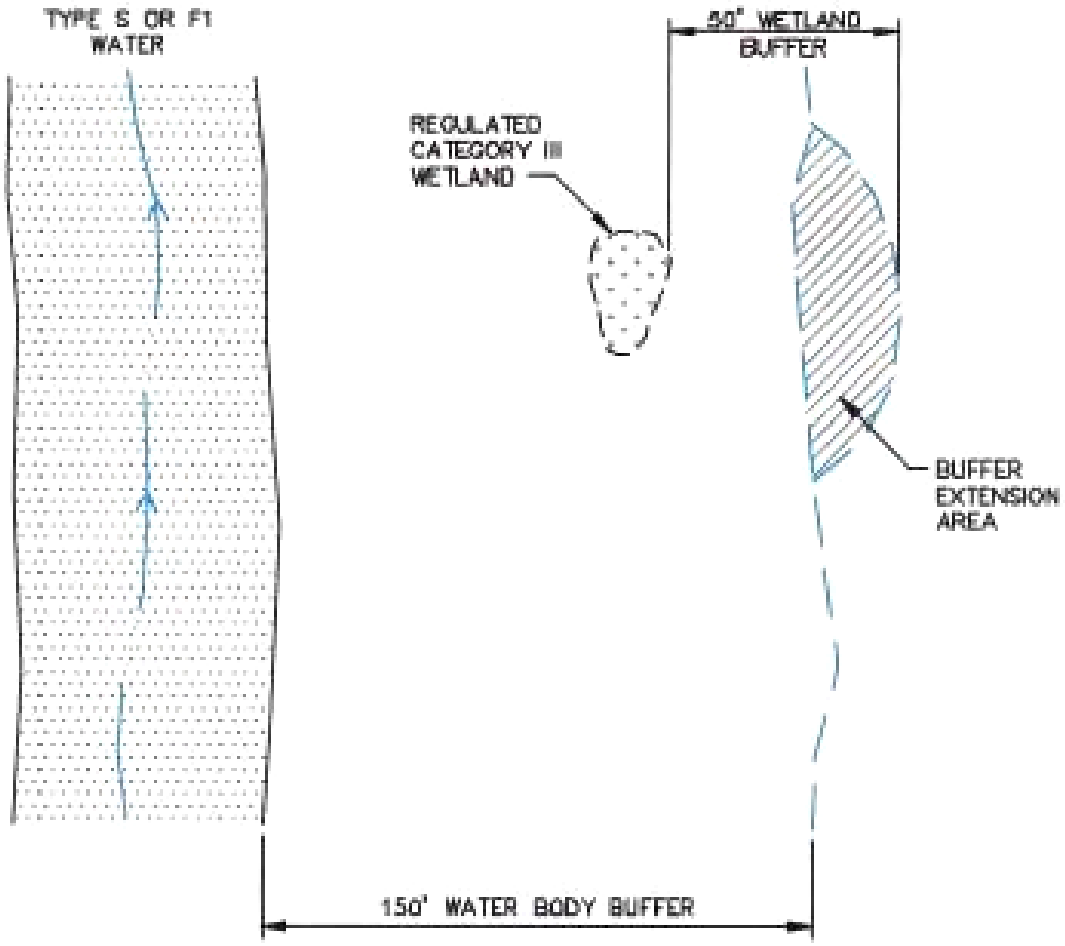
EXAMPLES OF POTENTIAL CRITICAL FISH AND WILDLIFE HABITAT AREAS

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**EXAMPLES OF POTENTIAL CRITICAL FISH AND WILDLIFE HABITAT AREAS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.40-2**

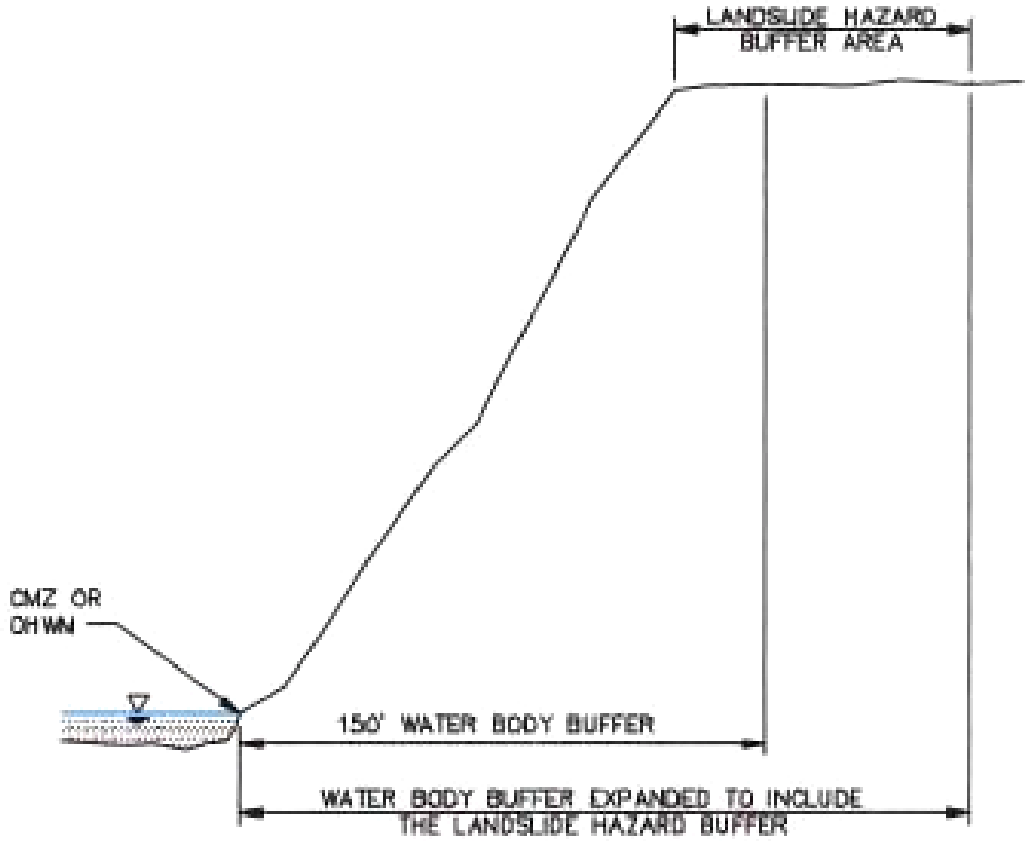


City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**CRITICAL FISH AND WILDLIFE HABITAT AREA REVIEW PROCEDURES**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.40-3**



RIPARIAN BUFFER EXTENSION - WATER BODY BUFFER EXPANDED TO INCLUDE THE BUFFER OF THE ADJACENT WETLAND

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**RIPARIAN BUFFER EXTENSION – WATER BODY BUFFER EXPANDED TO INCLUDE THE BUFFER OF THE ADJACENT WETLAND**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.40-4**



RIPARIAN BUFFER EXTENSION -
WATER BODY BUFFER EXPANDED TO INCLUDE
LANDSLIDE HAZARD BUFFER AREA

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**RIPARIAN BUFFER EXTENSION – WATER BODY BUFFER EXPANDED TO INCLUDE LANDSLIDE HAZARD BUFFER AREA**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.40-5**

Chapter 14.50

AQUIFER RECHARGE AND WELLHEAD PROTECTION AREAS

Sections:

14.50.010 Purpose.
14.50.020 Aquifer Recharge and Wellhead Protection Areas.
14.50.030 Aquifer Recharge and Wellhead Protection Area Review Procedures.
14.50.040 Aquifer Recharge and Wellhead Protection Area Standards.

14.50.010 Purpose.

The purpose of this Chapter is to protect critical aquifer recharge and wellhead protection areas from degradation or depletion resulting from new or changed land use activities. Due to the exceptional susceptibility and/or vulnerability of groundwater underlying aquifer recharge areas to contamination and the importance of such groundwater as sources of public water supply, it is the intent of this Chapter to safeguard groundwater resources and wellhead protection areas by mitigating or precluding future discharges of contaminants from new land use activities.

14.50.020 Aquifer Recharge and Wellhead Protection Areas.

A. **General.** Aquifer recharge and wellhead protection areas are areas that have a critical recharging effect on groundwater used for potable water supplies and/or that demonstrate a high level of susceptibility or vulnerability to groundwater contamination from land use activities.

B. **Aquifer Recharge Areas.** The boundaries of the two highest DRASTIC zones that are rated 180 and above on the DRASTIC index range, as identified in Map of Groundwater Pollution Potential, Edgewood, Washington, National Water Well Association, U.S. Environmental Protection Agency; and

C. **Wellhead Protection Areas.** Wellhead protection areas that lie within the ten-year time-of-travel zone boundary of a group A public water system well, as delineated by the water system purveyor or its designee, pursuant to WAC 246-290-135.

14.50.030 Aquifer Recharge and Wellhead Protection Area Review Procedures.

A. General Requirements.

1. The City's Critical Areas Atlas-Aquifer Recharge and Wellhead Protection Area Map provides an indication of where aquifer recharge and wellhead protection areas are located within the City and the map is updated as necessary.
2. The Department will complete a review of the Aquifer Recharge Area Map for any development proposal to determine whether the proposed project area for a regulated activity falls within an aquifer recharge or wellhead protection area.
3. When the Department's maps or sources indicate that the proposed project area for a regulated activity is located within an aquifer recharge or wellhead protection area, the Department shall require an aquifer recharge and wellhead protection area review as set forth in this Chapter.
4. Any proposed development located within an aquifer recharge or wellhead protection area shall comply with the standards set forth in Section 14.50.040.

5. Any hazardous uses, as defined in Section 14.50.040, shall require the submittal of a hydrogeologic assessment, as set forth in Section 14.50.030 B below.
6. The Department may waive some of the critical area protective measure provisions contained in Section 14.10.080.

B. **Hydrogeologic Assessment.**
1. The hydrogeologic assessment shall be prepared, signed, and dated by a state licensed geologist/hydrogeologist.
2. The hydrogeologic assessment shall be submitted in the form of a report detailing the subsurface conditions, the design of a proposed land use action, and the facilities operation which indicates the susceptibility and potential for contamination of groundwater supplies. The hydrogeologic assessment shall, at a minimum, include the following:
   a. Information sources;
   b. Geologic setting – includes well logs or borings used to identify information;
   c. Background water quality;
   d. Groundwater elevations;
   e. Location/depth to perched water tables;
   f. Recharge potential of facility site (permeability/transmissivity);
   g. Groundwater flow direction and gradient;
   h. Current available data on wells located within 1/4 mile of the site;
   i. Current available data on any spring within 1/4 mile of the site;
   j. Surface water location and recharge potential;
   k. Water source supply to facility (e.g., high capacity well);
   l. Any sampling schedules necessary;
   m. Discussion of the effects of the proposed project on the groundwater resource;
   n. Discussion of potential mitigation measures, should it be determined that the proposed project will have an adverse impact on groundwater resources; and
   o. Any other information as required by the TPCHD, including information required under Washington Department of Ecology Publication 97-30.

C. **Storage Tank Permits.** In addition to the requirements set forth in this Title, the following agencies also have the authority to regulate the installation, repair, replacement, or removal of underground storage tanks:
1. The Pierce County Fire Prevention Bureau regulates and authorizes permits for underground storage tanks, pursuant to the Uniform Fire Code (Article 79) and this Chapter.
2. The Washington Department of Ecology regulates and authorizes permits for underground storage tanks (WAC 173-360).
3. The TPCHD regulates and authorizes permits for the removal of underground storage tanks (Pierce County Code, Chapter 8.34).

14.50.040 Aquifer Recharge and Wellhead Protection Area Standards.

A. **General.** All regulated activities that are not exempt or prohibited under the provisions of this Chapter shall ensure sufficient groundwater recharge. In order to achieve sufficient groundwater recharge, the applicant shall comply with City's adopted Stormwater Manual or demonstrate that the infiltration rate for the proposed project area will be the same amount for post-development as the pre-development rate.

B. **Prohibited Uses.** Landfills (other than inert and demolition landfills), underground injection wells (Class I, III, and IV), metals mining, wood treatment facilities, pesticide

manufacturing, petroleum refining facilities (including distilled petroleum facilities), and the storage of large volumes of petroleum products are prohibited within aquifer recharge and wellhead protection areas.

C. **Agricultural Activities.** New agricultural activities that do not involve hazardous substance handling or application are allowed within an aquifer recharge or wellhead protection area subject to the following:
   1. The applicant is required to submit a farm management plan prepared by the USDA, NRCS, Pierce County Conservation District, or Washington State University, Cooperative Extension Office that certifies that water quality and quantity within the aquifer recharge area is maintained. The farm management plan shall at a minimum address the following:
      a. The limits of the proposed agricultural activities.
      b. The proposed scope of agricultural activities, including the use of any pesticides, fertilizers, or other chemicals.
      c. The existing nitrate levels on the site and any proposed increases in nitrate levels.
   2. Integrated Pest Management (IPM) practices for pest control and Best Management Practices (BMPs) for the use of fertilizers, as described by the Washington State University, Pierce County Cooperative Extension Office shall be utilized.
   3. Nitrate levels at down-gradient property line shall not exceed 2.5 mg/L or, if the background nitrate concentration exceeds 2.5 mg/L, that the concentration will not be increased more that 0.1 mg/L.
   4. Additional protective measures may be required if deemed necessary by the Department or TPCHD to protect public health or safety.

D. **Non-Hazardous Uses.** Subdivision of land as defined in EMC 16, residential structures housing three or more units and all commercial and industrial sites or activities that do not include or involve hazardous substance processing or handling in an aquifer recharge and/or wellhead protection area are allowed subject to the following standards:
   1. Stormwater treatment and control shall be provided in conformance with the City Stormwater Management Manual.
   2. Floor drains shall not be allowed to drain to the stormwater system and must be designed and installed to meet the Uniform Plumbing Code (UPC) Section 303.
   3. If any roof venting carries contaminants, then the portion of the roof draining from this area must go through pretreatment pursuant to UPC Section 304(b).
   4. All nonresidential vehicle washing must be self-contained or be discharged to a sanitary sewer system, if approved by the sewer utility, and is subject to UPC Sections 708 and 711.
   5. Integrated Pest Management (IPM) practices for pest control and Best Management Practices (BMPs) for the use of fertilizers as described by the Washington State University. Pierce County Cooperative Extension Office shall be utilized.
   6. For new or changes in regulated activities served by on-site sewage systems, the applicant must demonstrate to the TPCHD that nitrate levels at the down-gradient property line will not exceed 2.5 mg/L or that, if the background nitrate concentration exceeds 2.5 mg/L, the concentration will not be increased more than 0.1 mg/L.
   7. Additional protective measures may be required if deemed necessary by the Department or TPCHD to protect public health or safety.

E. **Hazardous Uses - General.** Hazardous substance processing or handling, hazardous waste treatment and storage facilities, animal containment areas, and solid waste facilities that require a Solid Waste Handling Permit from the TPCHD, requiring approval from the City,

shall be allowed only in an aquifer recharge and/or wellhead protection area subject to review and approval of a hydrogeologic assessment by the Department and review by the TPCHD. The Department has the authority to apply whatever standards deemed necessary to mitigate any negative impacts that may be associated with the proposed development and will consider comments by TPCHD.

F. **Hazardous Uses - Storage Tanks.** In addition to the requirement to submit a hydrogeologic assessment, the following standards apply to storage tanks in an aquifer recharge and/or wellhead protection area:
   1. **Underground Tanks.** All new underground storage facilities used or to be used for the underground storage of hazardous substances or hazardous wastes shall be designed and constructed so as to:
      a. Prevent releases due to corrosion or structural failure for the operational life of the tank;
      b. Be protected against corrosion, constructed of non-corrosive material, steel clad with a noncorrosive material, or designed to include a secondary containment system to prevent the release or threatened release of any stored substance; and
      c. Use material in the construction or lining of the tank which is compatible with the substance to be stored.
      d. The installation of underground storage tanks shall also be subject to other state and local permit requirements.
   2. **Aboveground Tanks.**
      a. No new aboveground storage facility or part thereof shall be fabricated, constructed, installed, used, or maintained in any manner which may allow the release of a hazardous substance to the ground, groundwater, or surface waters of Edgewood within an aquifer recharge area.
      b. A new above ground tank that will contain a hazardous substance will require both a double walled tank and a secondary containment system separate from the tank that will hold 110% of the tank's capacity. The secondary containment system or dike system must be designed and constructed to contain material stored in the tank(s).

Chapter 14.60

VOLCANIC HAZARD AREAS

Sections:

14.60.010 Purpose.
14.60.020 Volcanic Hazard Areas.
14.60.030 Volcanic Hazard Area Review Procedures.
14.60.040 Volcanic Hazard Area Standards.

14.60.010 Purpose.

At over 14,411 feet high, Mount Rainier dominates the skyline of the southern Puget Sound region. This glacier-clad mountain is a dormant volcano capable of generating large floods and lahars which have historically reached the floors of the lowlands south of the City of Seattle and out to Commencement Bay in the Port of Tacoma, spewing ash from pyroclastic eruptions. The purpose of this Chapter is to promote the public health, safety, and general welfare of the citizens of Edgewood by providing standards that minimize the loss of life that may occur as a result of volcanic events emanating from Mount Rainier.

14.60.020 Volcanic Hazard Areas.

A. **General.** Volcanic hazard areas are areas subject to pyroclastic flows, lava flows, and inundation by debris flows, mudflows, or related flooding resulting from geologic and volcanic events on Mount Rainier.

B. **Volcanic Hazard Area Categories.** Volcanic hazard areas are areas that have been historically inundated by a Case I, Case II, or Case III lahars or other types of debris flow; affected by pyroclastic flows, pyroclastic surges, lava flows, or ballistic projectiles in future eruptions; or are located in other drainages expected to be inundated by a future Case I, Case II, or Case III debris flow. Volcanic hazard areas are classified into the following categories:

1. **Inundation Zone for Case I Lahars.** Areas that could be affected by cohesive lahars that originate as enormous avalanches of weak chemically altered rock from the volcano. Case I lahars can occur with or without eruptive activity. The average reoccurrence rate for Case I lahars on Mount Rainier is about 500 to 1,000 years.
2. **Inundation Zone for Case II Lahars.** Areas that could be affected by relatively large non-cohesive lahars, which most commonly are caused by the melting of snow and glacier ice by hot rock fragments during an eruption, but which can also have a non-eruptive origin. The average time interval between Case II lahars from Mount Rainier is near the lower end of the 100 to 500 year range, making these flows analogous to the so-called “100-year flood” commonly considered in engineering practice.
3. **Inundation Zone for Case III Lahars.** Areas that could be affected by moderately large debris avalanches or small non-cohesive lahars, glacial outburst floods, or other types of debris flow, all of non-eruptive origin. The average time interval between Case III lahars at Mount Rainier is about 1 to 100 years.
4. **Pyroclastic-Flow Hazard Zone.** Areas that could be affected by pyroclastic flows, pyroclastic surges, lava flows, and ballistic projectiles in future eruptions. During any single eruption, some drainages may be unaffected by any of these phenomena, while

other drainages are affected by some or all phenomena. The average time interval between eruptions of Mount Rainier is about 100 to 1,000 years.

C. **Time Travel Zones.** The ability to evacuate people from within a volcanic hazard area correlates to the distance from the source of an event (i.e., those areas closest to the event will have less time to evacuate than those areas farther away from the source of an event). The amount of time that is anticipated for a debris flow, lahar, flood, or avalanche to travel geographically has been classified into the following time travel zones:
   1. **Time Zone A.** Time Zone A is an estimated one-hour travel distance from the source of the event.
   2. **Time Zone B.** Time Zone B is an estimated one and one-half hour travel distance from the source of the event.
   3. **Time Zone C.** Time Zone C is an estimated two-hour travel distance from the source of the event.
   4. **Time Zone D.** Time Zone D is an estimated two hours or greater travel distance from the source of the event.

14.60.030 Volcanic Hazard Area Review Procedures.

A. The City's Critical Areas Atlas-Volcanic Hazard Area Map provides an indication of where volcanic hazard areas are located within the City.
B. The Department will complete a review of the Volcanic Hazard Area maps for any development proposal to determine whether the proposed project area for a regulated activity falls within a volcanic hazard area.
C. When the Department's maps or sources indicate that the proposed project area for a regulated activity is located within a volcanic hazard area, the Department shall apply the standards for regulated activities in volcanic hazard areas, as set forth in Section 14.60.040.
D. Title and land division notification shall be required, as set forth in Section 14.10.110 C.

14.60.040 Volcanic Hazard Area Standards.

The following standards apply within the Inundation Zones for Case I, II, and III Lahars and within the Pyroclastic Flow Hazard Zone (refer to Table 14.60.040):

A. Bonus densities, as set forth in EMC 18.90.80, Housing Incentives Program shall be prohibited.
B. All essential facilities and hazardous facilities, as defined in Section 14.10.060, shall be prohibited, except sewer collection facilities and any other utilities that are located underground or not likely to cause harm to people or the environment if inundated by a lahar.
C. Special occupancy structures, as defined in Section 14.10.060, are subject to the following:
   1. **Time Travel Zone A.** Special occupancy structures located within the Time Travel Zone A area shall be limited to a maximum 100 person occupancy.
   2. **Time Travel Zone B.** Special occupancy structures located within the Time Travel Zone B area shall be limited to a maximum 500 person occupancy.
   3. **Time Travel Zone C.** Special occupancy structures located within the Time Travel Zone C area shall be limited to a maximum 1,000 person occupancy.
   4. **Time Travel Zone D.** Special occupancy structures located within the Time Travel Zone D area shall be limited to a maximum 5,000 person occupancy.

Table 14.60.040 Volcanic Hazard Area Standards				
Facility/ Occupancy List	**Case I Lahar Inundation Zone**	**Case II Lahar Inundation Zone**	**Case III Lahar Inundation Zone**	**Pyroclastic Flow Hazard Zone**
Bonus Densities(1)	Not Allowed	Not Allowed	Not Allowed	Not Allowed
Essential Facilities(2)	Not Allowed	Not Allowed	Not Allowed	Not Allowed
Hazardous Facilities(3)	Not Allowed	Not Allowed	Not Allowed	Not Allowed
Special Occupancies(4)	In Time Travel Zone A - Limited to 100 person occupant load. In Time Travel Zone B - Limited to 500 person occupant load. In Time Travel Zone C - Limited to 1,000 person occupant load. In Time Travel Zone D - Limited to 5,000 person occupant load.			
Other Occupancies	No Limitation	No Limitation	No Limitation	No Limitation

(1) Bonus Density as set forth in EMC 18.90.80, Housing Incentives Program.
(2) Essential Facility as defined in Section 14.60.040 B.
(3) Hazardous Facility as defined in Section 14.60.040 B.
(4) Special Occupancy structures as defined in Section 14.60.040 C.

Chapter 14.70

FLOOD HAZARD AREAS

Sections:

14.70.010 Purpose.
14.70.020 Flood Hazard Areas.
14.70.030 Flood Hazard Area Review Procedures.
14.70.040 Flood Hazard Area Standards.
14.70.050 Appendices.
- **A. Floodplain/Floodway Analysis.**
- **B. Channel Migration Zone Study.**

14.70.060 Figures.
- **14.70-1 Potential Flood Hazard Areas Detailed Study Area.**
- **14.70-2 Potential Flood Hazard Areas Natural Watercourse.**
- **14.70-3 Potential Flood Hazard Areas Unstudied Areas.**
- **14.70-4 Potential Flood Hazard Areas Groundwater Flooding Areas.**
- **14.70-5 Potential Flood Hazard Areas Potholes.**
- **14.70-6 Potential Flood Hazard Areas Potholes.**
- **14.70-7 Potential Flood Hazard Areas Channel Migration Zone.**
- **14.70-8 Floodway Flood Hazard Area.**
- **14.70-9 Deep and/or Fast Flowing Water Graph.**
- **14.70-10 Pothole & B Zone Flood Hazard Area.**
- **14.70-13 Compensatory Storage.**
- **14.70-14 Structure with Crawlspace Elevation by Fill.**
- **14.70-15 Building on Piles, Piers or Columns.**

14.70.010 Purpose.

The purpose of this Chapter is to promote the public health, safety, and general welfare of the citizens of Edgewood. The standards contained in this Chapter are intended to minimize public and private losses due to flood conditions in flood hazard areas and provide special criteria necessary for regulated activities located within flood hazard areas of the City. The following statements describe the purpose of this Chapter:

A. Protect human life and health;
B. Minimize expenditure of public money and costly flood control projects;
C. Minimize the need for rescue and relief efforts associated with flooding;
D. Minimize prolonged business interruptions;
E. Minimize damage to public infrastructure, facilities and utilities;
F. Minimize damage to critical fish and wildlife habitat areas;
G. Minimize net loss of ecological functions of floodplains;
H. Ensure that potential buyers are notified that property is in a flood hazard area;
I. Ensure that those who occupy flood hazard areas assume responsibility for their actions; and
J. Qualify Edgewood for participation in the National Flood Insurance Program, thereby giving the citizens of Edgewood the opportunity to purchase flood insurance with particular emphasis to those in flood hazard areas.

14.70.020 Flood Hazard Areas. Edgewood regulates the following flood hazard areas:

A. **Potential Flood Hazard Areas.**

1. Potential flood hazard areas, as depicted on the Critical Areas Atlas-Flood Hazard Area Map, include:
   a. **Detailed Study Areas.**
      (1) FEMA Flood Insurance Rate Map and Floodway Map A zone.
      (2) Areas within 300 feet horizontal distance from the base flood elevation established for the mapped A zones (see Figure 14.70-1).
      (3) Areas within 5 feet of vertical height from the base flood elevation established for the mapped A zones.
   b. **Unstudied Areas.** FEMA Flood Insurance Rate Map unnumbered A zones and B zones and areas within 300 feet horizontal distance from the mapped areas of the mapped A zones (see Figure 14.70-2).
   c. **Natural Waters/Watercourse.** Areas within five feet of vertical height above the ordinary high water mark of an identified natural watercourse (see Figure 14.70-3).
   d. **Groundwater Flooding Areas.** Areas within 300 feet horizontal distance from a mapped groundwater flooding area (see Figure 14.70-4).
   e. **Potholes.** Areas not identified as a mapped flood hazard area, but within 10 feet of vertical relief from the bottom of an identified pothole or within 2 feet of vertical relief of a potential surface water spillway or other type of outlet (see Figure 14.70-5 and Figure 14.70-6). Potholes may be identified by City topographic mapping, field survey, or site inspections.
   f. **Channel Migration Zones (CMZs).** Channel Migration Zones shall apply only to those watercourses listed below in 14.70.020 B4. In those areas where detailed CMZ studies have been completed and accepted by the Department, additional horizontal and vertical review threshold criteria (i.e., 300' horizontal and 5' vertical) shall not apply (see Figure 14.70-7).
2. The Critical Areas Atlas-Flood Hazard Areas Map may not show all potential flood hazard areas that may be necessary for a specific site analysis. The Department may make interpretations, where needed, as to the approximate location of the boundaries of potential flood hazard areas. When there is a conflict between the elevations and the mapped potential flood hazard area boundaries, the elevations shall govern.
3. Where there is insufficient information shown on the potential flood hazard area maps, the Department may require the applicant to verify that the site is out of the flood hazard area using the flood hazard area review procedures set forth in Section 14.70.030.

B. **Floodway.** A floodway is an extremely hazardous area due to the depth and/or velocity of floodwaters, which carry debris, potential projectiles, and have erosion potential (see Figure 14.70-8). The following areas are regulated by the City as floodways:

1. **Regulatory Floodway.** Regulatory floodway designated by flood hazard area maps.
2. **Deep and/or Fast Flowing Water Areas.** Areas of deep and/or fast flowing water shall be regulated as a floodway. Based on the criteria set forth in Section 14.70.030 E, the Department shall make the determination after review and approval of applicant's analysis of whether the project site falls within the floodway area based on deep and/or fast flowing waters (see Figure 14.70-9).
3. **Potholes and B Zones.** That portion of a pothole and B zone area that is three feet or greater in depth shall be regulated as a floodway (see Figure 14.70-10).
4. **Channel Migration Zones (CMZs).**
   a. Channel migration zones shall be regulated as a floodway.

b. Channel migration zones are equivalent to the base flood elevation limits (i.e., 100-year floodplain limits).

C. **Flood Fringe.** All areas subject to inundation by the base flood, but outside the limits of the floodway as set forth in 14.70.020 B. Those portions of the A and B zones not defined as floodway, and that portion of a pothole and FEMA B zone area that is between 0 feet (base flood elevation) and three feet in depth shall be regulated as a flood fringe.

D. **Other Areas of Special Flood Hazard.**

1. **Groundwater Flooding Areas.** Groundwater flooding areas are those areas identified by Edgewood and shown on flood hazard maps and are subject to flood inundation from subsurface waters that result from a fluctuation of the groundwater table. Groundwater flooding areas shall be regulated as a floodway or flood fringe pothole.
2. **Natural Waters/Watercourse.** Natural waters/watercourse as identified on City topographic, planimetric or orthophoto maps, WDNR stream classification maps, USGS quadrangle maps, or other source maps that are not identified as a flood hazard area on the FEMA maps. That portion of the natural watercourse located between the ordinary high water mark and a topographic elevation five feet above the ordinary high water mark shall be regulated as a floodway or flood fringe. If the applicant chooses to accept the five-foot topographic elevation line above the ordinary high water mark as the base flood elevation (i.e., floodplain elevation limits), a flood study shall not be required for a natural water/watercourse.
3. **Frequently Flooded Areas.** See 14.70.030 A9 as the areas defined by this section.

14.70.030 Flood Hazard Area Review Procedures.

A. **General Requirements.**

1. The City's Critical Areas Atlas-Flood Hazard Area Map provides an indication of where potential flood hazard areas are located within the City. The actual presence or location of a flood hazard area shall be determined using the procedures and criteria contained in this Chapter.
2. The Department will complete a review of the Flood Hazard Area Maps, and other source documents, for any development proposal to determine whether the proposed project area for a regulated activity falls within a potential flood hazard area. When there is a conflict between the elevations and the mapped 100- or 500-year floodplain or floodway boundaries, the elevations shall govern.
3. When the Department's maps or sources indicate that the proposed project area for a regulated activity is or may be located within a potential flood hazard area, the Department shall require a flood boundary verification survey as outlined in Section C below, and may require a flood study as outlined in Section D below, a deep and/or fast flowing water analysis as outlined in Section E. below, and/or a zero-rise analysis as outlined in Section F below, except for coastal flood hazard areas which shall not be required to submit a flood study, deep and/or fast flowing water analysis, or a zero-rise analysis.
4. Any proposed development located within a flood hazard area shall comply with the flood hazard area standards set forth in Section 14.70.040.
5. A FEMA Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR) shall not be submitted to FEMA until review and approval has been granted by the Department. The City shall not recognize any LOMA or LOMR as an amendment to the Department's Flood Hazard maps unless the Department has granted prior approval.

6. Unless otherwise stated in this Chapter, the critical area protective measure provisions contained in Section 14.10.080 shall apply.
7. The Federal Emergency Management Agency (FEMA) administers the nation's floodplain management program. FEMA has identified some of the flood prone areas in the City however, it is generally recognized that FEMA's Flood Insurance Rate Maps (FIRM's) do not accurately reflect the degree or frequency of flooding within all areas of the City and do not accurately show 100-year base flood elevations or 500-year flood boundaries. Therefore, existing City-specific information available through FEMA does not meet best available science criteria and cannot be used exclusively to address frequently flooded areas.
8. The City has determined that the following documents and sources are the most current and accurate information concerning frequently flooded areas within the City, and therefore represent best available science:
    a. The City's Surface Water Management Plan, 1997, or as amended thereafter.
    b. Aerial photographs of the City, especially those taken in wintertime 1996 and 1997.
    c. The City's two (2) foot elevation contour mapping performed by Nies Mapping Group Inc., 1999, or as subsequently updated.
    d. Relevant and verifiable information from the City's Capacity Analysis Technical Review AdHoc Committee draft report, 2000.
    e. Relevant and verifiable government and citizen photographs, notes, observations, etc. regarding historic ponding/flooding levels.
    f. Relevant and verifiable information available through Pierce County.
    g. Relevant and verifiable information available through FEMA.
9. Flooding conditions within the City generally falls into three distinct hydrologic settings; 1) Upland areas within enclosed depressions. 2) Streams that flow off the upland areas. 3) Valley lowlands. Accordingly, the City manages frequently flooded areas within these three zones, as described below:
    a. Upland areas within enclosed depressions: From the above list use the historic ponding elevation experienced during the 1996 and 1997 flood events, determined by 14.30.070 A8(a), (b), (c), (d) and/or (e), or the accurate and yet to be determined FEMA 100 year base flood elevation, whichever is highest.
    b. Streams which flow off the upland areas: From the above list use the historic flood elevation experienced during the 1996 and 1997 flood events, determined by 14.30.070 A8(a), (b), (c) and/or (e), or the accurate and yet to be determined FEMA 100 year base flood elevation, whichever is highest.
    c. Valley Lowlands: From the above list use the historic flood elevation experienced during the 1996 and 1997 flood events, determined by 14.30.070 A8(a), (b), (c), (d), (e) and/or (f), or the accurate and yet to be determined FEMA 100 year base flood elevation, whichever is highest.
10. The City will provide local flood information to FEMA, and request FEMA's assistance in accurately mapping and evaluating frequently flooded areas.
11. **Warning and disclaimer of liability.** The degree of flood protection required by this Chapter is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside frequently flooded areas or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of City, any officer or employee thereof, or the Federal Insurance Administration, for

any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

B. **Channel Migration Zone Study.**

1. In areas where Edgewood has not conducted a detailed channel migration zone study, an applicant may submit an independent channel migration zone study to demonstrate that the channel migration zone limits for those watercourses listed in 14.70.020 B4 are located inside the 100-year floodplain limits.
2. The channel migration zone study shall be prepared, signed, and dated by a professional engineer or professional geologist with at least five years of experience in fluvial geomorphology, river dynamics, or geotechnical engineering.
3. The channel migration zone study shall, at a minimum, contain the information set forth in section 14.70.050 Appendix B.
4. The Department shall review the channel migration zone study and either accept the new channel migration zone limits or reject the study and require the use of the 100-year floodplain limits. Once the Department has reviewed and approved the channel migration zone study, the applicant shall be required to provide a flood boundary verification survey, as outlined in Subsection C below, utilizing the newly established channel migration zone limits as the floodway limits.

C. **Flood Boundary Verification Survey.**

1. A flood boundary verification survey that delineates the horizontal and vertical limits of the base flood elevation shall be submitted to the Department when the Department's maps or sources indicate that the proposed project area for a regulated activity is located within a potential flood hazard area.
    a. Where a base flood elevation has not been determined, a flood study shall be required pursuant to Subsection D below.
    b. A base flood elevation that has been established through a detailed flood study accepted by the Department may be used in lieu of conducting a flood study.
    c. The base flood elevation for a natural watercourse as set forth in Section 14.70.020 E2 shall be established at the five-foot topographic elevation line above the ordinary high water mark.
2. The requirement to submit a flood boundary verification survey may be waived at the Department’s discretion, when the Department can determine, using contour elevations, base flood data, orthophotos, and parcel data, that the extent of the regulated activity is clearly above the base flood elevation.
3. The flood boundary verification survey shall be prepared, signed, and dated by a registered land surveyor or professional engineer.
4. The Department shall review the flood boundary verification survey to determine if the proposed development is located within a flood hazard area.
5. If the proposed development lies within the flood hazard area, the limits of the floodway, as well as the base flood elevation shall be shown on the flood boundary verification survey.

D. **Flood Study.**

1. A flood study shall be conducted when the Department’s maps or sources indicate that the proposed project area for a regulated activity is, or may be located within, a potential flood hazard area where base flood elevation data is not available through the Flood Insurance Study or other authoritative sources, or when an established base flood elevation is contested. A full engineering analysis to determine the base flood elevation shall be required by the Department. Base flood elevations shall be determined using the

detailed methods established in 14.70.050 Appendix A. The Department may approve alternative methods.

2. The flood study shall be prepared, signed, and dated by a professional engineer.
3. Once the Department has reviewed and approved the flood study, the applicant shall be required to provide a flood boundary verification survey, utilizing the newly established base flood elevation, as outlined in Subsection C above.
4. Flood studies shall not be required for coastal flood hazard areas.

E. **Deep and/or Fast Flowing Water Analysis.**

1. When the Department determines that a proposed project area for a regulated activity is located within a flood hazard area, a deep and/or fast flowing water analysis based on Figure 14.70-9 and 14.70.050 Appendix A shall be required to determine the floodway limits.
2. The floodway limits and flood fringe limits identified in the deep and/or fast flowing water analysis shall be depicted on the flood boundary verification survey, as outlined in Subsection C above.
3. The deep and/or fast flowing water analysis shall be prepared, signed, and dated by a professional engineer.
4. Deep and/or fast flowing water analysis shall not be required for coastal flood hazard areas.

F. **Zero-Rise Analysis.**

1. When the Department determines that a proposed project area for a regulated activity is located within a flood hazard area, a zero-rise analysis shall be required to determine that no increase in base flood elevation, displacement of flood volume, or flow conveyance reduction will occur as a result of the development.
2. The zero-rise analysis shall be conducted utilizing HEC-RAS (Hydrologic Engineering Center – River Analysis System, which can be found at the following web site – http://www.hec.usace.army.mil/software/software_distrib/hec-ras/hecrasprogram.html) modeling methodology or by other alternative methodologies approved by the City (see 14.70.050 Appendix A). The analysis shall show that no rise (0.01 foot or less) has occurred as a result of the proposed development. The proposed development may need to be reduced or specially engineered (such as utilizing piers or pilings) to achieve zero-rise.
3. The zero-rise analysis shall be prepared, signed, and dated by a professional engineer.
4. The zero-rise analysis shall be documented on the Zero-Rise Analysis Form, as set forth in 14.70.050 Appendix A, and shall be attached to the flood hazard area permit.
5. Zero-rise analysis shall not be required for coastal flood hazard areas.
6. When structures are elevated by pier or pilings and no fill is placed in the flood hazard area, the requirement to submit a zero rise analysis may be waived at the Department's discretion.

14.70.040 Flood Hazard Area Standards.

A. **General.**

1. New construction done by or for the City, such as bridges, roads, flood control works, revetments, retaining walls, drainage structures, sewer or water lines, parks, or other structures necessary to promote the public's health, safety, and welfare shall be allowed in a flood hazard area when:
   a. The project is prepared, dated, and stamped by a registered professional engineer in the State of Washington and is designed so the project does not result in any

increase in flood levels during the occurrence of the base flood discharge (zero-rise) and shall not obstruct the floodway or cause an adverse impact to critical fish or wildlife habitat or adjacent, cross-channel, or upstream or downstream properties; and

b. The improvements utilize appropriate flood hazard protection standards.

2. **Elevation Certificate.** A Federal Emergency Management Agency (FEMA) elevation certificate shall be required for new construction, additions affixed to the side of a structure, and substantial improvements located within flood hazard areas. The most current version of the FEMA elevation certificate must be completed and certified by an engineer or professional land surveyor, currently licensed in the State of Washington, and kept on file by the City.

B. **Floodways.** Any development, encroachments, filling, clearing or grading, new construction, and substantial improvements shall be prohibited within the floodway, except as allowed in the following standards:

1. Structures that do not require a building permit and that do not have any associated fill.
2. Agricultural activities that do not require the installation of structures and that do not have any associated fill.
3. Park and recreational uses and facilities that do not require the installation of structures and that do not have any associated fill.
4. Individual recreational vehicles, not located in a RV park, that are licensed and ready for highway use and are not permanently attached to the site.
5. Habitat enhancement/stream restoration activities are permitted subject to the provisions outlined in Section 14.70.040 D.
6. Rehabilitation, reconstruction, or an upper story addition to an existing structure that does not exceed the limits for a substantial improvement.
7. Private bridges may be allowed to cross the floodway provided that the structure meets the requirements contained in Section 14.70.030 and the following:
   a. The lowest structural member of a private bridge proposed to cross the floodway portion of any of the rivers listed in Section 14.70.020 B4 shall be a minimum of six feet above the base flood elevation.
   b. The lowest structural member of a private bridge proposed to cross the floodway portion of any other watercourse shall be a minimum of one foot above the base flood elevation.

C. **Flood Fringe Areas.** All activities allowed in Section 14.70.040 B shall be permitted in a flood fringe area. Any other proposed development, encroachments, filling, clearing or grading, new construction, and substantial improvements are prohibited in a flood fringe area except as permitted under the following standards:

1. Structures that do not require a building permit and that do not have any associated fill are permitted.
2. All other regulated activities shall only be allowed when the proposed development is located on an existing lot of record that was created prior to the effective date of this ordinance. Applicants shall demonstrate there are no other feasible alternatives that would allow the proposed development to occur completely outside the flood hazard area. At a minimum, the following shall be demonstrated:
   a. The development cannot be located outside the flood hazard area due to topographic constraints of the parcel or size and/or location of the parcel in relation to the limits of the flood hazard area and a building setback variance has been reviewed,

analyzed, and rejected as a feasible alternative to encroachment into the flood hazard area; and

b. The proposed development shall not cause an adverse impact to adjacent, cross-channel, or upstream or downstream properties.

3. **Roads, Bridges, Trails, and Parking Lots.**
   a. Roads, bridges, driveways, trails, emergency vehicle access, and access routes and easements, where allowed, shall be constructed and armored based on the standards in 14.70.040 C4 below and elevated a minimum of one foot above the base flood elevation.
   b. Parking lots shall be elevated to a minimum of one-half foot below the base flood elevation.
4. **Grading and Filling.** When development is permitted under this Subsection, it shall be designed to a zero-rise standard as set forth in Section 14.70.030 F and 14.70.050 Appendix A. Any filling, grading, or clearing associated with the permitted development shall not increase flood hazards, water velocities, or flood elevations. In addition to meeting the requirements for zero-rise, all permitted development must also meet the following requirements:
   a. Compensatory Storage. New excavated storage volume shall be equivalent to the flood storage capacity eliminated by filling or grading within the flood fringe. Equivalent shall mean that the storage removed shall be replaced by equal live storage volume between corresponding one-foot contour intervals that are hydraulically connected to the floodplain through their entire depth (refer to Figure 14.70-13).
   b. Flow Conveyance. New excavated conveyance areas shall be equivalent to existing conveyance within the flood fringe. Equivalent shall mean a mechanism for transporting water from one point to another using an open channel system.
   c. Erosion Protection. Development shall be protected from flow velocities greater than 2 feet per second through the use of bio-engineering methods or, when bio-engineering methods have been deemed insufficient to protect development, then hard armoring may be utilized. All erosion protection shall extend 1 to 3 feet, depending on development requirements, above the base flood elevation and shall be covered with topsoil and planted with native vegetation (see Figure 14.70-14).
5. **Critical Facilities.**
   a. New construction, additions affixed to the side of an existing structure, and substantial improvement of hazardous facilities, and special occupancy structures are prohibited.
   b. New construction of an essential facility, reconstruction of an existing essential facility, or additions to an existing essential facility that exceed the threshold for substantial improvement shall be permitted when no feasible alternative site is available outside the flood hazard area. Such regulated activities are subject to the following:
      (1) Essential facilities with a crawlspace elevated by fill shall have the lowest floor and any utilities and ductwork elevated a minimum of three feet above base flood elevation (see Figure 14.70-14).
      (2) Essential facilities elevated by piers or pilings shall have the finished floor and any utilities and ductwork elevated a minimum of three feet above the base

flood elevation and must be designed by a professional structural engineer (see Figure 14.70-15).

(3) Essential facilities shall be armored based on the standards in Section.14.70.040 C4 above.

(4) Flood proofing and sealing measures must be taken to insure that toxic or explosive substances will not be displaced or released into floodwaters.

6. **Structures.** Single-family, two-family, multi-family, mobile/manufactured homes, commercial, industrial, etc., except for critical facilities as set forth in Section 14.70.040 C5 above, shall be allowed subject to the following standards:
   a. New construction, additions affixed to the side of an existing structure, and substantial improvement of any structure with a crawlspace shall have the lowest floor elevated a minimum of two feet above base flood elevation (see Figure 14.70-14).
   b. New construction, additions affixed to the side of an existing structure, and substantial improvement of any structure elevated by piers or pilings shall have the bottom of the lowest horizontal structural member elevated a minimum of two feet above the base flood elevation and must be designed by a professional structural engineer. Electrical, heating, ventilation, plumbing, air-conditioning equipment, and other service facilities and associated ductwork shall be elevated a minimum of two feet above base flood elevation, however, the Department may approve a lesser minimum distance above base flood elevation provided that the systems are designed to prevent floodwater from entering or accumulating within the components (see Figure 14.70-15). Areas below the lowest horizontal structural member shall not be enclosed and shall remain free of obstructions.
7. **Agricultural Accessory Structures.** The lowest floor in an agricultural accessory structure shall be located at the base flood elevation or higher provided that the structure be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a professional engineer in the State of Washington or must meet or exceed the following minimum criteria:
   a. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided;
   b. The bottom of all openings shall be no higher than one foot above grade; and
   c. Openings may be equipped with screens, louvers, or other covering or devices provided that they permit the automatic entry and exit of floodwaters.
8. **Construction Standards.**
   a. Construction of a basement is prohibited.
   b. Crawl spaces shall be backfilled with clean earth material and shall meet Uniform Building Code requirements. Finished grade within the crawlspace shall be at least two feet above the base flood elevation.
   c. Flood proofing in lieu of elevating the structure is prohibited.
   c. All single-family, two-family, multi-family, mobile/manufactured homes, commercial, and industrial structures shall be placed on standard concrete stemwall/footing foundations or piles, piers, or column foundations and engineered pursuant to Uniform Building Code requirements.

9. **Sewage Disposal and Potable Water Installation.**
    a. New and replacement public water sources (i.e., wells and water supply lines) and public sanitary sewage conveyance systems are allowed. These systems shall be designed to withstand scour resulting from flow velocity, minimize or eliminate infiltration of floodwaters into the systems, and minimize or eliminate discharge from the systems into floodwaters.
    b. All replacement wells and replacement on-site sewage system (OSS) shall be designed to minimize or eliminate impairment to them or contamination from/to them during flooding (i.e., infiltration of floodwaters into or discharge out of the systems). They shall not be located in pothole or no-outlet floodplains.
    c. All new individual wells and new on-site sewage system (OSS) shall be prohibited. Conveyance systems from a structure to a well or OSS located outside of the flood hazard area shall be allowed provided these systems are designed to meet the standards in Section.14.70.040 C3 above.

D. **Alteration of Watercourses.** Any alteration of a watercourse shall comply with the following standards:
1. The City will notify adjacent communities and the Washington State Department of Ecology prior to any alteration or relocation of a watercourse proposed by the applicant and submit evidence of such notification to the Federal Insurance Administration.
2. The City shall require that maintenance be provided within the altered or relocated portion of said watercourse, so that the flood-carrying capacity is not diminished. Therefore, if the maintenance program calls for future cutting of planted native vegetation used in performing the alternation, the system shall be oversized at the time of construction to compensate for said vegetation growth or any other natural factor that may need future maintenance.
3. Alterations and relocations, including stabilization projects, shall not degrade fish habitat and shall be subject to the following provisions:
    a. Structures that cross all watercourses and water bodies shall meet fish habitat requirements of WDFW.
    b. Any culverts that are used on fish-bearing watercourses shall be arch/bottomless culverts or equivalent that provide comparable fish protection, and must meet fish habitat requirements of the latest edition of WDFW's Design Manual for Culverts.
    c. Bridges or other crossings shall allow for uninterrupted downstream movement of wood and gravel, be as close to perpendicular to the watercourse as possible, and be designed to minimize fill and to pass the base flood flows.
    d. Watercourse alterations shall maintain natural meander patterns, channel complexity, and floodplain connectivity. Where feasible, such characteristics shall be restored as part of the watercourse alteration.
    e. The applicant shall identify the channel migration zone for the watercourse at the project site and for a reasonable reach upstream and downstream of the site, and shall not undertake actions as part of the alteration that would in any way inhibit movement of the channel.
    f. Existing culverts that do not meet fish habitat requirements shall be removed or replaced as part of the approved watercourse alteration project.
    g. Watercourse alteration projects shall not result in a fish blockage of side channels. Known fish barriers into side channels shall be removed as part of the approved watercourse alteration project.

h. For any watercourse alteration of a Type S or F water (pursuant to Section 14.40.060 B) whose channel is subject to migration, bioengineered (soft) armoring of streambanks is required to allow for woody debris recruitment, gravels for spawning, and creation of side channels. The bioengineering technique used must be designed in accordance with the latest edition of WDFW's Integrated Streambank Protection Guidelines.

5. The project engineer shall design the watercourse alteration so the activity does not increase the water surface elevation (zero-rise); decrease the capacity, storage, and conveyance of the watercourse; or cause an adverse impact to adjacent, cross-channel, or upstream or downstream properties.

14.70.050 Appendices.

A. Floodplain/Floodway Analysis.

B. Channel Migration Zone Study.

14.70.060 Figures.

14.70-1 Potential Flood Hazard Areas Detailed Study Area.
14.70-2 Potential Flood Hazard Areas Natural Watercourse.
14.70-3 Potential Flood Hazard Areas Unstudied Areas.
14.70-4 Potential Flood Hazard Areas Groundwater Flooding Areas.
14.70-5 Potential Flood Hazard Areas Potholes.
14.70-6 Potential Flood Hazard Areas Potholes.
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14.70-8 Floodway Flood Hazard Area.
14.70-9 Deep and/or Fast Flowing Water Graph.
14.70-10 Pothole & B Zone Flood Hazard Area.
14.70-13 Compensatory Storage.
14.70-14 Structure with Crawlspace Elevation by Fill.
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14.70.050 Appendices

APPENDIX A

FLOODPLAIN/FLOODWAY ANALYSIS

This Appendix describes the flood hazard analyses and studies as required by Title 14.70, Flood Hazard Area Chapter. Flood hazard studies establish the base flood elevation and delineate floodplain and/or floodway(s) when a proposed project contains or is adjacent to a river, stream, lake, or closed depression.

Flood hazard studies must conform to FEMA regulations described in Part 65 of 44 Code of Federal Regulations (CFR). In addition, the following information must be provided and procedures performed for flood hazard studies used under Chapter 14.70 to examine development proposals or improvements within a floodplain.

I. FLOODWAY DETERMINATION

The City recognizes two distinct floodways. The FEMA floodway describes the limit to which encroachment into the natural conveyance channel can cause one foot or less rise in water surface elevation. The deep and/or fast flowing (DFF) water floodways are hazardous areas and conditions of the floodplain for both people and habitable structures. Life safety and protection to improved properties are compromised if encroached upon. Encroachment cannot occur within these areas.

A. **FEMA Floodways.**
   1. FEMA floodways are determined through the procedures outlined in the FEMA publication Guidelines and Specifications for Study Contractors using the 1-foot maximum allowable rise criteria.
   2. Transitions shall take into account obstructions to flow such as road approach grades, bridges, piers, culverts, or other restrictions. General guidelines for transitions may be found in HEC-RAS, Water Surface Profiles-Users Manual, Appendix IV, Application of HEC-RAS Bridge Routines, published by the Hydrologic Engineering Center, Davis, California.

B. **Deep and/or Fast Flowing (DFF) Floodways.**
   1. DFF floodways are generally assumed to include the entire 100-year floodplain until the Department approves a detailed floodway analysis that defines areas of DFF within the entire floodplain area based on the criteria.
   2. The hydraulic model must adequately be calibrated to known or recorded stage elevations of past flood events with computed recurrence frequency intervals for the 100-year flood recurrence interval. This is to ensure model accuracy.

II. FLOOD STUDY CONTENT AND REQUIRED INFORMATION

Three copies of the completed floodplain/floodway analysis study report and the modeling digital files shall be submitted. The report submittal must be stamped by a licensed professional civil engineer and include the following information in addition to that required for the drainage plan of a proposed project:

A. **Floodplain/Floodway Map.**

1. A scaled survey base map stamped by a licensed professional land surveyor registered in the State of Washington. The map must accurately locate the proposed development with respect to the floodplain and floodway, the channel of the subject stream, river, and/or pothole location, and the existing improvements within the subject study area. It must also supply all pertinent information such as the nature of the proposed project, legal description of the property on which the project would be located, fill quantity, limits and elevation, the building floor elevations, and use of compensatory storage.
2. The map must show elevation contours at a minimum of 2-foot vertical intervals and shall comply with survey and map guidelines published in the FEMA publication Guidelines and Specifications for Study Contractors. The map must show the following:
    a. Elevations and ground contours, spot elevations, and vertical datum NAVD 88 (North American Vertical Datum of 1988) (or most recent vertical datum accepted by the Department).
    b. Elevations and dimensions of existing structures, fill, and compensatory storage areas.
    c. Size, location, elevation and spatial arrangement of all proposed structures on the site.
    d. Location and elevations of roadways, drainage facilities, water supply lines, and sanitary sewer facilities.
    e. Areas of DFF must clearly be shown and plotted on the map sheet depicting the bounded area of the floodway on both sides of the study channel through the subject site. DFF floodway studies must reflect all transitions as referenced above as well.
    f. The base maps must also be accompanied by all field survey notes/computations, drawings, etc. for each cross-section with water surface elevation at the time the cross section field survey was done.

B. **Study Report.**

1. Soil maps, groundcover maps, and photographs.
2. A narrative report containing the purpose of the study and description of the study area, data collection, methodology for both the hydrology and hydraulics, detailed discussion on the input parameters used, modeling results, and conclusions.
3. A floodplain/floodway analysis must include calculations and all computer analysis input and output information, supporting graphical illustrations, as well as the following additional information:
    a. Scaled cross-sections showing the current/existing conditions of the river/stream channel, the floodplain adjoining each side of the channel, the computed floodway, the cross-sectional area to be occupied by any proposed development and all historic high water information.
    b. Profiles showing the bottom of the channel, the top of both left and right banks and computed base flood water surface elevations for the 10, 25, 50 and 100-year events.
    c. Plans and specifications of any flood protection for structures, construction areas, filling, dredging, channel improvements, storage of materials, water supply, and sanitary facilities within the floodplain.
    d. Complete printout of input and output data of the model that was used for the analysis. Liberal use of comments and written discussion will assist considerably in understanding the model logic and minimize misinterpretations and/or questions.
    e. A map, showing the graphical/plotted location and limits of the computed floodway and/or floodplain.

f. Three copies of ready-to-run digital files of both the hydrologic and hydraulic model and its input and output files used in the study. Data shall be submitted on a disk in standard ASCII format, ready to use on an IBM-compatible personal computer and in the applicable software application (i.e., HEC-RAS, HSPF – Hydrological Simulation Program--Fortran, SBUH, etc.).

g. A section on the flood flow including computer modeling and/or calculations (see below for additional requirements on flood flow determinations).

h. Aerial photographs of the site including pre-Feb. 1996 and post-Feb. 1996 photos of the site.

i. All field survey notes/computations, maps, and drawings for each cross-section with water surface elevation at the time of the cross-section field survey.

C. **Computer Modeling Information.** Floodway/floodplain studies submitted to the City for review must include output summary tables and include the following (but not limited to) items:

1. Cross-section(s) identification number.
2. Range of flows being examined.
3. Computed water surface elevation at each cross-section.
4. Energy grade line at each cross-section.
5. Graphical plots of the channel cross-sections with computed water surface elevations for all model runs including calibrated model runs.
6. All model input and output printouts.
7. Graphical plots of the model output data that shows the points and segments along each cross-section where deep and/or fast flowing water occurs. This shall include cross section plots of depth and velocity in one-unit increments. The plots shall also be accompanied with a table listing the station distance (right and left bank), flow rate, area, hydraulic depth, velocity, and whether each point is a floodway.
8. A plan sheet clearly showing the graphical representation of the bounded area of the floodway based on DFF criteria through the entire study site and reach. Note that identified islands or pockets within the middle of the bounded floodway area are generally considered as part of the floodway, unless otherwise approved by the Department.
9. Discussion on the starting water surface elevation for the hydraulic model.

III. DETERMINING FLOOD FLOWS

The three techniques used to determine the flows used in a flood study depend on whether gage data is available, whether a basin plan has been adopted, or a detailed flood study has been done and approved for use by the Department. The first technique is for basins with adopted basin plan areas. The second technique is used if a gaging station exists on the stream. The third technique is used on un-gaged catchments or those with an insufficient length of record. In all cases, the engineer shall be responsible for assuring that the hydrologic methods used are technically reasonable, conservative, conform the to the FEMA publication, Guidelines and Specifications for Study Contractors, and are acceptable by FEMA and the Department.

A. **Flood Flows from Adopted Basin Plan Information.** Flood flows may be determined using information from the City's basin plan. The hydrologic model used in the basin plan shall be updated to include the latest changes in zoning or any additional information regarding the basin which has been acquired since the adoption of the basin plan.

B. **Flood Flows from Stream Gage Data.** Determining flood flows from stream gage data uses the Log-Pearson Type III distribution method as described in the Guidelines for Determining Flood Flow Frequency, Bulletin 17B of the Hydrology Committee, United States Water Resources Council (revised October 1981).

1. This technique may be used only if data from a gaging station in the basin is available for a period of at least 10 years.
2. If the difference in the drainage area on the stream at the study site and the drainage area to a gaging station on the stream at a different location in the same basin is less than or equal to 50%, the flow at the study site shall be determined by transferring the calculated flow at the gage to the study site using a drainage area ratio raised to the 0.86 power, as in the following equation:

$$Q_{SS} = Q_S \left(A_{SS} / A_G \right)^{0.86}$$

where

Q_{ss} = estimated flow for the given return frequency on the stream at the study site.

Q_G = flow for the given return frequency on the stream at the gage site.

A_{SS} = drainage area tributary to the stream at the study site.

A_G = drainage area tributary to the stream at the gage site.

3. If the difference in the drainage area at the study site and the drainage area at a gaging station in the basin is more than 50% and a basin plan has not been prepared, a continuous model shall be used as described below to determine the flood flows at the study site.
4. In all cases where dams or reservoirs, floodplain development, or land use upstream may have altered the storage capacity or runoff characteristics of the basin so as to affect the validity of this technique, a continuous model shall be used to determine flood flows at the study site.

C. **Flood Flows from a Calibrated Continuous Model.** Flood flows may be determined by utilizing a continuous flow simulation model such as HSPF or other equivalent continuous flow simulation model, as approved by the City. Where flood elevation or stream gaging data are available, the model shall be calibrated to the known data. Otherwise, regional parameters may be used.

IV. DETERMINING FLOOD ELEVATIONS, PROFILES and FLOODWAYS (Hydraulic Model)

A. **Reconnaissance.** The applicant's project engineer is responsible for the collection of all existing data with regard to flooding in the study area. This shall include a literature search of all published reports in the study area and adjacent communities and an information search to obtain all unpublished information on flooding in the immediate and adjacent areas from Federal, State, and local units of government. This search shall include specific

information on past flooding in the area, drainage structures such as bridges and culverts that affect flooding in the area, available topographic maps, available community maps, photographs of past flood events, and general flooding problems within the community. Documented discussions with nearby property owners should also be done to obtain a witness account of the flooding extent. A field reconnaissance shall be made by the applicant's project engineer to determine hydraulic conditions of the study area, including type and number of structures, locations of cross-sections, and other parameters including the roughness values necessary for the hydraulic analysis.

B. **Base Data.** Channel cross-sections used in the hydraulic analysis shall be current/existing at the time the study is performed and shall be obtained by field survey. Topographic information obtained from aerial photographs/mapping may be used in combination with surveyed channel cross sections in the hydraulic analysis. The elevation datum of all information used in the hydraulic analysis shall be verified. All information shall be referenced directly to NAVD 1988 (and include local correlation to NGVD) unless otherwise approved by the City.

C. **Methodology.** Flood studies and analysis (including deep and/or fast flowing floodways and zero-rise analysis) shall be calculated using the U.S. Army Corps of Engineers HEC-RAS computer model (or subsequent revision) unless otherwise approved by the City.

D. **Adequacy of the Hydraulic Model.** Edgewood considers the following (but not limited to) factors when determining the adequacy of the hydraulic model for use in the floodway/floodplain model:
   1. Cross-section of a downstream starting location and spacing.
   2. Differences in energy grade line (significant differences in the energy grade line from cross-section to cross-section are an indication that cross-sections should be more closely spaced or that other inaccuracies exist in the hydraulic model.)
   3. Methods and results for analyzing the hydraulics of structures such as bridges and culverts.
   4. Lack of flow continuity.
   5. Use of a gradually varied flow model. In certain cases, rapidly varied flow techniques may need to be used in combination with a gradually varied flow model such as weir flow over a levee, flow through a spillway of a dam, or special application of bridge flow (pressure flow if bridge superstructure is shown to be submerged for the study event).
   6. Mannings "n" value.
   7. Calibration of hydraulic model to known and/or observed flow stage elevations including past flood events.
   8. Special applications. In some cases, steady state-one dimensional hydraulic models may not be sufficient for preparing the floodplain/floodway analysis. This may occur where sediment transport, two-dimensional flow, or other unique hydraulic circumstances affect the accuracy of the model. In these cases, the project engineer must propose and obtain Department approval of alternative models for establishing the water surface elevations.
   9. All reported error and/or warning messages by the model must be properly and adequately addressed and/or resolved and included in the report for review verification.

V. ZERO-RISE ANALYSIS (ZRA)

A. Zero-rise analysis (ZRA) is required where encroachment within the flood fringe area is allowed and approved by the Department. The ZRA must show that the proposed development encroachment in the flood fringe area will not show a measurable rise in the base flood elevation (i.e., less than 0.01 foot), resulting from a comparison of existing conditions and proposed conditions. This is directly attributable to development in the floodplain but not attributable to manipulation of mathematical variables such as roughness factors, coefficients, discharge, and other hydraulic parameters.

B. In addition to those items listed in A above, the following shall be included in a ZRA:
   1. Floodway boundaries (based on zero-rise) are to follow the stream lines and reasonably balance the rights of property owners on either side of the floodway. Use of the automatic equal conveyance encroachment option in the model will be considered equitable.
   2. The ZRA must include a sufficient number of cross-sections in order to accurately model the subject fill and compensatory storage areas of the site. In all cases, cross-sections shall be located downstream, through the subject site and upstream of the site at a very minimum. They shall also be located where changes in channel and the fill material characteristics occur, such as slope, shape, and roughness. The sections shall also be located perpendicular to the flow path in the channel and the outside overbank areas. The Department shall review and approve the proposed number and location of cross-sections. All cross-sections and surveys shall be prepared and certified by a professional land surveyor or registered professional engineer in the State of Washington.
   3. The difference between two profiles of water surface elevation at the cross section (e.g. difference between existing and encroached water surface). The model must report 0.01-ft or less an allowable change in the water surface elevation. This must be shown in the profile graphical plot as well.
   4. The difference between profiles of the energy grade line at the cross-section. The model must report 0.01-ft or less. This is the allowable change in the energy grade line. This must be shown in the profile graphical plot as well.

C. Conveyance Capacity:
   1. The ZRA must also show that the proposed development encroachment in the flood fringe area will not show a measurable decrease (less than 0.01 CFS) in the conveyance capacity of the channel, resulting from a comparison of existing conditions and proposed conditions, for each of the cross sections. This is also directly attributable to development in the floodplain but not attributable to manipulation of mathematical variables such as roughness factors, coefficients, discharge, and other hydraulic parameters.
   2. The analysis must provide calculations of the reduction in conveyance caused by the proposed development encroachment, assuming no change in the water surface elevation, and using the roughness coefficient value(s) appropriate for the proposed development.
   3. The analysis must then provide calculations for the increase in conveyance of the proposed compensatory measure, using the roughness coefficient value(s) appropriate for the proposed development.
   4. Include a comparison analysis and discussion from C2 and 3 above. The comparison must adequately show that the conveyance capacity has not measurably decreased between the existing condition and proposed development condition.

Floodplain/Floodway Zero-Rise Certification

This is to certify that I am a duly qualified professional engineer licensed to practice in the State of Washington.

This is to further certify that the attached floodplain/floodway Zero-Rise Analysis conclusively shows that the proposed development of:

_____ _____
(Name of Development) Parcel Number

will not increase the 100-yr base flood elevation(s) and widths nor reduce the conveyance capacity of the floodplain/floodway and its associated channel to the

_____
(Name of River, Stream, Pothole or other Watercourse)

Supporting Data

Base Flood Elevation (Pre-Development) = _____ FT (NAVD 88)

Base Flood Elevation (Post-Development) = _____ FT (NAVD 88)

Conveyance Capacity (Pre-Development) = _____ CFS

Conveyance Capacity (Post-Development with compensatory storage) = _____ CFS

_____ _____
Signature Date

_____ _____
Title Firm Name

_____
Address

_____
City

_____ _____
State Zip Code

Seal, Signature, and Date

14.70.50 Appendices.

APPENDIX B

CHANNEL MIGRATION ZONE STUDY REQUIREMENTS

The Channel Migration Zone (CMZ) is the area within the lateral extent of likely stream channel movement due to stream bank destabilization and erosion, rapid stream incision, and shifts in location of stream channels. The CMZ will define areas in which, to the best information available, development should be regulated due to the dangers expected from erosion.

I. DETERMINING CHANNEL MIGRATION ZONE LIMITS

A. The CMZ shall be based on available historic records of channel migration, or 100 years of calculated channel migration whichever is greater, and will generally include those areas that encompass:
   1. The limit of geologic controls, such as hill slope, bedrock outcrop, or abandoned floodplain terrace;
   2. Side channels, abandoned channels, and oxbows; and
   3. Outside edges of progressive bank erosion at meander bends.

B. Channel migration over the 100-year time frame can be estimated and predicted from geomorphic analysis of annual bank erosion rates, historic meander belt width, and measured meander bend amplitudes, potential avulsion sites, and previous river channel locations as depicted on historic aerial photographs and maps. The 100-year time span represents the time required to grow mature trees that can provide functional large woody debris to streams.

C. The CMZ boundaries will be determined using the following specific criteria:
   1. The representative average annual rate of channel migration in the affected river reach is calculated by dividing the lateral distance eroded with the corresponding elapsed time shown in sequential aerial photographs or historic maps (distance/time = channel movement). Measurements from reaches that have had some form of bank armoring shall not be included. Historical records will need to be checked closely for this information.
   2. Identify the width of the channel migration zone by multiplying the representative average annual erosion rate by 100 years.

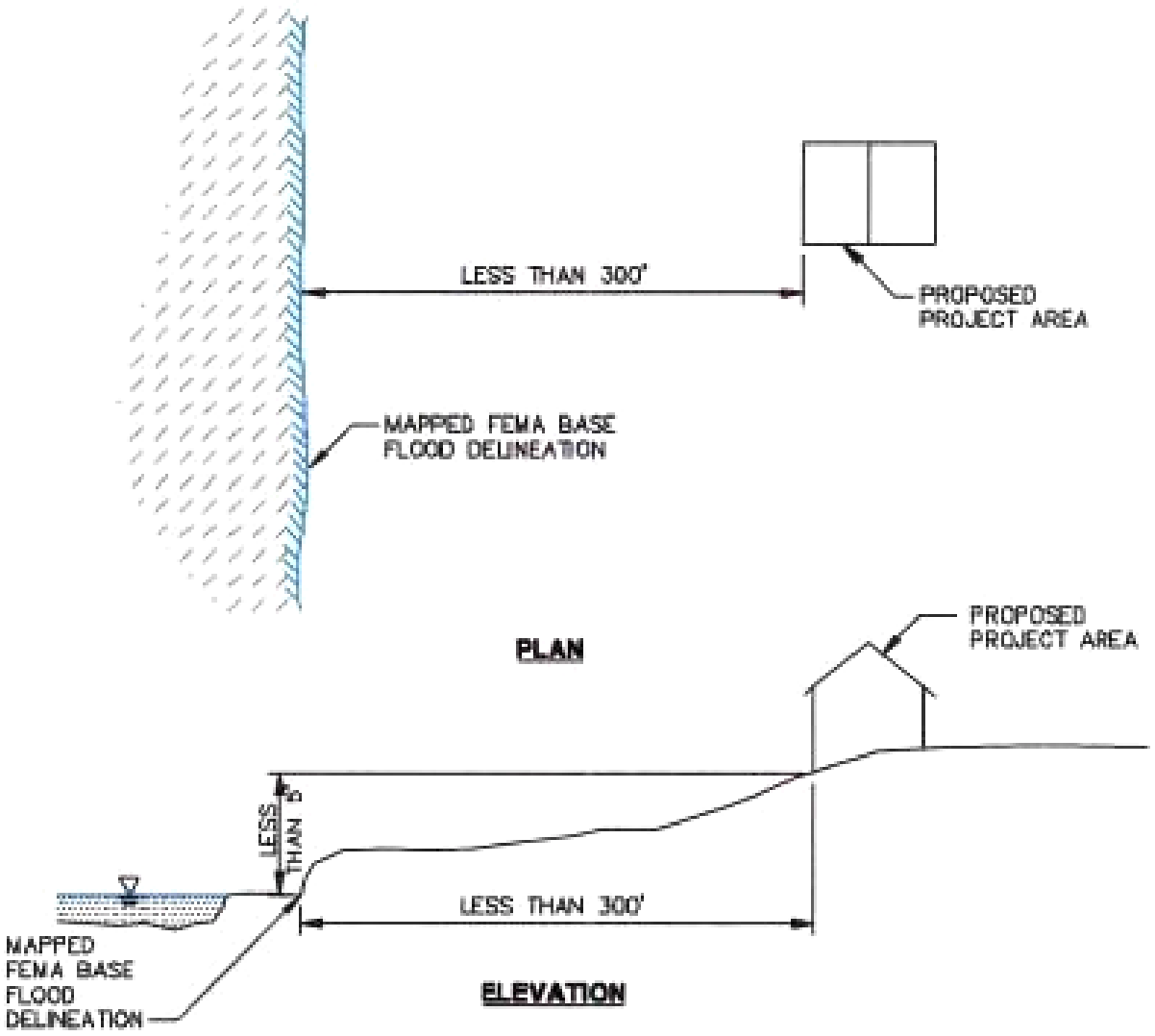
D. Areas separated from the active channel by legally existing artificial channel constraints (levees, roads, driveways, etc.) that limit bank erosion and channel avulsion to the 100-year recurrence interval flood elevation plus three feet of freeboard shall serve as a boundary for the outer limit of the CMZ.

II. CHANNEL MIGRATION ZONE STUDY CONTENT AND REQUIRED INFORMATION

Three copies of the completed channel migration zone study shall be submitted. The study submittal must be stamped by a licensed professional engineer or professional geologist with five years experience in fluvial geomorphology, river dynamics, or geotechnical engineering. The CMZ

study shall include the following information in addition to that required for the drainage plan of a proposed project. The CMZ study will consist of a written technical report including:

A. Detailed methods, techniques, and assumptions used in determining the location of the CMZ.
B. A vicinity map and site with scale, north arrow, and parcel number(s) or specific site being studied.
C. A clear statement of the requested revision to the County's determination of the 100-year floodplain limits as the CMZ.
D. A clearly stated conclusion of the study results that support the requested revision. The conclusion needs to document the basis for the revision, show how the data presented refutes the 100-year floodplain limits as the CMZ, and calculates the new results using the new information.
E. A map clearly delineating the subject property and the CMZ of the adjacent watercourse. In addition to providing a hard copy of the CMZ map, the CMZ map shall also be provided in ARC-View shapefile format. Contact the City GIS Department for mapping and aerial imaging standards.

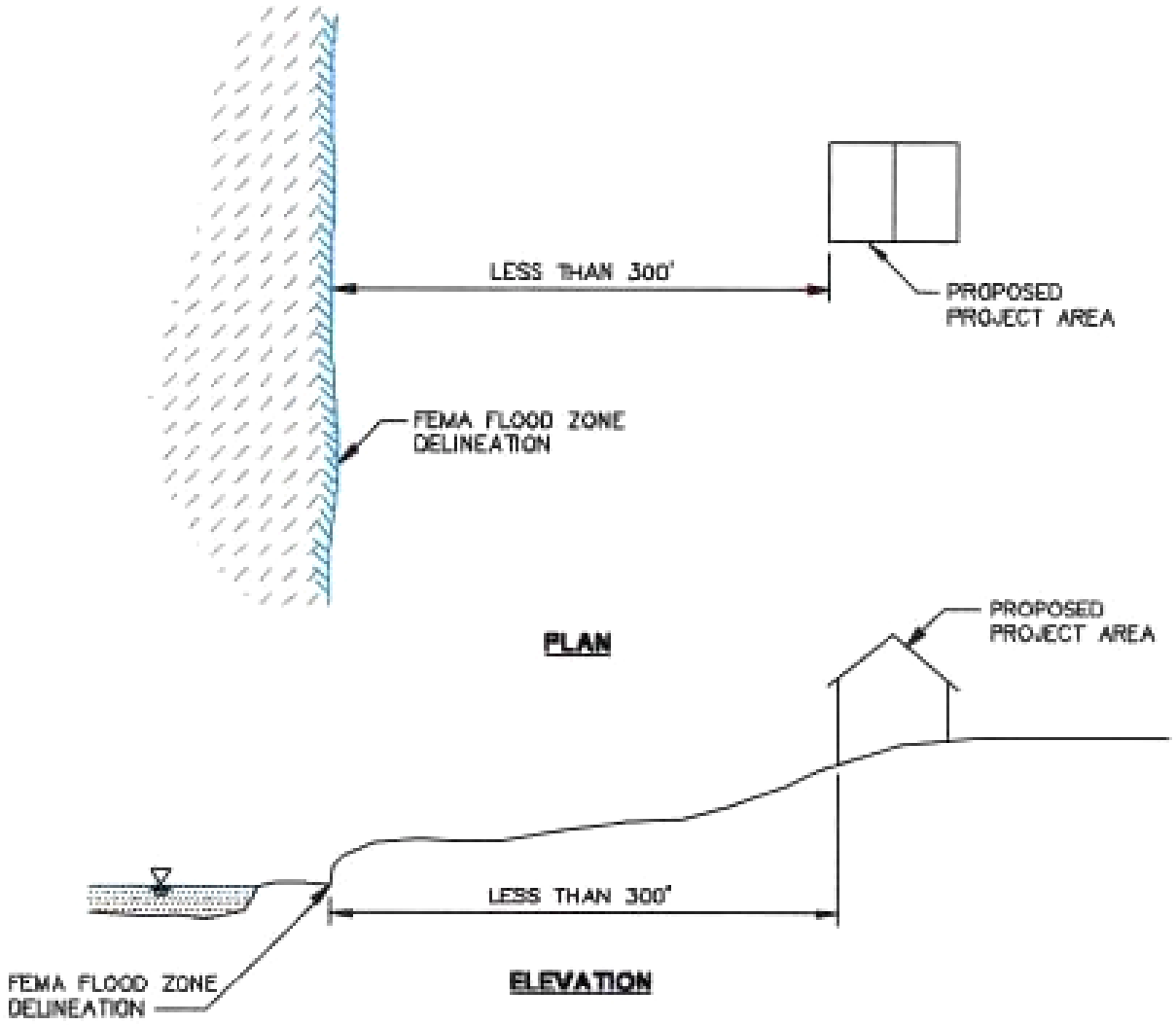


NOTE: AS SHOWN ABOVE, AREAS LESS THAN 300' HORIZONTAL DISTANCE FROM THE MAPPED FEMA BASE FLOOD DELINEATION, AND AREAS LESS THAN 5' VERTICAL HEIGHT ABOVE THE ESTABLISHED BASE FLOOD ELEVATION, ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA

POTENTIAL FLOOD HAZARD AREAS
DETAILED STUDY AREAS

NTS

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**POTENTIAL FLOOD HAZARD AREAS DETAILED STUDY AREA**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.70-1**

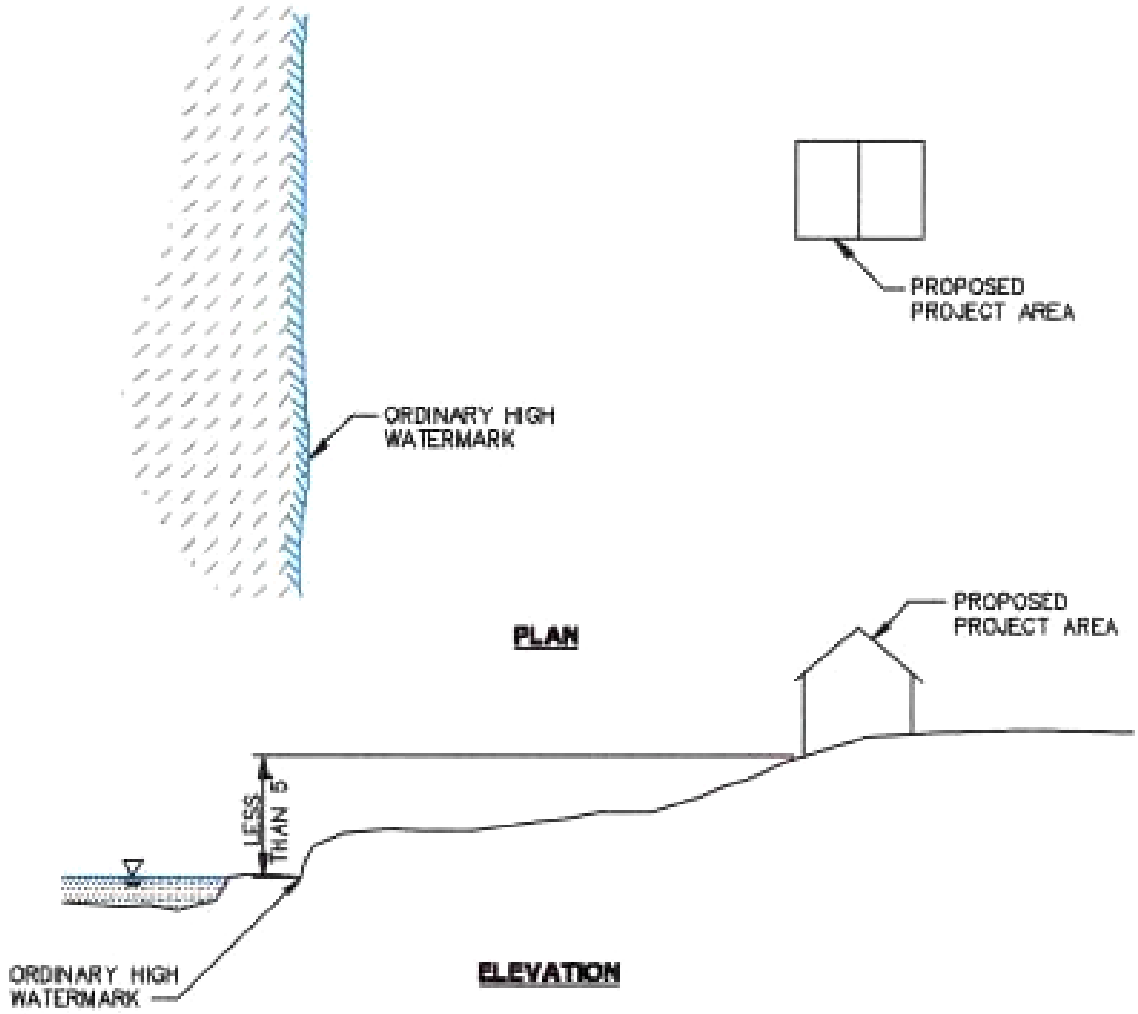


NOTE: AS SHOWN ABOVE, AREAS LESS THAN 300' HORIZONTAL DISTANCE FROM THE MAPPED DELINEATION OF THE FEMA FLOOD ZONE ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA.

POTENTIAL FLOOD HAZARD AREAS
UNSTUDIED AREAS

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**POTENTIAL FLOOD HAZARD AREAS UNSTUDIED AREAS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.70-2**

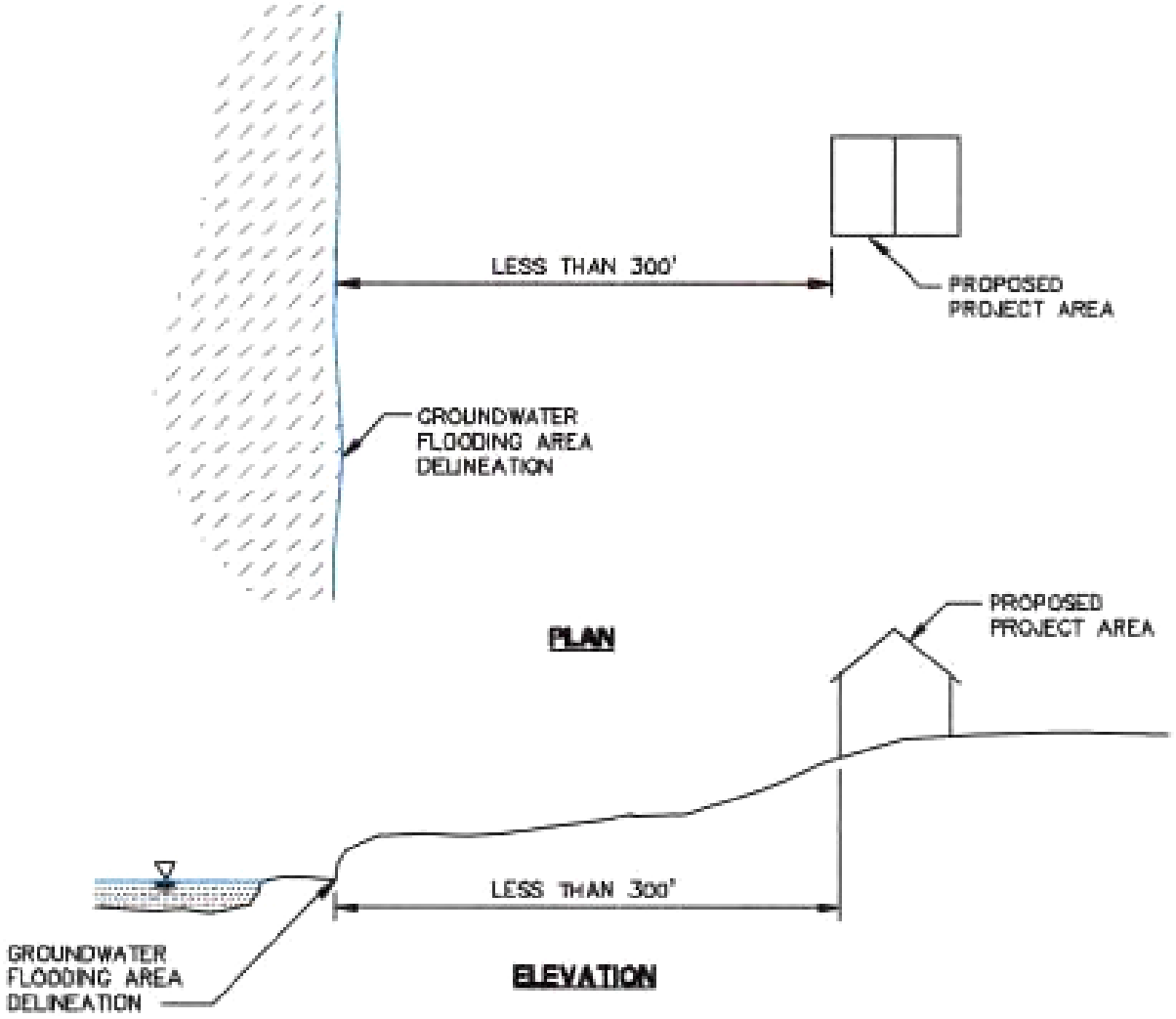


NOTE: AS SHOWN ABOVE, AREAS LESS THAN 5' VERTICAL HEIGHT ABOVE THE ORDINARY HIGH WATER MARK OF AN IDENTIFIED NATURAL WATER ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA.

POTENTIAL FLOOD HAZARD AREAS
NATURAL WATERCOURSE

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**POTENTIAL FLOOD HAZARD AREAS NATURAL WATERCOURSE**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.70-3**

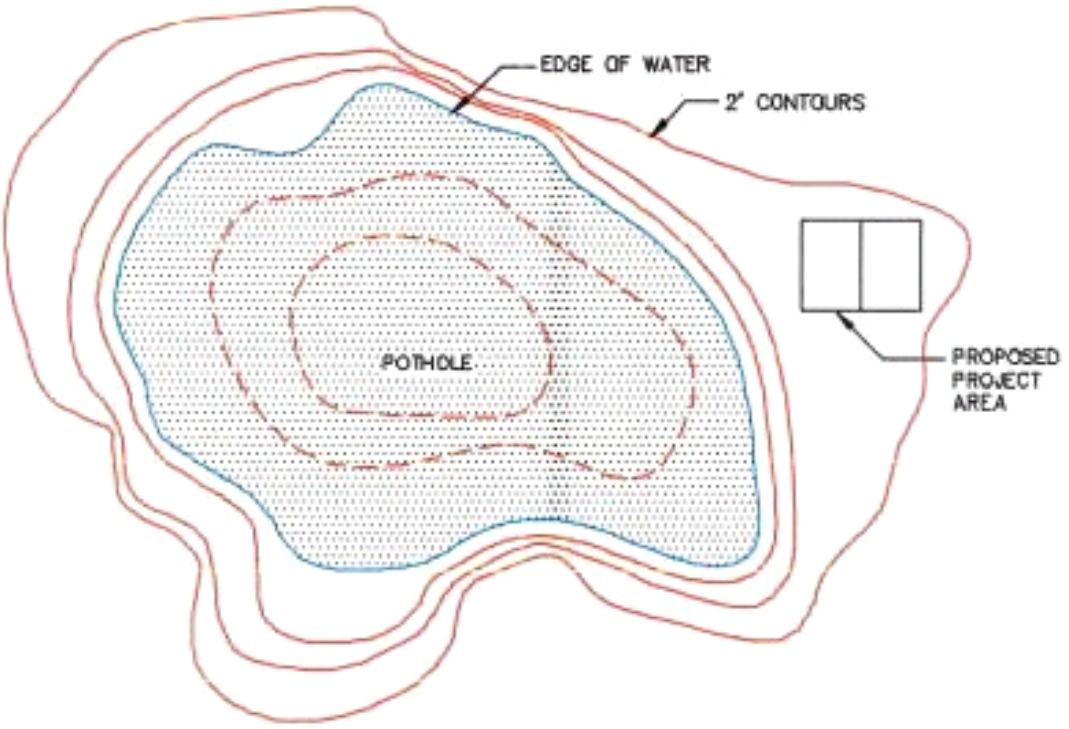


NOTE: AS SHOWN ABOVE, AREAS LESS THAN 300' HORIZONTAL DISTANCE FROM THE MAPPED DELINEATION OF A GROUNDWATER FLOODING AREA ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA

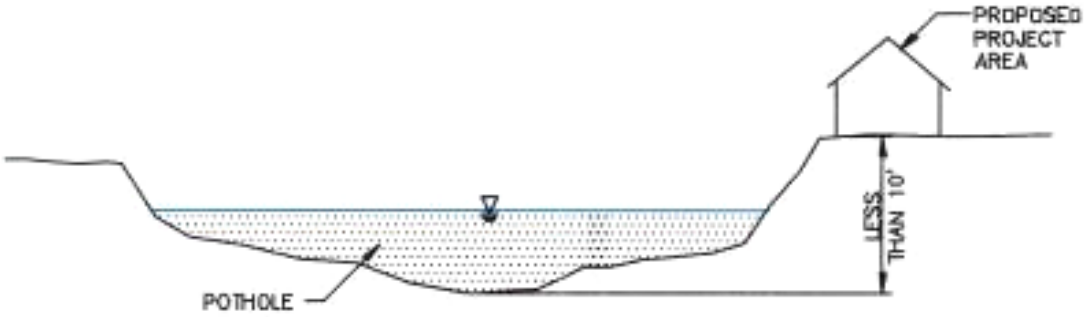
POTENTIAL FLOOD HAZARD AREAS
GROUNDWATER FLOODING AREAS

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**POTENTIAL FLOOD HAZARD AREAS GROUNDWATER FLOODING AREAS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.70-4**



PLAN



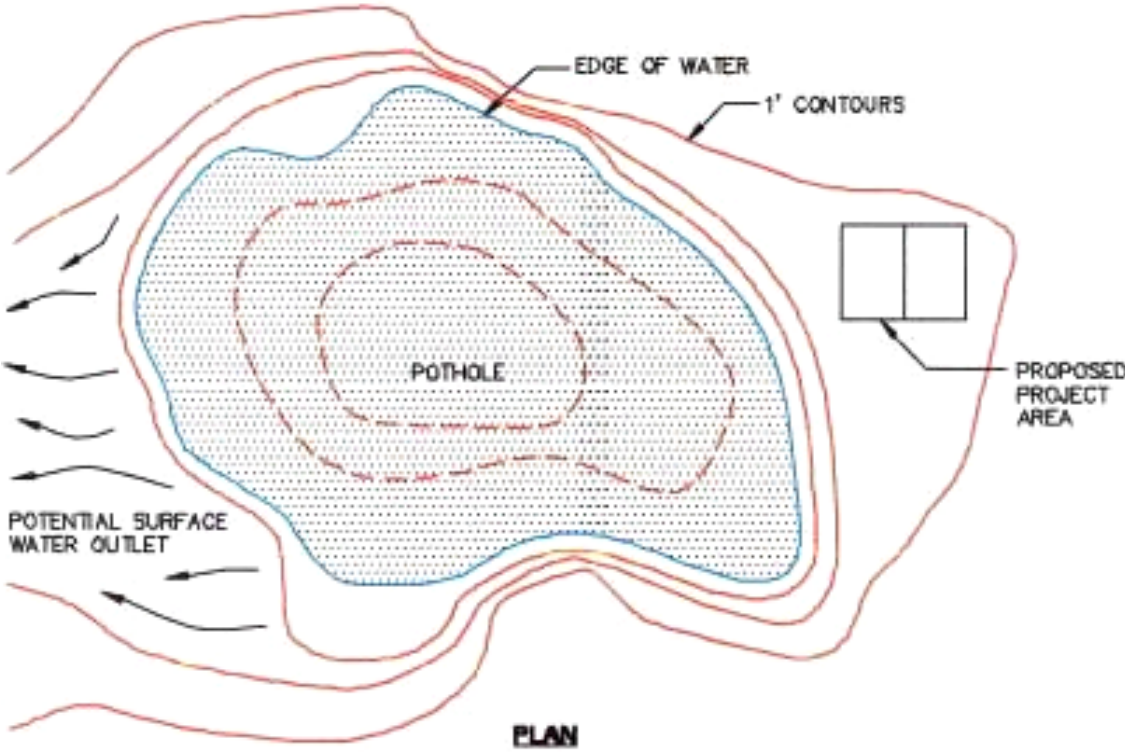
ELEVATION

NOTE: AS SHOWN ABOVE, AREAS LOCATED WITHIN 10' OF VERTICAL HEIGHT FROM THE BOTTOM ELEVATION OF AN IDENTIFIED POTHOLE ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA.

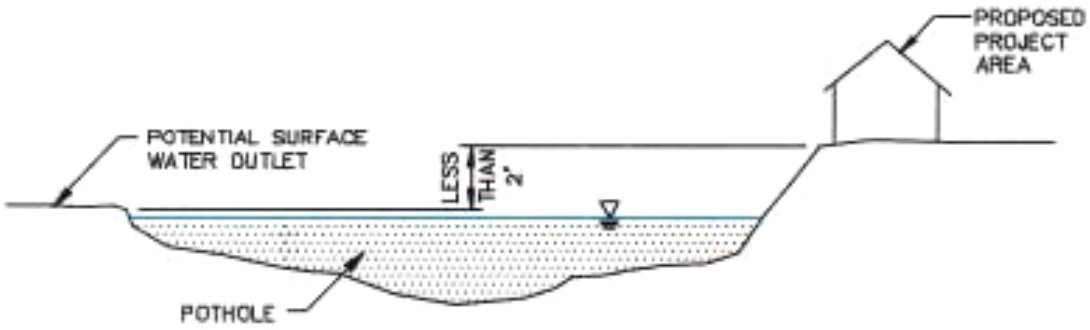
POTENTIAL FLOOD HAZARD AREAS
POTHOLES

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**POTENTIAL FLOOD HAZARD AREAS POTHOLES**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.70-5**



PLAN



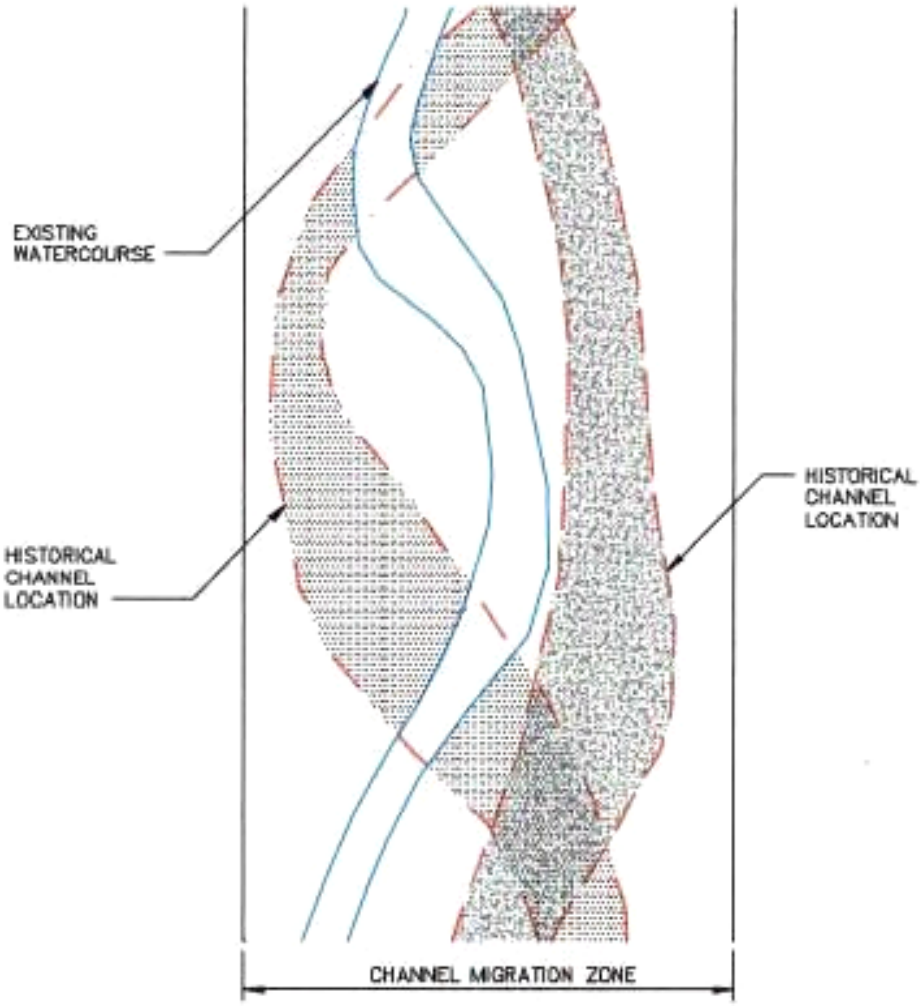
ELEVATION

NOTE: AS SHOWN ABOVE, AREAS LOCATED WITHIN 2' OF VERTICAL HEIGHT OF A POTENTIAL SURFACE WATER SPILLWAY FROM THE POTHOLE ARE WITHIN THE POTENTIAL FLOOD HAZARD AREA

POTENTIAL FLOOD HAZARD AREAS
POTHOLES

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**POTENTIAL FLOOD HAZARD AREAS POTHOLES**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.70-6**



MAPPING OF ALL HISTORICAL CHANNELS

NOTE: THE LOCATION OF MANY RIVER CHANNELS CHANGE OVER TIME. THE CHANNEL MIGRATION ZONE (CMZ) IS THAT AREA THAT CAN BE IDENTIFIED BY EVIDENCE OF PAST CHANNEL MOVEMENTS, INCLUDING THE PRESENT CHANNEL LOCATION. THE CMZ AREA IS CONSIDERED TO BE AT RISK FROM EROSION AND FLOODING, AND HAS SIMILAR TOPOGRAPHIC CHARACTERISTICS TO PRESENT AND HISTORIC STREAM CHANNELS.

POTENTIAL FLOOD HAZARD AREAS
CHANNEL MIGRATION ZONE

N.T.S

City of Edgewood
Community Development Department
2221 Meridian Avenue East
Edgewood, WA 98371 (253) 952-3299

POTENTIAL FLOOD HAZARD AREAS CHANNEL MIGRATION ZONE

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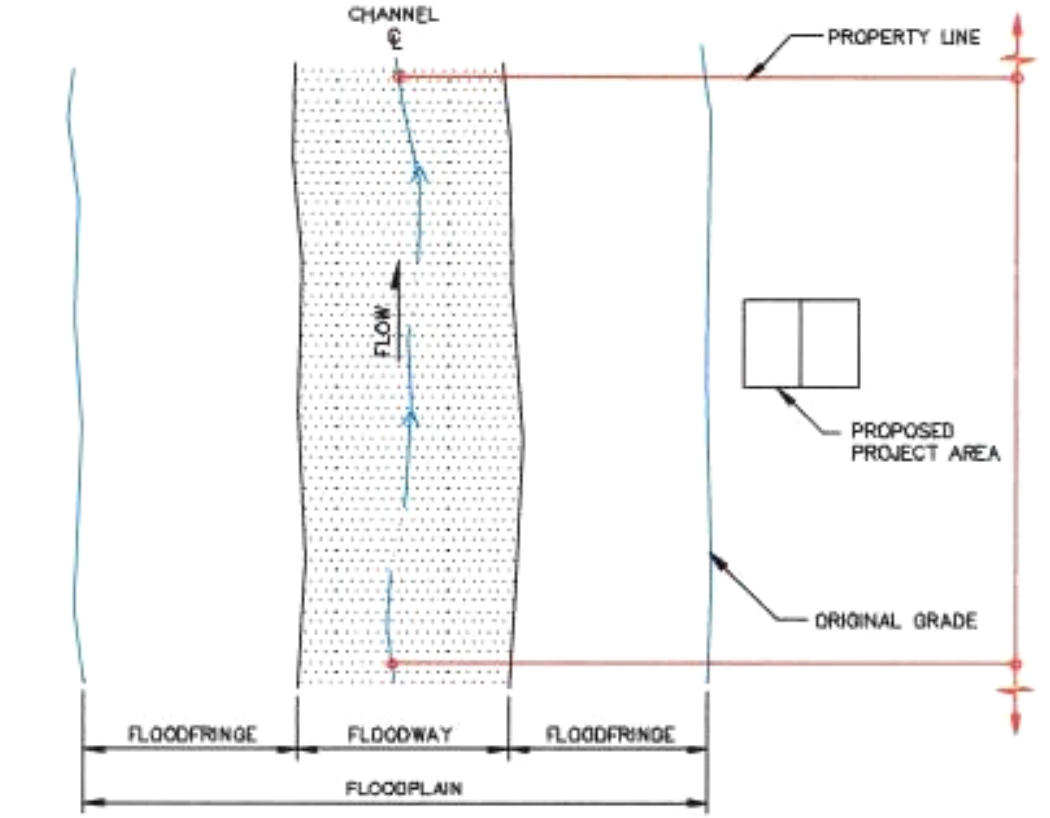
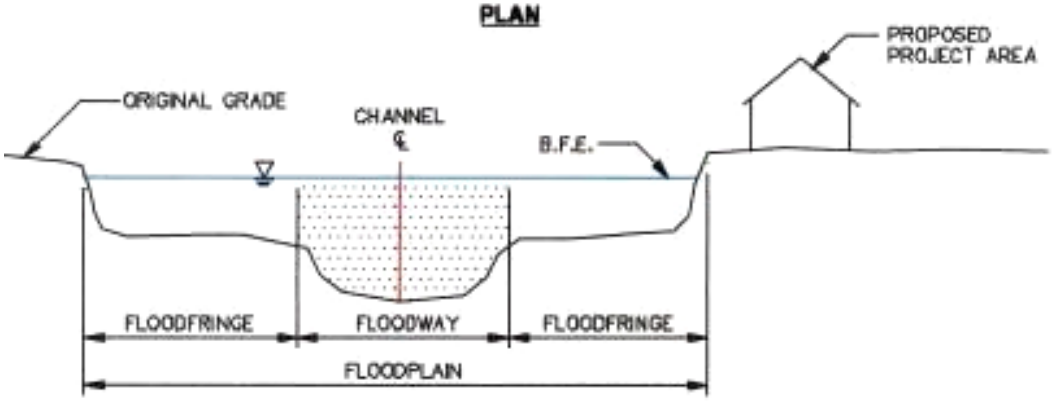


PLAN

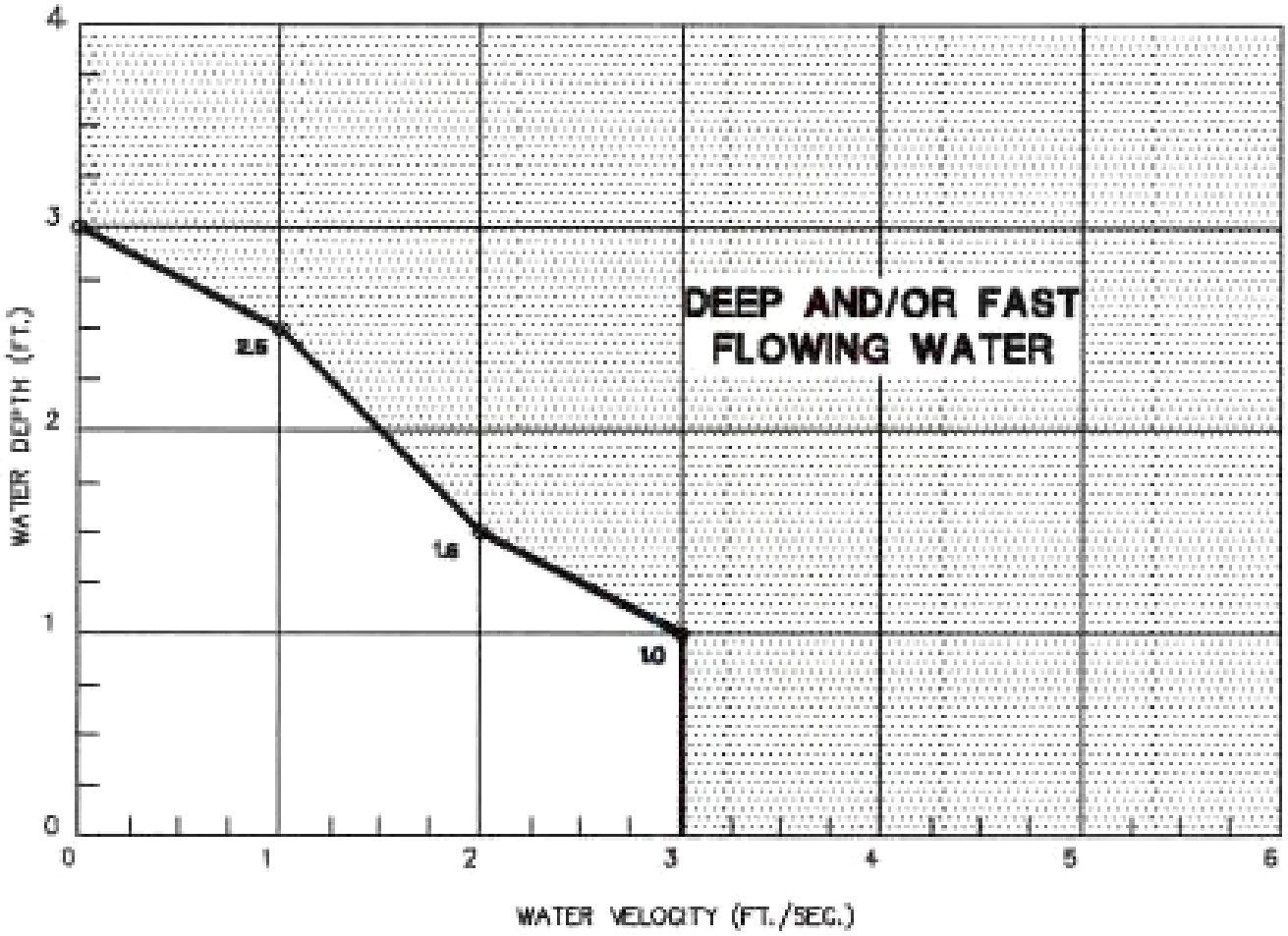


CROSS SECTION

FLOODWAY
FLOOD HAZARD AREA

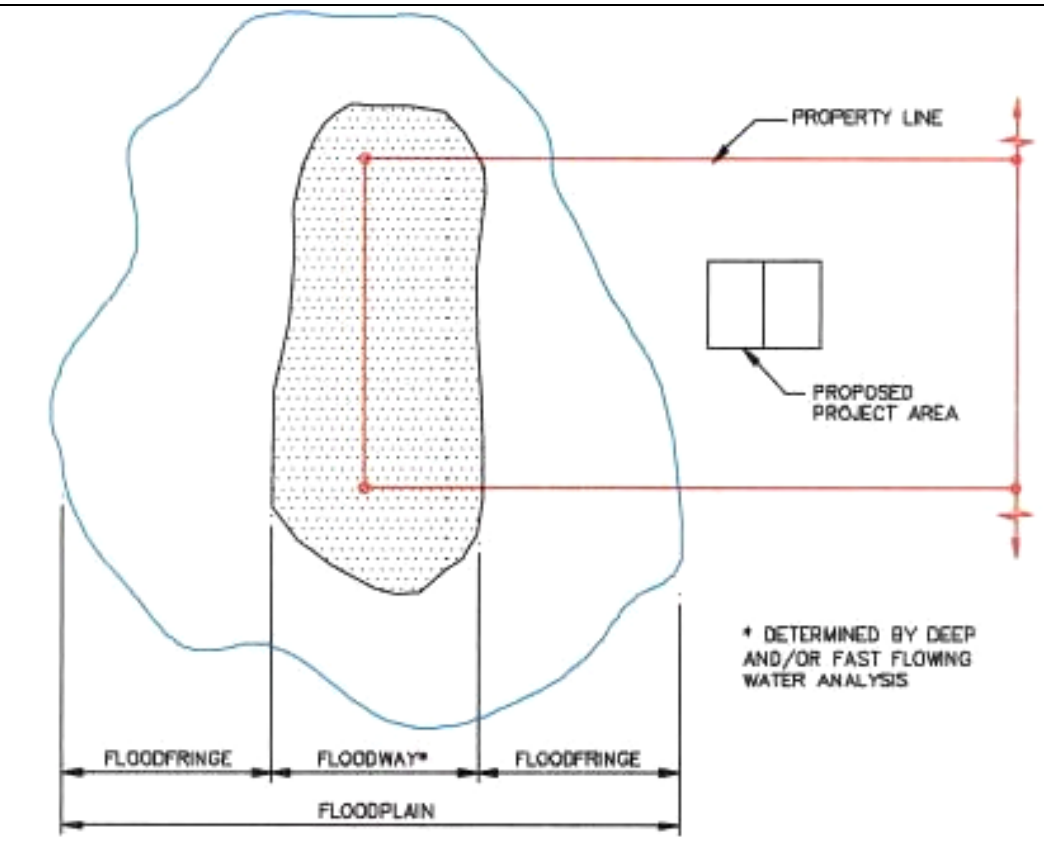
N.T.S

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**FLOODWAY FLOOD HAZARD AREA**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.70-8**

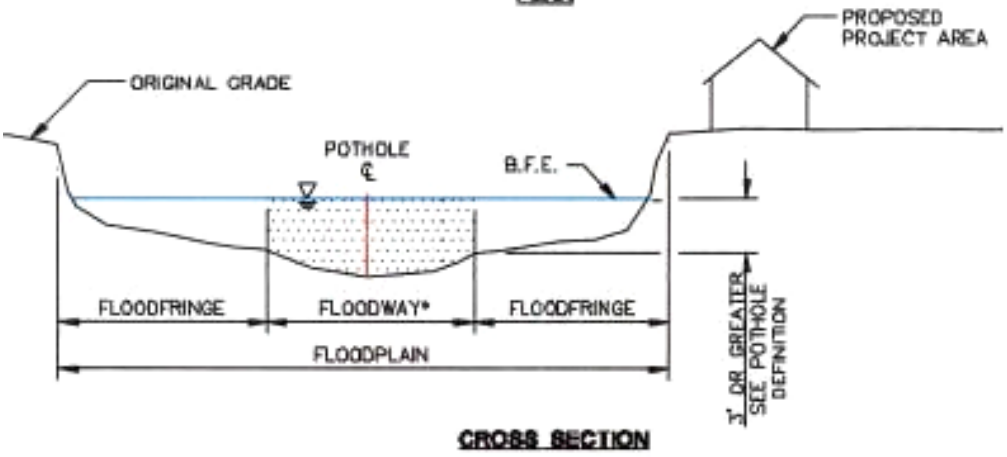


DEEP AND/OR FAST FLOWING WATER GRAPH

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**DEEP AND/OR FAST FLOWING WATER GRAPH**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.70-9**



PLAN

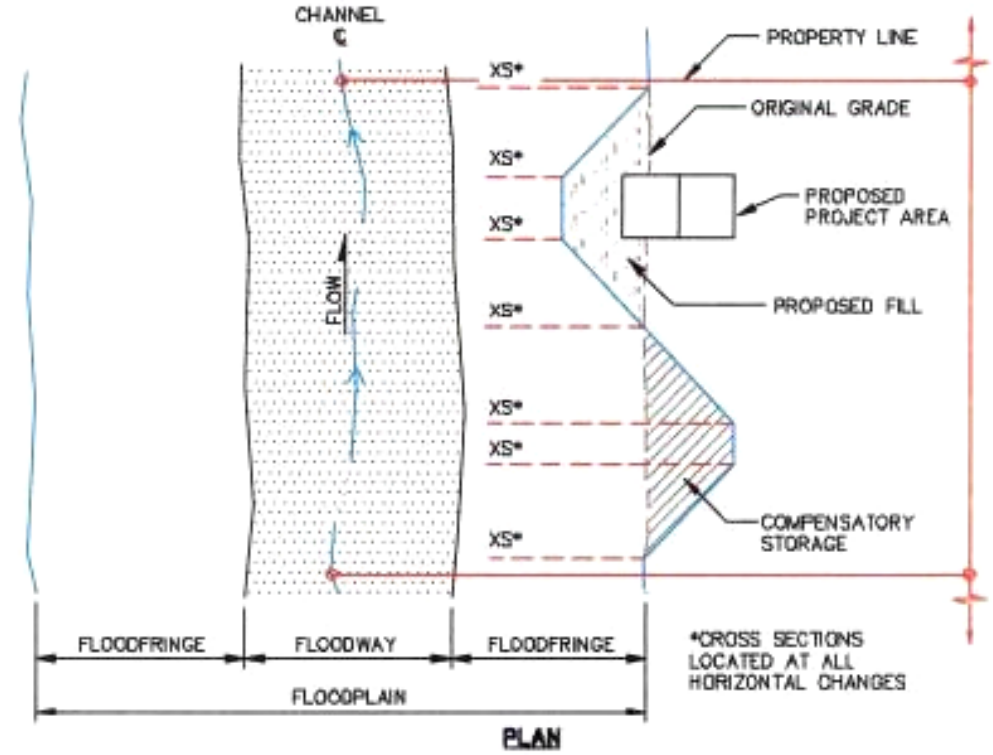


CROSS SECTION

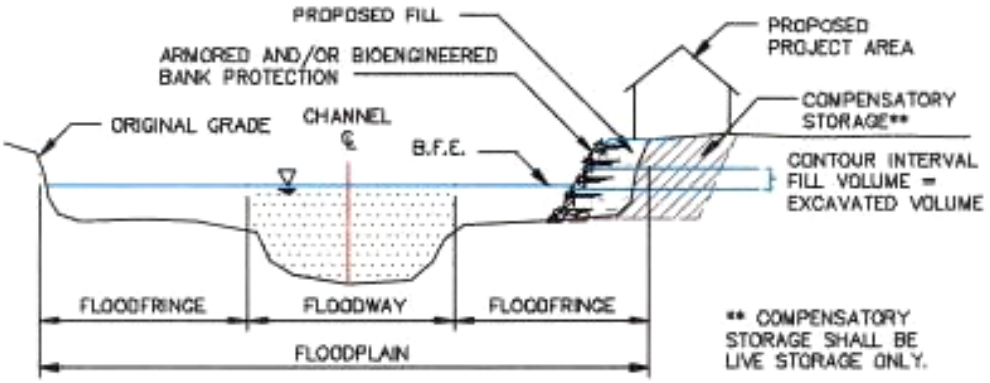
POTHOLE & B ZONE FLOOD HAZARD AREA

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**POTHOLE & B ZONE FLOOD HAZARD AREA**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.70-10**



PLAN



CROSS SECTION

NOTE: EXAMPLE PURPOSES ONLY. ACTUAL DESIGNS MAY/WILL VARY DEPENDING UPON POTENTIAL IMPACTS TO FLOW REGIME. COMPENSATORY STORAGE MUST NOT IMPACT FLOW CONVEYANCE.

COMPENSATORY STORAGE

N.T.S.

City of Edgewood
Community Development Department
2221 Meridian Avenue East
Edgewood, WA 98371 (253) 952-3299

COMPENSATORY STORAGE

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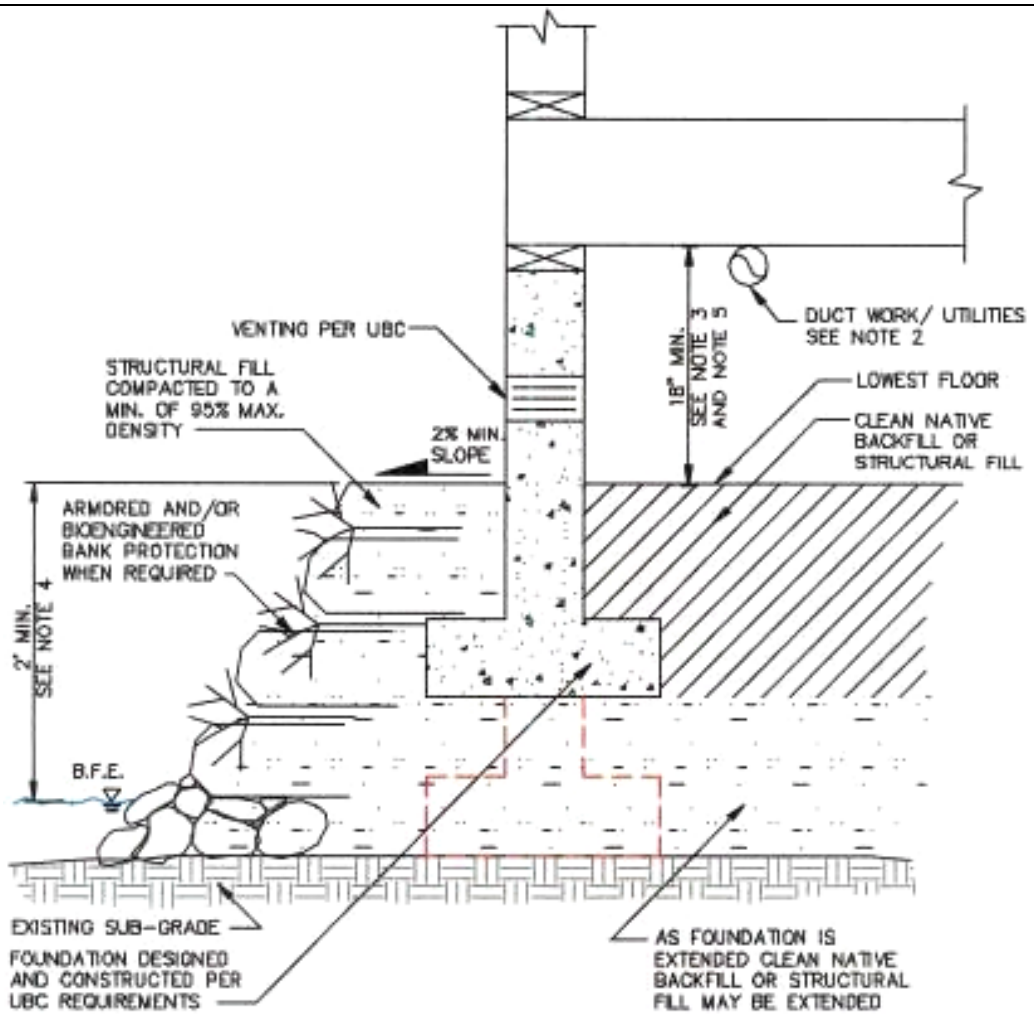


NOTES:

1. FILL MATERIAL SHALL MEET THE NO-RISE CRITERIA WITH SUPPORTING ANALYSIS
2. ALL BUILDING CONSTRUCTION MATERIALS (I.E. DUCT WORK, UTILITIES, SIDING, ETC.) SHALL HAVE 2' MIN VERTICAL SEPARATION FROM THE B.F.E.
3. APPLIES TO NON-PRESSURE TREATED FLOOR JOISTS.
4. VERTICAL SEPARATION SHALL BE 3' MIN. FOR CRITICAL FACILITES.
5. LOWEST FLOOR ELEVATION WILL AFFECT FLOOD INSURANCE PREMIUMS.

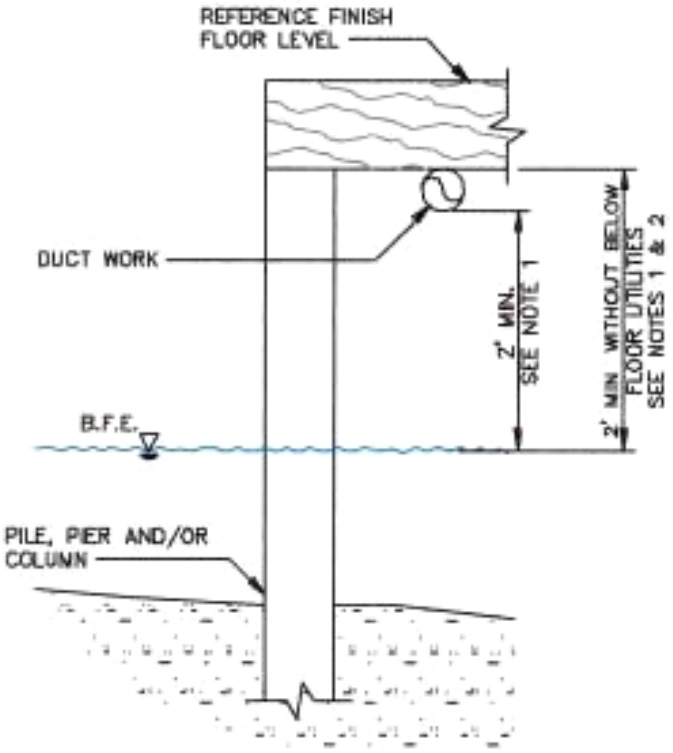
STRUCTURE WITH CRAWLSPACE ELEVATION BY FILL

N.T.S

City of Edgewood
Community Development Department
2221 Meridian Avenue East
Edgewood, WA 98371 (253) 952-3299

STRUCTURE WITH CRAWLSPACE ELEVATION BY FILL

Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	FIGURE 14.70-14



A AND V - ZONE

NOTES:

1. BOTTOM OF LOWEST HORIZONTAL STRUCTURAL MEMBER ELEVATION AND ALL BUILDING CONSTRUCTION MATERIALS (I.E. DUCT WORK, UTILITIES, SIDING, FLOOR JOISTS, ETC.) SHALL HAVE 2' MIN. VERTICAL SEPARATION FROM THE B.F.E.
2. BOTTOM OF LOWEST HORIZONTAL STRUCTURAL MEMEBER SHALL HAVE 3' MIN. VERTICAL SEPARATION FROM THE B.F.E. FOR CRITICAL FACILITIES IN A AND V ZONES.

BUILDING ON PILES, PIERS OR COLUMNS

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**BUILDING ON PILES, PIERS OR COLUMNS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.70-15**

Chapter 14.80

LANDSLIDE HAZARD AREAS

Sections:

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14.80.030 Landslide Hazard Area Review Procedures.
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Figure 14.80-1 Landslide Hazard Indicators.
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Figure 14.80-4 Interim Areas Between Landslide Hazard Areas.
Figure 14.80-5 Landslide Hazard Area Review.
Figure 14.80-6 Required Buffers for Active Landslide Hazard Areas.

14.80.010 Purpose.

The following statements describe the purpose of this Chapter is to:

A. Protect human life and health.
B. Regulate uses of land in order to avoid damage to structures and property being developed and damage to neighboring land and structures.
C. Identify and map active landslide hazard areas.
D. Minimize the ill effects on wetlands and critical fish and wildlife habitat that can result from landslides.
E. Establish permit requirement and review procedures for development proposals in areas with potential landslides.

14.80.020 Landslide Hazard Areas.

A. **Landslide Hazard Areas Indicators.** Landslide hazard areas are areas potentially subject to mass movement due to a combination of geologic, seismic, topographic, hydrologic, or manmade factors. Landslide hazard areas can be identified by the presence of any of the following indicators:
   1. Areas of historic failures, including areas of unstable, old and recent landslides or landslide debris within a head scarp.
   2. Areas with active bluff retreat that exhibit continuing sloughing or calving of bluff sediments, resulting in a vertical or steep bluff face with little or no vegetation.
   3. Areas with the following characteristics:
      a. Slopes steeper than 20% with a vertical relief of 20 feet or more (see Figure 14.80-1); and

b. Hillsides that intersect geologic contacts with a relatively permeable sediment overlying a relatively impermeable sediment or bedrock; and
c. Springs or groundwater seepage.

4. Slopes that are parallel or sub-parallel to planes of weakness, such as bedding planes, joint systems, and fault planes in subsurface materials.
5. Areas exhibiting geomorphological features indicative of past slope failure, such as hummocky ground, back-rotated benches on slopes, etc.
6. Areas with tension cracks or ground fractures along and/or near the edge of the top of a bluff or ravine.
7. Areas with structures that exhibit structural damage such as settling and cracking of building foundations or separation of steps or porch from a main structure that is located near the edge of a bluff or ravine.
8. The occurrence of toppling, leaning, bowed, or jackstrawed trees that are caused by disruption of ground surface by active movement.
9. Areas with slopes containing soft or liquifiable soils.
10. Areas where gullying and surface erosion have caused dissection of the bluff edge or slope face as a result of drainage or discharge from pipes, culverts, ditches, and natural drainage courses.
11. Areas where seeps or springs or indicators (e.g., vegetation type) of a shallow groundwater table are observed on or adjacent to the face of the slope.
12. Any area with a slope of 40% or steeper and with a vertical relief of 15 or more feet, except those manmade slopes created under the design and inspection of a geotechnical professional or slopes composed of competent bedrock. For the purposes of determining whether a slope is considered to be a landslide hazard area, the horizontal and vertical distance between the top and toe of slope are utilized (see 14.80 Appendix D, and Figure 14.80-1).
13. Areas that are at risk of mass movement due to seismic events.

B. **Potential Landslide Hazard Areas.** Potential landslide hazard areas (see Figure 14.80-2), as depicted on the Critical Areas Atlas-Landslide Hazard Areas Map, are those areas where the suspected risk of slope instability and landslide is sufficient to require a geological assessment to assess the potential for active landslide activity. Potential landslide hazard areas are determined by using the following criteria:

1. Areas identified on the City topographic maps as having slopes greater than 20% with a vertical relief of greater than 20 feet and any adjacent areas within a distance of 65 feet (see Figure 14.80-3).
2. Areas that possess one or more of the landslide hazard area indicators (stratigraphy, groundwater conditions, etc.) as set forth in Section 14.80.020 A and any adjacent area within a distance of 65 feet.

C. **Landslide Hazard Area Categories.** Landslide hazard areas shall be classified into categories, which reflect each landslide hazard areas past landslide activity, and the potential for future landslide activity based on an analysis of slope instability. Landslide hazard areas shall be designated as follows:

1. **Active Landslide Areas.** A composite of the active landslides and/or unstable areas, including that portion of the top of slope and slope face subject to failure and sliding as well as toe of slope areas subject to impact from down slope run-out, identified and mapped during a geological assessment of a site. An active landslide hazard area exhibits one or more of the following:

a. Areas of historical landslide movement on a site which have occurred in the past century including areas identified on the Coastal Zone Atlas of Washington, Volume VII, Pierce County as Urs (unstable recent slide).
b. Unstable areas that exhibit geological and geomorphologic evidence of past slope instability or landsliding or possess geological indicators (stratigraphy, ground water conditions, etc.), as set forth in 14.80.020 A, that have been determined through a geological assessment process to be presently failing or may be subject to future landslide activity. The impact of the proposed development activities must be considered in defining the extent of the active areas.
c. Interim areas are located between areas identified through the geological assessment process as an active landslide hazard area. Interim areas will be considered part of the active landslide hazard area if the required top of slope or toe of slope landslide hazard area buffer encompasses the area (see 14.80 Appendix D, and Figure 14.80-4).

2. **Stable Areas.** Areas that have been identified as potential landslide hazard areas' but through the geological assessment process, meet one of the following conditions:
   a. No indicators as set forth in 14.80.020 A actually exist that indicate the potential for future landslide activity to occur;
   b. A slope stability analysis has proven that there is no landslide potential; or
   c. Adequate engineering or structural measures have been provided through the submittal of a geological assessment – geotechnical report that mitigates the potential for a future landslide to occur as a result of current or cumulative development activity.

14.80.030 Landslide Hazard Area Review Procedures.

A. **General Requirements.**
   1. The City's Critical Area Atlas provides an indication of where active and potential landslide hazard areas are located within the City. The actual presence or location of an active landslide hazard area and/or additional potential landslide hazard areas that have not been mapped, but may be present on or adjacent to a site, shall be determined using the geological assessment procedures established in this Chapter.
   2. The Department will complete a review of the Critical Areas Atlas - Landslide Hazard Area Map and other source documents for any proposed regulated activity to determine whether the site is, or may be located within, an active or potential landslide hazard area. Identification of an active or potential landslide hazard area may also occur as a result of field investigations conducted by Department staff.
   3. When the Department's maps or sources indicate that the site for a proposed regulated activity is or may be located within an active or potential landslide hazard area, the Department shall require the submittal of a geological assessment as outlined in 14.80.030 B below (see Figure 14.80-5).
   4. Unless otherwise stated in this Chapter, the critical protective measure provisions contained in Section 14.10.080 shall apply.

B. **Geological Assessment.** A geological assessment is a site investigation process to evaluate the on-site geology affecting a subject property.
   1. Geological assessments shall be submitted to the Department for review and approval together with a landslide hazard area application and associated fee.

2. A geological assessment shall include a field investigation and may include the use of historical air photo analysis, review of public records and documentation, and interviews with adjacent property owners, etc.
3. The geological assessment shall include the following information and analysis:
    a. A determination of which areas on the site or within the vicinity of the site meet the criteria for an active landslide hazard area and stable area as set forth in Section 14.80.020 C1 and 2.
    b. Consider the run-out hazard of landslide debris to the proposed development that starts upslope (whether part of the subject property or on a neighboring property) and/or the impacts of landslide run-out on down slope properties.
    c. The geological assessment shall include a detailed review of the field investigations, published data and references, data and conclusions from past geological assessments, or geotechnical investigations of the site, site-specific measurements, tests, investigations, or studies, as well as the methods of data analysis and calculations that support the results, conclusions, and recommendations.
4. Geological assessments shall be prepared, signed, and dated by a geotechnical professional (as defined in Section 14.10.060 and established in this Chapter) and the format shall be pre-approved by the Department.
5. An engineering geologist shall complete a field investigation and geological assessment to determine whether or not an active landslide hazard area exists within 300 feet of the site (see Figure 14.80-5).
    a. The geological assessment shall be submitted in the form of a geotechnical letter when the engineering geologist finds that no active landslide hazard area exists within 300 feet of the site. The geotechnical letter shall meet the requirements contained in 14.80.060 Appendix A.
    b. The geological assessment shall be submitted in the form of geotechnical verification when the engineering geologist finds that an active landslide hazard area exists, but is located more than 300 feet away from the proposed project area. The geotechnical verification shall meet the requirements contained in 14.80.060 Appendix B.
    c. The geological assessment shall be submitted in the form of a geotechnical report when the engineering geologist finds that an active landslide hazard area exists within 300 feet of the proposed project area or when a geotechnical professional determines that mitigation measures are necessary in order to construct or develop within a potential landslide hazard area. The geotechnical report shall meet the requirements contained in 14.80.060 Appendix C.
6. Geological assessments that do not contain the minimum required information or comply with the landslide hazard area standards set forth in 14.80.030 will be returned to the geotechnical professional for revision.
7. The Department shall review the geological assessment and either:
    a. Accept the geological assessment; or
    b. Reject the geological assessment and require revisions or additional information.
8. When the geological assessment has been accepted, the Department shall issue a decision on the landslide hazard area application.
9. A geological assessment for a specific site may be valid for a period of up to five years when the proposed land use activity and surrounding site conditions are unchanged. However, if any environmental conditions associated with the site change during that five-year period, the applicant may be required to submit an amendment to the geological assessment.

14.80.040 Landslide and Erosion Hazard Area Standards.

A. **Active Landslide Hazard Areas.** Any development, encroachment, filling, clearing or grading, building structures, impervious surfaces, and vegetation removal shall be prohibited within active landslide hazard areas and associated buffers except as specified in the following standards:

1. **Stormwater Conveyance.** Stormwater conveyance shall be allowed when it is conveyed through a high-density polyethylene stormwater pipe with fuse-welded joints and when no other stormwater conveyance alternative is available. The pipe shall be located on the surface of the ground and be properly anchored so that it will continue to function in the event of an underlying slide.
2. **Utility Lines.** Utility lines will be permitted when no other conveyance alternative is available. The line shall be located above ground and properly anchored and/or designed so that it will continue to function in the event of an underlying slide.
3. **Roads, Bridges, and Trails.** Roads, bridges, and trails shall be allowed when all of the following conditions have been met:
    a. Mitigation measures are provided that ensure the roadway prism and/or bridge structure will not be susceptible to damage from landslide-induced ground deformation or impact/coverage by landslide debris. Mitigation measures shall be designed for static and seismic loading conditions in accordance with the most recent version of the American Association of State Highway and Transportation Officials (AASHTO) Manual.
    b. The road is not a sole access for a development.
    c. The removal or disturbance of vegetation, clearing or grading shall be prohibited during the wet season (November 1st to May 1st).

B. **Landslide Hazard Management Areas.** All regulated activities may be allowed in areas located within 300 feet of an active landslide hazard area subject to the following standards:

1. The Department reviews and approves a geological assessment - geotechnical report and determines that the potential landslide hazard area is stable.
2. The proposed development is located outside of an active landslide hazard area and any required buffer, as set forth in 14.80.050.
3. The proposed recommendations and mitigation measures contained within the geotechnical report are adequate to reduce or mitigate risks to health and safety.
4. The proposed development shall not decrease the factor of safety for landslide occurrence below the limits of 1.5 for static conditions and 1.2 for dynamic conditions. Analysis of dynamic (seismic) conditions shall be based on a minimum horizontal acceleration as established by the current version of the Washington State Uniform Building Code.
5. The removal and disturbance of vegetation, clearing or grading shall be limited to the area of the approved development and shall not be allowed during the wet season (November 1st through May 1st) unless adequate provisions for wet season erosion have been addressed in the geotechnical report and approved by the Department.
6. Surface drainage from developed areas, including downspouts and runoff from paved or unpaved surfaces up slope, shall not be directed through an active landslide hazard area or its associated buffer unless it is conveyed in conformance with the provisions in 14.80.030 A1 above.
7. Stormwater retention facilities, including infiltration systems utilizing perforated pipe, are prohibited unless the slope stability impacts of such systems have been analyzed and

mitigated by a geotechnical professional and the impacts have been determined to be negligible.

8. The proposed development shall not create a need for larger landslide hazard area buffers and setbacks on neighboring properties unless approved through a notarized written agreement with the affected property owner(s).
9. The proposed development shall be sited far enough from regressing slope faces to project 120 years of useful life for the proposed structure(s) or infrastructure.
10. Any proposed lots must be completely located outside any identified active landslide hazard areas or their associated buffers.
11. Stable landslide hazard areas that are directly adjacent to any riparian areas, or wetlands, may be subject to additional buffer requirements and standards as set forth in Chapter 14.60 Critical Fish and Wildlife Habitat Areas or wetlands as set forth in Chapter 14.30 Wetlands.

14.80.050 Buffer Requirements.

A. **Determining Buffer Widths.**
   1. The buffer width shall be measured on a horizontal plane from a perpendicular line established at the edge of the active landslide hazard area limits (both from the top and toe of the slope) (see 14.80 Appendix D, and Figure 14.80-6).
   2. A buffer of undisturbed vegetation shall be required for an active landslide hazard area. The required buffer width is the greater amount of the following distances:
      a. Fifty feet from all edges of the active landslide hazard area limits;
      b. A distance of one-third the height of the slope at the top of the active landslide hazard area and a distance of one-half the height of the slope at the bottom of an active landslide hazard area; or
      c. The minimum distance recommended by the geotechnical professional, measured from the edges of the active landslide hazard area.

B. **Modification of Buffer Widths.** The Department may require a larger buffer width than the buffer distance, as determined in A. above, if any of the following are identified:
   1. The adjacent land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse impacts.
   2. The area has a severe risk of slope failure or downslope stormwater drainage impacts.

14.80.060 Appendices.

A. **Geological Assessment-Landslide Hazard Geotechnical Letter.**
B. **Geological Assessment-Landslide Hazard Geotechnical Verification.**
C. **Geological Assessment-Landslide Hazard Geotechnical Report.**

14.80.070 Figures.

Figure 14.80-1 Landslide Hazard Indicators.
Figure 14.80-2 Potential Landslide Hazard Areas.
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14.80.060 Appendices.

APPENDIX A

GEOLOGICAL ASSESSMENT-
LANDSLIDE HAZARD GEOTECHNICAL LETTER

A. A geotechnical letter shall include the following:
   1. The letter shall be labeled identifying the submittal as a "Landslide Hazard Geotechnical Letter."
   2. The date when the geological assessment was performed. The date when the letter was prepared.
   3. The parcel number(s) of the site.
   4. Site address, if the City has assigned one.
   5. A brief description of the project (including the proposed land use) and a description of the area to be developed. The appropriate professional preparing the Geotechnical Letter shall provide conclusions and recommendations as to slope stability for the proposed development.
   6. A paragraph that states the following specific language:
      "I meet the qualifications contained in Title 14, Section 14.10.060 to prepare a landslide hazard geological assessment. I understand the requirements of the current Landslide Hazard Area Chapter 14.80 and the definitions of the applicable terms contained within Chapter 14.25 and Title 14. I have performed a landslide hazard geological assessment, conducted a field investigation, and researched historic records on or in the vicinity of the above referenced site and determined that no active landslide hazard area exists within 300 feet of the site."
   7. The name, mailing address, and telephone number of the engineering geologist who performed the geological assessment and prepared the letter.
   8. The name, mailing address, and telephone number of the property owner.

B. The engineering geologist who prepared the letter shall stamp the letter with his or her license stamp/seal.

C. Hold harmless clauses, disclaimers, and limitations are not allowed within a geotechnical letter.

D. Geotechnical letters shall be in conformance with a format that is pre-approved by the Department.

14.80.060 Appendices.

APPENDIX B

GEOLOGICAL ASSESSMENT-
LANDSLIDE HAZARD GEOTECHNICAL VERIFICATION

A. A geotechnical verification shall include the following:
   1. The first page of the document shall be labeled identifying the submittal as a "Landslide Hazard Geotechnical Verification."
   2. The date when the geological assessment was performed. The date when the verification document was prepared.
   3. The parcel number(s) of the site.
   4. Site address, if the City has assigned one.
   5. A detailed description of the project (including the proposed land use) and a description of the area to be developed.
   6. A description of the surface and subsurface geology, hydrology, soils, and vegetation at the site and a list of the landslide hazard area indicators, as set forth in Section 14.80.020 A, that were found on or in the vicinity of the site.
   7. A summary of the results, conclusions, and recommendations resulting from the geological assessment of the landslide hazards on or in the vicinity of the site. This summary shall address all of the information required in Section 14.80.030 B.
   8. An accurate site plan drawn at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department) is required. The Department may require that the site plan information listed below be based on a field survey by a licensed surveyor. The site plan shall include:
      a. The limits/location of the active landslide hazard area(s) set forth in Section 14.80.020C1.
      b. The limits/location of the required landslide hazard buffer based upon the requirements set forth in Section 14.80.050 A.
      c. The location of any existing and proposed structures, utilities, on-site septic systems, wells, and stormwater management facilities.
      d. The full geographical limits of the proposed project area (area to be developed).
      e. Dimension the closest distance between the identified active landslide hazard area boundary and the project area.
      f. Existing topography on the site presented in two-foot contours.
      g. Property lines for the site.
      h. North arrow and plan scale.
   9. A paragraph that states the following specific language:
      "I meet the qualifications contained in Title 14, Section 14.80.030 to prepare a landslide hazard geological assessment. I understand the requirements of the current Landslide Hazard Area Chapter 14.80 and the definitions of the applicable terms contained within Chapter 14.25 and Title 14. I have performed a landslide hazard geological assessment, conducted a field investigation, and researched historic records on or in the vicinity of the above referenced site and determined that no active landslide hazard area exists within 300 feet of the proposed project area."

10. The name, mailing address, and telephone number of engineering geologist who performed the geological assessment and prepared the verification document.
11. The name, mailing address, and telephone number of the property owner.

B. The engineering geologist who prepared the verification document shall stamp the verification with his or her license stamp/seal.

C. Hold harmless clauses, disclaimers, and limitations are not allowed within geotechnical verification.

D. Geotechnical verifications shall be in conformance with a format that is pre-approved by the Department.

14.80.060 Appendices.

APPENDIX C

GEOLOGICAL ASSESSMENT-
LANDSLIDE HAZARD GEOTECHNICAL REPORT

A. At a minimum, a geotechnical report shall include the following:
   1. The first page of the document shall clearly identify the submittal as a "Landslide Hazard Geotechnical Report."
   2. The date when the geological assessment was performed. The date when the geotechnical report was prepared.
   3. The parcel number(s) of the site.
   4. Site address if the City has assigned one.
   5. A detailed description of the project (including the proposed land use) and a description of the area to be developed.
   6. A description of the surface and subsurface geology, hydrology, soils, and vegetation of the site and a list of the landslide hazard area indicators, as set forth in Section 14.80.020 A, that were found on or in the vicinity of the site.
   7. A summary of the results, conclusions, and recommendations resulting from the geological assessment of the landslide hazards on or in the vicinity of the site. This summary shall address all of the information required in Section 14.80.030 B.
   8. An accurate site plan drawn at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department) is required. The Department may require that the site plan information listed below be based on a field survey by a licensed surveyor. The site plan shall include:
      a. The limits/location of the active landslide hazard area(s) set forth in Section 14.80.020C.1. Delineation of the active landslide hazard area limits shall differentiate between areas of historic landslide activity and adjacent unstable areas.
      b. The limits/location of the required landslide hazard buffer based upon the requirements set forth in Section 14.80.050 A.
      c. The limits/location of any potential landslide hazard areas that have been designated as stable areas in accordance with Section 14.80.020C2c.
      d. The location of any existing and proposed structures, utilities, on-site septic systems, wells, and stormwater management facilities.
      e. The full geographical limits of the proposed project area (area to be developed).
      f. Location and unique identifier of geotechnical borings, CPT soundings, or other surveys or explorations used to characterize subsurface conditions.
      g. Extent of cross-section(s) used to evaluate the three-dimensional subsurface geologic and groundwater conditions at the site.
      h. Extent of cross-section(s) used in the evaluation of slope instability.
      i. Existing topography on the site presented in two-foot contours.
      j. Property lines for the site.
      k. North arrow and plan scale.
   9. Subsurface characterization data must be provided. The data shall be based on both existing and new information that may include soil borings, test pits, geophysical surveys, or other appropriate subsurface exploration methods, development of site-

specific soil and/or rock stratigraphy, and measurement of groundwater levels including variability resulting from seasonal changes, alterations to the site, etc.

a. Conventional geotechnical boring data shall be reported as a graphic log utilizing the following standards:
   (1) The vertical scale of the graphic log shall be such that 5 feet of drilled depth is scaled to range of 1" to 2" (1:60- or 1:30-scale), and shall include vertical columns that record depth in 1 ft. increments, SPT value and incremental blow counts, a graphic pattern representation of the soil type encountered during drilling, and sample descriptions and other comments regarding drilling.
   (2) The graphic log shall have a header on the first page that includes a unique identifier for the boring, the times and dates of the start and completion of drilling, the manufacturer and model of the drilling rig, the company name of the drilling contractor, the name(s) of the site geologist(s) or engineer(s) overseeing the drilling activities, the details of the method used to advance the borehole (e.g., 4" i.d. hollow-stem auger), the type of drilling fluid used to stabilize the borehole, verification that the SPT followed all applicable ASTM standards including a description of the sampler, hammer weight, drop height, the type of hammer used to perform the SPT, number of turns of rope if a cathead is used to raise the hammer, condition of rope (i.e., new, used, frayed, oily, etc.), and the depth of static groundwater measured immediately prior to abandonment of the boring and the time and date of this measurement.
   (3) All subsequent pages of the graphic log shall have the unique identifier for the boring, the times and dates of the start and completion of drilling, and the number of the page and the total number of pages comprising the log.
   (4) Each SPT value will be reported in the appropriate column showing the blow counts recorded at each 6" interval, and the sum of the blow counts between penetration distances of 6" to 18", unless refusal conditions (50 or more blows with less than 6" of sampler penetration) are met anywhere in this interval. At refusal, the blow count shall be recorded as the number of blows with the corresponding sampler penetration, in inches.
   (5) SPT tests shall be performed every 5 feet during drilling, at a minimum. Additional undisturbed samples, collected following ASTM standards for undisturbed soil sampling, cannot be substituted for SPT testing.
   (6) The soil sample descriptions will include the total length of the recovered sample, the soil color, odor, the density or consistency (loose to very dense, very soft to very stiff), degree of water saturation (dry, moist, wet, saturated), and dilatancy. For granular (sand and gravel) soils, the description shall include a physical description of the soil sample, including size distribution (poorly or well graded), angularity, composition, amount and plasticity of the fines fraction. For fine soils (silt and clay), the description shall include a qualitative estimate of the proportion of the silt and clay size particles (e.g., silty clay, clay with some silt, etc.), plasticity, and amount and type of organic material. The sample description shall include a description of any bedding, laminations, slickensides, or other textural or deposition features, including contact between dissimilar soil types. The sample description shall also include a field classification of the soil sample using the Unified Soil Classification System where the classification is expressed in lower case letters (e.g., sp, ml, etc.). The sample classification shall be expressed in upper case letters (e.g., SP, ML, etc.)

where subsequent laboratory testing has been performed. This column of the graphic log will also include any other information relevant to the subsurface investigation, such as loss of drilling fluid, heaving, churning of the drill in gravelly soils, etc.

b. CPT sounding data shall be reported as a graphic log utilizing the following standards:
   (1) The vertical scale of the graphic log shall be such that 5 feet of penetrated depth is scaled to range of 1" to 2" (1:60- or 1:30-scale), and shall include vertical columns that record depth in 1 foot increments.
   (2) The graphic log shall have a header on the first page that includes a unique identifier for the boring, the times and dates of the start and completion of the CPT sounding, the manufacturer and model of the CPT system, the company name of the CPT service contractor, the name(s) of the site geologist(s) or engineer(s) overseeing the CPT sounding, and any comments regarding the conduct of the testing, reaction of the CPT system during sounding, etc.
   (3) All subsequent pages of the graphic log shall have the unique identifier for the boring, the times and dates of the start and completion of drilling, and the number of the page and the total number of pages comprising the log.
   (4) The graphic log shall display, at a minimum, a continuous depth plot of the uncorrected tip resistance, the friction (sleeve) resistance, the friction ratio, and the measured pore pressure with an overlay of the calculated hydrostatic pore pressure. These curves shall be plotted so as to show the full variation of the measured quantities within the depth range of the sounding, and each curve shall have a visible scale with the minimum and maximum ranges labeled.
   (5) All of the CPT data recorded for each sounding shall also be provided in either electronic or hardcopy format. Electronic data will be presented in an ASCII text file format.

c. Geotechnical borings or CPT soundings will be advanced to a depth sufficient to characterize geologic conditions within and below the existing or potential landslide mass.

d. Other methods used for subsurface characterization shall be assigned a unique identifier, and the basic data presented in appropriate graphical and/or tabular format.

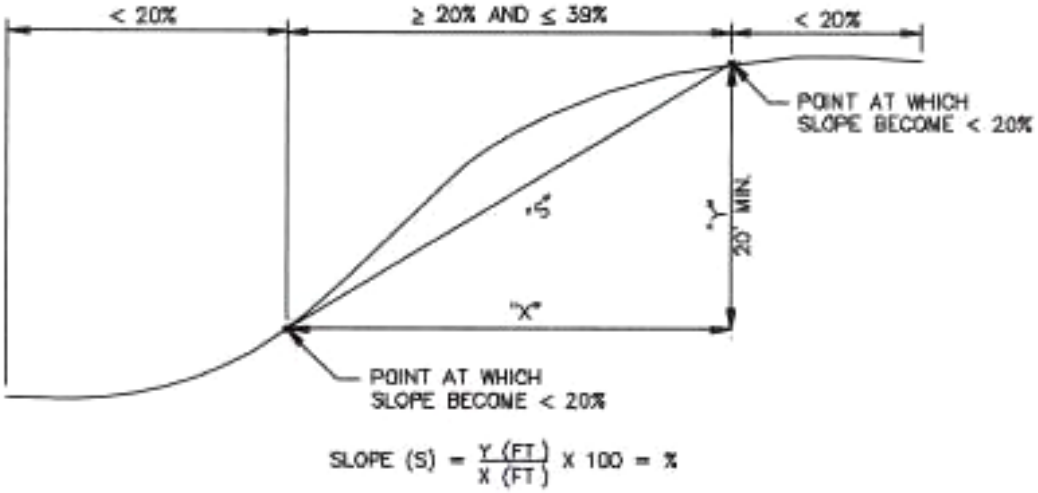
e. The three-dimensional subsurface conditions at the site shall be presented using one or more cross-sections showing location and depth penetration of geotechnical borings, CPT soundings, or other subsurface characterization methods, interpretation of the geometry of major soil units, and projected location of the static groundwater surface determined from the subsurface exploration. The cross-sections shall be presented at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department). Each cross-section shall have a legend with a description of the various major soil units.

10. Soil strength and index properties (i.e., unit weight, cohesion, etc.) shall be provided for each soil unit interpreted from the subsurface characterization of the site, and shall be presented in tabular format. Justification for the presented values of these soil parameters shall be based on one or more of the following approaches:
    a. Back analysis based on pre-landslide stability conditions.
    b. Laboratory measurement of strength or other index properties made on soil samples.

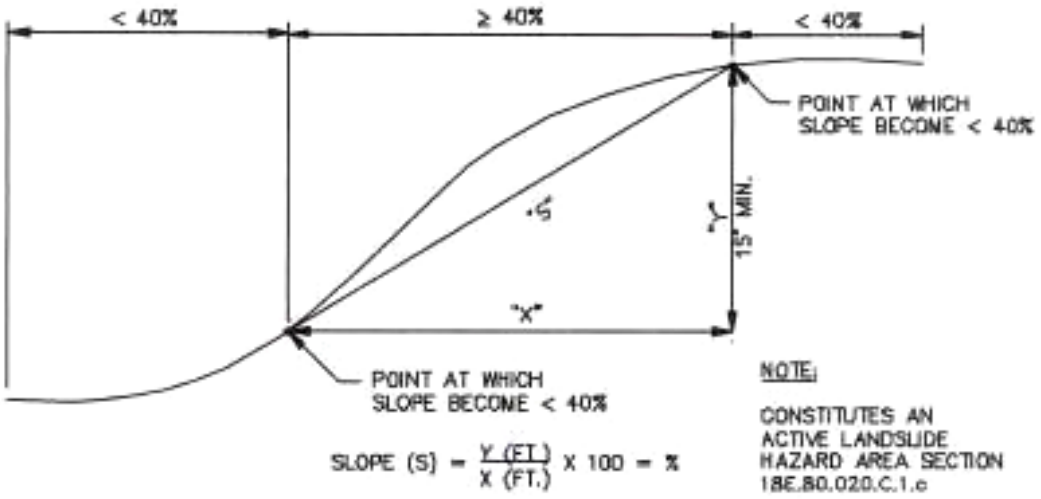
c. Correlation of soil strength index properties to other geotechnical indices (e.g., SPT blow counts, etc.), where the correlation relations are documented (e.g., published literatures, in-house empirical data set, etc.).
d. Soil strength and indices based on generic values must provide a clear justification for their use.

11. A detailed description of any prior grading activity, soil instability, or slope failure.
12. Assessments and conclusions regarding slope stability for both the existing and developed conditions shall be presented and documented. These assessments and conclusions shall include:
    a. Determination of the potential types of landslide failure mechanisms (e.g., debris flow, rotational slump, translational slip, etc.) that may affect the site.
    b. Quantitative stability evaluation of slope conditions of the various failure mechanisms using state-of-the-practice modeling techniques. Limiting equilibrium methods of analysis shall state the stability conditions as a factor of safety. The most unstable failure geometry(ies) shall be presented in the form of a cross-section(s), with the least stable failure geometry for each failure mechanism clearly indicated. The stability evaluation shall also consider dynamic (earthquake) loading, and shall use a minimum horizontal acceleration as established by the current version of the Washington State Uniform Building Code.
    c. An analysis of slope regression rate shall be presented in those cases where stability is impacted or influenced by erosional processes (e.g., wave cutting, stream meandering, etc.) acting on the toe of the slope.
13. Mitigation recommendations using engineered measures to protect the proposed structure(s) and any adjacent structures, infrastructure, adjacent wetlands, or critical fish and wildlife habitat from damage or destruction as a result of proposed construction activities shall be designed by a professional engineer. The geotechnical report shall contain:
    a. Design plans and associated design calculations for engineered structures or drainage systems (e.g., structural foundation requirements, retaining wall design, etc.).
    b. Recommendations and requirements pertaining to the handling of surface and subsurface runoff in the developed condition.
    c. Identification of necessary geotechnical inspections to assure conformance with the report mitigation and recommendations.
    d. Proposed angles of cut and fill slopes, site grading requirements, final site topography (shown as 2' contours), and the location of any proposed structures, on-site septic systems, wells, and stormwater management features or facilities associated with the development detailed within the body of the report and shown on a site map at the same scale as that required in Section A-7 of this Appendix.
    e. Soil compaction criteria and compaction inspection requirements.
    f. An analysis that indicates how the proposal meets the standards outlined in Section 14.80.040.
    g. Structural foundation requirements and estimated foundation settlement shall be provided if structures are proposed.
    h. Lateral earth pressures.
    i. Suitability of onsite soil for use as fill.
    j. Mitigation measures for building construction on each lot for short plats, large lots, or formal plats such that additional geotechnical professional involvement is minimized during building construction.

B. The geotechnical report shall be prepared by an engineering geologist and shall be co-written by both an engineering geologist and professional engineer where both geological interpretations and engineering analyses and designs are necessary or prudent in the mitigation of the landslide hazard.
C. The geotechnical professional(s) who prepared the geotechnical report shall stamp the report with his or her license stamp/seal.
D. The Department may request a geotechnical professional to provide additional information in the geotechnical report based upon existing conditions, changed conditions, or unique circumstances occurring on a case by case basis.
E. Hold harmless clauses, disclaimers, and limitations are not allowed to be included, neither expressly nor implied, within a geological assessment.
F. Geotechnical reports shall be in conformance with a format that is pre-approved by the Department.



20% - 39% SLOPE

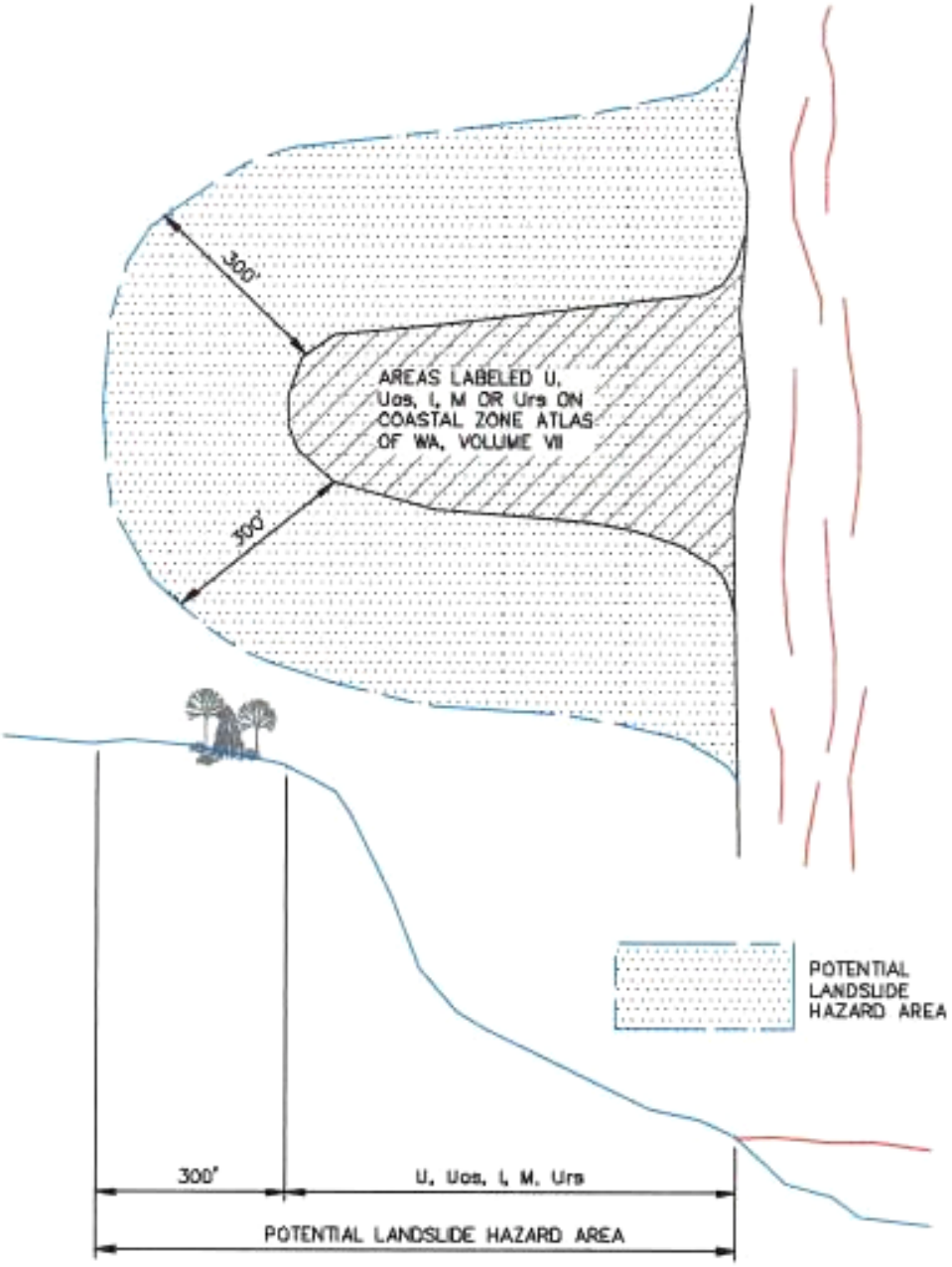


≥ 40% SLOPE

LANDSLIDE HAZARD INDICATORS

N T S

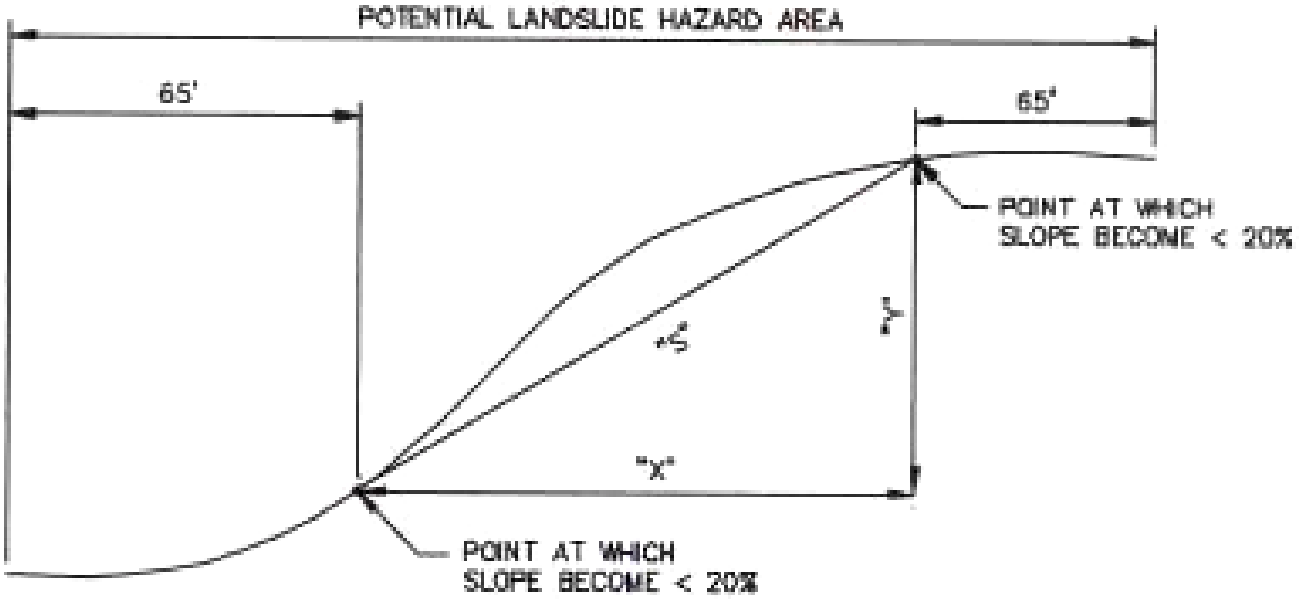
City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**LANDSLIDE HAZARD INDICATORS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.80-1**



POTENTIAL LANDSLIDE HAZARD AREA - AREAS LABELED U, Uos, I, M OR Urs

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**POTENTIAL LANDSLIDE HAZARD AREA AREAS LABELED U, Uos, I, M, or Urs**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.80-2**

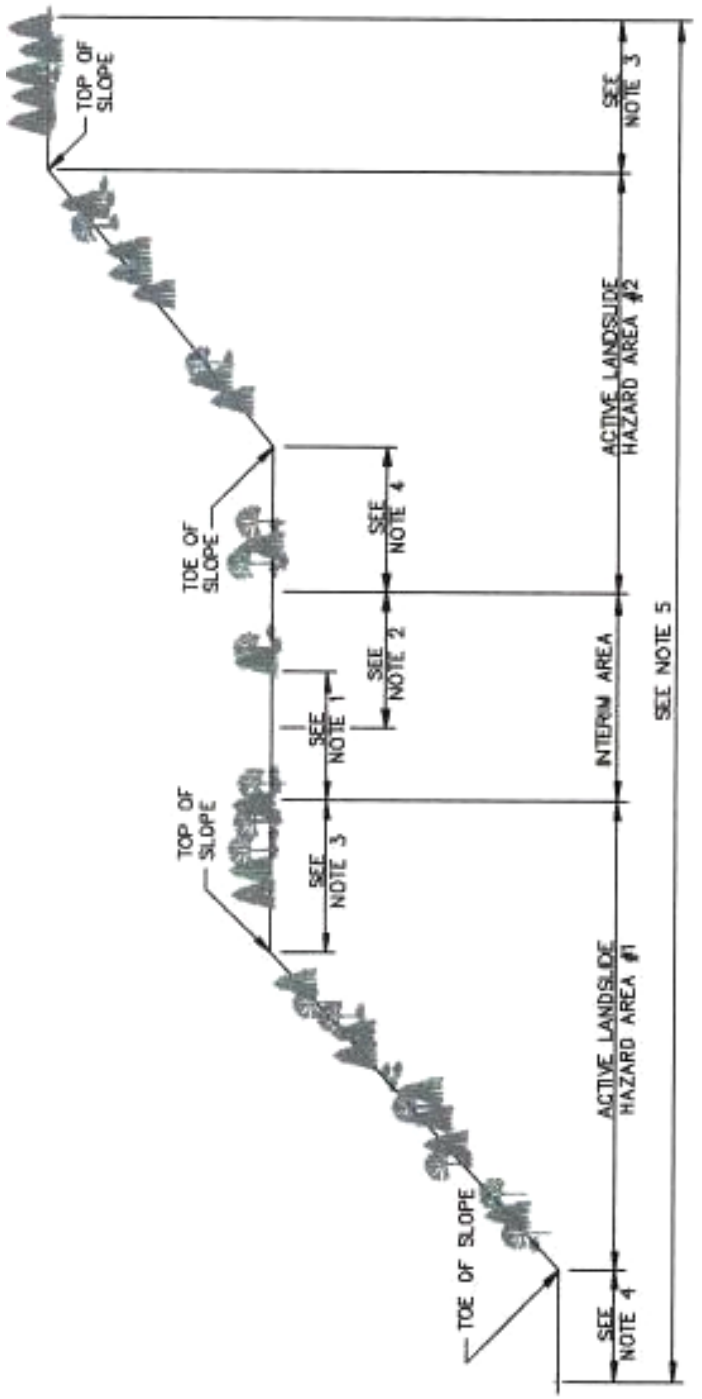


$$\text{SLOPE (S)} = \frac{Y\ (\text{FT.})}{X\ (\text{FT.})} \times 100 = \%$$

POTENTIAL LANDSLIDE HAZARD AREA - SLOPES GREATER THAN 20% WITH GREATER THAN 20' VERTICAL RELIEF

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**SLOPES GREATER THAN 20% WITH GREATER THAN 20' VERTICAL RELIEF**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.80-3**



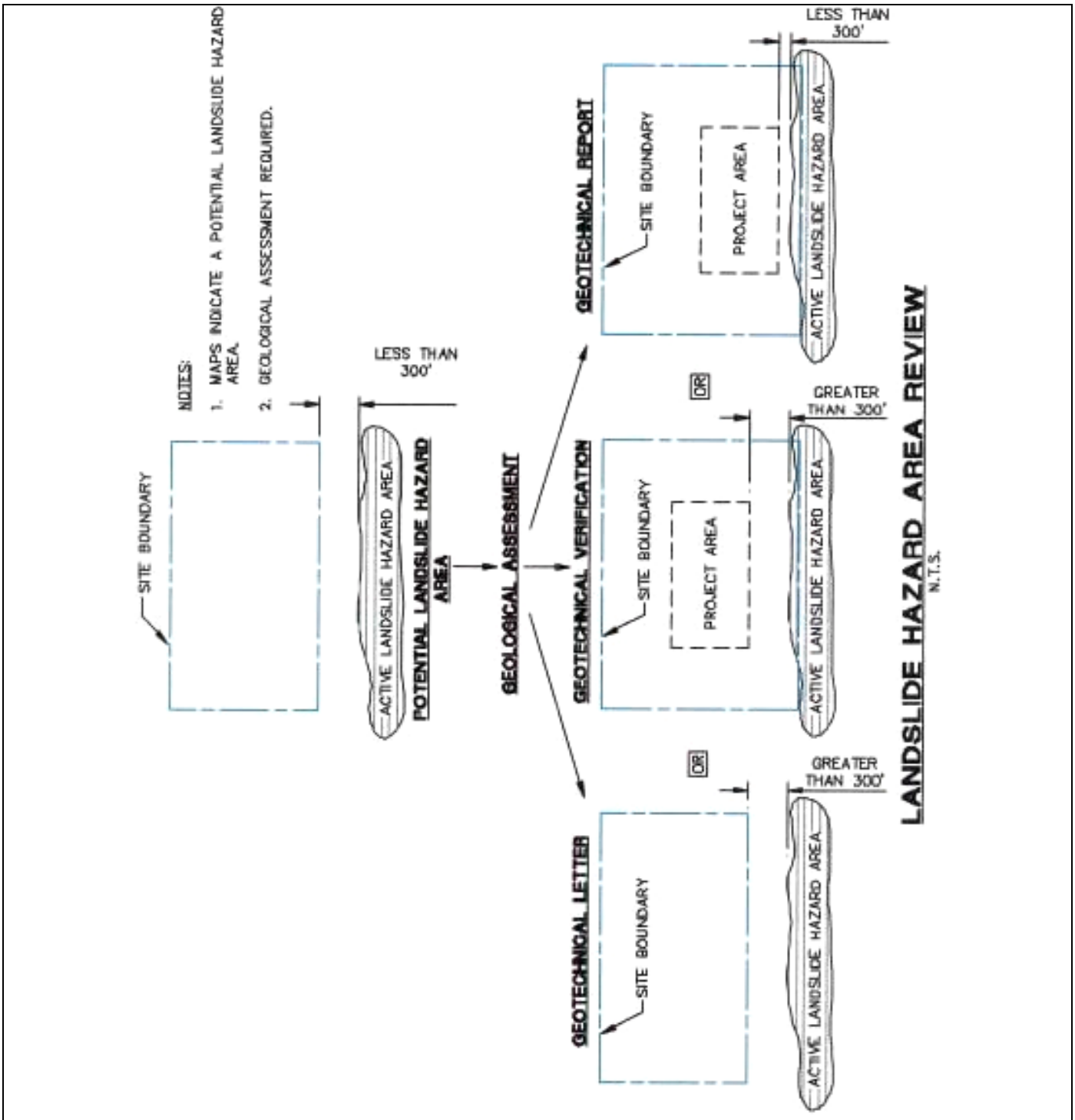
NOTES:

1. BUFFER FOR ACTIVE LANDSLIDE HAZARD AREA #1 AS PER SECTION 18E.80.050A.
2. BUFFER FOR ACTIVE LANDSLIDE HAZARD AREA #2 AS SECTION 18E.80.050A.
3. TOP OF SLOPE AREA THAT IS SUBJECT TO FAILURE AND SLIDING.
4. TOE OF SLOPE AREA SUBJECT TO DOWN SLOPE RUN-OUT.
5. ACTIVE LANDSLIDE HAZARD AREA #1, THE INTERIM AREA AND ACTIVE LANDSLIDE HAZARD AREA #2 SHALL BE COMBINED INTO ONE ACTIVE LANDSLIDE AREA WHEN THE BUFFERS FOR ACTIVE LANDSLIDE HAZARD AREA #1 AND #2 OVERLAP OR COINCIDE.

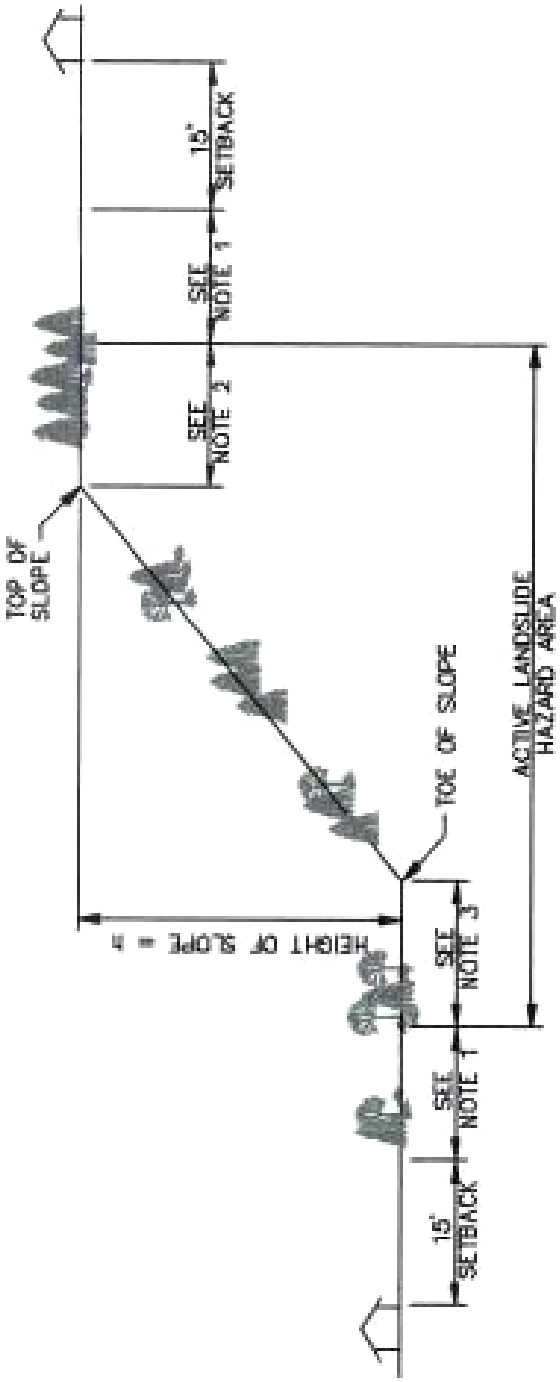
INTERIM AREAS BETWEEN LANDSLIDE HAZARD AREAS

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**	**INTERIM AREAS BETWEEN LANDSLIDE HAZARD AREAS**		
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.80-4**



City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**LANDSLIDE HAZARD AREA REVIEW**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.80-5**



NOTES:

1. BUFFER DISTANCE AS PER SECTION 18E.80.050A
2. TOP OF SLOPE AREA THAT IS SUBJECT TO FAILURE AND SLIDING.
3. TOE OF SLOPE AREA SUBJECT TO DOWN SLOPE RUNOUT.

REQUIRED BUFFERS FOR ACTIVE LANDSLIDE HAZARD AREAS

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**REQUIRED BUFFERS FOR ACTIVE LANDSLIDE HAZARD AREAS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.80-6**

Chapter 14.90

SEISMIC (EARTHQUAKE) HAZARD AREAS

Sections:

14.90.010 Purpose.
14.90.020 Seismic Hazard Areas.
14.90.030 Seismic Hazard Area Review Procedures.
14.90.040 Seismic Hazard Area Standards.
14.90.050 Buffer Requirements.
14.90.060 Appendices.
A. Geological Assessment - Liquefaction or Dynamic Settlement Hazard Area.
B. Geological Assessment - Fault Rupture Hazard Area.
14.90.070 Figures.
14.90-1 Fault Rupture Hazard Areas.
14.90-2 Seismic Hazard Area Review.
14.90-3 Fault Rupture Hazard Area Buffers.

14.90.010 Purpose.

Earthquakes have historically occurred throughout the Puget Sound region. Large earthquakes have caused loss of life and over a billion dollars in property damage. The purpose of this Chapter is to protect the public health, safety, and general welfare of the citizens of Edgewood from the damaging effects of earthquakes. This Chapter provides standards to ensure life safety and minimize public and private losses that may occur within a seismic hazard area.

14.90.020 Seismic Hazard Areas.

A. **General.** Seismic hazard areas are areas subject to severe risk of damage as a result of earthquake-induced landsliding, seismic ground shaking, dynamic settlement, fault rupture, soil liquefaction, or flooding caused by tsunamis and seiches.

B. **Potential Seismic Hazard Areas.** Potential seismic hazard areas, as depicted on the Critical Areas Atlas-Seismic Hazard Areas map, are those areas where the suspected risk of earthquake induced landsliding, dynamic settlement, fault rupture, ground deformation caused by soil liquefaction, or flooding is sufficient to require a further seismic hazard area review as set forth in Section 14.90.030. These potential seismic hazard areas are determined using the following criteria:

1. **Earthquake Induced Landslide Hazard Areas.** Areas identified as potential landslide hazard areas in Chapter 14.80, Section 14.80.020.
2. **Liquefaction and/or Dynamic Settlement Hazard Areas.** Areas identified as high and moderate liquefaction and dynamic settlement hazard areas on the Washington Department of Natural Resources, Division of Geology and Earth Resources liquefaction and dynamic settlement hazard area table.
3. **Fault Rupture Hazard Areas.** (Reserved)
4. **Tsunami and Seiche Hazard Areas.** Areas that are adjacent to Puget Sound marine waters, lakes, and ponds that are designated as “A” or “V” zones as defined by FEMA and depicted on the FEMA maps or other maps adopted by the City.

C. **Seismic Hazard Area Categories.**

1. **Earthquake Induced Landslide Hazard Areas.** Earthquake induced landslide hazard areas include slopes that can become unstable as a result of strong ground shaking, even though these areas may be stable under non-seismic conditions.
2. **Liquefaction and/or Dynamic Settlement Hazard Areas.**
   a. Liquefaction hazard areas are areas underlain by unconsolidated (corrected Standard Penetration Test blow counts, $[(N_1)_{60}]$ less than 30) sandy or silt soils (Unified Soil Classification System S or M soil-types) and a shallow groundwater table (static groundwater depth < 30') capable of liquefying in response to earthquake shaking.
   b. Dynamic settlement hazard areas are areas underlain by a significant thickness (more than 10') of loose or soft soil not susceptible to liquefaction (e.g., peats or organic silts and clays, unsaturated loose sands or silts), but that could result in vertical settlement of the ground surface in response to earthquake shaking.
3. **Fault Rupture Hazard Areas.** Fault rupture hazard areas include:
   a. Active fault rupture hazard areas are areas where displacement (movement up, down, or laterally) of the ground surface has occurred during past earthquake(s) in the Holocene Epoch; and
   b. Areas adjacent to the active fault rupture hazard area that may be potentially subject to ground surface displacement in a future earthquake (see Figure 14.90-1).

14.90.030 Seismic Hazard Area Review Procedures.

A. **General Requirements.**

1. The City's Critical Areas Atlas-Seismic Hazard Area Map provides an indication of where potential seismic hazard areas are located within the City.
2. The Department will complete a review of the Critical Areas Atlas-Seismic Hazard Area Map for any regulated activity to determine whether the site for a proposed regulated activity is located within a seismic hazard area.
3. When the Department's maps indicate that the site for a proposed regulated activity is located within a potential liquefaction or dynamic settlement hazard area, the Department shall require the submittal of a geological assessment as outlined in Section 14.90.030 B. below (see Figure 14.90-2).
4. When the Department's maps indicate that the site for a proposed regulated activity is located within a potential fault rupture hazard area, the Department shall require the submittal of a geological assessment as outlined in Section 14.90.030 B. below. The requirement to submit a geological assessment may be waived at the Departments discretion when it is determined that the proposed project area for the regulated activity is located outside the potential fault rupture hazard area.
5. When the Department's maps indicate that the site for a proposed regulated activity is or may be located within a potential earthquake-induced landslide hazard area, the Department shall conduct a review pursuant to the requirements set forth in Section 14.80.030.
6. Unless otherwise stated in this Chapter, the critical area protective measure provisions contained in Section 14.10.080 shall apply.

B. **Geological Assessments.** A geological assessment is a site investigation process to evaluate the on-site geology affecting a subject property and define the extent and severity of potential seismic hazards.

1. A geological assessment shall be required when the Department's maps, sources, or field investigation indicate a site contains a potential liquefaction, dynamic settlement,

or fault rupture hazard area. Geological assessments shall be submitted to the Department for review and approval together with a seismic hazard area application.

2. A geotechnical professional(s) shall complete a field investigation and geological assessment to determine whether or not the site for a proposed regulated activity is located within a liquefaction or dynamic settlement hazard area (see Figure 14.90-2).
   a. The geological assessment shall be submitted in the form of a geotechnical letter when the geotechnical professional(s) finds that no liquefaction or dynamic settlement hazard areas exist within the site. The geotechnical letter shall meet the requirements contained in 14.90.060 Appendix A.
   b. The geological assessment shall be submitted in the form of a geotechnical verification when the geotechnical professional(s) finds that a liquefaction or dynamic settlement hazard area exists on the site but is located outside the proposed project area. The geotechnical verification shall meet the requirements contained in 14.90.060 Appendix A.
   c. The geological assessment shall be submitted in the form of a geotechnical report when the geotechnical professional(s) finds that a liquefaction or dynamic settlement hazard area exists within the proposed project area. The geotechnical report shall meet the requirements contained in 14.90.060 Appendix A.
3. An engineering geologist shall complete a field investigation and geological assessment presented in the form of a geotechnical report to determine whether or not the site for a proposed regulated activity is located within a fault rupture hazard area. The geological assessment shall meet the requirements contained in 14.90.060 Appendix B. Any structural recommendations proposed to mitigate the fault rupture hazard that are included in the geotechnical report shall be prepared by an engineer.
4. All geological assessments for seismic hazards submitted under this Chapter shall include at a minimum, the following:
   a. The dates when the geological assessment was conducted and when the assessment was prepared.
   b. The parcel number(s) of the subject property.
   c. Site address, if the City has assigned one.
   d. A brief description of the project (including the proposed land use) and the area to be developed.
   e. A map showing the property lines for the site, existing two-foot contours of the existing site topography, and the location of any existing structures, utilities, wells, stormwater or septic systems, or other developments.
   f. A site plan delineating the limits of the proposed development and the location of all areas of the site subject to potential seismic hazards based on the Critical Areas Atlas-Seismic Hazard Areas Map and, if applicable, limits of associated buffers.
   g. A description of the surface and subsurface geology, hydrology, soils, and vegetation of the site.
   h. A detailed overview of the field investigations, published data and references, data and conclusions from past geological assessments or geotechnical investigations of the site, site-specific measurements, tests, investigations, or studies, as well as the methods of data analysis and calculations that support the determination regarding whether liquefaction and/or dynamic settlement hazards are present on the site.
   i. The results, conclusions, and recommendations resulting from the geological assessment of the liquefaction and/or dynamic settlement hazards on the subject property as prepared by a geotechnical professional(s).

5. Geological assessments shall be prepared, signed, and dated by the appropriate geotechnical professional(s) (as defined in Section 14.10.060 and established in this Chapter) and the format shall be pre-approved by the Department.
6. Geological assessments that do not contain the minimum required information will be returned to the geotechnical professional(s) for revision.
7. The Department shall review the geological assessment and either:
   a. Accept the geological assessment and approve the application; or
   b. Reject the geological assessment and require revisions or additional information.
8. A geological assessment for a specific site may be valid for a period of up to five years when the proposed land use activity and surrounding site conditions are unchanged. However, if any environmental conditions associated with the site change during that five-year period, the applicant may be required to submit an amendment to the geological assessment.

14.90.040 Seismic Hazard Area Standards.

A. **Earthquake Induced Landslide Hazard Areas.** All standards set forth in Chapter 14.80 shall apply to earthquake induced landslide hazard areas.

B. **Liquefaction and/or Dynamic Settlement Hazard Areas.**
   1. All building structures shall conform to the standards set forth in Title 15, Building and Construction.
   2. **Utility Lines.** Utility lines, except for gas pipelines, which are prohibited, will be permitted when no other conveyance alternative is available. The line shall be located above ground and properly anchored and/or designed so that it will continue to function in the event of seismically induced ground deformation. Provision for automatic shut-off of utilities in a ground-rupturing event will be required.
   3. **Roads, Bridges, and Trails.** Roads, bridges, and trails shall be allowed when mitigation measures are provided that ensure the roadway prism and/or bridge structure will not be susceptible to damage from seismic induced ground deformation. Mitigation measures shall be designed for static and seismic loading conditions in accordance with the most recent version of the American Association of State Highway and Transportation Officials (AASHTO) Manual and also for an estimated range of ground surface offset presented in the geotechnical report.

C. **Fault Rupture Hazard Areas.** Any development, encroachment, filling, grading, or building structures shall be prohibited within fault rupture hazard areas and associated buffers except as specified in the following standards:
   1. **Utility Lines.** Utility lines, except for gas pipelines, which are prohibited, will be permitted when no other conveyance alternative is available. The line shall be located above ground and properly anchored and/or designed so that it will continue to function in the event of seismically-induced ground deformation. Provision for automatic shut-off of utilities in a ground-rupturing event will be required.
   2. **Roads, Bridges, and Trails.** Roads, bridges, and trails shall be allowed when all of the following conditions have been met:
      a. Mitigation measures are provided that ensure the roadway prism and/or bridge structure will not be susceptible to damage from seismically-induced ground deformation. Mitigation measures shall be designed for static and seismic loading conditions in accordance with the most recent version of the American Association of State Highway and Transportation Officials (AASHTO) Manual and also for an estimated range of ground surface offset presented in the geotechnical report.

b. The road is not a sole access for a development.

14.90.050 Buffer Requirements.

A. **Determining Buffer Widths.**

1. The buffer width shall be measured on a horizontal plane from a perpendicular line established at the edge of the fault rupture hazard area limits (see Figure 14.90-3).
2. A buffer is an area that is adjacent to a fault rupture hazard area that may be potentially subject to ground surface displacement in a future earthquake. No development shall be permitted within a fault rupture hazard area and its associated buffer. The required buffer width is the greater amount of the following distances:
   a. Fifty feet from all edges of a fault rupture hazard area, except for high occupancy or essential facilities, where the minimum buffer distance shall be 100'; or
   b. The required buffer width is the minimum distance recommended by the geotechnical professional(s).

B. **Modification of Buffer Widths.** The Department may require a larger buffer width than the buffer distance, as determined in A. above, if the Department determines the standard or proposed buffer is not adequate to protect the health, safety, or welfare of any proposed development.

14.90.060 Appendices.

A. Geological Assessments - Liquefaction or Dynamic Settlement Hazard Areas.

B. Geological Assessments - Fault Rupture Hazard Areas.

14.90.070 Figures.

14.90-1 Fault Rupture Hazard Areas.

14.90-2 Seismic Hazard Area Review.

14.90-3 Fault Rupture Hazard Area Buffers.

14.90.060 Appendices.

APPENDIX A
GEOLOGICAL ASSESSMENTS -
LIQUEFACTION OR DYNAMIC SETTLEMENT HAZARD AREAS

I. GEOTECHNICAL LETTER

A. A geotechnical letter shall, at a minimum, include the following:
   1. The letter shall be labeled identifying the submittal as a "Liquefaction or Dynamic Settlement Hazard Geotechnical Letter," and will include all mandatory items listed in Section 14.90.030 B4.
   2. The geological assessment must include a determination that no portion of the subject property [site] includes a liquefaction and/or dynamic settlement hazard.
   3. A paragraph that states the following specific language:
      "I meet the qualifications contained in Section 14.90.030 to prepare this geological assessment. I understand the requirements of the current Seismic (Earthquake) Hazard Areas Chapter 14.90 and the definitions of the applicable terms contained within Chapter 14.25 and Title 14. I have conducted an investigation of sufficient scope on the above referenced site to determine that that no liquefaction and/or dynamic settlement hazard area exists within the boundaries of the proposed site."
   4. The name, mailing address and telephone number of geotechnical professional(s) who prepared the letter.
   5. The name, mailing address, and telephone number of the property owner.

B. The geotechnical professional(s) who prepared the geotechnical letter shall stamp the letter with his or her license stamp/seal.

C. Hold harmless clauses, disclaimers, and limitations are not allowed within a geotechnical letter.

II. GEOTECHNICAL VERIFICATION

A. A geotechnical verification shall, at a minimum, include the following:
   1. The first page of the document shall be labeled identifying the submittal as a "Liquefaction or Dynamic Settlement Hazard Geotechnical Verification," and will include all mandatory items listed in Section 14.90.030 B4.
   2. The geological assessment must include a determination that a liquefaction and/or dynamic settlement hazard exists on the site, but is located outside the proposed project area.
   3. The verification shall include an accurate site plan drawn at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department) is required. The Department may require that the site plan information be based on a field survey by a licensed surveyor. The site plan shall include:
      a. Property lines for the site, and the location of any existing structures.
      b. The existing site topography presented in two-foot contours.
      c. The limits/location of any liquefaction and/or dynamic settlement hazard area(s) as set forth in Section 14.90.020 C2.

d. The full geographical limits of the proposed project area (i.e., area to be developed) and the location of any proposed structures, on-site septic systems, wells, and stormwater management features or facilities associated with the development.
e. The limits of any setbacks from the defined locations of the liquefaction and/or dynamic settlement hazard areas determined by the geotechnical professional(s) as necessary to protect any portion of the proposed development activity from damage caused by liquefaction-induced ground displacement.

4. A paragraph that states the following specific language:
"I meet the qualifications contained in Section 14.90.030 to prepare this geological assessment. I understand the requirements of the current Seismic (Earthquake) Hazard Areas Chapter 14.90 and the definitions of the applicable terms contained within Chapter 14.25 and Title 14. I have conducted an investigation of sufficient scope on the above referenced site to determine that no liquefaction and/or dynamic settlement hazard area exists within the boundaries of the proposed project area."
5. The name, mailing address, and telephone number of geotechnical professional(s) who prepared the letter.
6. The name, mailing address, and telephone number of the property owner.

B. The geotechnical professional(s) who prepared the geotechnical verification shall stamp the verification with his or her license stamp/seal.

C. Hold harmless clauses, disclaimers, and limitations are not allowed within a geotechnical verification.

III. GEOTECHNICAL REPORT

A. A geotechnical report shall, at a minimum, include the following:
1. The first page of the document shall be labeled identifying the submittal as a "Liquefaction or Dynamic Settlement Hazard Geotechnical Report," and will include all mandatory items listed in Section 14.90.030 B4. The report shall be prepared by an engineer and shall be co-written by an engineering geologist where geological interpretations and conclusions critical to the assessment of liquefaction and/or dynamic settlement hazard and potential effects are necessary or prudent. The introductory section of the report shall specify the desired performance level of the structures and other development facilities (e.g., safety to building occupants, minimal damage to structure, post-earthquake serviceability for pre-earthquake operations, no damage, etc.).
2. The results, conclusions, and recommendations resulting from the geological assessment of the liquefaction and/or dynamic settlement hazards on the subject property as prepared by the geotechnical professional(s).
3. The geological assessment-geotechnical report shall include:
a. A statement that the proposed project area falls within a liquefaction and/or dynamic settlement hazard area.
b. A detailed engineering evaluation of expected ground displacements or other liquefaction and/or dynamic settlement effects (e.g., bearing failures, floatation of buried tanks, etc.) and proposed mitigation measures to ensure an acceptable level of risk for the proposed structure type or other development facilities, as well as, the proposed land use type (i.e., occupancy category). The minimum level of acceptable risk for any proposed structure or development facility shall ensure the life safety of any occupant. Designs shall evaluate the range of alternatives for achieving limited

structural damage to no structural damage based on the proposed use intended for the structure.

4. The report shall include an accurate site plan drawn at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department) is required. The Department may require that the site plan information be based on a field survey by a licensed surveyor. The site plan shall include:
   a. Property lines for the site and the location of any existing structures.
   b. The existing site topography presented in two-foot contours.
   c. The limits/location of any liquefaction and/or dynamic settlement hazard area(s) as set forth in Section 14.90.020 C2.
   d. The full geographical limits of the proposed project area (i.e. area to be developed) and the location of any proposed structures, on-site septic systems, wells, and stormwater management features or facilities associated with the development.
   e. The limits of any set-backs from the defined locations of the liquefaction and/or dynamic settlement hazard areas determined by the geotechnical professional(s) as necessary to protect any portion of the proposed development activity from damage caused by liquefaction-induced ground displacement.
   f. Location and unique identifier of geotechnical borings and/or CPT soundings used to characterize subsurface conditions.
5. The field investigation shall require the following elements:
   a. Subsurface characterization using conventional geotechnical borings and Standard Penetration Testing (SPT) or using Cone Penetration Testing (CPT).
   b. Conventional geotechnical boring data shall be reported as a graphic log utilizing the following standards:
      (1) The vertical scale of the graphic log shall be such that 5 feet of drilled depth is scaled to range of 1" to 2" (1:60- or 1:30-scale), and shall include vertical columns that record depth in 1-foot increments, SPT value and incremental blow counts, a graphic pattern representation of the soil type encountered during drilling, and sample descriptions and other comments regarding drilling.
      (2) The graphic log shall have a header on the first page that includes a unique identifier for the boring, the times and dates of the start and completion of drilling, the manufacturer and model of the drilling rig, the company name of the drilling contractor, the name(s) of the site geologist(s) or engineer(s) overseeing the drilling activities, the details of the method used to advance the borehole (e.g., 4" i.d. hollow-stem auger), the type of drilling fluid used to stabilize the borehole, verification that the SPT followed all applicable ASTM standards including a description of the sampler, hammer weight, drop height, the type of hammer used to perform the SPT, number of turns of rope if a cathead is used to raise the hammer, condition of rope (i.e., new, used, frayed, oily, etc.), and the depth of static groundwater measured immediately prior to abandonment of the boring and the time and date of this measurement.
      (3) All subsequent pages of the graphic log shall have the unique identifier for the boring, the times and dates of the start and completion of drilling, and the number of the page and the total number of pages comprising the log.
      (4) Each SPT value will be reported in the appropriate column showing the blow counts recorded at each 6" interval, and the sum of the blow counts between penetration distances of 6" to 18", unless refusal conditions (50 or more blows

with less than 6" of sampler penetration) are met anywhere in this interval. At refusal, the blow count shall be recorded as the number of blows with the corresponding sampler penetration, in inches.

(5) SPT tests shall be performed every 5 feet during drilling, at a minimum. Additional undisturbed samples, collected following ASTM standards for undisturbed soil sampling, cannot be substituted for SPT testing.

(6) The soil sample descriptions will include the total length of the recovered sample, the soil color, odor, the density or consistency (loose to very dense, very soft to very stiff), degree of water saturation (dry, moist, wet, saturated), and dilatancy. For granular (sand and gravel) soils, the description shall include a physical description of the soil sample, including size distribution (poorly or well graded), angularity, composition, amount and plasticity of the fines fraction. For fine soils (silt and clay), the description shall include a qualitative estimate of the proportion of the silt and clay size particles (e.g., silty clay, clay with some silt, etc.), plasticity, and amount and type of organic material. The sample description shall include a description of any bedding, laminations, slickensides, or other textural or deposition features, including contact between dissimilar soil types. The sample description shall also include a field classification of the soil sample using the Unified Soil Classification System where the classification is expressed in lower case letters (e.g., sp, ml, etc.). The sample classification shall be expressed in upper case letters (e.g., SP, ML, etc.) where subsequent laboratory testing has been performed. This column of the graphic log will also include any other information relevant to the subsurface investigation, such as loss of drilling fluid, heaving, churning of the drill in gravelly soils, etc.

c. CPT sounding data shall be reported as a graphic log utilizing the following standards:

(1) The vertical scale of the graphic log shall be such that 5 feet of penetrated depth is scaled to range of 1" to 2" (1:60- or 1:30-scale), and shall include vertical columns that record depth in 1 ft. increments.

(2) The graphic log shall have a header on the first page that includes a unique identifier for the boring, the times and dates of the start and completion of the CPT sounding, the manufacturer and model of the CPT system, the company name of the CPT service contractor, the name(s) of the site geologist(s) or engineer(s) overseeing the CPT sounding, and any comments regarding the conduct of the testing, reaction of the CPT system during sounding, etc.

(3) All subsequent pages of the graphic log shall have the unique identifier for the boring, the times and dates of the start and completion of drilling, and the number of the page and the total number of pages comprising the log.

(4) The graphic log shall display, at a minimum, a continuous depth plot of the uncorrected tip resistance, the friction (sleeve) resistance, the friction ratio, and the measured pore pressure with an overlay of the calculated hydrostatic pore pressure. These curves shall be plotted so as to show the full variation of the measured quantities within the depth range of the sounding, and each curve shall have a visible scale with the minimum and maximum ranges labeled.

(5) All of the CPT data recorded for each sounding shall also be provided in either electronic or hardcopy format. Electronic data will be presented in an ASCII text file format.

d. All SPT or CPT testing will be conducted to a minimum depth of 50 feet below the existing ground surface or lowest proposed finished grade, except where a minimum thickness of 10 feet of consolidated soils are encountered where the $(N_1)_{60}$ is greater than 30, or CPT corrected tip resistance (q_{c1N}) is greater than 175. In addition, SPT or CPT testing should extend a minimum of 20 feet below the lowest expected foundation level, including the lowest elevation of piling support.

6. The three-dimensional subsurface conditions at the site shall be presented using one or more cross-sections showing location and depth penetration of borings or CPT soundings, interpretation of the geometry of major soil units, and projected location of the static groundwater surface determined from the subsurface exploration. The cross-sections shall be presented at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department). Each cross-section shall have a legend with a description of the various major soil units.
7. All assessments of liquefaction and/or dynamic settlement hazards and effects will be based on a design earthquake using ground motion parameters consistent and equivalent to those specified in the Uniform Building Code. The choice of moment magnitude used in the determination of the magnitude-scaling factor, as well as the scaling relations used in the analysis, shall be justified in the report narrative. These assessments shall use the shallowest groundwater table observed during or inferred from subsurface exploration and characterization (e.g., the measured depth of static groundwater immediately prior to abandonment of borings, observation of iron-oxide mottling of soils samples, etc.).
8. Results of laboratory testing of samples retrieved during drilling and sampling shall be presented in order to support the values of fines contents used in subsequent analysis of liquefaction and/or dynamic settlement hazard. Where only CPT methods are used in site assessment, the correlation between fines content and CPT measurements will be discussed and documented. This documentation will require rigorous correlation of CPT and fines content measurements from similar geological deposits within the Puget Sound region.
9. The geotechnical report shall include a detailed assessment of the liquefaction and/or dynamic settlement hazard based on analysis of all available SPT or CPT data using state-of-the-practice methodologies, such as provided in Youd and Idriss (1997) or subsequent technical publications. The methodology used in the analysis shall be documented, and all results of intermediate and final calculations and results, including factors of safety, shall be included.
10. The geotechnical report shall contain an assessment of the potential for large lateral spreads or flow failures, bearing failures, settlement, limited lateral displacement, and floatation of buried facilities. The methodologies used must be, at a minimum, state-of-the-practice, and where applicable should employ more than one method of analysis. All results of intermediate and final calculations and conclusions regarding the potential and severity of the possible liquefaction- and/or dynamic settlement- induced failure modes shall be presented.
11. Alternative mitigative measures including structural and foundation design options and/or soil improvement techniques shall be evaluated and compared for their

effectiveness in reaching the level of performance specified in the report introduction. Final designs and specifications and plans for structural and/or foundation design shall be included if applicable. Effectiveness of soil improvement techniques shall be specified in terms of post-treatment densification or strength improvement as measured by appropriate subsurface investigation and testing. The extent of the post-treatment verification testing shall be provided on a site map at the same scale as the map presented in Section 4 above.

12. The name, mailing address, and telephone number of geotechnical professional(s) who prepared the letter.
13. The name, mailing address, and telephone number of the property owner.

B. The geotechnical professional(s) who prepared the geotechnical report shall stamp the report with his or her license stamp/seal.

C. Hold harmless clauses, disclaimers, and limitations are not allowed within a geotechnical report.

14.90.060 Appendices.

APPENDIX B

GEOLOGICAL ASSESSMENTS - FAULT RUPTURE HAZARD AREA GEOTECHNICAL REPORT

A. A geotechnical report shall, at a minimum, include the following:
   1. The first page of the document shall be labeled identifying the submittal as a "Fault Rupture Hazard Geotechnical Report," and will include all mandatory items listed in Section 14.90.030 B4. The report shall be prepared by an engineer and shall be co-written by an engineering geologist where geological interpretations and conclusions critical to the assessment of liquefaction and/or dynamic settlement hazard and potential effects are necessary or prudent.
   2. The geological assessment for fault rupture hazards shall include the minimum requirements specified in Section 14.90.030 B4.
   3. The following topics should be considered and addressed in detail where essential to support opinions, conclusions, and recommendations in any geologic report on faults. It is not expected that all the topics or investigative methods would be necessary in a single investigation. In specific cases, it may be necessary to extend some of the investigative methods well beyond the site or property being investigated.
      a. Purpose and scope of investigation; description of proposed development.
      b. Geologic and tectonic setting. Include seismicity and earthquake history.
      c. Site description and conditions, including dates of site visits and observations. Include information on geologic units, graded and filled areas, vegetation, existing structures, and other factors that may affect the choice of investigative methods and interpretation of data.
      d. Methods of investigation.
         (1) Review of published and unpublished literature, maps, and records concerning geologic units, faults, groundwater barriers, and other factors.
         (2) Stereoscopic interpretation of aerial photographs and other remotely sensed images to detect fault-related topography (geomorphic features), vegetation and soil contrasts, and other lineaments of possible fault origin. The area interpreted usually should extend beyond the site boundaries.
         (3) Surface observations, including mapping of geologic and soil units, geologic structures, geomorphic features and surfaces, springs, deformation of engineered structures due to fault creep, both on and beyond the site.
         (4) Subsurface investigations.
            (a) Trenching and other excavations to permit detailed and direct observation of continuously exposed geologic units, soils, and structures; must be of adequate depth and be carefully logged (Taylor & Cluff 1973, Hatheway & Leighton 1979, McCalpin 1996b).
            (b) Borings and test pits to permit collection of data on geologic units and groundwater at specific locations. Data points must be sufficient in number and spaced adequately to permit valid correlations and interpretations.
            (c) Cone penetrometer testing (CPT) (Grant et al 1997, Edelman et al 1996). CPT must be done in conjunction with continuously logged borings to correlate CPT results with on-site materials. The number of borings and spacing of CPT

soundings should be sufficient to adequately image site stratigraphy. The existence and location of a fault based on CPT data are interpretative.

(5) Geophysical Investigations. These are indirect methods that require a knowledge of specific geologic conditions for reliable interpretations. They should seldom, if ever, be employed alone without knowledge of the geology (Chase & Chapman 1976). Geophysical methods alone never prove the absence of a fault nor do they identify the recency of activity. The types of equipment and techniques used should be described and supporting data presented (California Board of Registration for Geologists and Geophysicists 1993).
   (a) High-resolution seismic reflection (Stephenson et al 1995, McCalpin 1996b).
   (b) Ground penetrating radar (Cai et al 1996).
   (c) Other methods include: seismic refraction, magnetic profiling, electrical resistivity, and gravity (McCalpin 1996b).

(6) Age-dating techniques are essential for determining the ages of geologic units, soils, and surfaces that bracket the time(s) of faulting (Pierce 1986, Birkeland et al 1991, Rutter & Catto 1995, McCalpin 1996a).
   (a) Radiometric dating (especially 14C).
   (b) Soil-profile development.
   (c) Rock and mineral weathering.
   (d) Landform development.
   (e) Stratigraphic correlation of rocks/minerals/fossils.
   (f) Other methods – artifacts, historical records, tephrochronology, fault scarp modeling, thermoluminescence, lichenometery, paleomagnetism, dendrochronology, etc.

(7) Other methods should be included when special conditions permit or requirements for critical structures demand a more intensive investigation.
   (a) Aerial reconnaissance overflights.
   (b) Geodetic and strain measurements.
   (c) Microseismicity monitoring.

e. Conclusions.
   (1) Location and existence (or absence) of hazardous faults on or adjacent to the site; ages of past rupture events.
   (2) Type of faults and nature of anticipated offset, including sense and magnitude of displacement, if possible.
   (3) Distribution of primary and secondary faulting (fault zone width) and fault-related deformation.
   (4) Probability of, or relative potential for, future surface displacement. The likelihood of future ground rupture seldom can be stated mathematically, but may be stated in semiquantitative terms such as low, moderate, or high, or in terms of slip rates determined for specific fault segments.
   (5) Degree of confidence in, and limitations of data and conclusions.

f. Recommendations.
   (1) The recommended increase from the standard buffer distance (50 feet) of proposed structures from fault rupture hazard areas. The recommended buffer distance generally will depend on the quality of data and type and complexity of fault(s) encountered at the site and the proposed land use type (i.e. occupancy). In order to establish an appropriate buffer distance from a fault located by indirect or interpretative methods (e.g., borings or cone penetrometer testing), the area between

data points also should be considered underlain by a fault unless additional data are used to more precisely locate the fault. Additional measures (e.g., strengthened foundations, engineering design, and flexible utility connections) to accommodate warping and distributive deformation associated with faulting (Lazarte and others, 1994).

(2) Risk evaluation relative to the proposed development.

(3) Limitations of the investigation; need for additional studies.

g. References.

(1) Literature and records cited or reviewed; citations should be complete.

(2) Aerial photographs or images interpreted -- list type, data, scale, source, and index numbers.

(3) Other sources of information, including well records, personal communications, and other data sources.

h. Illustrations. The following illustrations should be provided:

(1) A location map that identifies site locality, significant faults, geographic features, regional geology, seismic epicenters, and other pertinent data; 1:24,000 scale is recommended.

(2) A site development map that shows site boundaries, existing and proposed structures and limits of the proposed project area, graded areas, streets, exploratory trenches, borings geophysical traverses, locations of faults, and other data; recommended scale is 1:2,400 (1 inch equals 200 feet), or larger.

(3) A geologic map that shows the distribution of geologic units (if more than one), faults and other structures, geomorphic features, aerial photo graphic lineaments, and springs; on topographic map 1:24,000 scale or larger; can be combined with h(1) or (2).

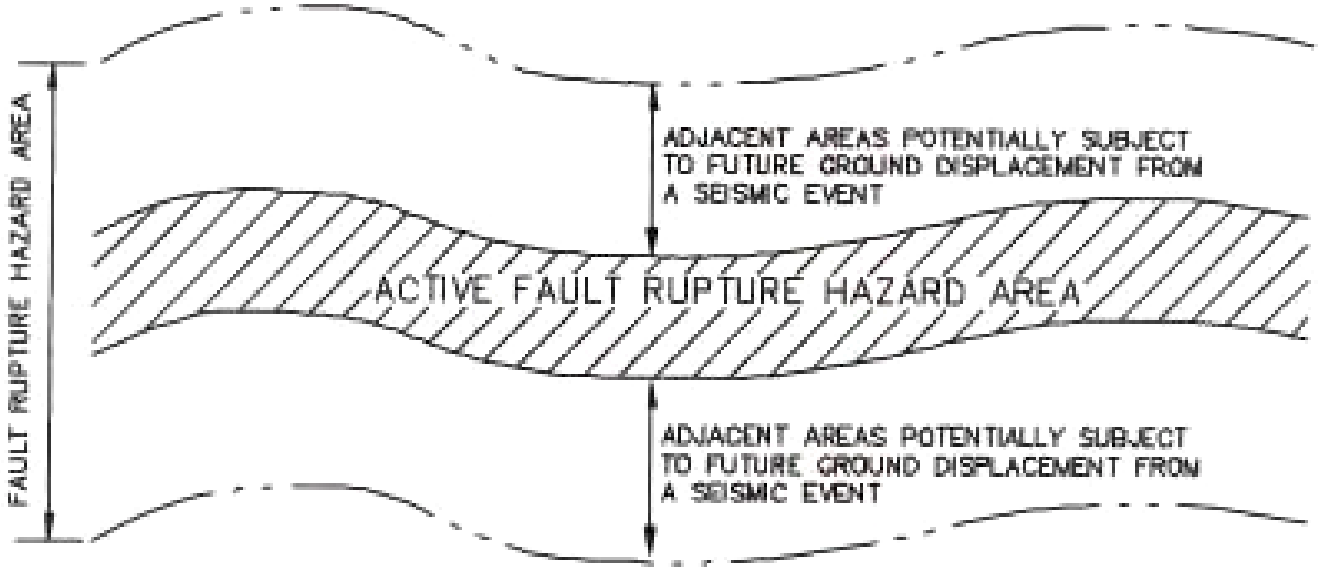
(4) Geologic cross sections, if needed, to provide three-dimensional picture.

(5) Logs of exploratory trenches and borings that show details of observed features and conditions (note: these should not be generalized or diagrammatic). Trench logs should show topographic profile and geologic structure at a 1:1 horizontal to vertical scale; scale should be 1:60 (1 inch = 5 feet) or larger.

(6) Geophysical data and geologic interpretations.

i. Appendix. Attach any supporting data not included above (e.g., water well data, photographs, aerial photographs).

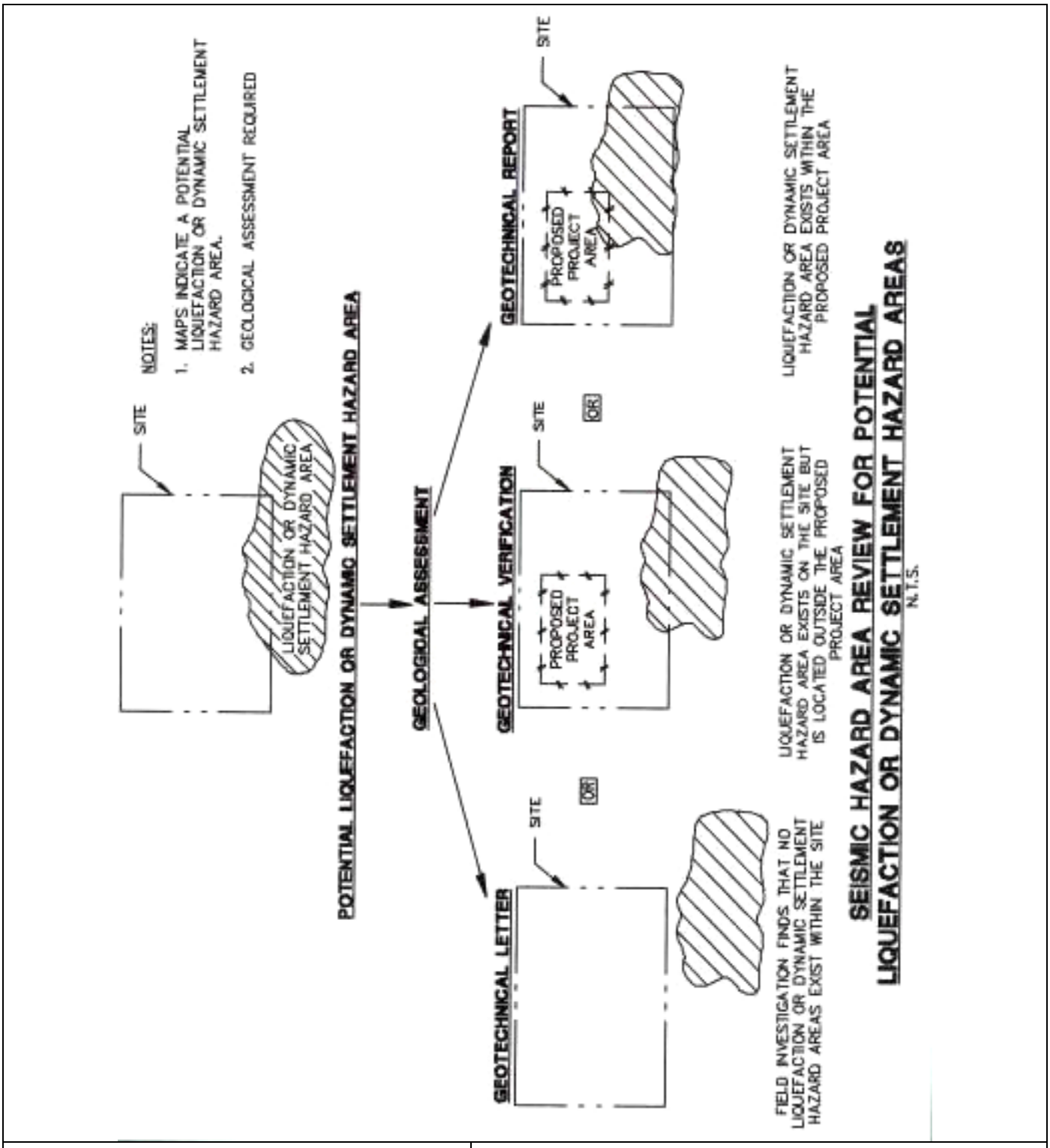
4. The geotechnical professional who prepared the geotechnical shall stamp the report with his or her license stamp/seal.
5. The Department may request a geotechnical professional to provide additional information in the geotechnical report based upon existing conditions, changed conditions, or unique circumstances occurring on a case by case basis.
6. Hold harmless clauses, disclaimers, and limitations are not allowed to be included, neither expressly nor implied, within a geological assessment.



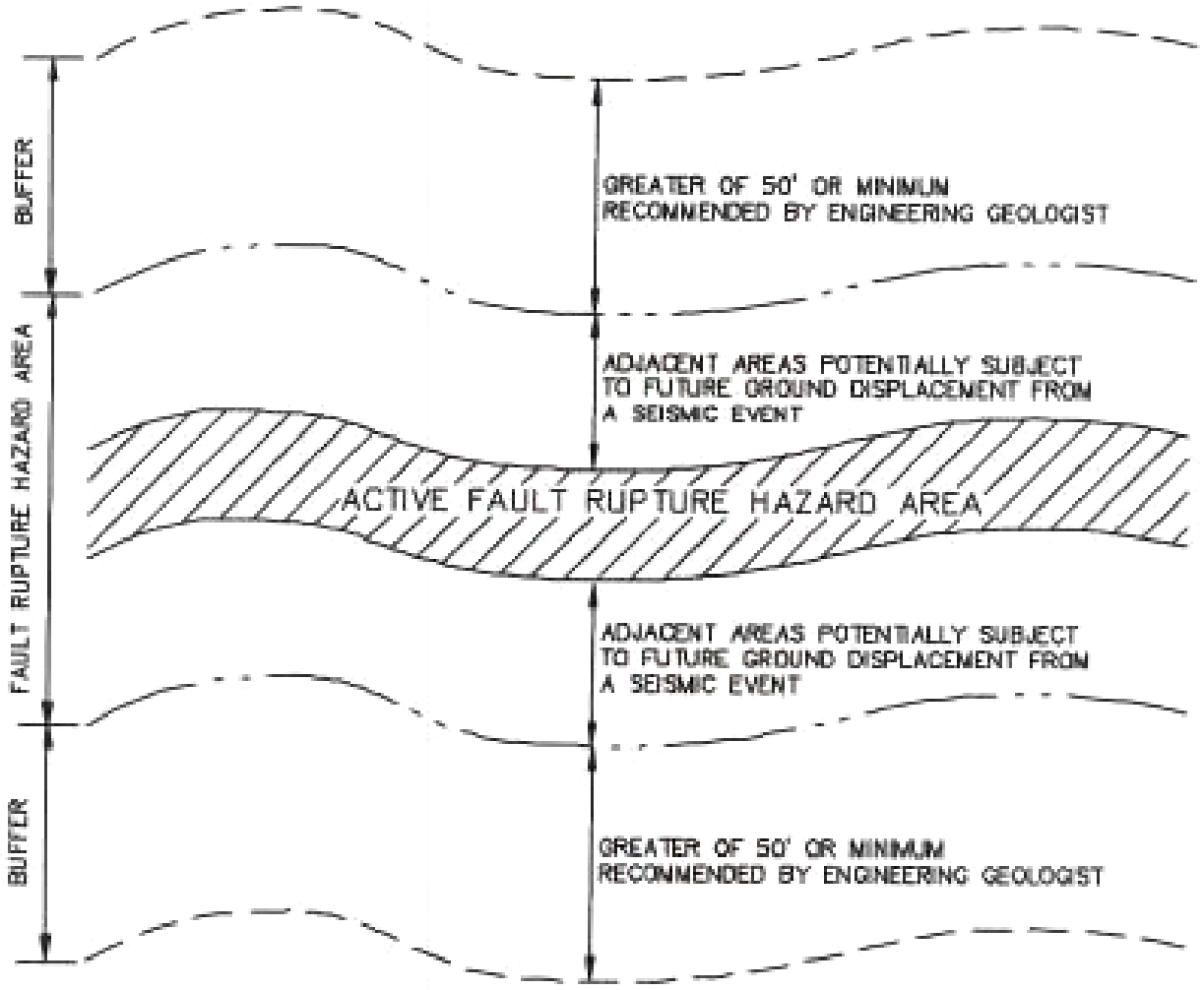
FAULT RUPTURE HAZARD AREAS

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**FAULT RUPTURE HAZARD AREAS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	FIGURE 14.90-1



City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**SEISMIC HAZARD AREA REVIEW FOR POTENTIAL LIQUEFACTION OR DYNAMIC SETTLEMENT HAZARD AREA**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.90-2**



FAULT RUPTURE HAZARD AREA BUFFERS

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**FAULT RUPTURE HAZARD AREA BUFFERS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.90-3**

Chapter 14.110

EROSION HAZARD AREAS

Sections:

14.110.010 Purpose.
14.110.020 Erosion Hazard Areas.
14.110.030 Erosion Hazard Area Review Procedures.
14.110.040 Erosion Hazard Area Standards.
14.110.050 Buffer Requirements.
14.110.060 Appendices.
A. Geological Assessment – Shoreline Erosion Hazard Geotechnical Letter
B. Geological Assessment – Shoreline Erosion Hazard Geotechnical Verification
C. Geological Assessment – Shoreline Erosion Hazard Geotechnical Report
14.110.070 Figures.
14.110-1 Potential Erosion Hazard Area.
14.110-2 Shoreline Erosion Hazard Area Review.
14.110-3 Active Shoreline Erosion Hazard Area Buffers.

14.110.010 Purpose.

The following statements describe the purpose of this Chapter:

A. Protect human life and health;
B. Regulate uses of land in order to avoid damage to structures and property being developed and damage to neighboring land and structures;
C. Identify and map erosion hazard areas;
D. Minimize impacts on wetlands and critical fish and wildlife species and their associated habitat that can result from erosion;
E. Establish a permit requirement and review procedures for development proposals in areas with potential erosion hazards;
F. Strike a balance between the need to maintain natural shoreline erosion/regression processes and the need to protect existing and proposed development.

14.110.020 Erosion Hazard Areas.

A. **Shoreline Erosion Hazard Indicators.** Shoreline hazard areas are areas potentially subject to land regression or retreat due to a combination of geologic, seismic, tidally influenced, and/or hydrologic or manmade factors. Shoreline hazard areas can be identified by the presence of any of the following indicators:
   1. Areas with active bluff retreat that exhibit continuing sloughing or calving of bluff sediments, resulting in a vertical or steep bluff face with little or no vegetation.
   2. Areas with active land retreat as a result of wave action.

B. **Erosion Hazard Area Categories.**
   1. **Potential Erosion Hazard Areas.** Potential erosion hazard areas, as depicted on the Critical Areas Atlas-Erosion Hazard Areas Map, are those areas where the suspected risk of erosion through either loss of soil, slope instability, or land regression is sufficient to require additional review to assess the potential for active erosion activity or apply additional standards. These potential erosion hazard areas are determined using the following criteria:

a. **Shoreline Erosion Hazard Areas.** Areas within 200 feet of a freshwater (lake, pond, or shoreline) as measured landward perpendicularly from the edge of the ordinary high water mark (see Figure 14.110-1).
b. **Riverine Erosion Hazard Areas.** The rivers subject to regulation as a channel migration zone listed in Chapter 14.70, Flood Hazard Areas, Section 14.70.020 B5.
c. **Soil Erosion Hazard Areas.** Areas identified as having slopes of 20% or greater and that are classified as having severe, or very severe erosion potential by the Soil Conservation Service, United States Department of Agriculture (USDA).

2. **Active Shoreline Erosion Hazard Areas.** Land areas located directly adjacent to freshwater or marine waters that, through the geological assessment process, are identified as regressing, retreating, or potentially unstable as a result of undercutting by wave action or bluff erosion. The limits of the active shoreline erosion hazard area shall extend landward to include that land area that is calculated, based on the rate of regression, to be subject to erosion processes within the next ten year time period.
3. **Riverine Erosion Hazard Areas.** Riverine erosion hazard areas are located within the lateral extent of likely watercourse channel movement due to bank destabilization and erosion, rapid incision, and shifts in location of watercourse channels. Riverine erosion hazard areas are also referred to as channel migration zones (CMZs). Rivers and streams subject to erosion are regulated as a CMZ as listed in Section 14.70.020 B5.
14. **Soil Erosion Hazard Areas.** Soil erosion hazard areas are identified by the presence or absence of natural vegetative cover, soil texture condition, slope, and rainfall patterns, or man-induced changes to such characteristics that create site conditions which are vulnerable to erosion of the upper soil horizon. Soil erosion hazard areas are those areas with slopes of 20% or greater and that are classified as having severe, or very severe erosion potential by the Soil Conservation Service, USDA.

14.110.030 Erosion Hazard Area Review Procedures.

A. **General Requirements.**

1. The City's Critical Areas Atlas-Erosion Hazard Area Map provides an indication of where potential erosion hazard areas are located within the County. The actual presence or location of an erosion hazard area and/or additional potential erosion hazard area that have not been mapped, but may be present on or adjacent to a site, shall be determined using the procedures and criteria established in this Chapter.
2. The Department will complete a review of the Critical Areas Atlas-Erosion Hazard Area Map, and any other source documents for any proposed regulated activity to determine whether the site for the regulated activity is located within a potential erosion hazard area.
3. When the Department's maps, sources, or field investigations indicate that the site for a proposed regulated activity is located within a potential shoreline erosion hazard area, the Department shall require a geological assessment as outlined in Section 14.110.030 B below (see Figure 14.110-2).
4. When the Department's maps, sources, or field investigations indicate that the proposed project area for a regulated activity is located within a potential riverine erosion hazard area (channel migration zone), the Department shall conduct a review pursuant to the requirements set forth in Section 14.70.030. All standards set forth in Chapter 14.70 shall apply to riverine erosion hazard areas (CZMs).

5. When the Department's maps, sources, or field investigations indicate that the proposed project area for a regulated activity is located within a potential soil erosion hazard area, the Department shall require submittal of an erosion control plan pursuant to the requirements set forth in EMC Title 15, Building and Construction.
6. Applicants requesting to develop a bulkhead along a freshwater or marine shoreline shall be required to submit a geotechnical report. The geotechnical report shall comply with the requirements established in 14.110.060 Appendix C.
7. Unless otherwise stated in this Chapter the critical area protective measure provisions contained in Section 14.10.080 shall apply.

B. **Geological Assessment.** A geological assessment is a site investigation process to evaluate the on-site geology affecting a subject property and proposed development.

1. Geological assessments shall be submitted to the Department for review and approval together with a shoreline erosion hazard area application.
2. The geological assessment shall include a field investigation and may also include review of public records and documentation, analysis of historical air photos, published data and references, etc.
3. The geological assessment shall include the following information and analysis:
   a. An analysis of the shoreline erosion processes on and in the vicinity of the site including an evaluation of erosion and bluff retreat that has occurred over the past decade and an estimated probable rate of erosion based upon the historic rate of erosion that has occurred on the site.
   b. A determination of which areas on the site meet the criteria for an active shoreline erosion hazard area as set forth in Section 14.110.020 B2.
   c. A determination of the area on the site or in the vicinity of the site that will experience regression in the next 120 years given natural processes.
4. Geological assessments shall be prepared, signed, and dated by a geotechnical professional (as defined in Section 14.10.060 and established in this Chapter) and the format shall be pre-approved by the Department.
5. A geotechnical professional shall complete a field investigation and geological assessment to determine whether or not an active shoreline erosion hazard area exists within 200 feet of the site (see Figure 14.110-2).
   a. The geological assessment shall be submitted in the form of a geotechnical letter when the geotechnical professional finds that no active shoreline erosion hazard area exists within 200 feet of the site. The geotechnical letter shall meet the requirements contained in 14.110.060 Appendix A.
   b. The geological assessment shall be submitted in the form of geotechnical verification when the geotechnical professional finds that an active shoreline erosion hazard area exists but is located more than 200 feet away from the proposed project area. The geotechnical verification shall meet the requirements contained in 14.110.060 Appendix B.
   c. The geological assessment shall be submitted in the form of a geotechnical report when the geotechnical professional finds that an active shoreline erosion hazard area exists within 200 feet of the proposed project area or when a geotechnical professional determines that mitigation measures, such as a bulkhead, are necessary in order to construct or develop within a potential shoreline erosion hazard area. The geotechnical report shall meet the requirements contained in Section 14.110.060 Appendix C.

6. The Department shall review the geological assessment and either:
    a. Accept the geological assessment and approve the application; or
    b. Reject the geological assessment and require revisions or additional information.
7. A geological assessment for a specific site may be valid for a period of up to five years when the proposed land use activity and surrounding site conditions are unchanged. However, if any environmental conditions associated with the site change during that five-year period, the applicant may be required to submit an amendment to the geological assessment.

C. **Riverine Erosion Hazard Area (Channel Migration Zones) Review.** Riverine erosion hazard areas shall be reviewed pursuant to the requirements set forth in Chapter 14.70 Flood Hazard Areas, Section 14.70.030.

D. **Soil Erosion Hazard Area Review.** Soil erosion hazard areas shall be reviewed pursuant to the requirements set forth in Title 17A, Building and Construction.

14.110.040 Erosion Hazard Area Standards.

A. **Active Shoreline Erosion Hazard Areas.** Any development, encroachment, filling, clearing, or grading, timber harvest, building structures, impervious surfaces, and vegetation removal shall be prohibited within active shoreline erosion hazard areas and associated buffers except as specified in the following standards:

1. **Shoreline Erosion Protection Measures.** Shoreline erosion protection measures located within or adjacent to freshwater or marine shorelines shall be allowed subject to the following:
    a. The proposed shoreline protection measure shall comply with the standards set forth in Section 14.40.030.
    b. A geological assessment-shoreline erosion geotechnical report has been conducted in accordance with the provisions set forth in Section 14.110.030 B that indicates that the shoreline is currently experiencing active erosion (i.e., land retreat or regression).
    c. The use of the shoreline erosion protection measure will not cause an significant adverse impact on adjacent properties or critical fish and wildlife species and their associated habitat (i.e., increase erosion on adjacent properties).
    d. The use of soft armoring techniques (soil bioengineering erosion control measures) is the preferred method for shoreline protection.
    e. Hard armoring shoreline erosion control measures shall be approved only when a geological assessment-shoreline erosion geotechnical report, as set forth in Section 14.110.030 B, has been completed and indicates the following:
        (1) The regression has been monitored on a yearly interval for a period of at least five consecutive years prior to allowing a bulkhead to be constructed. This monitoring shall be conducted by field survey measurements of a licensed surveyor. The Department may shorten or eliminate the monitoring period if there are indicators that the regression rate is rapid and an existing structure may be threatened prior to completion of the monitoring period;
        (2) The use of beach nourishment alone or in combination with soft armoring techniques is not adequate to protect the property from shoreline erosion processes; and
        (3) The property contains an existing structure(s) that will be threatened within the next 10 years or the buildability of an undeveloped site will be threatened within the next 10 years if a hard armoring method of shoreline erosion protection is not provided.

f. Hard armoring shoreline protection measures shall not be allowed when structures can be located landward of the 120-year rate of regression area.

2. **Stormwater Conveyance.** Surface drainage into an active shoreline erosion hazard area should be avoided. If there are no other alternatives for discharge, then drainage must be collected upland of the top of the active shoreline erosion hazard area and directed downhill in a high density polyethylene stormwater pipe with fuse welded joints that includes an energy dissipating device at the base of the active landslide hazard area. The pipe shall be located on the surface of the ground and be properly anchored so that it will continue to function in the event of an underlying slide. The number of these pipes should be minimized along the slope frontage.
3. **Utility Lines.** Utility lines will be permitted when no other conveyance alternative is available. The line shall be located above ground and properly anchored and/or designed so that it will continue to function in the event of an underlying slide.
4. **Roads, Bridges, and Trails.** Roads, bridges, and trails shall be allowed when all of the following conditions have been met:
   a. Mitigation measures are provided that ensure the roadway prism and/or bridge structure will not be susceptible to damage from active erosion.
   b. The road is not a sole access for a development.

B. **Shoreline Erosion Hazard Management Area.** All regulated activities such as but not limited to building structures, impervious surfaces, vegetation removal, timber harvest, and clearing or grading activities may be allowed in areas located within 200 feet of an active shoreline erosion hazard area subject to the following standards:
1. The Department reviews and approves a geological assessment-shoreline erosion hazard geotechnical report and determines that the proposed project area is located outside an active shoreline hazard area and the required buffer, as set forth in 14.110.050.
2. The proposed recommendations and mitigation measures contained within the geotechnical report are adequate to reduce or mitigate risks to the natural environment, health, and safety.
3. Surface drainage from the proposed project area, including downspouts, landscape irrigation systems, and runoff from paved or unpaved surfaces upland of the shoreline, shall not be directed through an active shoreline erosion hazard area or its associated buffer unless it is conveyed in conformance with the provisions in 14.110.040 A2 above.
4. Stormwater retention and detention systems, such as dry wells and infiltration systems utilizing buried pipe or french drains, shall not be permitted unless such systems are designed by a professional engineer and the geotechnical report indicates that such a system will not affect the stability of the shoreline.
5. Proposed developments, with the exception of shoreline erosion protection measures, shall be sited far enough from regressing shorelines to insure 120 years of useful life for any proposed structures or infrastructure.

C. **Riverine Erosion Hazard Area (Channel Migration Zones) Review.** Riverine erosion hazard areas shall be reviewed pursuant to the requirements set forth in Chapter 14.70 Flood Hazard Areas, Section 14.70.030.

D. **Soil Erosion Hazard Area Review.** Soil erosion hazard areas shall be reviewed pursuant to the requirements set forth in Title 17A, Building and Construction.

14.110.050 Buffer Requirements.

A. **Determining Buffer Widths**.

1. The buffer width shall be measured on a horizontal plane from a perpendicular line established at the edge of the active shoreline erosion hazard area limits (see Figure 14.110-3).
2. An undisturbed buffer of existing vegetation shall be required for an active shoreline erosion hazard area. The required standard buffer width is the greatest amount of the following distances:
   a. Fifty feet from all edges of the active shoreline erosion hazard area limits;
   b. A distance of one-third the height of the slope at the top of the slope and a distance of one-half the height at the bottom of the slope; or
   c. The minimum distance recommended by the geotechnical professional measured from the edge of the active shoreline erosion hazard area.

B. **Modification of Buffer Widths.** The Department may require a larger buffer width than the standard buffer distance, as determined in A above, if any of the following are identified through the geological assessment process:

1. The adjacent land is susceptible to severe erosion and erosion control measures will not effectively prevent adverse impacts.
2. The area has a severe risk of slope failure or downslope stormwater drainage impacts.

14.110.060 Appendices.

A. Shoreline Erosion Hazard Geotechnical Letter.
B. Shoreline Erosion Hazard Geotechnical Verification.
C. Shoreline Erosion Hazard Geotechnical Report.

14.110.070 Figures.

14.110-1 Potential Erosion Hazard Area.
14.110-2 Shoreline Erosion Hazard Area Review.
14.110-3 Active Shoreline Erosion Hazard Area Buffers.

14.110.060 Appendices.

APPENDIX A

GEOLOGICAL ASSESSMENT - SHORELINE EROSION HAZARD GEOTECHNICAL LETTER

A. A geotechnical letter shall, at a minimum, include the following:
   1. The letter shall be labeled identifying the submittal as a "Shoreline Erosion Hazard Geotechnical Letter."
   2. The date when the geological assessment was conducted. The date when the letter was prepared.
   3. The parcel number(s) of the site.
   4. Site address, if the City has assigned one.
   5. A brief description of the project (including the proposed land use) and a description of the area to be developed. The appropriate professional preparing the Geotechnical Letter shall provide conclusions and recommendations as to slope stability for the proposed development.
   6. A paragraph that states the following specific language:
      "I meet the qualifications contained in Title 14, Section 14.110.030 to prepare a geological assessment. I understand the requirements of the current Erosion Hazard Area Chapter 14.110 and the definitions of the applicable terms contained within Chapter 14.25 and Title 14. I have performed a shoreline erosion hazard geological assessment, conducted a field investigation, and researched available historic records on the above referenced site and determined that that no active shoreline erosion hazard area exists within 200 feet of the site."
   7. The name, mailing address, and telephone number of the geotechnical professional who prepared the letter.
   8. The name, mailing address, and telephone number of the property owner.

B. The geotechnical professional who prepared the geotechnical letter shall stamp the letter with his or her seal.

C. Hold harmless clauses, disclaimers, and limitations are not allowed within a geotechnical letter.

14.110.060 Appendices.

APPENDIX B

GEOLOGICAL ASSESSMENT - SHORELINE EROSION HAZARD GEOTECHNICAL VERIFICATION

A. A geotechnical verification shall, at a minimum, include the following:
   1. The cover letter for the document shall clearly identify the submittal as a "Shoreline Erosion Hazard Geotechnical Verification."
   2. The date when the geological assessment was conducted. The date when the verification was prepared.
   3. The parcel number(s) of the site.
   4. Site address, if the City has assigned one.
   5. A detailed description of the project (including the proposed land use) and a description of the area to be developed.
   6. A summary of the results, conclusions, and recommendations resulting from the geological assessment, as set forth in Section 14.10.030 B.
   7. An accurate site plan drawn at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department) is required. The Department may require that the site plan information listed below be based on a field survey by a licensed surveyor. The site plan shall include:
      a. The limits/location of the active shoreline erosion hazard area(s) set forth in Section 14.110.020 B2.
      b. The limits of the required shoreline erosion hazard buffer based upon the requirements set forth in Section 14.110.050 A.
      c. The limits/location of the Shoreline Erosion Hazard Management Area.
      d. The limits/location of the 120 year regression area.
      e. The location of any existing structures, utilities, on-site septic systems, wells, and stormwater management facilities.
      f. The location of any proposed structures, utilities, on-site septic systems, wells, and stormwater management facilities.
      g. The full geographical limits of the proposed project area (area to be developed).
      h. Dimension of the closest distance between the identified active shoreline hazard area boundary and the proposed project area.
      i. Dimension of the closest distance between the 120-year regression line and the proposed project area.
      j. Existing contours on the site at two-foot intervals.
      k. Property lines for the site.
      l. North arrow and scale.
   8. A paragraph that states the following specific language:
      "I meet the qualifications contained in Title 14, Section 14.110.030 to prepare a geological assessment. I understand the requirements of the current Erosion Hazard Area Chapter 14.110 and the definitions of the applicable terms contained within Chapter 14.25 and Title 14. I have performed a shoreline erosion hazard geological assessment, conducted a field investigation, and researched available historic records on the above referenced site and determined that an active shoreline erosion hazard area exists, but is located more than 200 feet away from the proposed project area."

9. The name, mailing address, and telephone number of the geotechnical professional who prepared the verification.
10. The name, mailing address, and telephone number of the property owner.

B. The geotechnical professional who prepared the geotechnical verification shall stamp the verification with his or her seal.

C. Hold harmless clauses, disclaimers, and limitations are not allowed within a geotechnical verification.

14.110.060 Appendices.

APPENDIX C

GEOLOGICAL ASSESSMENT - SHORELINE EROSION HAZARD GEOTECHNICAL REPORT

A. A geotechnical report shall, at a minimum, include the following:
   1. The cover letter for the document shall clearly identify the submittal as a "Shoreline Erosion Hazard Geotechnical Report."
   2. The date when the geological assessment was conducted. The date when the verification was prepared.
   3. The parcel number(s) of the site.
   4. Site address, if the City has assigned one.
   5. A detailed description of the project (including the proposed land use) and a description of the area to be developed.
   6. A summary of the results, conclusions, and recommendations resulting from the geological assessment, as set forth in Section 14.10.030 B. The summary shall specifically address:
      a. Whether it is possible given the physical constraints of the property (size, shape, building setbacks, utility requirements, etc.) to locate the proposed development outside of the 120-year area of regression based on natural shoreline processes.
      b. If it is not possible to locate the development outside of the 120-year area of regression (based on natural processes), determine whether beach nourishment and/or soft armoring techniques can be used to slow the rate of regression such that the proposed development is no longer within the 120-year regression area.
      c. If it is not possible to locate the development outside of the 120 year area of regression (based on the use of beach nourishment and/or soft armoring techniques), outline the strategy, as set forth in Section 14.110.040 A1, to monitor the rate of regression on the site.
      d. Determine whether any proposed shoreline erosion protection measures will cause an increase in the rate of regression on neighboring properties.
   7. An accurate site plan drawn at a scale of 1" = 20', 1" = 30', 1" = 50' (or other scale deemed appropriate by the Department) is required. The Department may require that the site plan information listed below be based on a field survey by a licensed surveyor. The site plan shall include:
      a. The limits/location of the active shoreline erosion hazard area(s) set forth in Section 14.110.020 B2.
      b. The limits of the required shoreline erosion hazard buffer based upon the requirements set forth in Section 14.110.050 A.
      c. The limits/location of the Shoreline Erosion Hazard Management Area.
      d. The limits/location of the 120-year regression area based on natural shoreline processes and, if applicable, based upon proposed shoreline protection measures.
      e. The location of any existing structures, utilities, on-site septic systems, wells, and stormwater management facilities.
      f. The location of any proposed structures, utilities, on-site septic systems, wells, and stormwater management facilities.

g. The full geographical limits of the proposed project area (area to be developed).
h. Dimension of the closest distance between the identified active shoreline hazard area boundary and the proposed project area.
i. Dimension of the closest distance between the 120-year regression line and the proposed project area.
j. Existing contours on the site at two-foot intervals.
k. Property lines for the site.
l. North arrow and scale.

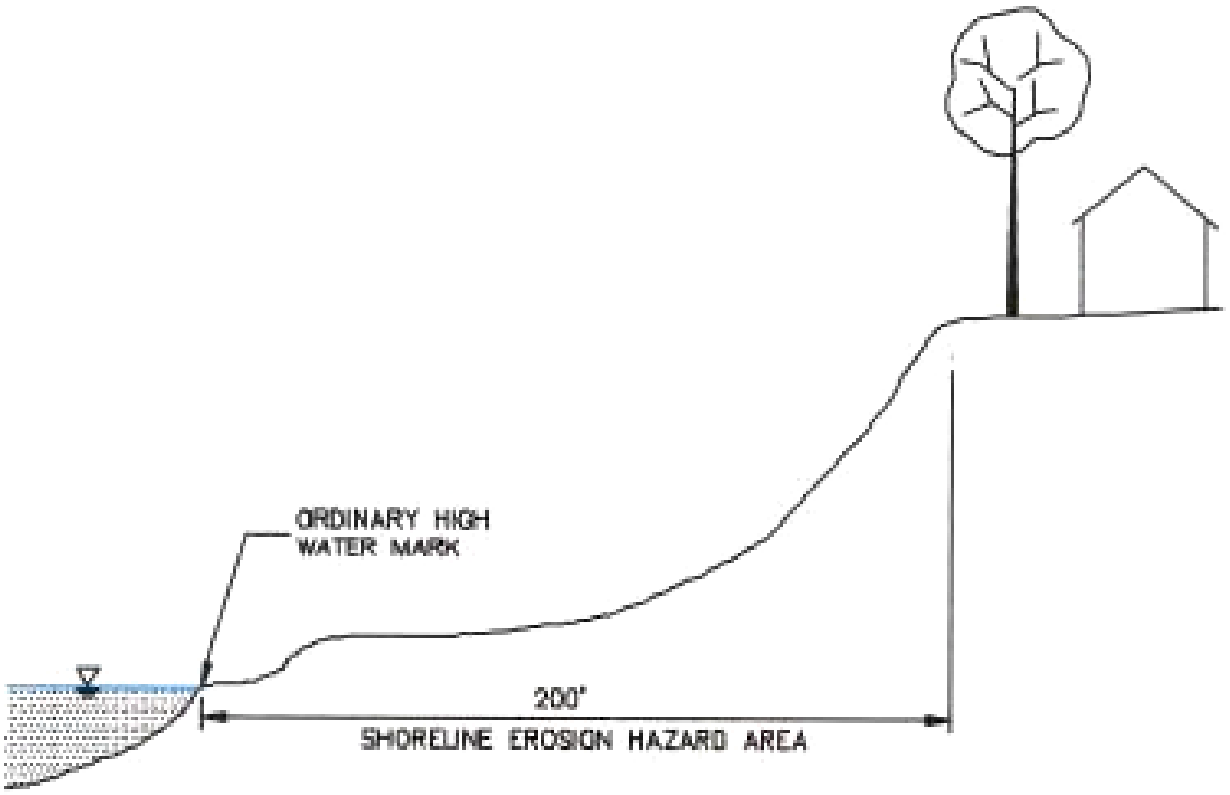
8. A discussion of any proposed shoreline protection measures including design and construction drawings is required.
9. A list of references utilized in preparation of the report.
10. The name, mailing address, and telephone number of the geotechnical professional(s) who prepared the report.
11. The name, mailing address, and telephone number of the property owner.

B. The geotechnical professional(s) who performed the geological assessment shall stamp the report with his or her license stamp/ seal. The report must be co-authored by a licensed professional engineer when engineering designs or interpretations are necessary to address the report requirements. The engineer must also stamp the report with his or her license stamp/seal.

C. The Department may request a geotechnical professional to provide additional information in the geotechnical report based upon existing conditions, changed conditions, or unique circumstances occurring on a case by case basis.

D. Hold harmless clauses, disclaimers, and limitations are not allowed within a geotechnical report.

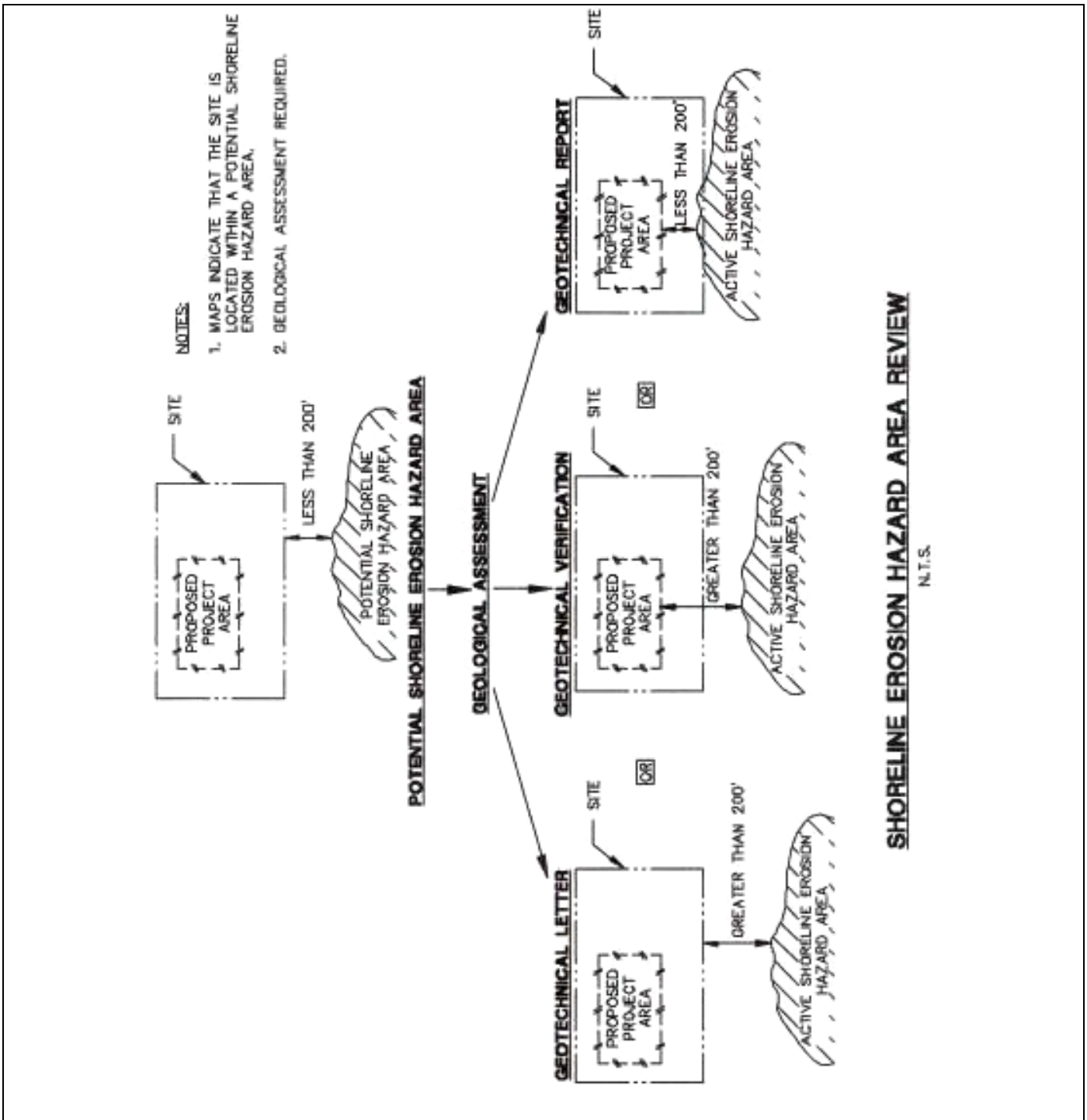
E. Geotechnical reports shall be in conformance with a format that is pre-approved by the Department.



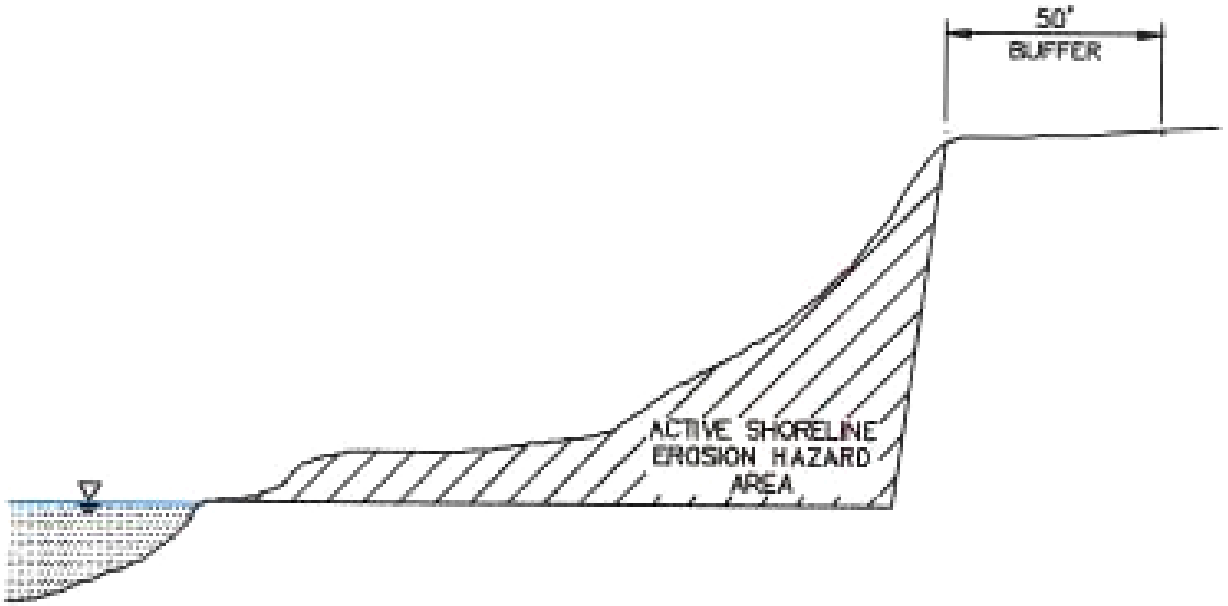
POTENTIAL EROSION HAZARD AREA - SHORELINE EROSION HAZARD AREA

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**CRITICAL AREA PROTECTIVE MEASURES – TRACTS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.110-1**



City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**SHORELINE EROSION HAZARD AREA REVIEW**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.110-2**



ACTIVE SHORELINE EROSION HAZARD AREA BUFFERS

N.T.S.

City of Edgewood **Community Development Department** **2221 Meridian Avenue East** **Edgewood, WA 98371 (253) 952-3299**		**ACTIVE SHORELINE EROSION HAZARD AREA BUFFERS**	
Copied By: DC	Approved by: Ord. No. 02-0200	Date: December 24, 2002	**FIGURE 14.110-3**

Chapter 14.500

NATURAL RESOURCE LANDS

Sections:

14.500.010 Purpose.
14.500.020 Intent.
14.500.030 Applicability.
14.500.040 Natural Resource Lands Noticing Requirements.
14.500.050 Current Use Assessment.
14.500.060 Variances and Appeals.
14.500.070 Review Process.
14.500.080 Title, Plat, and Regulated Activities Notification.
14.500.090 Permitted Uses.
14.500.100 Appendices.
A. Property Adjacent to Resource Lands.
B. Agriculture Lands Noticing.
C. Mineral Resource Lands Noticing.

14.500.010 Purpose.

This Chapter establishes requirements and regulations to protect natural resource lands and is established pursuant to WAC 197-11-908 and RCW 36.70A.170 and 36.70A.060. The City therefore designates agricultural lands and mineral resource lands, and all associated buffers as being environmentally sensitive areas and designated natural resource lands. By regulating development within, and adjacent to, or abutting natural resource lands, this Title seeks to implement the following goals and policies to:

A. Inform the public of the existence, location and potential incompatibility impacts of development on, or adjacent to, these environmentally sensitive areas within the City.
B. Encourage the retention of open space, development of recreational opportunities, conserve priority habitat, increase access to natural resource lands and water, and develop parks.
C. Assure the conservation of resource lands and related activities by limiting encroachment of incompatible development thereon.
D. Promote the conservation of mineral resource lands through inclusion of known deposits of minerals and materials.
E. Assure that undeveloped mineral and material resources will not be forever lost by prior development of the land for other purposes.
F. Allow for the necessary mineral processing to convert such minerals and materials into marketable products.
G. Protect the environment and enhance the State's high quality of life, including air and water quality and the availability of water.
H. Maintain and enhance the biological and physical functions and values of wetlands.

14.500.020 Intent. Resource lands are of special concern to the citizens, the City, and the State. The intent of this chapter is to conserve resource lands by establishing standards for development of sites which contain, or are adjacent to, resource lands to promote the public health, safety, and welfare by:

A. Noticing of property on, or within, natural resource land areas;
B. Mitigating unavoidable impacts by regulating development;

C. Protecting from development impacts;
D. Protecting the public against losses from:
   1. Costs of public emergency rescue and relief operations where the causes are avoidable;
   2. Degradation of the natural environment and the expense associated with repair or replacement;
E. Preventing adverse impacts on water availability, water quality, wetlands, and streams;
F. Protecting unique, fragile, and valuable elements of the environment, including fish and wildlife habitat;
G. Providing sufficient information to show that critical areas are adequately protected prior to approving, conditioning, or denying public or private development activity;
H. Providing the public with sufficient information and notice of potential risks associated with development in critical and sensitive areas;
I. Implementing the goals and requirements of the Growth Management Act of 1990, the State Environmental Policy Act, the Puget Sound Water Quality Management Plan, the Pierce County Charter, the Pierce County Growth Management Policies, the City of Edgewood Comprehensive Plan, and all updates and amendments, functional plans, and other land use policies formally adopted or accepted by the City.

14.500.030 Applicability. This chapter shall apply to all properties designated as resource lands (Agricultural Lands or Mineral Resource Lands) or properties adjacent to designated resource lands within Edgewood. When the requirements of this Title are more stringent than those of other local, State or Federal law, codes, or regulations, the requirements of this Title shall apply.

A. **Agricultural Lands**. Lands that are not already characterized by urban growth and that have long-term significance for the commercial production of food or other agricultural products. Agricultural Lands are those lands meeting all of the following criteria:
   1. Lands in parcels which are ten acres or larger in size;
   2. Lands which are on prime or unique soils as identified in:
      a. United States Department of Agriculture (USDA), Soil Conservation Service. February 1979, Soil Survey of Pierce County Area, Washington; or
      b. USDA, Soil Conservation Service, June 1981, Important Farmlands of Pierce County, Washington;
      c. Lands which are primarily devoted to the commercial production of horticultural, viticultural, floricultural, dairy, apiary, vegetable, or animal products or of berries, grain, hay, straw, turf, seed, Christmas trees not subject to the excise tax imposed by RCW 84.33.100 through 84.33.140, or livestock, and which have long-term commercial significance for agricultural production; and
      d. Lands which are not adjacent to lots of record of one acre or less on more than 50 percent of the perimeter of the parcel.

B. **Mineral Resource Lands.** Lands that have long-term significance for the extraction of minerals.
   1. Any area under this Chapter presently operating under a valid Washington State Department of Natural Resources (DNR) surface mining permit.
   2. Any other area shall be classified Mineral Resource Lands when:
      a. A surface mining permit is granted by the DNR; and
      b. A Conditional Use Permit is granted pursuant to EMC 18.50.040, Conditional Use Permit, provided all of the additional criteria are met:
         (1) The site does not contain prime agricultural soils;
         (2) The site is not a registered or designated historic or archeological site; and

(3) The site is not within a shoreline of the State or have statewide significance designated Natural.

C. **Property adjacent to resource lands**. All plats, short plats, development permits, and building permits issued for development activities within 500 feet of lands designated as Natural Resource Lands shall contain a notice that a variety of commercial activities may occur that are not compatible with residential development for certain periods of limited duration.

14.500.040
Natural Resource Lands Noticing Requirements.

Pursuant to RCW 36.70A.060, the City shall require that all plats, development applications, or permits issued for development activities on, abutting, or within 500 feet of lands designated as natural resource lands contain a notice (see Appendix A-C).

A. **General.** If more than one natural resource land subject to the provisions of this Title intersects the subject parcel, then one notice addressing all of the natural resource areas shall be sufficient.

B. **Title Notification.**
   1. When the City determines that activities not exempt from this Title are proposed, the owner shall file a notice with the Pierce County Auditor (Appendix A-C). The notice shall provide a public record of the presence of the sensitive area(s); the application of this Title to the property; and any limitations on activity in or affecting such sensitive area.
   2. The notice shall be notarized and recorded with the Pierce County Auditor before approval of any regulated use or activity on the site.

C. **Plat Notification.** For all proposals requiring a plat within sensitive areas, the applicant shall note the face of the plat consistent with the language set forth in Appendices A-C.

D. **Permit Notification.** The Department shall require that all permits issued for regulated activities within or adjacent to natural resource lands contain a notice as set forth in Appendices A-C.

14.500.050 Current use assessment.

A. An owner of natural resource lands or open space desiring current use classification under RCW 84.40 may file for such current use classification.

B. An owner of undeveloped land with critical areas which has been placed in a separate tract or tracts, protective easement, public or private land trust dedication, or other similarly preserved area for the protection of these critical areas may have that portion of land reviewed for reassessment by the Assessor-Treasurer's Office consistent with those restrictions to determine the fair market value of the land pursuant to RCW 84.40.030.

C. The owner shall notify the Assessor-Treasurer's Office when restrictions on development occur on a particular site, and shall provide a plat map in addition to the following, or other special study documents as may be required by the Department:
   1. Wetland delineation; and/or
   2. Geotechnical study; and/or
   3. Priority habitat studies; and/or
   4. Special studies as determined by the Department.

14.500.060 Variances and Appeals.

Procedures for variances and appeals of an administrative decision issued pursuant to this

chapter are set forth in EMC 18.40.090, Process II, Administrative Action.

14.500.070 Review Process.

A. The Department shall review any permit or application requested for any regulated activity, including, but not limited to, those set forth in section 14.500.010 on a site which includes, or is adjacent to, or abutting one or more resource land is located, unless otherwise provided in this Title.

B. As part of all development applications:

1. The Department shall review the information submitted by the applicant to:
    a. Confirm the nature and type of the resource land and evaluate any required title, plat, and/or regulated activity notification;
    b. Determine whether the development proposal is consistent with this Title; and
    c. Determine whether any proposed alterations to the site containing resource lands are necessary.

C. The City may approve, approve with conditions, or deny any development proposal in order to comply with the requirements and carry out the goals, purposes, objectives, and requirements of this Title.

D. Approval of a development proposal does not discharge the obligation of the applicant to comply with the provisions of this Title.

14.500.080 Title, Plat, and Regulated Activities Notification.

A. If more than one resource land subject to the provisions of this Title exists on the site, then one notice addressing all of the resource lands shall be sufficient.

B. Notification shall be approved by the Department and shall be consistent with the forms set forth in Chapter 14.130 Appendices A-C as applicable.

C. Title notifications shall be notarized and recorded with the Pierce County Auditor prior to approval of any regulated use or activity for the site.

14.500.090 Permitted Uses.

Uses permitted on designated resource land sites shall be the same as those permitted in the zone classifications shown on the City zoning map.

14.500.100 Appendices.

A. Property Adjacent to Resource Lands.

B. Agriculture Lands Noticing.

C. Mineral Resource Lands Noticing.

14.500.060 Appendices.

APPENDIX A
PROPERTY ADJACENT TO RESOURCE LANDS

A. **TITLE NOTIFICATION**

Parcel Number: _____Site Address: _____

> **NOTICE:** This parcel lies within 500 feet of land designated Resource Lands by Edgewood. A variety of commercial and industrial activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of chemicals, or from spraying or extraction which occasionally generates dust, smoke, noise, and odor. The City has established resource uses as priority uses on productive resource lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary commercial resource lands operations.

Signature of Owner_____
(NOTARY ACKNOWLEDGMENT)_____

B. **PLAT NOTIFICATION.** The owner of any site within 500 feet of land designated as Resource Lands on which a large lot, short subdivision, or formal subdivision is submitted, shall record a notice on the face of the plat. Such notification shall be in the form as set forth below:

> **PROPERTY ADJACENT TO RESOURCE LANDS PLAT NOTIFICATION.** This property lies within 500 feet of land designated Resource Lands by Edgewood. A variety of commercial and industrial activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of chemicals, or from spraying or extraction which occasionally generates dust, smoke, noise, and odor. The City has established resource uses as priority uses on productive resource lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary commercial resource lands operations.

C. **REGULATED ACTIVITIES NOTIFICATION.** The Department shall require that permits issued for regulated activities, as defined in section 14.500, within 500 feet of lands designated as Resource Lands, contain a notice as set forth below.

> **REGULATED ACTIVITIES NOTIFICATION.** This property lies within 500 feet of land designated Resource Lands by Edgewood. A variety of commercial and industrial activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of chemicals, or from spraying or extraction which occasionally generates dust, smoke, noise, and odor. The City has established resource uses as priority uses on productive resource lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary commercial resource lands operations.

14.500.060 Appendices.

APPENDIX B
AGRICULTURAL LANDS NOTICING

A. **TITLE NOTIFICATION.**

Parcel Number: _____
Site Address: _____

NOTICE: This parcel lies within an area identified as Agricultural Lands by Edgewood. A variety of commercial agricultural activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of agricultural chemicals, including herbicides, pesticides, and fertilizers; or from spraying, pruning, and harvesting which occasionally generate dust, smoke, noise, and odor. Edgewood has established agriculture as a priority use on productive Agricultural Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary farm operations.

Signature of Owner_____
Signature of Owner_____

(NOTARY ACKNOWLEDGMENT)_____

B. **PLAT NOTIFICATION.** The owner of any site within this designation on which a large lot, short subdivision, or formal subdivision is submitted, shall record a notice on the face of the plat. Such notification shall be in the form as set forth below.

> **AGRICULTURAL LANDS PLAT NOTIFICATION.** This parcel lies within an area identified as Agricultural Lands by Edgewood. A variety of commercial agricultural activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of agricultural chemicals, including herbicides, pesticides, and fertilizers; or from spraying, pruning, and harvesting which occasionally generate dust, smoke, noise, and odor. The City has established agriculture as a priority use on productive Agricultural Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary farm operations.

C. **REGULATED ACTIVITIES NOTIFICATION.** The Department shall require that all permits issued for regulated activities, as defined in section 14.500, within this zone classification contain a notice as set forth below.

> **REGULATED ACTIVITIES NOTIFICATION.** This parcel lies within an area identified as Agricultural Lands by Edgewood. A variety of commercial agricultural activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of agricultural chemicals, including herbicides, pesticides, and fertilizers; or from spraying, pruning, and harvesting which occasionally generate dust, smoke, noise, and odor. The City has established agriculture as a priority use on productive Agricultural Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary farm operations.

14.500.060 Appendices.

APPENDIX C
MINERAL RESOURCE LANDS NOTICING

A. **TITLE NOTIFICATION**

Parcel Number: _____
Site Address: _____

> **NOTICE**: This parcel lies within an area of land designated Mineral Resource Lands by the City. A variety of commercial mineral extraction activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of heavy equipment, chemicals, and spraying which may generate dust, smoke, and noise associated with the extraction of mineral resources. Edgewood has established mineral resource extraction as a priority use on productive Mineral Resource Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary mineral resource extraction operations.

Signature of Owner_____
(NOTARY ACKNOWLEDGMENT)_____

B. **PLAT NOTIFICATION.** The owner of any site within this overlay district on which a large lot, short subdivision, or formal subdivision is submitted, shall record a notice on the face of the plat. Such notification shall be in the form as set forth below:

> **MINERAL RESOURCE LANDS PLAT NOTIFICATION.** This property lies within an area of land designated Mineral Resource Lands by The City of Edgewood. A variety of mineral resource extraction activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of heavy equipment, chemicals, and spraying which may generate dust, smoke, and noise associated with the extraction of mineral resources. Edgewood has established mineral resource extraction as a priority use on productive Mineral Resource Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary mineral resource extraction lands.

C. **REGULATED ACTIVITIES NOTIFICATION.** The Department shall require that all permits issued for regulated activities, as defined in section 14.500, within this designation contain a notice as set forth below:

> **REGULATED ACTIVITIES NOTIFICATION**. This property lies within an area of land designated Mineral Resource Lands by Edgewood. A variety of mineral resource extraction activities occur in the area that may be inconvenient or cause discomfort to area residents. This may arise from the use of chemicals and extraction of minerals, which occasionally generates dust, smoke, noise, and odor. The City has established mineral resource extraction as a priority use on productive Mineral Resource Lands, and residents of adjacent property should be prepared to accept such inconveniences or discomfort from normal, necessary mineral resource extraction lands.

Chapter 43.21C RCW
STATE ENVIRONMENTAL POLICY

Compile the complete chapter as a single file.

SECTIONS

43.21C.010 Purposes.

43.21C.020 Legislative recognitions -- Declaration -- Responsibility.

43.21C.030 Guidelines for state agencies, local governments -- Statements -- Reports -- Advice -- Information.

43.21C.031 Significant impacts.

43.21C.033 Threshold determination to be made within ninety days after application is complete.

43.21C.034 Use of existing documents.

43.21C.035 Certain irrigation projects decisions exempt from RCW 43.21C.030(2)(c).

43.21C.036 Hazardous substance remedial actions -- Procedural requirements and documents to be integrated.

43.21C.037 Application of RCW 43.21C.030(2)(c) to forest practices.

43.21C.038 Application of RCW 43.21C.030(2)(c) to school closures.

43.21C.0381 Application of RCW 43.21C.030(2)(c) to decisions pertaining to air operating permits.

43.21C.0382 Application of RCW 43.21C.030(2)(c) to watershed restoration projects -- Fish habitat enhancement projects.

43.21C.0383 Application of RCW 43.21C.030(2)(c) to waste discharge permits.

43.21C.0384 Application of RCW 43.21C.030(2)(c) to personal wireless services facilities.

43.21C.039 Metals mining and milling operations -- Environmental impact statements required.

43.21C.040 Examination of laws, regulations, policies by state agencies and local authorities -- Report of deficiencies and corrective measures.

43.21C.050 Specific statutory obligations not affected.

43.21C.060 Chapter supplementary -- Conditioning or denial of governmental action.

43.21C.065 Impact fees and fees for system improvements.

43.21C.075 Appeals.

43.21C.080 Notice of action by governmental agency -- How publicized -- Time limitation for commencing challenge to action.

43.21C.087 List of filings required by RCW 43.21C.080.

43.21C.090 Decision of governmental agency to be accorded substantial weight.

43.21C.095 State environmental policy act rules to be accorded substantial deference.

43.21C.110 Content of state environmental policy act rules.

43.21C.120 Rules, ordinances, resolutions and regulations -- Adoption -- Effective dates.

43.21C.130 Model ordinances.

43.21C.135 Authority of local governmental units to adopt rules, guidelines and model ordinances by reference.

43.21C.150 RCW 43.21C.030(2)(c) inapplicable when statement previously prepared pursuant to national environmental policy act.

43.21C.160 Utilization of statement prepared under RCW 43.21C.030 to implement chapter 90.62 RCW -- Utilization of chapter 90.62 RCW procedures to satisfy RCW 43.21C.030(2)(c).

43.21C.165 Challenges to consistency of rules adopted pursuant to RCW 43.21C.110 and 43.21C.160 -- Procedure -- Finality.

43.21C.170 Council on environmental policy.

43.21C.175 Council on environmental policy -- Personnel.

43.21C.210 Certain actions during state of emergency exempt from chapter.

43.21C.220 Incorporation of city or town exempt from chapter.

43.21C.222 Annexation by city or town exempt from chapter.

43.21C.225 Consolidation and annexation of cities and towns exempt from chapter.

43.21C.227 Disincorporation of a city or town or reduction of city or town limits exempt from chapter.

43.21C.230 Development and adoption of plan under chapter 43.180 RCW exempt from chapter.

43.21C.240 Project review under the growth management act.

43.21C.250 Forest practices board -- Emergency rules -- Exempt from chapter.

43.21C.260 Certain actions not subject to RCW 43.21C.030(2)(c) -- Threshold determination on a watershed analysis.

43.21C.270 Certain secure community transition facilities not subject to this chapter.

43.21C.300 Workshops -- Handbook.

43.21C.400 Unfinished nuclear power projects -- Council action exempt from this chapter.

43.21C.900 Short title.

43.21C.910 Severability -- 1974 ex.s. c 179.

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43.21C.912 Applicability -- 1983 c 117.

43.21C.913 Severability -- 1983 c 117.

43.21C.914 Effective dates -- 1983 c 117.

NOTES:

Economic policy: Chapter 43.21H RCW.

Chapter 197-11 WAC
SEPA RULES
(Formerly chapter 197-10 WAC.)

Compile the complete chapter as a single file. **Last Update: 3/4/98**

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Show Dispositions Of Sections Formerly Codified In This Chapter

Chapter 173-22 WAC

ADOPTION OF DESIGNATIONS OF SHORELANDS AND WETLANDS ASSOCIATED WITH SHORELINES OF THE STATE

Compile the complete chapter as a single file. **Last Update: 2/5/97**

WAC SECTIONS

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(Formerly Flood control zones by state)

Compile the complete chapter as a single file.

SECTIONS

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86.16.120 Flood damages defined.

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Chapter 36.70A RCW
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Compile the complete chapter as a single file.

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36.70A.011 Findings -- Rural lands.

36.70A.020 Planning goals.

36.70A.030 Definitions.

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NOTES:

Building permits--Evidence of adequate water supply required: RCW 19.27.097.

Expediting completion of industrial projects of statewide significance -- Planning requirements: RCW 43.157.020.

Impact fees: RCW 82.02.050 through 82.02.100.

Population forecasts: RCW 43.62.035.

Regional transportation planning: Chapter 47.80 RCW.

Subdivision and short subdivision requirements: RCW 58.17.060, 58.17.110.

Title 84 RCW
PROPERTY TAXES

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84.08 General powers and duties of department of revenue.

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84.12 Assessment and taxation of public utilities.

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NOTES:

Additional provisions relating to taxes, see titles pertaining to particular taxing authorities, i.e., cities, counties, school districts, etc.

Building permits, new construction: Chapter 36.21 RCW.

Burying place exempt from execution: RCW 68.24.220.

Cemetery associations, nonprofit: RCW 68.20.110, 68.20.120.

Cities, unfit buildings: Chapter 35.80 RCW.

Cities and towns, prepayment by taxpayer of taxes and assessments owed to: RCW 35.21.650.

Columbia Basin project: RCW 89.12.120.

Community renewal: Chapter 35.81 RCW.

Conservation districts: Chapter 89.08 RCW.

Constitutional limitations generally: State Constitution Art. 2 § 40, Art. 7, Art. 11, §§ 9, 12.

Counties, prepayment and deposit of taxes and assessments: RCW 36.32.120.

Federal agencies and instrumentalities, taxation: State Constitution Art. 7 §§ 1, 3; Title 37 RCW.

Flood control district property: RCW 86.09.520.

Irrigation district property: RCW 87.03.260.

Lease of tax acquired property for underground storage of natural gas: RCW 80.40.070.

Limitation on levies: State Constitution Art. 7 § 2.

Local improvement trust property: RCW 35.53.010.

Olympic National Park: RCW 37.08.210.

Personal exemption not applicable to tax levied on such property: RCW 6.15.010.

Privilege taxes: Chapter 54.28 RCW.

Public utility districts: RCW 54.16.080.

Qualifications for persons assessing real property -- Examination: RCW 36.21.015.

Rainier National Park: RCW 37.08.200.

Real estate, excise tax on transfer: Chapters 82.45 and 82.46 RCW.

Savings and loan associations: RCW 33.28.040.

Tax returns, remittances, etc., filing and receipt: RCW 1.12.070.

Taxing districts, general indebtedness limitation: Chapter 39.36 RCW.

Termination of tax preferences: Chapter 43.136 RCW.

Washington Principal and Income Act of 2002: Chapter 11.104A RCW.

US Army Corps of Engineers
Waterways Experiment Station

Wetlands Research Program Technical Report Y-87-1 (on-line edition)

Corps of Engineers Wetlands Delineation Manual

by Environmental Laboratory

January 1987 - Final Report
Approved For Public Release; Distribution Is Unlimited

The following two letters used as part of the number designating technical reports of research published under the Wetlands Research Program identify the area under which the report was prepared:

	Task		Task
CP	Critical Processes	RE	Restoration & Establishment
DE	Delineation & Evaluation	SM	Stewardship & Management

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January 1987

Corps of Engineers Wetlands Delineation Manual

by Environmental Laboratory

U.S. Army Corps of Engineers
Waterways Experiment Station
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

Final report

Approved for public release; distribution is unlimited

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Preface to the On-Line Edition

This is an electronic version of the 1987 *Corps of Engineers Wetlands Delineation Manual* (the 1987 Manual). The 1987 Manual is the current Federal delineation manual used in the Clean Water Act Section 404 regulatory program for the identification and delineation of wetlands. Except where noted in the manual, the approach requires positive evidence of hydrophytic vegetation, hydric soils, and wetland hydrology for a determination that an area is a wetland.

The original manual and this on-line edition were prepared by the Environmental Laboratory (EL) of the U.S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi. The work was sponsored by Headquarters, U.S. Army Corps of Engineers (HQUSACE), through the Wetlands Research Program.

The manual was originally published in January 1987, following several years of development and testing of draft versions. Since that time, the use and interpretation of the 1987 Manual have been clarified and updated through a series of guidance documents and memoranda from HQUSACE. This electronic edition does not change the intent or jurisdictional area of the 1987 Manual. It does, however, attempt to clarify the manual and current guidance by including a number of boxed "USER NOTES" indicating where the original manual has been augmented by more recent information or guidance. USER NOTES were written by Dr. James S. Wakeley, EL, WES. Due to re-formatting of the text and insertion of the USER NOTES, page numbers in this edition do not match those in the original edition. Some obsolete material appears in this document as struck-out text (e.g., ~~obsolete material~~), and hypertext links are provided to sources of important supplementary information (e.g., hydric soils lists, wetland plant lists). References cited in the USER NOTES refer to the following guidance documents from HQUSACE:

"Clarification of the Phrase "Normal Circumstances" as it pertains to Cropped Wetlands," Regulatory Guidance Letter (RGL) 90-7 dated 26 September 1990.

"Implementation of the 1987 Corps Wetland Delineation Manual," memorandum from John P. Elmore dated 27 August 1991.

"Questions & Answers on the 1987 Manual," memorandum from John F. Studt dated 7 October 1991.

"Clarification and Interpretation of the 1987 Manual," memorandum from Major General Arthur E. Williams dated 6 March 1992.

"Revisions to National Plant Lists," memorandum from Michael L. Davis dated 17 January 1996.

"NRCS Field Indicators of Hydric Soils," memorandum from John F. Studt dated 21 March 1997.

Copies of the original published manual are available through the National Technical Information Service (phone 703-487-4650, NTIS document number ADA 176734/2INE). The report should be cited as follows:

> Environmental Laboratory. (1987). "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Useful supplementary information for making wetland determinations can also be found at the following sites on the World Wide Web:

- Hydric soils definition, criteria, and lists
- National list of plant species that occur in wetlands
- Analyses of normal precipitation ranges and growing season limits
- National Wetlands Inventory maps and databases

Preface to the Original Edition

This manual is a product of the Wetlands Research Program (WRP) of the U.S. Army Engineer Waterways Experiment Station (WES), Vicksburg, MS. The work was sponsored by the Office, Chief of Engineers (OCE), U.S. Army. OCE Technical monitors for the WRP were Drs. John R. Hall and Robert J. Pierce, and Mr. Phillip C. Pierce.

The manual has been reviewed and concurred in by the Office of the Chief of Engineers and the Office of the Assistant Secretary of the Army (Civil Works) ~~as a method approved for voluntary use in the field for a trial period of 1 year~~.

~~This manual is not intended to change appreciably the jurisdiction of the Clean Water Act (CWA) as it is currently implemented. Should any District find that use of this method appreciably contracts or expands jurisdiction in their District as the District currently interprets CWA authority, the District should immediately discontinue use of this method and furnish a full report of the circumstances to the Office of the Chief of Engineers~~.

USER NOTES: Use of the 1987 Manual to identify and delineate wetlands potentially subject to regulation under Section 404 is now mandatory. (HQUSACE, 27 Aug 91)

This manual describes technical guidelines and methods using a multiparameter approach to identify and delineate wetlands for purposes of Section 404 of the Clean Water Act. Appendices of supporting technical information are also provided.

The manual is presented in four parts. Part II was prepared by Dr. Robert T. Huffman, formerly of the Environmental Laboratory (EL), WES, and Dr. Dana R. Sanders, Sr., of the Wetland and Terrestrial Habitat Group (WTHG), Environmental Resources Division (ERD), EL. Dr. Huffman prepared the original version of Part II in 1980, entitled "Multiple Parameter Approach to the Field Identification and Delineation of Wetlands." The original version was distributed to all Corps field elements, as well as other Federal resource and environmental regulatory agencies, for review and comments. Dr. Sanders revised the original version in 1982, incorporating review comments. Parts I, III, and IV

were prepared by Dr. Sanders, Mr. William B. Parker (formerly detailed to WES by the U.S. Department of Agriculture (USDA), Soil Conservation Service (SCS)) and Mr. Stephen W. Forsythe (formerly detailed to WES by the U.S. Department of the Interior, Fish and Wildlife Service (FWS)). Dr. Sanders also served as overall technical editor of the manual. The manual was edited by Ms. Jamie W. Leach of the WES Information Products Division.

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The work was monitored at WES under the direct supervision of Dr. Hanley K. Smith, Chief, WTHG, and under the general supervision of Dr. Conrad J. Kirby, Jr., Chief, ERD. Dr. Smith, Dr. Sanders, and Mr. Theriot were Managers of the WRP. Dr. John Harrison was Chief, EL.

Director of WES during the preparation of this report was COL Allen F. Grum, USA. During publication, COL Dwayne G. Lee, CE, was Commander and Director. Technical Director was Dr. Robert W. Whalin.

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Conversion Factors, Non-SI to SI Units of Measurement

Non-SI units of measurement used in this report can be converted to SI (metric) units as follows:

Multiply	By	To Obtain
acres	0.4047	hectares
Fahrenheit degrees	5/9	Celsius degrees[1]
feet	0.3048	metres
inches	2.54	centimetres
miles (U.S. statute)	1.6093	kilometres
square inches	6.4516	square centimetres

[1] To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use the following formula: C = (5/9) (F - 32).

Part I: Introduction

Background

1. Recognizing the potential for continued or accelerated degradation of the Nation's waters, the U.S. Congress enacted the Clean Water Act (hereafter referred to as the Act), formerly known as the Federal Water Pollution Control Act (33 U.S.C. 1344). The objective of the Act is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. Section 404 of the Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the waters of the United States, including wetlands.

Purpose and Objectives

Purpose

2. The purpose of this manual is to provide users with guidelines and methods to determine whether an area is a wetland for purposes of Section 404 of the Act.

Objectives

3. Specific objectives of the manual are to:

a. Present technical guidelines for identifying wetlands and distinguishing them from aquatic habitats and other nonwetlands.[1]

b. Provide methods for applying the technical guidelines.

c. Provide supporting information useful in applying the technical guidelines.

[1] Definitions of terms used in this manual are presented in the Glossary, Appendix A.

Scope

4. This manual is limited in scope to wetlands that are a subset of "waters of the United States" and thus subject to Section 404. The term "waters of the United States" has broad meaning and incorporates both deep-water aquatic habitats and special aquatic sites, including wetlands (*Federal Register* 1982), as follows:

a. The territorial seas with respect to the discharge of fill material.

b. Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands.

c. Tributaries to navigable waters of the United States, including adjacent wetlands.

d. Interstate waters and their tributaries, including adjacent wetlands.

e. All others waters of the United States not identified above, such as isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not a part of a tributary system to interstate waters or navigable waters of the United States, the degradation or destruction of which could affect interstate commerce.

Determination that a water body or wetland is subject to interstate commerce and therefore is a "water of the United States" shall be made independently of procedures described in this manual.

Special aquatic sites

5. The Environmental Protection Agency (EPA) identifies six categories of special aquatic sites in their Section 404 b.(l) guidelines (*Federal Register* 1980), including:

a. Sanctuaries and refuges.

b. Wetlands.

c. Mudflats.

d. Vegetated shallows.

e. Coral reefs.

f. Riffle and pool complexes.

Although all of these special aquatic sites are subject to provisions of the Clean Water Act, this manual considers only wetlands. By definition, wetlands are vegetated. Thus, unvegetated special aquatic sites (e.g., mudflats lacking macrophytic vegetation) are not covered in this manual.

Relationship to wetland classification systems

6. The technical guideline for wetlands does not constitute a classification system. It only provides a basis for determining whether a given area is a wetland for purposes of Section 404, without attempting to classify it by wetland type.

7. Consideration should be given to the relationship between the technical guideline for wetlands and the classification system developed for the Fish and Wildlife Service (FWS), U.S. Department of the Interior, by Cowardin et al. (1979). The FWS classification system was developed as a basis for identifying, classifying, and mapping wetlands, other special aquatic sites, and deepwater aquatic habitats. Using this classification system, the National Wetland Inventory (NWI) is mapping the wetlands, other special aquatic sites, and deepwater aquatic habitats of the United States, and is also developing both a list of plant species that occur in wetlands and an associated plant database. These products should contribute significantly to application of the technical guideline for wetlands. The technical guideline for wetlands as presented in the manual includes most, but not all, wetlands identified in the FWS system. The difference is due to two principal factors:

a. The FWS system includes all categories of special aquatic sites identified in the EPA Section 404 b.(l) guidelines. All other special aquatic sites are clearly within the purview of Section 404; thus, special methods for their delineation are unnecessary.

b. The FWS system requires that a positive indicator of wetlands be present for any one of the three parameters, while the technical guideline for wetlands requires that a positive wetland indicator be present for each parameter (vegetation, soils, and hydrology), except in limited instances identified in the manual.

Organization

8. This manual consists of four parts and four appendices. Part I presents the background, purpose and objectives, scope, organization, and use of the manual.

9. Part II focuses on the technical guideline for wetlands, and stresses the need for considering all three parameters (vegetation, soils, and hydrology) when making wetland determinations. Since wetlands occur in an intermediate posi-

tion along the hydrologic gradient, comparative technical guidelines are also presented for deepwater aquatic sites and nonwetlands.

10. Part III contains general information on hydrophytic vegetation, hydric soils, and wetland hydrology. Positive wetland indicators of each parameter are included.

11. Part IV, which presents methods for applying the technical guideline for wetlands, is arranged in a format that leads to a logical determination of whether a given area is a wetland. Section A contains general information related to application of methods. Section B outlines preliminary data-gathering efforts. Section C discusses two approaches (routine and comprehensive) for making wetland determinations and presents criteria for deciding the correct approach to use. Sections D and E describe detailed procedures for making routine and comprehensive determinations, respectively. The basic procedures are described in a series of steps that lead to a wetland determination.

12. The manual also describes (Part IV, Section F) methods for delineating wetlands in which the vegetation, soils, and/or hydrology have been altered by recent human activities or natural events, as discussed below:

a. The definition of wetlands contains the phrase "under normal circumstances," which was included because there are instances in which the vegetation in a wetland has been inadvertently or purposely removed or altered as a result of recent natural events or human activities. Other examples of human alterations that may affect wetlands are draining, ditching, levees, deposition of fill, irrigation, and impoundments. When such activities occur, an area may fail to meet the diagnostic criteria for a wetland. Likewise, positive hydric soil indicators may be absent in some recently created wetlands. In such cases, an alternative method must be employed in making wetland determinations.

USER NOTES: "Normal circumstances" has been further defined as "the soil and hydrologic conditions that are normally present, without regard to whether the vegetation has been removed." The determination of whether normal circumstances exist in a disturbed area "involves an evaluation of the extent and relative permanence of the physical alteration of wetlands hydrology and hydrophytic vegetation" and consideration of the "purpose and cause of the physical alterations to hydrology and vegetation." (RGL 90-7, 26 Sep 90; HQUSACE, 7 Oct 91)

b. Natural events may also result in sufficient modification of an area that indicators of one or more wetland parameters are absent. For example, changes in river course may significantly alter hydrology, or beaver dams may create new wetland areas that lack hydric soil conditions. Catastrophic events (e.g., fires, avalanches, mudslides,

and volcanic activities) may also alter or destroy wetland indicators on a site.

Such atypical situations occur throughout the United States, and all of these cannot be identified in this manual.

13. Certain wetland types, under the extremes of normal circumstances, may not always meet all the wetland criteria defined in the manual. Examples include prairie potholes during drought years and seasonal wetlands that may lack hydrophytic vegetation during the dry season. Such areas are discussed in Part IV, Section G, and guidance is provided for making wetland determinations in these areas. However, such wetland areas may warrant additional research to refine methods for their delineation.

14. Appendix A is a glossary of technical terms used in the manual. Definitions of some terms were taken from other technical sources, but most terms are defined according to the manner in which they are used in the manual.

15. Data forms for methods presented in Part IV are included in Appendix B. Examples of completed data forms are also provided.

16. Supporting information is presented in Appendices C and D. ~~Appendix C contains lists of plant species that occur in wetlands. Section 1 consists of regional lists developed by a Federal interagency panel. Section 2 consists of shorter lists of plant species that commonly occur in wetlands of each region.~~

USER NOTES: CE-supplied plant lists are obsolete and have been superseded by the May 1988 version of the "National List of Plant Species that Occur in Wetlands" published by the U.S. Fish and Wildlife Service and available on the World Wide Web. (HQUSACE, 27 Aug 91)

Section 3 describes morphological, physiological, and reproductive adaptations associated with hydrophytic species, as well as a list of some species exhibiting such adaptations. Appendix D discusses procedures for examining soils for hydric soil indicators, ~~and also contains a list of hydric soils of the United States~~.

USER NOTES: The hydric soil list published in the 1987 Corps Manual is obsolete. Current hydric soil definition, criteria, and lists are available over the World Wide Web from the U.S.D.A. Natural Resources Conservation Service (NRCS). (HQUSACE, 27 Aug 91, 6 Mar 92)

Use

17. Although this manual was prepared primarily for use by Corps of Engineers (CE) field inspectors, it should be useful to anyone who makes wetland determinations for purposes of Section 404 of the Clean Water Act. The user is

directed through a series of steps that involve gathering of information and decisionmaking, ultimately leading to a wetland determination. A general flow diagram of activities leading to a determination is presented in Figure 1. However, not all activities identified in Figure 1 will be required for each wetland determination. For example, if a decision is made to use a routine determination procedure, comprehensive determination procedures will not be employed.

Premise for use of the manual

18. Three key provisions of the CE/EPA definition of wetlands include:

a. Inundated or saturated soil conditions resulting from permanent or periodic inundation by ground water or surface water.

b. A prevalence of vegetation typically adapted for life in saturated soil conditions (hydrophytic vegetation).

c. The presence of "normal circumstances."

19. Explicit in the definition is the consideration of three environmental parameters: hydrology, soil, and vegetation. Positive wetland indicators of all three parameters are normally present in wetlands. Although vegetation is often the most readily observed parameter, sole reliance on vegetation or either of the other parameters as the determinant of wetlands can sometimes be misleading. Many plant species can grow successfully in both wetlands and nonwetlands, and hydrophytic vegetation and hydric soils may persist for decades following alteration of hydrology that will render an area a nonwetland. The presence of hydric soils and wetland hydrology indicators in addition to vegetation indicators will provide a logical, easily defensible, and technical basis for the presence of wetlands. The combined use of indicators for all three parameters will enhance the technical accuracy, consistency, and credibility of wetland determinations. Therefore, all three parameters were used in developing the technical guideline for wetlands and all approaches for applying the technical guideline embody the multiparameter concept.

Approaches

20. The approach used for wetland delineations will vary, based primarily on the complexity of the area in question. Two basic approaches described in the manual are (a) routine and (b) comprehensive.

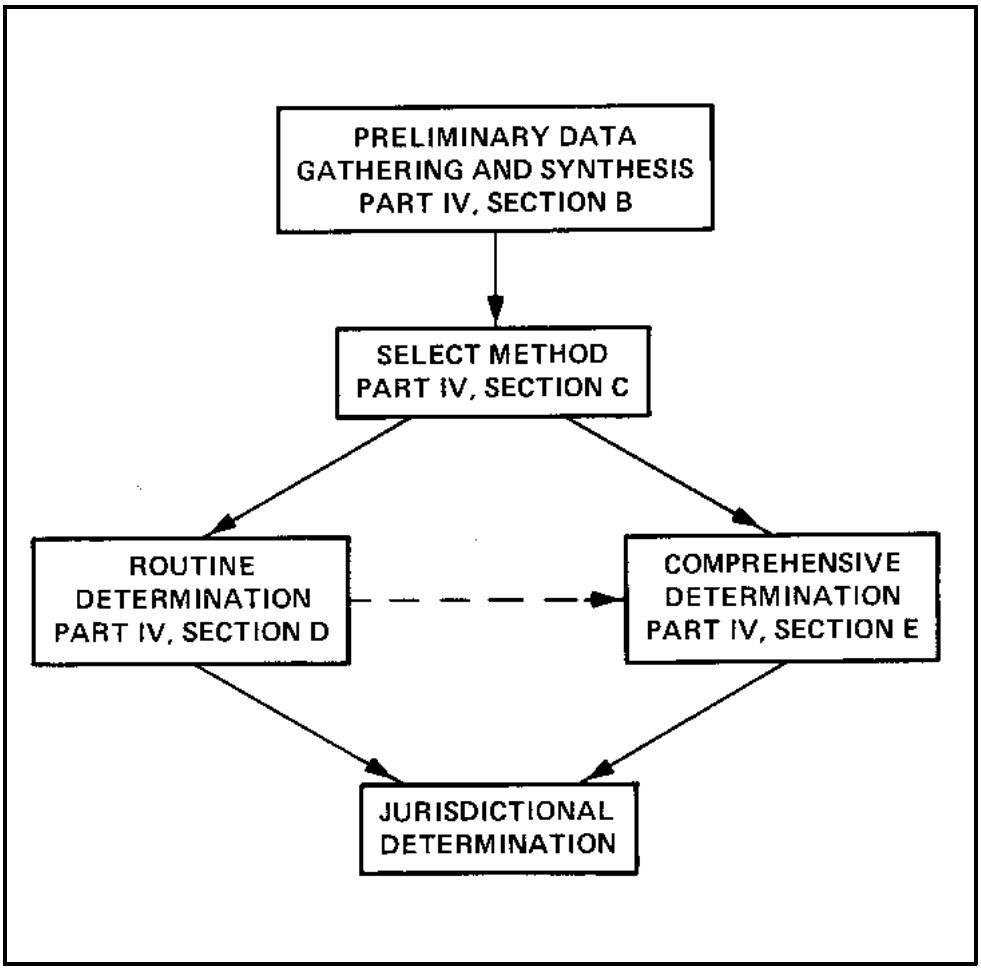

Figure 1. General schematic diagram of activities leading to a wetland/non-wetland determination

21. **Routine approach.** The routine approach normally will be used in the vast majority of determinations. The routine approach requires minimal level of effort, using primarily qualitative procedures. This approach can be further subdivided into three levels of required effort, depending on the complexity of the area and the amount and quality of preliminary data available. The following levels of effort may be used for routine determinations:

a. *Level 1 - Onsite inspection unnecessary.* (Part IV, Section D, Subsection 1).

b. *Level 2 - Onsite inspection necessary.* (Part IV, Section D, Subsection 2).

c. *Level 3 - Combination of Levels 1 and 2.* (Part IV, Section D, Subsection 3).

22. **Comprehensive approach.** The comprehensive approach requires application of quantitative procedures for making wetland determinations. It should

seldom be necessary, and its use should be restricted to situations in which the wetland is very complex and/or is the subject of likely or pending litigation. Application of the comprehensive approach (Part IV, Section E) requires a greater level of expertise than application of the routine approach, and only experienced field personnel with sufficient training should use this approach.

Flexibility

23. Procedures described for both routine and comprehensive wetland determinations have been tested and found to be reliable. However, site-specific conditions may require modification of field procedures. For example, slope configuration in a complex area may necessitate modification of the baseline and transect positions. Since specific characteristics (e.g., plant density) of a given plant community may necessitate the use of alternate methods for determining the dominant species, the user has the flexibility to employ sampling procedures other than those described. However, the basic approach for making wetland determinations should not be altered (i.e., the determination should be based on the dominant plant species, soil characteristics, and hydrologic characteristics of the area in question). The user should document reasons for using a different characterization procedure than described in the manual. *CAUTION: Application of methods described in the manual or the modified sampling procedures requires that the user be familiar with wetlands of the area and use his or her training, experience, and good judgment in making wetland determinations.*

Part II: Technical Guidelines

24. The interaction of hydrology, vegetation, and soil results in the development of characteristics unique to wetlands. Therefore, the following technical guideline for wetlands is based on these three parameters, and diagnostic environmental characteristics used in applying the technical guideline are represented by various indicators of these parameters.

25. Because wetlands may be bordered by both wetter areas (aquatic habitats) and by drier areas (nonwetlands), guidelines are presented for wetlands, deepwater aquatic habitats, and nonwetlands. However, procedures for applying the technical guidelines for deepwater aquatic habitats and nonwetlands are not included in the manual.

Wetlands

26. The following definition, diagnostic environmental characteristics, and technical approach comprise a guideline for the identification and delineation of wetlands:

a. *Definition.* The CE (*Federal Register* 1982) and the EPA (*Federal Register* 1980) jointly define wetlands as: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

b. *Diagnostic environmental characteristics.* Wetlands have the following general diagnostic environmental characteristics:

(1) *Vegetation.* The prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrologic and soil conditions described in *a* above. Hydrophytic species, due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic

soil conditions.[1] Indicators of vegetation associated with wetlands are listed in paragraph 35.

(2) *Soil*. Soils are present and have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions. Indicators of soils developed under reducing conditions are listed in paragraphs 44 and 45.

(3) *Hydrology*. The area is inundated either permanently or periodically at mean water depths ≤6.6 ft, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation.[2] Indicators of hydrologic conditions that occur in wetlands are listed in paragraph 49.

c. Technical approach for the identification and delineation of wetlands. Except in certain situations defined in this manual, evidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination.

Deepwater Aquatic Habitats

27. The following definition, diagnostic environmental characteristics, and technical approach comprise a guideline for deepwater aquatic habitats:

a. Definition. Deepwater aquatic habitats are areas that are permanently inundated at mean annual water depths >6.6 ft or permanently inundated areas ≤6.6 ft in depth that do not support rooted-emergent or woody plant species.[3]

b. Diagnostic environmental characteristics. Deepwater aquatic habitats have the following diagnostic environmental characteristics:

(1) *Vegetation.* No rooted-emergent or woody plant species are present in these permanently inundated areas.

(2) *Soil*. The substrate technically is not defined as a soil if the mean water depth is >6.6 ft or if it will not support rooted emergent or woody plants.

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[1] Species (e.g., *Acer rubrum*) having broad ecological tolerances occur in both wetlands and nonwetlands.

[2] The period of inundation or soil saturation varies according to the hydrologic/soil moisture regime and occurs in both tidal and nontidal situations.

[3] Areas ≤6.6 ft mean annual depth that support only submergent aquatic plants are vegetated shallows, not wetlands.

(3) *Hydrology*. The area is permanently inundated at mean water depths >6.6 ft.

c. Technical approach for the identification and delineation of deepwater aquatic habitats. When any one of the diagnostic characteristics identified in *b* above is present, the area is a deepwater aquatic habitat.

Nonwetlands

28. The following definition, diagnostic environmental characteristics, and technical approach comprise a guideline for the identification and delineation of nonwetlands:

a. Definition. Nonwetlands include uplands and lowland areas that are neither deepwater aquatic habitats, wetlands, nor other special aquatic sites. They are seldom or never inundated, or if frequently inundated, they have saturated soils for only brief periods during the growing season, and, if vegetated, they normally support a prevalence of vegetation typically adapted for life only in aerobic soil conditions.

b. Diagnostic environmental characteristics. Nonwetlands have the following general diagnostic environmental characteristics:

(1) *Vegetation.* The prevalent vegetation consists of plant species that are typically adapted for life only in aerobic soils. These mesophytic and/or xerophytic macrophytes cannot persist in predominantly anaerobic soil conditions.[1]

(2) *Soil*. Soils, when present, are not classified as hydric, and possess characteristics associated with aerobic conditions.

(3) *Hydrology*. Although the soil may be inundated or saturated by surface water or ground water periodically during the growing season of the prevalent vegetation, the average annual duration of inundation or soil saturation does not preclude the occurrence of plant species typically adapted for life in aerobic soil conditions.

c. Technical approach for the identification and delineation of nonwetlands. When any one of the diagnostic characteristics identified in *b* above is present, the area is a nonwetland.

[1] Some species, due to their broad ecological tolerances, occur in both wetlands and nonwetlands (e.g., *Acer rubrum).*

Part III: Characteristics and Indicators of Hydrophytic Vegetation, Hydric Soils, and Wetland Hydrology

Hydrophytic Vegetation

Definition

29. **Hydrophytic vegetation.** Hydrophytic vegetation is defined herein as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. The vegetation occurring in a wetland may consist of more than one plant community (species association). The plant community concept is followed throughout the manual. Emphasis is placed on the assemblage of plant species that exert a controlling influence on the character of the plant community, rather than on indicator species. Thus, the presence of scattered individuals of an upland plant species in a community dominated by hydrophytic species is not a sufficient basis for concluding that the area is an upland community. Likewise, the presence of a few individuals of a hydrophytic species in a community dominated by upland species is not a sufficient basis for concluding that the area has hydrophytic vegetation. *CAUTION: In determining whether an area is "vegetated" for the purpose of Section 404 jurisdiction, users must consider the density of vegetation at the site being evaluated. While it is not possible to develop a numerical method to determine how many plants or how much biomass is needed to establish an area as being vegetated or unvegetated, it is intended that the predominant condition of the site be used to make that characterization. This concept applies to areas grading from wetland to upland, and from wetland to other waters. This limitation would not necessarily apply to areas which have been disturbed by man or recent natural events.*

30. **Prevalence of vegetation.** The definition of wetlands includes the phrase "prevalence of vegetation." Prevalence, as applied to vegetation, is an imprecise, seldom-used ecological term. As used in the wetlands definition, prevalence refers to the plant community or communities that occur in an area at some point in time. Prevalent vegetation is characterized by the dominant species comprising the plant community or communities. Dominant plant species are those that contribute more to the character of a plant community than other species present, as estimated or measured in terms of some ecological parameter or parameters. The two most commonly used estimates of dominance are basal area (trees) and percent areal cover (herbs). Hydrophytic vegetation is prevalent in an area when the dominant species comprising the plant community or communities are typically adapted for life in saturated soil conditions.

USER NOTES: The "50/20 rule" is the recommended method for selecting dominant species from a plant community when quantitative data are available. The rule states that for each stratum in the plant community, dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50% of the total dominance measure for the stratum, plus any additional species that individually comprise 20% or more of the total dominance measure for the stratum. The list of dominant species is then combined across strata. (HQUSACE, 6 Mar 92)

31. **Typically adapted.** The term "typically adapted" refers to a species being normally or commonly suited to a given set of environmental conditions, due to some morphological, physiological, or reproductive adaptation (Appendix C, Section 3). As used in the CE wetlands definition, the governing environmental conditions for hydrophytic vegetation are saturated soils resulting from periodic inundation or saturation by surface or ground water. These periodic events must occur for sufficient duration to result in anaerobic soil conditions. When the dominant species in a plant community are typically adapted for life in anaerobic soil conditions, hydrophytic vegetation is present. Species ~~listed in Appendix C, Section 1 or 2,~~ that have an indicator status of OBL, FACW, or FAC[1] (Table 1) are considered to be typically adapted for life in anaerobic soil conditions (see paragraph 35*a*).

Influencing factors

32. Many factors (e.g., light, temperature, soil texture and permeability, man-induced disturbance, etc.) influence the character of hydrophytic vegetation. However, hydrologic factors exert an overriding influence on species that can occur in wetlands. Plants lacking morphological, physiological, and/or reproductive adaptations cannot grow, effectively compete, reproduce, and/or persist in areas that are subject to prolonged inundation or saturated soil conditions.

[1] Species having a FAC- indicator status are not considered to be typically adapted for life in anaerobic soil conditions.

Table 1
Plant Indicator Status Categories[1]

Indicator Category	Indicator Symbol	Definition
Obligate Wetland Plants	OBL	Plants that occur almost always (estimated probability >99 percent) in wetlands under natural conditions, but which may also occur rarely (estimated probability <1 percent) in nonwetlands. Examples: *Spartina alterniflora, Taxodium distichum*.
Facultative Wetland Plants	FACW	Plants that occur usually (estimated probability >67 percent to 99 percent) in wetlands, but also occur (estimated probability 1 percent to 33 percent) in nonwetlands. Examples: *Fraxinus pennsylvanica, Cornus stolonifera.*
Facultative Plants	FAC	Plants with a similar likelihood (estimated probability 33 percent to 67 percent) of occurring in both wetlands and nonwetlands. Examples: *Gleditsia triacanthos, Smilax rotundifolia.*
Facultative Upland Plants	FACU	Plants that occur sometimes (estimated probability 1 percent to <33 percent) in wetlands, but occur more often (estimated probability >67 percent to 99 percent) in nonwetlands. Examples: *Quercus rubra, Potentilla arguta.*
Obligate Upland Plants	UPL	Plants that occur rarely (estimated probability <1 percent) in wetlands, but occur almost always (estimated probability >99 percent) in nonwetlands under natural conditions. Examples: *Pinus echinata, Bromus mollis*.

[1] Categories were originally developed and defined by the USFWS National Wetlands Inventory and subsequently modified by the National Plant List Panel. The three facultative categories are subdivided by (+) and (–) modifiers ~~(see Appendix C, Section 1)~~.

Geographic diversity

33. Many hydrophytic vegetation types occur in the United States due to the diversity of interactions among various factors that influence the distribution of hydrophytic species. General climate and flora contribute greatly to regional variations in hydrophytic vegetation. Consequently, the same associations of hydrophytic species occurring in the southeastern United States are not found in the Pacific Northwest. In addition, local environmental conditions (e.g., local climate, hydrologic regimes, soil series, salinity, etc.) may result in broad variations in hydrophytic associations within a given region. For example, a coastal saltwater marsh will consist of different species than an inland freshwater marsh in the same region. An overview of hydrophytic vegetation occurring in each region of the Nation has been published by the CE in a series of eight preliminary wetland guides (Table 2), and a group of wetland and estuarine ecological profiles (Table 3) has been published by FWS.

Classification

34. Numerous efforts have been made to classify hydrophytic vegetation. Most systems are based on general characteristics of the dominant species occurring in each vegetation type. These range from the use of general physiognomic categories (e.g., overstory, subcanopy, ground cover, vines) to specific vegetation types (e.g., forest type numbers as developed by the Society of American Foresters). In other cases, vegetational characteristics are combined with hydrologic features to produce more elaborate systems. The most recent example of such a system was developed for the FWS by Cowardin et al. (1979).

Table 2
List of CE Preliminary Wetland Guides

Region	Publication Date	WES Report No.
Peninsular Florida	February 1978	TR Y-78-2
Puerto Rico	April 1978	TR Y-78-3
West Coast States	April 1978	TR-Y-78-4
Gulf Coastal Plain	May 1978	TR Y-78-5
Interior	May 1982	TR Y-78-6
South Atlantic States	May 1982	TR Y-78-7
North Atlantic States	May 1982	TR Y-78-8
Alaska	February 1984	TR Y-78-9

Table 3
List of Ecological Profiles Produced by the FWS Biological Services Program

Title	Publication Date	FWS Publication No.
"The Ecology of Intertidal Flats of North Carolina"	1979	79/39
"The Ecology of New England Tidal Flats"	1982	81/01
"The Ecology of the Mangroves of South Florida"	1982	81/24
"The Ecology of Bottomland Hardwood Swamps of the Southeast"	1982	81/37
"The Ecology of Southern California Coastal Salt Marshes"	1982	81/54
"The Ecology of New England High Salt Marshes"	1982	81/55
"The Ecology of Southeastern Shrub Bogs (Pocosins) and Carolina Bays"	1982	82/04
"The Ecology of the Apalachicola Bay System"	1984	82/05
"The Ecology of the Pamlico River, North Carolina"	1984	82/06
"The Ecology of the South Florida Coral Reefs"	1984	82/08
"The Ecology of the Sea Grasses of South Florida"	1982	82/25
"The Ecology of Tidal Marshes of the Pacific Northwest Coast"	1983	82/32
"The Ecology of Tidal Freshwater Marshes of the U.S. East Coast"	1984	83/17
"The Ecology of San Francisco Bay Tidal Marshes"	1983	82/23
"The Ecology of Tundra Ponds of the Arctic Coastal Plain"	1984	83/25
"The Ecology of Eelgrass Meadows of the Atlantic Coast"	1984	84/02
"The Ecology of Delta Marshes of Louisiana"	1984	84/09
"The Ecology of Eelgrass Meadows in the Pacific Northwest"	1984	84/24
"The Ecology of Irregularly Flooded Marshes of North-eastern Gulf of Mexico"	(In press)	85(7.1)
"The Ecology of Giant Kelp Forests in California"	1985	85(7.2)

Indicators of hydrophytic vegetation

35. Several indicators may be used to determine whether hydrophytic vegetation is present on a site. However, the presence of a single individual of a hydrophytic species does not mean that hydrophytic vegetation is present. The strongest case for the presence of hydrophytic vegetation can be made when

several indicators, such as those in the following list, are present. However, any one of the following is indicative that hydrophytic vegetation is present:[1]

a. *More than 50 percent of the dominant species are OBL, FACW, or FAC*[2] *(Table 1) on lists of plant species that occur in wetlands.* A national interagency panel has prepared a National List of Plant Species that occur in wetlands. This list categorizes species according to their affinity for occurrence in wetlands. ~~Regional subset lists of the national list, including only species having an indicator status of OBL, FACW, or FAC, are presented in Appendix C, Section 1. The CE has also developed regional lists of plant species that commonly occur in wetlands (Appendix C, Section 2). Either list may be used.~~

USER NOTES: CE-supplied plant lists are obsolete and have been superseded by the May 1988 version of the "National List of Plant Species that Occur in Wetlands" published by the U.S. Fish and Wildlife Service and available on the World Wide Web. Subsequent changes to the May 1988 national plant list, or regional versions of the national list, should not be used until they receive official review and approval. (HQUSACE, 27 Aug 91 and 17 Jan 96)

Note: A District that, on a subregional basis, questions the indicator status of FAC species may use the following option: When FAC species occur as dominants along with other dominants that are not FAC (either wetter or drier than FAC), the FAC species can be considered as neutral, and the vegetation decision can be based on the number of dominant species wetter than FAC as compared to the number of dominant species drier than FAC. When a tie occurs or all dominant species are FAC, the nondominant species must be considered. The area has hydrophytic vegetation when more than 50 percent of all considered species are wetter than FAC. When either all considered species are FAC or the number of species wetter than FAC equals the number of species drier than FAC, the wetland determination will be based on the soil and hydrology parameters. Districts adopting this option should provide documented support to the Corps representative on the regional plant list panel, so that a change in indicator status of FAC species of concern can be pursued. Corps representatives on the regional and national plant list panels will continually strive to ensure that plant species are properly designated on both a regional and subregional basis.

[1] Indicators are listed in order of decreasing reliability. Although all are valid indicators, some are stronger than others. When a decision is based on an indicator appearing in the lower portion of the list, re-evaluate the parameter to ensure that the proper decision was reached.

[2] FAC+ species are considered to be wetter (i.e., have a greater estimated probability of occurring in wetlands) than FAC species, while FAC- species are considered to be drier (i.e., have a lesser estimated probability of occurring in wetlands) than FAC species.

USER NOTES: The FAC-neutral option can not be used to exclude areas as wetlands that meet the basic vegetation rule (i.e., more than 50% of dominant species are FAC, FACW, or OBL) and meet wetland hydrology and hydric soil requirements. Presence of a plant community that satisfies the FAC-neutral option may be used as a secondary indicator of wetland hydrology. (HQUSACE, 6 Mar 92)

b. Other indicators. Although there are several other indicators of hydrophytic vegetation, it will seldom be necessary to use them. However, they may provide additional useful information to strengthen a case for the presence of hydrophytic vegetation. Additional training and/or experience may be required to employ these indicators.

(1) *Visual observation of plant species growing in areas of prolonged inundation and/or soil saturation.* This indicator can only be applied by experienced personnel who have accumulated information through several years of field experience and written documentation (field notes) that certain species commonly occur in areas of prolonged (>10 percent) inundation and/or soil saturation during the growing season. Species such as *Taxodium distichum, Typha latifolia,* and *Spartina alterniflora* normally occur in such areas. Thus, occurrence of species commonly observed in other wetland areas provides a strong indication that hydrophytic vegetation is present. *CAUTION: The presence of standing water or saturated soil on a site is insufficient evidence that the species present are able to tolerate long periods of inundation. The user must relate the observed species to other similar situations and determine whether they are normally found in wet areas, taking into consideration the season and immediately preceding weather conditions.*

(2) *Morphological adaptations.* Some hydrophytic species have easily recognized physical characteristics that indicate their ability to occur in wetlands. A given species may exhibit several of these characteristics, but not all hydrophytic species have evident morphological adaptations. A list of such morphological adaptations and a partial list of plant species with known morphological adaptations for occurrence in wetlands are provided in Appendix C, Section 3.

(3) *Technical literature.* The technical literature may provide a strong indication that plant species comprising the prevalent vegetation are commonly found in areas where soils are periodically saturated for long periods. Sources of available literature include:

(a) *Taxonomic references.* Such references usually contain at least a general description of the habitat in which a species occurs. A habitat description such as, "Occurs in water of streams and lakes and in alluvial floodplains subject to

periodic flooding," supports a conclusion that the species typically occurs in wetlands. Examples of some useful taxonomic references are provided in Table 4.

Table 4
List of Some Useful Taxonomic References

Title	Author(s)
Manual of Vascular Plants of Northeastern United States and Adjacent Canada	Gleason and Cronquist (1963)
Gray's Manual of Botany, 8th edition	Fernald (1950)
Manual of the Southeastern Flora	Small (1933)
Manual of the Vascular Flora of the Carolinas	Radford, Ahles, and Bell (1968)
A Flora of Tropical Florida	Long and Lakela (1976)
Aquatic and Wetland Plants of the Southwestern United States	Correll and Correll (1972)
Arizona Flora	Kearney and Peebles (1960)
Flora of the Pacific Northwest	Hitchcock and Cronquist (1973)
A California Flora	Munz and Keck (1959)
Flora of Missouri	Steyermark (1963)
Manual of the Plants of Colorado	Harrington (1979)
Intermountain Flora - Vascular Plants of the Intermountain West, USA - Vols I and II	Cronquist et al. (1972)
Flora of Idaho	Davis (1952)
Aquatic and Wetland Plants of the Southeastern United States - Vols I and II	Godfrey and Wooten (1979)
Manual of Grasses of the U.S.	Hitchcock (1950)

(b) *Botanical journals.* Some botanical journals contain studies that define species occurrence in various hydrologic regimes. Examples of such journals include: *Ecology, Ecological Monographs, American Journal of Botany, Journal of American Forestry, and Wetlands: The Journal of the Society of Wetland Scientists.*

(c) *Technical reports.* Governmental agencies periodically publish reports (e.g., literature reviews) that contain information on plant species occurrence in relation to hydrologic regimes. Examples of such publications include the CE preliminary regional wetland guides (Table 2) published by the U.S. Army Engineer Waterways Experiment Station (WES) and the wetland community and estuarine profiles of various habitat types (Table 3) published by the FWS.

(d) *Technical workshops, conferences, and symposia.* Publications resulting from periodic scientific meetings contain valuable information that can be used to support a decision regarding the presence of hydrophytic vegetation. These usually address specific regions or wetland types. For example, distribution of bottomland hardwood forest species in relation to hydrologic regimes was examined at a workshop on bottomland hardwood forest wetlands of the Southeastern United States (Clark and Benforado 1981).

(e) *Wetland plant database.* The NWI is producing a Plant Database that contains habitat information on approximately 5,200 plant species that occur at some estimated probability in wetlands, as compiled from the technical literature. When completed, this computerized database will be available to all governmental agencies.

(4) *Physiological adaptations.* Physiological adaptations include any features of the metabolic processes of plants that make them particularly fitted for life in saturated soil conditions. *NOTE: It is impossible to detect the presence of physiological adaptations in plant species during onsite visits.* Physiological adaptations known for hydrophytic species and species known to exhibit these adaptations are listed and discussed in Appendix C, Section 3.

(5) *Reproductive adaptations.* Some plant species have reproductive features that enable them to become established and grow in saturated soil conditions. Reproductive adaptations known for hydrophytic species are presented in Appendix C, Section 3.

Hydric Soils

Definition

36. ~~A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) 1985, as amended by the National Technical Committee for Hydric Soils (NTCHS) in December 1986).~~

Criteria for hydric soils

37. ~~Based on the above definition, the NTCHS developed the following criteria for hydric soils:~~

a. ~~All Histosols[1] except Folists;~~

b. ~~Soils in Aquic suborders, Aquic subgroups, Albolls suborder, Salorthids great group, or Pell great groups of Vertisols that are:~~

(1) ~~Somewhat poorly drained and have a water table less than 0.5 ft[2] from the surface for a significant period (usually a week or more) during the growing season, or~~

(2) ~~Poorly drained or very poorly drained and have either:~~

(a) ~~A water table at less than 1.0 ft from the surface for a significant period (usually a week or more) during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within 20 inches; or~~

(b) ~~A water table at less than 1.5 ft from the surface for a significant period (usually a week or more) during the growing season if permeability is less than 6.0 in/hr in any layer within 20 inches; or~~

c. ~~Soils that are ponded for long or very long duration during the growing season; or~~

d. ~~Soils that are frequently flooded for long duration or very long duration during the growing season.~~

USER NOTES: The hydric soil definition and criteria published in the 1987 Corps Manual are obsolete. Current hydric soil definition, criteria, and lists are available over the World Wide Web from the U.S.D.A. Natural Resources Conservation Service (NRCS). (HQUSACE, 27 Aug 91, 6 Mar 92)

A hydric soil may be either drained or undrained, and a drained hydric soil may not continue to support hydrophytic vegetation. Therefore, not all areas having hydric soils will qualify as wetlands. Only when a hydric soil supports hydrophytic vegetation and the area has indicators of wetland hydrology may the soil be referred to as a "wetland" soil.

38. A drained hydric soil is one in which sufficient ground or surface water has been removed by artificial means such that the area will no longer support hydrophyte vegetation. Onsite evidence of drained soils includes:

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[1] Soil nomenclature follows USDA-SCS (1975).

[2] A table of factors for converting Non-SI Units of Measurement to SI (metric) units is presented on page x.

a. Presence of ditches or canals of sufficient depth to lower the water table below the major portion of the root zone of the prevalent vegetation.

b. Presence of dikes, levees, or similar structures that obstruct normal inundation of an area.

c. Presence of a tile system to promote subsurface drainage.

d. Diversion of upland surface runoff from an area.

Although it is important to record such evidence of drainage of an area, a hydric soil that has been drained or partially drained still allows the soil parameter to be met. However, the area will not qualify as a wetland if the degree of drainage has been sufficient to preclude the presence of either hydrophytic vegetation or a hydrologic regime that occurs in wetlands. *NOTE: The mere presence of drainage structures in an area is not sufficient basis for concluding that a hydric soil has been drained; such areas may continue to have wetland hydrology.*

General information

39. Soils consist of unconsolidated, natural material that supports, or is capable of supporting, plant life. The upper limit is air and the lower limit is either bedrock or the limit of biological activity. Some soils have very little organic matter (mineral soils), while others are composed primarily of organic matter (Histosols). The relative proportions of particles (sand, silt, clay, and organic matter) in a soil are influenced by many interacting environmental factors. As normally defined, a soil must support plant life. The concept is expanded to include substrates that could support plant life. For various reasons, plants may be absent from areas that have well-defined soils.

40. A soil profile (Figure 2) consists of various soil layers described from the surface downward. Most soils have two or more identifiable horizons. A soil horizon is a layer oriented approximately parallel to the soil surface, and usually is differentiated from contiguous horizons by characteristics that can be seen or measured in the field (e.g., color, structure, texture, etc.). Most mineral soils have A-, B-, and C-horizons, and many have surficial organic layers (O-horizon). The A-horizon, the surface soil or topsoil, is a zone in which organic matter is usually being added to the mineral soil. It is also the zone from which both mineral and organic matter are being moved slowly downward. The next major horizon is the B-horizon, often referred to as the subsoil. The B-horizon is the zone of maximum accumulation of materials. It is usually characterized by higher clay content and/or more pronounced soil structure development and lower organic matter than the A-horizon. The next major horizon is usually the C-horizon, which consists of unconsolidated parent material that has not been sufficiently weathered to exhibit characteristics of the B-horizon. Clay content and degree of soil structure development in the C-horizon are usually less than in the B-horizon. The lowest major horizon, the R-horizon, consists of consoli-

dated bedrock. In many situations, this horizon occurs at such depths that it has no significant influence on soil characteristics.

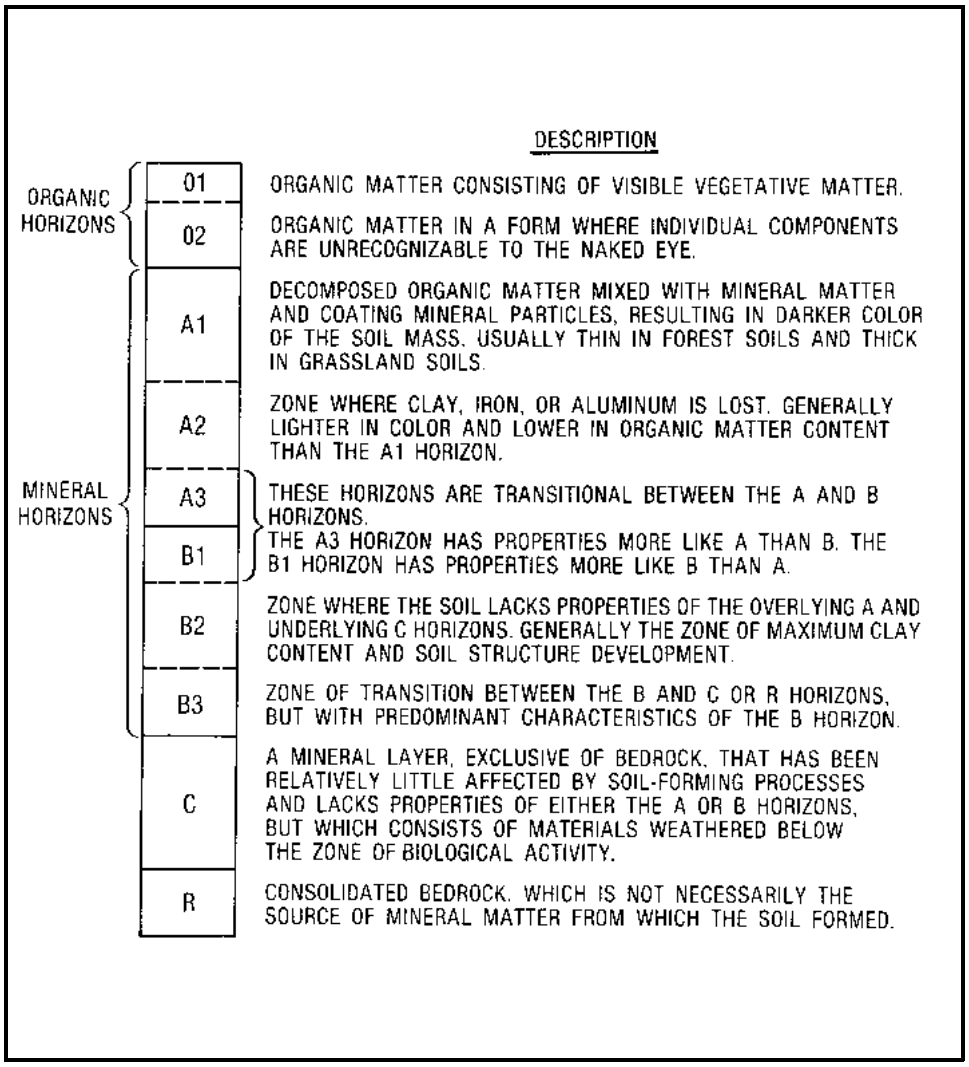

Figure 2. Generalized soil profile

Influencing factors

41. Although all soil-forming factors (climate, parent material, relief, organisms, and time) affect the characteristics of a hydric soil, the overriding influence is the hydrologic regime. The unique characteristics of hydric soils result from the influence of periodic or permanent inundation or soil saturation for sufficient duration to effect anaerobic conditions. Prolonged anaerobic soil conditions lead to a reducing environment, thereby lowering the soil redox potential. This results in chemical reduction of some soil components (e.g., iron and manganese oxides), which leads to development of soil colors and other physical characteristics that usually are indicative of hydric soils.

Classification

42. Hydric soils occur in several categories of the current soil classification system, which is published in *Soil Taxonomy* (USDA-SCS 1975). This classification system is based on physical and chemical properties of soils that can be seen, felt, or measured. Lower taxonomic categories of the system (e.g., soil series and soil phases) remain relatively unchanged from earlier classification systems.

43. Hydric soils may be classified into two broad categories: organic and mineral. Organic soils (Histosols) develop under conditions of nearly continuous saturation and/or inundation. All organic soils are hydric soils except Folists, which are freely drained soils occurring on dry slopes where excess litter accumulates over bedrock. Organic hydric soils are commonly known as peats and mucks. All other hydric soils are mineral soils. Mineral soils have a wide range of textures (sandy to clayey) and colors (red to gray). Mineral hydric soils are those periodically saturated for sufficient duration to produce chemical and physical soil properties associated with a reducing environment. They are usually gray and/or mottled immediately below the surface horizon (see paragraph 44*d*), or they have thick, dark-colored surface layers overlying gray or mottled subsurface horizons.

Wetland indicators (nonsandy soils)

44. Several indicators are available for determining whether a given soil meets the definition and criteria for hydric soils. Any one of the following indicates that hydric soils are present:[1]

Figure 3. Organic soil

a. *Organic soils (Histosols).* A soil is an organic soil when: (1) more than 50 percent (by volume) of the upper 32 inches of soil is composed of organic soil material;[2] or (2) organic soil material of any thickness rests on bedrock. Organic soils (Figure 3) are saturated for long periods and are commonly called peats or mucks.

b. *Histic epipedons.* A histic epipedon is an 8- to 16-inch layer at or near the surface of a mineral hydric soil that is saturated with

[1] Indicators are listed in order of decreasing reliability. Although all are valid indicators, some are stronger indicators than others. When a decision is based on an indicator appearing in the lower portion of the list, re-evaluate the parameter to ensure that the proper decision was reached.

[2] A detailed definition of organic soil material is available in USDA-SCS (1975).

water for 30 consecutive days or more in most years and contains a minimum of 20 percent organic matter when no clay is present or a minimum of 30 percent organic matter when clay content is 60 percent or greater. Soils with histic epipedons are inundated or saturated for sufficient periods to greatly retard aerobic decomposition of the organic surface, and are considered to be hydric soils.

c. *Sulfidic material.* When mineral soils emit an odor of rotten eggs, hydrogen sulfide is present. Such odors are only detected in waterlogged soils that are permanently saturated and have sulfidic material within a few centimeters of the soil surface. Sulfides are produced only in a reducing environment.

d. *Aquic or peraquic moisture regime.* An aquic moisture regime is a reducing one; i.e., it is virtually free of dissolved oxygen because the soil is saturated by ground water or by water of the capillary fringe (USDA-SCS 1975). Because dissolved oxygen is removed from ground water by respiration of microorganisms, roots, and soil fauna, it is also implicit that the soil temperature is above biologic zero (5° C) at some time while the soil is saturated. Soils with *peraquic* moisture regimes are characterized by the presence of ground water always at or near the soil surface. Examples include soils of tidal marshes and soils of closed, landlocked depressions that are fed by permanent streams.

e. *Reducing soil conditions.* Soils saturated for long or very long duration will usually exhibit reducing conditions. Under such conditions, ions of iron are transformed from a ferric valence state to a ferrous valence state. This condition can often be detected in the field by a ferrous iron test. A simple colorimetric field test kit has been developed for this purpose. When a soil extract changes to a pink color upon addition of α,α'-dipyridyl, ferrous iron is present, which indicates a reducing soil environment. *NOTE: This test cannot be used in mineral hydric soils having low iron content, organic soils, and soils that have been desaturated for significant periods of the growing season.*

f. *Soil colors.* The colors of various soil components are often the most diagnostic indicator of hydric soils. Colors of these components are strongly influenced by the frequency and duration of soil saturation, which leads to reducing soil conditions. Mineral hydric soils will be either gleyed or will have bright mottles and/or low matrix chroma. These are discussed below:

(1) *Gleyed soils (gray colors).* Gleyed soils develop when anaerobic soil conditions result in pronounced chemical reduction of iron, manganese, and other elements, thereby producing gray soil colors. Anaerobic conditions that occur in waterlogged soils result in the predominance of reduction processes, and such soils are greatly reduced. Iron is one of the most abundant elements in soils. Under anaerobic conditions, iron in converted from the oxidized (ferric)

Figure 4. Gleyed soil

Figure 5. Soil showing matrix (brown) and mottles (reddish-brown)

state to the reduced (ferrous) state, which results in the bluish, greenish, or grayish colors associated with the gleying effect (Figure 4). Gleying immediately below the A-horizon or 10 inches (whichever is shallower) is an indication of a markedly reduced soil, and gleyed soils are hydric soils. Gleyed soil conditions can be determined by using the gley page of the Munsell Color Book (Munsell Color 1975).

(2) *Soils with bright mottles and/or low matrix chroma.* Mineral hydric soils that are saturated for substantial periods of the growing season (but not long enough to produce gleyed soils) will either have bright mottles and a low matrix chroma or will lack mottles but have a low matrix chroma (see Appendix D, Section 1, for a definition and discussion of "chroma" and other components of soil color). *Mottled* means "marked with spots of contrasting color." Soils that have brightly colored mottles and a low matrix chroma are indicative of a fluctuating water table. The soil *matrix* is the portion (usually more than 50 percent) of a given soil layer that has the predominant color (Figure 5). Mineral hydric soils usually have one of the following color features in the horizon immediately below the A-horizon or 10 inches (whichever is shallower):

(a) Matrix chroma of 2 or less[1] in mottled soils.

(b) Matrix chroma of 1 or less[1] in unmottled soils.

NOTE: The matrix chroma of some dark (black) mineral hydric soils will not conform to the criteria described in (a) and (b) above; in such soils, gray mottles occurring at 10 inches or less are indicative of hydric conditions.

[1] Colors should be determined in soils that have been moistened; otherwise, state that colors are for dry soils.

CAUTION: Soils with significant coloration due to the nature of the parent material (e.g., red soils of the Red River Valley) may not exhibit the above characteristics. In such cases, this indicator cannot be used.

g. Soil appearing on hydric soils list. Using the criteria for hydric soils (paragraph 37), the NTCHS has developed a list of hydric soils.

USER NOTES: The NRCS has developed local lists of hydric soil mapping units that are available from NRCS county and area offices. These local lists are the preferred hydric soil lists to use in making wetland determinations. (HQUSACE, 6 Mar 92)

Listed soils have reducing conditions for a significant portion of the growing season in a major portion of the root zone and are frequently saturated within 12 inches of the soil surface. ~~The NTCHS list of hydric soils is presented in Appendix D, Section 2.~~ *CAUTION: Be sure that the profile description of the mapping unit conforms to that of the sampled soil.*

h. Iron and manganese concretions. During the oxidation-reduction process, iron and manganese in suspension are sometimes segregated as oxides into concretions or soft masses (Figure 6). These accumulations are usually black or dark brown. Concretions >2 mm in diameter occurring within 7.5 cm of the surface are evidence that the soil is saturated for long periods near the surface.

Figure 6. Iron and manganese concretions

Wetland indicators (sandy soils)

45. Not all indicators listed in paragraph 44 can be applied to sandy soils. *In particular, soil color should not be used as an indicator in most sandy soils.* However, three additional soil features may be used as indicators of sandy hydric soils, including:

a. High organic matter content in the surface horizon. Organic matter tends to accumulate above or in the surface horizon of sandy soils that

are inundated or saturated to the surface for a significant portion of the growing season. Prolonged inundation or saturation creates anaerobic conditions that greatly reduce oxidation of organic matter.

b. *Streaking of subsurface horizons by organic matter.* Organic matter is moved downward through sand as the water table fluctuates. This often occurs more rapidly and to a greater degree in some vertical sections of a sandy soil containing high content of organic matter than in others. Thus, the sandy soil appears vertically streaked with darker areas. When soil from a darker area is rubbed between the fingers, the organic matter stains the fingers.

c. *Organic pans.* As organic matter is moved downward through sandy soils, it tends to accumulate at the point representing the most commonly occurring depth to the water table. This organic matter tends to become slightly cemented with aluminum, forming a thin layer of hardened soil (spodic horizon). These horizons often occur at depths of 12 to 30 inches below the mineral surface. Wet spodic soils usually have thick dark surface horizons that are high in organic matter with dull, gray horizons above the spodic horizon.

USER NOTES: The NRCS has developed regional lists of "Field Indicators of Hydric Soils in the United States" (Version 3.2, July 1996, or later). Until approved, these indicators do not supersede those given in the 1987 Corps Manual and supplemental guidance but may be used as supplementary information. Several of the NRCS indicators were developed specifically to help in identifying hydric soils in certain problem soil types (e.g., sandy soils, soils derived from red parent materials, soils with thick, dark surfaces). These indicators may be used under procedures given in the Problem Area section of the 1987 Manual. (HQUSACE, 21 Mar 97)

CAUTION: In recently deposited sandy material (e.g., accreting sandbars), it may be impossible to find any of these indicators. In such cases, consider this as a natural atypical situation.

Wetland Hydrology

Definition

46. The term "wetland hydrology" encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and reducing conditions, respectively. Such characteristics are usually present in areas that

are inundated or have soils that are saturated to the surface for sufficient duration to develop hydric soils and support vegetation typically adapted for life in periodically anaerobic soil conditions. Hydrology is often the least exact of the parameters, and indicators of wetland hydrology are sometimes difficult to find in the field. However, it is essential to establish that a wetland area is periodically inundated or has saturated soils during the growing season.

USER NOTES: The 1987 Manual (see glossary, Appendix A) defines "growing season" as the portion of the year when soil temperature (measured 20 inches below the surface) is above biological zero (5° C or 41° F). This period "can be approximated by the number of frost-free days." Estimated starting and ending dates for the growing season are based on 28° F air temperature thresholds at a frequency of 5 years in 10 (HQUSACE, 6 Mar 92). This information is available in NRCS county soil survey reports or from the NRCS Water and Climate Center in Portland, Oregon, for most weather stations in the country.

Influencing factors

47. Numerous factors (e.g., precipitation, stratigraphy, topography, soil permeability, and plant cover) influence the wetness of an area. Regardless, the characteristic common to all wetlands is the presence of an abundant supply of water. The water source may be runoff from direct precipitation, headwater or backwater flooding, tidal influence, ground water, or some combination of these sources. The frequency and duration of inundation or soil saturation varies from nearly permanently inundated or saturated to irregularly inundated or saturated. Topographic position, stratigraphy, and soil permeability influence both the frequency and duration of inundation and soil saturation. Areas of lower elevation in a floodplain or marsh have more frequent periods of inundation and/or greater duration than most areas at higher elevations. Floodplain configuration may significantly affect duration of inundation. When the floodplain configuration is conducive to rapid runoff, the influence of frequent periods of inundation on vegetation and soils may be reduced. Soil permeability also influences duration of inundation and soil saturation. For example, clayey soils absorb water more slowly than sandy or loamy soils, and therefore have slower permeability and remain saturated much longer. Type and amount of plant cover affect both degree of inundation and duration of saturated soil conditions. Excess water drains more slowly in areas of abundant plant cover, thereby increasing frequency and duration of inundation and/or soil saturation. On the other hand, transpiration rates are higher in areas of abundant plant cover, which may reduce the duration of soil saturation.

Classification

48. Although the interactive effects of all hydrologic factors produce a continuum of wetland hydrologic regimes, efforts have been made to classify wet-

land hydrologic regimes into functional categories. These efforts have focused on the use of frequency, timing, and duration of inundation or soil saturation as a basis for classification. A classification system developed for nontidal areas is presented in Table 5. This classification system was slightly modified from the system developed by the Workshop on Bottomland Hardwood Forest Wetlands of the Southeastern United States (Clark and Benforado 1981). Recent research indicates that duration of inundation and/or soil saturation during the growing season is more influential on the plant community than frequency of inundation/ saturation during the growing season (Theriot, in press). Thus, frequency of inundation and soil saturation are not included in Table 5. ~~The WES has developed a computer program that can be used to transform stream gage data to mean sea level elevations representing the upper limit of each hydrologic zone shown in Table 5. This program is available upon request~~.[1]

USER NOTES: Based on Table 5 and on paragraph 55, Step 8.i., an area has wetland hydrology if it is inundated or saturated to the surface continuously for at least 5% of the growing season in most years (50% probability of recurrence). These areas are wetlands if they also meet hydrophytic vegetation and hydric soil requirements. (HQUSACE, 7 Oct 91 and 6 Mar 92)

Table 5
Hydrologic Zones[1] - Nontidal Areas

Zone	Name	Duration[2]	Comments
I[3]	Permanently inundated	100 percent	Inundation >6.6 ft mean water depth
II	Semipermanently to nearly permanently inundated or saturated	>75 - <100 percent	Inundation defined as ≤6.6 ft mean water depth
III	Regularly inundated or saturated	>25 - 75 percent	
IV	Seasonally inundated or saturated	>12.5 - 25 percent	
V	Irregularly inundated or saturated	≥5 - 12.5 percent	Many areas having these hydrologic characteristics are not wetlands
VI	Intermittently or never inundated or saturated	<5 percent	Areas with these hydrologic characteristics are not wetlands

[1] Zones adapted from Clark and Benforado (1981).
[2] Refers to duration of inundation and/or soil saturation during the growing season.
[3] This defines an aquatic habitat zone.

Wetland indicators

49. Indicators of wetland hydrology may include, but are not necessarily limited to: drainage patterns, drift lines, sediment deposition, watermarks,

[1] ~~R. F. Theriot, Environmental Laboratory, U.S. Army Engineer Waterways Experiment Station, P.O. Box 631, Vicksburg, MS 39180.~~

stream gage data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation. Any of these indicators may be evidence of wetland hydrologic characteristics. Methods for determining hydrologic indicators can be categorized according to the type of indicator. Recorded data include stream gage data, lake gage data, tidal gage data, flood predictions, and historical records. Use of these data is commonly limited to areas adjacent to streams or other similar areas. Recorded data usually provide both short- and long-term information about frequency and duration of inundation, but contain little or no information about soil saturation, which must be gained from soil surveys or other similar sources. The remaining indicators require field observations. Field indicators are evidence of present or past hydrologic events (e.g., location and height of flooding). Indicators for recorded data and field observations include:[1]

a. *Recorded data.* Stream gage data, lake gage data, tidal gage data, flood predictions, and historical data may be available from the following sources:

(1) *CE District Offices.* Most CE Districts maintain stream, lake, and tidal gage records for major water bodies in their area. In addition, CE planning and design documents often contain valuable hydrologic information. For example, a General Design Memorandum (GDM) usually describes flooding frequencies and durations for a project area. Furthermore, the extent of flooding within a project area is sometimes indicated in the GDM according to elevation (height) of certain flood frequencies (1-, 2-, 5-, 10-year, etc.).

(2) *U.S. Geological Survey (USGS).* Stream and tidal gage data are available from the USGS offices throughout the Nation, and the latter are also available from the National Oceanic and Atmospheric Administration. CE Districts often have such records.

(3) *State, county, and local agencies.* These agencies often have responsibility for flood control/relief and flood insurance.

(4) *Soil Conservation Service Small Watershed Projects.* Planning documents from this agency are often helpful, and can be obtained from the SCS district office in the county.

(5) *Planning documents of developers.*

b. *Field data.* The following field hydrologic indicators can be assessed quickly, and although some of them are not necessarily indicative of hydrologic events that occur only during the growing season, they do provide evidence that inundation and/or soil saturation has occurred:

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[1] Indicators are listed in order of decreasing reliability. Although all are valid indicators, some are stronger indicators than others. When a decision is based on an indicator appearing in the lower portion of the list, re-evaluate the parameter to ensure that the proper decision was reached.

(1) *Visual observation of inundation.* The most obvious and revealing hydrologic indicator may be simply observing the areal extent of inundation. However, because seasonal conditions and recent weather conditions can contribute to surface water being present on a nonwetland site, both should be considered when applying this indicator.

(2) *Visual observation of soil saturation.* Examination of this indicator requires digging a soil pit (Appendix D, Section 1) to a depth of 16 inches and observing the level at which water stands in the hole after sufficient time has been allowed for water to drain into the hole. The required time will vary depending on soil texture. In some cases, the upper level at which water is flowing into the pit can be observed by examining the wall of the hole. This level represents the depth to the water table. The depth to saturated soils will always be nearer the surface due to the capillary fringe.

For soil saturation to impact vegetation, it must occur within a *major portion of the root zone* (usually within 12 inches of the surface) of the prevalent vegetation. The major portion of the root zone is that portion of the soil profile in which more than one half of the plant roots occur. *CAUTION: In some heavy clay soils, water may not rapidly accumulate in the hole even when the soil is saturated. If water is observed at the bottom of the hole but has not filled to the 12-inch depth, examine the sides of the hole and determine the shallowest depth at which water is entering the hole. When applying this indicator, both the season of the year and preceding weather conditions must be considered.*

Figure 7. Watermark on trees

(3) *Watermarks.* Watermarks are most common on woody vegetation. They occur as stains on bark (Figure 7) or other fixed objects (e.g., bridge pillars, buildings, fences, etc.). When several watermarks are present, the highest reflects the maximum extent of recent inundation.

(4) *Drift lines.* This indicator is most likely to be found adjacent to streams or other

sources of water flow in wetlands, but also often occurs in tidal marshes. Evidence consists of deposition of debris in a line on the surface (Figure 8) or debris entangled in aboveground vegetation or other fixed objects. Debris usually consists of remnants of vegetation (branches, stems, and leaves), sediment, litter, and other waterborne materials deposited parallel to the direction of water flow. Drift lines provide an indication of the minimum portion of the area inundated during a flooding event; the maximum level of inundation is generally at a higher elevation than that indicated by a drift line.

Figure 8. Absence of leaf litter

(5) *Sediment deposits.* Plants and other vertical objects often have thin layers, coatings, or depositions of mineral or organic matter on them after inundation (Figure 9). This evidence may remain for a considerable period before it is removed by precipitation or subsequent inundation. Sediment deposition on vegetation and other objects provides an indication of the minimum inundation level. When sediments are primarily organic (e.g., fine organic material, algae), the detritus may become encrusted on or slightly above the soil surface after dewatering occurs (Figure 10).

Figure 9. Sediment deposit on plants

Figure 10. Encrusted detritus

(6) *Drainage patterns within wetlands.* This indicator, which occurs primarily in wetlands

adjacent to streams, consists of surface evidence of drainage flow into or through an area (Figure 11). In some wetlands, this evidence may exist as a drainage pattern eroded into the soil, vegetative matter (debris) piled against thick vegetation or woody stems oriented perpendicular to the direction of water flow, or the absence of leaf litter (Figure 8). Scouring is often evident around roots of persistent vegetation. Debris may be deposited in or along the drainage pattern (Figure 12).

Figure 11. Drainage pattern

Figure 12. Debris deposited in stream channel

CAUTION: Drainage patterns also occur in upland areas after periods of considerable precipitation; therefore, topographic position must also be considered when applying this indicator.

USER NOTES: The hydrology indicators described above are considered to be "primary indicators", any one of which is sufficient evidence that wetland hydrology is present when combined with a hydrophytic plant community and hydric soils. In addition, the following "secondary indicators" may also be used to determine whether wetland hydrology is present. In the absence of a primary indicator, any two secondary indicators must be present to conclude that wetland hydrology is present. Secondary indicators are: presence of oxidized rhizospheres associated with living plant roots in the upper 12 inches of the soil, presence of water-stained leaves, local soil survey hydrology data for identified soils, and the FAC-neutral test of the vegetation. (HQUSACE, 6 Mar 92)

Part IV: Methods

Section A. Introduction

50. Part IV contains sections on preliminary data gathering, method selection, routine determination procedures, comprehensive determination procedures, methods for determinations in atypical situations, and guidance for wetland determinations in natural situations where the three-parameter approach may not always apply.

51. Significant flexibility has been incorporated into Part IV. The user is presented in Section B with various potential sources of information that may be helpful in making a determination, but not all identified sources of information may be applicable to a given situation. *NOTE: The user is not required to obtain information from all identified sources.* Flexibility is also provided in method selection (Section C). Three levels of routine determinations are available, depending on the complexity of the required determination and the quantity and quality of existing information. Application of methods presented in both Section D (routine determinations) and Section E (comprehensive determinations) may be tailored to meet site-specific requirements, especially with respect to sampling design.

52. Methods presented in Sections D and E vary with respect to the required level of technical knowledge and experience of the user. Application of the qualitative methods presented in Section D (routine determinations) requires considerably less technical knowledge and experience than does application of the quantitative methods presented in Section E (comprehensive determinations). The user must at least be able to identify the dominant plant species in the project area when making a routine determination (Section D), and should have some basic knowledge of hydric soils when employing routine methods that require soils examination. Comprehensive determinations require a basic understanding of sampling principles and the ability to identify all commonly occurring plant species in a project area, as well as a good understanding of indicators of hydric soils and wetland hydrology. The comprehensive method should only be employed by experienced field inspectors.

Section B. Preliminary Data Gathering and Synthesis

53. This section discusses potential sources of information that may be helpful in making a wetland determination. When the routine approach is used, it may often be possible to make a wetland determination based on available vegetation, soils, and hydrology data for the area. However, this section deals only with identifying potential information sources, extracting pertinent data, and synthesizing the data for use in making a determination. Based on the quantity and quality of available information and the approach selected for use (Section C), the user is referred to either Section D or Section E for the actual determination. Completion of Section B is not required, but is recommended because the available information may reduce or eliminate the need for field effort and decrease the time and cost of making a determination. However, there are instances in small project areas in which the time required to obtain the information may be prohibitive. In such cases PROCEED to paragraph 55, complete STEPS 1 through 3, and PROCEED to Section D or E.

Data sources

54. Obtain the following information, when available and applicable:

a. USGS quadrangle maps. USGS quadrangle maps are available at different scales. When possible, obtain maps at a scale of 1:24,000; otherwise, use maps at a scale of 1:62,500. Such maps are available from USGS in Reston, VA, and Menlo Park, CA, but they may already be available in the CE District Office. These maps provide several types of information:

(1) Assistance in locating field sites. Towns, minor roads, bridges, streams, and other landmark features (e.g., buildings, cemeteries, water bodies, etc.) not commonly found on road maps are shown on these maps.

(2) Topographic details, including contour lines (usually at 5- or 10-ft contour intervals).

(3) General delineation of wet areas (swamps and marshes). *NOTE: The actual wet area may be greater than that shown on the map because USGS generally maps these areas based on the driest season of the year.*

(4) Latitude, longitude, townships, ranges, and sections. These provide legal descriptions of the area.

(5) Directions, including both true and magnetic north.

(6) Drainage patterns.

(7) General land uses, such as cleared (agriculture or pasture), forested, or urban.

CAUTION: Obtain the most recent USGS maps. Older maps may show features that no longer exist and will not show new features that have developed since the map was constructed. Also, USGS is currently changing the mapping scale from 1:24,000 to 1:25,000.

b. National Wetlands Inventory products.

(1) *Wetland maps.* The standard NWI maps are at a scale of 1:24,000 or, where USGS base maps at this scale are not available, they are at 1:62,500 (1:63,350 in Alaska). Smaller scale maps ranging from 1:100,000 to 1:500,000 are also available for certain areas. Wetlands on NWI maps are classified in accordance with Cowardin et al. (1979). *CAUTION: Since not all delineated areas on NWI maps are wetlands under Department of Army jurisdiction, NWI maps should not be used as the sole basis for determining whether wetland vegetation is present.* NWI "User Notes" are available that correlate the classification system with local wetland community types. An important feature of this classification system is the water regime modifier, which describes the flooding or soil saturation characteristics. Wetlands classified as having a temporarily flooded or intermittently flooded water regime should be viewed with particular caution since this designation is indicative of plant communities that are transitional between wetland and nonwetland. These are among the most difficult plant communities to map accurately from aerial photography. For wetlands "wetter" than temporarily flooded and intermittently flooded, the probability of a designated map unit on recent NWI maps being a wetland (according to Cowardin et al. 1979) at the time of the photography is in excess of 90 percent. *CAUTION: Due to the scale of aerial photography used and other factors, all NWI map boundaries are approximate.* The optimum use of NWI maps is to plan field review (i.e., how wet, big, or diverse is the area?) and to assist during field review, particularly by showing the approximate areal extent of the wetland and its association with other communities. NWI maps are available either as a composite with, or an overlay for, USGS base maps and may be obtained from the NWI Central Office in St. Petersburg, FL, the Wetland Coordinator at each FWS regional office, or the USGS.

USER NOTES: NWI products and information are available over the World Wide Web.

(2) *Plant database*. This database of approximately 5,200 plant species that occur in wetlands provides information (e.g., ranges, habitat, etc.) about each plant species from the technical literature. The database served as a focal point for development of a national list of plants that occur in wetlands (~~Appendix C, Section 1~~).

c. *Soil Surveys.* Soil surveys are prepared by the SCS for political units (county, parish, etc.) in a state. Soil surveys contain several types of information:

(1) General information (e.g., climate, settlement, natural resources, farming, geology, general vegetation types).

(2) Soil maps for general and detailed planning purposes. These maps are usually generated from fairly recent aerial photography. *CAUTION: The smallest mapping unit is 3 acres, and a given soil series as mapped may contain small inclusions of other series.*

(3) Uses and management of soils. Any wetness characteristics of soils will be mentioned here.

(4) Soil properties. Soil and water features are provided that may be very helpful for wetland investigations. Frequency, duration, and timing of inundation (when present) are described for each soil type. Water table characteristics that provide valuable information about soil saturation are also described. Soil permeability coefficients may also be available.

(5) Soil classification. Soil series and phases are usually provided. Published soil surveys will not always be available for the area. If not, contact the county SCS office and determine whether the soils have been mapped.

d. *Stream and tidal gage data.* These documents provide records of tidal and stream flow events. They are available from either the USGS or CE District office.

e. *Environmental impact assessments (EIAs), environmental impact statements (EISs), general design memoranda (GDM), and other similar publications.* These documents may be available from Federal agencies for an area that includes the project area. They may contain some indication of the location and characteristics of wetlands consistent with the required criteria (vegetation, soils, and hydrology), and often contain flood frequency and duration data.

f. *Documents and maps from State, county, or local governments.* Regional maps that characterize certain areas (e.g., potholes, coastal areas, or basins) may be helpful because they indicate the type and character of wetlands.

g. *Remote sensing.* Remote sensing is one of the most useful information sources available for wetland identification and delineation. Recent aerial photography, particularly color infrared, provides a detailed view of an area; thus, recent land use and other features (e.g., general type and areal extent of plant communities and degree of inundation of the area when the photography was taken) can be determined. The multiagency cooperative National High Altitude Aerial Photography Program (HAP) has 1:59,000-scale color infrared photography for approximately 85 percent (December 1985) of the coterminous United States from 1980 to 1985. This photography has excellent resolution and can be ordered enlarged to 1:24,000 scale from USGS. Satellite images provide similar information as aerial photography, although the much smaller scale makes observation of detail more difficult without sophisticated equipment and extensive training. Satellite images provide more recent coverage than aerial photography (usually at 18-day intervals). Individual satellite images are more expensive than aerial photography, but are not as expensive as having an area flown and photographed at low altitudes. However, better resolution imagery is now available with remote sensing equipment mounted on fixed-wing aircraft.

h. *Local individuals and experts.* Individuals having personal knowledge of an area may sometimes provide a reliable and readily available source of information about the area, particularly information on the wetness of the area.

i. *USGS land use and land cover maps.* Maps created by USGS using remotely sensed data and a geographical information system provide a systematic and comprehensive collection and analysis of land use and land cover on a national basis. Maps at a scale of 1:250,000 are available as overlays that show land use and land cover according to nine basic levels. One level is wetlands (as determined by the FWS), which is further subdivided into forested and nonforested areas. Five other sets of maps show political units, hydrologic units, census subdivisions of counties, Federal land ownership, and State land ownership. These maps can be obtained from any USGS mapping center.

j. *Applicant's survey plans and engineering designs.* In many cases, the permit applicant will already have had the area surveyed (often at 1-ft contours or less) and will also have engineering designs for the proposed activity.

Data synthesis

55. When employing Section B procedures, use the above sources of information to complete the following steps:

- *STEP 1 - Identify the project area on a map.* Obtain a USGS quadrangle map (1:24,000) or other appropriate map, and locate the area identified in the permit application. PROCEED TO STEP 2.

- *STEP 2 - Prepare a base map.* Mark the project area boundaries on the map. Either use the selected map as the base map or trace the area on a mylar overlay, including prominent landscape features (e.g., roads, buildings, drainage patterns, etc.). If possible, obtain diazo copies of the resulting base map. PROCEED TO STEP 3.

- *STEP 3 - Determine size of the project area.* Measure the area boundaries and calculate the size of the area. PROCEED TO STEP 4 OR TO SECTION D OR E IF SECTION B IS NOT USED.

- *STEP 4 - Summarize available information on vegetation.* Examine available sources that contain information about the area vegetation. Consider the following:

    a. USGS quadrangle maps. Is the area shown as a marsh or swamp? *CAUTION: Do not use this as the sole basis for determining that hydrophytic vegetation is present.*

    b. NWI overlays or maps. Do the overlays or maps indicate that hydrophytic vegetation occurs in the area? If so, identify the vegetation type(s).

    c. EIAs, EISs, or GDMs that include the project area. Extract any vegetation data that pertain to the area.

    d. Federal, State, or local government documents that contain information about the area vegetation. Extract appropriate data.

    e. Recent (within last 5 years) aerial photography of the area. Can the area plant community type(s) be determined from the photography? Extract appropriate data.

    f. Individuals or experts having knowledge of the area vegetation. Contact them and obtain any appropriate information. *CAUTION: Ensure that the individual providing the information has firsthand knowledge of the area.*

    g. Any published scientific studies of the area plant communities. Extract any appropriate data.

    h. Previous wetland determinations made for the area. Extract any pertinent vegetation data.

    When the above have been considered, PROCEED TO STEP 5.

- *STEP 5 - Determine whether the vegetation in the project area is adequately characterized.* Examine the summarized data (STEP 4) and determine whether the area plant communities are adequately characterized. For routine determinations, the plant community type(s) and the dominant species in each vegetation layer of each community type must be known. Dominant species are those that have the largest relative basal area (overstory),[1] height (woody understory), number of stems (woody vines), or greatest areal cover (herbaceous understory). For comprehensive determinations, each plant community type present in the project area must have been quantitatively described within the past 5 years using accepted sampling and analytical procedures, and boundaries between community types must be known. Record information on DATA FORM 1.[2] In either case, PROCEED TO Section F if there is evidence of recent significant vegetation alteration due to human activities or natural events. Otherwise, PROCEED TO STEP 6.

- *STEP 6 - Summarize available information on area soils.* Examine available information and describe the area soils. Consider the following:

    a. County soil surveys. Determine the soil series present and extract characteristics for each. *CAUTION: Soil mapping units sometimes include more than one soil series.*

    b. Unpublished county soil maps. Contact the local SCS office and determine whether soil maps are available for the area. Determine the soil series of the area, and obtain any available information about possible hydric soil indicators (paragraph 44 or 45) for each soil series.

    c. Published EIAs, EISs, or GDMs that include soils information. Extract any pertinent information.

    d. Federal, State, and/or local government documents that contain descriptions of the area soils. Summarize these data.

    e. Published scientific studies that include area soils data. Summarize these data.

    f. Previous wetland determinations for the area. Extract any pertinent soils data.

    When the above have been considered, PROCEED TO STEP 7.

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[1] This term is used because species having the largest individuals may not be dominant when only a few are present. To use relative basal area, consider both the size and number of individuals of a species and subjectively compare with other species present.

[2] A separate DATA FORM 1 must be used for each plant community type.

- *STEP 7 - Determine whether soils of the project area have been adequately characterized.* Examine the summarized soils data and determine whether the soils have been adequately characterized. For routine determinations, the soil series must be known. For comprehensive determinations, both the soil series and the boundary of each soil series must be known. Record information on DATA FORM 1. In either case, if there is evidence of recent significant soils alteration due to human activities or natural events, PROCEED TO Section F. Otherwise, PROCEED TO STEP 8.

- *STEP 8 - Summarize available hydrology data.* Examine available information and describe the area hydrology. Consider the following:

    a. USGS quadrangle maps. Is there a significant, well-defined drainage through the area? Is the area within a major floodplain or tidal area? What range of elevations occur in the area, especially in relation to the elevation of the nearest perennial watercourse?

    b. NWI overlays or maps. Is the area shown as a wetland or deepwater aquatic habitat? What is the water regime modifier?

    c. EIAs, EISs, or GDMs that describe the project area. Extract any pertinent hydrologic data.

    d. Floodplain management maps. These maps may be used to extrapolate elevations that can be expected to be inundated on a l-, 2-, 3-year, etc., basis. Compare the elevations of these features with the elevation range of the project area to determine the frequency of inundation.

    e. Federal, State, and local government documents (e.g., CE floodplain management maps and profiles) that contain hydrologic data. Summarize these data.

    f. Recent (within past 5 years) aerial photography that shows the area to be inundated. Record the date of the photographic mission.

    g. Newspaper accounts of flooding events that indicate periodic inundation of the area.

    h. SCS County Soil Surveys that indicate the frequency and duration of inundation and soil saturation for area soils. *CAUTION: Data provided only represent average conditions for a particular soil series in its natural undrained state, and cannot be used as a positive hydrologic indicator in areas that have significantly altered hydrology.*

i. Tidal or stream gage data for a nearby water body that apparently influences the area. Obtain the gage data and complete (1) below if the routine approach is used, or (2) below if the comprehensive approach is used (OMIT IF GAGING STATION DATA ARE UNAVAILABLE):

(1) *Routine approach.* Determine the highest water level elevation reached during the growing season for each of the most recent 10 years of gage data. Rank these elevations in descending order and select the fifth highest elevation. Combine this elevation with the mean sea level elevation of the gaging station to produce a mean sea level elevation for the highest water level reached every other year. *NOTE: Stream gage data are often presented as flow rates in cubic feet per second. In these cases, ask the CE District's Hydrology Branch to convert flow rates to corresponding mean sea level elevations and adjust gage data to the site.* Compare the resulting elevations reached biennially with the project area elevations. If the water level elevation exceeds the area elevation, the area is inundated during the growing season on average at least biennially.

(2) *Comprehensive approach.* Complete the following:

(a) *Decide whether hydrologic data reflect the apparent hydrology.* Data available from the gaging station may or may not accurately reflect the area hydrology. Answer the following questions:

- Does the water level of the area appear to fluctuate in a manner that differs from that of the water body on which the gaging station is located? (In ponded situations, the water level of the area is usually higher than the water level at the gaging station.)

- Are less than 10 years of daily readings available for the gaging station?

- Do other water sources that would not be reflected by readings at the gaging station appear to significantly affect the area? For example, do major tributaries enter the stream or tidal area between the area and gaging station?

If the answer to any of the above questions is YES, the area hydrology cannot be determined from the

gaging station data. If the answer to all of the above questions is NO, PROCEED TO (b).

(b) *Analyze hydrologic data.* Subject the hydrologic data to appropriate analytical procedures. Either use duration curves or a computer program developed by WES (available from the Environmental Laboratory upon request) for determining the mean sea level elevation representing the upper limits of wetland hydrology. In the latter case, when the site elevation is lower than the mean sea level elevation representing a 5-percent duration of inundation and saturation during the growing season, the area has a hydrologic regime that may occur in wetlands. *NOTE: Duration curves do not reflect the period of soil saturation following dewatering.*

When all of the above have been considered, PROCEED TO STEP 9.

- *STEP 9 - Determine whether hydrology is adequately characterized.* Examine the summarized data and determine whether the hydrology of the project area is adequately characterized. For routine determinations, there must be documented evidence of frequent inundation or soil saturation during the growing season. For comprehensive determinations, there must be documented quantitative evidence of frequent inundation or soil saturation during the growing season, based on at least 10 years of stream or tidal gage data. Record information on DATA FORM 1. In either case, if there is evidence of recent significant hydrologic alteration due to human activities or natural events, PROCEED TO Section F. Otherwise, PROCEED TO Section C.

Section C. Selection of Method

56. All wetland delineation methods described in this manual can be grouped into two general types: routine and comprehensive. Routine determinations (Section D) involve simple, rapidly applied methods that result in sufficient qualitative data for making a determination. Comprehensive methods (Section E) usually require significant time and effort to obtain the needed quantitative data. The primary factor influencing method selection will usually be the complexity of the required determination. However, comprehensive methods may sometimes be selected for use in relatively simple determinations when rigorous documentation is required.

57. Three levels of routine wetland determinations are described below. Complexity of the project area and the quality and quantity of available information will influence the level selected for use.

a. *Level 1 - Onsite Inspection Unnecessary*. This level may be employed when the information already obtained (Section B) is sufficient for making a determination for the entire project area (see Section D, Subsection 1).

b. *Level 2 - Onsite Inspection Necessary.* This level must be employed when there is insufficient information already available to characterize the vegetation, soils, and hydrology of the entire project area (see Section D, Subsection 2).

c. *Level 3 - Combination of Levels 1 and 2.* This level should be used when there is sufficient information already available to characterize the vegetation, soils, and hydrology of a portion, but not all, of the project area. Methods described for Level 1 may be applied to portions of the area for which adequate information already exists, and onsite methods (Level 2) must be applied to the remainder of the area (see Section D, Subsection 3).

58. After considering all available information, select a tentative method (see above) for use, and PROCEED TO EITHER Section D or E, as appropriate. *NOTE: Sometimes it may be necessary to change to another method described in the manual, depending on the quality of available information and/or recent changes in the project area.*

Section D. Routine Determinations

59. This section describes general procedures for making routine wetland determinations. It is assumed that the user has already completed all applicable steps in Section B,[1] and a routine method has been tentatively selected for use (Section C). Subsections 1 through 3 describe steps to be followed when making a routine determination using one of the three levels described in Section C. Each subsection contains a flowchart that defines the relationship of steps to be used for that level of routine determinations. *NOTE: The selected method must be considered tentative because the user may be required to change methods during the determination.*

Subsection 1 - Onsite Inspection Unnecessary

60. This subsection describes procedures for making wetland determinations when sufficient information is already available (Section B) on which to base

[1] If it has been determined that it is more expedient to conduct an onsite inspection than to search for available information, complete STEPS 1 through 3 of Section B, and PROCEED TO Subsection 2.

the determination. A flowchart of required steps to be completed is presented in Figure 13, and each step is described below.

Equipment and materials

61. No special equipment is needed for applying this method. The following materials will be needed:

a. Map of project area (Section B, STEP 2).

b. Copies of DATA FORM 1 (Appendix B).

c. Appendices C and D to this manual.

Procedure

62. Complete the following steps, as necessary:

- *STEP 1 - Determine whether available data are sufficient for entire project area.* Examine the summarized data (Section B, STEPS 5, 7, and 9) and determine whether the vegetation, soils, and hydrology of the entire project area are adequately characterized. If so, PROCEED TO STEP 2. If all three parameters are adequately characterized for a portion, but not all, of the project area, PROCEED TO Subsection 3. If the vegetation, soils, and hydrology are not adequately characterized for any portion of the area, PROCEED TO Subsection 2.

- *STEP 2 - Determine whether hydrophytic vegetation is present.* Examine the vegetation data and list on DATA FORM 1 the dominant plant species found in each vegetation layer of each community type. *NOTE: A separate DATA FORM 1 will be required for each community type.* Record the indicator status for each dominant species ~~(Appendix C, Section 1 or 2)~~. When more than 50 percent of the dominant species in a plant community have an indicator status of OBL, FACW, and/or FAC,[1] hydrophytic vegetation is present. If one or more plant communities comprise hydrophytic vegetation, PROCEED TO STEP 3. If none of the plant communities comprise hydrophytic vegetation, none of the area is a wetland. Complete the vegetation section for each DATA FORM 1.

[1] For the FAC-neutral option, see paragraph 35*a*.

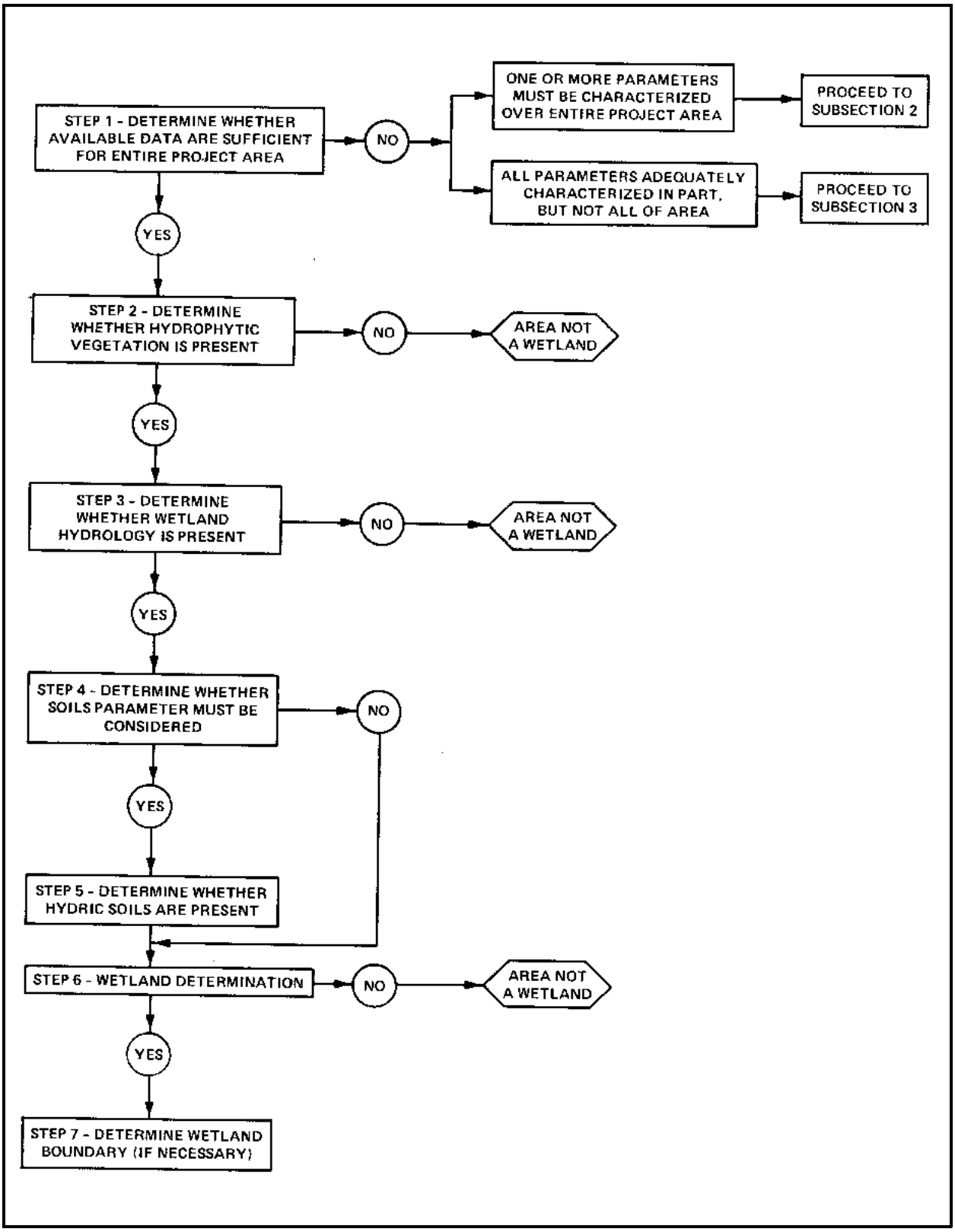

Figure 13. Flowchart of steps involved in making a wetland determination when an onsite inspection is unnecessary

- *STEP 3 - Determine whether wetland hydrology is present.* When one of the following conditions applies (STEP 2), it is only necessary to confirm that there has been no recent hydrologic alteration of the area:

    a. The entire project area is occupied by a plant community or communities in which all dominant species are OBL ~~(Appendix C, Section 1 or 2)~~.

    b. The project area contains two or more plant communities, all of which are dominated by OBL and/or FACW species, and the wetland-nonwetland boundary is abrupt[1] (e.g., a *Spartina alterniflora* marsh bordered by a road embankment).

  If either *a* or *b* applies, look for recorded evidence of recently constructed dikes, levees, impoundments, and drainage systems, or recent avalanches, mudslides, beaver dams, etc., that have significantly altered the area hydrology. If any significant hydrologic alteration is found, determine whether the area is still periodically inundated or has saturated soils for sufficient duration to support the documented vegetation (*a* or *b* above). When *a* or *b* applies and there is no evidence of recent hydrologic alteration, or when *a* or *b* do not apply and there is documented evidence that the area is periodically inundated or has saturated soils, wetland hydrology is present. Otherwise, wetland hydrology does not occur on the area. Complete the hydrology section of DATA FORM 1 and PROCEED TO STEP 4.

- *STEP 4 - Determine whether the soils parameter must be considered.* When either *a* or *b* of STEP 3 applies *and* there is either no evidence of recent hydrologic alteration of the project area or if wetland hydrology presently occurs on the area, hydric soils can be assumed to be present. If so, PROCEED TO STEP 6. Otherwise PROCEED TO STEP 5.

- *STEP 5 - Determine whether hydric soils are present.* Examine the soils data (Section B, STEP 7) and record the soil series or soil phase on DATA FORM 1 for each community type. Determine whether the soil is listed as a hydric soil ~~(Appendix D, Section 2)~~. If all community types have hydric soils, the entire project area has hydric soils. *(CAUTION: If the soil series description makes reference to inclusions of other soil types, data must be field verified).* Any portion of the area that lacks hydric soils is a nonwetland. Complete the soils section of each DATA FORM 1 and PROCEED TO STEP 6.

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[1] There must be documented evidence of periodic inundation or saturated soils when the project area: (a) has plant communities dominated by one or more FAC species; (b) has vegetation dominated by FACW species but no adjacent community dominated by OBL species; (c) has a gradual, nondistinct boundary between wetlands and nonwetlands; and/or (d) is known to have or is suspected of having significantly altered hydrology.

- *STEP 6 - Wetland determination.* Examine the DATA FORM 1 for each community type. Any portion of the project area is a wetland that has:

    a. Hydrophytic vegetation that conforms to one of the conditions identified in STEP 3*a* or 3*b* and has either no evidence of altered hydrology or confirmed wetland hydrology.

    b. Hydrophytic vegetation that does not conform to STEP 3*a* or 3*b*, has hydric soils, and has confirmed wetland hydrology.

    If STEP 6*a* or 6*b* applies to the entire project area, the entire area is a wetland. Complete a DATA FORM 1 for all plant community types. Portions of the area not qualifying as a wetland based on an office determination might or might not be wetlands. If the data used for the determination are considered to be highly reliable, portions of the area not qualifying as wetlands may properly be considered nonwetlands. PROCEED TO STEP 7. If the available data are incomplete or questionable, an onsite inspection (Subsection 2) will be required.

- *STEP 7 - Determine wetland boundary*. Mark on the base map all community types determined to be wetlands with a W and those determined to be nonwetlands with an N. Combine all wetland community types into a single mapping unit. The boundary of these community types is the interface between wetlands and nonwetlands.

Subsection 2 - Onsite Inspection Necessary

63. This subsection describes procedures for routine determinations in which the available information (Section B) is insufficient for one or more parameters. If only one or two parameters must be characterized, apply the appropriate steps and return to Subsection 1 and complete the determination. A flowchart of steps required for using this method is presented in Figure 14, and each step is described below.

Equipment and materials

64. The following equipment and materials will be needed:

a. Base map (Section B, STEP 2).

b. Copies of DATA FORM 1 (one for each community type and additional copies for boundary determinations).

c. Appendices C and D.

d. Compass.

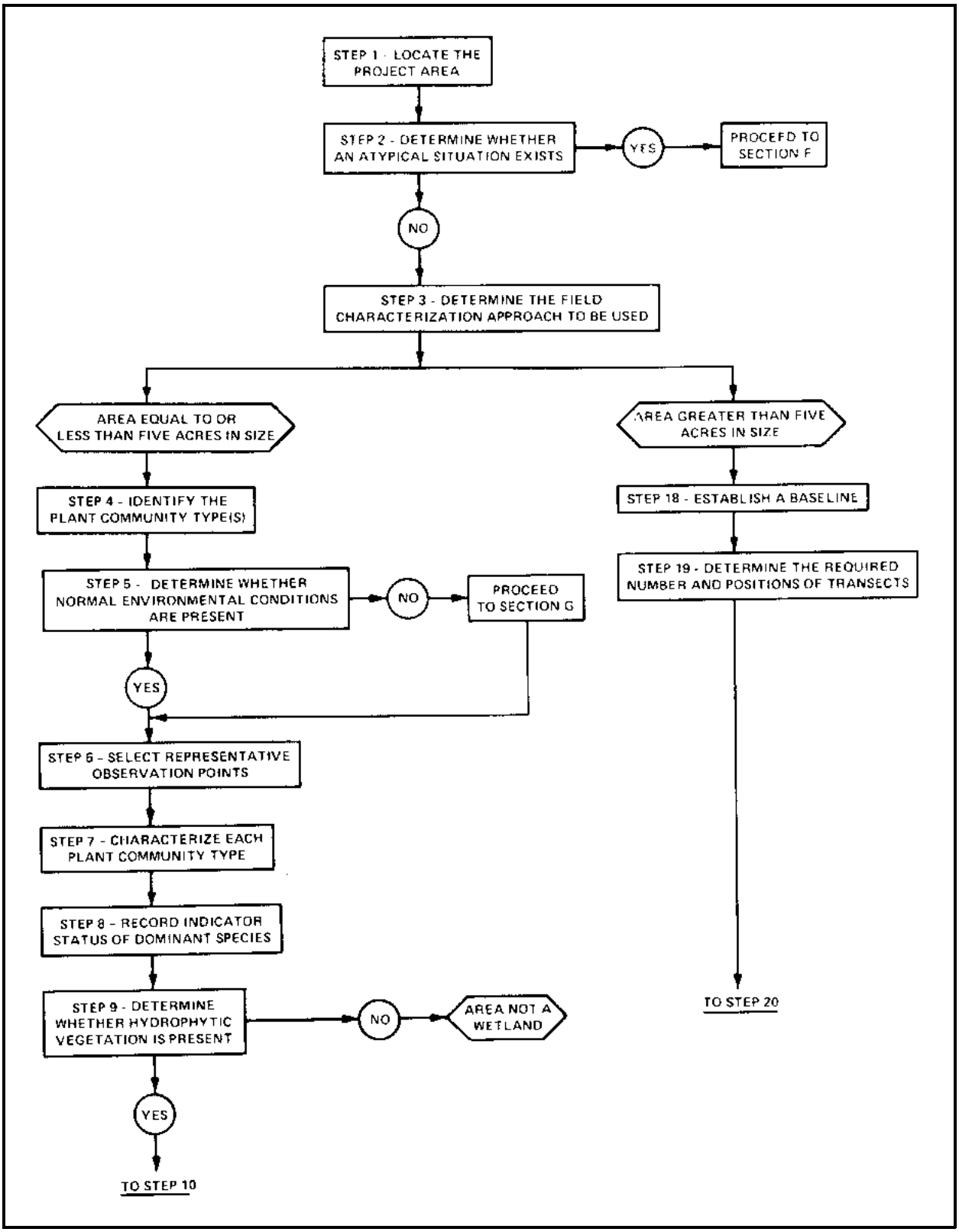

Figure 14. Flowchart of steps involved in making a routine wetland determination when an onsite visit is necessary (Continued)

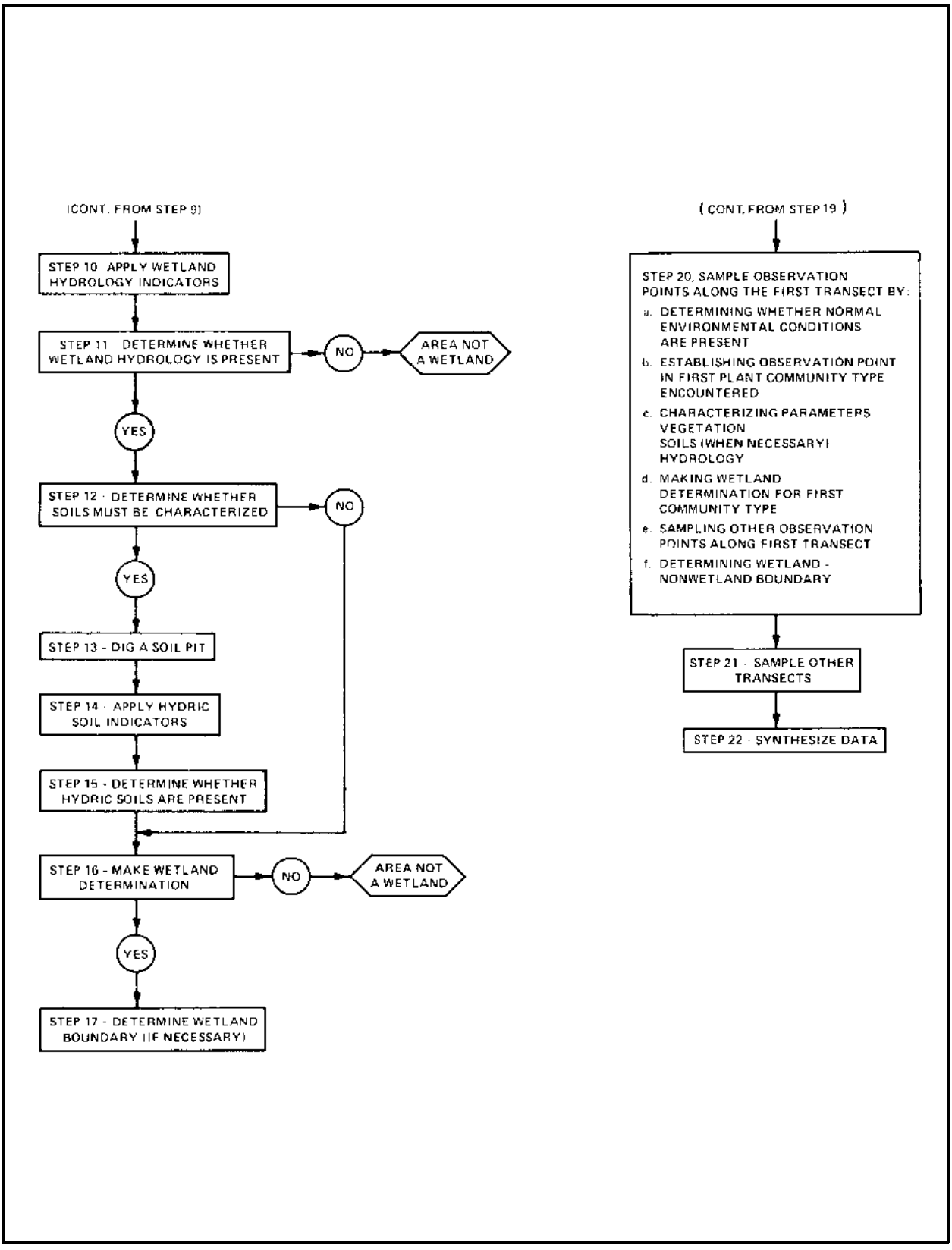

Figure 14. (Concluded)

e. Soil auger or spade (soils only).

f. Tape (300 ft).

g. Munsell Color Charts (Munsell Color 1975) (soils only).

Procedure

65. Complete the following steps, as necessary:

- *STEP 1 - Locate the project area.* Determine the spatial boundaries of the project area using information from a USGS quadrangle map or other appropriate map, aerial photography, and/or the project survey plan (when available). PROCEED TO STEP 2.

- *STEP 2 - Determine whether an atypical situation exists.* Examine the area and determine whether there is evidence of sufficient natural or human-induced alteration to significantly alter the area vegetation, soils, and/or hydrology. *NOTE: Include possible offsite modifications that may affect the area hydrology.* If not, PROCEED TO STEP 3.

  If one or more parameters have been significantly altered by an activity that would normally require a permit, PROCEED TO Section F and determine whether there is sufficient evidence that hydrophytic vegetation, hydric soils, and/or wetland hydrology were present prior to this alteration. Then, return to this subsection and characterize parameters not significantly influenced by human activities. PROCEED TO STEP 3.

- *STEP 3 - Determine the field characterization approach to be used.* Considering the size and complexity of the area, determine the field characterization approach to be used. When the area is equal to or less than 5 acres in size (Section B, STEP 3) and the area is thought to be relatively homogeneous with respect to vegetation, soils, and/or hydrologic regime, PROCEED TO STEP 4. When the area is greater than 5 acres in size (Section B, STEP 3) or appears to be highly diverse with respect to vegetation, PROCEED TO STEP 18.

Areas Equal To or Less Than 5 Acres in Size

- *STEP 4 - Identify the plant community type(s).* Traverse the area and determine the number and locations of plant community types. Sketch the location of each on the base map (Section B, STEP 2), and give each community type a name. PROCEED TO STEP 5.

- *STEP 5 - Determine whether normal environmental conditions are present.* Determine whether normal environmental conditions are present by considering the following:

    a. Is the area presently lacking hydrophytic vegetation or hydrologic indicators due to annual or seasonal fluctuations in precipitation or ground-water levels?

    b. Are hydrophytic vegetation indicators lacking due to seasonal fluctuations in temperature?

  If the answer to either of these questions is thought to be YES, PROCEED TO Section G. If the answer to both questions is NO, PROCEED TO STEP 6.

- *STEP 6 - Select representative observation points.* Select a representative observation point in each community type. A representative observation point is one in which the apparent characteristics (determine visually) best represent characteristics of the entire community. Mark on the base map the approximate location of the observation point. PROCEED TO STEP 7.

- *STEP 7 - Characterize each plant community type.* Visually determine the dominant plant species in each vegetation layer of each community type and record them on DATA FORM 1 (use a separate DATA FORM 1 for each community type). Dominant species are those having the greatest relative basal area (woody overstory),[1] greatest height (woody understory), greatest percentage of areal cover (herbaceous understory), and/or greatest number of stems (woody vines). PROCEED TO STEP 8.

- *STEP 8 - Record indicator status of dominant species.* Record on DATA FORM 1 the indicator status ~~(Appendix C, Section 1 or 2)~~ of each dominant species in each community type. PROCEED TO STEP 9.

- *STEP 9 - Determine whether hydrophytic vegetation is present.* Examine each DATA FORM 1. When more than 50 percent of the dominant species in a community type have an indicator status (STEP 8) of OBL, FACW, and/or FAC,[2] hydrophytic vegetation is present. Complete the vegetation section of each DATA FORM 1. Portions of the area failing this test are not wetlands. PROCEED TO STEP 10.

- *STEP 10 - Apply wetland hydrologic indicators.* Examine the portion of the area occupied by each plant community type for positive indicators

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[1] This term is used because species having the largest individuals may not be dominant when only a few are present. To determine relative basal area, consider both the size and number of individuals of a species and subjectively compare with other species present.

[2] For the FAC-neutral option, see paragraph 35*a*.

of wetland hydrology (Part III, paragraph 49). Record findings on the appropriate DATA FORM 1. PROCEED TO STEP 11.

- *STEP 11 - Determine whether wetland hydrology is present.* Examine the hydrologic information on DATA FORM 1 for each plant community type. Any portion of the area having a positive wetland hydrology indicator has wetland hydrology. If positive wetland hydrology indicators are present in all community types, the entire area has wetland hydrology. If no plant community type has a wetland hydrology indicator, none of the area has wetland hydrology. Complete the hydrology portion of each DATA FORM 1. PROCEED TO STEP 12.

- *STEP 12 - Determine whether soils must be characterized.* Examine the vegetation section of each DATA FORM 1. Hydric soils are assumed to be present in any plant community type in which:

    a. All dominant species have an indicator status of OBL.

    b. All dominant species have an indicator status of OBL or FACW, and the wetland boundary (when present) is abrupt.[1]

  When either *a* or *b* occurs and wetland hydrology is present, check the hydric soils blank as positive on DATA FORM 1 and PROCEED TO STEP 16. If neither *a* nor *b* applies, PROCEED TO STEP 13.

- *STEP 13 - Dig a soil pit.* Using a soil auger or spade, dig a soil pit at the representative location in each community type. The procedure for digging a soil pit is described in Appendix D, Section 1. When completed, approximately 16 inches of the soil profile will be available for examination. PROCEED TO STEP 14.

- *STEP 14 - Apply hydric soil indicators.* Examine the soil at each location and compare its characteristics immediately below the A-horizon or 10 inches (whichever is shallower) with the hydric soil indicators described in Part III, paragraph 44 and/or 45. Record findings on the appropriate DATA FORM 1's. PROCEED TO STEP 15.

- *STEP 15 - Determine whether hydric soils are present.* Examine each DATA FORM 1 and determine whether a positive hydric soil indicator was found. If so, the area at that location has hydric soil. If soils at all sampling locations have positive hydric soil indicators, the entire area has hydric soils. If soils at all sampling locations lack positive hydric soil indicators, none of the area is a wetland. Complete the soil section of each DATA FORM 1. PROCEED TO STEP 16.

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[1] The soils parameter must be considered in any plant community in which: (a) the community is dominated by one or more FAC species; (b) no community type dominated by OBL species is present; (c) the boundary between wetlands and nonwetlands is gradual or nondistinct; (d) the area is known to or is suspected of having significantly altered hydrology.

- *STEP 16 - Make wetland determination.* Examine DATA FORM 1. If the entire area presently or normally has wetland indicators of all three parameters (STEPS 9, 11, and 15), the entire area is a wetland. If the entire area presently or normally lacks wetland indicators of one or more parameters, the entire area is a nonwetland. If only a portion of the area presently or normally has wetland indicators for all three parameters, PROCEED TO STEP 17.

- *STEP 17 - Determine wetland-nonwetland boundary.* Mark each plant community type on the base map with a W if wetland or an N if non-wetland. Combine all wetland plant communities into one mapping unit and all nonwetland plant communities into another mapping unit. The wetland-nonwetland boundary will be represented by the interface of these two mapping units.

Areas Greater Than 5 Acres in Size

- *STEP 18 - Establish a baseline.* Select one project boundary as a baseline. The baseline should parallel the major watercourse through the area or should be perpendicular to the hydrologic gradient (Figure 15). Determine the approximate baseline length. PROCEED TO STEP 19.

- *STEP 19 - Determine the required number and position of transects.* Use the following to determine the required number and position of transects (specific site conditions may necessitate changes in intervals):

Baseline Length, Miles	Number of Required Transects
≤0.25	3
>0.25 - 0.50	3
>0.50 - 0.75	3
>0.75 - 1.00	3
>1.00 - 2.00	3-5
>2.00 - 4.00	5-8
>4.00	8 or more[1]

[1] Transect intervals should not exceed 0.5 mile.

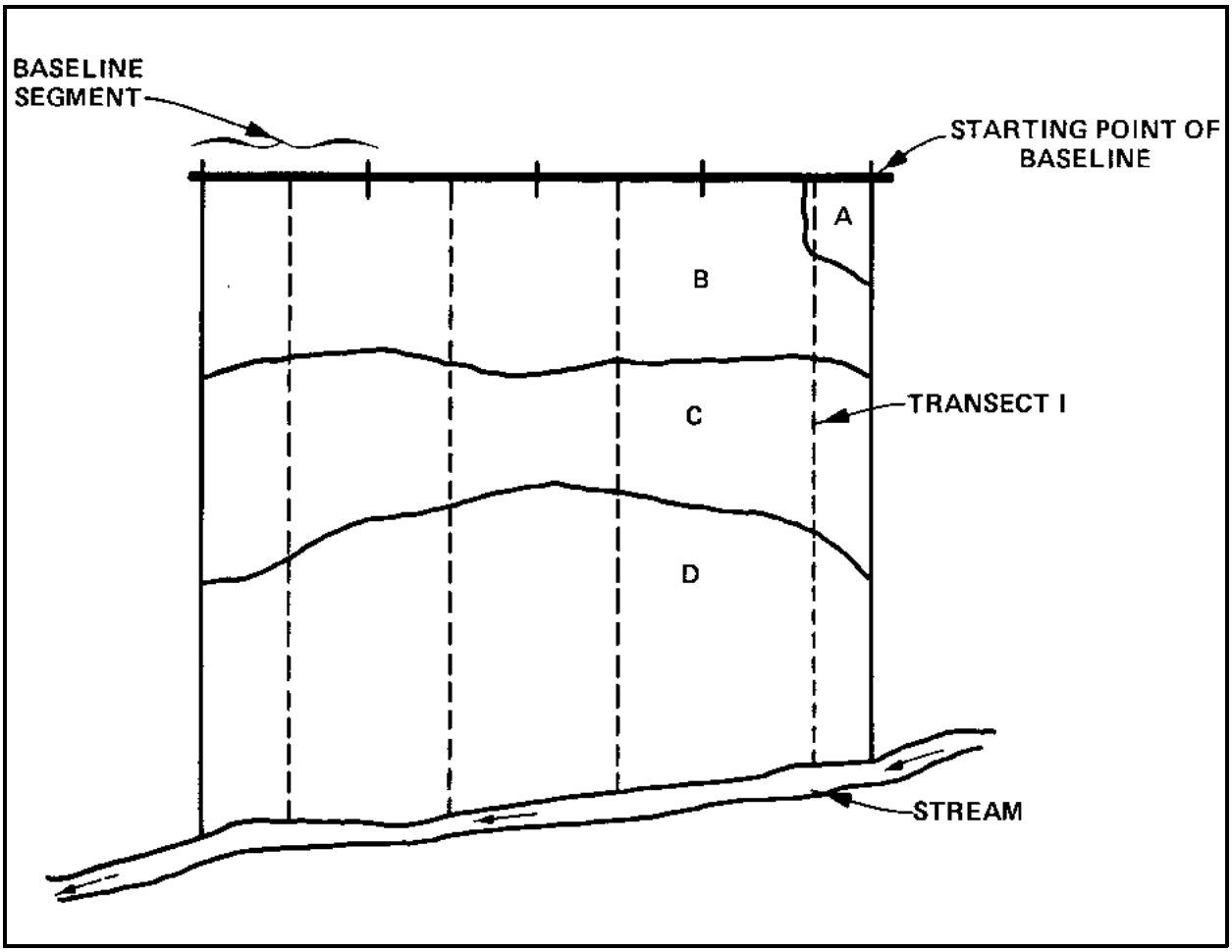

Figure 15. General orientation of baseline and transects (dotted lines) in a hypothetical project area. Alpha characters represent different plant communities. All transects start at the midpoint of a baseline segment except the first, which was repositioned to include community type A

Divide the baseline length by the number of required transects. Establish one transect in each resulting baseline increment. Use the midpoint of each baseline increment as a transect starting point. For example, if the baseline is 1,200 ft in length, three transects would be established—one at 200 ft, one at 600 ft, and one at 1,000 ft from the baseline starting point. *CAUTION: All plant community types must be included. This may necessitate relocation of one or more transect lines. PROCEED TO STEP 20.*

- *STEP 20 - Sample observation points along the first transect.* Beginning at the starting point of the first transect, extend the transect at a 90-deg angle to the baseline. Use the following procedure as appropriate to simultaneously characterize the parameters at each observation point. Combine field-collected data with information already available and make a wetland determination at each observation point. A DATA FORM 1 must be completed for each observation point.

a. *Determine whether normal environmental conditions are present.* Determine whether normal environmental conditions are present by considering the following:

(1) Is the area presently lacking hydrophytic vegetation and/or hydrologic indicators due to annual or seasonal fluctuations in precipitation or ground-water levels?

(2) Are hydrophytic vegetation indicators lacking due to seasonal fluctuations in temperature?

If the answer to either of these questions is thought to be YES, PROCEED TO Section G. If the answer to both questions is NO, PROCEED TO STEP 20*b*.

b. *Establish an observation point in the first plant community type encountered.* Select a representative location along the transect in the first plant community type encountered. When the first plant community type is large and covers a significant distance along the transect, select an area that is no closer than 300 ft to a perceptible change in plant community type. PROCEED TO STEP 20*c*.

c. *Characterize parameters.* Characterize the parameters at the observation point by completing (1), (2), and (3) below:

(1) *Vegetation.* Record on DATA FORM 1 the dominant plant species in each vegetation layer occurring in the immediate vicinity of the observation point. Use a 5-ft radius for herbs and saplings/shrubs, and a 30-ft radius for trees and woody vines (when present). Subjectively determine the dominant species by estimating those having the largest relative basal area[1] (woody overstory), greatest height (woody understory), greatest percentage of areal cover (herbaceous understory), and/or greatest number of stems (woody vines). *NOTE: Plot size may be estimated, and plot size may also be varied when site conditions warrant.* Record on DATA FORM 1 any dominant species observed to have morphological adaptations (Appendix C, Section 3) for occurrence in wetlands, and determine and record dominant species that have known physiological adaptations for occurrence in wetlands (Appendix C, Section 3). Record on DATA FORM 1 the indicator status ~~(Appendix C, Section 1 or 2)~~ of each dominant species. Hydrophytic

[1] This term is used because species having the largest individuals may not be dominant when only a few are present. To use relative basal area, consider both the size and number of individuals of a species and subjectively compare with other species present.

vegetation is present at the observation point when more than 50 percent of the dominant species have an indicator status of OBL, FACW, and/or FAC;[1] when two or more dominant species have observed morphological or known physiological adaptations for occurrence in wetlands; or when other indicators of hydrophytic vegetation (Part III, paragraph 35) are present. Complete the vegetation section of DATA FORM 1. PROCEED TO (2).

(2) *Soils.* In some cases, it is not necessary to characterize the soils. Examine the vegetation of DATA FORM 1. Hydric soils can be assumed to be present when:

(a) All dominant plant species have an indicator status of OBL.

(b) All dominant plant species have an indicator status of OBL and/or FACW (at least one dominant species must be OBL).[2]

When either (a) or (b) applies, check the hydric soils blank as positive and PROCEED TO (3). If neither (a) nor (b) applies but the vegetation qualifies as hydrophytic, dig a soil pit at the observation point using the procedure described in Appendix D, Section 1. Examine the soil immediately below the A-horizon or 10-inches (whichever is shallower) and compare its characteristics (Appendix D, Section 1) with the hydric soil indicators described in Part III, paragraph 44 and/or 45. Record findings on DATA FORM 1. If a positive hydric soil indicator is present, the soil at the observation point is a hydric soil. If no positive hydric soil indicator is found, the area at the observation point does not have hydric soils and the area at the observation point is not a wetland. Complete the soils section of DATA FORM 1 for the observation point. PROCEED TO (3) if hydrophytic vegetation (1) and hydric soils (2) are present. Otherwise, PROCEED TO STEP 20*d*.

(3) *Hydrology*. Examine the observation point for indicators of wetland hydrology (Part III, paragraph 49) and record observations on DATA FORM 1. Consider the indicators in the same sequence as presented in Part III, paragraph 49. If a positive wetland hydrology indicator

[1] For the FAC-neutral option, see paragraph 35*a*.
[2] Soils must be characterized when any dominant species has an indicator status of FAC.

is present, the area at the observation point has wetland hydrology. If no positive wetland hydrologic indicator is present, the area at the observation point is not a wetland. Complete the hydrology section of DATA FORM 1 for the observation point. PROCEED TO STEP 20*d*.

d. *Wetland determination.* Examine DATA FORM 1 for the observation point. Determine whether wetland indicators of all three parameters are or would normally be present during a significant portion of the growing season. If so, the area at the observation point is a wetland. If no evidence can be found that the area at the observation point normally has wetland indicators for all three parameters, the area is a nonwetland. PROCEED TO STEP 20*e*.

e. *Sample other observation points along the first transect.* Continue along the first transect until a different community type is encountered. Establish a representative observation point within this community type and repeat STEP 20*c* and 20*d*. If the areas at both observation points are either wetlands or nonwetlands, continue along the transect and repeat STEP 20*c* and 20*d* for the next community type encountered. Repeat for all other community types along the first transect. If the area at one observation point is wetlands and the next observation point is nonwetlands (or vice versa), PROCEED TO STEP 20*f*.

f. *Determine wetland-nonwetland boundary.* Proceed along the transect from the wetland observation point toward the nonwetland observation point. Look for subtle changes in the plant community (e.g., the first appearance of upland species, disappearance of apparent hydrology indicators, or slight changes in topography). When such features are noted, establish an observation point and repeat the procedures described in STEP 20*c* through 20*d*. *NOTE: A new DATA FORM 1 must be completed for this observation point, and all three parameters must be characterized by field observation.* If the area at this observation point is a wetland, proceed along the transect toward the nonwetland observation point until upland indicators are more apparent. Repeat the procedures described in STEP 20*c* through 20*d*. If the area at this observation point is a nonwetland, move halfway back along the transect toward the last documented wetland observation point and repeat the procedure described in STEP 20*c* through 20*d*. Continue this procedure until the wetland-nonwetland boundary is found. It is not necessary to complete a DATA FORM 1 for all intermediate points, but a DATA FORM 1 should be completed for the wetland-nonwetland boundary. Mark the position of the wetland boundary on the base map, and continue along the first transect until all community types have been sampled and

all wetland boundaries located. *CAUTION: In areas where wetlands are interspersed among nonwetlands (or vice versa), several boundary determinations will be required.* When all necessary wetland determinations have been completed for the first transect, PROCEED TO STEP 21.

- *STEP 21 - Sample other transects.* Repeat procedures described in STEP 21 for all other transects. When completed, a wetland determination will have been made for one observation point in each community type along each transect, and all wetland-nonwetland boundaries along each transect will have been determined. PROCEED TO STEP 22.

- *STEP 22 - Synthesize data.* Examine all completed copies of DATA FORM 1, and mark each plant community type on the base map. Identify each plant community type as either a wetland (W) or nonwetland (N). If all plant community types are identified as wetlands, the entire area is wetlands. If all plant community types are identified as nonwetlands, the entire area is nonwetlands. If both wetlands and nonwetlands are present, identify observation points that represent wetland boundaries on the base map. Connect these points on the map by generally following contour lines to separate wetlands from nonwetlands. Walk the contour line between transects to confirm the wetland boundary. Should anomalies be encountered, it will be necessary to establish short transects in these areas, apply the procedures described in STEP 20*f*, and make any necessary adjustments on the base map.

Subsection 3 - Combination of Levels I and 2

66. In some cases, especially for large projects, adequate information may already be available (Section B) to enable a wetland determination for a portion of the project area, while an onsite visit will be required for the remainder of the area. Since procedures for each situation have already been described in Subsections 1 and 2, they will not be repeated. Apply the following steps:

- *STEP 1 - Make wetland determination for portions of the project area that are already adequately characterized.* Apply procedures described in Subsection 1. When completed, a DATA FORM 1 will have been completed for each community type, and a map will have been prepared identifying each community type as wetland or nonwetland and showing any wetland boundary occurring in this portion of the project area. PROCEED TO STEP 2.

- *STEP 2 - Make wetland determination for portions of the project area that require an onsite visit.* Apply procedures described in Subsection 2. When completed, a DATA FORM 1 will have been completed for each plant community type or for a number of observation points (including

wetland boundary determinations). A map of the wetland (if present) will also be available. PROCEED TO STEP 3.

- *STEP 3 - Synthesize data.* Using the maps resulting from STEPS 1 and 2, prepare a summary map that shows the wetlands of the entire project area. *CAUTION: Wetland boundaries for the two maps will not always match exactly. When this occurs, an additional site visit will be required to refine the wetland boundaries. Since the degree of resolution of wetland boundaries will be greater when determined onsite, it may be necessary to employ procedures described in Subsection 2 in the vicinity of the boundaries determined from Subsection 1 to refine these boundaries.*

Section E. Comprehensive Determinations

67. This section describes procedures for making comprehensive wetland determinations. Unlike procedures for making routine determinations (Section D), application of procedures described in this section will result in maximum information for use in making determinations, and the information usually will be quantitatively expressed. Comprehensive determinations should only be used when the project area is very complex and/or when the determination requires rigorous documentation. This type of determination may be required in areas of any size, but will be especially useful in large areas. There may be instances in which only one parameter (vegetation, soil, or hydrology) is disputed. In such cases, only procedures described in this section that pertain to the disputed parameter need be completed. It is assumed that the user has already completed all applicable steps in Section B. *NOTE: Depending on site characteristics, it may be necessary to alter the sampling design and/or data collection procedures.*

68. This section is divided into five basic types of activities. The first consists of preliminary field activities that must be completed prior to making a determination (STEPS 1 through 5). The second outlines procedures for determining the number and locations of required determinations (STEPS 6 through 8). The third describes the basic procedure for making a comprehensive wetland determination at any given point (STEPS 9 through 17). The fourth describes a procedure for determining wetland boundaries (STEP 18). The fifth describes a procedure for synthesizing the collected data to determine the extent of wetlands in the area (STEPS 20 and 21). A flowchart showing the relationship of various steps required for making a comprehensive determination is presented in Figure 16.

Equipment and materials

69. Equipment and materials needed for making a comprehensive determination include:

a. Base map (Section B, STEP 2).

b. Copies of DATA FORMS 1 and 2.

c. Appendices C and D.

d. Compass.

e. Tape (300 ft).

f. Soil auger or spade.

g. Munsell Color Charts (Munsell Color 1975).

h. Quadrat (3.28 ft by 3.28 ft).

i. Diameter or basal area tape (for woody overstory).

Field procedures

70. Complete the following steps:

- *STEP 1 - Identify the project area.* Using information from the USGS quadrangle or other appropriate map (Section B), locate and measure the spatial boundaries of the project area. Determine the compass heading of each boundary and record on the base map (Section B, STEP 2). The applicant's survey plan may be helpful in locating the project boundaries. PROCEED TO STEP 2.

- *STEP 2 - Determine whether an atypical situation exists.* Examine the area and determine whether there is sufficient natural or human-induced alteration to significantly change the area vegetation, soils, and/or hydrology. If not, PROCEED TO STEP 3. If one or more parameters have been recently altered significantly, PROCEED TO Section F and determine whether there is sufficient evidence that hydrophytic vegetation, hydric soils, and/or wetland hydrology were present on the area prior to alteration. Then return to this section and characterize parameters not significantly influenced by human activities. PROCEED TO STEP 3.

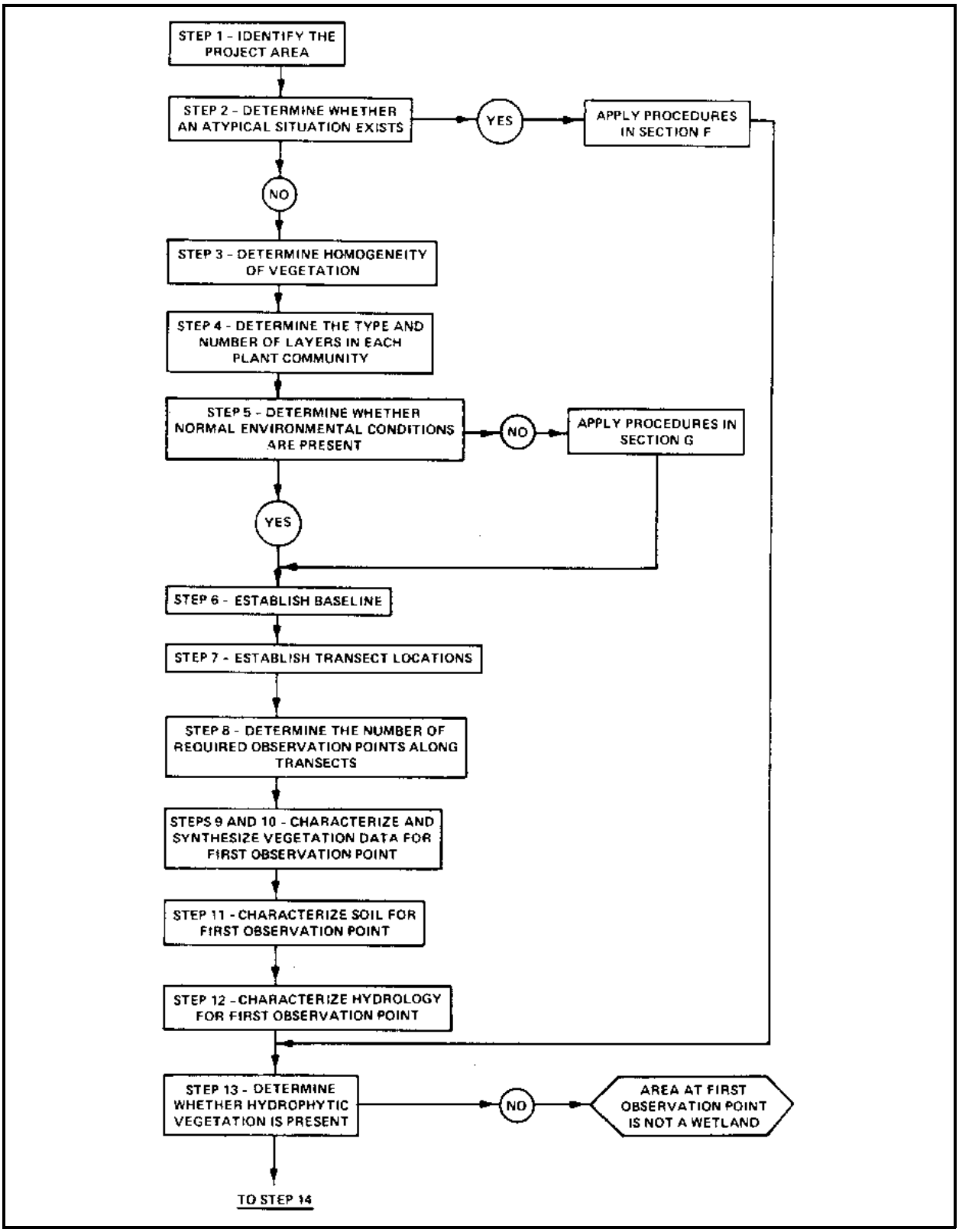

Figure 16. Flowchart of steps involved in making a comprehensive wetland determination (Section E) (Continued)

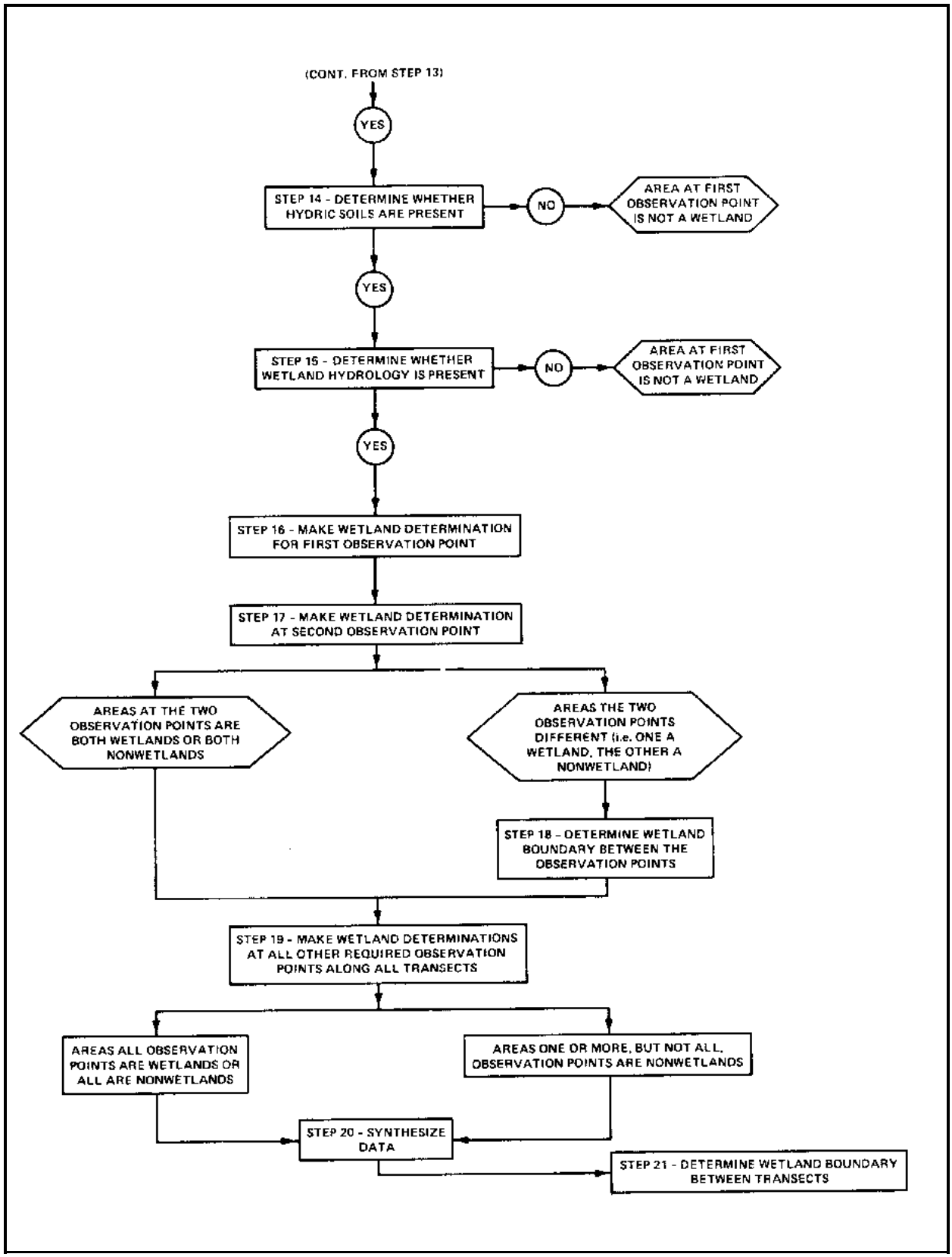

Figure 16. (Concluded)

- *STEP 3 - Determine homogeneity of vegetation.* While completing STEP 2, determine the number of plant community types present. Mark the approximate location of each community type on the base map. The number and locations of required wetland determinations will be strongly influenced by both the size of the area and the number and distribution of plant community types; the larger the area and greater the number of plant community types, the greater the number of required wetland determinations. It is imperative that all plant community types occurring in all portions of the area be included in the investigation. PROCEED TO STEP 4.

- *STEP 4 - Determine the type and number of layers in each plant community.* Examine each identified plant community type and determine the type(s) and number of layers in each community. Potential layers include trees (woody overstory), saplings/shrubs (woody understory), herbs (herbaceous understory), and/or woody vines. PROCEED TO STEP 5.

- *STEP 5 - Determine whether normal environmental conditions are present.* Determine whether normal environmental conditions are present at the observation point by considering the following:

    a. Is the area at the observation point presently lacking hydrophytic vegetation and/or hydrologic indicators due to annual or seasonal fluctuations in precipitation or groundwater levels?

    b. Are hydrophytic vegetation indicators lacking due to seasonal fluctuations in temperature?

    If the answer to either of these questions is thought to be YES, PROCEED TO Section G. If the answer to both questions is NO, PROCEED TO STEP 6.

- *STEP 6 - Establish a baseline.* Select one project boundary area as a baseline. The baseline should extend parallel to any major watercourse and/or perpendicular to a topographic gradient (see Figure 17). Determine the baseline length and record on the base map both the baseline length and its compass heading. PROCEED TO STEP 7.

- *STEP 7 - Establish transect locations.* Divide the baseline into a number of equal segments (Figure 17). Use the following as a guide to determine the appropriate number of baseline segments:

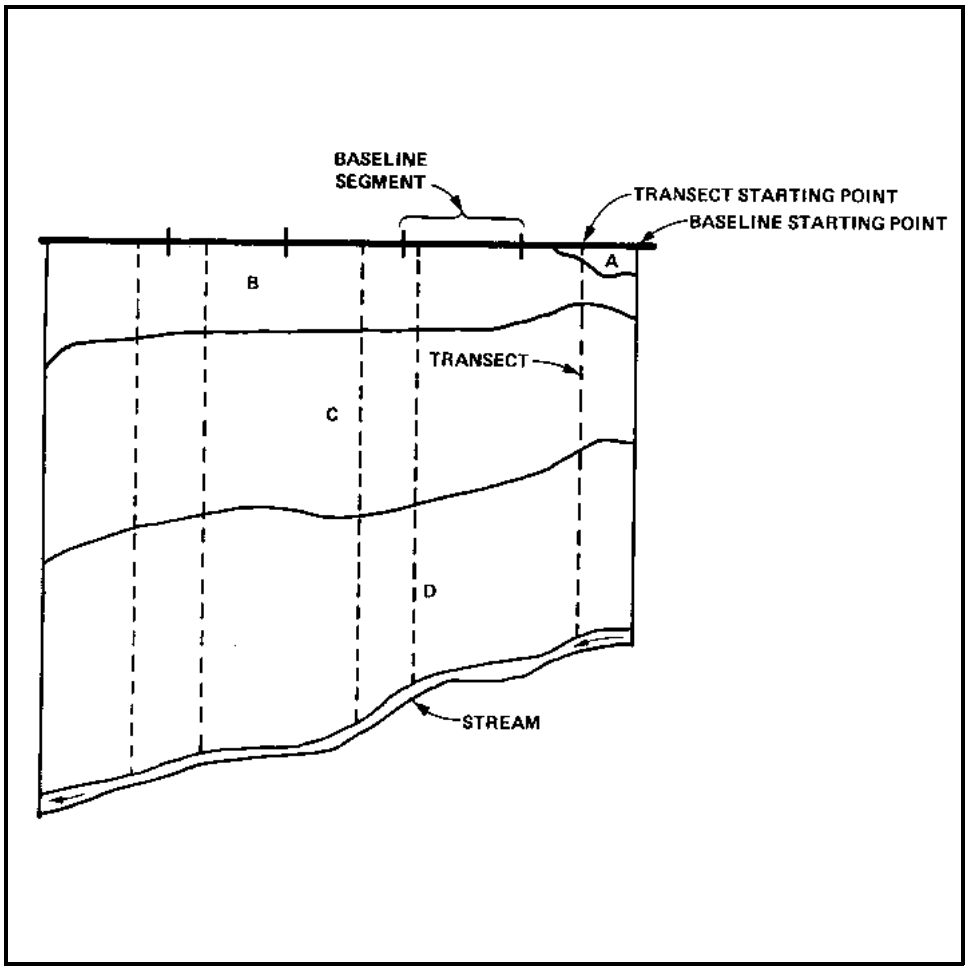

Figure 17. General orientation of baseline and transects in a hypothetical project area. Alpha characters represent different plant communities. Transect positions were determined using a random numbers table

Baseline Length, ft	Number of Segments	Length of Baseline Segment, ft
>50 - 500	3	18 - 167
>500 - 1,000	3	167 - 333
>1,000 - 5,000	5	200 - 1,000
>5,000 - 10,000	7	700 - 1,400
>10,000[1]	Variable	2,000

[1] If the baseline exceeds 5 miles, baseline segments should be 0.5 mile in length.

Use a random numbers table or a calculator with a random numbers generation feature to determine the position of a transect starting point within each baseline segment. For example, when the baseline is 4,000 ft, the number of baseline segments will be five, and the baseline segment length will be 4,000/5 = 800 ft. Locate the first transect within the first 800 ft of the baseline. If the random numbers table yields 264 as the

distance from the baseline starting point, measure 264 ft from the baseline starting point and establish the starting point of the first transect. If the second random number selected is 530, the starting point of the second transect will be located at a distance of 1,330 ft (800 + 530 ft) from the baseline starting point. *CAUTION: Make sure that each plant community type is included in at least one transect. If not, modify the sampling design accordingly.* When the starting point locations for all required transects have been determined, PROCEED TO STEP 8.

- *STEP 8 - Determine the number of required observation points along transects.* The number of required observation points along each transect will be largely dependent on transect length. Establish observation points along each transect using the following as a guide:

Transect Length, ft	Number of Observation Points	Interval Between Observation Points, ft
<1,000	2-10	100
1,000 - <5,000	10	100 - 500
5,000 - <10,000	10	500 - 1,000
≥ 10,000	>10	1,000

Establish the first observation point at a distance of 50 ft from the baseline (Figure 17). When obvious nonwetlands occupy a long portion of the transect from the baseline starting point, establish the first observation point in the obvious nonwetland at a distance of approximately 300 ft from the point that the obvious nonwetland begins to intergrade into a potential wetland community type. Additional observation points must also be established to determine the wetland boundary between successive regular observation points when one of the points is a wetland and the other is a nonwetland. *CAUTION: In large areas having a mosaic of plant community types, several wetland boundaries may occur along the same transect.* PROCEED TO STEP 9 and apply the comprehensive wetland determination procedure at each required observation point. Use the described procedure to simultaneously characterize the vegetation, soil, and hydrology at each required observation point along each transect, and use the resulting characterization to make a wetland determination at each point. *NOTE: ALL required wetland boundary determinations should be made while proceeding along a transect.*

- *STEP 9 - Characterize the vegetation at the first observation point along the first transect.*[1] Record on DATA FORM 2 the vegetation occurring

[1] There is no single best procedure for characterizing vegetation. Methods described in STEP 9 afford standardization of the procedure. However, plot size and descriptors for determining dominance may vary.

at the first observation point along the first transect by completing the following (as appropriate):

a. *Trees.* Identify each tree occurring within a 30-ft radius[1] of the observation point, measure its basal area (square inches) or diameter at breast height (DBH) using a basal area tape or diameter tape, respectively, and record. *NOTE: If DBH is measured, convert values to basal area by applying the formula* $A = \pi r^2$. *This must be done on an individual basis.* A tree is any nonclimbing, woody plant that has a DBH of ≥ 3.0 in., regardless of height.

b. *Saplings/shrubs.* Identify each sapling/shrub occurring within a 10-ft radius of the observation point, estimate its height, and record the midpoint of its class range using the following height classes (height is used as an indication of dominance; taller individuals exert a greater influence on the plant community):

Height Class	Height Class Range, ft	Midpoint of Range, ft
1	1-3	2
2	3-5	4
3	5-7	6
4	7-9	8
5	9-11	10
6	>11	12

A sapling/shrub is any woody plant having a height >3.2 ft but a stem diameter of <3.0 in., exclusive of woody vines.

c. *Herbs.* Place a 3.28- by 3.28-ft quadrat with one corner touching the observation point and one edge adjacent to the transect line. As an alternative, a 1.64-ft-radius plot with the center of the plot representing the observation point position may be used. Identify each plant species with foliage extending into the quadrat and estimate its percent cover by applying the following cover classes:

[1] A larger sampling plot may be necessary when trees are large and widely spaced.

Cover Class	Class Range, Percent	Midpoint of Class Range, Percent
1	0-5	2.5
2	>5-25	15.0
3	>25-50	37.5
4	>50-75	62.5
5	>75-95	85.0
6	>95-100	97.5

Include all nonwoody plants and woody plants <3.2 ft in height. *NOTE: Total percent cover for all species will often exceed 100 percent.*

d. *Woody vines (lianas).* Identify species of woody vines climbing each tree and sapling/shrub sampled in STEPS 9*a* and 9*b* above, and record the number of stems of each. Since many woody vines branch profusely, count or estimate the number of stems at the ground surface. Include only individuals rooted in the 10-ft radius plot. Do not include individuals <3.2 ft in height. PROCEED TO STEP 10.

- *STEP 10 - Analyze field vegetation data.* Examine the vegetation data (STEP 9) and determine the dominant species in each vegetation layer[1] by completing the following:

a. *Trees.* Obtain the total basal area (square inches) for each tree species identified in STEP 9*a* by summing the basal area of all individuals of a species found in the sample plot. Rank the species in descending order of dominance based on total basal area. Complete DATA FORM 2 for the tree layer.

b. *Saplings/shrubs.* Obtain the total height for each sapling/shrub species identified in STEP 9*b*. Total height, which is an estimate of dominance, is obtained by summing the midpoints of height classes for all individuals of a species found in the sample plot. Rank the species in descending order of dominance based on sums of midpoints of height class ranges. Complete DATA FORM 2 for the sapling/shrub layer.

c. *Herbs.* Obtain the total cover for each herbaceous and woody seedling species identified in STEP 9*c*. Total cover is obtained by using the midpoints of the cover class range as-

[1] The same species may occur as a dominant in more than one vegetation layer.

signed to each species (only one estimate of cover is made for a species in a given plot). Rank herbs and woody seedlings in descending order of dominance based on percent cover. Complete DATA FORM 2 for the herbaceous layer.

d. *Woody vines (lianas).* Obtain the total number of individuals of each species of woody vine identified in STEP 9*d*. Rank the species in descending order of dominance based on number of stems. Complete DATA FORM 2 for the woody vine layer. PROCEED TO STEP 11.

- *STEP 11 - Characterize soil.* If a soil survey is available (Section B), the soil type may already be known. Have a soil scientist confirm that the soil type is correct, and determine whether the soil series is a hydric soil ~~(Appendix D, Section 2)~~. *CAUTION: Mapping units on soil surveys sometimes have inclusions of soil series or phases not shown on the soil survey map.* If a hydric soil type is confirmed, record on DATA FORM 1 and PROCEED TO STEP 12. If not, dig a soil pit using a soil auger or spade (See Appendix D, Section 1) and look for indicators of hydric soils immediately below the A-horizon or 10 inches (whichever is shallower) (Part III, paragraphs 44 and/or 45). Record findings on DATA FORM 1. PROCEED TO STEP 12.

- *STEP 12 - Characterize hydrology.* Examine the observation point for indicators of wetland hydrology (Part III, paragraph 49) and record observations on DATA FORM 1. Consider indicators in the same sequence as listed in paragraph 49. PROCEED TO STEP 13.

- *STEP 13 - Determine whether hydrophytic vegetation is present.* Record the three dominant species from each vegetation layer (five species if only one or two layers are present) on DATA FORM 1.[1] Determine whether these species occur in wetlands by considering the following:

  a. *More than 50 percent of the dominant plant species are OBL, FACW, and/or FAC[2] on lists of plant species that occur in wetlands.* Record the indicator status of all dominant species ~~(Appendix C, Section 1 or 2)~~ on DATA FORM 1. Hydrophytic vegetation is present when the majority of the dominant species have an indicator status of OBL, FACW, or FAC. *CAUTION: Not necessarily all plant communities composed of only FAC species are hydrophytic communities. They are hydrophytic communities only when positive indicators of hydric soils and wetland hydrology are also found.* If this indicator is satisfied, complete the vegetation portion of

[1] Record all dominant species when less than three are present in a vegetation layer.
[2] For the FAC-neutral option, see paragraph 35*a*.

DATA FORM 1 and PROCEED TO STEP 14. If not, consider other indicators of hydrophytic vegetation.

b. *Presence of adaptations for occurrence in wetlands.* Do any of the species listed on DATA FORM 1 have observed morphological or known physiological adaptations (Appendix C, Section 3) for occurrence in wetlands? If so, record species having such adaptations on DATA FORM 1. When two or more dominant species have observed morphological adaptations or known physiological adaptations for occurrence in wetlands, hydrophytic vegetation is present. If so, complete the vegetation portion of DATA FORM 1 and PROCEED TO STEP 14. If not, consider other indicators of hydrophytic vegetation.

c. *Other indicators of hydrophytic vegetation.* Consider other indicators (see Part III, paragraph 35) that the species listed on DATA FORM 1 are commonly found in wetlands. If so, complete the vegetation portion of DATA FORM 1 by recording sources of supporting information, and PROCEED TO STEP 14. If no indicator of hydrophytic vegetation is present, the area at the observation point is not a wetland. In such cases, it is unnecessary to consider soil and hydrology at that observation point. PROCEED TO STEP 17.

- *STEP 14 - Determine whether hydric soils are present.* Examine DATA FORM 1 and determine whether any indicator of hydric soils is present. If so, complete the soils portion of DATA FORM 1 and PROCEED TO STEP 15. If not, the area at the observation point is not a wetland. PROCEED TO STEP 17.

- *STEP 15 - Determine whether wetland hydrology is present.* Examine DATA FORM 1 and determine whether any indicator of wetland hydrology is present. Complete the hydrology portion of DATA FORM 1 and PROCEED TO STEP 16.

- *STEP 16 - Make wetland determination.* When the area at the observation point presently or normally has wetland indicators of all three parameters, it is a wetland. When the area at the observation point presently or normally lacks wetland indicators of one or more parameters, it is a nonwetland. PROCEED TO STEP 17.

- *STEP 17 - Make wetland determination at second observation point.* Locate the second observation point along the first transect and make a wetland determination by repeating procedures described in STEPS 9 through 16. When the area at the second observation point is the same as the area at the first observation point (i.e., both wetlands or both nonwetlands), PROCEED TO STEP 19. When the areas at the two ob-

servation points are different (i.e., one wetlands, the other nonwetlands), PROCEED TO STEP 18.

- *STEP 18 - Determine the wetland boundary between observation points.* Determine the position of the wetland boundary by applying the following procedure:

    a. Look for a change in vegetation or topography. *NOTE: The changes may sometimes be very subtle.* If a change is noted, establish an observation point and repeat STEPS 9 through 16. Complete a DATA FORM 1. If the area at this point is a wetland, proceed toward the nonwetland observation point until a more obvious change in vegetation or topography is noted and repeat the procedure. If there is no obvious change, establish the next observation point approximately halfway between the last observation point and the nonwetland observation point and repeat STEPS 9 through 16.

    b. Make as many additional wetland determinations as necessary to find the wetland boundary. *NOTE: The completed DATA FORM 1's for the original two observation points often will provide a clue as to the parameters that change between the two points.*

    c. When the wetland boundary is found, mark the boundary location on the base map and indicate on the DATA FORM 1 that this represents a wetland boundary. Record the distance of the boundary from one of the two regular observation points. Since the regular observation points represent known distances from the baseline, it will be possible to accurately pinpoint the boundary location on the base map. PROCEED TO STEP 19.

- *STEP 19 - Make wetland determinations at all other required observation points along all transects.* Continue to locate and sample all required observation points along all transects. *NOTE: The procedure described in STEP 18 must be applied at every position where a wetland boundary occurs between successive observation points.* Complete a DATA FORM 1 for each observation point and PROCEED TO STEP 20.

- *STEP 20 - Synthesize data to determine the portion of the area containing wetlands.* Examine all completed copies of DATA FORM 1 (STEP 19), and mark on a copy of the base map the locations of all observation points that are wetlands with a W and all observation points that are nonwetlands with an N. Also, mark all wetland boundaries occurring along transects with an X. If all the observation points are wetlands, the entire area is wetlands. If all observation points are nonwetlands, none of the area is wetlands. If some wetlands and some nonwetlands are present, connect the wetland boundaries (X) by following contour lines between transects. *CAUTION: If the determination is considered to be*

highly controversial, it may be necessary to be more precise in determining the wetland boundary between transects. This is also true for very large areas where the distance between transects is greater. If this is necessary, PROCEED TO STEP 21.

- *STEP 21 - Determine wetland boundary between transects.* Two procedures may be used to determine the wetland boundary between transects, both of which involve surveying:

    a. *Survey contour from wetland boundary along transects.* The first method involves surveying the elevation of the wetland boundaries along transects and then extending the survey to determine the same contour between transects. This procedure will be adequate in areas where there is no significant elevational change between transects. However, if a significant elevational change occurs between transects, either the surveyor must adjust elevational readings to accommodate such changes or the second method must be used. *NOTE: The surveyed wetland boundary must be examined to ensure that no anomalies exist. If these occur, additional wetland determinations will be required in the portion of the area where the anomalies occur, and the wetland boundary must be adjusted accordingly.*

    b. *Additional wetland determinations between transects.* This procedure consists of traversing the area between transects and making additional wetland determinations to locate the wetland boundary at sufficiently close intervals (not necessarily standard intervals) so that the area can be surveyed. Place surveyor flags at each wetland boundary location. Enlist a surveyor to survey the points between transects. From the resulting survey data, produce a map that separates wetlands from nonwetlands.

Section F. Atypical Situations

71. Methods described in this section should be used only when a determination has already been made in Section D or E that positive indicators of hydrophytic vegetation, hydric soils, and/or wetland hydrology could not be found due to effects of recent human activities or natural events. This section is applicable to delineations made in the following types of situations:

a. *Unauthorized activities.* Unauthorized discharges requiring enforcement actions may result in removal or covering of indicators of one or more wetland parameters. Examples include, but are not limited to: (1) alteration or removal of vegetation; (2) placement of dredged or fill material over hydric soils; and/or (3) construction of levees, drainage systems, or

dams that significantly alter the area hydrology. NOTE: This section should not be used for activities that have been previously authorized or those that are exempted from CE regulation. For example, this section is not applicable to areas that have been drained under CE authorization or that did not require CE authorization. Some of these areas may still be wetlands, but procedures described in Section D or E must be used in these cases.

b. *Natural events.* Naturally occurring events may result in either creation or alteration of wetlands. For example, recent beaver dams may impound water, thereby resulting in a shift of hydrology and vegetation to wetlands. However, hydric soil indicators may not have developed due to insufficient time having passed to allow their development. Fire, avalanches, volcanic activity, and changing river courses are other examples. *NOTE: It is necessary to determine whether alterations to an area have resulted in changes that are now the "normal circumstances."* The relative permanence of the change and whether the area is now functioning as a wetland must be considered.

c. *Man-induced wetlands.* Procedures described in Subsection 4 are for use in delineating wetlands that have been purposely or incidentally created by human activities, but in which wetland indicators of one or more parameters are absent. For example, road construction may have resulted in impoundment of water in an area that previously was nonwetland, thereby effecting hydrophytic vegetation and wetland hydrology in the area. However, the area may lack hydric soil indicators. *NOTE: Subsection D is not intended to bring into CE jurisdiction those manmade wetlands that are exempted under CE regulations or policy.* It is also important to consider whether the man-induced changes are now the "normal circumstances" for the area. Both the relative permanence of the change and the functioning of the area as a wetland are implied.

72. When any of the three types of situations described in paragraph 71 occurs, application of methods described in Sections D and/or E will lead to the conclusion that the area is not a wetland because positive wetland indicators for at least one of the three parameters will be absent. Therefore, apply procedures described in one of the following subsections (as appropriate) to determine whether positive indicators of hydrophytic vegetation, hydric soils, and/or wetland hydrology existed prior to alteration of the area. Once these procedures have been employed, RETURN TO Section D or E to make a wetland determination. PROCEED TO the appropriate subsection.

Subsection 1 - Vegetation

73. Employ the following steps to determine whether hydrophytic vegetation previously occurred:

- *STEP 1 - Describe the type of alteration.* Examine the area and describe the type of alteration that occurred. Look for evidence of selective harvesting, clear cutting, bulldozing, recent conversion to agriculture, or other activities (e.g., burning, discing, or presence of buildings, dams, levees, roads, parking lots, etc.). Determine the approximate date[1] when the alteration occurred. Record observations on DATA FORM 3, and PROCEED TO STEP 2.

- *STEP 2 - Describe effects on vegetation.* Record on DATA FORM 3 a general description of how the activities (STEP 1) have affected the plant communities. Consider the following:

    a. Has all or a portion of the area been cleared of vegetation?

    b. Has only one layer of the plant community (e.g., trees) been removed?

    c. Has selective harvesting resulted in removal of some species?

    d. Has all vegetation been covered by fill, dredged material, or structures?

    e. Have increased water levels resulted in the death of some individuals?

    PROCEED TO STEP 3.

- *STEP 3 - Determine the type of vegetation that previously occurred.* Obtain all possible evidence of the type of plant communities that occurred in the area prior to alteration. Potential sources of such evidence include:

    a. *Aerial photography*. Recent (within 5 years) aerial photography can often be used to document the type of previous vegetation. The general type of plant communities formerly present can usually be determined, and species identification is sometimes possible.

    b. *Onsite inspection.* Many types of activities result in only partial removal of the previous plant communities, and remaining species may be indicative of hydrophytic vegetation. In other cases, plant fragments (e.g., stumps, roots) may be used to reconstruct the plant community types that occurred prior to site alteration. Sometimes, this can be determined by examining piles of debris resulting from land-clearing opera-

[1] It is especially important to determine whether the alteration occurred prior to implementation of Section 404.

tions or excavation to uncover identifiable remains of the previous plant community.

c. *Previous site inspections.* Documented evidence from previous inspections of the area may describe the previous plant communities, particularly in cases where the area was altered after a permit application was denied.

d. *Adjacent vegetation.* Circumstantial evidence of the type of plant communities that previously occurred may sometimes be obtained by examining the vegetation in adjacent areas. If adjacent areas have the same topographic position, soils, and hydrology as the altered area, the plant community types on the altered area were probably similar to those of the adjacent areas.

e. *SCS records.* Most SCS soil surveys include a description of the plant community types associated with each soil type. If the soil type on the altered area can be determined, it may be possible to generally determine the type of plant communities that previously occurred.

f. *Permit applicant.* In some cases, the permit applicant may provide important information about the type of plant communities that occurred prior to alteration.

g. *Public.* Individuals familiar with the area may provide a good general description of the previously occurring plant communities.

h. *NWI wetland maps.* The NWI has developed wetland type maps for many areas. These may be useful in determining the type of plant communities that occurred prior to alteration.

To develop the strongest possible record, all of the above sources should be considered. If the plant community types that occurred prior to alteration can be determined, record them on DATA FORM 3 and also record the basis used for the determination. PROCEED TO STEP 4. If it is impossible to determine the plant community types that occurred on the area prior to alteration, a determination cannot be made using all three parameters. In such cases, the determination must be based on the other two parameters. PROCEED TO Subsection 2 or 3 if one of the other parameters has been altered, or return to the appropriate Subsection of Section D or to Section E, as appropriate.

- *STEP 4 - Determine whether plant community types constitute hydrophytic vegetation.* Develop a list of species that previously occurred on the site (DATA FORM 3). Subject the species list to applicable indicators of hydrophytic vegetation (Part III, paragraph 35). If none of the

indicators are met, the plant communities that previously occurred did not constitute hydrophytic vegetation. If hydrophytic vegetation was present and no other parameter was in question, record appropriate data on the vegetation portion of DATA FORM 3, and return to either the appropriate subsection of Section D or to Section E. If either of the other parameters was also in question, PROCEED TO Subsection 2 or 3.

Subsection 2 - Soils

74. Employ the following steps to determine whether hydric soils previously occurred:

- *STEP 1 - Describe the type of alteration.* Examine the area and describe the type of alteration that occurred. Look for evidence of:

    a. *Deposition of dredged or fill material or natural sedimentation.* In many cases the presence of fill material will be obvious. If so, it will be necessary to dig a hole to reach the original soil (sometimes several feet deep). Fill material will usually be a different color or texture than the original soil (except when fill material has been obtained from like areas onsite). Look for decomposing vegetation between soil layers and the presence of buried organic or hydric soil layers. In accreting or recently formed sandbars in riverine situations, the soils may support hydrophytic vegetation but lack hydric soil characteristics.

    b. *Presence of nonwoody debris at the surface.* This can only be applied in areas where the original soils do not contain rocks. Nonwoody debris includes items such as rocks, bricks, and concrete fragments.

    c. *Subsurface plowing.* Has the area recently been plowed below the A-horizon or to depths of greater than 10 in.?

    d. *Removal of surface layers.* Has the surface soil layer been removed by scraping or natural landslides? Look for bare soil surfaces with exposed plant roots or scrape scars on the surface.

    e. *Presence of man-made structures.* Are buildings, dams, levees, roads, or parking lots present?

Determine the approximate date[1] when the alteration occurred. This may require checking aerial photography, examining building permits, etc. Record on DATA FORM 3, and PROCEED TO STEP 2.

- *STEP 2 - Describe effects on soils.* Record on DATA FORM 3 a general description of how identified activities in STEP 1 have affected the soils. Consider the following:

    a. Has the soil been buried? If so, record the depth of fill and determine whether the original soil is intact.

    b. Has the soil been mixed at a depth below the A-horizon or 10 inches? If so, it will be necessary to examine soil at a depth immediately below the plowed zone. Record supporting evidence.

    c. Has the soil been sufficiently altered to change the soil phase? Describe these changes.

    PROCEED TO STEP 3.

- *STEP 3 - Characterize soils that previously occurred.* Obtain all possible evidence that may be used to characterize soils that previously occurred on the area. Consider the following potential sources of information:

    a. Soil surveys. In many cases, recent soil surveys will be available. If so, determine the soil series that were mapped for the area, and compare these soil series with the list of hydric soils ~~(Appendix D, Section 2)~~. If all soil series are listed as hydric soils, the entire area had hydric soils prior to alteration.

    b. Characterization of buried soils. When fill material has been placed over the original soil without physically disturbing the soil, examine and characterize the buried soils. To accomplish this, dig a hole through the fill material until the original soil is encountered. Determine the point at which the original soil material begins. Remove 12 inches of the original soil from the hole and look for indicators of hydric soils (Part III, paragraphs 44 and/or 45) immediately below the A-horizon or 10 inches (whichever is shallower). Record on DATA FORM 3 the color of the soil matrix, presence of an organic layer, presence of mottles or gleying, and/or presence of iron and manganese concretions. If the original soil is mottled and the

[1] It is especially important to determine whether the alteration occurred prior to implementation of Section 404.

chroma of the soil matrix is 2 or less,[1] a hydric soil was formerly present on the site. If any of these indicators are found, the original soil was a hydric soil. *(NOTE: When the fill material is a thick layer, it might be necessary to use a backhoe or posthole digger to excavate the soil pit.)* If USGS quadrangle maps indicate distinct variation in area topography, this procedure must be applied in each portion of the area that originally had a different surface elevation. Record findings on DATA FORM 3.

c. *Characterization of plowed soils.* Determine the depth to which the soil has been disturbed by plowing. Look for hydric soil characteristics (Part III, paragraphs 44 and/or 45) immediately below this depth. Record findings on DATA FORM 3.

d. *Removal of surface layers.* Dig a hole (Appendix D, Section 1) and determine whether the entire surface layer (A-horizon) has been removed. If so, examine the soil immediately below the top of the subsurface layer (B-horizon) for hydric soil characteristics. As an alternative, examine an undisturbed soil of the same soil series occurring in the same topographic position in an immediately adjacent area that has not been altered. Look for hydric soil indicators immediately below the A-horizon or 10 inches (whichever is shallower), and record findings on DATA FORM 3.

If sufficient data on soils that existed prior to alteration can be obtained to determine whether a hydric soil was present, PROCEED TO STEP 4. If not, a determination cannot be made using soils. Use the other parameters (Subsections 1 and 3) for the determination.

- *STEP 4 - Determine whether hydric soils were formerly present.* Examine the available data and determine whether indicators of hydric soils (Part III, paragraphs 44 and/or 45) were formerly present. If no indicators of hydric soils were found, the original soils were not hydric soils. If indicators of hydric soils were found, record the appropriate indicators on DATA FORM 3 and PROCEED TO Subsection 3 if the hydrology of the area has been significantly altered or return either to the appropriate subsection of Section D or to Section E and characterize the area hydrology.

[1] The matrix chroma must be 1 or less if no mottles are present. The soil must be moist when colors are determined.

Subsection 3 - Hydrology

75. Apply the following steps to determine whether wetland hydrology previously occurred:

- *STEP 1 - Describe the type of alteration.* Examine the area and describe the type of alteration that occurred. Look for evidence of:

    a. *Dams.* Has recent construction of a dam or some natural event (e.g., beaver activity or landslide) caused the area to become increasingly wetter or drier? *NOTE: This activity could have occurred a considerable distance away from the site in question.*

    b. *Levees, dikes, and similar structures.* Have levees or dikes recently been constructed that prevent the area from becoming periodically inundated by overbank flooding?

    c. *Ditching.* Have ditches been constructed recently that cause the area to drain more rapidly following inundation?

    d. *Filling of channels or depressions (land-leveling).* Have natural channels or depressions been recently filled?

    e. *Diversion of water.* Has an upstream drainage pattern been altered that results in water being diverted from the area?

    f. *Ground-water extraction.* Has prolonged and intensive pumping of ground water for irrigation or other purposes significantly lowered the water table and/or altered drainage patterns?

    g. *Channelization.* Have feeder streams recently been channelized sufficiently to alter the frequency and/or duration of inundation?

    Determine the approximate date[1] when the alteration occurred. Record observations on DATA FORM 3 and PROCEED TO STEP 2.

- *STEP 2 - Describe effects of alteration on area hydrology.* Record on DATA FORM 3 a general description of how the observed alteration (STEP 1) has affected the area. Consider the following:

    a. Is the area more frequently or less frequently inundated than prior to alteration? To what degree and why?

[1] It is especially important to determine whether the alteration occurred prior to implementation of Section 404.

b. Is the duration of inundation and soil saturation different than prior to alteration? How much different and why?

PROCEED TO STEP 3.

- *STEP 3 - Characterize the hydrology that previously existed in the area.* Obtain all possible evidence that may be used to characterize the hydrology that previously occurred. Potential sources of information include:

  a. *Stream or tidal gage data.* If a stream or tidal gaging station is located near the area, it may be possible to calculate elevations representing the upper limit of wetlands hydrology based on duration of inundation. Consult hydrologists from the local CE District Office for assistance. The resulting mean sea level elevation will represent the upper limit of inundation for the area in the absence of any alteration. If fill material has not been placed on the area, survey this elevation from the nearest USGS benchmark. Record elevations representing zone boundaries on DATA FORM 3. If fill material has been placed on the area, compare the calculated elevation with elevations shown on a USGS quadrangle or any other survey map that predated site alteration.

  b. *Field hydrologic indicators.* Certain field indicators of wetland hydrology (Part III, paragraph 49) may still be present. Look for watermarks on trees or other structures, drift lines, and debris deposits. Record these on DATA FORM 3. If adjacent undisturbed areas are in the same topographic position and are similarly influenced by the same sources of inundation, look for wetland indicators in these areas.

  c. *Aerial photography.* Examine any available aerial photography and determine whether the area was inundated at the time of the photographic mission. Consider the time of the year that the aerial photography was taken and use only photography taken during the growing season and prior to site alteration.

  d. *Historical records.* Examine any available historical records for evidence that the area has been periodically inundated. Obtain copies of any such information and record findings on DATA FORM 3.

  e. *Floodplain management maps.* Determine the previous frequency of inundation of the area from Floodplain Management Maps (if available). Record flood frequency on DATA FORM 3.

f. *Public or local government officials.* Contact individuals who might have knowledge that the area was periodically inundated.

If sufficient data on hydrology that existed prior to site alteration can be obtained to determine whether wetland hydrology was previously present, PROCEED TO STEP 4. If not, a determination involving hydrology cannot be made. Use other parameters (Subsections 1 and 2) for the wetland determination. Return to either the appropriate subsection of Section D or to Section E and complete the necessary data forms. PROCEED TO STEP 4 if the previous hydrology can be characterized.

- *STEP 4 - Determine whether wetland hydrology previously occurred.* Examine the available data and determine whether indicators of wetland hydrology (Part III, paragraph 49) were present prior to site alteration. If no indicators of wetland hydrology were found, the original hydrology of the area was not wetland hydrology. If indicators of wetland hydrology were found, record the appropriate indicators on DATA FORM 3 and return either to the appropriate subsection of Section D or to Section E and complete the wetland determination.

Subsection 4 - Man-Induced Wetlands

76. A man-induced wetland is an area that has developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities. Examples of man-induced wetlands include irrigated wetlands, wetlands resulting from impoundment (e.g., reservoir shorelines), wetlands resulting from filling of formerly deepwater habitats, dredged material disposal areas, and wetlands resulting from stream channel realignment. Some man-induced wetlands may be subject to Section 404. In virtually all cases, man-induced wetlands involve a significant change in the hydrologic regime, which may either increase or decrease the wetness of the area. Although wetland indicators of all three parameters (i.e., vegetation, soils, and hydrology) may be found in some man-induced wetlands, indicators of hydric soils are usually absent. Hydric soils require long periods (hundreds of years) for development of wetness characteristics, and most man-induced wetlands have not been in existence for a sufficient period to allow development of hydric soil characteristics. Therefore, application of the multiparameter approach in making wetland determinations in man-induced wetlands must be based on the presence of hydrophytic vegetation and wetland hydrology. [1] There must also be documented evidence that the wetland resulted from human activities. Employ the following steps to determine whether an area consists of wetlands resulting from human activities:

[1] Uplands that support hydrophytic vegetation due to agricultural irrigation and that have an obvious hydrologic connection to other "waters of the United States" should not be delineated as wetlands under this subsection.

- *STEP 1 - Determine whether the area represents a potential man-induced wetland.* Consider the following questions:

    a. Has a recent man-induced change in hydrology occurred that caused the area to become significantly wetter?

    b. Has a major man-induced change in hydrology that occurred in the past caused a former deepwater aquatic habitat to become significantly drier?

    c. Has man-induced stream channel realignment significantly altered the area hydrology?

    d. Has the area been subjected to long-term irrigation practices?

    If the answer to any of the above questions is YES, document the approximate time during which the change in hydrology occurred, and PROCEED TO STEP 2. If the answer to all of the questions is NO, procedures described in Section D or E must be used.

- *STEP 2 - Determine whether a permit will be needed if the area is found to be a wetland.* Consider the current CE regulations and policy regarding man-induced wetlands. If the type of activity resulting in the area being a potential man-induced wetland is exempted by regulation or policy, no further action is needed. If not exempt, PROCEED TO STEP 3.

- *STEP 3 - Characterize the area vegetation, soils, and hydrology.* Apply procedures described in Section D (routine determinations) or Section E (comprehensive determinations) to the area. Complete the appropriate data forms and PROCEED TO STEP 4.

- *STEP 4 - Wetland determination.* Based on information resulting from STEP 3, determine whether the area is a wetland. When wetland indicators of all three parameters are found, the area is a wetland. When indicators of hydrophytic vegetation and wetland hydrology are found *and* there is documented evidence that the change in hydrology occurred so recently that soils could not have developed hydric characteristics, the area is a wetland. In such cases, it is assumed that the soils are functioning as hydric soils. *CAUTION: If hydrophytic vegetation is being maintained only because of man-induced wetland hydrology that would no longer exist if the activity (e.g., irrigation) were to be terminated, the area should not be considered a wetland.*

Section G - Problem Areas

77. There are certain wetland types and/or conditions that may make application of indicators of one or more parameters difficult, at least at certain times of the year. These are not considered to be atypical situations. Instead, they are wetland types in which wetland indicators of one or more parameters may be periodically lacking due to *normal* seasonal or annual variations in environmental conditions that result from causes other than human activities or catastrophic natural events.

Types of problem areas

78. Representative examples of potential problem areas, types of variations that occur, and their effects on wetland indicators are presented in the following subparagraphs. Similar situations may sometimes occur in other wetland types. *NOTE: This section is not intended to bring nonwetland areas having wetland indicators of two, but not all three, parameters into Section 404 jurisdiction.*

a. *Wetlands on drumlins.* Slope wetlands occur in glaciated areas in which thin soils cover relatively impermeable glacial till or in which layers of glacial till have different hydraulic conditions that produce a broad zone of ground-water seepage. Such areas are seldom, if ever, flooded, but downslope groundwater movement keeps the soils saturated for a sufficient portion of the growing season to produce anaerobic and reducing soil conditions. This fosters development of hydric soil characteristics and selects for hydrophytic vegetation. Indicators of wetland hydrology may be lacking during the drier portion of the growing season.

b. *Seasonal wetlands.* In many regions (especially in western states), depressional areas occur that have wetland indicators of all three parameters during the wetter portion of the growing season, but normally lack wetland indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetland plant species ~~(Appendix C, Section 1 or 2)~~ normally are dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. These areas may be inundated during the wetter portion of the growing season, but wetland hydrology indicators may be totally lacking during the drier portion of the growing season. It is important to establish that an area truly is a water body. Water in a depression normally must be sufficiently persistent to exhibit an ordinary high-water mark or the presence of wetland characteristics before it can be considered as a water body potentially subject to Clean Water Act jurisdiction. The determination that an area exhibits wetland characteristics for a sufficient portion of the growing season to qualify as a wetland under the Clean Water Act must be made on a case-by-case basis. Such determinations should consider the respective length of time that the area exhibits upland and wetland characteristics, and the manner in which the area fits

into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soil, drainage characteristics, uses to which it has been subjected, and weather or hydrologic records.

c. *Prairie potholes.* Prairie potholes normally occur as shallow depressions in glaciated portions of the north-central United States. Many are landlocked, while others have a drainage outlet to streams or other potholes. Most have standing water for much of the growing season in years of normal or above normal precipitation, but are neither inundated nor have saturated soils during most of the growing season in years of below normal precipitation. During dry years, potholes often become incorporated into farming plans, and are either planted to row crops (e.g., soybeans) or are mowed as part of a haying operation. When this occurs, wetland indicators of one or more parameters may be lacking. For example, tillage would eliminate any onsite hydrologic indicator, and would make detection of soil and vegetation indicators much more difficult.

d. *Vegetated flats.* In both coastal and interior areas throughout the Nation, vegetated flats are often dominated by annual species that are categorized as OBL. Application of procedures described in Sections D and E during the growing season will clearly result in a positive wetland determination. However, these areas will appear to be unvegetated mudflats when examined during the nongrowing season, and the area would not qualify at that time as a wetland due to an apparent lack of vegetation.

Wetland determinations in problem areas

79. Procedures for making wetland determinations in problem areas are presented below. Application of these procedures is appropriate only when a decision has been made in Section D or E that wetland indicators of one or more parameters were lacking, probably due to normal seasonal or annual variations in environmental conditions. Specific procedures to be used will vary according to the nature of the area, site conditions, and parameter(s) affected by the variations in environmental conditions. A determination must be based on the best evidence available to the field inspector, including:

a. Available information (Section B).

b. Field data resulting from an onsite inspection.

c. Basic knowledge of the ecology of the particular community type(s) and environmental conditions associated with the community type.

NOTE: The procedures described below should only be applied to parameters not adequately characterized in Section D or E. Complete the following steps:

- *STEP 1 - Identify the parameter(s) to be considered.* Examine the DATA FORM 1 (Section D or E) and identify the parameter(s) that must be given additional consideration. PROCEED TO STEP 2.

- *STEP 2 - Determine the reason for further consideration.* Determine the reason why the parameter(s) identified in STEP 1 should be given further consideration. This will require a consideration and documentation of:

    a. Environmental condition(s) that have impacted the parameter(s).

    b. Impacts of the identified environmental condition(s) on the parameter(s) in question.

  Record findings in the comments section of DATA FORM 1. PROCEED TO STEP 3.

- *STEP 3 - Document available information for parameter(s) in question.* Examine the available information and consider personal ecological knowledge of the range of normal environmental conditions of the area. Local experts (e.g., university personnel) may provide additional information. Record information on DATA FORM 1. PROCEED TO STEP 4.

- *STEP 4 - Determine whether wetland indicators are normally present during a portion of the growing season.* Examine the information resulting from STEP 3 and determine whether wetland indicators are *normally* present during part of the growing season. If so, record on DATA FORM 1 the indicators normally present and return to Section D or Section E and make a wetland determination. If no information can be found that wetland indicators of all three parameters are normally present during part of the growing season, the determination must be made using procedures described in Section D or Section E.

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Appendix A
Glossary

Active water table. A condition in which the zone of soil saturation fluctuates, resulting in periodic anaerobic soil conditions. Soils with an active water table often contain bright mottles and matrix chromas of 2 or less.

Adaptation. A modification of a species that makes it more fit for existence under the conditions of its environment. These modifications are the result of genetic selection processes.

Adventitious roots. Roots found on plant stems in positions where they normally do not occur.

Aerenchymous tissue. A type of plant tissue in which cells are unusually large and arranged in a manner that results in air spaces in the plant organ. Such tissues are often referred to as spongy and usually provide increased buoyancy.

Aerobic. A situation in which molecular oxygen is a part of the environment.

Anaerobic. A situation in which molecular oxygen is absent (or effectively so) from the environment.

Aquatic roots. Roots that develop on stems above the normal position occupied by roots in response to prolonged inundation.

Aquic moisture regime. A mostly reducing soil moisture regime nearly free of dissolved oxygen due to saturation by ground water or its capillary fringe and occurring at periods when the soil temperature at 19.7 in. is greater than 5 °C.

Arched roots. Roots produced on plant stems in a position above the normal position of roots, which serve to brace the plant during and following periods of prolonged inundation.

Areal cover. A measure of dominance that defines the degree to which above-ground portions of plants (not limited to those rooted in a sample plot) cover the ground surface. It is possible for the total areal cover in a community to exceed 100 percent because (a) most plant communities consist of two or more vegetative strata; (b) areal cover is estimated by vegetative layer; and (c) foliage within a single layer may overlap.

Atypical situation. As used herein, this term refers to areas in which one or more parameters (vegetation, soil, and/or hydrology) have been sufficiently altered by recent human activities or natural events to preclude the presence of wetland indicators of the parameter.

Backwater flooding. Situations in which the source of inundation is overbank flooding from a nearby stream.

Basal area. The cross-sectional area of a tree trunk measured in square inches, square centimeters, etc. Basal area is normally measured at 4.5 ft above the ground level and is used as a measure of dominance. The most easily used tool for measuring basal area is a tape marked in square inches. When plot-less methods are used, an angle gauge or prism will provide a means for rapidly determining basal area. This term is also applicable to the cross-sectional area of a clumped herbaceous plant, measured at 1.0 in. above the soil surface.

Bench mark. A fixed, more or less permanent reference point or object, the elevation of which is known. The U.S. Geological Survey (USGS) installs brass caps in bridge abutments or otherwise permanently sets bench marks at convenient locations nationwide. The elevations on these marks are referenced to the National Geodetic Vertical Datum (NGVD), also commonly known as mean sea level (MSL). Locations of these bench marks on USGS quadrangle maps are shown as small triangles. However, the marks are sometimes destroyed by construction or vandalism. The existence of any bench mark should be field verified before planning work that relies on a particular reference point. The USGS and/or local state surveyor's office can provide information on the existence, exact location, and exact elevation of bench marks.

Biennial. An event that occurs at 2-year intervals.

Buried soil. A once-exposed soil now covered by an alluvial, loessal, or other deposit (including man-made).

Canopy layer. The uppermost layer of vegetation in a plant community. In forested areas, mature trees comprise the canopy layer, while the tallest herbaceous species constitute the canopy layer in a marsh.

Capillary fringe. A zone immediately above the water table (zero gauge pressure) in which water is drawn upward from the water table by capillary action.

Chemical reduction. Any process by which one compound or ion acts as an electron donor. In such cases, the valence state of the electron donor is decreased.

Chroma. The relative purity or saturation of a color; intensity of distinctive hue as related to grayness; one of the three variables of color.

Comprehensive wetland determination. A type of wetland determination that is based on the strongest possible evidence, requiring the collection of quantitative data.

Concretion. A local concentration of chemical compounds (e.g., calcium carbonate, iron oxide) in the form of a grain or nodule of varying size, shape, hardness, and color. Concretions of significance in hydric soils are usually iron and/or manganese oxides occurring at or near the soil surface, which develop under conditions of prolonged soil saturation.

Contour. An imaginary line of constant elevation on the ground surface. The corresponding line on a map is called a "contour line."

Criteria. Standards, rules, or tests on which a judgment or decision may be based.

Deepwater aquatic habitat. Any open water area that has a mean annual water depth >6.6 ft, lacks soil, and/or is either unvegetated or supports only floating or submersed macrophytes.

Density. The number of individuals of a species per unit area.

Detritus. Minute fragments of plant parts found on the soil surface. When fused together by algae or soil particles, this is an indicator that surface water was recently present.

Diameter at breast height (DBH). The width of a plant stem as measured at 4.5 ft above the ground surface.

Dike. A bank (usually earthen) constructed to control or confine water.

Dominance. As used herein, a descriptor of vegetation that is related to the standing crop of a species in an area, usually measured by height, areal cover, or basal area (for trees).

Dominant species. As used herein, a plant species that exerts a controlling influence on or defines the character of a community.

Drained. A condition in which ground or surface water has been reduced or eliminated from an area by artificial means.

Drift line. An accumulation of debris along a contour (parallel to the water flow) that represents the height of an inundation event.

Duration (inundation/soil saturation). The length of time during which water stands at or above the soil surface (inundation), or during which the soil is saturated. As used herein, duration refers to a period during the growing season.

Ecological tolerance. The range of environmental conditions in which a plant species can grow.

Emergent plant. A rooted herbaceous plant species that has parts extending above a water surface.

Field capacity. The percentage of water remaining in a soil after it has been saturated and after free drainage is negligible.

Fill material. Any material placed in an area to increase surface elevation.

Flooded. A condition in which the soil surface is temporarily covered with flowing water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow from high tides, or any combination of sources.

Flora. A list of all plant species that occur in an area.

Frequency (inundation or soil saturation). The periodicity of coverage of an area by surface water or soil saturation. It is usually expressed as the number of years (e.g., 50 years) the soil is inundated or saturated at least once each year during part of the growing season per 100 years or as a l-, 2-, 5-year, etc., inundation frequency.

Frequency (vegetation). The distribution of individuals of a species in an area. It is quantitatively expressed as

$$\frac{\text{Number of samples containing species A}}{\text{Total number of samples}} \times 100$$

More than one species may have a frequency of 100 percent within the same area.

Frequently flooded. A flooding class in which flooding is likely to occur often under normal weather conditions (more than 50-percent chance of flooding in any year or more than 50 times in 100 years).

Gleyed. A soil condition resulting from prolonged soil saturation, which is manifested by the presence of bluish or greenish colors through the soil mass or in mottles (spots or streaks) among other colors. Gleying occurs under re-

ducing soil conditions resulting from soil saturation, by which iron is reduced predominantly to the ferrous state.

Ground water. That portion of the water below the ground surface that is under greater pressure than atmospheric pressure.

Growing season. The portion of the year when soil temperatures at 19.7 in. below the soil surface are higher than biologic zero (5 °C) (U.S. Department of Agriculture—Soil Conservation Service 1985). For ease of determination this period can be approximated by the number of frost-free days (U.S Department of the Interior 1970).

Habitat. The environment occupied by individuals of a particular species, population, or community.

Headwater flooding. A situation in which an area becomes inundated directly by surface runoff from upland areas.

Herb. A nonwoody individual of a macrophytic species. In this manual, seedlings of woody plants (including vines) that are less than 3.2 ft in height are considered to be herbs.

Herbaceous layer. Any vegetative stratum of a plant community that is composed predominantly of herbs.

Histic epipedon. An 8- to 16-in. soil layer at or near the surface that is saturated for 30 consecutive days or more during the growing season in most years and contains a minimum of 20 percent organic matter when no clay is present or a minimum of 30 percent organic matter when 60 percent or greater clay is present.

Histosols. An order in soil taxonomy composed of organic soils that have organic soil materials in more than half of the upper 80 cm or that are of any thickness if directly overlying bedrock.

Homogeneous vegetation. A situation in which the same plant species association occurs throughout an area.

Hue. A characteristic of color that denotes a color in relation to red, yellow, blue, etc; one of the three variables of color. Each color chart in the Munsell Color Book (Munsell Color 1975) consists of a specific hue.

Hydric soil. A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (U.S. Department of Agriculture—Soil Conservation Service 1985). Hydric soils that occur in areas having positive indicators of hydrophytic vegetation and wetland hydrology are wetland soils.

Hydric soil condition. A situation in which characteristics exist that are associated with soil development under reducing conditions.

Hydrologic regime. The sum total of water that occurs in an area on average during a given period.

Hydrologic zone. An area that is inundated or has saturated soils within a specified range of frequency and duration of inundation and soil saturation.

Hydrology. The science dealing with the properties, distribution, and circulation of water.

Hydrophyte. Any macrophyte that grows in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content; plants typically found in wet habitats.

Hydrophytic vegetation. The sum total of macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. When hydrophytic vegetation comprises a community where indicators of hydric soils and wetland hydrology also occur, the area has wetland vegetation.

Hypertrophied lenticels. An exaggerated (oversized) pore on the surface of stems of woody plants through which gases are exchanged between the plant and the atmosphere. The enlarged lenticels serve as a mechanism for increasing oxygen to plant roots during periods of inundation and/or saturated soils.

Importance value. A quantitative term describing the relative influence of a plant species in a plant community, obtained by summing any combination of relative frequency, relative density, and relative dominance.

Indicator. As used in this manual, an event, entity, or condition that typically characterizes a prescribed environment or situation; indicators determine or aid in determining whether or not certain stated circumstances exist.

Indicator status. One of the categories (e.g., OBL) that describes the estimated probability of a plant species occurring in wetlands.

Intercellular air space. A cavity between cells in plant tissues, resulting from variations in cell shape and configuration. Aerenchymous tissue (a morphological adaptation found in many hydrophytes) often has large intercellular air spaces.

Inundation. A condition in which water from any source temporarily or permanently covers a land surface.

Levee. A natural or man-made feature of the landscape that restricts movement of water into or through an area.

Liana. As used in this manual, a layer of vegetation in forested plant communities that consists of woody vines. The term may also be applied to a given species.

Limit of biological activity. With reference to soils, the zone below which conditions preclude normal growth of soil organisms. This term often is used to refer to the temperature (5 °C) in a soil below which metabolic processes of soil microorganisms, plant roots, and animals are negligible.

Long duration (flooding). A flooding class in which the period of inundation for a single event ranges from 7 days to 1 month.

Macrophyte. Any plant species that can be readily observed without the aid of optical magnification. This includes all vascular plant species and mosses (e.g., *Sphagnum* spp.), as well as large algae (e.g., *Cara* spp., kelp).

Macrophytic. A term referring to a plant species that is a macrophyte.

Major portion of the root zone. The portion of the soil profile in which more than 50 percent of plant roots occur. In wetlands, this usually constitutes the upper 12 in. of the profile.

Man-induced wetland. Any area that develops wetland characteristics due to some activity (e.g., irrigation) of man.

Mapping unit. As used in this manual, some common characteristic of soil, vegetation, and/or hydrology that can be shown at the scale of mapping for the defined purpose and objectives of a survey.

Mean sea level. A datum, or "plane of zero elevation," established by averaging all stages of oceanic tides over a 19-year tidal cycle or "epoch." This plane is corrected for curvature of the earth and is the standard reference for elevations on the earth's surface. The correct term for mean sea level is the National Geodetic Vertical Datum (NGVD).

Mesophytic. Any plant species growing where soil moisture and aeration conditions lie between extremes. These species are typically found in habitats with average moisture conditions, neither very dry nor very wet.

Metabolic processes. The complex of internal chemical reactions associated with life-sustaining functions of an organism.

Method. A particular procedure or set of procedures to be followed.

Mineral soil. A soil consisting predominantly of, and having its properties determined predominantly by, mineral matter usually containing less than 20 percent organic matter.

Morphological adaptation. A feature of structure and form that aids in fitting a species to its particular environment (e.g., buttressed base, adventitious roots, aerenchymous tissue).

Mottles. Spots or blotches of different color or shades of color interspersed within the dominant color in a soil layer, usually resulting from the presence of periodic reducing soil conditions.

Muck. Highly decomposed organic material in which the original plant parts are not recognizable.

Multitrunk. A situation in which a single individual of a woody plant species has several stems.

Nonhydric soil. A soil that has developed under predominantly aerobic soil conditions. These soils normally support mesophytic or xerophytic species.

Nonwetland. Any area that has sufficiently dry conditions that indicators of hydrophytic vegetation, hydric soils, and/or wetland hydrology are lacking. As used in this manual, any area that is neither a wetland, a deepwater aquatic habitat, nor other special aquatic site.

Organic pan. A layer usually occurring at 12 to 30 in. below the soil surface in coarse-textured soils, in which organic matter and aluminum (with or without iron) accumulate at the point where the top of the water table most often occurs. Cementing of the organic matter slightly reduces permeability of this layer.

Organic soil. A soil is classified as an organic soil when it is: (1) saturated for prolonged periods (unless artificially drained) and has more than 30 percent organic matter if the mineral fraction is more than 50 percent clay, or more than 20 percent organic matter if the mineral fraction has no clay; or (2) never saturated with water for more than a few days and having more than 34 percent organic matter.

Overbank flooding. Any situation in which inundation occurs as a result of the water level of a stream rising above bank level.

Oxidation-reduction process. A complex of biochemical reactions in soil that influences the valence state of component elements and their ions. Prolonged soil saturation during the growing season elicits anaerobic conditions that shift the overall process to a reducing condition.

Oxygen pathway. The sequence of cells, intercellular spaces, tissues, and organs, through which molecular oxygen is transported in plants. Plant species having pathways for oxygen transport to the root system are often adapted for life in saturated soils.

Parameter. A characteristic component of a unit that can be defined. Vegetation, soil, and hydrology are three parameters that may be used to define wetlands.

Parent material. The unconsolidated and more or less weathered mineral or organic matter from which a soil profile develops.

Ped. A unit of soil structure (e.g., aggregate, crumb, prism, block, or granule) formed by natural processes.

Peraquic moisture regime. A soil condition in which a reducing environment always occurs due to the presence of ground water at or near the soil surface.

Periodically. Used herein to define detectable regular or irregular saturated soil conditions or inundation, resulting from ponding of ground water, precipitation, overland flow, stream flooding, or tidal influences that occur(s) with hours, days, weeks, months, or even years between events.

Permeability. A soil characteristic that enables water or air to move through the profile, measured as the number of inches per hour that water moves downward through the saturated soil. The rate at which water moves through the least permeable layer governs soil permeability.

Physiognomy. A term used to describe a plant community based on the growth habit (e.g., trees, herbs, lianas) of the dominant species.

Physiological adaptation. A feature of the basic physical and chemical activities that occurs in cells and tissues of a species, which results in it being better fitted to its environment (e.g., ability to absorb nutrients under low oxygen tensions).

Plant community. All of the plant populations occurring in a shared habitat or environment.

Plant cover. See areal cover.

Pneumatophore. Modified roots that may function as a respiratory organ in species subjected to frequent inundation or soil saturation (e.g., cypress knees).

Ponded. A condition in which water stands in a closed depression. Water may be removed only by percolation, evaporation, and/or transpiration.

Poorly drained. Soils that commonly are wet at or near the surface during a sufficient part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these conditions.

Population. A group of individuals of the same species that occurs in a given area.

Positive wetland indicator. Any evidence of the presence of hydrophytic vegetation, hydric soil, and/or wetland hydrology in an area.

Prevalent vegetation. The plant community or communities that occur in an area during a given period. The prevalent vegetation is characterized by the dominant macrophytic species that comprise the plant community.

Quantitative. A precise measurement or determination expressed numerically.

Range. As used herein, the geographical area in which a plant species is known to occur.

Redox potential. A measure of the tendency of a system to donate or accept electrons, which is governed by the nature and proportions of the oxidizing and reducing substances contained in the system.

Reducing environment. An environment conducive to the removal of oxygen and chemical reduction of ions in the soils.

Relative density. A quantitative descriptor, expressed as a percent, of the relative number of individuals of a species in an area; it is calculated by

$$\frac{\text{Number of individuals of species A}}{\text{Total number of individuals of all species}} \times 100$$

Relative dominance. A quantitative descriptor, expressed as a percent, of the relative size or cover of individuals of a species in an area; it is calculated by

$$\frac{\text{Amount}^{1} \text{ of species A}}{\text{Total amount of all species}} \times 100$$

Relative frequency. A quantitative descriptor, expressed as a percent, of the relative distribution of individuals of a species in an area; it is calculated by

$$\frac{\text{Frequency of species A}}{\text{Total frequency of all species}} \times 100$$

Relief. The change in elevation of a land surface between two points; collectively, the configuration of the earth's surface, including such features as hills and valleys.

---

[1] The "amount" of a species may be based on percent areal cover, basal area, or height.

Reproductive adaptation. A feature of the reproductive mechanism of a species that results in it being better fitted to its environment (e.g., ability for seed germination under water).

Respiration. The sum total of metabolic processes associated with conversion of stored (chemical) energy into kinetic (physical) energy for use by an organism.

Rhizosphere. The zone of soil in which interactions between living plant roots and microorganisms occur.

Root zone. The portion of a soil profile in which plant roots occur.

Routine wetland determination. A type of wetland determination in which office data and/or relatively simple, rapidly applied onsite methods are employed to determine whether or not an area is a wetland. Most wetland determinations are of this type, which usually does not require collection of quantitative data.

Sample plot. An area of land used for measuring or observing existing conditions.

Sapling/shrub. A layer of vegetation composed of woody plants <3.0 in. in diameter at breast height but greater than 3.2 ft in height, exclusive of woody vines.

Saturated soil conditions. A condition in which all easily drained voids (pores) between soil particles in the root zone are temporarily or permanently filled with water to the soil surface at pressures greater than atmospheric.

Soil. Unconsolidated mineral and organic material that supports, or is capable of supporting, plants, and which has recognizable properties due to the integrated effect of climate and living matter acting upon parent material, as conditioned by relief over time.

Soil horizon. A layer of soil or soil material approximately parallel to the land surface and differing from adjacent genetically related layers in physical, chemical, and biological properties or characteristics (e.g., color, structure, texture, etc.).

Soil matrix. The portion of a given soil having the dominant color. In most cases, the matrix will be the portion of the soil having more than 50 percent of the same color.

Soil permeability. The ease with which gases, liquids, or plant roots penetrate or pass through a layer of soil.

Soil phase. A subdivision of a soil series having features (e.g., slope, surface texture, and stoniness) that affect the use and management of the soil, but

which do not vary sufficiently to differentiate it as a separate series. These are usually the basic mapping units on detailed soil maps produced by the Soil Conservation Service.

Soil pore. An area within soil occupied by either air or water, resulting from the arrangement of individual soil particles or peds.

Soil profile. A vertical section of a soil through all its horizons and extending into the parent material.

Soil series. A group of soils having horizons similar in differentiating characteristics and arrangement in the soil profile, except for texture of the surface horizon.

Soil structure. The combination or arrangement of primary soil particles into secondary particles, units, or peds.

Soil surface. The upper limits of the soil profile. For mineral soils, this is the upper limit of the highest (Al) mineral horizon. For organic soils, it is the upper limit of undecomposed, dead organic matter.

Soil texture. The relative proportions of the various sizes of particles in a soil.

Somewhat poorly drained. Soils that are wet near enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, wet conditions high in the profile, additions of water through seepage, or a combination of these conditions.

Stilted roots. Aerial roots arising from stems (e.g., trunk and branches), presumably providing plant support (e.g., *Rhizophora mangle).*

Stooling. A form of asexual reproduction in which new shoots are produced at the base of senescing stems, often resulting in a multitrunk growth habit.

Stratigraphy. Features of geology dealing with the origin, composition, distribution, and succession of geologic strata (layers).

Substrate. The base or substance on which an attached species is growing.

Surface water. Water present above the substrate or soil surface.

Tidal. A situation in which the water level periodically fluctuates due to the action of lunar and solar forces upon the rotating earth.

Topography. The configuration of a surface, including its relief and the position of its natural and man-made features.

Transect. As used herein, a line on the ground along which observations are made at some interval.

Transition zone. The area in which a change from wetlands to nonwetlands occurs. The transition zone may be narrow or broad.

Transpiration. The process in plants by which water vapor is released into the gaseous environment, primarily through stomata.

Tree. A woody plant >3.0 in. in diameter at breast height, regardless of height (exclusive of woody vines).

Typical. That which normally, usually, or commonly occurs.

Typically adapted. A term that refers to a species being normally or commonly suited to a given set of environmental conditions, due to some feature of its morphology, physiology, or reproduction.

Unconsolidated parent material. Material from which a soil develops, usually formed by weathering of rock or placement in an area by natural forces (e.g., water, wind, or gravity).

Under normal circumstances. As used in the definition of wetlands, this term refers to situations in which the vegetation has not been substantially altered by man's activities.

Uniform vegetation. As used herein, a situation in which the same group of dominant species generally occurs throughout a given area.

Upland. As used herein, any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils, and/or hydrologic characteristics associated with wetlands. Such areas occurring within floodplains are more appropriately termed nonwetlands.

Value (soil color). The relative lightness or intensity of color, approximately a function of the square root of the total amount of light reflected from a surface; one of the three variables of color.

Vegetation. The sum total of macrophytes that occupy a given area.

Vegetation layer. A subunit of a plant community in which all component species exhibit the same growth form (e.g., trees, saplings/shrubs, herbs).

Very long duration (flooding). A duration class in which the length of a single inundation event is greater than 1 month.

Very poorly drained. Soils that are wet to the surface most of the time. These soils are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

Watermark. A line on a tree or other upright structure that represents the maximum static water level reached during an inundation event.

Water table. The upper surface of ground water or that level below which the soil is saturated with water. It is at least 6 in. thick and persists in the soil for more than a few weeks.

Wetlands. Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetland boundary. The point on the ground at which a shift from wetlands to nonwetlands or aquatic habitats occurs. These boundaries usually follow contours.

Wetland determination. The process or procedure by which an area is adjudged a wetland or nonwetland.

Wetland hydrology. The sum total of wetness characteristics in areas that are inundated or have saturated soils for a sufficient duration to support hydrophytic vegetation.

Wetland plant association. Any grouping of plant species that recurs wherever certain wetland conditions occur.

Wetland soil. A soil that has characteristics developed in a reducing atmosphere, which exists when periods of prolonged soil saturation result in anaerobic conditions. Hydric soils that are sufficiently wet to support hydrophytic vegetation are wetland soils.

Wetland vegetation. The sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. As used herein, hydrophytic vegetation occurring in areas that also have hydric soils and wetland hydrology may be properly referred to as wetland vegetation.

Woody vine. See liana.

Xerophytic. A plant species that is typically adapted for life in conditions where a lack of water is a limiting factor for growth and/or reproduction. These species are capable of growth in extremely dry conditions as a result of morphological, physiological, and/or reproductive adaptations.

Appendix B
Blank and Example Data Forms

USER NOTES: The following field data form ("Data Form, Routine Wetland Determination, 1987 COE Wetlands Delineation Manual") dated 3/92 is the HQUSACE-approved replacement for Data Form 1 given in the 1987 Manual. (HQUSACE, 6 Mar 92)

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: _____ Applicant/Owner: _____ Investigator: _____	Date: _____ County: _____ State: _____
Do Normal Circumstances exist on the site? Yes No Is the site significantly disturbed (Atypical Situation)? Yes No Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)	Community ID: _____ Transect ID: _____ Plot ID: _____

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1.			9.		
2.			10.		
3.			11.		
4.			12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). _____

Remarks:

HYDROLOGY

___ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____(in.)

Depth to Free Water in Pit: _____(in.)

Depth to Saturated Soil: _____(in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks:

SOILS

Map Unit Name
(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/ Size/Contrast	Texture, Concretions, Structure, etc.

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No	(Circle)	
Wetland Hydrology Present?	Yes	No		
Hydric Soils Present?	Yes	No		
				(Circle)
Is this Sampling Point Within a Wetland?				Yes No

Remarks:

Approved by HQUSACE 3/92

DATA FORM 1

WETLAND DETERMINATION

Applicant Name:_____ Application Number:_____ Project Name:_____

State:_____ County:_____ Legal Description: Township:_____ Range:_____

Date:_____ Plot No.:_____ Section:_____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		Herbs	
1.		7.	
2.		8.	
3.		9.	
Saplings/shrubs		Woody vines	
4.		10.	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC:____. Other indicators:_____.

Hydrophytic vegetation: Yes ____ No ____. Basis:_____.

Soil

Series and phase:_____ On hydric soils list? Yes_____; No____.

Mottled: Yes_____; No_____. Mottle color:_____; Matrix color:_____.

Gleyed: Yes_____ No_____ Other indicators:_____.

Hydric soils: Yes_____ No_____; Basis:_____.

Hydrology

Inundated: Yes_____; No_____. Depth of standing water:_____.

Saturated soils: Yes_____; No_____. Depth to saturated soil:_____.

Other indicators:_____.

Wetland hydrology: Yes_____; No_____. Basis:_____.

Atypical situation: Yes____; No_____.

Normal Circumstances? Yes_____ No_____.

Wetland Determination: Wetland_____; Nonwetland_____.

Comments:

Determined by:_____

DATA FORM 2

VEGETATION-COMPREHENSIVE DETERMINATION

Applicant Name:_____ Application No.:_____ Project Name:_____

Location:_____ Plot #:_____ Date:_____ Determined By:_____

VEGETATION LAYER

TREES	BASAL AREA	TOTAL BASAL AREA	RANK	HERBS	MIDPOINT OF % COVER CLASS	RANK
1				1		
2				2		
3				3		
4				4		
5				5		
6				6		
7				7		
8				8		
9				9		
10				10		

SAPLINGS/SHRUBS	MIDPOINT OF HEIGHT CLASS	TOTAL HEIGHT CLASS	RANK	WOODY VINES	NUMBER OF STEMS	RANK
1				1		
2				2		
3				3		
4				4		
5				5		
6				6		
7				7		
8				8		
9				9		
10				10		

DATA FORM 3

ATYPICAL SITUATIONS

Applicant Name:_____ Application Number:_____ Project Name:_____

Location:_____ Plot Number:_____ Date:_____

A. VEGETATION:

1. Type of Alteration:_____

_____

_____.

2. Effect on Vegetation:_____

_____

_____.

3. Previous Vegetation:_____

(Attach documentation) _____

_____.

4. Hydrophytic Vegetation? Yes_____No_____.

B. SOILS:

1. Type of Alteration:_____

_____

_____.

2. Effect on Soils:_____

_____

_____.

3. Previous Soils:_____

(Attach documentation) _____

_____.

4. Hydric Soils? Yes_____No_____.

C. HYDROLOGY:

1. Type of Alteration:_____

_____

_____.

2. Effect on Hydrology:_____

_____

_____.

3. Previous Hydrology:_____

(Attach documentation) _____

_____.

4. Wetland Hydrology? Yes_____No_____.

Characterized By:_____

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: John Doe Application Number: R-85-1421 Project Name: Zena Acricultural Land

State: LA County: Choctaw Legal Description: Township: 7N Range: 2E

Date: 10/08/85 Plot No.: 1-1 Section: 32

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		Herbs	
1. *Quercus lyrata*	OBL	7. *Polygonum hydropiperoides*	OBL
2. *Carya aquatica*	OBL	8. *Boehmeria cylindrica*	FACW+
3. *Gleditsia aquatica*	OBL	9. *Brunnichia cirrhosa*	--
Saplings/shurbs		Woody vines	
4. *Forestiera acuminata*	OBL	10. *Toxicodendron radicans*	FAC
5. *Planera aquatica*	OBL	11. --	--
6. --	--	12. --	--

% of species that are OBL, FACW, and/or FAC: 100%. Other indicators: --.

Hydrophytic vegetation: Yes X No ____. Basis: 50% of dominants are OBL, FACW, and/or FAC on plant list.

Soil

Series and phase: Sharkey, frequently flooded On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 5YR4/6; Matrix color: 10YR4/1.

Gleyed: Yes ____ No X. Other indicators: ____.

Hydric soils: Yes X No ____; Basis: On hydric soil list and matrix color.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: --.

Saturated soils: Yes X; No ____. Depth to saturated soil: 6".

Other indicators: Drift lines and sediment deposits present on trees.

Wetland hydrology: Yes X; No ____. Basis: Saturated soils.

Atypical situation: Yes ____; No X.

Normal Circumstances?: Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: No rain reported from area in previous two weeks.

Determined by: Zelda Schmell (Signed)

DATA FORM 2

VEGETATION-COMPREHENSIVE DETERMINATION

Applicant Name: John Doe Application No.: R-85-1421 Project Name: Zena Agricultural Land

Location: LA (Choctaw Parish) Plot #: 1-1 Date: 10/08/85 Determined By: Zelda Schmell

VEGETATION LAYER

	TREES	BASAL AREA (in^2)	TOTAL BASAL AREA	RANK
1	*Quercus lyrata*	465	1,145	1
2	*Quercus lyrata*	680		
3	*Carya aquatica*	85	243	3
4	*Carya aquatica*	120		
5	*Carya aquatica*	38		
6	*Gleditsia aquatica*	235	253	2
7	*Gleditsia aquatica*	18		
8	*Diospyros virginiana*	46	46	
9				
10				

	HERBS	MIDPOINT OF % COVER CLASS	RANK
1	*Boehmeria cylindrica*	37.5	2
2	*Polygonum hydropiperoides*	62.5	1
3	*Brunnichia ovata*	37.5	3
4	*Gleditsia aquatica* (seedling)	2.5	
5	*Eclipta alba*	2.5	
6			
7			
8			
9			
10			

	SAPLINGS/SHRUBS	MIDPOINT OF HEIGHT CLASS	TOTAL HEIGHT CLASS	RANK
1	*Forestiera acuminata*	4.5	13.0	1
2	*Forestiera acuminata*	4.5		
3	*Forestiera acuminata*	1.5		
4	*Forestiera acuminata*	2.5		
5	*Planera aquatica*	4.5	8.0	2
6	*Planera aquatica*	3.5		
7	*Carya aquatica*	1.5	1.5	
8				
9				
10				

	WOODY VINES	NUMBER OF STEMS	RANK
1	*Toxicodendron radicans*	35	1
2	(only woody vine present)		
3			
4			
5			
6			
7			
8			
9			
10			

DATA FORM 3

ATYPICAL SITUATIONS

Applicant Name: Wetland Developers, Inc. Application Number: R-85-12 Project Name: Big Canal

Location: Joshua Co., MT Plot Number: 2 Date: 10/08/85

A. VEGETATION:

1. Type of Alteration: Vegetation totally removed or covered by placement of fill from canal (1984).

2. Effect on Vegetation: None remaining.

3. Previous Vegetation: *Carex nebrascensis* - *Juncus effusus* freshwater marsh (based on contiguous plant communities and aerial photography predating fill).
(Attach documentation)

4. Hydrophytic Vegetation? Yes X No .

B. SOILS:

1. Type of Alteration: Original soil covered by 4 feet of fill material excavated from canal.

2. Effect on Soils: Original soil buried in 1984.

3. Previous Soils: Original soil examined at 10 inches below original soil surface. Soil gleyed (color notation 5Y2/0).
(Attach documentation)

4. Hydric Soils? Yes X No .

C. HYDROLOGY:

1. Type of Alteration: 4 feet of fill material placed on original surface.

2. Effect on Hydrology: Area no longer is inundated.

3. Previous Hydrology: Examination of color IR photography taken on 6/5/84 showed the area to be inundated. Gaging station data from gage 2 miles upstream indicated the area has been inundated for as much as 3 months of the growing season during 8 of the past 12 years.
(Attach documentation)

4. Wetland Hydrology? Yes X No .

Characterized By: Joe Zook

Appendix C
Vegetation

1. This appendix contains three sections. ~~Section 1 is a subset of the regional list of plants that occur in wetlands, but includes only those species having an indicator status of OBL, FACW, or FAC. Section 2 is a list of plants that commonly occur in wetlands of a given region. Since many geographic areas of Section 404 responsibility include portions of two or more plant list regions, users will often need more than one regional list; thus, Sections 1 and 2 will be published separately from the remainder of the manual. Users will be furnished all appropriate regional lists.~~

USER NOTES: CE-supplied plant lists are obsolete and have been superseded by the May 1988 version of the "National List of Plant Species that Occur in Wetlands" published by the U.S. Fish and Wildlife Service and available on the World Wide Web. (HQUSACE, 27 Aug 91)

2. Section 3, which is presented herein, describes morphological, physiological, and reproductive adaptations that can be observed or are known to occur in plant species that are typically adapted for life in anaerobic soil conditions.

Section 3 - Morphological, Physiological, and Reproductive Adaptations of Plant Species for Occurrence in Areas Having Anaerobic Soil Conditions

Morphological adaptations

3. Many plant species have morphological adaptations for occurrence in wetlands. These structural modifications most often provide the plant with increased buoyancy or support. In some cases (e.g., adventitious roots), the adaptation may facilitate the uptake of nutrients and/or gases (particularly oxygen). However, not all species occurring in areas having anaerobic soil condi-

tions exhibit morphological adaptations for such conditions. The following is a list of morphological adaptations that a species occurring in areas having anaerobic soil conditions may possess (a partial list of species with such adaptations is presented in Table Cl):

Table C1
Partial List of Species with Known Morphological Adaptations for Occurrence in Wetlands[1]

Species	Common Name	Adaptation
Acer negundo	Box elder	Adventitious roots
Acer rubrum	Red maple	Hypertrophied lenticels
Acer saccharinum	Silver maple	Hypertrophied lenticels; adventitious roots (juvenile plants)
Alisma spp.	Water plantain	Polymorphic leaves
Alternanthera philoxeroides	Alligatorweed	Adventitious roots; inflated, floating stems
Avicennia nitida	Black mangrove	Pneumatophores; hypertrophied lenticels
Brasenia schreberi	Watershield	Inflated, floating leaves
Caladium mariscoides	Twig rush	Inflated stems
Cyperus spp. (most species)	Flat sedge	Inflated stems and leaves
Eleocharis spp. (most species)	Spikerush	Inflated stems and leaves
Forestiera accuminata	Swamp privet	Multi-trunk, stooling
Fraxinus pennsylvanica	Green ash	Buttressed trunks; adventitious roots
Gleditsia aquatica	Water locust	Hypertrophied lenticels
Juncus spp.	Rush	Inflated stems and leaves
Limnobium spongia	Frogbit	Inflated, floating leaves
Ludwigia spp.	Waterprimrose	Adventitious roots; inflated floating stems
Menyanthes trifoliata	Buckbean	Inflated stems (rhizome)
Myrica gale	Sweetgale	Hypertrophied lenticels
Nelumbo spp.	Lotus	Floating leaves
Nuphar spp.	Cowlily	Floating leaves
Nymphaea spp.	Waterlily	Floating leaves
Nyssa aquatica	Water tupelo	Buttressed trunks; pneumatophores; adventitious roots
Nyssa ogechee	Ogechee tupelo	Buttressed trunks; multi-trunk; stooling
Nyssa sylvatica var. *biflora*	Swamp blackgum	Buttressed trunks
Platanus occidentalis	Sycamore	Adventitious roots
Populus deltoides	Cottonwood	Adventitious roots
Quercus laurifolia	Laurel oak	Shallow root system
Quercus palustris	Pin oak	Adventitious roots
Rhizophora mangle	Red mangrove	Pneumatophores
Sagittaria spp.	Arrowhead	Polymorphic leaves
Salix spp.	Willow	Hypertrophied lenticels; adventitious roots; oxygen pathway to roots
Scirpus spp.	Bulrush	Inflated stems and leaves
Spartina alterniflora	Smooth cordgrass	Oxygen pathway to roots
Taxodium distichum	Bald cypress	Buttressed trunks; pneumatophores

[1] Many other species exhibit one or more morphological adaptations for occurrence in wetlands. However, not all individuals of a species will exhibit these adaptations under field conditions, and individuals occurring in uplands characteristically may not exhibit them.

a. Buttressed tree trunks. Tree species (e.g., *Taxodium distichum)* may develop enlarged trunks (Figure Cl) in response to frequent inundation. This adaptation is a strong indicator of hydrophytic vegetation in non-tropical forested areas.

b. Pneumatophores. These modified roots may serve as respiratory organs in species subjected to frequent inundation or soil saturation. Cypress knees (Figure C2) are a classic example, but other species (e.g., *Nyssa aquatica, Rhizophora mangle)* may also develop pneumatophores.

Figure C1. Buttressed tree truck (bald cypress)

Figure C2. Pneumatophores (bald cypress)

c. Adventitious roots. Sometimes referred to as "water roots," adventitious roots occur on plant stems in positions where roots normally are not found. Small fibrous roots protruding from the base of trees (e.g., *Salix nigra)* or roots on stems of herbaceous plants and tree seedlings in positions immediately above the soil surface (e.g., *Ludwigia* spp.) occur in response to inundation or soil saturation (Figure C3). These usually develop during periods of sufficiently prolonged soil saturation to destroy most of the root system. *CAUTION: Not all adventitious roots develop as a result of inundation or soil saturation. For example, aerial roots on woody vines are not normally produced as a response to inundation or soil saturation.*

Figure C3. Adventitious roots

d. Shallow root systems. When soils are inundated or saturated for long periods during the growing season, anaerobic conditions develop in the zone of root growth. Most species with deep root systems cannot survive in such conditions. Most species capable of growth during periods when soils are oxygenated only near the surface have shallow root systems. In forested wetlands,

windthrown trees (Figure C4) are often indicative of shallow root systems.

Figure C4. Wind-thrown tree with shallow root system

e. *Inflated leaves, stems, or roots.* Many hydrophytic species, particularly herbs (e.g., *Limnobium spongia*, *Ludwigia* spp.) have or develop spongy (aerenchymous) tissues in leaves, stems, and/or roots that provide buoyancy or support and serve as a reservoir or passageway for oxygen needed for metabolic processes. An example of inflated leaves is shown in Figure C5.

Figure C5. Inflated leaves

f. *Polymorphic leaves.* Some herbaceous species produce different types of leaves, depending on the water level at the time of leaf formation. For example, *Alisma* spp. produce strap-shaped leaves when totally submerged, but produce broader, floating leaves when plants are emergent. *CAUTION: Many upland species also produce polymorphic leaves.*

g. *Floating leaves.* Some species (e.g., *Nymphaea* spp.) produce leaves that are uniquely adapted for floating on a water surface (Figure C6). These leaves have stomata primarily on the upper surface and a thick waxy cuticle that restricts water penetration. The presence of species with floating leaves is strongly indicative of hydrophytic vegetation.

Figure C6. Floating leaves

h. *Floating stems.* A number of species (e.g., *Alternanthera philoxeroides*) produce matted stems that have large internal air spaces when occurring in inun-

dated areas. Such species root in shallow water and grow across the water surface into deeper areas. Species with floating stems often produce adventitious roots at leaf nodes.

i. *Hypertrophied lenticels.* Some plant species (e.g., *Gleditsia aquatica*) produce enlarged lenticels on the stem in response to prolonged inundation or soil saturation. These are thought to increase oxygen uptake through the stem during such periods.

Figure C7. Multitrunk plant

k. *Multitrunks or stooling.* Some woody hydrophytes characteristically produce several trunks of different ages (Figure C7) or produce new stems arising from the base of a senescing individual (e.g., *Forestiera acuminata, Nyssa ogechee)* in response to inundation.

l. *Oxygen pathway to roots.* Some species (e.g., *Spartina alterniflora*) have a specialized cellular arrangement that facilitates diffusion of gaseous oxygen from leaves and stems to the root system.

Physiological adaptations

4. Most, if not all, hydrophytic species are thought to possess physiological adaptations for occurrence in areas that have prolonged periods of anaerobic soil conditions. However, relatively few species have actually been proven to possess such adaptations, primarily due to the limited research that has been conducted. Nevertheless, several types of physiological adaptations known to occur in hydrophytic species are discussed below, and a list of species having one or more of these adaptations is presented in Table C2. *NOTE: Since it is impossible to detect these adaptations in the field, use of this indicator will be limited to observing the species in the field and checking the list in Table C2 to determine whether the species is known to have a physiological adaptation for occurrence in areas having anaerobic soil conditions.*

Table C2
Species Exhibiting Physiological Adaptations for Occurrence in Wetlands

Species	Physiological Adaptation
Alnus incana	Increased levels of nitrate reductase; malate accumulation
Alnus rubra	Increased levels of nitrate reductase
Baccharis viminea	Ability for root growth in low oxygen tensions
Betula pubescens	Oxidizes the rhizosphere; malate accumulation
Carex arenaria	Malate accumulation
Carex flacca	Absence of ADH activity
Carex lasiocarpa	Malate accumulation
Deschampsia cespitosa	Absence of ADH activity
Filipendula ulmaria	Absence of ADH activity
Fraxinus pennsylvanica	Oxidizes the rhizosphere
Glyceria maxima	Malate accumulation; absence of ADH activity
Juncus effusus	Ability for root growth in low oxygen tensions; absence of ADH activity
Larix laricina	Slight increases in metabolic rates; increased levels of nitrate reductase
Lobelia dortmanna	Oxidizes the rhizosphere
Lythrum salicaria	Absence of ADH activity
Molinia caerulea	Oxidizes the rhizosphere
Myrica gale	Oxidizes the rhizosphere
Nuphar lutea	Organic acid production
Nyssa aquatica	Oxidizes the rhizosphere
Nyssa sylvatica var. *biflora*	Oxidizes the rhizosphere; malate accumulation
Phalaris arundinacea	Absence of ADH activity; ability for root growth in low oxygen tensions
Phragmites australis	Malate accumulation
Pinus contorta	Slight increases in metabolic rates; increased levels of nitrate reductase
Polygonum amphibium	Absence of ADH activity
Potentilla anserina	Absence of ADH activity; ability for root growth in low oxygen tensions
Ranunculus flammula	Malate accumulation; absence of ADH activity
Salix cinerea	Malate accumulation
Salix fragilis	Oxidizes the rhizosphere
Salix lasiolepis	Ability for root growth in low oxygen tensions
Scirpus maritimus	Ability for root growth in low oxygen tensions
Senecio vulgaris	Slight increases in metabolic rates
Spartina alterniflora	Oxidizes the rhizosphere
Trifolia subterraneum	Low ADH activity
Typha angustifolia	Ability for root growth in low oxygen tensions

a. *Accumulation of malate.* Malate, a nontoxic metabolite, accumulates in roots of many hydrophytic species (e.g., *Glyceria maxima*, *Nyssa sylvatica* var. *biflora*). Nonwetland species concentrate ethanol, a toxic by-product of anaerobic respiration, when growing in anaerobic soil conditions. Under such conditions, many hydrophytic species produce high concentrations of malate and unchanged concentrations of ethanol, thereby avoiding accumulation of toxic materials. Thus, species having the ability to concentrate malate instead of ethanol in the root system under anaerobic soil conditions are adapted for life in such conditions, while species that concentrate ethanol are poorly adapted for life in anaerobic soil conditions.

b. *Increased levels of nitrate reductase.* Nitrate reductase is an enzyme involved in conversion of nitrate nitrogen to nitrite nitrogen, an intermediate step in ammonium production. Ammonium ions can accept electrons as a replacement for gaseous oxygen in some species, thereby allowing continued functioning of metabolic processes under low soil oxygen conditions. Species that produce high levels of nitrate reductase (e.g., *Larix laricina*) are adapted for life in anaerobic soil conditions.

c. *Slight increases in metabolic rates.* Anaerobic soil conditions effect short-term increases in metabolic rates in most species. However, the rate of metabolism often increases only slightly in wetland species, while metabolic rates increase significantly in nonwetland species. Species exhibiting only slight increases in metabolic rates (e.g., *Larix laricina, Senecio vulgaris)* are adapted for life in anaerobic soil conditions.

d. *Rhizosphere oxidation.* Some hydrophytic species (e.g., *Nyssa sylvatica, Myrica gale*) are capable of transferring gaseous oxygen from the root system into soil pores immediately surrounding the roots. This adaptation prevents root deterioration and maintains the rates of water and nutrient absorption under anaerobic soil conditions.

e. *Ability for root growth in low oxygen tensions.* Some species (e.g., *Typha angustifolia, Juncus effusus*) have the ability to maintain root growth under soil oxygen concentrations as low as 0.5 percent. Although prolonged (>l year) exposure to soil oxygen concentrations lower than 0.5 percent generally results in the death of most individuals, this adaptation enables some species to survive extended periods of anaerobic soil conditions.

f. *Absence of alcohol dehydrogenase (ADH) activity.* ADH is an enzyme associated with increased ethanol production. When the enzyme is not functioning, ethanol production does not increase significantly. Some hydrophytic species (e.g., *Potentilla anserina, Polygonum amphibium*) show only slight increases in ADH activity under anaerobic soil conditions. Therefore, ethanol production occurs at a slower rate in species that have low concentrations of ADH.

Reproductive adaptations

5. Some plant species have reproductive features that enable them to become established and grow in saturated soil conditions. The following have been identified in the technical literature as reproductive adaptations that occur in hydrophytic species:

a. *Prolonged seed viability.* Some plant species produce seeds that may remain viable for 20 years or more. Exposure of these seeds to atmospheric oxygen usually triggers germination. Thus, species (e.g., *Taxodium distichum)* that grow in very wet areas may produce seeds that germinate only during infrequent periods when the soil is dewatered. *NOTE: Many upland species also have prolonged seed viability, but the trigger mechanism for germination is not exposure to atmospheric oxygen.*

b. *Seed germination under low oxygen concentrations.* Seeds of some hydrophytic species germinate when submerged. This enables germination during periods of early-spring inundation, which may provide resulting seedlings a competitive advantage over species whose seeds germinate only when exposed to atmospheric oxygen.

c. *Flood-tolerant seedlings.* Seedlings of some hydrophytic species (e.g., *Fraxinus pennsylvanica)* can survive moderate periods of total or partial inundation. Seedlings of these species have a competitive advantage over seedlings of flood-intolerant species.

Appendix D
Hydric Soils

1. This appendix consists of two sections. Section 1 describes the basic procedure for digging a soil pit and examining for hydric soil indicators. ~~Section 2 is a list of hydric soils of the United States.~~

Section I - Procedures for Digging a Soil Pit and Examining for Hydric Soil Indicators

Digging a soil pit

2. Apply the following procedure: Circumscribe a 1-ft-diam area, preferably with a tile spade (sharpshooter). Extend the blade vertically downward, cut all roots to the depth of the blade, and lift the soil from the hole. This should provide approximately 16 inches of the soil profile for examination. *NOTE: Observations are usually made immediately below the A-horizon or 10 in. (whichever is shallower).* In many cases, a soil auger or probe can be used instead of a spade. If so, remove successive cores until 16 inches of the soil profile have been removed. Place successive cores in the same sequence as removed from the hole. *NOTE: An auger or probe cannot be effectively used when the soil profile is loose, rocky, or contains a large volume of water (e.g., peraquic moisture regime).*

Examining the soil

3. Examine the soil for hydric soils indicators (paragraphs 44 and/or 45 of main text (for sandy soils)). *NOTE: It may not be necessary to conduct a classical characterization (e.g., texture, structure, etc.) of the soil*. Consider the hydric soil indicators in the following sequence *(NOTE: The soil examination can be terminated when a positive hydric soil indicator is found):*

Nonsandy soils.

a. Determine whether an organic soil is present (see paragraph 44 of the main text). If so, the soil is hydric.

b. Determine whether the soil has a histic epipedon (see paragraph 44 of the main text). Record the thickness of the histic epipedon on Data Form 1.

c. Determine whether sulfidic materials are present by smelling the soil. The presence of a "rotten egg" odor is indicative of hydrogen sulfide, which forms only under extreme reducing conditions associated with prolonged inundation/soil saturation.

d. Determine whether the soil has an aquic or peraquic moisture regime (see paragraph 44 of the main text). If so, the soil is hydric.

e. Conduct a ferrous iron test. A colorimetric field test kit has been developed for this purpose. A reducing soil environment is present when the soil extract turns pink upon addition of α,α'-dipyridyl.

f. Determine the color(s) of the matrix and any mottles that may be present. Soil color is characterized by three features: hue, value, and chroma. Hue refers to the soil color in relation to red, yellow, blue, etc. Value refers to the lightness of the hue. Chroma refers to the strength of the color (or departure from a neutral of the same lightness). Soil colors are determined by use of a Munsell Color Book (Munsell Color 1975).[1] Each Munsell Color Book has color charts of different hues, ranging from 10R to 5Y. Each page of hue has color chips that show values and chromas. Values are shown in columns down the page from as low as 0 to as much as 8, and chromas are shown in rows across the page from as low as 0 to as much as 8. In writing Munsell color notations, the sequence is always hue, value, and chroma (e.g., 10YR 5/2). To determine soil color, place a small portion of soil[2] in the openings behind the color page and match the soil color to the appropriate color chip. *NOTE: Match the soil to the nearest color chip.* Record on DATA FORM 1 the hue, value, and chroma of the best matching color chip. *CAUTION: Never place soil on the face or front of the color page because this might smear the color chips.* Mineral hydric soils usually have one of the following color features immediately below the A-horizon or 10 inches (whichever is shallower):

(1) Gleyed soil.

---

[1] See references at the end of the main text.

[2] The soil must be moistened if dry at the time of examination.

Determine whether the soil is gleyed. If the matrix color best fits a color chip found on the gley page of the Munsell soil color charts, the soil is gleyed. This indicates prolonged soil saturation, and the soil is highly reduced.

(2) Nongleyed soil.

(a) Matrix chroma of 2 or less in mottled soils.[1]

(b) Matrix chroma of 1 or less in unmottled soils.[1]

(c) Gray mottles within 10 in. of the soil surface in dark (black) mineral soils (e.g., Mollisols) that do not have characteristics of (a) or (b) above.

Soils having the above color characteristics are normally saturated for significant duration during the growing season. However, hydric soils with significant coloration due to the nature of the parent material (e.g., red soils of the Red River Valley) may not exhibit chromas within the range indicated above. In such cases, this indicator cannot be used.

g. Determine whether the mapped soil series or phase is on the national list of hydric soils (Section 2). *CAUTION: It will often be necessary to compare the profile description of the soil with that of the soil series or phase indicated on the soil map to verify that the soil was correctly mapped. This is especially true when the soil survey indicates the presence of inclusions or when the soil is mapped as an association of two or more soil series.*

h. Look for iron and manganese concretions. Look for small (>0.08-in.) aggregates within 3 in. of the soil surface. These are usually black or dark brown and reflect prolonged saturation near the soil surface.

Sandy soils.

Look for one of the following indicators in sandy soils:

a. A layer of organic material above the mineral surface or high organic matter content in the surface horizon (see paragraph 45*a* of the main text). This is evidenced by a darker color of the surface layer due to organic matter interspersed among or adhering to the sand particles. This is not observed in upland soils due to associated aerobic conditions.

b. Streaking of subsurface horizons (see paragraph 45*b* of the main text). Look for dark vertical streaks in subsurface horizons. These streaks

[1] The soil must be moistened if dry at the time of examination.

represent organic matter being moved downward in the profile. When soil is rubbed between the fingers, the organic matter will leave a dark stain on the fingers.

c. Organic pans (see paragraph 45*c* of the main text). This is evidenced by a thin layer of hardened soil at a depth of 12 to 30 inches below the mineral surface.

Section 2 - Hydric Soils of the United States

4. The list of hydric soils of the United States ~~(Table D1)~~ was developed by the National Technical Committee for Hydric Soils (NTCHS), a panel consisting of representatives of the Soil Conservation Service (SCS), Fish and Wildlife Service, Environmental Protection Agency, Corps of Engineers, Auburn University, University of Maryland, and Louisiana State University. Keith Young of SCS was committee chairman.

5. The NTCHS developed the following definition of hydric soils:

~~A hydric soil is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (U.S. Department of Agriculture (USDA) Soil Conservation Service 1985, as amended by the NTCHS in December 1986).~~

USER NOTES: The hydric soil definition, criteria, and hydric soil list (Table D1) published in the 1987 Corps Manual are obsolete. Current hydric soil definition, criteria, and lists are available over the World Wide Web from the U.S.D.A. Natural Resources Conservation Service (NRCS). (HQUSACE, 27 Aug 91, 6 Mar 92)

Criteria for hydric soils

6. Based on the above definition, the NTCHS developed the following criteria for hydric soils, and all soils appearing on the list will meet at least one criterion:

a. ~~All Histosols[1] except Folists;~~

b. ~~Soils in Aquic suborders, Aquic subgroups, Albolls suborder, Salorthids great group, or Pell great groups of Vertisols that are:~~

[1] Soil taxa conform to USDA-SCS (1975).

(1) Somewhat poorly drained and have water table less than 0.5 ft from the surface for a significant period (usually a week or more) during the growing season, or

(2) Poorly drained or very poorly drained and have either:

(a) A water table at less than 1.0 ft from the surface for a significant period (usually a week or more) during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within 20 inches; or

(b) A water table at less than 1.5 ft from the surface for a significant period (usually a week or more) during the growing season if permeability is less than 6.0 in/hr in any layer within 20 inches; or

c. Soils that are ponded for long duration or very long duration during part of the growing season; or

d. Soils that are frequently flooded for long duration or very long duration during the growing season.

7. The hydric soils list was formulated by applying the above criteria to soil properties documented in USDA-SCS (1975) and the SCS Soil Interpretation Records (SOI-5).

Use of the list

8. The list of hydric soils of the United States (Table D1) is arranged alphabetically by soil series. Unless otherwise specified, all phases of a listed soil series are hydric. In some cases, only those phases of a soil series that are ponded, frequently flooded, or otherwise designated as wet are hydric. Such phases are denoted in Table D1 by the following symbols in parentheses after the series name:

F - flooded

FF - frequently flooded

P - ponded

W - wet

D - depressional

9. Drained phases of some soil series retain their hydric properties even after drainage. Such phases are identified in Table D1 by the symbol "DR" in parentheses following the soil series name. In such cases, both the drained and un-

~~drained phases of the soil series are hydric.~~ *CAUTION: Be sure that the profile description of the mapping unit conforms to that of the sampled soil. Also, designation of a soil series or phase as hydric does not necessarily mean that the area is a wetland. An area having a hydric soil is a wetland only if positive indicators of hydrophytic vegetation and wetland hydrology are also present.*

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13. ABSTRACT ***(Maximum 200 words)***

This document presents approaches and methods for identifying and delineating wetlands for purposes of Section 404 of the Clean Water Act. It is designed to assist users in making wetland determinations using a multiparameter approach. Except where noted in the manual, this approach requires positive evidence of hydrophytic vegetation, hydric soils, and wetland hydrology for a determination that an area is a wetland. The multiparameter approach provides a logical, easily defensible, and technical basis for wetland determinations. Technical guidelines are presented for wetlands, deepwater aquatic habitats, and nonwetlands (uplands).

Hydrophytic vegetation, hydric soils, and wetland hydrology are also characterized, and wetland indicators of each parameter are listed.

Methods for applying the multiparameter approach are described. Separate sections are devoted to preliminary data gathering and analysis, method selection, routine determinations, comprehensive determinations, atypical situations, and problem areas. Three levels of routine determinations are described, thereby affording significant flexibility in method selection.

(Continued)

14. SUBJECT TERMS

Delineation	Methods	Vegetation
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Four appendices provide supporting information. Appendix A is a glossary of technical terms used in the manual. Appendix B contains data forms for use with the various methods. Appendix C, developed by a Federal interagency panel, contains a list of all plant species known to occur in wetlands of the region. Each species has been assigned an indicator status that describes its estimated probability of occurring in wetlands of the region. Morphological, physiological, and reproductive adaptations that enable a plant species to occur in wetlands are also described, along with a listing of some species having such adaptations. Appendix D describes the procedure for examining the soil for indicators of hydric soil conditions, and includes a national list of hydric soils developed by the National Technical Committee for Hydric Soils.

Chapter 18.43 RCW
ENGINEERS AND LAND SURVEYORS

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18.43.020 Definitions.

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18.43.033 Pro tem board members -- Limits -- Duties.

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18.43.040 Registration requirements.

18.43.050 Application -- Registration fees.

18.43.060 Examinations.

18.43.070 Certificates and seals.

18.43.075 Retired status certificate.

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18.43.930 Severability -- 1961 c 142.

NOTES:

Actions or claims for engineering and surveying services, limitations upon: RCW 4.16.300 through 4.16.320.

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Chapter 18.220 RCW
GEOLOGISTS

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Classification of Wetlands and Deepwater Habitats of the United States

By

Lewis M. Cowardin[1], Virginia Carter[2], Francis C. Golet[3], and Edward T. LaRoe[4]

U.S. Department of the Interior

Fish and Wildlife Service

Office of Biological Services

Washington, D.C. 20240

Abstract

This classification, to be used in a new inventory of wetlands and deepwater habitats of the United States, is intended to describe ecological taxa, arrange them in a system useful to resource managers, furnish units for mapping, and provide uniformity of concepts and terms. Wetlands are defined by plants (hydrophytes), soils (hydric soils), and frequency of flooding. Ecologically related areas of deep water, traditionally not considered wetlands, are included in the classification as deepwater habitats.

Systems form the highest level of the classification hierarchy; five are defined--Marine, Estuarine, Riverine, Lacustrine, and Palustrine. Marine and Estuarine Systems each have two Subsystems, Subtidal and Intertidal; the Riverine System has four Subsystems, Tidal, Lower Perennial, Upper Perennial, and Intermittent; the Lacustrine has two, Littoral and Limnetic; and the Palustrine has no Subsystems.

Within the Subsystems, Classes are based on substrate material and flooding regime, or on vegetative life form. The same Classes may appear under one or more of the Systems or Subsystems. Six Classes are based on substrate and flooding regime: (1) Rock Bottom with a substrate of bedrock, boulders, or stones; (2) Unconsolidated Bottom with a substrate of cobbles, gravel, sand, mud, or organic material; (3) Rocky Shore with the same substrates as Rock Bottom; (4) Unconsolidated Shore with the same substrates as Unconsolidated Bottom; (5) Streambed with any of the substrates; and (6) Reef with a substrate composed of the living and dead remains of invertebrates (corals, mollusks, or worms). The bottom Classes, (1) and (2) above, are flooded all or most of the time and the shore Classes, (3) and (4), are exposed most of the time. The Class Streambed is restricted to channels of intermittent streams and tidal channels that are dewatered at low tide. The life form of the dominant vegetation defines the five Classes based on vegetative form: (1) Aquatic Bed, dominated by plants that grow principally on or below the surface of the water; (2) Moss-Lichen Wetland, dominated by mosses or lichens; (3) Emergent Wetland, dominated by emergent herbaceous angiosperms; (4) Scrub-Shrub Wetland, dominated by shrubs or small trees; and (5) Forested Wetland, dominated by large trees.

The Dominance Type, which is named for the dominant plant or animal forms, is the lowest level of the classification hierarchy. Only examples are provided for this level; Dominance Types must be developed by individual users of the classification.

Modifying terms applied to the Classes or Subclasses are essential for use of the system. In tidal areas, the type and duration of flooding are described by four Water Regime Modifiers: subtidal, irregularly exposed, regularly flooded, and irregularly flooded. In nontidal areas, eight Regimes are used: permanently flooded, intermittently exposed, semipermanently flooded, seasonally flooded, saturated, temporarily flooded, intermittently flooded, and artificially flooded. A hierarchical system of Water Chemistry Modifiers, adapted from the Venice System, is used to describe the salinity of the water. Fresh waters are further divided on the basis of pH. Use of a hierarchical system of soil modifiers taken directly from U.S. soil taxonomy is also required. Special modifiers are used where appropriate: excavated, impounded, diked, partly drained, farmed, and artificial.

Regional differences important to wetland ecology are described through a regionalization that combines a system developed for inland areas by R. G. Bailey in 1976 with our Marine and Estuarine provinces.

The structure of the classification allows it to be used at any of several hierarchical levels. Special data required for detailed application of the system are frequently unavailable, and thus data gathering may be prerequisite to classification. Development of rules by the user will be required for specific map scales. Dominance Types and relationships of plant and animal communities to environmental characteristics must also be developed by users of the classification. Keys to the Systems and Classes are furnished as a guide, and numerous wetlands and deepwater habitats are illustrated and classified. The classification system is also compared with several other systems currently in use in the United States.

This resource is based on the following source (Northern Prairie Publication 0421):

Cowardin, L. M., V. Carter, F. C. Golet, E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U. S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 131pp.

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http://www.npwrc.usgs.gov/resource/1998/classwet/classwet.htm
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[1]U.S. Fish and Wildlife Service, Northern Prairie Wildlife Research Center, Jamestown, North Dakota 58401
[2]U.S. Geological Survey, Reston, Virginia 22092
[3]Department of Natural Resources Science, University of Rhode Island, Kingston, Rhode Island 02881
[4]U.S. National Oceanographic and Atmospheric Administration, Office of Coastal Zone Management, Washington, D.C. 20235

Downloading Instructions -- Instructions on downloading and extracting files from this site.

classwet.zip *(2280997 bytes)* -- **Classification of Wetlands and Deepwater Habitats of the United States**

Installation: Extract all files and open **classwet.htm** in a web browser.

Publications

Department of Ecology

Publication Summary search

TITLE	State Wetlands Delineation Manual
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This document is Washington State's official manual for delineating wetlands. Delineation manuals are used to determine the edge of a wetland based on three "parameters:" water, plants, and soil.

The purpose of this manual is to provide users with guidelines and methods to determine whether an area is a wetland and to delineate its boundaries for purposes of Section 404 of the federal Clean Water Act, the state Shoreline Management Act, or local regulations adopted under requirements of the Growth Management Act.

For the purposes of this manual, the user is provided with indicators for each parameter (from the field or other data sources) that can be used to determine if a wetland is present, and to delineate its boundaries. The indicators have been developed through the study of wetland characteristics and can be considered accurate if used and interpreted correctly.

This manual also provides the user with methods frequently used to collect, record, and interpret field data. Although the manual will provide the user with good technical information, the accuracy of a delineation is directly dependent upon the education and experience of the user. A good delineator is a person who has extensive field experience, is familiar with wetlands ecology, is knowledgeable of the region in which they are working and exercises sound and unbiased scientific and professional judgment.

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Publications index
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Chapter 16-750 WAC

STATE NOXIOUS WEED LIST AND SCHEDULE OF MONETARY PENALTIES

Compile the complete chapter as a single file. **Last Update: 11/28/01**

WAC SECTIONS

16-750-001 State noxious weed list -- Purpose.

16-750-003 Definitions.

16-750-004 Noxious weed region descriptions.

16-750-005 State noxious weed list -- Class A noxious weeds.

16-750-011 State noxious weed list -- Class B noxious weeds.

16-750-015 State noxious weed list -- Class C noxious weeds.

16-750-020 Noxious weeds -- Civil infractions -- Schedule of monetary penalties.

16-750-025 Plant monitor list -- Purpose.

16-750-100 State noxious weed control board -- Description -- Purpose.

16-750-105 State noxious weed control board -- Powers -- Duties -- Responsibilities.

16-750-110 State noxious weed control board -- Mission.

16-750-115 State noxious weed control board -- Membership.

16-750-120 State noxious weed control board -- Nominations -- Elections -- Terms of office -- Vacancies.

16-750-125 State noxious weed control board position numbers -- Eligibility for voting.

16-750-130 State noxious weed control board -- Organization.

16-750-135 State noxious weed control board -- Meetings.

16-750-140 State noxious weed control board -- Committees.

16-750-145 State noxious weed control board -- Executive secretary -- Definition.

16-750-150 State noxious weed control board -- Executive secretary -- Hiring and dismissal.

16-750-155 State noxious weed control board -- Exchange time.

16-750-160 State noxious weed control board -- Antidiscrimination clause.

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Show Dispositions Of Sections Formerly Codified In This Chapter

Washington State Wetlands Identification and Delineation Manual

WASHINGTON STATE DEPARTMENT OF ECOLOGY

March 1997

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Note to the User: This document is the wetland delineation manual that is to be used in determining wetland areas when applying state and local government regulations under the Shoreline Management Act and the Growth Management Act in Washington State. This delineation manual is a revised version of the Corps of Engineers 1987 manual (see Preface for a description of the revisions). The relevant mandatory elements of this manual have been adopted into state regulations (WAC 173-22-080). In addition to the mandatory elements, this manual contains additional background material, recommended data gathering methods, illustrations and appendices. If you have any questions about the applicability of this manual to a particular regulatory situation, consult the appropriate agency with jurisdiction.

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For more information or if you have special accommodation needs, please contact Ecology's Shorelands and Water Resources Program at (360) 407-7256.

Acknowledgments

This document is a revised version of the Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1) which was originally prepared and published by the Environmental Laboratory of the Corps Waterways Experiment Station in Vicksburg, Mississippi. The original 1987 manual was developed by a host of wetlands staff from the Corps. These revisions were prepared by Andy McMillan, Wetlands Specialist with the Washington State Department of Ecology. Extensive review and support was provided by Kathy Kunz and Chris McAuliffe of the Seattle District Corps of Engineers, Dr. Fred Weinmann of the Environmental Protection Agency, Region 10, and Charles J. Newling of Wetland Science Applications, Inc. Additional review was provided by numerous interested parties in Washington State. Flow charts and diagrams designed by Tom Leonard. Cover art by Nikki McClure.

Preface

The 1995 Washington State Legislature passed Engrossed Senate Bill 5776 which directed the Department of Ecology to "adopt a manual for the delineation of wetlands under this chapter that implements and is consistent with the 1987 manual in use on January 1, 1995, by the Corps of Engineers and the Environmental Protection Agency." This state manual is required to be used by all state agencies in the application of any state laws and regulations as well as by any city or county in the implementation of any regulations under the Growth Management Act.

The Corps' Wetlands Delineation Manual (1987) was amended and clarified in 1991 and 1992 by the Corps headquarters office to reflect more current technical information developed since the original Manual was published. The "Questions and Answers on the 1987 Manual" memo issued October 7, 1991 provided clarification on several issues related to use of the 1987 Manual. The "Clarification and Interpretation of the 1987 Manual" memo issued March 6, 1992 directs that actual changes be made in the use of the Manual. The Seattle District Corps of Engineers and the Region 10 office of the Environmental Protection Agency have also issued regional clarification guidance (see Regional guidance dated May 23, 1994). While the regional guidance does NOT change the 1987 Manual, it provides a clarification of issues often misunderstood by users. All of these guidance documents may be found in Appendix E.

This document incorporates the key provisions of these guidance documents into the text of the Manual. The Corps' 1987 Manual also includes numerous examples and references to wetland types found throughout the United States. This Washington State Manual has been revised to delete references to wetland types not found in Washington and include information and examples specific to the State of Washington. The organization, structure, and intent of the Manual remains essentially the same. **It is the intent of this document to result in the identification and delineation of the same areas as would be identified and delineated under the Corps 1987 Manual as it is currently applied in Washington state. Revisions are intended to incorporate all pertinent information into one document and to make the Manual easier to understand and apply in Washington.**

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Introduction for the Layperson

Wetlands can exist where the surface is flooded for extended periods or where there is soil saturation because the groundwater is at or near the land surface. Recurrent, sustained saturation of the upper part of the soil profile is the most basic requirement for wetlands (Lewis, 1995).

Wetlands have many distinguishing features, the most notable of which are the presence of water at or near the surface, wetland soils, and vegetation adapted to or tolerant of saturated soils (Mitsch and Gosselink, 1993). These three characteristics (wetland hydrology, hydric soils, and hydrophytic vegetation) are sometimes referred to as "parameters" or "factors." Observing evidence of the presence of each parameter (or factor), has become widely accepted as a valid way to confirm the presence or absence of wetlands. The delineation technique described in the Manual requires that the user observe evidence of hydric soils, hydrophytic vegetation, and sufficient water (or indirect evidence thereof) to cause the formation of hydric soils and the growth of hydrophytic vegetation.

A delineation manual is not meant to define a wetland, but rather to aid a delineator in applying a definition of wetlands to the landscape (Lewis, 1995). For the purposes of this Manual, the user is provided with indicators for each parameter (from the field or other data sources) that can be used to determine if a wetland is present, and to delineate its boundaries. The indicators have been developed through the study of wetland characteristics and can be considered accurate if used and interpreted correctly.

This Manual also provides the user with methods frequently used to collect, record, and interpret field data. Although the Manual will provide the user with good technical information, the accuracy of a delineation is directly dependent upon the education and experience of the user. A good delineator is a person who has extensive field experience, is familiar with wetlands ecology, is knowledgeable of the region in which they are working and exercises sound and unbiased scientific and professional judgment.

Regional experience for delineators is almost a necessity because of the variety of wetlands that appear on the landscape. Some wetlands can easily be delineated at all times of the year, some are difficult to identify because of unique characteristics, and some are difficult to identify at certain times of the year. It is frequently difficult to conclude the presence or absence of wetlands based on a single field visit at one time of the year.

Wetland identification and delineation in Washington state presents some unique challenges because of the varied geology and climate. Many Washington wetlands have highly seasonal hydrologic conditions due to seasonal variation in precipitation and prolonged summer drought. Wetlands east of the Cascade Mountains can be very different from wetlands west of the Cascades because of the different climate. Wetlands in the areas covered by continental glaciation can have very different characteristics than those in areas that were never glaciated. Lastly, human activities have significantly altered surface and groundwater hydrology, soils and vegetation in

many parts of the state. All these elements influence where wetlands are found and how they appear.

It is the purpose of this manual to provide information and methods that will allow a delineator to make an accurate wetland delineation at any time of the year. However, it must be recognized that some wetlands will be more difficult to delineate than others and that all information collected must be used in conjunction with the knowledge and experience of the delineator. The proper collection and recording of field and other supporting data is one of the most critical aspects of any wetland delineation.

Washington State Wetlands Identification and Delineation Manual

Part I: Introduction

Background

1. Recognizing the potential for continued or accelerated degradation of the Nation's waters, the US Congress enacted the Clean Water Act (hereafter referred to as the Act), formerly known as the Federal Water Pollution Control Act (33 U.S.C. 1344). The objective of the Act is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States. Section 404 of the Act authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the waters of the United States, including wetlands.

2. The 1995 Washington State Legislature enacted a bill (SSB 5776) requiring the Department of Ecology to adopt a wetland delineation manual that "implements and is consistent with the 1987 manual in use on January 1, 1995 by the United States Army Corps of Engineers and the United States Environmental Protection Agency." This manual is intended to be used in implementing the Shoreline Management Act and other applicable state statutes. The Manual is also to be used by local governments in implementing local regulations under the Growth Management Act.

3. This version of the Manual takes the original 1987 manual and incorporates the changes made by the federal government to the 1987 manual since that time. This includes the national guidance issued by the Corps in 1991 and 1992, and the regional guidance issued by the Corps and EPA in 1994. All other changes are of two types: 1) additional language added to assist the user in applying the manual to the variety of situations found in the state of Washington; or 2) cosmetic changes of material irrelevant to Washington. Since the original 1987 manual was developed for use throughout the United States, it contains many references that do not apply to our state. Where appropriate, references to species or situations found in Washington have been added.

Purpose and Objectives

Purpose

4. The purpose of this manual is to provide users with guidelines and methods to determine whether an area is a wetland and to delineate its boundaries for purposes of Section 404 of the

Clean Water Act, the Shoreline Management Act and other applicable state laws, or local regulations adopted under requirements of the Growth Management Act.

Objectives

5. Specific objectives of the manual are to:

   a. Present criteria for identifying wetlands and distinguishing them from aquatic habitats and other nonwetlands.*
   b. Provide methods for applying the criteria.
   c. Provide supporting information useful in applying the criteria.

Scope

6. This manual is intended to assist users in identifying areas that meet the definition of wetlands found in state law (Shoreline Management Act, Growth Management Act) and the regulations of the federal Clean Water Act. Use of this manual is intended to identify the same areas identified in the Corps of Engineers 1987 Wetlands Delineation Manual and subsequent revisions. For purposes of the Clean Water Act this manual is limited in scope to wetlands that are a subset of "waters of the United States" and thus subject to Section 404. The term "waters of the United States" has broad meaning and incorporates both deepwater aquatic habitats and special aquatic sites, including wetlands (Federal Register 1982), as follows:

   a. The territorial seas with respect to the discharge of fill material.

   b. Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands.

   c. Tributaries to navigable waters of the United States, including adjacent wetlands.

   d. Interstate waters and their tributaries, including adjacent wetlands.

   e. All others waters of the United States not identified above, such as isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not a part of a tributary system to interstate waters or navigable waters of the United States, the degradation or destruction of which could affect interstate commerce.

   Determination that a water body or wetland is subject to interstate commerce and therefore is a "water of the United States" for purposes of federal jurisdiction shall be made independently of procedures described in this manual.

---

* Definitions of terms used in this manual are presented in the Glossary, Appendix A.

Special aquatic sites

7. The Environmental Protection Agency (EPA) identifies six categories of special aquatic sites in their Section 404 b.(l) guidelines (Federal Register 1980), including:

   a. Sanctuaries and refuges.
   b. Wetlands.
   c. Mudflats.
   d. Vegetated shallows.
   e. Coral reefs.
   f. Riffle and pool complexes.

   Although all of these special aquatic sites are subject to provisions of the Clean Water Act, this manual considers only wetlands. By definition (see paragraph 26a), wetlands are vegetated. Thus, unvegetated special aquatic sites (e.g. mudflats lacking macrophytic vegetation) are not covered in this manual.

Relationship to wetland classification systems

8. The technical approach for identifying and delineating wetlands does not constitute a classification system. It provides a basis for determining whether a given area is a wetland for purposes of federal, state and local regulations without attempting to classify it by wetland type. Different classification systems have been developed for wetlands, including the Cowardin system (Cowardin, 1979) for inventorying wetlands and the Hydrogeomorphic system (Brinson, 1993) for use with wetland function assessment approaches.

Organization

9. This manual consists of four parts and five appendices. PART I presents the background, purpose and objectives, scope, organization, and use of the manual. PART II focuses on the criteria for wetlands, and stresses the need for considering all three parameters (vegetation, soils, and hydrology) when making wetland determinations and delineations. Since wetlands occur in an intermediate position along the hydrologic gradient, comparative criteria are also presented for deepwater aquatic sites and nonwetlands. PART III contains general information on hydrophytic vegetation, hydric soils, and wetland hydrology. Positive wetland indicators of each parameter are included. PART IV, which presents methods for applying the criteria for wetlands, is arranged in a format that leads to a logical determination of whether a given area is a wetland. Section A contains general information related to application of methods. Section B outlines preliminary data-gathering efforts. Section C discusses two approaches (routine and comprehensive) for making wetland determinations, and presents criteria for deciding the correct approach to use. Sections D and E describe detailed procedures for making routine and comprehensive determinations, respectively. The basic procedures are described in a series of steps that lead to a wetland determination. All of the methods presented in PART IV are optional. The methods presented in PART IV are all valid methods which have been found to

be effective in identifying wetland indicators. However, the user is free to use any scientifically valid method to determine if a wetland indicator is present. If a user has any questions about appropriate methods s/he should consult with the agency with jurisdiction.

10. The manual also describes (PART IV, Section F Atypical Situations) methods for delineating wetlands in which the vegetation, soils, and/or hydrology have been altered by recent human activities or natural events, as discussed below:

    a. The definition of wetlands (paragraph 26a) contains the phrase "under normal circumstances," which was included because there are instances in which the vegetation in a wetland has been inadvertently or purposely removed or altered as a result of recent natural events or human activities. Other examples of human alterations that may affect wetlands are draining, ditching, levees, deposition of fill, irrigation, and impoundments. When such activities occur, an area may fail to meet the diagnostic criteria for a wetland. Likewise, positive hydric soil indicators may be absent in some recently created wetlands. In such cases, an alternative method must be employed in making wetland determinations. A suggested method is outlined in Section F. These atypical situations occur when natural events or human actions alter a wetland so that one or more of the three parameters are difficult to determine. If the alteration is a natural event or a lawful, human action that has altered the hydrology of the site **so that wetland conditions no longer exist**, then the site should be identified as a non-wetland.

    b. Natural events may also result in sufficient modification of an area such that indicators of one or more wetland parameters are absent. For example, changes in a river course may significantly alter hydrology, or beaver dams may create new wetland areas that lack hydric soil conditions. Catastrophic events (e.g. fires, avalanches, mudslides, and volcanic activities) may also alter or destroy wetland indicators on a site.

    Such atypical situations occur throughout Washington, and all of these cannot be specifically identified in this manual.

11. Certain wetland types, under the extremes of normal seasonal or annual variability, may not always meet all the wetland criteria defined in the Manual. An example is seasonal wetlands that may lack hydrophytic vegetation and/or wetland hydrology during the dry season. Such areas are discussed in PART IV, Section G, Problem Areas, and guidance is provided for making wetland determinations in these areas. However, such wetland areas may warrant additional research to refine methods for their delineation. Specific information on wetland types known to be difficult to identify in Washington state has been added to that section.

12. Appendix A is a glossary of technical terms used in the Manual. Definitions of some terms were taken from other technical sources, but most terms are defined according to the manner in which they are used in this Manual.

13. Data forms for methods presented in PART IV are included in Appendix B.

14. Supporting information is presented in Appendices C and D. Appendix C describes morphological, physiological, and reproductive adaptations associated with hydrophytic species. Appendix D discusses procedures for examining soils for hydric soil indicators.

Use

15. This manual is for use by individuals needing to identify and delineate wetlands for federal, state or local regulatory purposes. [For determining federal jurisdiction on agricultural lands, the Natural Resources Conservation Service uses the Food Security Act Manual, Third Edition (180-V-NFSAM, Third Ed., March 1994) to identify and delineate wetlands. This manual is similar to the 1987 Corps of Engineers manual but does have some differences.]

The user is directed through a series of steps that involve gathering of information and decision-making, ultimately leading to a wetland determination. A general flow diagram of activities leading to a determination is presented in Figure 1. However, not all activities identified in Figure 1 will be required for each wetland determination. For example, if a decision is made to use a routine determination procedure, comprehensive determination procedures need not be employed.

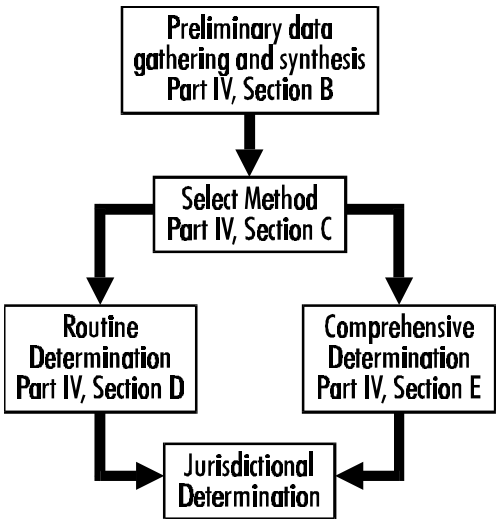

Figure 1 General schematic diagram of activities leading to a wetland/nonwetland determination.

Premise for use of the Manual

16. Three key provisions of the definition of wetlands (see paragraph 26a) include:

    a. Inundated or saturated soil conditions resulting from permanent or periodic inundation or saturation by ground water or surface water.
    b. A prevalence of vegetation typically adapted for life in saturated soil conditions (hydrophytic vegetation).
    c. The presence of "normal circumstances."

17. **Explicit in the definition is the consideration of three environmental parameters: hydrology, soil, and vegetation. Positive wetland indicators of all three parameters are normally present in wetlands. Although vegetation is often the most readily observed parameter, sole reliance on vegetation or either of the other parameters as the determinant of wetlands can sometimes be misleading.** Many plant species can grow successfully in both wetlands and nonwetlands, and hydrophytic vegetation and hydric soils may persist for decades following alteration of hydrology that will render an area a nonwetland. The presence of hydric soils and wetland hydrology indicators in addition to vegetation indicators will provide a logical, easily defensible, and technical basis for the presence of wetlands. The combined use of indicators for all three parameters will enhance the technical accuracy, consistency, and credibility of wetland determinations. Therefore, all three parameters were used in developing the criteria for wetlands and all approaches for applying the criteria embody the multiparameter concept.

Approaches

18. The approach used for wetland delineations will vary, based primarily on the complexity of the area in question. Two basic approaches described in the manual are (a) routine and (b) comprehensive.

19. **Routine approach.** The routine approach normally will be used in the vast majority of determinations. The routine approach requires minimal level of effort, using primarily qualitative procedures. This approach can be further subdivided into three levels of required effort, depending on the complexity of the area and the amount and quality of preliminary data available. The following levels of effort may be used for routine determinations:

    a. **Level 1 - Onsite inspection unnecessary.** (PART IV, Section D, Subsection 1).

    b. **Level 2 - Onsite inspection necessary.** (PART IV, Section D, Subsection 2).

    c. **Level 3 - Combination of Levels 1 and 2.** (PART IV, Section D, Subsection 3).

20. **Comprehensive approach.** The comprehensive approach requires application of quantitative procedures for making wetland determinations. It should seldom be necessary, and its use should be restricted to situations in which the wetland is very complex. Application of the

comprehensive approach (PART IV, Section E) requires a greater level of expertise than application of the routine approach, and only experienced field personnel with sufficient training should use this approach.

Flexibility

21. Procedures described for both routine and comprehensive wetland determinations have been tested and found to be reliable. However, site-specific conditions may require modification of field procedures. For example, slope configuration in a complex area may necessitate modification of the baseline and transect positions or the shape of sampling plots. Since specific characteristics (e.g. plant density) of a given plant community may necessitate the use of alternative methods for determining the dominant species, the user has the flexibility to employ sampling procedures other than those described. However, the basic approach for making wetland determinations should not be altered (i.e. the determination should be based on the dominant plant species, soil characteristics, and hydrologic characteristics of the area in question). The user should document reasons for using a different characterization procedure than described in the Manual. *CAUTION: Application of methods described in the manual or the use of modified sampling procedures requires that the user be familiar with wetlands of the area and use his/her training, experience, and good judgment in making wetland determinations.*

Part II: Technical Criteria

22. The interaction of hydrology, vegetation, and soil results in the development of characteristics unique to wetlands. Therefore, the following criteria for wetlands are based on these three parameters.

23. Because wetlands may be bordered by both wetter areas (aquatic habitats) and by drier areas (nonwetlands), guidelines are presented for wetlands, deepwater aquatic habitats, and nonwetlands. However, procedures for applying the criteria for deepwater aquatic habitats and nonwetlands are not included in the manual.

24. The following definition of wetlands includes the language found in the federal Clean Water Act regulations. It also includes additional language found in the Shoreline Management Act (SMA) and Growth Management Act (GMA) which specifically excludes several types of "artificial" wetlands. Many of these areas specifically excluded in the definition will meet the technical requirements for being a wetland (i.e. will meet all three criteria). This manual identifies all areas that meet the necessary wetland criteria and does not attempt to distinguish these "artificial" wetlands. If necessary, the user will need to independently determine if a wetland as identified by this manual fits in any of the categories of "artificial" wetlands specifically excluded in the SMA/GMA definition.

Wetlands

25. The following definition, criteria, and technical approach comprise a guideline for the identification and delineation of wetlands:

    a. Definition. The Corps of Engineers (CE) (Federal Register 1982), the Environmental Protection Agency (EPA) (Federal Register 1985), the Shoreline Management Act (SMA) and the Growth Management Act (GMA) all define wetlands as: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. In addition, the SMA and GMA definitions add: "Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas to mitigate the conversion of wetlands."

b. Wetlands meet the following criteria:

(1) **Vegetation.** The prevalent vegetation consists of macrophytes that are typically adapted to areas having hydrologic and soil conditions described in a above. Hydrophytic species, due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions.* Indicators of vegetation associated with wetlands are listed in paragraph 35.

(2) **Soil.**

a. "All Histosols** except Folists; or

b. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Pachic subgroups, or Cumulic subgroups that are:

(1) Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or

(2) Poorly drained or very poorly drained and have either:

(a) A water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches(in), or for other soils

(b) A water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour in all layers within 20 in, or

(c) the water table is at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/hour in any layer within 20 in, or

c. Soils that are frequently ponded for long or very long duration during the growing season; or

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* Species (e.g. *Alnus rubra*) having broad ecological tolerances can occur in both wetlands and nonwetlands.

** Soil nomenclature follows Keys to Soil Taxonomy (current edition).

d. Soils that are frequently flooded for long duration or very long duration during the growing season."

(3) **Hydrology.** Areas which are inundated and/or saturated to the surface for a consecutive number of days for more than 12.5 percent of the growing season* are wetlands, provided the soil and vegetation parameters are met. Areas inundated or saturated to the surface for a consecutive number of days between 5 percent and 12.5 percent of the growing season in most years (see Table 3) may or may not be wetlands. Areas inundated or saturated to the surface for less than 5 percent of the growing season are non-wetlands. Wetland hydrology exists if field indicators are present as described in Part III below.

c. **Technical approach for the identification and delineation of wetlands.** Except in certain situations defined in this manual, evidence of at least one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination.

Deepwater Aquatic Habitats

26. The following definition, criteria, and technical approach comprise a guideline for deepwater aquatic habitats:

a. **Definition.** Deepwater aquatic habitats are areas that are permanently inundated at mean annual water depths >6.6 ft or permanently inundated areas ≤6.6 ft in depth that do not support rooted-emergent or woody plant species.**

b. **Criteria.** Deepwater aquatic habitats meet the following criteria:

(1) **Vegetation.** No rooted-emergent or woody plant species are present in these permanently inundated areas.

(2) **Soil.** The substrate technically is not defined as a soil if the mean water depth is >6.6 ft or if it will not support rooted emergent or woody plants.

(3) **Hydrology.** The area is permanently inundated at mean water depths >6.6 ft.

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* The period of inundation or soil saturation varies according to the hydrologic/soil moisture regime and occurs in both tidal and nontidal situations.

** Areas ≤6.6 ft mean annual depth that support only submergent aquatic plants are vegetated shallows, not wetlands.

c. **Technical approach for the identification and delineation of deepwater aquatic habitats.** When any one of the criteria identified in b above is present, the area is a deepwater aquatic habitat.

Nonwetlands

27. The following definition, criteria, and technical approach comprise a guideline for the identification and delineation of nonwetlands:

a. **Definition**. Nonwetlands include uplands and lowland areas that are neither deepwater aquatic habitats, wetlands, nor other special aquatic sites. They are seldom or never inundated, or if frequently inundated, they have saturated soils for only brief periods during the growing season, and, if vegetated, they normally support a prevalence of vegetation typically adapted for life only in aerobic soil conditions.

b. **Criteria.** Nonwetlands meet the following criteria:

(1) **Vegetation.** The prevalent vegetation consists of plant species that are typically adapted for life only in aerobic soils. These mesophytic and/or xerophytic macrophytes cannot persist in predominantly anaerobic soil conditions.*

(2) **Soil.** Soils, when present, are not classified as hydric, and possess characteristics associated with aerobic conditions.

(3) **Hydrology.** Although the soil may be inundated or saturated by surface water or ground water periodically during the growing season of the prevalent vegetation, the average annual duration of inundation or soil saturation does not preclude the occurrence of plant species typically adapted for life in aerobic soil conditions.

c. **Technical approach for the identification and delineation of nonwetlands.** When any one of the criteria identified in b above is present, the area is a nonwetland.

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* Some species, due to their broad ecological tolerances, can occur in both wetlands and nonwetlands (e.g. *Alnus rubra*).

Part III: Characteristics And Indicators Of Hydrophytic Vegetation, Hydric Soils, And Wetland Hydrology

NOTE: Except in certain situations defined in this manual, evidence of at least one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination.

Hydrophytic Vegetation

Definition

28. **Hydrophytic vegetation.** Hydrophytic vegetation is defined herein as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present. The vegetation occurring in a wetland may consist of more than one **plant community** (species association). The plant community concept is followed throughout the manual. Emphasis is placed on the assemblage of plant species that exert a controlling influence on the character of the plant community, rather than on indicator species. Thus, the presence of scattered individuals of an upland plant species in a community dominated by hydrophytic species is not a sufficient basis for concluding that the area is an upland community. Likewise, the presence of a few individuals of a hydrophytic species in a community dominated by upland species is not a sufficient basis for concluding that the area has hydrophytic vegetation. *CAUTION: In determining whether an area is "vegetated", users must consider the density of vegetation at the site being evaluated. While it is not possible to develop a numerical method to determine how many plants or how much biomass is needed to establish an area as being vegetated or unvegetated, it is intended that the predominant condition of the site be used to make that characterization. This concept applies to areas grading from wetland to upland, and from wetland to other waters. This limitation would not necessarily apply to areas which have been disturbed by humans or recent natural events.*

29. **Prevalence of vegetation.** The definition of wetlands (paragraph 26a) includes the phrase "Prevalence of vegetation." **Prevalence**, as applied to vegetation, is an imprecise, seldom-used ecological term. As used in the wetlands definition, prevalence refers to the plant community or communities that occur in an area at some point in time. Prevalent vegetation is characterized by the dominant species comprising the plant community or communities. **Dominant** plant species are those that contribute more to the character of a plant community than other species present, as estimated or measured in terms of some ecological parameter or parameters. The two most commonly used estimates of dominance are basal area (trees) and percent areal cover

(shrubs and herbs). Hydrophytic vegetation is prevalent in an area when the dominant species comprising the plant community or communities are typically adapted for life in saturated soil conditions.

30. **Typically adapted.** The term "typically adapted" refers to a species being normally or commonly suited to a given set of environmental conditions, due to some morphological, physiological, or reproductive adaptation (Appendix C, Section 3). As used in the wetlands definition, the governing environmental conditions for hydrophytic vegetation are saturated soils resulting from periodic inundation or saturation by surface or ground water. These periodic events must occur for sufficient duration to result in anaerobic soil conditions. When the dominant species in a plant community are typically adapted for life in anaerobic soil conditions, hydrophytic vegetation is present. Species listed in Appendix C, Section 1 or 2, that have an indicator status of OBL, FACW, or FAC (Table 1) are considered to be typically adapted for life in anaerobic soil conditions (see paragraph 35a).

Influencing factors

31. Many factors (e.g. light, temperature, soil texture and permeability, human-induced disturbance, etc.) influence the character of hydrophytic vegetation. However, hydrologic factors exert an overriding influence on species that can occur in wetlands. Plants lacking morphological, physiological, and/or reproductive adaptations cannot grow, effectively compete, reproduce, and/or persist in areas that are subject to prolonged inundation or saturated soil conditions.

Geographic diversity

32. Many hydrophytic vegetation types occur in Washington state due to the diversity of interactions among various factors that influence the distribution of hydrophytic species. General climate and flora contribute greatly to regional variations in hydrophytic vegetation. Consequently, the same associations of hydrophytic species occurring in the Olympic Peninsula are not found in the Columbia Basin. In addition, local environmental conditions (e.g. local climate, hydrologic regimes, soil type, salinity, etc.) may result in broad variations in hydrophytic associations within a given region. For example, a coastal saltwater marsh will consist of different species than an inland freshwater marsh in the same region.

Classification

33. Numerous efforts have been made to classify hydrophytic vegetation. Most systems are based on general characteristics of the dominant species occurring in each vegetation type. These range from the use of general physiognomic categories (e.g. overstory, subcanopy, ground cover, vines) to specific vegetation types (e.g. forest type numbers as developed by the Society of American Foresters). In other cases, vegetational characteristics are combined with hydrologic features to produce more elaborate systems. One example of such a system was developed for the FWS by Cowardin et al. (1979).

Table 1

Plant Indicator Status Categories*

Indicator Category	Indicator Symbol	Definition
OBLIGATE WETLAND PLANTS	OBL	Plants that almost always occur (estimated probability >99%) in wetlands under natural conditions, but which may also occur rarely (estimated probability <1%) in nonwetlands. Examples: *Typha latifolia, Lysichitum americanum*
FACULTATIVE WETLAND PLANTS	FACW	Plants that usually occur (estimated probability 67% to 99%) in wetlands, but also occur (estimated probability 1% to 33% in nonwetlands). Examples: *Fraxinus latifolia Cornus stolonifera.*
FACULTATIVE PLANTS	FAC**	Plants with a similar likelihood (estimated probability 34% to 66%) of occurring in both wetlands and nonwetlands. Examples: *Alnus rubra, Rubus spectabilis*
FACULTATIVE UPLAND PLANTS	FACU	Plants that sometimes occur (estimated probability 1% to <33%) in wetlands, but occur more often (estimated probability 67% to 99%) in nonwetlands. Examples: *Acer macrophyllum, Rubus discolor*
OBLIGATE UPLAND PLANTS	UPL	Plants that rarely occur (estimated probability <1%) in wetlands, but occur almost always (estimated probability >99%) in nonwetlands under natural conditions.

* Categories were originally developed and defined by the USFWS National Wetlands Inventory and subsequently modified by the National Plant List Panel. The three facultative categories are subdivided by (+) and (-) modifiers (see Reed 1988 and 1993).

** FAC+ species are considered to have a somewhat greater estimated probability of occurring in wetlands than FAC species, while FAC- species are considered to have a somewhat lesser estimated probability of occurring in wetlands than FAC species.

Indicators of hydrophytic vegetation

34. Several indicators may be used to determine whether hydrophytic vegetation is present on a site. However, the presence of a single individual of a hydrophytic species does not mean that hydrophytic vegetation is present. The strongest case for the presence of hydrophytic vegetation can be made when several indicators, such as those in the following list, are present. However, any one of the following is indicative that hydrophytic vegetation is present.* One of the most common errors made in delineating wetlands has been to assume that the first indicator (a) must be met in every case. This has led to some wetland areas being called non-wetland. Keep in mind that any of the following indicators may be used to meet the vegetation criteria. However, when using any indicator other than (a) it is important to have solid documentation of wetland hydrology and hydric soils.

a. **More than 50 percent of the dominant species are OBL, FACW+, FACW, FACW-, FAC+, or FAC** (Table 1) on lists of plant species that occur in wetlands.** A national interagency panel has prepared a National List of Plant Species that Occur in Wetlands (Reed 1988a). This list categorizes species according to their affinity for occurrence in wetlands. [Regional subset lists of the national list, include a list for the northwest (Reed 1988b).]In addition, a 1993 supplement to the plants species list for Region 9 (Northwest) has been prepared (Reed 1993). Be sure to consult this supplement or any more recent supplements to confirm that a species has the proper indicator status. (The Seattle District of the Corps does not use the FAC neutral option as an indicator of hydrophytic vegetation but does allow the use the FAC neutral option as an indicator of hydrology and soils. See Hydrology indicator # 10, p. for definition)

b. **Other indicators.** Although there are several other indicators of hydrophytic vegetation, it will seldom be necessary to use them. However, they may provide additional useful information to strengthen a case for the presence of hydrophytic vegetation. Additional training and/or experience may be required to employ these indicators.

(1) **Visual observation of plant species growing in areas of prolonged inundation and/or soil saturation.** This indicator can only be applied by experienced personnel who have accumulated information through several years of field experience and written documentation (field notes) that certain

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* Indicators are listed in order of decreasing reliability. Although all are valid indicators, some are stronger than others. When a decision is based on an indicator appearing in the lower portion of the list, re-evaluate the parameter to ensure that the proper decision was reached.

** FAC- species do not count as FAC species for the purposes of meeting indicator a. Only FAC, FAC+, FACW (+,-) and OBL species count.

species commonly occur in areas of prolonged (>12.5 percent) inundation and/or soil saturation during the growing season. In certain situations, areas with wetland hydrology and hydric soils may be dominated by plant species classified as facultative upland. The most common examples in Washington are Western Hemlock forested wetlands and wet meadows planted with pasture grasses. It is important to keep in mind that facultative upland species are found in wetlands up to 33% of the time and, under certain circumstances, they can be the dominant species in a wetland plant community. Usually, however, FACU species are found in uplands. Thus, if you encounter a situation where the hydrology and soil parameters are **clearly** met, do not eliminate the area from consideration as a wetland based on a lack of prevalence of facultative or wetter vegetation. Species such *as Gaultheria shallon, Acer circinatum,* and *Pteridium aquilinum* may be found in these areas, often on hummocks or downed logs or stumps. More typical wetland species may occur in such areas, though often as non-dominants. Thus, occurrence of species commonly observed in other wetland areas provides a strong indication that hydrophytic vegetation is present. If you have strong evidence that the hydrology and soil parameters are met then the vegetation is acting as a hydrophyte and the area is probably a wetland. *CAUTION: It is necessary to have good documentation that the area experiences prolonged inundation and/or saturation in order to call it a wetland. The presence of standing water or saturated soil on a site at a single point in time or for short periods is insufficient evidence that the species present are able to tolerate long periods of inundation. The user must relate the observed species to other similar situations and determine whether they are normally found in wet areas, taking into consideration the season and immediately preceding weather conditions. If you encounter this situation, you may be dealing with an atypical situation (see Part IV, Section F) or a problem area (see Part IV, Section G).*

(2) **Morphological adaptations.** Some hydrophytic species have easily recognized physical characteristics that indicate their ability to occur in wetlands. A given species may exhibit several of these characteristics, but not all hydrophytic species have evident morphological adaptations. A list of such morphological adaptations is provided in Appendix C.

(3) **Technical literature.** The technical literature may provide a strong indication that plant species comprising the prevalent vegetation are commonly found in areas where soils are periodically saturated for long periods. Sources of available literature include:

(a) **Taxonomic references.** Such references usually contain at least a general description of the habitat in which a species occurs. A habitat description such as, "Occurs in water of streams and lakes and in alluvial floodplains subject to periodic flooding," supports a conclusion

that the species typically occurs in wetlands. Examples of some useful taxonomic references are provided in Table 2.

(b) **Botanical journals.** Some botanical journals contain studies that define species occurrence in various hydrologic regimes. Examples of such journals include: **Ecology**, **Ecological Monographs**, **American Journal of Botany, Journal of American Forestry**, and **Wetlands: The Journal of the Society of Wetland Scientists.**

(c) **Technical reports.** Governmental agencies periodically publish reports (e.g. literature reviews) that contain information on plant species occurrence in relation to hydrologic regimes. Examples of such publications include the CE preliminary regional wetland guides published by the US Army Engineer Waterways Experiment Station (WES) and the wetland community and estuarine profiles of various habitat types published by the FWS.

(d) **Technical workshops, conferences, and symposia.** Publications resulting from periodic scientific meetings contain valuable information that can be used to support a decision regarding the presence of hydrophytic vegetation. These usually address specific regions or wetland types.

(e) **Wetland plant database.** The National Wetland Inventory is producing a Plant Database that contains habitat information on over 6,700 plant species that occur at some estimated probability in wetlands, as compiled from the technical literature.

(4) **Physiological adaptations.** Physiological adaptations include any features of the metabolic processes of plants that make them particularly fitted for life in saturated soil conditions. *NOTE: It is impossible to detect the presence of physiological adaptations in plant species during onsite visits.* Physiological adaptations known for hydrophytic species are listed and discussed in Appendix C,.

(5) **Reproductive adaptations.** Some plant species have reproductive features that enable them to become established and grow in saturated soil conditions. Reproductive adaptations known for hydrophytic species are presented in Appendix C.

Table 2

List of Some Useful Taxonomic References

Title	Author(s)
Gray's Manual of Botany, 8th edition	Fernald (1950)
Flora of the Pacific Northwest	Hitchcock and Cronquist (1973)
A California Flora	Munz and Keck (1959)
Intermountain Flora - Vascular Plants of the Intermountain West, USA - Vols I and II	Cronquist et al. (1972)
Flora of Idaho	Davis (1952)
Manual of Grasses of the United States	Hitchcock (1950)
Plants of the Pacific Northwest Coast	Pojar and MacKinnon (1994)
Higher Plants of California, The Jepson Manual	Hickman (Ed.) (1993)
Mountain Plants of the Pacific Northwest	Taylor and Douglas (1995)
Weeds of the West	Whitson (Ed.) (1992)
Wetland Plants of the Pacific Northwest	Weinmann, F.C. et al, USACE, Seattle District (1985)
Trees, Shrubs, and Flowers to Know in Washington and British Columbia	Lyons and Merilees (1995)
Western Wetland Flora, Field Office Guide to Plant Species	USDA-NRCS

Hydric Soils

Definition

35. A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. (USDA-NRCS 1995, Federal Register, 7/13/94, Vol. 59, No. 133, pp 35680-83). The following criteria reflect those soils that meet this definition:

Criteria for hydric soils

36. Based on the above definition, the National Technical Committee for Hydric Soils (NTCHS) developed the following criteria for hydric soils:

    a. "All Histosols* except Folists; or

    b. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Pachic subgroups, or Cumulic subgroups that are:

        (1) Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or

        (2) Poorly drained or very poorly drained and have either:

            (a) A water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches(in), or for other soils

            (b) A water table is at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour in all layers within 20 in, or

            (c) the water table is at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/hour in any layer within 20 in, or

    c. Soils that are frequently ponded for long or very long duration during the growing season; or

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* Soil nomenclature follows Keys to Soil Taxonomy (current edition)

d. Soils that are frequently flooded for long duration or very long duration during the growing season."

The definition and criteria for hydric soils may change periodically as a result of revisions by the National Technical Committee for Hydric Soils (NTCHS). The most recent NTCHS version should be used.

A hydric soil may be either drained or undrained, and a drained hydric soil may not continue to support hydrophytic vegetation or wetland hydrology. Therefore, not all areas having hydric soils will qualify as wetlands. Only when a hydric soil supports hydrophytic vegetation and the area has indicators of wetland hydrology may the area be referred to as a wetland.

37. A drained hydric soil is one in which sufficient ground or surface water has been removed by artificial means such that the area will no longer support hydrophytic vegetation. Onsite evidence of drained soils includes:

a. Presence of ditches or canals of sufficient depth to lower the water table below the major portion of the root zone of the prevalent vegetation.

b. Presence of dikes, levees, or similar structures that obstruct normal inundation of an area.

c. Presence of a tile system to promote subsurface drainage.

d. Diversion of upland surface runoff from an area.

Although it is important to record such evidence of drainage of an area, a hydric soil that has been drained or partially drained still allows the soil parameter to be met. However, the area will not qualify as a wetland if the degree of drainage has been sufficient to preclude the presence of either hydrophytic vegetation or a hydrologic regime that occurs in wetlands. *NOTE: the mere presence of drainage structures in an area is not sufficient basis for concluding that a hydric soil has been drained; such areas may continue to have wetland hydrology.*

General information

38. Soils consist of unconsolidated, natural material that supports, or is capable of supporting, plant life. The upper limit is air and the lower limit is either bedrock or the limit of biological activity. Some soils have very little organic matter (mineral soils), while others are composed primarily of organic matter (Histosols). The relative proportions of particles (sand, silt, clay, and organic matter) in a soil are influenced by many interacting environmental factors. As normally defined, a soil must support plant life. The concept is expanded to include substrates that could support plant life. For various reasons, plants may be absent from areas that have well-defined soils.

39. A soil profile (Figure 2) consists of various soil layers (horizons) described from the surface downward. Most soils have two or more identifiable horizons. A soil horizon is a layer oriented approximately parallel to the soil surface, and usually is differentiated from contiguous horizons by characteristics that can be seen or measured in the field (e.g., color, structure, texture, etc.). Most mineral soils have A-, B-, and C-horizons, and many have surficial organic layers (O-horizon). The A-horizon, the surface soil or topsoil, is a zone in which organic matter is usually being added to the mineral- soil. It is also the zone from which both mineral and organic matter are being moved slowly downward. The next major horizon is the B-horizon, often referred to as the subsoil. The B-horizon is the zone of maximum accumulation of materials. It is usually characterized by higher clay content and/or more pronounced soil structure development and lower organic matter than the A-horizon. The next major horizon is usually the C-horizon, which consists of unconsolidated parent material that has not been sufficiently weathered to exhibit characteristics of the B-horizon. Clay content and degree of soil structure development in the C-horizon are usually less than in the B-horizon. The lowest major horizon, the -R- horizon, consists of consolidated bedrock. In many situations, this horizon occurs at such depths that it has no significant influence on soil characteristics.

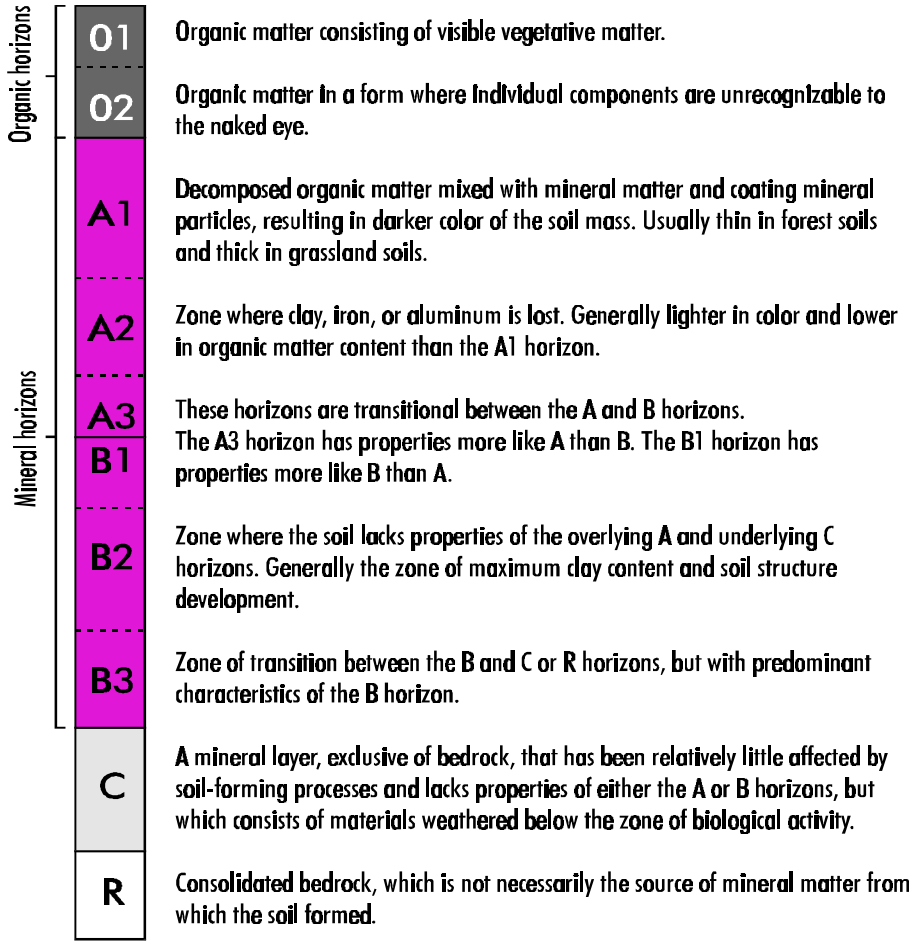

Figure 2. Generalized soil profile

Influencing factors

40. Although all soil-forming factors (climate, parent material, relief, organisms, and time) affect the characteristics of a hydric soil, the overriding influence is the hydrologic regime. The unique characteristics of hydric soils result from the influence of periodic or permanent inundation or soil saturation for sufficient duration to affect anaerobic conditions. Prolonged anaerobic soil conditions lead to a chemically reducing environment, thereby lowering the soil redox potential. This results in chemical reduction of some soil components (e.g. iron and manganese oxides), which leads to development of soil colors and other physical characteristics that usually are indicative of hydric soils.

Classification

41. Hydric soils occur in several categories of the current soil classification system, which is published in Keys to **Soil Taxonomy** (current edition). This classification system is based on physical and chemical properties of soils that can be seen, felt, or measured. Lower taxonomic categories of the system (e.g. soil series and soil phases) remain relatively unchanged from earlier classification systems.

42. Hydric soils may be classified into two broad categories: organic and mineral. Organic soils (Histosols) develop under conditions of nearly continuous saturation and/or inundation. All organic soils are hydric soils except Folists, which are freely drained soils occurring on dry slopes where excess litter accumulates over bedrock. Organic hydric soils are commonly known as peats and mucks. All other hydric soils are mineral soils. Mineral soils have a wide range of textures (sandy to clayey) and colors (red to gray). Mineral hydric soils are those periodically saturated for sufficient duration to produce chemical and physical soil properties associated with a reducing environment. They are usually gray and/or mottled immediately below the surface horizon (see paragraph 44d), or they have thick, dark-colored surface layers overlying gray or mottled subsurface horizons.

Indicators of Hydric Soils (nonsandy soils)

43. Several indicators are available for determining whether a given soil meets the definition and criteria for hydric soils. Any one of the following indicates that hydric soils are present:*

    a. **Organic soils (Histosols).** As a general rule a soil is an organic soil when: 1) more than 50 percent (by volume) of the upper 32 inches of soil is composed of organic soil

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* Indicators are listed in order of decreasing reliability. Although all are valid indicators, some are stronger indicators than others. When a decision is based on an indicator appearing in the lower portion of the list, re-evaluate the parameter to ensure that the proper decision was reached.

material;** or (2) organic soil material of any thickness rests on bedrock. Organic soils are saturated for long periods and are commonly called peats or mucks.

b. **Histic epipedons.** A histic epipedon is an 8- to 16-inch layer at or near the surface of a mineral hydric soil that is saturated with water for 30 consecutive days or more in most years and contains a minimum of 20 percent organic matter when no clay is present or a minimum of 30 percent organic matter when clay content is 60 percent or greater. Soils with histic epipedons are inundated or saturated for sufficient periods to greatly retard aerobic decomposition of the organic surface, and are considered to be hydric soils.

c. **Sulfidic material.** When mineral soils emit an odor of rotten eggs, hydrogen sulfide is present. Such odors are only detected in soils that are permanently saturated and have sulfidic material within a few centimetres of the soil surface. Sulfides are produced only in a reducing environment.

d. **Aquic or peraquic moisture regime.** An **aquic** moisture regime is a reducing one; i.e., it is virtually free of dissolved oxygen because the soil is saturated by ground water or by water of the capillary fringe(Keys to Soil Taxonomy). Because dissolved oxygen is removed from ground water by respiration of microorganisms, roots, and soil fauna, it is also implicit that the soil temperature is above biologic zero (41°F at 19.7 inches) at the same time while the soil is saturated. Soils with **peraquic** moisture regimes are characterized by the presence of ground water which is always at or near the soil surface and exhibits chemically reducing conditions. Examples include soils of tidal marshes and soils of closed, landlocked depressions that are fed by permanent streams. Positive confirmation of this indicator usually involves repeated observation of water table depths and/or depth of inundation/saturation over time.

e. **Reducing soil conditions.** Soils saturated for long or very long duration will usually exhibit reducing conditions. Under such conditions, ions of iron are transformed (reduced) from a ferric valence state (Fe3+) to a ferrous valence state (Fe2+). This condition can often be detected in the field by a ferrous iron test. A simple colorimetric field test kit has been developed for this purpose. When a soil extract changes to a pink color upon addition of alpha-aalpha-dipyridil, ferrous iron is present, which indicates a reducing soil environment. *NOTE: This test cannot be used in mineral hydric soils having low iron content, organic soils, and soils that have been desaturated for significant periods of the growing season. CAUTION: This test can only be used as a positive indicator of reducing conditions and it is only effective if it is done at the time that a mineral soil is actively reducing. While the presence of a reaction indicates anaerobic conditions, the lack of a reaction* ***does not*** *indicate a lack of anaerobic conditions.*

** A detailed definition of organic soil material is available in Keys to Soil Taxonomy (current edition).

f. **Soil colors.** The colors of various soil components are often the most diagnostic indicator of hydric soils. Colors of these components are strongly influenced by the frequency and duration of soil saturation, which leads to reducing soil conditions. Mineral hydric soils will be either gleyed or will have contrasting mottles and/or low chroma matrix. These are discussed below:
NOTE: Soil terminology is undergoing constant change, and terms such as "mottles" and "low chroma colors" are being replaced with the term "redoximorphic features" (Vepraskas 1994). In order to retain consistency with the Corps 1987 Manual, and to use terms familiar to most wetland scientists, the older terms are used in this manual.

(1) **Gleyed soils (gray colors).** Gleyed soils develop when anaerobic soil conditions result in pronounced chemical reduction of iron, manganese, and other elements, thereby producing gray soil colors. Anaerobic conditions that occur in waterlogged soils result in the predominance of reduction processes, and such soils are greatly reduced. Iron is one of the most abundant elements in soils. Under anaerobic conditions, iron is converted from the oxidized (ferric) state to the reduced (ferrous) state, which results in the bluish, greenish, or grayish colors associated with the gleying effect. Gleying immediately below the A-horizon or 10 inches (whichever is shallower) is an indication of a markedly reduced soil, and gleyed soils are hydric soils. Gleyed soil conditions can be determined by using the gley page of the Munsell Color Charts (Munsell Color 1990).

(2) **Soils with contrasting mottles and/or low chroma matrix.** Mineral hydric soils that are saturated for substantial periods of the growing season (but not long enough to produce gleyed soils) will either have high chroma mottles and a low chroma matrix or will lack mottles but have a low chroma matrix (see Appendix D, Section 1, for a definition and discussion of "chroma" and other components of soil color). **Mottled** means "marked with spots of contrasting color." Soils that have high chroma mottles (redox concentrations) and a low chroma matrix are indicative of a fluctuating water table. Hydric soils can also have low chroma mottles (redox depletions) that contrast with the matrix color. The soil **matrix** is the portion (usually more than 50 percent) of a given soil layer that has the predominant color. Mineral hydric soils usually have one of the following color features in the horizon immediately below the A-horizon or 10 inches (whichever is shallower):

(a) Matrix chroma of 2 or less* in mottled soils.

(b) Matrix chroma of 1 or less* in unmottled soils.

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* Colors should be determined in soils that have been moistened; otherwise, state that colors are for dry soils.

NOTE: The matrix chroma of some dark (black) mineral hydric soils (e.g. Aquolls) will not conform to the criteria described in (a) and (b) above; in such soils, gray mottles occurring at 10 inches or less are indicative of hydric conditions. Mollisols that are not hydric will still have dark colored surface soils.

CAUTION: Soils with significant coloration due to the particular chemical nature of the parent material may not exhibit the above characteristics. In such cases, this indicator cannot be used.

g. **Soil appearing on hydric soils list.** Using the criteria for hydric soils (paragraph 37), the NTCHS has developed a list of hydric soils. Listed soils have reducing conditions for a significant portion of the growing season in a major portion of the root zone and are frequently saturated within 12 inches of the soil surface if they have not been effectively drained. *CAUTION: Do not use this indicator unless you have field verified that the profile description of the mapping unit conforms to that of the sampled soil.*

h. **Iron and manganese concretions.** During the oxidation-reduction process, iron and manganese in suspension are sometimes segregated as oxides into concretions, nodules or soft masses. These accumulations are usually black or dark brown. Concretions >2 mm in diameter occurring within 7.5 cm of the surface are evidence that the soil is saturated for long periods near the surface. *CAUTION: concretions may be relict features. Be careful to confirm that the hydrologic conditions that created the concretions still exist before relying on this indicator.*

Additional Indicators of Hydric Soils (for sandy soils)

44. Not all indicators listed in paragraph 44 can be applied to sandy soils. **In particular, soil color may not be a reliable indicator in most sandy soils.** However, three additional soil features may be used as indicators of sandy hydric soils, including:

a. **High organic matter content in the surface horizon.** Organic matter tends to accumulate above or in the surface horizon of sandy soils that are inundated or saturated to the surface for a significant portion of the growing season. Prolonged inundation or saturation creates anaerobic conditions that greatly inhibit decomposition (oxidation) of organic matter.

b. **Streaking of subsurface horizons by organic matter.** Organic matter is moved downward through sand as the water table fluctuates. This often occurs more rapidly and to a greater degree in some vertical sections of a sandy soil containing high content of organic matter than in others. Thus, the sandy soil appears streaked with darker areas. When soil from a darker area is rubbed between the fingers, the organic matter stains the fingers.

c. **Organic pans.** As organic matter is moved downward through sandy soils, it tends to accumulate at the point representing the most commonly occurring depth to the water table. This organic matter tends to become slightly cemented with iron and aluminum, forming a thin layer of hardened soil (spodic horizon). These horizons often occur at depths of 12 to 30 inches below the mineral surface. Wet spodic soils usually have thick dark surface horizons that are high in organic matter with dull, gray horizons above the spodic horizon. Generally, the nearer to the surface the spodic horizon, the more likely the soil is hydric.

CAUTION: In recently deposited sandy material (e.g. accreting sandbars), it may be impossible to find any of these indicators. In such cases, consider this a problem area (Entisols).
NOTE: The NRCS developed and published Field Indicators of Hydric Soils in the United States in July 1996 (USDA-NRCS 1996). This document includes many useful indicators of hydric soil;, however, some hydric soils will lack one of the indicators included in the NRCS document. Therefore, the indicators are useful only as positive indicators -- if one or more of the indicators is present, the soil is a hydric soil, but the lack of any of these indicators does not mean the soil is nonhydric. In addition, the Corps has not authorized the use of these new field indicators and has stated that while they may be used as additional information, they do not replace the indicators in the 1987 Manual, nor may they be used to contradict the 1987 Manual soil indicators. The same holds true for this manual.

Wetland Hydrology

Definition

45. The term "wetland hydrology" encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and chemically reducing conditions, respectively. Such characteristics are usually present in areas that are inundated or have soils that are saturated to the surface for sufficient duration to develop hydric soils and support vegetation typically adapted for life in periodically anaerobic soil conditions. **Hydrology is often the least exact of the parameters, and indicators of wetland hydrology are sometimes difficult to find in the field.** However, it is essential to establish that a wetland area is periodically inundated or has saturated soils for a sufficient duration during the growing season.

Wetland Hydrology Criteria

46. Areas which are seasonally inundated and/or saturated to the surface for a consecutive number of days ≥ 12.5 percent of the growing season are wetlands, provided the soil and vegetation parameters are met. Areas inundated or saturated between 5 percent and 12.5 percent of the growing season in most years (see Table 3) may or may not be wetlands. Areas inundated or saturated to the surface for less than 5 percent of the growing season are non-wetlands. Wetland hydrology exists if field indicators are present as described below. (It is usually impractical to accurately measure the duration of soil saturation in the field because it takes repeated visits over a lengthy (several years) period of time. However, there has been a sufficient amount of research to support that the field indicators provided in the Manual and supplementary guidance can be good measures of both the frequency and duration of soil saturation

A Note About Growing Season: Given the requirement that inundation/saturation must be present for a certain portion of the growing season it is important to understand how the concept of growing season should be applied. The definition of growing season is : " The portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biological zero (41 degrees F). For ease of determination this period can be **approximated** by the number of frost-free days."

Using climatic data provided in most modern soil surveys, growing season can be **approximated** as (in 5 out of 10 years) being from the last date in spring that the air temperature drops to 28 degrees F to the first date in the fall that it drops to 28 degrees F. (NRCS uses 24 degrees for wetland determinations on agricultural land. Several issues arise in determining the growing season:

- In portions of Washington state some plant species are growing during every month of the year;

- Each county soil survey has several locations for which air temperature data is tabulated. This can result in numerous "growing seasons" for each county;

- The data location nearest to a wetland delineation site may not be representative of the growing season for the site being investigated. For example, NRCS data may be from a site at sea level but the delineation site may be at a higher elevation with an annual temperature regime much different from the NRCS data site.

Thus, it is important to use sound professional judgment based on careful observation to determine if the growing season is in progress. For example, evidence of new or recent growth such as flowers, new shoots, new leaves, or swollen buds on plants suggests that active growth is occurring. **Basically, if the predominant plants of the area in question are growing, it is the growing season.** Another method is to take soil temperature readings at 19.7 inches to determine if the formal definition is met. Soil thermometers are available at most forestry supply stores. Use sound professional judgment in interpreting the data tables in the

soil surveys. Use the data set which makes the most sense for the site being investigated. Be particularly cautious when the site being investigated is located far from or in a different physiographic setting than the nearest data station.

For much of Western Washington at low elevations, the mesic growing season (March 1 to October 31), has been considered a good rule - except for some coastal areas which may have a year-round growing season. However, this rule should not be used if it conflicts with field data and observations.

Influencing factors

47. Numerous factors (e.g., precipitation, stratigraphy, topography, soil permeability, human disturbance, and plant cover) influence the wetness of an area. Regardless, the characteristic common to all wetlands is the presence of an abundant supply of water. The water source may be runoff from direct precipitation, headwater or backwater flooding, tidal influence, ground water, or some combination of these sources. The frequency and duration of inundation or soil saturation varies from nearly permanently inundated or saturated to irregularly inundated or saturated. Topographic position, stratigraphy, and soil permeability influence both the frequency and duration of inundation and soil saturation. Areas of lower elevation in a floodplain or marsh have more frequent periods of inundation and/or greater duration than most areas at higher elevations. Floodplain configuration may significantly affect duration of inundation. When the floodplain configuration is conducive to rapid runoff, the influence of frequent periods of inundation on vegetation and soils may be reduced. Soil permeability also influences duration of inundation and soil saturation. For example, clayey soils absorb water more slowly than sandy or loamy soils, and therefore have slower permeability and remain saturated much longer. Type and amount of plant cover affect both degree of inundation and duration of saturated soil conditions. Excess water drains more slowly in areas of abundant plant cover, thereby increasing frequency and duration of inundation and/or soil saturation. On the other hand, transpiration rates are higher in areas of abundant plant cover, which may reduce the duration of soil saturation. Human disturbance, especially in agricultural lands may necessitate more rigorous analysis to determine the frequency and duration of inundation or saturation.

Classification

48. Although the interactive effects of all hydrologic factors produce a continuum of wetland hydrologic regimes, efforts have been made to classify wetland hydrologic regimes into functional categories. These efforts have focused on the use of frequency, timing, and duration of inundation or soil saturation as a basis for classification. A classification system developed for nontidal areas is presented in Table 3. This classification system was slightly modified from the system developed by the Workshop on Bottomland Hardwood Forest Wetlands of the Southeastern United States (Clark and Benforado 1981). More recent research indicates that duration of inundation and/or soil saturation during the growing season is more influential on

the plant community than frequency of inundation/saturation during the growing season (Theriot, in press). Thus, frequency of inundation and soil saturation are not included in Table 3. The Corps Waterways Experiment Station has developed a computer program that can be used to transform stream gage data to mean sea level elevations representing the upper limit of each hydrologic zone shown in Table 3. This program is available upon request.

Table 3

Hydrologic Zones* Nontidal Areas

Zone	Name	Duration**	Comments
I†	Permanently inundated	100%	Inundation >6.6 ft mean water depth
II	Semipermanently to nearly permanently inundated or saturated	>75 % - <100%	Inundation defined as £6.6 ft mean water depth
III	Regularly inundated or saturated	>25% - 75%	
IV	Seasonally inundated or saturated	>12.5% - 25%	
V	Irregularly inundated or saturated	³5% - 12.5%	Many areas having these hydrologic characteristics are not wetlands
VI	Intermittently or never inundated or saturated	<5%	Areas with these hydrologic characteristics are not wetlands

* Zones adapted from Clark and Benforado (1981).

** Refers to duration of inundation and/or soil saturation during the growing season. This defines an aquatic habitat zone.

Indicators of Wetland Hydrology

49. Indicators of wetland hydrology may include, **but are not necessarily limited to**: drainage patterns, drift lines, sediment deposition, watermarks, stream gage data and flood predictions, historic records, visual observation of saturated soils, and visual observation of inundation. Any of these indicators may be evidence of wetland hydrologic characteristics. Methods for determining hydrologic indicators can be categorized according to the type of indicator. Recorded data include stream gage data, lake gage data, tidal gage data, flood predictions, and historical records. Use of these data is commonly limited to areas adjacent to streams or other similar areas. Recorded data usually provide both short- and long-term information about frequency and duration of inundation, but contain little or no information about soil saturation, which must be gained from soil surveys or other similar sources. The remaining indicators require field observations. Field indicators are evidence of present or past hydrologic events (e.g. location and height of flooding). Indicators for recorded data and field observations include:*

a. Recorded data. Stream gage data, lake gage data, tidal gage data, flood predictions, and historical data may be available from the following sources:

(1) **CE District Offices.** Most CE Districts maintain stream, lake, and tidal gage records for major water bodies in their area. In addition, CE planning and design documents often contain valuable hydrologic information. For example, a General Design Memorandum (GDM) usually describes flooding frequencies and durations for a project area. Furthermore, the extent of flooding within a project area is sometimes indicated in the GDM according to elevation (height) of certain flood frequencies (1-, 2-, 5-, 10-year, etc.).

(2) **US Geological Survey (USGS).** Stream and tidal gage data are available from the USGS offices throughout the Nation, and the latter are also available from the National Oceanic and Atmospheric Administration. CE Districts often have such records.

(3) **State, county, and local agencies.** These agencies often have responsibility for flood control/relief and flood insurance.

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* Indicators are listed in order of decreasing reliability. Although all are valid indicators, some are stronger indicators than others. When a decision is based on an indicator appearing in the lower portion of the list, re-evaluate the parameter to ensure that the proper decision was reached.

(4) **Natural Resource Conservation Service Small Watershed Projects.** Planning documents from this agency are often helpful, and can be obtained from the NRCS field office in the county.

(5) Planning documents of developers.

b. **Field data.** The following field hydrologic indicators can be assessed quickly, and although some of them are not necessarily indicative of hydrologic events that occur only during the growing season, they do provide evidence that inundation and/or soil saturation has occurred:

CAUTION: Many delineators have made the mistake of assuming that the wettest conditions occur in the earliest part of the growing season - usually March and April. However, in some situations, the wettest time of the growing season may be later. This is especially true in areas that receive snowmelt runoff or irrigation water or are subject to tidal influence.

(1) **Visual observation of inundation.** The most obvious and revealing hydrologic indicator may be simply observing the areal extent of inundation. **However, because seasonal conditions and recent weather conditions can contribute to surface water being present on a nonwetland site, both should be considered when applying this indicator.**

(2) **Visual observation of soil saturation.** Examination of this indicator requires digging a soil pit to a depth of 16 inches and observing the level at which water stands in the hole after sufficient time has been allowed for water to drain into the hole. The required time will vary depending on soil texture. In some cases, the upper level at which water is flowing into the pit can be observed by examining the wall of the hole. This level usually represents the depth to the water table. The depth to saturated soils will always be nearer the surface due to the capillary fringe. For soil saturation to impact vegetation, it must occur within a **major portion of the root zone** (usually within 12 inches of the surface) of the prevalent vegetation. The major portion of the root zone is that portion of the soil profile in which more than one half of the plant roots occur. *CAUTION: In some heavy clay soils, water may not rapidly accumulate in the hole even when the soil is saturated. If water is observed at the bottom of the hole but has not filled to the 12-inch depth, examine the sides of the hole and determine the shallowest depth at which water is entering the hole. When applying this indicator, the season of the year and preceding weather conditions as well as the duration of saturation must be considered.* ***NOTE: This indicator has caused confusion in relation to the hydrology criteria, which stipulates that saturation must be to the surface. If the water table (the level at which standing water is found in an unlined hole) is found within twelve inches of the soil surface in a nonsandy soil, one can assume that soil saturation occurs to the surface. For sandy soils, the water table must be within six inches of the soil surface. However, simply finding***

the water table at the appropriate depth on one particular day, does not necessarily confirm that saturation to the surface for the appropriate length of time does occur. Conversely, finding the water table below the appropriate depth on one particular day does not necessarily confirm that saturation to the surface for the appropriate length of time does not occur.

(3) **Watermarks.** Watermarks are most common on woody vegetation. They occur as stains on bark or other fixed objects (e.g. bridge pillars, buildings, tree trunks, fences, etc.). When several watermarks are present, the highest reflects the maximum extent of recent inundation.

(4) **Drift lines.** This indicator is most likely to be found adjacent to streams or other sources of water flow in wetlands, but also often occurs in tidal marshes. Evidence consists of deposition of debris in a line on the surface or debris entangled in aboveground vegetation or other fixed objects. Debris usually consists of remnants of vegetation (branches, stems, and leaves), sediment, litter, and other waterborne materials deposited parallel: to the direction of water flow. Drift lines provide an indication of the minimum portion of the area inundated during a flooding event; the maximum level of inundation is generally at a higher elevation than that indicated by a drift line.

(5) **Sediment deposits.** Plants and other vertical objects often have thin layers, coatings, or depositions of mineral or organic matter on them after inundation. This evidence may remain for a considerable period before it is removed by precipitation or subsequent inundation. Sediment deposition on vegetation and other objects provides an indication of the minimum inundation level. When sediments are primarily organic (e.g. fine organic material, algae), the detritus may become encrusted on or slightly above the soil surface after dewatering occurs.

(6) **Drainage patterns within wetlands.** This indicator, which occurs primarily in wetlands adjacent to streams or in depressions with closed or restricted outlets and impervious subsoils, consists of surface evidence of drainage flow into or through an area that is restricted for a substantial duration. In some wetlands, this evidence may exist as a drainage pattern eroded into the soil, vegetative matter (debris) piled against thick vegetation or woody stems oriented perpendicular to the direction of water flow, or the absence of expected leaf litter. Scouring is often evident around roots of persistent vegetation. Debris may be deposited in or along the drainage pattern. *CAUTION: Drainage patterns also occur in upland areas after periods of considerable precipitation; therefore, topographic position must also be considered when applying this indicator.*

*(*7) **Oxidized rhizospheres surrounding living roots** are acceptable hydrology indicators on a case-by-case basis and may be useful in groundwater driven

systems. Rhizospheres should also be reasonably abundant and within the upper 12 inches of the soil profile. Oxidized rhizospheres should be supported by other indicators of hydrology if hydrology evidence is weak. *Caution: Make sure that the oxidation is occurring along live roots/rhizomes and thus, that they are not relict. Oxidized rhizospheres are the result of mineral deposition on and in the soil material surrounding the root and should not be confused with decomposing organic tissue.*

*(*8) **Local soil survey data -** If you can field verify that the soil at your sampling site is a soil listed in the county soil survey or on the Washington State List of Hydric Soils , then the data in the soil survey referring to the flooding and/or high water table conditions for that soil can be accepted as valid for your site (assuming the site has not been effectively drained since the time it was mapped by the NRCS).

(9) **Water-stained leaves** - Forested wetlands that are inundated at some time of the year will frequently have water-stained leaves on the forest floor. These leaves are generally grayish or blackish in appearance, as a result of being underwater for significant periods. This indicator should be used with caution as water-stained leaves don't always indicate long-term inundation/saturation. It is important to compare the color of the leaves in the area presumed to be wetland with leaves of the same species in an adjacent area that is clearly upland. Due to differential decomposition, there should be a distinct difference in the texture and color of the leaves.

(10) **FAC neutral test** - In areas where hydrology evidence is weak or lacking, the FAC neutral test may be employed to corroborate the presence of sufficient hydrology. Apply as follows: compare the number of dominants that are FACW and OBL with the number of dominants that are FACU and UPL (ignore the "neutral" FAC dominants). If there are more dominants that are FACW or wetter than there are dominants that are FACU or drier, then one can infer that the plant community is reflecting the presence of wetland hydrology. If there is a tie, compare the number of FAC+ dominants with the FAC- dominants to see if there is a difference. If there is still a tie between the numbers of dominants, examine the nondominant species to determine if they provide an indication of how strongly hydrophytic the vegetation is. Any use of nondominants should be clearly documented and explained.

(11) **Other** - Explain and provide rationale for use.

Part IV: Methods

Section A. Introduction

50. PART IV contains sections on preliminary data gathering, method selection, routine determination procedures, comprehensive determination procedures, methods for determinations in atypical situations, and guidance for wetland determinations in natural situations where the three-parameter approach may not always apply.

51. Significant flexibility has been incorporated into PART IV. The user is presented in Section B with various potential sources of information that may be helpful in making a determination, but not all identified sources of information may be applicable to a given situation. *Note: The user is not required to obtain information from all identified sources.* Flexibility is also provided in method selection (Section C). Three levels of routine determinations are available, depending on the complexity of the required determination and the quantity and quality of existing information. Application of methods presented in both Section D (routine determinations) and Section E (comprehensive determinations) may be tailored to meet site-specific requirements, especially with respect to sampling design.

52. Methods presented in Sections D and E vary with respect to the required level of technical knowledge and experience of the user. Application of the qualitative methods presented in Section D (routine determinations) requires considerably less technical knowledge and experience than does application of the quantitative methods presented in Section E (comprehensive determinations). The user must at least be able to identify the dominant plant species in the project area when making a routine determination (Section D), and should have some basic knowledge of hydric soils when employing routine methods that require soils examination. Comprehensive determinations require a basic understanding of sampling principles and the ability to identify all commonly occurring plant species in a project area, as well as a good understanding of indicators of hydric soils and wetland hydrology. The comprehensive method should only be employed by experienced field inspectors.

Section B. Preliminary Data Gathering and Synthesis

53. This section discusses potential sources of information that may be helpful in making a wetland determination. When the routine approach is used, it may often be possible to make a wetland determination based on available vegetation, soils, and hydrology data for the area. However, this section deals only with identifying potential information sources, extracting pertinent data, and synthesizing the data for use in making a determination. Based on the quantity and quality of available information and the approach selected for use (Section C), the user is referred to either Section D or Section E for the actual determination. Completion of Section B is not required, but is recommended because the available information may reduce or eliminate the need for field effort and decrease the time and cost of making a determination. However, there are instances in small project areas in which the time required to obtain the information may be prohibitive. In such cases PROCEED to paragraph 55, complete STEPS 1 through 3, and PROCEED to Section D or E.

Data sources

54. Obtain the following information, when available and applicable:

a. **USGS quadrangle maps.** USGS quadrangle maps are available at different scales. When possible, obtain maps at a scale of 1:24,000; otherwise, use maps at a scale of 1:62,500. Such maps are available from USGS in Reston, Va., and Menlo Park, Calif., but they may already be available in the CE District Office. These maps provide several types of information:

(1) Assistance in locating field sites. Towns, minor roads, bridges, streams, and other landmark features (e.g. buildings, cemeteries, water bodies, etc.) not commonly found on road maps are shown on these maps.

(2) Topographic details, including contour lines (usually at 5- or 10-ft contour intervals).

(3) General delineation of wet areas (swamps and marshes). *Note: The actual wet area may be greater than that shown on the map because USGS generally maps these areas based on the driest season of the year.*

(4) Latitude, longitude, townships, ranges, and sections. These provide legal descriptions of the area.

(5) Directions, including both true and magnetic north.

(6) Drainage patterns.

(7) General land uses, such as cleared (agriculture or pasture), forested, or urban.

CAUTION: Obtain the most recent USGS maps. Older maps may show features that no longer exist and will not show new features that have developed since the map was constructed. Also, USGS is currently changing the mapping scale from 1:24,000 to 1:25,000.

b. National Wetlands Inventory products.

(1) **Wetland maps.** The standard NWI maps are at a scale of 1:24,000 or, where USGS base maps at this scale are not available, they are at 1:62,500 (1:63,350 in Alaska). Smaller scale maps ranging from 1:100,000 to 1:500,000 are also available for certain areas. Wetlands on NWI maps are classified in accordance with Cowardin et al. (1979). *CAUTION: Since not all delineated areas on NWI maps are wetlands under federal, state or local jurisdiction, NWI maps should not be used as the sole basis for determining whether wetland vegetation is present.* NWI "User Notes" are available that correlate the classification system with local wetland community types. An important feature of this classification system is the water regime modifier, which describes the flooding or soil saturation characteristics. Wetlands classified as having a temporarily flooded or intermittently flooded water regime should be viewed with particular caution since this designation is indicative of plant communities that are transitional between wetland and nonwetland. These are among the most difficult plant communities to map accurately from aerial photography. For wetlands "wetter" than temporarily flooded and intermittently flooded, the probability of a designated map unit on recent NWI maps being a wetland (according to Cowardin et al. 1979) at the time of the photography is in excess of 90 percent. *CAUTION: Due to the scale of aerial photography used and other factors, all NWI map boundaries are approximate.* The optimum use of NWI maps is to plan field review (i.e. how wet, big, or diverse is the area?) and to assist during field review, particularly by showing the approximate areal extent of the wetland and its association with other communities. NWI maps are available either as a composite with, or an overlay for, USGS base maps and may be obtained from the NWI Central Office in St. Petersburg, Fla., the Wetland Coordinator at each FWS regional office, or the USGS.

(2) **Plant database.** This database of approximately 6700 plant species that occur in wetlands provides information (e.g., ranges, habitat, etc.) about each plant species from the technical literature. The database served as a focal point for development of a national list of plants that occur in wetlands.

c. **Soil surveys.** Soil surveys are prepared by the NRCS for political units (county, parish, etc.) in a state. Soil surveys contain several types of information:

(1) General information (e.g. climate, settlement, natural resources, farming, geology, general vegetation types).

(2) Soil maps for general and detailed planning purposes. These maps are usually generated from fairly recent aerial photography. *CAUTION: The smallest mapping unit is 3 acres, and a given soil series as mapped may contain small inclusions of other series.*

(3) Uses and management of soils. Any wetness characteristics of soils will be mentioned here.

(4) Soil properties. Soil and water features are provided that may be very helpful for wetland investigations. Frequency, duration, and timing of inundation (when present) are described for each soil type. Water table characteristics that provide valuable information about soil saturation are also described. Soil permeability coefficients may also be available.

(5) Soil classification. Soil series and phases are usually provided. Published soil surveys will not always be available for the area. If not, contact the county NRCS office and determine whether the soils have been mapped.

d. **Stream and tidal gage data.** These documents provide records of tidal and stream flow events. They are available from either the USGS or CE District office.

e. **Environmental impact assessments (EIAs), environmental impact statements (EISs), general design memoranda (GDM), and other similar publications.** These documents may be available from Federal agencies for an area that includes the project area. They may contain some indication of the location and characteristics of wetlands consistent with the required criteria (vegetation, soils, and hydrology), and often contain flood frequency and duration data.

f. **Documents and maps from State, county, or local governments.** Regional maps that characterize certain areas (e.g., potholes, coastal areas, or basins) may be helpful because they indicate the type and character of wetlands.

g. **Remote sensing.** Remote sensing is one of the most useful information sources available for wetland identification and delineation. Recent aerial photography, particularly color infrared, provides a detailed view of an area; thus, recent land use and other features (e.g. general type and areal extent of plant communities and degree of inundation of the area when the photography was taken) can be determined. The multiagency cooperative National High Altitude Aerial Photography Program (RAP) has 1:59,000-scale color infrared photography for approximately 85 percent (December 1985) of the coterminous United States from 1980 to 1985. This photography has excellent resolution and can be ordered enlarged to 1:24,000 scale from USGS. Satellite images provide similar information as aerial photography, although the much smaller scale makes observation of detail more difficult without sophisticated equipment and extensive training. Satellite images provide more recent

coverage than aerial photography (usually at 18-day intervals). Individual satellite images are more expensive than aerial photography, but are not as expensive as having an area flown and photographed at low altitudes. However, better resolution imagery is now available with remote sensing equipment mounted on fixed-wing aircraft.

h. **Local individuals and experts.** Individuals having personal knowledge of an area may sometimes provide a reliable and readily available source of information about the area, particularly information on the wetness of the area.

i. **USGS land use and land cover maps.** Maps created by USGS using remotely sensed data and a geographical information system provide a systematic and comprehensive collection and analysis of land use and land cover on a national basis. Maps at a scale of 1:250,000 are available as overlays that show land use and land cover according to nine basic levels. One level is wetlands (as determined by the FWS), which is further subdivided into forested and nonforested areas. Five other sets of maps show political units, hydrologic units, census subdivisions of counties, Federal land ownership, and State land ownership. These maps can be obtained from any USGS mapping center.

j. **Applicant's survey plans and engineering designs.** In many cases, the permit applicant will already have had the area surveyed (often at 1-ft contours or less) and will also have engineering designs for the proposed activity.

Data synthesis

55. When employing Section B procedures, use the above sources of information to complete the following steps:

- **STEP 1 - Identify the Project Area on a Map.** Obtain a USGS quadrangle map (1:24,000) or other appropriate map, and locate the area identified in the permit application. PROCEED TO STEP 2.

- **STEP 2 - Prepare a Base Map.** Mark the project area boundaries on the map. Either use the selected map as the base map or trace the area on a mylar overlay, including prominent landscape features (e.g., roads, buildings, drainage patterns, etc.). If possible, obtain diazo copies of the resulting base map. PROCEED TO STEP 3.

- **STEP 3 - Determine Size of the Project Area.** Measure the area boundaries and calculate the size of the area. PROCEED TO STEP 4 OR TO SECTION D OR E IF SECTION B IS NOT USED.

- **STEP 4 - Summarize Available Information on Vegetation.** Examine available sources that contain information about the area vegetation.

Consider the following:

a. USGS quadrangle maps. Is the area shown as a marsh or swamp? *CAUTION: Do not use this as the sole basis for determining that hydrophytic vegetation is present.*

b. NWI overlays or maps. Do the overlays or maps indicate that hydrophytic vegetation occurs in the area?, If so, identify the vegetation type(s).

c. EIAs, EISs, or GDMs that include the project area. Extract any vegetation data that pertain to the area.

d. Federal, State, or local government documents that contain information about the area vegetation. Extract appropriate data.

e. Recent (within last 5 years) aerial photography of the area. Can the area plant community type(s) be determined from the photography? Extract appropriate data.

f. Individuals or experts having knowledge of the area vegetation. Contact them and obtain any appropriate information. *CAUTION: Ensure that the individual providing the information has firsthand knowledge of the area.*

g. Any published scientific studies of the area plant communities. Extract any appropriate data.

h. Previous wetland determinations made for the area. Extract any pertinent vegetation data.

When the above have been considered, PROCEED TO STEP 5.

- **STEP 5 - Determine Whether the Vegetation in the Project Area Is Adequately Characterized.** Examine the summarized data (STEP 4) and determine whether the area plant communities are adequately characterized. For routine determinations, the plant community type(s) and the dominant species in each vegetation layer of each community type must be known. Dominant species are those that have the largest relative basal area (overstory),* height (woody understory), number of stems (woody vines), or greatest areal cover (herbaceous understory). For comprehensive determinations, each plant community type present in the project area must have been **quantitatively described** within the past 5 years using accepted sampling and analytical procedures, and boundaries between community types must be known. Record information on DATA FORM 1.** In either

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* This term is used because species having the largest individuals may not be dominant when only a few are present. To use relative basal area, consider both the size and number of individuals of a species and subjectively compare with other species present.

** A separate DATA FORM 1 must be used for each plant community type.

case, PROCEED TO Section F if there is evidence of recent significant vegetation alteration due to human activities or natural events. Otherwise, PROCEED TO STEP 6.

- **STEP 6 - Summarize Available Information on Area Soils.** Examine available information and describe the area soils. Consider the following:

  a. County soil surveys. Determine the soil series present and extract characteristics for each. *CAUTION: Soil mapping units sometimes include more than one soil series.*

  b. Unpublished county soil maps. Contact the local NRCS office and determine whether soil maps are available for the area. Determine the soil series of the area, and obtain any available information about possible hydric soil indicators (paragraph 44 or 45) for each soil series.

  c. Published EIAs, ElSs, or GDMs that include soils information. Extract any pertinent information.

  d. Federal, State, and/or local government documents that contain descriptions of the area soils. Summarize these data.

  e. Published scientific studies that include area soils data. Summarize these data.

  f. Previous wetland determinations for the area. Extract any pertinent soils data.

When the above have been considered, PROCEED TO STEP 7.

- **STEP 7 - Determine Whether Soils of the Project Area Have Been Adequately Characterized.** Examine the summarized soils data and determine whether the soils have been adequately characterized. For routine determinations, the soil series must be known. For comprehensive determinations, both the soil series and the boundary of each soil series must be known. Record information on DATA FORM 1. In either case, if there is evidence of recent significant soils alteration due to human activities or natural events, PROCEED TO Section F. Otherwise, PROCEED TO STEP 8.

- **STEP 8 - Summarize Available Hydrology Data.** Examine available information and describe the area hydrology. Consider the following:

  a. USGS quadrangle maps. Is there a significant, well-defined drainage through the area? Is the area within a major floodplain or tidal area? What range of elevations occur in the area, especially in relation to the elevation of the nearest perennial watercourse?

  b. NWI overlays or maps. Is the area shown as a wetland or deepwater aquatic habitat? What is the water regime modifier?

c. EIAs, EISs, or GDMs that describe the project area. Extract any pertinent hydrologic data.

d. Floodplain management maps. These maps may be used to extrapolate elevations that can be expected to be inundated on a l-, 2-, 3-year, etc., basis. Compare the elevations of these features with the elevation range of the project area to determine the frequency of inundation.

e. Federal, State, and local government documents (e.g. CE floodplain management maps and profiles) that contain hydrologic data. Summarize these data.

f. Recent (within past 5 years) aerial photography that shows the area to be inundated. Record the date of the photographic mission.

g. Newspaper accounts of flooding events that indicate periodic inundation of the area.

h. NRCS County Soil Surveys that indicate the frequency and duration of inundation and soil saturation for area soils. *CAUTION: Data provided only represent average conditions for a particular soil series in its natural undrained state, and cannot be used as a positive hydrologic indicator in areas that have significantly altered hydrology.*

i. Tidal or stream gage data for a **nearby** water body that apparently influences the area. Obtain the gage data and complete (1) below if the routine approach is used, or (2) below if the comprehensive approach is used (OMIT IF GAGING STATION DATA ARE UNAVAILABLE):

(1) **Routine approach.** Determine the highest water level elevation reached during the growing season for each of the most recent 10 years of gage data.. Rank these elevations in descending order and select the fifth highest elevation. Combine this elevation with the mean sea level elevation of the gaging station to produce a mean sea level elevation for the highest water level reached every other year. *NOTE: Stream gage data are often presented as flow rates in cubic feet per second. In these cases, ask the CE District's Hydrology Branch to convert flow rates to corresponding mean sea level elevations and adjust gage data to the site.* Compare the resulting elevations reached biennially with the project area elevations. If the water level elevation exceeds the area elevation, the area is inundated during the growing season on average at least biennially.

(2) **Comprehensive approach.** Complete the following:

(a) **Decide whether hydrologic data reflect the apparent hydrology.** Data available from the gaging station may or may not accurately reflect the area hydrology. Answer the following questions:

- Does the water level of the area appear to fluctuate in a manner that differs from that of the water body on which the gaging station is located? (In ponded situations, the water level of the area is usually higher than the water level at the gaging station.)

- Are less than 10 years of daily readings available for the gaging station?

- Do other water sources that would not be reflected by readings at the gaging station appear to significantly affect the area? For example, do major tributaries enter the stream or tidal area between the area and gaging station?

If the answer to any of the above questions is YES, the area hydrology cannot be determined from the gaging station data. If the answer to all of the above questions is NO, PROCEED TO (b).

(b) **Analyze hydrologic data.** Subject the hydrologic data to appropriate analytical procedures. Either use duration curves or a computer program developed by WES (available from the Environmental Laboratory upon request) for determining the mean sea level elevation representing the upper limits of wetland hydrology. In the latter case, when the site elevation is lower than the mean sea level elevation representing a 5-percent duration of inundation and saturation during the growing season, the area has a hydrologic regime that may occur in wetlands. *NOTE: Duration curves do not reflect the period of soil saturation following dewatering.*

When all of the above have been considered, PROCEED TO STEP 9.

- **STEP 9 - Determine Whether Hydrology Is Adequately Characterized.** Examine the summarized data and determine whether the hydrology of the project area is adequately characterized. For routine determinations, there must be documented evidence of frequent inundation or soil saturation during the growing season. For comprehensive determinations, there must be documented **quantitative** evidence of frequent inundation or soil saturation during the growing season, based on at least 10 years of stream or tidal gage data. Record information on DATA FORM 1. In either case, if there is evidence of recent significant hydrologic alteration due to human activities or natural events, PROCEED TO Section F. Otherwise, PROCEED TO Section C.

Section C. Selection of Method

56. All wetland delineation methods described in this manual can be grouped into two general types: routine and comprehensive. Routine determinations (Section D) involve simple, rapidly applied methods that result in sufficient qualitative data for making a determination. Comprehensive methods (Section E) usually require significant time and effort to obtain the needed quantitative data. The primary factor influencing method selection will usually be the complexity of the required determination. However, comprehensive methods may sometimes be selected for use in relatively simple determinations when rigorous documentation is required.

57. Three levels of routine wetland determinations are described below. Complexity of the project area and the quality and quantity of available information will influence the level selected for use.

    a. **Level 1 - Onsite Inspection Unnecessary.** This level may be employed when the information already obtained (Section B) is sufficient for making a determination for the entire project area (see Section D, Subsection 1).

    b. **Level 2 - Onsite Inspection Necessary.** This level must be employed when there is insufficient information already available to characterize the vegetation, soils, and hydrology of the entire project area (see Section D, Subsection 2).

    c. **Level 3 - Combination of Levels 1 and 2.** This level should be used when there is sufficient information already available to characterize the vegetation, soils, and hydrology of a portion, but not all, of the project area. Methods described for Level 1 may be applied to portions of the area for which adequate information already exists, and onsite methods (Level 2) must be applied to the remainder of the area (see Section D, Subsection 3).

58. After considering all available information, select a tentative method (see above) for use, and PROCEED TO EITHER Section D or E, as appropriate. *NOTE: Sometimes it may be necessary to change to another method described in the manual, depending on the quality of available information and/or recent changes in the project area.*

Section D. Routine Determinations

59. This section describes general procedures for making routine wetland determinations. It is assumed that the user has already completed all applicable steps in Section B,* and a routine method has been tentatively selected for use (Section C). Subsections 1-3 describe steps to be followed when making a routine determination using one of the three levels described in Section C. Each subsection contains a flowchart that defines the relationship of steps to be used for that level of routine determinations. *NOTE: The selected method must be considered tentative because the user may be required to change methods during the determination.*

Subsection 1 - Onsite Inspection Unnecessary

60. This subsection describes procedures for making wetland determinations when sufficient information is already available (Section B) on which to base the determination. A flowchart of required steps to be completed is presented in Figure 3, and each step is described below.

Figure 3. Flowchart of steps involved in making a wetland determination when an onsite inspsection is unnecessary.

* If it has been determined that it is more expedient to conduct an onsite inspection than to search for available information, complete STEPS 1 through 3 of Section B, and PROCEED TO Subsection 2.

Equipment and materials

61. No special equipment is needed for applying this method. The following materials will be needed:

    a. Map of project area (Section B, STEP 2).
    b. Copies of DATA FORM (Appendix B).
    c. Plant indicator status list and hydric soils list

Procedure

62. Complete the following steps, as necessary:

- **STEP 1 - Determine Whether Available Data Are Sufficient for Entire Project Area.** Examine the summarized data (Section B, STEPS 5, 7, and 9) and determine whether the vegetation, soils, and hydrology of the entire project area are adequately characterized. If so, PROCEED TO STEP 2. If all three parameters are adequately characterized for a portion, but not all, of the project area, PROCEED TO Subsection 3. If the vegetation, soils, and hydrology are not adequately characterized for any portion of the area, PROCEED TO Subsection 2.

- **STEP 2 - Determine Whether Hydrophytic Vegetation Is Present.** Examine the vegetation data and list on DATA FORM 1 the dominant plant species found in each vegetation layer of each community type. *NOTE: A separate DATA FORM 1 will be required for each community type*. Record the indicator status for each dominant species .When more than 50 percent of the dominant species in a plant community have an indicator status of OBL, FACW, and/or FAC, hydrophytic vegetation is present. If one or more plant communities comprise of hydrophytic vegetation, PROCEED TO STEP 3. If none of the plant communities comprise hydrophytic vegetation, none of the area is a wetland. Complete the vegetation section for each DATA FORM 1.

- **STEP 3 - Determine Whether Wetland Hydrology Is Present.** When one of the following conditions applies (STEP 2), it is only necessary to confirm that there has been no recent hydrologic alteration of the area:

a. The entire project area is occupied by a plant community or communities in which all dominant species are OBL.

b. The project area contains two or more plant communities, all of which are dominated by OBL and/or FACW species, and the wetland-nonwetland boundary is abrupt* (e.g. a *Spartina alterniflora* marsh bordered by a road embankment).

If either a or b applies, look for recorded evidence of recently constructed dikes, levees, impoundments, and drainage systems, or recent avalanches, mudslides, beaver dams, etc., that have significantly altered the area hydrology. If any significant hydrologic alteration is found, determine whether the area is still periodically inundated or has saturated soils for sufficient duration to support the documented vegetation (a or b above). When a or b applies and there is no evidence of recent hydrologic alteration, or when a or b do not apply and there is documented evidence that the area is periodically inundated or has saturated soils, wetland hydrology is present. Otherwise, wetland hydrology does not occur on the area. Complete the hydrology section of DATA FORM and PROCEED TO STEP 4.

- **STEP 4 - Determine Whether the Soils Parameter Must Be Considered.** When either a or b of STEP 3 applies and there is either no evidence of recent hydrologic alteration of the project area or if wetland hydrology presently occurs on the area, hydric soils can be assumed to be present. If so, PROCEED TO STEP 6. Otherwise PROCEED TO STEP 5.

- **STEP 5 - Determine Whether Hydric Soils Are Present.** Examine the soils data (Section B, STEP 7) and record the soil series or soil phase on DATA FORM 1 for each community type. Determine whether the soil is listed as a hydric soil .If all community types have hydric soils, the entire project area has hydric soils. *(CAUTION: If the soil series description makes reference to inclusions of other soil types, data must be field verified).* Any portion of the area that lacks hydric soils is a nonwetland. Complete the soils section of each DATA FORM 1 and PROCEED TO STEP 6.

- **STEP 6 - Wetland Determination.** Examine the DATA FORM 1 for each community type. Any portion of the project area is a wetland that has:

a. Hydrophytic vegetation that conforms to one of the conditions identified in STEP 3a or 3b and has either no evidence of altered hydrology or confirmed wetland hydrology.

b. Hydrophytic vegetation that does not conform to STEP 3a or 3b, has hydric soils, and has confirmed wetland hydrology.

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* There must be documented evidence of periodic inundation or saturated soils when the project area:

a. Has plant communities dominated by one or more FAC species;
b. Has vegetation dominated by FACW species but no adjacent community dominated by OBL species;
c. Has a gradual, nondistinct boundary between wetlands and nonwetlands; and/or
d. Is known to have or is suspected of having significantly altered hydrology.

If STEP 6a or 6b applies to the entire project area, the entire area is a wetland. Complete a DATA FORM 1 for all plant community types. Portions of the area not qualifying as a wetland based on an office determination might or might not be wetlands. If the data used for the determination are considered to be highly reliable, portions of the area not qualifying as wetlands may properly be considered nonwetlands. PROCEED TO STEP 7. If the available data are incomplete or questionable, an onsite inspection (Subsection 2) will be required.

- **STEP 7 - Determine Wetland Boundary.** Mark on the base map all community types determined to be wetlands with a W and those determined to be nonwetlands with an N. Combine all wetland community types into a single mapping unit. The boundary of these community types is the interface between wetlands and nonwetlands.

Subsection 2 - Onsite Inspection Necessary

63. This subsection describes procedures for routine determinations in which the available information (Section B) is insufficient for one or more parameters. If only one or two parameters must be characterized, apply the appropriate steps and return to Subsection 1 and complete the determination. A flowchart of steps required for using this method is presented in Figure 4, and each step is described below.

Equipment and materials

64. The following equipment and materials will be needed:

a. Base map (Section B, STEP 2).

b. Copies of DATA FORM 1 (one for each community type and additional copies for boundary determinations).

c. Plant indicator status list and hydric soils list.

d. Compass.

e. Soil auger or spade (soils only).

f. Tape (300 ft).

g. Munsell Color Charts (Munsell Color 1975) (soils only).

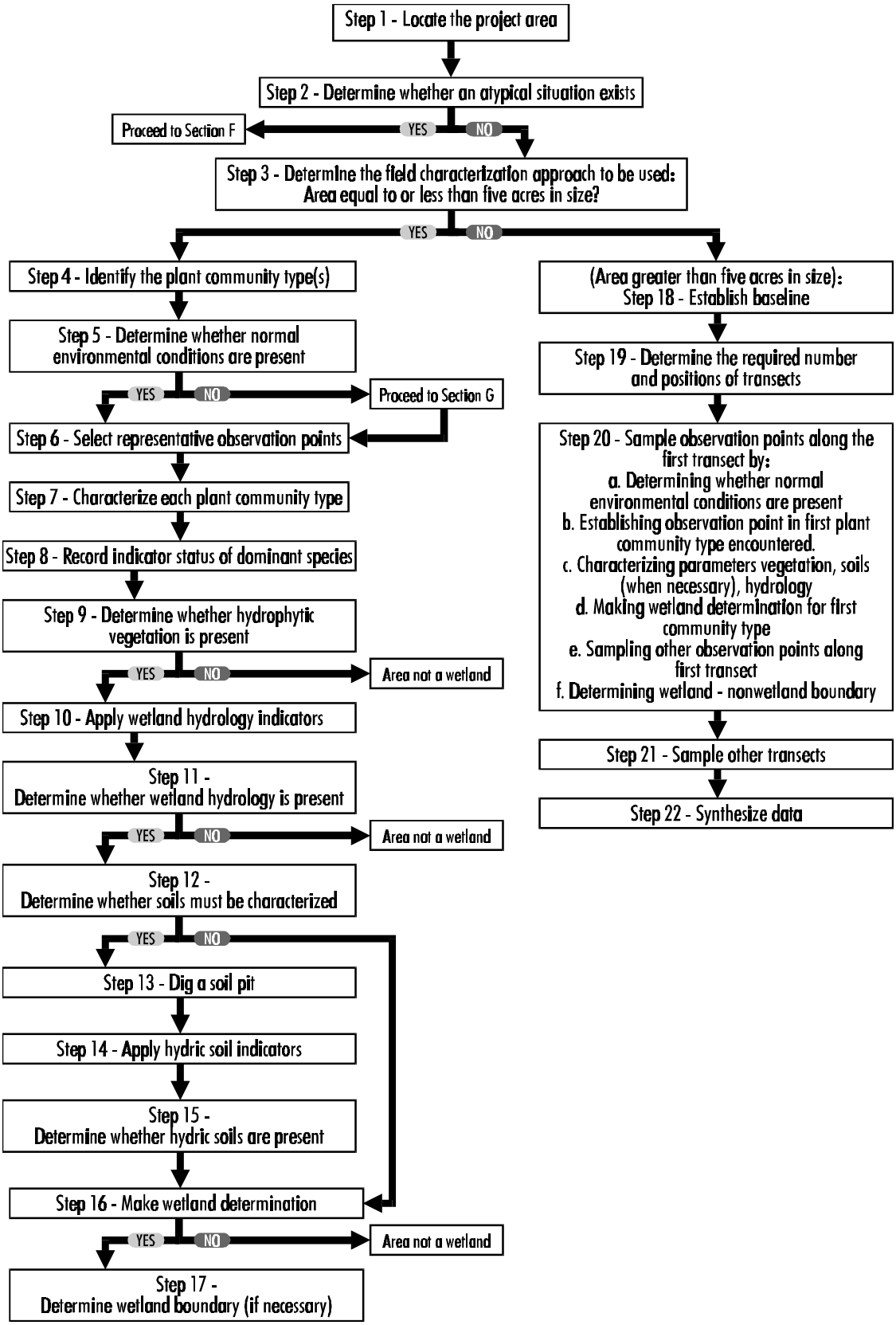

Figure 4. Flowchart of steps involved in making a routine wetland determination when an onsite visit is necessary.

Procedure

65. Complete the following steps, as necessary:

- **STEP 1 - Locate the Project Area.** Determine the spatial boundaries of the project area using information from a USGS quadrangle map or other appropriate map, aerial photography, and/or the project survey plan (when available). PROCEED TO STEP 2.

- **STEP 2 - Determine Whether an Atypical Situation Exists.** Examine the area and determine whether there is evidence of sufficient natural or human-induced alteration to significantly alter the area vegetation, soils, and/or hydrology. *NOTE: Include possible onsite modifications that may affect the area hydrology.* If not, PROCEED TO STEP 3.

If one or more parameters have been significantly altered by an activity that would normally require a permit, PROCEED TO Section F and determine whether there is sufficient evidence that hydrophytic vegetation, hydric soils, and/or wetland hydrology were present prior to this alteration. Then, return to this subsection and characterize parameters not significantly influenced by human activities. PROCEED TO STEP 3.

- **STEP 3 - Determine the Field Characterization Approach to be Used.** Considering the size and complexity of the area, determine the field characterization approach to be used. When the area is equal to or less than 5 acres in size (Section B, STEP 3) and the area is thought to be relatively homogeneous with respect to vegetation, soils, and/or hydrologic regime, PROCEED

TO STEP 4. When the area is greater than 5 acres in size (Section B, STEP 3) or appears to be highly diverse with respect to vegetation, PROCEED TO STEP 18.

Areas Equal to or Less Than 5 Acres in Size

- **STEP 4 - Identify the Plant Community Type(s).** Traverse the area and determine the number and locations of plant community types. Sketch the location of each on the base map (Section B, STEP 2), and give each community type a name. PROCEED TO STEP 5.

- **STEP 5 - Determine Whether Normal Environmental Conditions Are Present.** Determine whether normal environmental conditions are present by considering the following:

a. Is the area presently lacking hydrophytic vegetation or hydrologic indicators due to annual or seasonal fluctuations in precipitation or ground-water levels?

b. Are hydrophytic vegetation indicators lacking due to seasonal fluctuations in temperature?

If the answer to either of these questions is thought to be YES, PROCEED TO Section G. If the answer to both questions is NO, PROCEED TO STEP 6.

- **STEP 6 - Select Representative Observation Points.** Select a representative observation point in each community type. A representative observation point is one in which the apparent characteristics (determine visually) best represent characteristics of the entire community. Mark on the base map the approximate location of the observation point. PROCEED TO STEP 7.

- **STEP 7 - Characterize Each Plant Community Type.** Visually determine the dominant plant species in each vegetation layer of each community type and record them on DATA FORM 1 (use a separate DATA FORM 1 for each community type). Dominant species are those having the greatest relative basal area (woody overstory),* greatest height (woody understory), greatest percentage of areal cover (herbaceous understory), and/or greatest number of stems (woody vines). PROCEED TO STEP 8.

- **STEP 8 - Record Indicator Status of Dominant Species.** Record on DATA FORM I the indicator status of each dominant species in each community type. PROCEED TO STEP 9.

- **STEP 9 - Determine Whether Hydrophytic Vegetation Is Present.** Examine each DATA FORM 1. When more than 50 percent of the dominant species in a community type have an indicator status (STEP 8) of OBL, FACW, and/or FAC, hydrophytic vegetation is present. Complete the vegetation section of each DATA FORM 1. Portions of the area failing this test are not wetlands. PROCEED TO STEP 10.

- **STEP 10 - Apply Wetland Hydrologic Indicators.** Examine the portion of the area occupied by each plant community type for positive indicators of wetland hydrology (PART III, paragraph 49). Record findings on the appropriate DATA FORM 1. PROCEED TO STEP 11.

- **STEP 11 - Determine Whether Wetland Hydrology Is Present.** Examine the hydrologic information on DATA FORM 1 for each plant community type. Any portion of the area having a positive wetland hydrology indicator has wetland hydrology. If positive wetland hydrology indicators are present in all community types, the entire area has wetland hydrology. If no plant community type has a wetland hydrology indicator, none of the area has wetland hydrology. Complete the hydrology portion of each DATA FORM 1. PROCEED TO STEP 12.

- **STEP 12 - Determine Whether Soils Must Be Characterized.** Examine the vegetation section of each DATA FORM 1. Hydric soils are assumed to be present in any plant community type in which:

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* This term is used because species having the largest individuals may not be dominant when only a few are present. To determine relative basal area, consider both the size and number of individuals of a species and subjectively compare with other species present.

a. All dominant species have an indicator status of OBL.

b. All dominant species have an indicator status of OBL or FACW, and the wetland boundary (when present) is abrupt.*

When either a or b occurs and wetland hydrology is present, check the hydric soils blank as positive on DATA FORM 1 and PROCEED TO STEP 16. If neither a nor b applies, PROCEED TO STEP 13.

- **STEP 13 - Dig a Soil Pit.** Using a soil auger or spade, dig a soil pit at the representative location in each community type. When completed, approximately 16 inches of the soil profile will be available for examination. PROCEED TO STEP 14.

- **STEP 14 - Apply Hydric Soil Indicators.** Examine the soil at each location and compare its characteristics immediately below the A-horizon or 10 inches (whichever is shallower) with the hydric soil indicators described in PART III, paragraphs 44 and/or 45. Record findings on the appropriate DATA FORM 1s. PROCEED TO STEP 15.

- **STEP 15 - Determine Whether Hydric Soils Are Present.** Examine each DATA FORM 1 and determine whether a positive hydric soil indicator was found. If so, the area at that location has hydric soil. If soils at all sampling locations have positive hydric soil indicators, the entire area has hydric soils. If soils at all sampling locations lack positive hydric soil indicators, none of the area is a wetland. Complete the soil section of each DATA FORM 1. PROCEED TO STEP 16.

- **STEP 16 - Make Wetland Determination.** Examine DATA FORM 1. If the entire area presently or normally has wetland indicators of all three parameters (STEPS 9, 11, and 15), the entire area is a wetland. If the entire area presently or normally lacks wetland indicators of one or more parameters, the entire area is a nonwetland. If only a portion of the area presently or normally has wetland indicators for all three parameters, PROCEED TO STEP 17.

- **STEP 17 - Determine Wetland-Nonwetland Boundary.** Mark each plant community type on the base map with a W if wetland or an N if nonwetland. Combine all wetland plant communities into one mapping unit and all nonwetland plant communities into another mapping unit. The wetland-nonwetland boundary will be represented by the interface of these two mapping units.

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* The soils parameter must be considered in any plant community in which:
a. The community is dominated by one or more FAC species.
b. No community type dominated by OBL species is present.
c. The boundary between wetlands and nonwetlands is gradual or nondistinct.
d. The area is known to or is suspected of having significantly altered hydrology.

Areas Greater Than 5 Acres in Size

- **STEP 18 - Establish a Baseline.** Select one project boundary as a baseline. The baseline should parallel the major watercourse through the area or should be perpendicular to the hydrologic gradient (Figure 5). Determine the approximate baseline length. PROCEED TO STEP 19.

Figure 5. General orientation of baseline and transects (dotted lines) in a hypothetical project area. Alpha characters represent different plant communities. All transects start at the midpoint of a baseline segment except the first, which was repositioned to include community type A.

- **STEP 19 - Determine the Required Number and Position of Transects.** Use the following to determine the required number and position of transects (specific site conditions may necessitate changes in intervals):

Baseline length, miles	Number of Required Transects
<0.25	3
>0.25-0.50	3
>0.50-0.75	3
>0.75-1.00	3
>1.00-2.00	3-5
>2.00-4.00	5-8
>4.00	8 or more*

* Transect intervals should not exceed 0.5 mile.

Divide the baseline length by the number of required transects. Establish one transect in each resulting baseline increment. Use the midpoint of each baseline increment as a transect starting point. For example, if the baseline is 1,200 ft in length, three transects would be established--one at 200 ft, one at 600 ft, and one at 1,000 ft from the baseline starting point. *CAUTION: All plant community types must be included. This may necessitate relocation of one or more transect lines.* PROCEED TO STEP 20.

- **STEP 20 - Sample Observation Points Along the First Transect.** Beginning at the starting point of the first transect, extend the transect at a 90-deg angle to the baseline. Use the following procedure as appropriate to simultaneously characterize the parameters at each observation point. Combine field-collected data with information already available and make a wetland determination at each observation point. A DATA FORM 1 must be completed for each observation point.

a. **Determine whether normal environmental conditions are present.** Determine whether normal environmental conditions are present by considering the following:

(1) Is the area presently lacking hydrophytic vegetation and/or hydrologic indicators due to annual or seasonal fluctuations in precipitation or ground-water levels?

(2) Are hydrophytic vegetation indicators lacking due to seasonal fluctuations in temperature?

If the answer to either of these questions is thought to be YES, PROCEED TO Section G. If the answer to both questions is NO, PROCEED TO STEP 20b.

b. **Establish an observation point in the first plant community type encountered.** Select a representative location along the transect in the first plant community type

encountered. When the first plant community type is large and covers a significant distance along the transect, select an area that is no closer than 300 ft to a perceptible change in plant community type. PROCEED TO STEP 20c.

c. **Characterize parameters.** Characterize the parameters at the observation point by completing (1), (2), and (3) below:

(1) **Vegetation.** Record on DATA FORM 1 the dominant plant species in each vegetation layer occurring in the immediate vicinity of the observation point. Use a 5-ft radius for herbs and saplings/shrubs, and a 30-ft radius for trees and woody vines (when present). Subjectively determine the dominant species by estimating those having the largest relative basal area* (woody overstory), greatest height (woody understory), greatest percentage of areal cover (herbaceous understory), and/or greatest number of stems (woody vines). *NOTE: Plot size may be estimated, and plot size may also be varied when site conditions warrant*. Record on DATA FORM 1 any dominant species observed to have morphological adaptations for occurrence in wetlands, and determine and record dominant species that have known physiological adaptations for occurrence in wetlands . Record on DATA FORM I the indicator status of each dominant species. Hydrophytic vegetation is present at the observation point when more than 50 percent of the dominant species have an indicator status of OBL, FACW, and/or FAC; when two or more dominant species have observed morphological or known physiological adaptations for occurrence in wetlands; or when other indicators of hydrophytic vegetation (PART III, paragraph 35) are present. Complete the vegetation section of DATA FORM 1. PROCEED TO (2).

(2) **Soils.** In some cases, it is not necessary to characterize the soils. Examine the vegetation of DATA FORM 1. Hydric soils can be assumed to be present when:

(a) All dominant plant species have an indicator status of OBL.

(b) All dominant plant species have an indicator status of OBL and/or FACW (at least one dominant species must be OBL).*

When either (a) or (b) applies, check the hydric soils blank as positive and PROCEED TO (3). If neither (a) nor (b) applies but the vegetation qualifies as hydrophytic, dig a soil pit at the observation point using the procedure described in Appendix D,

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* This term is used because species having the largest individuals may not be dominant when only a few are present. To use relative basal area, consider both the size and number of individuals of a species and subjectively compare with other species present.

* Soils must be characterized when any dominant species has an indicator status of FAC.

Section 1. Examine the soil immediately below the A-horizon or 10-inches (whichever is shallower) and compare its characteristics (Appendix D, Section 1) with the hydric soil indicators described in PART III, paragraphs 44 and/or 45. Record findings on DATA FORM 1. If a positive hydric soil indicator is present, the soil at the observation point is a hydric soil. If no positive hydric soil indicator is found, the area at the observation point does not have hydric soils and the area at the observation point is not a wetland. Complete the soils section of DATA FORM 1 for the observation point. PROCEED TO (3) if hydrophytic vegetation (1) and hydric soils (2) are present. Otherwise, PROCEED TO STEP 20d.

(3) **Hydrology.** Examine the observation point for indicators of wetland hydrology (PART III, paragraph 49), and record observations on DATA FORM 1. Consider the indicators in the same sequence as presented in PART III, paragraph 49. If a positive wetland hydrology indicator is present, the area at the observation point has wetland hydrology. If no positive wetland hydrologic indicator is present, the area at the observation point is not a wetland. Complete the hydrology section of DATA FORM 1 for the observation point. PROCEED TO STEP 20d.

d. **Wetland determination.** Examine DATA FORM 1 for the observation point. Determine whether wetland indicators of all three parameters are or would normally be present during a significant portion of the growing season. If so, the area at the observation point is a wetland. If no evidence can be found that the area at the observation point normally has wetland indicators for all three parameters, the area is a nonwetland. PROCEED TO STEP 20e.

e. **Sample other observation points along the first transect.** Continue along the first transect until a different community type is encountered. Establish a representative observation point within this community type and repeat STEP 20c - 20d. If the areas at both observation points are either wetlands or nonwetlands, continue along the transect and repeat STEP 20c - 20d for the next community type encountered. Repeat for all other community types along the first transect. If the area at one observation point is wetlands and the next observation point is nonwetlands (or vice versa), PROCEED TO STEP 20f.

f. **Determine wetland-nonwetland boundary.** Proceed along the transect from the wetland observation point toward the nonwetland observation point. Look for subtle changes in the plant community (e.g. the first appearance of upland species, disappearance of apparent hydrology indicators, or slight changes in topography). When such features are noted, establish an observation point and repeat the procedures described in STEP 20c - 20d. *NOTE: A new DATA FORM 1 must be completed for this observation point, and all three parameters must be characterized by field observation.* If the area at this observation point is a wetland, proceed along the transect toward the nonwetland observation point until upland indicators are more apparent. Repeat the procedures described in STEP 20c - 20d. If the area at this

observation point is a nonwetland, move halfway back along the transect toward the last documented wetland observation point and repeat the procedure described in STEP 20c - 20d. Continue this procedure until the wetland-nonwetland boundary is found. It is not necessary to complete a DATA FORM 1 for all intermediate points, but a DATA FORM 1 should be completed for the wetland-nonwetland boundary. Mark the position of the wetland boundary on the base map, and continue along the first transect until all community types have been sampled and all wetland boundaries located. *CAUTION: In areas where wetlands are interspersed among nonwetlands (or vice versa), several boundary determinations will be required.* When all necessary wetland determinations have been completed for the first transect, PROCEED TO STEP 21.

- **STEP 21 - Sample Other Transects.** Repeat procedures described in STEP 21 for all other transects. When completed, a wetland determination will have been made for one observation point in each community type along each transect, and all wetland-nonwetland boundaries along each transect will have been determined. PROCEED TO STEP 22.

- **STEP 22 - Synthesize Data.** Examine all completed copies of DATA FORM 1, and mark each plant community type on the base map. Identify each plant community type as either a wetland (W) or nonwetland (N). If all plant community types are identified as wetlands, the entire area is wetlands. If all plant community types are identified as nonwetlands, the entire area is nonwetlands. If both wetlands and nonwetlands are present, identify observation points that represent wetland boundaries on the base map. Connect these points on the map by generally following contour lines to separate wetlands from nonwetlands. Walk the contour line between transects to confirm the wetland boundary. Should anomalies be encountered, it will be necessary to establish short transects in these areas, apply the procedures described in STEP 20f, and make any necessary adjustments on the base map.

Subsection 3 - Combination of Levels 1 and 2

66. In some cases, especially for large projects, adequate information may already be available (Section B) to enable a wetland determination for a portion of the project area, while an onsite visit will be required for the remainder of the area. Since procedures for each situation have already been described in Subsections 1 and 2, they will not be repeated. Apply the following steps:

- **STEP 1 - Make Wetland Determination for Portions of the Project Area That Are Already Adequately Characterized.** Apply procedures described in Subsection 1. When completed, a DATA FORM 1 will have been completed for each community type, and a map will have been prepared identifying each community type as wetland or nonwetland and showing any wetland boundary occurring in this portion of the project area. PROCEED TO STEP 2.

- **STEP 2 - Make Wetland Determination for Portions of the Project Area That Require an Onsite Visit.** Apply procedures described in Subsection 2. When completed, a DATA FORM 1 will have been completed for each plant community type or for a number of observation points (including wetland boundary determinations). A map of the wetland (if present) will also be available. PROCEED TO STEP 3.

- **STEP 3 - Synthesize Data.** Using the maps resulting from STEPS 1 and 2, prepare a summary map that shows the wetlands of the entire project area. *CAUTION: Wetland boundaries for the two maps will not always match exactly. When this occurs, an additional site visit will be required to refine the wetland boundaries. Since the degree of resolution of wetland boundaries will be greater when determined onsite, it may be necessary to employ procedures described in Subsection 2 in the vicinity of the boundaries determined from Subsection 1 to refine these boundaries.*

Section E. Comprehensive Determinations

67. This section describes procedures for making comprehensive wetland determinations. Unlike procedures for making routine determinations (Section D), application of procedures described in this section will result in maximum information for use in making determinations, and the information usually will be quantitatively expressed. Comprehensive determinations should only be used when the project area is very complex and/or when the determination requires rigorous documentation. This type of determination may be required in areas of any size, but will be especially useful in large areas. There may be instances in which only one parameter (vegetation, soil, or hydrology) is disputed. In such cases, only procedures described in this section that pertain to the disputed parameter need be completed. It is assumed that the user has already completed all applicable steps in Section B. *NOTE: Depending on site characteristics, it may be necessary to alter the design and/or data collection procedures.*

68. This section is divided into five basic types of activities. The first consists of preliminary field activities that must be completed prior to making a determination (STEPS 1-5). The second outlines procedures for determining the number and locations of required determinations (STEPS 6-8). The third describes the basic procedure for making a comprehensive wetland determination at any given point (STEPS 9-17). The fourth describes a procedure for determining wetland boundaries (STEP 18). The fifth describes a procedure for synthesizing the collected data to determine the extent of wetlands in the area (STEPS 20-21). A flowchart showing the relationship of various steps required for making a comprehensive determination is presented in Figure 6.

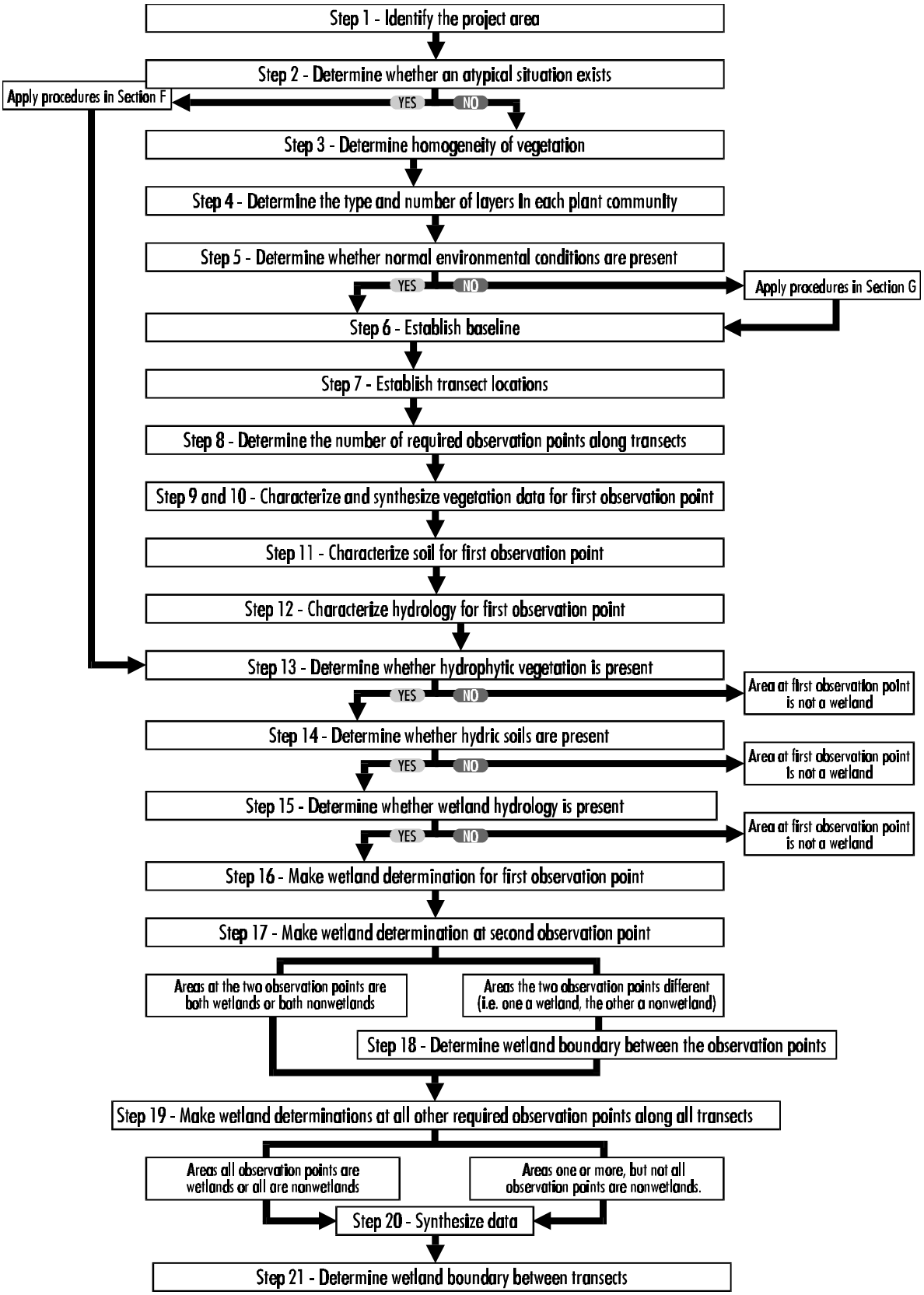

Figure 6. Flowchart of steps involved in making a comprehensive wetland determination (Section E).

Equipment and material

69. Equipment and materials needed for making a comprehensive determination include:

a. Base map (Section B, STEP 2).

b. Copies of DATA FORMS 1 and 2.

c. Plant indicator status list and hydric soils list.

d. Compass.

e. Tape (300 ft).

f. Soil auger or spade.

g. Munsell Color Charts (Munsell Color 1975).

h. Quadrat (3.28 ft by 3.28 ft).

i. Diameter or basal area tape (for woody overstory).

Field procedures

70. Complete the following steps:

- **STEP 1 - Identify the Project Area.** Using information from the USGS quadrangle or other appropriate map (Section B), locate and measure the spatial boundaries of the project area. Determine the compass heading of each boundary and record on the base map (Section B, STEP 2). The applicantš survey plan may be helpful in locating the project boundaries. PROCEED TO STEP 2.

- **STEP 2 - Determine Whether an Atypical Situation Exists.** Examine the area and determine whether there is sufficient natural or human-induced alteration to significantly change the area vegetation, soils, and/or hydrology. If not, PROCEED TO STEP 3. If one or more parameters have been recently altered significantly, PROCEED TO Section F and determine whether there is sufficient evidence that hydrophytic vegetation, hydric soils, and/or wetland hydrology were present on the area prior to alteration. Then return to this section and characterize parameters not significantly influenced by human activities. PROCEED TO STEP 3.

- **STEP 3 - Determine Homogeneity of Vegetation.** While completing STEP 2, determine the number of plant community types present. Mark the approximate location of each community type on the base map. The number and locations of required wetland

determinations will be strongly influenced by both the size of the area and the number and distribution of plant community types; the larger the area and greater the number of plant community types, the greater the number of required wetland determinations. It is imperative that **all** plant community types occurring in all portions of the area be included in the investigation. PROCEED TO STEP 4.

- **STEP 4 - Determine the Type and Number of Layers in Each Plant Community.** Examine each identified plant community type and determine the type(s) and number of layers in each community. Potential layers include trees (woody overstory), saplings/shrubs (woody understory), herbs (herbaceous understory), and/or woody vines. PROCEED TO STEP 5.

- **STEP 5 - Determine Whether Normal Environmental Conditions Are Present.** Determine whether normal environmental conditions are present at the observation point by considering the following:

  a. Is the area at the observation point presently lacking hydrophytic vegetation and/or hydrologic indicators due to annual or seasonal fluctuations in precipitation or groundwater levels?

  b. Are hydrophytic vegetation indicators lacking due to seasonal fluctuations in temperature?

  If the answer to either of these questions is thought to be YES, PROCEED TO Section G. If the answer to both questions is NO, PROCEED TO STEP 6.

- **STEP 6 - Establish a Baseline.** Select one project boundary area as a baseline. The baseline should extend parallel to any major watercourse and/or perpendicular to a topographic gradient (see Figure 7). Determine the baseline length and record on the base map both the baseline length and its compass heading. PROCEED TO STEP 7.

- **STEP 7. Establish Transect Locations.** Divide the baseline into a number of equal segments (Figure 7). Use the following as a guide to determine the appropriate number of baseline segments:

Baseline Length, ft	Number of Segments	Length of Baseline Segment, ft
>50 - 500	3	18 - 167
>500 - 1,000	3	167 - 333
>1,000 - 5,000	5	200 - 1,000
>5,000 - 10,000	7	700 - 1,400
>10,000*	variable	2,000

* If the baseline exceeds 5 miles, baseline segments should be 0.5 mile in length.

Use a random numbers table or a calculator with a random numbers generation feature to determine the position of a transect starting point within each baseline segment. For example, when the baseline is 4,000 ft, the number of baseline segments will be five, and the baseline segment length will be 4,000 ft. - 800 ft. Locate the first transect within the first 800 ft of the baseline. If the random numbers table yields 264 as the distance from the baseline starting point, measure 264 ft from the baseline starting point and establish the starting point of the first transect. If the second random number selected is 530, the starting point of the second transect will be located at a distance of 1,330 ft (800 + 530 ft) from the baseline starting point. *CAUTION: Make sure that each plant community type is included in at least one transect. If not, modify the sampling design accordingly*. When the starting point locations for all required transects have been determined, PROCEED TO STEP 8.

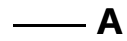

Figure 7. General orientation of baseline and transects in a hypothetical project area. Alpha characters represent different plant communities. Transect positions were determined using a random numbers table.

- **STEP 8 - Determine the Number of Required Observation Points Along Transects.** The number of required observation points along each transect will be largely dependent on transect length. Establish observation points along each transect using the following as a guide:

Transect Length, ft	Number of Observation Points	Interval Between Observation Points, ft
<1,000	2-10	100
1,000 - <5,000	10	100 - 500
5,000 - <10,000	10	500 - 1,000
≥10,000	>10	1,000

Establish the first observation point at a distance of 50 ft from the baseline (Figure 7). When obvious nonwetlands occupy a long portion of the transect from the baseline starting point, establish the first observation point in the obvious nonwetland at a distance of approximately 300 ft from the point that the obvious nonwetland begins to intergrade into a potential wetland community type. Additional observation points must also be established to determine the wetland boundary between successive regular observation points when one of the points is a wetland and the other is a nonwetland. *CAUTION: In large areas having a mosaic of plant community types, several wetland boundaries may occur along the same transect.* PROCEED TO STEP 9 and apply the comprehensive wetland determination procedure at each required observation point. Use the described procedure to simultaneously characterize the vegetation, soil, and hydrology at each required observation point along each transect, and use the resulting characterization to make a wetland determination at each point. *NOTE: All required wetland boundary determinations should be made while proceeding along a transect.*

- **STEP 9 - Characterize the Vegetation at the First Observation Point Along the First Transect.**[*] Record on DATA FORM 2 the vegetation occurring at the first observation point along the first transect by completing the following (as appropriate):

  a. **Trees.** Identify each tree occurring within a 30-ft radius[**] of the observation point, measure its basal area (square inches) or diameter at breast height (DBH) using a basal area tape or diameter tape, respectively, and record. *NOTE: If DBH is measured, convert values to basal area by applying the formula* $A = pr^2$. *This must be done on an individual basis.* A tree is any nonclimbing, woody plant that has a DBH of ≥3.0 in., regardless of height.

[*] There is no single best procedure for characterizing vegetation. Methods described in STEP 9 afford standardization of the procedure. However, plot size and descriptors for determining dominance may vary.

[**] A larger sampling plot may be necessary when trees are large and widely spaced.

b. **Saplings/shrubs.** Identify each sapling/shrub occurring within a 10-ft radius of the observation point, estimate its height, and record the midpoint of its class range using the following height classes (height is used as an indication of dominance; taller individuals exert a greater influence on the plant community):

Height Class	Height Class Range, ft	Midpoint of Range, ft
1	1 - 3	2
2	3 - 5	4
3	5 - 7	6
4	7 - 9	8
5	9 - 11	10
6	>11	12

A sapling/shrub is any woody plant having a height >3.2 ft but a stem diameter of <3.0 in., exclusive of woody vines.

c. **Herbs.** Place a 3.28- by 3.28-ft quadrat with one corner touching the observation point and one edge adjacent to the transect line. As an alternative, a 1.64-ft-radius plot with the center of the plot representing the observation point position may be used. Identify each plant species with foliage extending into the quadrat and estimate its percent cover by applying the following cover classes:

Cover Class	Class Range, %	Midpoint of Class Range, %
1	0 - 5	2.5
2	>5 - 25	15.0
3	>25 - 50	37.5
4	>50 - 75	62.5
5	>75 - 95	85.0
6	>95 - 100	97.5

Include all nonwoody plants and woody plants <3.2 ft in height. *NOTE: Total percent cover for all species will often exceed 100 percent.*

d. **Woody vines (lianas).** Identify species of woody vines climbing each tree and sapling/shrub sampled in STEPS 9a and 9b above, and record the number of stems of each. Since many woody vines branch profusely, count or estimate the number of stems at the ground surface. Include only individuals rooted in the

10-ft radius plot. Do not include individuals <3.2 ft in height. PROCEED TO STEP 10.

- **STEP 10 - Analyze Field Vegetation Data.** Examine the vegetation data (STEP 9) and determine the dominant species in each vegetation layer* by completing the following:

  a. **Trees.** Obtain the total basal area (square inches) for each tree species identified in STEP 9a by summing the basal area of all individuals of a species found in the sample plot. Rank the species in descending order of dominance based on total basal area. Complete DATA FORM 2 for the tree layer.

  b. **Saplings/shrubs.** Obtain the total height for each sapling/shrub species identified in STEP 9b. Total height, which is an estimate of dominance, is obtained by summing the midpoints of height classes for all individuals of a species found in the sample plot. Rank the species in descending order of dominance based on sums of midpoints of height class ranges. Complete DATA FORM 2 for the sapling/shrub layer.

  c. **Herbs.** Obtain the total cover for each herbaceous and woody seedling species identified in STEP 9c. Total cover is obtained by using the midpoints of the-cover class range assigned to each species (only one estimate of cover is made for a species in a given plot). Rank herbs and woody seedlings in descending order of dominance based on percent cover. Complete DATA FORM 2 for the herbaceous layer.

  d. **Woody vines (lianas).** Obtain the total number of individuals of each species of woody vine identified in STEP 9d. Rank the species in descending order of dominance based on number of stems. Complete DATA FORM 2 for the woody vine layer. PROCEED TO STEP 11.

- **STEP 11 - Characterize Soil.** If a soil survey is available (Section B), the soil type may already be known. Have a soil scientist confirm that the soil type is correct, and determine whether the soil series is a hydric soil. *CAUTION: Mapping units on soil surveys sometimes have inclusions of soil series or phases not shown on the soil survey map.* If a hydric soil type is confirmed, record on DATA FORM 1 and PROCEED TO STEP 12. If not, dig a soil pit using a soil auger or spade and look for indicators of hydric soils immediately below the A-horizon or 10 inches (whichever is shallower) (PART III, paragraphs 44 and/or 45). Record findings on DATA FORM 1. PROCEED TO STEP 12.

- **STEP 12 - Characterize Hydrology.** Examine the observation point for indicators of wetland hydrology (PART III, paragraph 49), and record observations on DATA

* The same species may occur as a dominant in more than one vegetation layer.

FORM 1. Consider indicators in the same sequence as listed in paragraph 49. PROCEED TO STEP 13.

- **STEP 13 - Determine Whether Hydrophytic Vegetation Is Present.** Record the three dominant species from each vegetation layer (five species if only one or two layers are present) on DATA FORM 1.* Determine whether these species occur in wetlands by considering the following:

  a. **More than 50 percent of the dominant plant species are OBL, FACW, and/or FAC on lists of plant species that occur in wetlands.** Record the indicator status of all dominant species on DATA FORM 1. Hydrophytic vegetation is present when the majority of the dominant species have an indicator status of OBL, FACW, or FAC. *CAUTION: Not necessarily all plant communities composed of only FAC species are hydrophytic communities. They are hydrophytic communities only when positive indicators of hydric soils and wetland hydrology are also found.* If this indicator is satisfied, complete the vegetation portion of DATA FORM 1 and PROCEED TO STEP 14. If not, consider other indicators of hydrophytic vegetation.

  b. **Presence of adaptations for occurrence in wetlands.** Do any of the species listed on DATA FORM 1 have observed morphological or known physiological adaptations (Appendix C, Section 3) for occurrence in wetlands? If so, record species having such adaptations on DATA FORM 1. When two or more dominant species have observed morphological adaptations or known physiological adaptations for occurrence in wetlands, hydrophytic vegetation is present. If so, complete the vegetation portion of DATA FORM 1 and PROCEED TO STEP 14. If not, consider other indicators of hydrophytic vegetation.

  c. **Other indicators of hydrophytic vegetation.** Consider other indicators (see PART III, paragraph 35) that the species listed on DATA FORM 1 are commonly found in wetlands. If so, complete the vegetation portion of DATA FORM 1 by recording sources of supporting information, and PROCEED TO STEP 14. If no Indicator of hydrophytic vegetation is present, the area at the observation point is not a wetland. In such cases, it is unnecessary to consider soil and hydrology at that observation point. PROCEED To STEP 17.

- **STEP 14 - Determine Whether Hydric Soils Are Present.** Examine DATA FORM 1 and determine whether any indicator of hydric soils is present. If so, complete the soils portion of DATA FORM 1 and PROCEED TO STEP 15. If not, the area at the observation point is not a wetland. PROCEED TO STEP 17.

* Record all dominant species when less than three are present in a vegetation layer.

- **STEP 15 - Determine Whether Wetland Hydrology Is Present.** Examine DATA FORM 1 and determine whether any indicator of wetland hydrology is present. Complete the hydrology portion of DATA FORM 1 and PROCEED TO STEP 16.

- **STEP 16 - Make Wetland Determination.** When the area at the observation point presently or normally has wetland indicators of all three parameters, it is a wetland. When the area at the observation point presently or normally lacks wetland indicators of one or more parameters, it is a nonwetland. PROCEED TO STEP 17.

- **STEP 17 - Make Wetland Determination at Second Observation Point.** Locate the second observation point along the first transect and make a wetland determination by repeating procedures described in STEPS 9-16. When the area at the second observation point is the same as the area at the first observation point (i.e. both wetlands or both nonwetlands), PROCEED TO STEP 19. When the areas at the two observation points are different (i.e. one wetlands, the other nonwetlands), PROCEED TO STEP 18.

- **STEP 18 - Determine the Wetland Boundary Between Observation Points.** Determine the position of the wetland boundary by applying the following procedure:

    a. Look for a change in vegetation or topography. *NOTE: The changes may sometimes be very subtle.* If a change is noted, establish an observation point and repeat STEPS 9-16. Complete a DATA FORM 1. If the area at this point is a wetland, proceed toward the nonwetland observation point until a more obvious change in vegetation or topography is noted and repeat the procedure. If there is no obvious change, establish the next observation point approximately halfway between the last observation point and the nonwetland observation point and repeat STEPS 9-16.

    b. Make as many additional wetland determinations as necessary to find the wetland boundary. *NOTE: The completed DATA FORM 1's for the original two observation points often will provide a clue as to the parameter(s) that change between the two points.*

    c. When the wetland boundary is found, mark the boundary location on the base map and indicate on the DATA FORM 1 that this represents a wetland boundary. Record the distance of the boundary from one of the two regular observation points. Since the regular observation points represent known distances from the baseline, it will be possible to accurately pinpoint the boundary location on the base map. PROCEED TO STEP 19.

- **STEP 19 - Make Wetland Determinations at All Other Required Observation Points Along All Transects.** Continue to locate and sample all required observation points along all transects. *NOTE: The procedure described in STEP 18 must be applied at every position where a wetland boundary occurs between successive observation points.* Complete a DATA FORM 1 for each observation point and PROCEED TO STEP 20.

- **STEP 20 - Synthesize Data to Determine the Portion of the Area Containing Wetlands.** Examine all completed copies of DATA FORM 1 (STEP 19), and mark on a copy of the base map the locations of all observation points that are wetlands with a W and all observation points that are nonwetlands with an N. Also, mark all wetland boundaries occurring along transects with an X. If all the observation points are wetlands, the entire area is wetlands. If all observation points are nonwetlands, none of the area is wetlands. If some wetlands and some nonwetlands are present, connect the wetland boundaries (X) by following contour lines between transects. *CAUTION: If the determination is considered to be highly controversial, it may be necessary to be more precise in determining the wetland boundary between transects. This is also true for very large areas where the distance between transects is greater. If this is necessary, PROCEED TO STEP 21.*

- **STEP 21 - Determine Wetland Boundary Between Transects.** Two procedures may be used to determine the wetland boundary between transects, both of which involve surveying:

  a. **Survey contour from wetland boundary along transects.** The first method involves surveying the elevation of the wetland boundaries along transects and then extending the survey to determine the same contour between transects. This procedure will be adequate in areas where there is no significant elevational change between transects. However, if a significant elevational change occurs between transects, either the surveyor must adjust elevational readings to accommodate such changes or the second method must be used. *NOTE: The surveyed wetland boundary must be examined to ensure that no anomalies exist. If these occur, additional wetland determinations will be required in the portion of the area where the anomalies occur, and the wetland boundary must be adjusted accordingly.*

  b. **Additional wetland determinations between transects.** This procedure consists of traversing the area between transects and making additional wetland determinations to locate the wetland boundary at sufficiently close intervals (not necessarily standard intervals) so that the area can be surveyed. Place surveyor flags at each wetland boundary location. Enlist a surveyor to survey the points between transects. From the resulting survey data, produce a map that separates wetlands from nonwetlands.

Section F. Atypical Situations

71. Methods described in this section should be used only when a determination has already been made in Section D or E that positive indicators of hydrophytic vegetation, hydric soils, and/or wetland hydrology could not be found due to effects of recent human activities or natural events. Recent means that period of time since legal jurisdiction of an applicable law began. This section is applicable to delineations made in the following types of situations:

    a. **Unauthorized activities.** Unauthorized discharges requiring enforcement actions may result in removal or covering of indicators of one or more wetland parameters. Examples include, but are not limited to: (1) alteration or removal of vegetation; (2) placement of dredged or fill material over hydric soils; and/or (3) construction of levees, drainage systems, or dams that significantly alter the area hydrology. *NOTE: This section should not be used for activities that have been previously authorized or those that are exempted from regulation. For example, this section is not applicable to areas that have been legally drained or not regulated. Some of these areas may still be wetlands, but procedures described in Section D or E must be used in these cases.*

    b. **Natural events.** Naturally occurring events may result in either creation or alteration of wetlands. For example, recent beaver dams may impound water, thereby resulting in a shift of hydrology and vegetation to wetlands. However, hydric soil indicators may not have developed due to insufficient time having passed to allow their development. Fire, avalanches, volcanic activity, and changing river courses are other examples. *NOTE: It is necessary to determine whether alterations to an area have resulted in changes that are now the "normal circumstances."* The relative permanence of the change and whether the area is now functioning as a wetland must be considered.

    c. **Human-induced wetlands.** Procedures described in Subsection 4 are for use in delineating wetlands that have been purposely or incidentally created by human activities, but in which wetland indicators of one or more parameters are absent. For example, road construction may have resulted in impoundment of water in an area that previously was nonwetland, thereby effecting hydrophytic vegetation and wetland hydrology in the area. However, the area may lack hydric soil indicators. *NOTE: Subsection D is not intended to bring into jurisdiction those humanmade wetlands that are exempted under applicable regulations or policy.* It is also important to consider whether the human-induced changes are now the "normal circumstances" for the area. Both the relative permanence of the change and the functioning of the area as a wetland are implied.

72. When any of the three types of situations described in paragraph 71 occurs, application of methods described in Sections D and/or E will lead to the conclusion that the area is not a wetland because positive wetland indicators for at least one of the three parameters will be absent. Therefore, apply procedures described in one of the following subsections (as appropriate) to determine whether positive indicators of hydrophytic vegetation, hydric soils, and/or

wetland hydrology existed prior to alteration of the area. Once these procedures have been employed, RETURN TO Section D or E to make a wetland determination. PROCEED TO the appropriate subsection.

Subsection 1 - Vegetation

73. Employ the following steps to determine whether hydrophytic vegetation previously occurred:

- **STEP 1 - Describe the Type of Alteration.** Examine the area and describe the type of alteration that occurred. Look for evidence of selective harvesting, clear cutting, bulldozing, recent conversion to agriculture, or other activities (e.g., burning, discing, or presence of buildings, dams, levees, roads, parking lots, etc.). Determine the approximate date* when the alteration occurred. Record observations on DATA FORM 3, and PROCEED TO STEP 2.

- **STEP 2 - Describe Effects on Vegetation.** Record on DATA FORM 3 a general description of how the activities (STEP 1) have affected the plant communities. Consider the following:

  a. Has all or a portion of the area been cleared of vegetation?

  b. Has only one layer of the plant community (e.g. trees) been removed?

  c. Has selective harvesting resulted in removal of some species?

  d. Has all vegetation been covered by fill, dredged material, or structures?

  e. Have increased water levels resulted in the death of some individuals?

PROCEED TO STEP 3.

- **STEP 3 - Determine the Type of Vegetation That Previously Occurred.** Obtain all possible evidence of the type of plant communities that occurred in the area prior to alteration. Potential sources of such evidence include:

  a. **Aerial photography.** Recent (within 5 years) aerial photography can often be used to document the type of previous vegetation. The general type of plant communities formerly present can usually be determined, and species identification is sometimes possible.

* It is especially important to determine whether the alteration occurred prior to implementation of applicable regulations.

b. **Onsite inspection.** Many types of activities result in only partial removal of the previous plant communities, and remaining species may be indicative of hydrophytic vegetation. In other cases, plant fragments (e.g. stumps, roots) may be used to reconstruct the plant community types that occurred prior to site alteration. Sometimes, this can be determined by examining piles of debris resulting from land-clearing operations or excavation to uncover identifiable remains of the previous plant community.

c. **Previous site inspections.** Documented evidence from previous inspections of the area may describe the previous plant communities, particularly in cases where the area was altered after a permit application was denied.

d. **Adjacent vegetation.** Circumstantial evidence of the type of plant communities that previously occurred may sometimes be obtained by examining the vegetation in adjacent areas. If adjacent areas have the same topographic position, soils, and hydrology as the altered area, the plant community types on the altered area were probably similar to those of the adjacent areas.

e. **NRCS records**. Most NRCS soil surveys include a description of the plant community types associated with each soil type. If the soil type on the altered area can be determined, it may be possible to generally determine the type of plant communities that previously occurred.

f. **Permit applicant.** In some cases, the permit applicant may provide important information about the type of plant communities that occurred prior to alteration.

g. **Public.** Individuals familiar with the area may provide a good general description of the previously occurring plant communities.

h. **NWI wetland maps.** The NWI has developed wetland type maps for many areas. These may be useful in determining the type of plant communities that occurred prior to alteration.

To develop the strongest possible record, all of the above sources should be considered. If the plant community types that occurred prior to alteration can be determined, record them on DATA FORM 3 and also record the basis used for the determination. PROCEED TO STEP 4. If it is impossible to determine the plant community types that occurred on the area prior to alteration, a determination cannot be made using all three parameters. In such cases, the determination must be based on the other two parameters. PROCEED TO Subsection 2 or 3 if one of the other parameters has been altered, or return to the appropriate Subsection of Section D or to Section E, as appropriate.

- **STEP 4 - Determine Whether Plant Community Types Constitute Hydrophytic Vegetation.** Develop a list of species that previously occurred on the site (DATA FORM 3). Subject the species list to applicable indicators of hydrophytic vegetation (PART III, paragraph 35). If none of the indicators are met, the plant communities that previously occurred did not constitute hydrophytic vegetation. If hydrophytic vegetation was present and no other parameter was in question, record appropriate data on the vegetation portion of DATA FORM 3, and return to either the appropriate subsection of Section D or to Section E. If either of the other parameters was also in question, PROCEED TO Subsection 2 or 3.

Subsection 2 - Soils

74. Employ the following steps to determine whether hydric soils previously occurred:

- **STEP 1 - Describe the Type of Alteration.** Examine the area and describe the type of alteration that occurred. Look for evidence of:

  a. **Deposition of dredged or fill material or natural sedimentation.** In many cases the presence of fill material will be obvious. If so, it will be necessary to dig a hole to reach the original soil (sometimes several feet deep). Fill material will usually be a different color or texture than the original soil (except when fill material has been obtained from like areas onsite). Look for decomposing vegetation between soil layers and the presence of buried organic or hydric soil layers. In accreting or recently formed sandbars in riverine situations, the soils may support hydrophytic vegetation but lack hydric soil characteristics.

  b. **Presence of nonwoody debris at the surface.** This can only be applied in areas where the original soils do not contain rocks. Nonwoody debris includes items such as rocks, bricks, and concrete fragments.

  c. **Subsurface plowing.** Has the area recently been plowed below the A-horizon or to depths of greater than 10 in.?

  d. **Removal of surface layers.** Has the surface soil layer been removed by scraping or natural landslides? Look for bare soil surfaces with exposed plant roots or scrape scars on the surface.

  e. **Presence of human-made structures.** Are buildings, dams, levees, roads, or parking lots present?

Determine the approximate date* when the alteration occurred. This may require checking aerial photography, examining building permits, etc. Record on DATA FORM 3, and PROCEED TO STEP 2.

- **Step 2 - Describe Effects on Soils.** Record on DATA FORM 3 a general description of how identified activities in STEP I have affected the soils. Consider the following:

  a. Has the soil been buried? If so, record the depth of fill material and determine whether the original soil is intact.

  b. Has the soil been mixed at a depth below the A-horizon or greater than 10 inches? If so, it will be necessary to examine the original soil at a depth immediately below the plowed zone. Record supporting evidence.

  c. Has the soil been sufficiently altered to change the soil phase? Describe these changes.

PROCEED TO STEP 3.

- **STEP 3 - Characterize Soils That Previously Occurred.** Obtain all possible evidence that may be used to characterize soils that previously occurred on the area. Consider the following potential sources of information:

  a. **Soil surveys.** In many cases, recent soil surveys will be available. If so, determine the soil series that were mapped for the area, and compare these soil series with the list of hydric soils (Appendix D, Section 2). If all soil series are listed as hydric soils, the entire area had hydric soils prior to alteration.

  b. **Characterization of buried soils.** When fill material has been placed over the original soil without physically disturbing the soil, examine and characterize the buried soils. To accomplish this, dig a hole through the fill material until the original soil is encountered. Determine the point at which the original soil material begins. Remove 12 inches of the original soil from the hole and look for indicators of hydric soils (PART III, paragraphs 44 and/or 45) immediately below the A-horizon or 10 inches (whichever is shallower). Record on DATA FORM 3 the color of the soil matrix, presence of an organic layer, presence of mottles or gleying, and/or presence of iron and manganese concretions. If the original soil is mottled and the chroma of the soil matrix is 2 or less,* a hydric

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* It is especially important to determine whether the alteration occurred prior to implementation of applicable regulations.

* The matrix chroma must be 1 or less if no mottles are present (see paragraph 44). The soil must be moist when colors are determined.

soil was formerly present on the site. If any of these indicators are found, the original soil was a hydric soil. *(NOTE: When the fill material is a thick layer, it might be necessary to use a backhoe or posthole digger to excavate the soil pit.)* If USGS quadrangle maps indicate distinct variation in area topography, this procedure must be applied in each portion of the area that originally had a different surface elevation. Record findings on DATA FORM 3.

c. **Characterization of plowed soils.** Determine the depth to which the soil has been disturbed by plowing. Look for hydric soil characteristics (PART III, paragraphs 44 and/or 45) immediately below this depth. Record findings on DATA FORM 3.

d. **Removal of surface layers.** Dig a hole and determine whether the entire surface layer (A-horizon) has been removed. If so, examine the soil immediately below the top of the subsurface layer (B-horizon) for hydric soil characteristics. As an alternative, examine an undisturbed soil of the same soil series occurring in the same topographic position in an immediately adjacent area that has not been altered. Look for hydric soil indicators immediately below the A-horizon or 10 inches (whichever is shallower), and record findings on DATA FORM 3.

If sufficient data on soils that existed prior to alteration can be obtained to determine whether a hydric soil was present, PROCEED TO STEP 4. If not, a determination cannot be made using soils. Use the other parameters (Subsections 1 and 3) for the determination.

- **STEP 4 - Determine Whether Hydric Soils Were Formerly Present.** Examine the available data and determine whether indicators of hydric soils (PART III, paragraphs 44 and/or 45) were formerly present. If no indicators of hydric soils were found, the original soils were not hydric soils. If indicators of hydric soils were found, record the appropriate indicators on DATA FORM 3 and PROCEED TO Subsection 3 if the hydrology of the area has been significantly altered or return either to the appropriate subsection of Section D or to Section E and characterize the area hydrology.

Subsection 3 - Hydrology

75. Apply the following steps to determine whether wetland hydrology previously occurred:

- **STEP 1 - Describe the Type of Alteration.** Examine the area and describe the type of alteration that occurred. Look for evidence of:

a. **Dams.** Has recent construction of a dam or some natural event (e.g. beaver activity or landslide) caused the area to become increasingly wetter or drier? *NOTE: This activity could have occurred a considerable distance away from the site in question.*

b. **Levees, dikes, and similar structures.** Have levees or dikes recently been constructed that prevent the area from becoming periodically inundated by overbank flooding?

c. **Ditching.** Have ditches been constructed recently that cause the area to drain more rapidly following inundation?

d. **Filling of channels or depressions (land-leveling).** Have natural channels or depressions been recently filled?

e. **Diversion of water.** Has an upstream drainage pattern been altered that results in water being diverted from the area?

f. **Ground-water extraction.** Has prolonged and intensive pumping of ground water for irrigation or other purposes significantly lowered the water table and/or altered drainage patterns?

g. **Channelization.** Have feeder streams recently been channelized sufficiently to alter the frequency and/or duration of inundation?

Determine the approximate date* when the alteration occurred. Record observations on DATA FORM 3 and PROCEED TO STEP 2.

- **STEP 2 - Describe Effects of Alteration on Area Hydrology.** Record on DATA FORM 3 a general description of how the observed alteration (STEP 1) has affected the area. Consider the following:

  a. Is the area more frequently or less frequently inundated than prior to alteration? To what degree and why?

  b. Is the duration of inundation and soil saturation different than prior to alteration? How much different and why?

PROCEED TO STEP 3.

- **STEP 3 - Characterize the Hydrology That Previously Existed in the Area.** Obtain all possible evidence that may be used to characterize the hydrology that previously occurred. Potential sources of information include:

  a. **Stream or tidal gage data.** If a stream or tidal gaging station is located near the area, it may be possible to calculate elevations representing the upper limit

* It is especially important to determine whether the alteration occurred prior to implementation of Section 404.

of wetlands hydrology based on duration of inundation. Consult hydrologists from the local CE District Office for assistance. The resulting mean sea level elevation will represent the upper limit of inundation for the area in the absence of any alteration. If fill material has not been placed on the area, survey this elevation from the nearest USGS benchmark. Record elevations representing zone boundaries on DATA FORM 3. If fill material has been placed on the area, compare the calculated elevation with elevations shown on a USGS quadrangle or any other survey map that predated site alteration.

b. **Field hydrologic indicators.** Certain field indicators of wetland hydrology (PART III, paragraph 49) may still be present. Look for watermarks on trees or other structures, drift lines, and debris deposits. Record these on DATA FORM 3. If adjacent undisturbed areas are in the same topographic position and are similarly influenced by the same sources of inundation, look for wetland indicators in these areas.

c. **Aerial photography.** Examine any available aerial photography and determine whether the area was inundated at the time of the photographic mission. Consider the time of the year that the aerial photography was taken and use only photography taken during the growing season and prior to site alteration.

d. **Historical records.** Examine any available historical records for evidence that the area has been periodically inundated. Obtain copies of any such information and record findings on DATA FORM 3.

e. **Floodplain Management Maps.** Determine the previous frequency of inundation of the area from Floodplain Management Maps (if available). Record flood frequency on DATA FORM 3.

f. **Public or local government officials.** Contact individuals who might have knowledge that the area was periodically inundated.

If sufficient data on hydrology that existed prior to site alteration can be obtained to determine whether wetland hydrology was previously present, PROCEED TO STEP 4. If not, a determination involving hydrology cannot be made. Use other parameters (Subsections 1 and 2) for the wetland determination. Return to either the appropriate subsection of Section D or to Section E and complete the necessary data forms. PROCEED TO STEP 4 if the previous hydrology can be characterized.

- **STEP 4 - Determine Whether Wetland Hydrology Previously Occurred.** Examine the available data and determine whether indicators of wetland hydrology (PART III, paragraph 49) were present prior to site alteration. If no indicators of wetland hydrology were found, the original hydrology of the area was not wetland hydrology. If indicators of wetland hydrology were found, record the appropriate indicators on DATA FORM 3 and

return either to the appropriate subsection of Section D or to Section E and complete the wetland determination.

Subsection 4 - Human-Induced Wetlands

76. A human-induced wetland is an area that has developed at least some characteristics of naturally occurring wetlands due to either intentional or incidental human activities. Examples of human-induced wetlands include irrigated wetlands, wetlands resulting from impoundment (e.g. reservoir shorelines), wetlands resulting from filling of formerly deepwater habitats, dredged material disposal areas, and wetlands resulting from stream channel realignment. Some human-induced wetlands may be subject to regulation. In virtually all cases, human-induced wetlands involve a significant change in the hydrologic regime, which may either increase or decrease the wetness of the area. Although wetland indicators of all three parameters (i.e. vegetation, soils, and hydrology) may be found in some human-induced wetlands, indicators of hydric soils are usually absent. Hydric soils require long periods for development of wetness characteristics, and most human-induced wetlands have not been in existence for a sufficient period to allow development of hydric soil characteristics. Therefore, application of the multi-parameter approach in making wetland determinations in human-induced wetlands must be based on the presence of hydrophytic vegetation and wetland hydrology.[*] There must also be documented evidence that the wetland resulted from human activities. Employ the following steps to determine whether an area consists of wetlands resulting from human activities:

- **STEP 1 - Determine Whether the Area Represents a Potential Human-Induced Wetland.** Consider the following questions:

    a. Has a recent human-induced change in hydrology occurred that caused the area to become significantly wetter?

    b. Has a major man-induced change in hydrology that occurred in the past caused a former deepwater aquatic habitat to become significantly drier?

    c. Has human-induced stream channel realignment significantly altered the area hydrology?

    d. Has the area been subjected to long-term irrigation practices?

    If the answer to any of the above questions is YES, document the approximate time during which the change in hydrology occurred, and PROCEED TO STEP 2. If the answer to all of the questions is NO, procedures described in Section D or E must be used.

[*] Uplands that support hydrophytic vegetation due to agricultural irrigation and that have an obvious hydrologic connection to other "waters of the United States" should not be delineated as wetlands under this subsection.

- **STEP 2 - Determine Whether a Permit Will be Needed if the Area is Found to be a Wetland**. Consider the applicable regulations and policy regarding human-induced wetlands. If the type of activity resulting in the area being a potential human-induced wetland is exempted by regulation or policy, no further action is needed. If not exempt, PROCEED TO STEP 3.

- **STEP 3 - Characterize the Area Vegetation, Soils, and Hydrology.** Apply procedures described in Section D (routine determinations) or Section E (comprehensive determinations) to the area. Complete the appropriate data forms and PROCEED TO STEP 4.

- **STEP 4 - Wetland Determination.** Based on information resulting from STEP 3, determine whether the area is a wetland. When wetland indicators of all three parameters are found, the area is a wetland. When indicators of hydrophytic vegetation and wetland hydrology are found and there is documented evidence that the change in hydrology occurred so recently that soils could not have developed hydric characteristics, the area is a wetland. In such cases, it is assumed that the soils are functioning as hydric soils. *CAUTION: If hydrophytic vegetation is being maintained only because of human-induced wetland hydrology that would no longer exist if the activity (e.g. irrigation) were to be terminated, the area should not be considered a wetland.*

Section G: Problem Areas

77. There are certain wetland types and/or conditions that may make application of indicators of one or more parameters difficult, at least at certain times of the year. These are not considered to be atypical situations. Instead, they are wetland types in which wetland indicators of one or more parameters may be periodically lacking due to **normal environmental conditions or** seasonal or annual variations in environmental conditions that result from causes other than human activities or catastrophic natural events.

Types of problem areas

78. Representative examples of potential problem areas, types of variations that occur, and their effects on wetland indicators are presented in the following subparagraphs. Similar situations may sometimes occur in other wetland types. *Note: This section is not intended to bring nonwetland areas having wetland indicators of two, but not all three, parameters into jurisdiction. (The original list has been expanded to include problem areas common in Washington. The original list was never intended to be limiting. Likewise, this list is not intended to be limiting.)*

a. **Wetlands on slopes (seeps) and other glacial features.** Slope wetlands can occur in certain glaciated areas in which thin soils cover relatively impermeable unsorted glacial material or till or in which layers of sorted glacial material have different hydraulic conditions that produce a broad zone of ground-water seepage. Such areas are seldom, if ever, flooded, but downslope groundwater movement keeps the soils saturated for a sufficient portion of the growing season to produce anaerobic and chemically reducing soil conditions. This fosters development of hydric soil characteristics and selects for hydrophytic vegetation. Indicators of wetland hydrology may be lacking during the drier portion of the growing season.

b. **Seasonal wetlands.** In Washington, some depression areas have wetland indicators of all three parameters during the wetter portion of the growing season, but normally lack wetland indicators of hydrology and/or vegetation during the drier portion of the growing season. For example, obligate and facultative wetland plant species (Appendix C) normally are dominant during the wetter portion of the growing season, while upland species (annuals) may be dominant during the drier portion of the growing season. Also, these areas may be inundated during the wetter portion of the growing season, but wetland hydrology indicators may be totally lacking during the drier portion of the growing season. It is important to establish that an area truly is a wetland. Water in a depression normally must be sufficiently persistent to exhibit an ordinary high-water mark or the presence of wetland characteristics before it can be considered as wetland potentially subject to jurisdiction. The determination that an area exhibits wetland characteristics for a sufficient portion of the growing season to qualify as a wetland must be made on a case-by-case basis. Such determinations should consider the respective length of time that the area exhibits upland and wetland characteristics, and the manner in which the area fits into the overall ecological system as a wetland. Evidence concerning the persistence of an area's wetness can be obtained from its history, vegetation, soil, drainage characteristics, uses to which it has been subjected, and weather or hydrologic records. This situation is common in eastern Washington and parts of western Washington, where precipitation is highly seasonal and/or prolonged droughts occur frequently. It is important to become familiar with the types of wetlands found in these areas. In some cases, it may be necessary to withhold making a final wetland determination until a site is examined during the wet part of the growing season. Consultation with other experienced delineators may be helpful as well.

c. **Vernal wetlands** - Although these systems are usually associated with California, Washington does have vernal wetlands, particularly in the region around Spokane. These wetlands are a distinct type of seasonal wetland described above. The hydrology in these wetlands is driven by winter and early spring rain and snowmelt and may be totally lacking by early summer. A wetland plant community grows and reproduces in spring in response to the wet conditions and is replaced by an upland plant community by summer. Attempts to delineate these wetlands in summer or fall may result in a false negative conclusion. In addition, during periods of extended drought, these wetlands may remain dry for several years.

d. **Vegetated flats.** In both coastal and interior areas of Washington, vegetated flats are often dominated by annual species (usually non-persistent, broad-leaved emergents. that are categorized as OBL. Application of procedures described in Sections D and E during the growing season will clearly result in a positive wetland determination. However, these areas will appear to be unvegetated mudflats when examined during the nongrowing season, and the area would not qualify at that time as a wetland due to an apparent lack of vegetation

e. **Mollisols (prairie and steppe soils)** - Mollisols are base-rich soils that are usually dark-colored. They are common in grassland areas of the state, especially in eastern Washington . These soils typically have deep, dark topsoil layers (mollic epipedons) and low chroma matrix colors to considerable depths. They are rich in organic matter due largely to the vegetation (deep roots) and reworking of the soil and organic matter by earthworms, ants, moles, and rodents. The low chroma colors of mollisols are not necessarily due to prolonged saturation, so be particularly careful in making wetland determinations in these soils. Become familiar with the characteristics of mollisols with aquic moisture regimes, and be able to recognize these from nonhydric mollisols.

f. **Entisols (floodplain and sandy soils*)*** - Entisols are usually young or recently formed soils that have little or no evidence of pedogenically developed horizons (U.S.D.A. Soil Survey Staff 1975). These soils are typical of floodplains throughout Washington, but are also found in glacial outwash plains, along tidal waters, and in other areas. They include sandy soils of riverine islands, bars, and banks and finer-textured soils of floodplain terraces. Wet entisols have an aquic or peraquic moisture regime and are considered wetland soils. Some entisols are easily recognized as hydric soils such as the sulfaquents of tidal salt marshes, whereas others pose problems because they do not possess typical hydric soil field indicators. Wet sandy entisols (with loamy fine sand and coarser textures in horizons within 20 inches of the surface) may lack sufficient organic matter and clay to develop hydric soil colors. When these soils have a hue between 10YR and 10Y and distinct or prominent mottles present, a chroma of 3 or less is permitted to identify the soil as hydric (i.e., an aquic moisture regime). Also, hydrologic data showing that NTCHS criteria #3 or #4 (p.6) are met are sufficient to verify these soils as hydric. Become familiar with wet entisols and their diagnostic field properties (see "Keys to Soil Taxonomy" (current edition), U.S.D.A. Soil Survey Staff 1975 and county soil surveys).

g. **Red parent material and volcanic ash soils** - Hydric mineral soil derived from red parent materials (e.g., weathered clays, Triassic sandstones, and Triassic shales) may lack the low chroma colors characteristic of most hydric mineral soils. In these soils, the hue is redder than 10YR because of parent materials that remain red after citrate-dithionite extraction, so the low chroma requirement for hydric soil is waived (U.S.D.A. Soil Conservation Service 1982). Additionally, some hydric soils in Washington that are influenced by volcanic ash or other volcanic material may not exhibit hydric soil indicators. Become familiar with these hydric soils and learn how to recognize them in the field (see "Keys to Soil Taxonomy" current edition, U.S.D.A. Soil Survey Staff 1975 and county soil surveys).

h. **Spodosols (evergreen forest soils)** - These soils are usually associated with coniferous forests. Spodosols have a gray eluvial E-horizon overlying a diagnostic spodic horizon of accumulated (sometimes weakly cemented) organic matter and aluminum (U.S.D.A. Soil Survey Staff 1975). A process called podzolization is responsible for creating these two soil layers. Organic acids from the leaf litter on the soil surface are moved downward through the soil with rainfall, cleaning the sand grains in the first horizon then coating the sand grains with organic matter and iron oxides in the second layer. Certain vegetation produces organic acids that speed podzolization including western hemlock (*Tsuga heterophylla),* spruces (*Picea* spp.), pine (*Pinus* spp.), larches (*Larix* spp.), and oaks (*Quercus* spp.) (Buol, *et al*, 1980). To the untrained observer, the gray leached layer may be mistaken as a field indicator of hydric soil, but if one looks below the spodic horizon the brighter matrix colors often distinguish nonhydric spodosols from hydric ones. The wet spodosols (formerly called "groundwater podzolic soils") usually have thick dark surface horizons, dull gray E-horizons, and low chroma subsoils. In addition, the closer to the surface the spodic horizon is found, the more likely the soil is hydric. Become familiar with these soils and their diagnostic properties (see "Keys to Soil Taxonomy" current edition, U.S.D.A. Soil Survey Staff 1975 and county soil surveys).

i. **Interdunal swale wetlands** - Along the Washington coastline, seasonally wet swales supporting hydrophytic vegetation are located within sand dune complexes on barrier islands and beaches. Some of these swales are inundated or saturated to the surface for considerable periods during the growing season, while others are wet for only the early part of the season. In some cases, swales may be flooded irregularly by the tides. These wetlands have sandy soils that generally lack field indicators of hydric soil. In addition, indicators of wetland hydrology may be absent during the drier part of the growing season. Consequently, these wetlands may be difficult to identify.

j **Vegetated river bars and adjacent flats** - Along streams, particularly in arid and semiarid parts of the state, some river bars and flats may be vegetated by FACU species while others may be colonized by wetter species. If these areas are frequently inundated for $\geq$12.5% of the growing season, they are wetlands. The soils often do not reflect the characteristic field indicators of hydric soils, however, and thereby pose delineation problems.

Wetland determinations in problem areas

79. Procedures for making wetland determinations in problem areas are presented below. Application of these procedures is appropriate only when a decision has been made in Section D or E that wetland indicators of one or more parameters were lacking, probably due to normal seasonal or annual variations in environmental conditions. Specific procedures to be used will vary according to the nature of the area, site conditions, and parameter(s) affected by the variations in environmental conditions. A determination must be based on the best evidence available to the field inspector, including:

a. Available information (Section B).

b. Field data resulting from an onsite inspection.

c. Basic knowledge of the ecology of the particular community type(s) and environmental conditions associated with the community type.

NOTE: The procedures described below should only be applied to parameters not adequately characterized in Section D or E. Complete the following steps:

- **STEP 1 - Identify the Parameter(s) to be Considered.** Examine the DATA FORM I (Section D or E) and identify the parameter(s) that must be given additional consideration. PROCEED TO STEP 2.

- **STEP 2 - Determine the Reason for Further Consideration.** Determine the reason why the parameter(s) identified in STEP 1 should be given further consideration. This will require a consideration and documentation of:

    a. Environmental condition(s) that have impacted the parameter(s).

    b. Impacts of the identified environmental condition(s) on the parameter(s) in question.

  Record findings in the comments section of DATA FORM 1. PROCEED TO STEP 3.

- **STEP 3 - Document Available Information for Parameter(s) in Question.** Examine the available information and consider personal ecological knowledge of the range of normal environmental conditions of the area. Local experts (e.g. university personnel) may provide additional information. Record information on DATA FORM 1. PROCEED TO STEP 4.

- **STEP 4 - Determine Whether Wetland Indicators are Normally Present During a Portion of the Growing Season.** Examine the information resulting from STEP 3 and determine whether wetland indicators are **normally** present during part of the growing season. If so, record on DATA FORM 1 the indicators normally present and return to Section D or Section E and make a wetland determination. If no information can be found that wetland indicators of all three parameters are normally present during part of the growing season, the determination must be made using procedures described in Section D or Section E.

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Appendix A: Glossary

Active water table - A condition in which the zone of soil saturation fluctuates, resulting in periodic anaerobic soil conditions. Soils with an active water table often contain bright mottles and matrix chromas of 2 or less.

Adaptation - A modification of a species that makes it more fit for existence under the conditions of its environment. These modifications are the result of genetic selection processes.

Adventitious roots - Roots found on plant stems in positions where they normally do not occur.

Aerenchymous tissue - A type of plant tissue in which cells are unusually large and arranged in a manner that results in air spaces in the plant organ. Such tissues are often referred to as spongy and usually provide increased buoyancy.

Aerobic - A situation in which molecular oxygen is a part of the environment.

Anaerobic - A situation in which molecular oxygen is absent (or effectively so) from the environment.

Aquatic roots - Roots that develop on stems above the normal position occupied by roots in response to prolonged inundation.

Aquic moisture regime - A mostly reducing soil moisture regime virtually free of dissolved oxygen due to saturation by ground water or its capillary fringe and occurring at periods when the soil temperature at 19.7 in. is greater than 5° C.

Arched roots - Roots produced on plant stems in a position above the normal position of roots, which serve to brace the plant during and following periods of prolonged inundation.

Areal cover - A measure of dominance that defines the degree to which aboveground portions of plants (not limited to those rooted in a sample plot) cover the ground surface. It is possible for the total areal cover in a community to exceed 100 percent because (a) most plant communities consist of two or more vegetative strata; (b) areal cover is estimated by vegetative layer; and (c) foliage within a single layer may overlap.

Atypical situation - As used herein, this term refers to areas in which one or more parameters (vegetation, soil, and/or hydrology) have been sufficiently altered by recent human activities or natural events to preclude the presence of wetland indicators of the parameter. Recent is intended to mean that period of time since legal jurisdiction of an applicable law began.

Backwater flooding - Situations in which the source of inundation is overbank flooding from a nearby stream.

Basal area - The cross-sectional area of a tree trunk measured in square inches, square centimetres, etc. Basal area is normally measured at 4.5 ft above the ground level and is used as a measure of dominance. The most easily used tool for measuring basal area is a tape marked in square inches. When plotless methods are used, an angle gauge or prism will provide a means for rapidly determining basal area. This term is also applicable to the crosssectional area of a clumped herbaceous plant, measured at 1.0 in. above the soil surface.

Bench mark - A fixed, more or less permanent reference point or object, the elevation of which is known. The US Geological Survey (USGS) installs brass caps in bridge abutments or otherwise permanently sets bench marks at convenient locations nationwide. The elevations on these marks are referenced to the National Geodetic Vertical Datum (NGVD), also commonly known as mean sea level (MSL). Locations of these bench marks on USGS quadrangle maps are shown as small triangles. However, the marks are sometimes destroyed by construction or vandalism. The existence of any bench mark should be field verified before planning work that relies on a particular reference point. The USGS and/or local state surveyor's office can provide information on the existence, exact location, and exact elevation of bench marks.

Biennial - An event that occurs at 2-year intervals.

Buried soil - A once-exposed soil now covered by an alluvial, loessal, or other deposit (including man-made).

Canopy layer - The uppermost layer of vegetation in a plant community. In forested areas, mature trees comprise the canopy layer, while the tallest herbaceous species constitute the canopy layer in a marsh.

Capillary fringe - A zone immediately above the water table (zero gauge pressure) in which water is drawn upward from the water table by capillary action.

Chemical reduction - Any process by which one compound or ion acts as an electron donor. In such cases, the valence state of the electron donor is decreased.

Chroma - The relative purity or saturation of a color; intensity of distinctive hue as related to grayness; one of the three variables of color.

Comprehensive wetland determination - A type of wetland determination that is based on the strongest possible evidence, requiring the collection of quantitative data.

Concretion - A local concentration of chemical compounds (e.g. calcium carbonate, iron oxide) in the form of a grain or nodule of varying size, shape, hardness, and color. Concretions of significance in hydric soils are usually iron and/or manganese oxides occurring at or near the soil surface, which develop under conditions of prolonged soil saturation.

Contour - An imaginary line of constant elevation on the ground surface. The corresponding line on a map is called a recontour line."

Criteria - Standards, rules, or tests on which a judgment or decision may be based.

Deepwater aquatic habitat - Any open water area that has a mean annual water depth >6.6 ft, lacks soil, and/or is either unvegetated or supports only floating or submersed macrophytes.

Density - The number of individuals of a species per unit area.

Detritus - Minute fragments of plant parts found on the soil surface. When fused together by algae or soil particles, this is an indicator that surface water was recently present.

Diameter at breast height (DBH) - The width of a plant stem as measured at 4.5 ft above the ground surface.

Dike - A bank (usually earthen) constructed to control or confine water.

Dominance - As used herein, a descriptor of vegetation that is related to the standing crop of a species in an area, usually measured by height, areal cover, or basal area (for trees).

Dominant species - As used herein, a plant species that exerts a controlling influence on or defines the character of a community.

Drained - A condition in which ground or surface water has been reduced or eliminated from an area by artificial means.

Drift line - An accumulation of debris along a contour (parallel to the water flow) that represents the height of an inundation event.

Duration (inundation/soil saturation) - The length of time during which water stands at or above the soil surface (inundation), or during which the soil is saturated. As used herein, duration refers to a period during the growing season.

Ecological tolerance - The range of environmental conditions in which a plant species can grow.

Emergent plant - A rooted herbaceous plant species that has parts extending above a water surface.

Field capacity - The percentage of water remaining in a soil after it has been saturated and after free drainage is negligible.

Fill material - Any material placed in an area to increase surface elevation.

Flooded - A condition in which the soil surface is temporarily covered with flowing water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow from high tides, or any combination of sources.

Flora - A list of all plant species that occur in an area.

Frequency (inundation or soil saturation) - The periodicity of coverage of an area by surface water or soil saturation. It is usually expressed as the number of years (e.g. 50 years) the soil is inundated or saturated at least once each year during part of the growing season per 100 years or as a l-, 2-, 5-year, etc., inundation frequency.

Frequency (vegetation) - The distribution of individuals of a species in an area. It is quantitatively expressed as

$$\frac{\text{Number of samples containing species A}}{\text{Total number of samples}} \times 100$$

More than one species may have a frequency of 100 percent within the same area.

Frequently flooded - A flooding class in which flooding is likely to occur often under normal weather conditions (more than 50-percent chance of flooding in any year or more than 50 times in 100 years).

Gleyed - A soil condition resulting from prolonged soil saturation, which is manifested by the presence of bluish or greenish colors through the soil mass or in mottles (spots or streaks) among other colors. Gleying occurs under reducing soil conditions resulting from soil saturation, by which iron is reduced predominantly to the ferrous state.

Ground water - That portion of the water below the ground surface that is under greater pressure than atmospheric pressure.

Growing season - The portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biologic zero (5° C) (US Department of Agriculture - Soil Conservation Service 1985).* For ease of determination this period can be approximated by the number of frost-free days (US Department of the Interior 1970).

Habitat - The environment occupied by individuals of a particular species, population, or community.

Headwater flooding - A situation in which an area becomes inundated directly by surface runoff from upland areas.

Herb - A nonwoody individual of a macrophytic species. In this manual, seedlings of woody plants (including vines) that are less than 3.2 ft in height are considered to be herbs.

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* See references at the end of the main text.

Herbaceous layer - Any vegetative stratum of a plant community that is composed predominantly of herbs.

Histic epipedon - An 8- to 16-in. soil layer at or near the surface that is saturated for 30 consecutive days or more during the growing season in most years and contains a minimum of 20 percent organic matter when no clay is present or a minimum of 30 percent organic matter when 60 percent or greater clay is present.

Histosols - An order in soil taxonomy composed of organic soils that have organic soil materials in more than half of the upper 80 cm or that are of any thickness if directly overlying bedrock.

Homogeneous vegetation - A situation in which the same plant species association occurs throughout an area.

Hue - A characteristic of color that denotes a color in relation to red, yellow, blue, etc; one of the three variables of color. Each color chart in the Munsell Color Book (Munsell Color 1975) consists of a specific hue.

Hydric soil - A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. (USDA-NRCS 1995, Federal Register, 7/13/94, Vol. 59, No. 133, pp 35680-83). Hydric soils that occur in areas having positive indicators of hydrophytic vegetation and wetland hydrology are wetland soils.

Hydric soil condition - A situation in which characteristics exist that are associated with soil development under reducing conditions.

Hydrologic regime - The sum total of water that occurs in an area on average during a given period.

Hydrologic zone - An area that is inundated or has saturated soils within a specified range of frequency and duration of inundation and soil saturation.

Hydrology - The science dealing with the properties, distribution, and circulation of water.

Hydrophyte - Any macrophyte that grows in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content; plants typically found in wet habitats.

Hydrophytic vegetation - The sum total of macrophytic plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. When hydrophytic vegetation comprises a community where indicators of hydric soils and wetland hydrology also occur, the area has wetland vegetation.

Hypertrophied lenticels - An exaggerated (oversized) pore on the surface of stems of woody plants through which gases are exchanged between the plant and the atmosphere. The enlarged

lenticels serve as a mechanism for increasing oxygen to plant roots during periods of inundation and/or saturated soils.

Importance value - A quantitative term describing the relative influence of a plant species in a plant community, obtained by summing any combination of relative frequency, relative density, and relative dominance.

Indicator - As used in this manual, an event, entity, or condition that typically characterizes a prescribed environment or situation; indicators determine or aid in determining whether or not certain stated circumstances exist.

Indicator status - One of the categories (e.g. OBL) that describes the estimated probability of a plant species occurring in wetlands.

Intercellular air space - A cavity between cells in plant tissues, resulting from variations in cell shape and configuration. Aerenchymous tissue (a morphological adaptation found in many hydrophytes) often has large intercellular air spaces.

Inundation - A condition in which water from any source temporarily or permanently covers a land surface.

Levee - A natural or man-made feature of the landscape that restricts movement of water into or through an area.

Liana - As used in this manual, a layer of vegetation in forested plant communities that consists of woody vines. The term may also be applied to a given species.

Limit of biological activity - With reference to soils, the zone below which conditions preclude normal growth of soil organisms. This term often is used to refer to the temperature (5'C) in a soil below which metabolic processes of soil microorganisms, plant roots, and animals are negligible.

Long duration (flooding) - A flooding class in which the period of inundation for a single event ranges from 7 days to 1 month.

Macrophyte - Any plant species that can be readily observed without the aid of optical magnification. This includes all vascular plant species and mosses *(e.g., Sphagnum* spp.), as well as large algae (e.g. *Chara* spp., kelp).

Macrophytic - A term referring to a plant species that is a macrophyte.

Major portion of the root zone - The portion of the soil profile in which more than 50 percent of plant roots occur. In wetlands, this usually constitutes the upper 12 in. of the profile.

Man-induced wetland - Any area that develops wetland characteristics due to some activity (e.g., irrigation) of man.

Mapping unit - As used in this manual, some common characteristic of soil, vegetation, and/or hydrology that can be shown at the scale of mapping for the defined purpose and objectives of a survey.

Mean sea level - A datum, or "plane of zero elevation," established by averaging all stages of oceanic tides over a 19-year tidal cycle or "epoch." This plane is corrected for curvature of the earth and is the standard reference for elevations on the earth's surface. The correct term for mean sea level is the National Geodetic Vertical Datum (NGVD).

Mesophytic - Any plant species growing where soil moisture and aeration conditions lie between extremes. These species are typically found in habitats with average moisture conditions, neither very dry nor very wet.

Metabolic processes - The complex of internal chemical reactions associated with life-sustaining functions of an organism.

Method - A particular procedure or set of procedures to be followed.

Mineral soil - A soil consisting predominantly of, and having its properties determined predominantly by, mineral matter usually containing less than 20 percent organic matter.

Morphological adaptation - A feature of structure and form that aids in fitting a species to its particular environment (e.g. buttressed base, adventitious roots, aerenchymous tissue).

Mottles - Spots or blotches of different color or shades of color interspersed within the dominant color in a soil layer, usually resulting from the presence of periodic reducing soil conditions.

Muck - Highly decomposed organic material in which the original plant parts are not recognizable.

Multitrunk - A situation in which a single individual of a woody plant species has several stems.

Nonhydric soil - A soil that has developed under predominantly aerobic soil conditions. These soils normally support mesophytic or xerophytic species.

Nonwetland - Any area that has sufficiently dry conditions that indicators of hydrophytic vegetation, hydric soils, and/or wetland hydrology are lacking. As used in this manual, any area that is neither a wetland, a deepwater aquatic habitat, nor other special aquatic site.

Organic pan - A layer usually occurring at 12 to 30 inches below the soil surface in coarse-textured soils, in which organic matter and aluminum (with or without iron) accumulate at the point where the top of the water table most often occurs. Cementing of the organic matter slightly reduces permeability of this layer.

Organic soil - A soil is classified as an organic soil when it is: (1) saturated for prolonged periods (unless artificially drained) and has more than 30-percent organic matter if the mineral fraction is more than 50-percent clay, or more than 20-percent organic matter if the mineral fraction has no clay; or (2) never saturated with water for more than a few days and having more than 34-percent organic matter.

Overbank flooding - Any situation in which inundation occurs as a result of the water level of a stream rising above bank level.

Oxidation-reduction process - A complex of biochemical reactions in soil that influences the valence state of component elements and their ions. Prolonged soil saturation during the growing season elicits anaerobic conditions that shift the overall process to a reducing condition.

Oxygen pathway - The sequence of cells, intercellular spaces, tissues, and organs, through which molecular oxygen is transported in plants. Plant species having pathways for oxygen transport to the root system are often adapted for life in saturated soils.

Parameter - A characteristic component of a unit that can be defined. Vegetation, soil, and hydrology are three parameters that may be used to define wetlands.

Parent material - The unconsolidated and more or less weathered mineral or organic matter from which a soil profile develops.

Ped - A unit of soil structure (e.g. aggregate, crumb, prism, block, or granule) formed by natural processes.

Peraquic moisture regime - A soil condition in which a reducing environment always occurs due to the presence of ground water at or near the soil surface.

Periodically - Used herein to define detectable regular or irregular saturated soil conditions or inundation, resulting from ponding of ground water, precipitation, overland flow, stream flooding, or tidal influences that occur(s) with hours, days, weeks, months, or even years between events.

Permeability - A soil characteristic that enables water or air to move through the profile, measured as the number of inches per hour that water moves downward through the saturated soil. The rate at which water moves through the least permeable layer governs soil permeability.

Physiognomy - A term used to describe a plant community based on the growth habit (e.g., trees, herbs, lianas) of the dominant species.

Physiological adaptation - A feature of the basic physical and chemical activities that occurs in cells and tissues of a species, which results in it being better fitted to its environment (e.g. ability to absorb nutrients under low oxygen tensions).

Plant community - All of the plant populations occurring in a shared habitat or environment.

Plant cover - See areal cover.

Pneumatophore - Modified roots that may function as a respiratory organ in species subjected to frequent inundation or soil saturation (e.g., cypress knees).

Ponded - A condition in which water stands in a closed depression. Water may be removed only by percolation, evaporation, and/or transpiration.

Poorly drained - Soils that commonly are wet at or near the surface during a sufficient part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these conditions.

Population - A group of individuals of the same species that occurs in a given area.

Positive wetland indicator - Any evidence of the presence of hydrophytic vegetation, hydric soil, and/or wetland hydrology in an area.

Prevalent vegetation - The plant community or communities that occur in an area during a given period. The prevalent vegetation is characterized by the dominant macrophytic species that comprise the plant community.

Quantitative - A precise measurement or determination expressed numerically.

Range - As used herein, the geographical area in which a plant species is known to occur.

Redox potential - A measure of the tendency of a system to donate or accept electrons, which is governed by the nature and proportions of the oxidizing and reducing substances contained in the system.

Reducing environment - An environment conducive to the removal of oxygen and chemical reduction of ions in the soils.

Relative density - A quantitative descriptor, expressed as a percent, of the relative number of individuals of a species in an area; it is calculated by

$$\frac{\text{Number of individuals of species A}}{\text{Total number of individuals of all species}} \times 100$$

Relative dominance - A quantitative descriptor, expressed as a percent, of the relative size or cover of individuals of a species in an area; it is calculated by

$$\frac{\text{Amount}^{*} \text{ of species A}}{\text{Total amount of all species}} \times 100$$

Relative frequency - A quantitative descriptor, expressed as a percent, of the relative distribution of individuals of a species in an area; it is calculated by

$$\frac{\text{Frequency of species A}}{\text{Total frequency of all species}} \times 100$$

Relief - The change in elevation of a land surface between two points; collectively, the configuration of the earth's surface, including such features as hills and valleys.

Reproductive adaptation - A feature of the reproductive mechanism of a species that results in it being better fitted to its environment (e.g. ability for seed germination under water).

Respiration - The sum total of metabolic processes associated with conversion of stored (chemical) energy into kinetic (physical) energy for use by an organism.

Rhizosphere - The zone of soil in which interactions between living plant roots and microorganisms occur.

Root zone - The portion of a soil profile in which plant roots occur.

Routine wetland determination - A type of wetland determination in which office data and/or relatively simple, rapidly applied onsite methods are employed to determine whether or not an area is a wetland. Most wetland determinations are of this type, which usually does not require collection of quantitative data.

Sample plot - An area of land used for measuring or observing existing conditions.

Sapling/shrub - A layer of vegetation composed of woody plants <3.0 in. in diameter at breast height but greater than 3.2 ft in height, exclusive of woody vines.

Saturated soil conditions - A condition in which all easily drained voids (pores between soil particles in the root zone are temporarily or permanently filled with water to the soil surface at pressures greater than atmospheric.

Soil - Unconsolidated mineral and organic material that supports, or is capable of supporting, plants, and which has recognizable properties due to the integrated effect of climate and living matter acting upon parent material, as conditioned by relief over time.

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* The "amount" of a species may be based on percent areal cover, basal area, or height.

Soil horizon - A layer of soil or soil material approximately parallel to the land surface and differing from adjacent genetically related layers in physical, chemical, and biological properties or characteristics (e.g. color, structure, texture, etc.).

Soil matrix - The portion of a given soil having the dominant color. In most cases, the matrix will be the portion of the soil having more than 50 percent of the same color.

Soil permeability - The ease with which gases, liquids, or plant roots penetrate or pass through a layer of soil.

Soil phase - A subdivision of a soil series having features (e.g. slope, surface texture, and stoniness) that affect the use and management of the soil, but which do not vary sufficiently to differentiate it as a separate series. These are usually the basic mapping units on detailed soil maps produced by the Soil Conservation Service.

Soil pore - An area within soil occupied by either air or water, resulting from the arrangement of individual soil particles or peds.

Soil profile - A vertical section of a soil through all its horizons and extending into the parent material.

Soil series - A group of soils having horizons similar in differentiating characteristics and arrangement in the soil profile, except for texture of the surface horizon.

Soil structure - The combination or arrangement of primary soil particles into secondary particles, units, or peds.

Soil surface - The upper limits of the soil profile. For mineral soils, this is the upper limit of the highest (A1) mineral horizon. For organic soils, it is the upper limit of undecomposed, dead organic matter.

Soil texture - The relative proportions of the various sizes of particles in a soil.

Somewhat poorly drained - Soils that are wet near enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, wet conditions high in the profile, additions of water through seepage, or a combination of these conditions.

Stilted roots - Aerial roots arising from stems (e.g., trunk and branches), presumably providing plant support (e.g., *Rhizophora mangle).*

Stooling - A form of asexual reproduction in which new shoots are produced at the base of senescing stems, often resulting in a multitrunk growth habit.

Stratigraphy - Features of geology dealing with the origin, composition, distribution, and succession of geologic strata (layers).

Substrate - The base or substance on which an attached species is growing.

Surface water - Water present above the substrate or soil surface.

Tidal - A situation in which the water level periodically fluctuates due to the action of lunar and solar forces upon the rotating earth.

Topography - The configuration of a surface, including its relief and the position of its natural and man-made features.

Transect - As used herein, a line on the ground along which observations are made at some interval.

Transition zone - The area in which a change from wetlands to nonwetlands occurs. The transition zone may be narrow or broad.

Transpiration - The process in plants by which water vapor is released into the gaseous environment, primarily through stomata.

Tree - A woody plant >3.0 in. in diameter at breast height, regardless of height (exclusive of woody vines).

Typical - That which normally, usually, or commonly occurs.

Typically adapted - A term that refers to a species being normally or commonly suited to a given set of environmental conditions, due to some feature of its morphology, physiology, or reproduction.

Unconsolidated parent material - Material from which a soil develops, usually formed by weathering of rock or placement in an area by natural forces (e.g. water, wind, or gravity).

Under normal circumstances - As used in the definition of wetlands, this term refers to situations in which the vegetation has not been substantially altered by manŝ activities.

Uniform vegetation - As used herein, a situation in which the same group of dominant species generally occurs throughout a given area.

Upland - As used herein, any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils, and/or hydrologic characteristics associated with wetlands. Such areas occurring within floodplains are more appropriately termed nonwetlands.

Value (soil color) - The relative lightness or intensity of color, approximately a function of the square root of the total amount of light reflected from a surface; one of the three variables of color.

Vegetation - The sum total of macrophytes that occupy a given area.

Vegetation layer - A subunit of a plant community in which all component species exhibit the same growth form (e.g., trees, saplings/shrubs, herbs).

Very long duration (flooding) - A duration class in which the length of a single inundation event is greater than 1 month.

Very poorly drained - Soils that are wet to the surface most of the time. These soils are wet enough to prevent the growth of important crops (except rice) unless artificially drained.

Watermark - A line on a tree or other upright structure that represents the maximum static water level reached during an inundation event.

Water table - The upper surface of ground water or that level below which the soil is saturated with water. It is at least 6 in. thick and persists in the soil for more than a few weeks.

Wetlands - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetland boundary - The point on the ground at which a shift from wetlands to nonwetlands or aquatic habitats occurs. These boundaries usually follow contours.

Wetland determination - The process or procedure by which an area is adjudged a wetland or nonwetland.

Wetland hydrology - The sum total of wetness characteristics in areas that are inundated or have saturated soils for a sufficient duration to support hydrophytic vegetation.

Wetland plant association - Any grouping of plant species that recurs wherever certain wetland conditions occur.

Wetland soil - A soil that has characteristics developed in a reducing atmosphere, which exists when periods of prolonged soil saturation result in anaerobic conditions. Hydric soils that are sufficiently wet to support hydrophytic vegetation are wetland soils.

Wetland vegetation - The sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present.

As used herein, hydrophytic vegetation occurring in areas that also have hydric soils and wetland hydrology may be properly referred to as wetland vegetation.

Woody vine - See liana.

Xerophytic - A plant species that is typically adapted for life in conditions where a lack of water is a limiting factor for growth and/or reproduction. These species are capable of growth in extremely dry conditions as a result of morphological, physiological, and/or reproductive adaptations.

Appendix B: Sample Data Forms

DATA FORM 1 *(Revised)*
Routine Wetland Determination
(WA State Wetland Delineation Manual or
1987 Corps Wetland Delineation Manual)

Project/Site: Applicant/owner: Investigator(s):	Date: County: State: S/T/R:
Do Normal Circumstances exist on the site? yes no Is the site significantly disturbed (atypical situation)? yes no Is the area a potential Problem Area? yes no Explanation of atypical or problem area:	Community ID: Transect ID: Plot ID:

VEGETATION (For strata, indicate T = tree; S = shrub; H = herb; V = vine)

Dominant Plant Species	Stratum	% cover	Indicator	Dominant Plant Species	Stratum	% cover	Indicator

HYDROPHYTIC VEGETATION INDICATORS:

% of dominants OBL, FACW, & FAC _____

Check all indicators that apply & explain below:

Visual observation of plant species growing in areas of prolonged inundation/saturation	_____	Physiological/reproductive adaptations	_____
		Wetland plant database	_____
Morphological adaptations	_____	Personal knowledge of regional plant communities	_____
Technical Literature	_____	Other (explain)	_____

Hydrophytic vegetation present? yes no
Rationale for decision/Remarks:

HYDROLOGY

Is it the growing season? yes no	Water Marks: yes no on _____	Sediment Deposits: yes no
Based on: _____ soil temp (record temp _____) _____ other (explain)	Drift Lines: yes no	Drainage Patterns: yes no
Dept. of inundation: _____ inches	Oxidized Root (live roots) Channels <12 in. yes no	Local Soil Survey: yes no
Depth to free water in pit: _____ inches Depth to saturated soil: _____ inches	FAC Neutral: yes no	Water-stained Leaves yes no
Check all that apply & explain below: Stream, Lake or gage data: _____ Aerial photographs: _____ Other: ____	Other (explain):	

Wetland hydrology present? yes no
Rationale for decision/Remarks:

SOILS

Map Unit Name _____ (Series & Phase)

Drainage Class _____

Taxonomy (subgroup) _____

Field observations confirm mapped type? Yes No

Profile Description

Depth (inches)	Horizon	Matrix color (Munsell moist)	Mottle colors (Munsell moist)	Mottle abundance size & contrast	Texture, concretions, structure, etc.	Drawing of soil profile (match description)

Hydric Soil Indicators: (check all that apply)

_____ Histosol
_____ Histic Epipedon
_____ Sulfidic Odor
_____ Aquic Moisture Regime
_____ Reducing Conditions
_____ Gleyed or Low-Chroma (=1) matrix
_____ Matrix chroma ≤ 2 with mottles
_____ Mg or Fe Concretions
_____ High Organic Content in Surface Layer of Sandy Soils
_____ Organic Streaking in Sandy Soils
_____ Listed on National/Local Hydric Soils List
_____ Other (explain in remarks)

Hydric soils present? **yes** **no**

Rationale for decision/Remarks:

Wetland Determination (circle)

Hydrophytic vegetation present? yes no
Hydric soils present? yes no
Wetland hydrology present? yes no

Is the sampling point within a wetland? yes no

Rationale/Remarks:

NOTES:

Revised 4/97

Data Form 2: Atypical Situations

Applicant Name: _____ Applicant Number: _____ Project Name: _____
Location: _____ Plot Number: _____ Date: _____

A. **Vegetation:**

1. Type of Alteration: _____
_____
_____
2. Effect on Vegetation: _____
_____
_____
3. Previous Vegetation: _____
(Attach documentation)_____
_____
4. Hydrophytic Vegetation? Yes_____No_____

B. **Soils:**

1. Type of Alteration: _____
_____
_____
2. Effect on Soils: _____
_____
_____
3. Previous Soils:_____
(Attach documentation)_____
_____
4. Hydric Soils? Yes_____No_____

C. **Hydrology:**

1. Type of Alteration: _____
_____
_____
2. Effect on Hydrology: _____
_____
_____
3. Previous Hydrology: _____
(Attach documentation) _____
_____
4. Wetland Hydrology? Yes_____No_____

Characterized By: _____

Appendix C: Vegetation

1. For a list of plants that occur in Washington's wetlands refer to:

   - Reed, P.B., Jr. 1988. "National list of plant species that occur in wetlands: Northwest (Region 9)." U.S. Fish and Wildlife Service, Biological Report 88(26.9).

   - Reed, P.B., Jr. 1993. "1993 Supplement to list of plant species that occur in wetlands: Northwest (Region 9)." U.S. Fish and Wildlife Service, Supplement to Biological Report 88(26.9).

Morphological, Physiological, and Reproductive Adaptations of Plant Species for Occurrence in Areas Having Anaerobic Soil Conditions

Morphological adaptations

2. Many plant species have morphological adaptations for occurrence in wetlands. These structural modifications most often provide the plant with increased buoyancy or support. In some cases (e.g. adventitious roots), the adaptation may facilitate the uptake of nutrients and/or gases (particularly oxygen). However, not all species occurring in areas having anaerobic soil conditions exhibit morphological adaptations for such conditions. The following is a list of morphological adaptations that a species occurring in areas having anaerobic soil conditions may possess:

   a. **Buttressed tree trunks.** Tree species (e.g. *Taxodium distichum)* may develop enlarged trunks n response to frequent inundation. This adaptation is a strong indicator of hydrophytic vegetation in nontropical forested areas.

   b. **Pneumatophores**. These modified roots may serve as respiratory organs in species subjected to frequent inundation or soil saturation. Cypress knees are a classic example, but other species (e.g., *Nyssa aquatics, Rhizophora* mangle) may also develop pneumatophores.

   c. **Adventitious roots.** Sometimes referred to as "water roots," adventitious roots occur on plant stems in positions where roots normally are not found. Small fibrous roots protruding from the base of trees (e.g. *Salix nigra)* or roots on stems of herbaceous plants and tree seedlings in positions immediately above the soil surface (e.g. *Ludwigia* spp.) occur in response to inundation or soil saturation. These usually develop during periods of sufficiently prolonged soil saturation to destroy most of the root system. *CAUTION: Not all adventitious roots develop as a result of inundation or soil saturation. For example, aerial roots on woody vines are not* normally *produced as a response to inundation or soil saturation.*

d. **Shallow root systems.** When soils are inundated or saturated for long periods during the growing season, anaerobic conditions develop in the zone of root growth. Most species with deep root systems cannot survive in such conditions. Most species capable of growth during periods when soils are oxygenated only near the surface have shallow root systems. In forested wetlands, wind- thrown trees are often indicative of shallow root systems.

e. **Inflated leaves, stems, or roots**. Many hydrophytic species, particularly herbs (e.g. *Limnobium spongia, Ludwigia* spp.), have or develop spongy (aerenchymous) tissues in leaves, stems, and/or roots that provide buoyancy or support and serve as a reservoir or passageway for oxygen needed for metabolic processes.

f. **Polymorphic leaves.** Some herbaceous species produce different types of leaves, depending on the water level at the time of leaf formation. For example, *Alisma* spp. produce strap-shaped leaves when totally submerged, but produce broader, floating leaves when plants are emergent. *CAUTION: Many upland species also produce polymorphic leaves.*

g. **Floating leaves**. Some species (e.g. *Nymphaea* spp.) produce leaves that are uniquely adapted for floating on a water surface. These leaves have stomata primarily on the upper surface and a thick waxy cuticle that restricts water penetration. The presence of species with floating leaves is strongly indicative of hydrophytic vegetation.

h. **Floating stems**. A number of species (e.g., *Alternanthera philoxeroides)* produce matted stems that have large internal air spaces when occurring in inundated areas. Such species root in shallow water and grow across the water surface into deeper areas. Species with floating stems often produce adventitious roots at leaf nodes.

i. **Hypertrophied lenticels**. Some plant species (e.g. *Gleditsia aquatica*) produce enlarged lenticels on the stem in response to prolonged inundation or soil saturation. These are thought to increase oxygen uptake through the stem during such periods.

j. **Multitrunks or stooling**. Some woody hydrophytes characteristically produce several trunks of different ages or produce new stems arising from the base of a senescing individual (e.g. *Forestiera acuminata, Nyssa agechee*) in response to inundation.

k. **Oxygen pathway to roots**. Some species (e.g. *Spartina alterniflora*) have a specialized cellular arrangement that facilitates diffusion of gaseous oxygen from leaves and stems to the root system.

Physiological adaptations

3. Most, if not all, hydrophytic species are thought to possess physiological adaptations for occurrence in areas that have prolonged periods of anaerobic soil conditions. However, relatively few species have actually been proven to possess such adaptations, primarily due to the limited research that has been conducted. Nevertheless, several types of physiological adaptations known to occur in hydrophytic species are discussed below. *NOTE: Since it is impossible to detect these adaptations in the field, use of this indicator will be limited to observing the species in the field and checking the regional wetland plant list to determine whether the species is known to have a physiological adaptation for occurrence in areas having anaerobic soil conditions:*

   a. **Accumulation of malate**. Malate, a nontoxic metabolite, accumulates in roots of many hydrophytic species (e.g. *Glyceria maxima, Nyssa sylvatica* var. *biflora).* Nonwetland species concentrate ethanol, a toxic by-product of anaerobic respiration, when growing in anaerobic soil conditions. Under such conditions, many hydrophytic species produce high concentrations of malate and unchanged concentrations of ethanol, thereby avoiding accumulation of toxic materials. Thus, species having the ability to concentrate malate instead of ethanol in the root system under anaerobic soil conditions are adapted for life in such conditions, while species that concentrate ethanol are poorly adapted for life in anaerobic soil conditions.

   b. **Increased levels of nitrate reductase**. Nitrate reductase is an enzyme involved in conversion of nitrate nitrogen to nitrite nitrogen, an intermediate step in ammonium production. Ammonium ions can accept electrons as a replacement for gaseous oxygen in some species, thereby allowing continued functioning of metabolic processes under low soil oxygen conditions. Species that produce high levels of nitrate reductase (e.g. *Larix laricina*) are adapted for life in anaerobic soil conditions.

   c. **Slight increases in metabolic rates**. Anaerobic soil conditions effect short-term increases in metabolic rates in most species. However, the rate of metabolism often increases only slightly in wetland species, while metabolic rates increase significantly in nonwetland species. Species exhibiting only slight increases in metabolic rates (e.g. *Larix laricina, Senecio vulgaris)* are adapted for life in anaerobic soil conditions.

   d. **Rhizosphere oxidation**. Some hydrophytic species (e.g. *Nyssa aquatica, Myrica gale)* are capable of transferring gaseous oxygen from the root system into soil pores immediately surrounding the roots. This adaptation prevents root deterioration and maintains the rates of water and nutrient absorption under anaerobic soil conditions.

e. **Ability for root growth in low oxygen tensions**. Some species (e.g. *Typha angustifolia, Juncus effusus)* have the ability to maintain root growth under soil oxygen concentrations as low as 0.5 percent. Although prolonged (>l year) exposure to soil oxygen concentrations lower than 0.5 percent generally results in the death of most individuals, this adaptation enables some species to survive extended periods of anaerobic soil conditions.

f. **Absence of alcohol dehydrogenase (ADH) activity**. ADH is an enzyme associated with increased ethanol production. When the enzyme is not functioning, ethanol production does not increase significantly. Some hydrophytic species (e.g. *Potentilla anserina, Polygonum amp*hibium) show only slight increases in ADH activity under anaerobic soil conditions. Therefore, ethanol production occurs at a slower rate in species that have low concentrations of ADH.

Reproductive adaptations

4 Some plant species have reproductive features that enable them to become established and grow in saturated soil conditions. The following have been identified in the technical literature as reproductive adaptations that occur in hydrophytic species:

a. **Prolonged seed viability.** Some plant species produce seeds that may remain viable for 20 years or more. Exposure of these seeds to atmospheric oxygen usually triggers germination. Thus, species (e.g., *Taxodium distichum)* that grow in very wet areas may produce seeds that germinate only during infrequent periods when the soil is dewatered. *NOTE: Many upland species also have prolonged seed viability, but the trigger mechanism for germination is not exposure to atmospheric oxygen.*

b. **Seed germination under low oxygen concentrations**. Seeds of some hydrophytic species germinate when submerged. This enables germination during periods of early-spring inundation, which may provide resulting seedlings a competitive advantage over species whose seeds germinate only when exposed to atmospheric oxygen.

c. **Flood-tolerant seedlings.** Seedlings of some hydrophytic species (e.g. *Fraxinus pennsylvanica)* can survive moderate periods of total or partial inundation. Seedlings of these species have a competitive advantage over seedlings of flood-intolerant species.

Appendix D: Hydric Soils

1. This appendix describes the basic procedure for digging a soil pit and examining for hydric soil indicators.

Procedures for Digging a Soil Pit and Examining for Hydric Soil Indicators

Digging a soil pit

2. Apply the following procedure: Circumscribe a 1-ft-diameter area, preferably with a tile spade (sharpshooter). Extend the blade vertically downward, cut all roots to the depth of the blade, and lift the soil from the hole. This should provide approximately 16 inches of the soil profile for examination. *Note: Observations are usually made immediately below the A-horizon or 10 inches (whichever is shallower).* In many cases, a soil auger or probe can be used instead of a spade. If so, remove successive cores until 16 inches of the soil profile have been removed. Place successive cores in the same sequence as removed from the hole. *Note: An auger or probe cannot be effectively used when the soil profile is loose, rocky, or contains a large volume of water (e.g. peraquic moisture regime).*

Examining the soil

3. Examine the soil for hydric soils indicators (paragraphs 44 and/or 45 of main text (for sandy soils)). *Note: It may not be necessary to* conduct *a classical characterization (e.g. texture, structure, etc.) of the soil.* Consider the hydric soil indicators in the following sequence *(Note: THE SOIL EXAMINATION CAN BE TERMINATED WHEN A POSITIVE HYDRIC SOIL INDICATOR IS FOUND):*

Nonsandy soils.

a. Determine whether an organic soil is present (see paragraph 44 of the main text). If so, the soil is hydric.

b. Determine whether the soil has a histic epipedon (see paragraph 44 of the main text). Record the thickness of the histic epipedon on DATA FORM 1.

c. Determine whether sulfidic materials are present by smelling the soil. The presence of a "rotten egg" odor is indicative of hydrogen sulfide, which forms only under extreme reducing conditions associated with prolonged inundation/soil saturation.

d. Determine whether the soil has an aquic or peraquic moisture regime (see paragraph 44 of the main text). If so, the soil is hydric.

e. Conduct a ferrous iron test. A colorimetric field test kit has been developed for this purpose. A reducing soil environment is present when the soil extract turns pink upon addition of ∝-∝-dipyridil.

f. Determine the color(s) of the matrix and any mottles that may be present. Soil color is characterized by three features: hue, value, and chrome. **Hue** refers to the soil color in relation to red, yellow, blue, etc. **Value** refers to the lightness of the hue. **Chroma** refers to the strength of the color (or departure from a neutral of the same lightness). Soil colors are determined by use of a Munsell Color Book (Munsell Color 1975).* Each Munsell Color Book has color charts of different hues, ranging from 10R to 5Y. Each page of hue has color chips that show values and chromas. Values are shown in columns down the page from as low as 0 to as much as 8, and chromas are shown in rows across the page from as low as 0 to as much as 8. In writing Munsell color notations, the sequence is always hue, value, and chroma (e.g. 10YR5/2). To determine soil color, place a small portion of soil** in the openings behind the color page and match the soil color to the appropriate color chip. *Note: Match the soil to the nearest color chip.* Record on DATA FORM 1 the hue, value, and chroma of the best matching color chip. *CAUTION: Never place soil* on the *face or front of the color page because this might smear the color chips.* Mineral hydric soils usually have one of the following color features immediately below the A-horizon or 10 inches (whichever is shallower):

(1) Gleyed soil.

Determine whether the soil is gleyed. If the matrix color best fits a color chip found on the gley page of the Munsell soil color charts, the soil is gleyed. This indicates prolonged soil saturation, and the soil is highly reduced.

(2) Nongleyed soil.

(a) Matrix chroma of 2 or less in mottled soils.**

(b) Matrix chroma of 1 or less in unmottled soils.**

(c) Gray mottles within 10 inches of the soil surface in dark (black) mineral soils (e.g., Mollisols) that do not have characteristics of (a) or (b) above.

Soils having the above color characteristics are normally saturated for significant duration during the growing season. However, hydric soils with significant

* See references at the end of the main text.

** The soil must be moistened if dry at the time of examination.

coloration due to the nature of the parent material may not exhibit chromas within the range indicated above. In such cases, this indicator cannot be used.

g. Determine whether the mapped soil series or phase is on the national list of hydric soils (Section 2). *CAUTION: It will often be necessary to compare the profile description of the soil with that of the soil series or phase indicated on the soil map to verify* that the *soil was correctly mapped. This is especially true when the soil survey indicates the presence of inclusions or when the soil is mapped as an association of two or more soil series.*

h. Look for iron and manganese concretions. Look for small (>O.08-inch) aggregates within 3 inches of the soil surface. These are usually black or dark brown and reflect prolonged saturation near the soil surface.

Sandy soils.

Look for one of the following indicators in sandy soils:

a. A layer of organic material above the mineral surface or high organic matter content in the surface horizon (see paragraph 45a of the main text). This is evidenced by a darker color of the surface layer due to organic matter interspersed among or adhering to the sand particles. This is not observed in upland soils due to associated aerobic conditions.

b. Streaking of subsurface horizons (see paragraph 45c of the main text). Look for dark vertical streaks in subsurface horizons. These streaks represent organic matter being moved downward in the profile. When soil is rubbed between the fingers, the organic matter will leave a dark stain on the fingers.

c. Organic pans (see paragraph 45b of the main text). This is evidenced by a thin layer of hardened soil at a depth of 12 to 30 inches below the mineral surface.

Appendix E: Corps of Engineers Guidance

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, DC 20314-1000

27 August 1991

CECW-OR

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Implementation of the 1987 Corps Wetland Delineation Manual

1. The purpose of this memorandum is to provide guidance concerning the implementation of the 1987 Corps of Engineers Wetlands Delineation Manual (1987 Manual) (Waterways Experiment Station Technical Report Y-87-1, January 1987). This guidance supercedes the guidance provided in John Studt's 21 August memorandum to the field. Further, this guidance is to be used in conjunction with memoranda dated 23 August, 1991, concerning wetlands delineation and the 1992 Energy and Water Development Appropriations Act (Act). In accordance with the Act and the 23 August memoranda, the 1987 Manual is now used to delineate potentially jurisdictional wetlands in place of the 1989 **Federal Manual for Identifying and Delineating Jurisdictional Wetlands.**

2. The guidance in paragraph 3 will be followed in the application of the 1987 Manual.

3. Use of the 1987 Manual is mandatory, however, the Appendices are modified as discussed below:

a. Appendix A: The definition of "under normal circumstances" provided in this glossary is modified pursuant to Regulatory Guidance Letter (RGL) #90-7;

b. Appendix B: Use of the data sheets provided is recommended, but is not mandatory;

c. Appendix C: Sections 1 and 2 - These sections are replaced with the May 1988 **National List of Plant Species That Occur in Wetlands** and associated regional lists (U.S. Fish and Wildlife Service, Summary 88(24) and Biological Reports 88(26.126.13). The referenced lists will be used to determine the wetland indicator status of plant species and any subsequent updates will be adopted;

d. Appendix D: Section 2 - The most recent **Hydric Soils of the United States** list developed by the U.S. Department of Agriculture, Soil Conservation Service (SCS), will be used to determine if a particular soil has been designated as hydric by the National Technical Committee for Hydric Soils. The current hydric soils list was published by SCS in December 1987, and any subsequent updates will be adopted.

4. All other current policy considerations concerning wetlands in general (e.g., RGLS) remain in effect during interim use of the 1987 Corps Manual.

5. The Waterways Experiment Station will provide each division and district copies of the 1987 Manual. In addition, a copy of the Environmental Effects of Dredging Technical Notes (EEDP-04-7) dated January 1988, an article which summarizes the methods for delineating wetlands as presented in the 1987 Manual, will follow under separate cover. The article does not reflect the guidance contained in this memorandum; however, it does provide a general overall summary of the 1987 Manual.

JOHN P. ELMORE
Chief, Operations, Construction and
Readiness Division
Directorate of Civil Works

Questions and Answers on 1987 Corps of Engineers Manual

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON. D.C. 20314-1000

7 October 1991

7 October 1991

CECW-OR

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Questions & Answers on 1987 Manual

1. In response to questions from the field, the Qs & As on the 1987 Corps of Engineers Wetland Delineation Manual (1987 Manual) have been further clarified (in particular, questions #7 & 8). We clarified that for saturated only systems, the saturation must be to the surface for the appropriate number of days during the growing season. Furthermore, we clarified that the number of days for inundation or saturation to the surface are consecutive, not cumulative. The enclosed Qs and As dated 7 October, 1991 supercede those previously distributed under the cover memorandum of 16 September, 1991.

2. I want to again emphasize that the 1987 Manual stresses the need to verify that all three parameters exist prior to identifying and delineating an area as a wetland. Further, the 1987 Manual focuses on hydrology (i.e., inundation &/or saturation to the surface). In situations where hydrology is questionable, the 1987 Manual requires stronger evidence regarding the hydrophytic nature of the vegetation. The 1987 Manual also stresses the need to use sound professional judgment, providing latitude to demonstrate whether an area is a wetland or not based on a holistic and careful consideration of evidence for all three parameters. As indicated in the 1987 Manual and the attached Qs and As, careful professional judgment must be used in situations where indicators of hydrology are not clear and the dominant vegetation is facultative.

JOHN F. STUDT
Chief, Regulatory Branch
Operations, Construction and
Readiness Division
Directorate of Civil Works

Enclosure

Questions & Answers on 1987 Corps of Engineers Manual

1.Q. What is the definition and practical interpretation of the growing season which should be used in the application of the 1987 Manual?

A. The 1987 Manual defines the growing season as tithe portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biological zero (5 degrees C)." This is the definition found in Soil Taxonomy, and growing season months can be assumed based on temperature regimes (e.g., mesic: March-October). The 1987 Manual further states this period can be approximated by the number of frost-free days. The Waterways Experiment Station (WES) indicates that the county soil surveys, which utilize 32 degrees, provide the growing season for each county. There is some flexibility in the determination of the growing season in the 1987 Manual. The growing season, based on air temperature in the county soil surveys, can be approximated as the period of time between the average date of the first killing frost to average date of the last killing frost, which sometimes does not accurately reflect the period of time when the soil temperatures are higher than biological zero. The source of the information may vary, however, the growing season generally is to be determined by the number of killing frost-free days. In certain parts of the country where plant communities in general have become more adapted to regional conditions, local means of **determining** growing season may be more appropriate and can be used.

2.Q. Should the determination of hydric soils be based on the presence of an indicator listed in the 1987 Manual or on the series name appearing on the **Hydric Soils of the United States** list, an indicator which is listed as less reliable in the hierarchy of hydric soil indicators in the 1987 Manual?

A. The order of soil indicators reliability as listed in the 1987 Manual remains valid and will be used. The reliability of the indicators is based on the fact that field verification of a soilš hydric characteristics is more accurate than mapping or soils lists. Soils listed on the most recent Hydric Soils list have been determined by the **National Technical Committee for Hydric Soils** (NTCHS) to meet the criteria for hydric soils. When in the field, verification that mapped hydric soils actually exhibit indicators identified in the 1987 Manual for hydric soils is recommended. Although a soil may appear on the list of hydric soils, inclusions or disturbances may alter this designation to some degree, so the list alone may not always be reliable. In obvious wetlands, if the soil is on the list and the area meets the hydrology and vegetation criteria, the area is a wetland. As found with the 1989 Manual, one cannot rely solely on the fact that a soil is mapped as hydric in making the wetland delineation. In all cases, best professional judgment should be used. The county lists provide valuable information, but again should not solely be relied on to make a final determination as to whether hydric soils are present. Verification of the presence of at least one of the indicators for hydric soils on the list (pgs. 30-34) is required in conjunction with the use of a county soils list. The national soils list to be used has recently been updated by

A. The definition of "under normal circumstances" in the 1987 Manual states briefly that "this term refers to situations in which the vegetation has not been substantially altered by man's activities." As stated in item #3 of the memorandum of 27 August, 1991, the definition of normal circumstances used in the 1987 Manual has been clarified by Regulatory Guidance Letter (RGL) 90-7. Although this RGL deals primarily with agricultural activities in wetlands, paragraphs #3 & #4 discuss normal circumstances with respect to all areas potentially subject to 404. Further guidance on normal circumstances is found in RGL 86-9 regarding construction sites and irrigated wetlands. The guidance should be followed in preferential sequence of; 1) RGL 90-7, 2) RGL 86-9, and 3) 1987 Manual.

4.Q. Does the vegetation criteria in the 1987 manual require the use of the facultative (FAC)-neutral vegetation test (i.e., count the dominant species wetter & drier than FAC, and ignore all of the FACs in the vegetation determination)?

A. While the 1987 Manual mentions use of the FAC-neutral test for determining the presence of wetland vegetation in several places, the first indicator of wetland vegetation criteria is the presence of more than 50% of the dominant plant species FAC or wetter (not including FAC-species, which are considered nonwetland indicators under the 1987 manual). The indicator status of each of the dominant species is determined by consulting the current regional plant list published by the FWS. The 1987 Manual provides an option in this determination of applying the FACneutral test in cases where the delineator questions the status designation of a particular plant species on a subregional basis (see page 23). As always, any deviation from established protocol requires documentation. The FAC-neutral option may also prove useful in questionable areas or when the determination relies on the vegetation call in an area that is not otherwise an obvious wetland. Specifically, the 1987 Manual is replete with cautions and guidance that the Corps regulators **must be confident** that the area is wetland when the area has a FAC-dominated plant community. Uncertainty regarding the status of an area as a wetland where the dominant vegetation is FAC would be a valid reason to use the FACneutral option. Situations exist where use of the FAC-neutral method will not serve to provide any additional information as to the hydrophytic nature of the plant community (e.g., all species are FAC or there is an equal number of species wetter and drier than FAC such that they cancel each other out). In these cases, it may be appropriate to consider the + and - modifiers associated with some FAC species, which indicate the species frequency of occurrence in a wetter or drier environment, in the overall assessment of the vegetation parameter. Documentation supporting reasons for using the FAC-neutral option must always be provided and acceptance of delineations, as always, remains up to the discretion of the District.

5.Q. Can indicators for any of the criteria in the 1989 Manual be used as indicators for verification of the same or other criteria presented in the 1987 Manual?

A. The indicators of hydrology in the 1987 Manual differ from those of the 1989 Manual, and are not interchangeable. In particular, the hydrology determination in the 1989 Manual often relied on evidence of properties from the soil and/or vegetation parameters. Indicators provided in the 1989 manual for field verification of a certain criterion that are not presented in the 1987 Manual for application with the same criterion cannot be used except as additional information in support of the verification. It is unlikely that an area which is a wetland will fail to meet a criteria utilizing the indicators which are listed in the 1987 Manual.

6.Q. Will the other Federal agencies be utilizing the 1987 Manual in their wetland determinations as well as the Corps of Engineers?

A. EPA has concurred with the Corps using the 1987 Manual for all actions. Further, we understand that EPA will likely use the 1987 Manual for EPA's delineations as well. The other agencies (SCS & FWS) typically do not make delineations for purposes of Section 404.

7.Q. To what depth should one look in the soil to find indicators of hydrology?

A. In accordance with the 1987 Manual's guidance on reading soil color (D2), after digging a 16" soil pit observations should be made immediately below the A-horizon or within 10" of the soil surface (whichever is shallower). This guidance pertains to observations of indicators of the **soil criterion**. For indicators of saturation to the surface in the **hydrology criterion,** observations are made within a major portion of the root zone (usually within 12"), again in the 16" pit. Visual observation of standing water within 12" of the surface may, under certain circumstances, be considered a positive indicator of wetland hydrology (i.e., saturation to the surface) as stated on page 38. When using water table within 12" of the surface as an indicator of hydrology, care must be used to consider conditions and the soil types (i.e., to ensure that the capillary ability of the soil texture is considered in regard to the water table depth). Vegetation and soil properties used in the determination of hydrology in the 1989 Manual, are typically not available for field verification of this criterion in the 1987 Manual. However, the 1987 Manual allows for some flexibility with regards to indicators of wetland hydrology, and states that indicators are not limited to those listed on pages 37-41. Other indicators, such as some type of recorded data (e.g., soil surveys which provide specific and strong information about the soil series' hydrology) may be used to verify a wetland hydrology call in a saturated but not inundated area. Appropriate documentation to support the call is necessary in all cases.

8.Q. What length of time must wetland hydrology be present for an area to be determined a wetland under the 1987 Manual?

A. In the hydrology section of Part III, the 1987 Manual discusses the hydrologic zones which were developed through research at WES to indicate the duration of inundation and/or soil saturation during the growing season. Wetland hydrology is defined in the 1987 Manual as the sum total of wetness characteristics in areas that are inundated or have saturated soils for a sufficient duration to support hydrophytic vegetation. The 1987 Manual discusses hydrology in terms of a percent of the growing season when an area is wet (page 36). Generally speaking, areas

which are seasonally inundated and/or saturated to the surface for more than 12.5% of the growing season are wetlands. Areas saturated to the surface between 5% and 12.5% of the growing season are sometimes wetlands and sometimes uplands. Areas saturated to the surface for less than 5% of the growing season are non-wetlands. The percent of growing season translates to a number of days, depending an the length of the growing season in any particular area (e.g., 12.5% of a 170 day growing season is 21 consecutive days). This system for the classification of hydrologic zones based on stream gauge data transformed to mean sea level elevations is useful as a guide to time frames of wetness sufficient to create wetlands. The length of time an area is wet for hydrology is based on **consecutive** days during the growing season. If an area is only saturated to the surface for a period of between 5% and 12.5% of the growing season and no clear indicators of wetland hydrology exist (i.e., recorded or field data; also see answer #7 above), then the vegetation test should be critically reviewed. Specifically, in such cases a vegetative community dominated by FAC species would generally indicate that the area is not a wetland (unless the FAC-neutral test was indicative of wetlands). The actual number of days an area is inundated and/or saturated to the surface for an area to be called a wetland varies; the identification of an indicator of recorded or field data is necessary to document that an area meets the wetland hydrology criterion of the 1987 Manual (i.e., the list of hydrology indicators on pages 37-41, which are to be used in the preferential order shown; also see question #7). The number of days specified in the June 1991 **Hydric Soils of the United States** (i.e., usually more than 2 weeks during the growing season) as the criteria for hydric soils pertains to hydric soils and not the hydrology criterion of the 1987 Manual, which varies with the growing season as previously discussed.

9.Q. Will delineations made now under the 1987 Corps Manual be subject to redelineation under the revised 1989 Manual after it is finalized?

A. Wetland determinations made after 17 August, 1991, are made following the guidance provided in the 1987 Corps Manual and memoranda of 23 & 27 August, 1991 and these questions and answers. These delineations are subject to and remain valid for the period of time described in RGL 90-6. As discussed in Issue #4 of the preamble to the proposed revisions to the 1989 **Federal Manual for Identifying and Delineating Jurisdictional Wetlands** issued 14 August in the **Federal Register,** wetland calls made after the issuance date of these revisions but prior to finalization of the revised manual may be subject to redelineation under the new manual at the request of the landowner. Final actions will generally not be reopened. Wetland calls made under the 1989 Manual are already subject to redelineation under the 1987 Manual in accordance with the guidance issued 23 August. Until such time as the proposed revisions to the 1989 Manual are finalized, it is unclear as to what effect, if any, the equity provision in the preamble to the proposed revisions will have on the 404 program. Therefore, written delineations made with the 1987 Manual will explicitly state they are final for a period of three years as specified in RGL 90-6, subject to any equity provisions that may be adopted as part of implementation of the final revisions to the 1989 Manual.

10.Q. How does the 1987 Manual compare to the 1989 Manual or its proposed revisions?

A. The various manuals have been compared by WES and the side-by-side comparison is available for your information.

11.Q. Will applicants be subject to delay with use of 1987 Manual?

A. During the initial transition to use of the 1987 Manual for wetland delineations as of 17 August, some delays are unavoidable. The Corps field offices must adhere to the procedures provided in the 23 August memorandum, while striving to expedite the review process to the extent possible. No offices should indicate that they cannot operate due to lack of guidance during this transition period. HQUSACE recognizes that there will be delays associated with implementing the Corps 1987 Manual and we will take these delays into account when reviewing district application performance data (e.g., % of IPs evaluated in 60 days). Districts should not stop the permit clock, but should indicate where substantial impacts to permit evaluation performance have resulted from implementation the 1987 Manual.

Corps Clarification Letter

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
WASHINGTON, D.C. 20314-1000

6 March 1992

CECW-OR

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Clarification and Interpretation of the 1987 Manual

1. The purpose of this memorandum is to provide additional clarification and guidance concerning the application of the **Corps of Engineers Wetlands Delineation Manual,** Technical Report Y-87-1, January 1987, Final Report (1987 Manual). As discussed in my 20 February 1992 memorandum, procedures for the identification and delineation of wetlands must be fully consistent with both the 1987 Manual and the Questions and Answers issued 7 October 1991. The technical and procedural guidance contained in paragraphs 2 thru 6 below has been prepared by the Waterways Experiment Station (WES) and is provided as further guidance. The following guidance is considered to be consistent with the 1987 Manual and the 7 October Questions and Answers. Further, this guidance will be presented in the upcoming Regulatory IV wetlands delineation training sessions in FY 92. The alternative technical methods of data gathering discussed below are acceptable as long as the basic decision rules (i.e., criteria and indicators) established in the 1987 Manual are applied. Also enclosed is a revised data form which may be used in lieu of the routine data sheet provided with the 1987 Manual, if desired. As discussed in my 20 February 1992 memorandum to the field, regional approaches and/or alternative data sheets must be reviewed and approved by HQUSACE (CECW-OR) prior to regional implementation. Notwithstanding this requirement, we encourage interagency coordination and cooperation on implementation of the 1987 Manual. Such cooperation can facilitate the continued success of our use of the 1987 Manual.

2. Vegetation:

a. Basic rule: More than 50 percent of dominant species from all strata are OBL, FACW, or FAC (excluding FAC-) on the appropriate Fish and Wildlife Service regional list of plant species that occur in wetlands.

b. The 1987 manual provides that the 3 most dominant species be selected from each stratum (select 5 from each stratum if only 1-2 strata are present). However, alternative ecologically based methods for selecting dominant species from each stratum are also acceptable. The dominance method described in the 1989 interagency manual is an appropriate alternative.

5. Methods:

a. As stated in the 1987 Manual (footnote, p. 76), alternative plot sizes and dominance measures are acceptable.

b. For comprehensive determinations involving a patchy or diverse herb layer, a single, centrally located 3.28 x 3.28-foot quadrat may not give a representative sample. As an alternative, the multiple-quadrat procedure presented in the 1989 Manual (p. 42) is recommended.

6. Problem Areas

a. Page 93, paragraph 78 of the 1987 Manual states that similar problem situations may occur in other wetland types; therefore, problem areas are not limited to this list.

b. Problem soil situations mentioned elsewhere in the Manual include soils derived from red parent materials, some Entisols, Mollisols, and Spodosols.

7. Questions concerning this information should be directed to Ms. Karen A. Kochenbach, HQUSACE (CECW-OR), at (202) 272-1784, or Mr. James S. Wakeley, WES, at (601) 634-3702.

Encl

ARTHUR E. WILLIAMS
Major General, USA
Directorate of Civil Works

Public Notice

U.S. Army Corps of Engineers
Seattle District
Regulatory Branch
Post Office Box 3755
Seattle, Washington 98124-2255
Telephone (206) 764-3495
ATTN: Debbie Knaub
Environmental Analyst

U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue
M/S WD-128
Seattle, Washington 98101
Telephone (206) 553-1414
ATTN: Fred Weinmann
Wetland Specialist

23 May 1994

SUBJECT: WASHINGTON REGIONAL GUIDANCE ON THE 1987 WETLAND DELINEATION MANUAL

Introduction and Background. Several issues have arisen regionally regarding the identification and delineation of wetlands using the 1987 Corps of Engineers' Wetlands Delineation Manual

The purpose of this information paper is to provide guidance on specific issues which are frequently misunderstood when using the Manual. These issues include the following:

1. Interpretation of Hydrophytic Vegetation Indicators.
2. Other Hydrophytic Vegetation Field Indicators.
3. Methods for Analyzing Vegetation Communities.
4. Growing Season.
S. Interpretation of Normal Circumstances.
6. Interpretation of Hydrologic Data.

ISSUE 1: 1987 Manual, pages 19-26, Guidance on "Indicators of Hydrophytic Vegetation" paragraphs 35 a and 35 b (1) , pages 19 and 23.

Issue Description.

In the 1987 manual, the hydrophytic vegetation criteria are defined in **Part II** and are termed "diagnostic characteristics." **Part III** describes the technical basis of the criteria and identifies **indicators** which help to determine if a criterion is met.

An item of particular concern has been proper interpretation of the vegetation indicators. We have found that many manual users focus only on the indicator which states that: "More than 50% of the

dominant species (in a plant community) are OBL, FACW or FAC on lists of plant species that occur in wetlands."

In Washington, we are aware of several wetland plant community types which do not provide a positive indicator of hydrophytic vegetation when consideration is limited to only "indicator all" (i.e., presence of over 50% FAC, FACW, or OBL plant species) These wetland communities can occur on either organic or **mineral** soils and under a wide spectrum of water regimes. They are generally referred to as "facultative upland (FACU) dominated wetlands." Because FACU dominated wetlands are common in Washington, it is essential that hydrophytic vegetation indicators be properly interpreted.

It is important to consider that wetlands develop in response to hydrologic conditions; i.e., presence of water (we do not regulate hydrophytic vegetation or hydric soils of the U.S., rather we regulate **waters** of the U.S.) Thus, the known presence of wetland hydrology is very strong evidence of wetland occurrence if soils and vegetation are present. The utility and necessity for wetland identification manual(s) derives from our frequent inability to directly observe hydrologic conditions thus creating a need to rely on **indicators** of vegetation, soils, and hydrology to make a determination.

Guidance.

There are several positive indicators for hydrophytic vegetation provided in the Manual. In referring to these indicators the 1987 Manual states: ". . . any one of the following is indicative that hydrophytic vegetation is present." (listed on pages 19-26). Investigators should consider whether any of the positive indicators of hydrophytic vegetation are present and consider information on soils and hydrology before making a decision on the presence of hydrophytic vegetation.

There is also confusion regarding interpretation of "indicator b (1) Visual observation of plant species growing in areas of prolonged inundation and/or soil saturation (page 23 of the 1987 Manual) . In general, if the hydrology and soils criteria are clearly met, then an area has prolonged periods of inundation or saturation. Thus, one has made an observation of plant species growing under wetland conditions consistent with the Diagnostic Environmental Characteristics (i.e., criteria) for vegetation.

Caution is urged in interpreting this field indicator. Documentation should be included to indicate that the situation observed is not the result of unusual flooding, particularly high rainfall, or a one time condition such as a temporary water diversion.

Interpretation of this field indicator is more difficult when soils and hydrology features are not so evident; i.e., during dry seasons when direct observation of wetland hydrology is not possible or where some drainage has taken place. In such cases, investigators should rely on their previous experience, consultation with other experienced delineators and the literature to determine if the vegetation community is known to occur in areas of prolonged inundation or soil saturation.

Vegetation information should be combined with soils and hydrology observations to make a wetland determination. Information sources used as a basis of the decision should be documented. Documentation should include description of previous field observations of similar communities, who was consulted, etc.

Investigators must also be certain that the site being investigated does not represent an **Atypical Situation** (Section F, Page 83 of the Manual). The site may also represent a **Problem Area** (Section G, Page 93) where positive evidence of vegetation is absent during some seasons .of the year.

ISSUE 2: 1987 Manual, Pages 23, 24, 26, Paragraph 35 b (2) (3) (4) and (5): Other Hydrophytic Vegetation Field Indicators.

Issue Description.

The Manual is inconsistent in its guidance regarding use of hydrophytic vegetation field indicators other than "indicator a." In the section on routine delineation for areas under 5 acres, (page 61), the 1987 Manual states under Step 9: "When more than 50% of the dominant species in a community type have an indicator status of OBL, FACW, and/or FAC, hydrophytic vegetation is present . . . [p]ortions of the area failing this test are not wetlands." In contrast to this, on page 65 of the 1987 Manual, in the method for areas greater than 5 acres in size at step 19 c. 1. it states: "Hydrophytic vegetation is present at the observation point when 50% of the dominant species have an indicator status of OBL, FACW, and/or FAC; when two or more dominant species have observed morphological or known physiological adaptations for occurrence in wetlands; or when other indicators of hydrophytic vegetation are present."

Guidance.

The size of the project site is irrelevant when applying the field indicators. observations of all evident field indicators should be recorded for each site investigated and all should be used to determine if hydrophytic vegetation is present.

ISSUE 3: Methods used for determining dominant plant species.

Issue Discussion and Guidance.

DATA FORM 1 in the 1987 Manual states under **Vegetation:** [list the three **dominant** species in each vegetation layer (5 if only 1 or 2 layers)]." Recent guidance (see reference 3) states that other ecologically based methods for selecting dominant species from each stratum are acceptable. Methods contained in the 1989 Manual are specifically referred to as acceptable. For example, when quantitative data is collected, the definition in the 1989 manual can be used. It states the following:

> Dominant species are those species in each stratum that, when ranked in descending order of abundance and cumulatively totaled, immediately exceed 50 percent of the total

dominance measure for that stratum, plus any additional plant species comprising 20 percent or more of the total dominance measure for that stratum. Dominance measures include percent areal coverage and basal area, for example.

In low diversity communities, dominants will be less than five or three and may only be one. Sound professional judgment based on careful observation and data collection must be used in selecting dominant species.

ISSUE 4: Growing season.

Issue Discussion.

The manual defines the growing season as:

> The portion of the year when soil temperatures at 19.7 inches below the sol surface are higher than biologic zero (5 degrees C). For ease of determination this period can be approximated by the number of frost-free days."

Several issues arise in determining the growing season:

> --In much of the Northwestern U.S. some plant species are growing during every month of the year.
>
> --Each county soil survey has several locations for which air temperature data is tabulated. This can result in numerous growing seasons for each county.
>
> --The data location nearest to a wetland delineation site may not be representative of the growing season for the site being investigated. For example, SCS data may be from a site at sea level but the delineation site may be at high elevation with an annual temperature regime much different than the SCS data site.

Guidance.

Use sound professional judgment based on careful observation to determine if the growing season is in progress. For example, evidence of new or recent growth such as flowers, new shoots, new leaves, or swollen buds on plants suggests that active growth is occurring. Basically, if plants are growing, it is the growing season.

Take soil temperatures at 19.7 inches to determine if the formal definition of growing season is met. Soil thermometers are readily available at most forestry supply stores.

Use sound professional judgment in interpreting the data tables in the soil surveys. Use the data set which makes the most sense for the site being investigated. Be particularly cautious when the site being investigated is located far from or in a different physiographic setting than the nearest data station.

For much of Western Washington the mesic growing season has, in the past, been considered a good rule of thumb; i.e., 1 March to 31 October (except for some coastal areas which may have a year round growing season and in areas that have more extreme winter temperatures which may result in a shorter growing season). However, this should not be used to conflict with field data and observations.

ISSUE 5: Normal Circumstances.

Issue Discussion.

The term "normal circumstances" has created confusion for many Manual users as it is often misinterpreted to mean "normal environmental conditions." As such, users often confuse the methodology associated with the Section F (Atypical Situations) and the Section G (Problem Areas).

Guidance.

Normal circumstances is an integral and important term in determining the extent of jurisdiction under the Clean Water Act. The term comes from the definition of wetlands:

"Wetlands are those areas that are inundated and saturated for a frequency and duration sufficient to support and, under **NORMAL CIRCUMSTANCES** do support a prevalence of vegetation typically adapted to life in saturated soil conditions . . . . "

The original intent of this term was to assure that the extent of Federal jurisdiction would not be obscured by human-caused activities done without benefit of a Section 404 Permit. For example, if an individual removed the vegetation of a wetland, it would still be a wetland under normal circumstances. That is, physically removing the vegetation neither eliminates the site from jurisdiction nor from the definition of wetlands. The same would hold true if fill materials were placed in wetlands without benefit of permit; the area is still under the jurisdiction of the Federal Government even though the wetlands have been covered by unauthorized fill. These conditions are discussed in the Manual under Section F - Atypical Situations. There is also a methodology associated with Atypical Situations which helps the user assess the extent of jurisdiction when the wetland parameters are obscured due to unauthorized activities.

Keep in mind that if fill is placed **with benefit of permit** (that is, the fill is placed legally), that condition is now the new "normal circumstances" and the area would not be considered jurisdictional, unless wetland characteristics return.

A "problem area" is a wetland system that is a natural or naturalized system that may permanently or periodically lack certain field indicators for a specific parameter. These can be a seasonal wetland where hydrology is missing during the dry season; a newly created wetland; a wetland with soils derived from red parent materials; etc. This is discussed in Section G of the Manual and also in the March 6, 1992, Guidance.

ISSUE 6: Interpretation of Hydrologic Data.

Issue Discussion.

Many users of the Manual have spent considerable time and effort installing and monitoring ground water wells under the assumption that the water table must be at 12 inches for sufficient time during the growing season for the wetland hydrology criterion to be met. However, the hydrology criterion states:

> "The area is inundated either permanently or periodically at mean water depths $\leq$ 6.6 ft., OR the soil is saturated to the surface at some time during the growing season of the prevalent vegetation." (Page 14, Diagnostic Environmental Indicators).

Under "Field Indicators of Hydrology" the Manual states:

> "For soil saturation to impact vegetation, it must occur within **a major portion of the root zone** (usually within 12 inches of the surface) of the prevalent vegetation). Page 38, field indicators.

Well data only reflects the depth of the water table and not the zone of soil saturation. If the water table is near or at the surface for sufficient time, the observer can be reasonably certain that surface saturation is occurring. However, several soils can have a capillary fringe of 18 inches or greater (especially organic soils). In addition, wetland systems that are driven by surface water may have a deep water table where the root zones of the soil are saturated from persistent surface water (not just periodic rainfall).

While well data can be extremely useful, without supplemental observations of surface soil saturation and/or observations of surface ponding or flooding, the data may be meaningless.

Many users have also limited the amount of time that they make groundwater observations (2-3 months out of the year) making the assumption that this was sufficient time to adequate characterize wetland hydrology. This limited sampling time may incorrectly interpret the hydrology of the site. We recommend that the sample adequately reflect seasonal hydrology and its effect on vegetation (generally from about mid-October to mid-June to capture both dormancy and new growth)

Guidance.

Ground-water well data must always be supplemented with observations of the extent in the soil profile of the capillary fringe. This can be done by examining a soil profile in the nearby vicinity of a ground-water well every time depth to the ground water is measured. Observations of surface ponding and/or flooding should also be made. In addition, soil temperatures at approximately 20 inches should be recorded to adequately determine extent of the growing season at that site. As

discussed in Issue 4, reliance on air temperature data to determine growing season may artificially restrict the time pat a site is actively functioning as a wetland.

ADDITIONAL INFORMATION. Should you be interested in obtaining any of the available references cited or have further questions, please contact either of the following Federal agencies:

LOCATION:	Regulatory Branch U.S. Army Corps of Engineers Seattle District Federal Center South 4735 East Marginal Way South Seattle, Washington
CONTACTS:	Debbie Knaub, Chris McAuliffe, T. J. Stetz
TELEPHONE:	(206) 764-3495
MAILING ADDRESS:	Post Office Box 3755 Seattle, Washington 98124-22S5

or

MAILING/LOCATION:	Wetlands Section U.S. Environmental Protection Agency Region 10 1200 Sixth Avenue, M/S WD-128 Seattle, Washington 98101
CONTACT:	Fred Weinmann
TELEPHONE:	(206) 553-1414

References

1. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. January, 1987.

2. CECW-OR Memorandum dated 7 October 1991 titled: Questions and Answers on 1987 Manual.

3. CECW-OR Memorandum dated 6 March 1992 titled: Clarification and Interpretation of the 1987 Manual.

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6. Tiner, Ralph. How Wet is a Wetland? Great Lakes Wetlands, Vol. 2, No. 3. Summer, 1991.

Washington State Wetlands Rating System

Western Washington

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Preface

This document is a revision of the *Washington State Wetland Rating System,* published by the Washington Department of Ecology in October 1991. The original document was published with an understanding that modifications would be incorporated as we increase our understanding of wetland systems, and as the rating system is used by many different people.

The need to revise the original version became apparent as we trained different groups in the use of the rating system. Several textual inconsistencies and ambiguities were identified that made a consistent application of the ratings by different people difficult Furthermore, Thurston County undertook a detailed analysis of the wetlands in over 50 square miles of the county using the State rating system, and the Army Corps of Engineers rated 128 wetlands in the Mill Creek drainage basin. In both of these large-scale assessments, additional ambiguities with the original rating system were identified that were not evident during the field-testing carried out for the original draft. Before undertaking the revisions, comments were also sought from ax wide range of users of the rating system.

Where possible, the comments we have received to date have been incorporated into this revision. A draft of the revisions was sent out to a subgroup of the original review team Listed in Appendix 4), and their comments were taken into account in preparing the final document.

Acknowledgments

First Edition - October 1991

Stewart Toshach - Project Lead and Author
Andy McMillan and Sue Mauermann - Principal Authors
Dyanne Sheldon - Field Testing and Major Reviewer
Ecology Wetlands Section Technical Unit Staff - Field Testing and Review
Members of the Technical and Implementation Review Teams - (see appendix 4)

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Tom Hruby and Andy McMillan - Project Leads
Bill Leonard and Nancy McLeod - Logistical Assistance
Sarah Cooke, Linda Kunze, Dyanne Sheldon & Bob Zeigler - Principal Reviewers
Ecology Wetlands Section Technical Unit Staff - Field Testing and Review
Thanks to Shapiro & Associates, Raedeke & Associates, Steve Morrison (Thurston Regional Planning), and Marion Carey (Pierce County)-for their review and input.

Introduction

The remaining wetlands in Washington State differ widely in resource value. Some wetland types are common, and others are rare, but all provide some valued functions. These may be ecological, economic, recreational, or esthetic. To effectively protect the remaining wetlands, managers, planners, and citizens need to be able to better understand the resource value of individual wetlands. One way to accomplish this is with a wetlands rating system: a process that differentiates wetlands according to specific characteristics or functional attributes. Permit decisions can then be considered in light of the wetland rating and the potential impact. Protective measures are varied, with the highest levels of protection given to the highest rated wetlands. (An example of appropriate protection standards for use with this rating system is found in Appendix 6.)

Amongst wetland scientists, planners, and regulators there is a continuing debate on the merits of rating wetlands at all. Advocates of wetland rating note that this management approach avoids a multitude of case-by-case, subjective impact determinations made by permit administrators. Wetland rating systems also afford potential developers with early notice of wetland sensitivity according to the rating assigned to a wetland. A rating system will increase predictability, certainty, and consistency of decision making. Additionally, it may simplify and expedite permit review. Wetland rating can also increase the credibility of a wetland protection program by relating protection standards to wetland value.

Critics of wetland rating are concerned that it can be used as a mechanism to direct development impacts to lower rated wetlands, serving only to protect higher rated wetlands. Other critics point to possibly subjective interpretations that may be required on behalf of the wetland evaluator in order to determine a wetland's category or rating, and the high amount of training which may be necessary to ensure appropriate determinations. Additionally, rating systems differentiate and place value on wetland characteristics that are not fully understood. One concern is that there is less published scientific data concerning Northwest wetlands than those in other areas of the United States. Another concern is that we lack complete information on the complex internal processes of individual wetlands and the full effects of their cumulative loss.

Despite the potential drawbacks, the Department of Ecology has developed a rating system to be used in the State of Washington. Ecology's rating system uses specific criteria to allow a determination of the resource value of individual wetlands within four possible categories. **The rating value is based on wetland functions and values, sensitivity to disturbance, rarity, and irreplacability.**

The management decisions which can be made according to this system include: the level of impact avoidance to require; the width of buffers necessary to protect wetlands from adjacent land development; mitigation acreage and replacement ratios; and permitted uses in wetlands (see Appendix 6 for recommended protection standards.). This system does not replace a functional assessment of a wetland, which will be necessary in order to plan and monitor a wetland mitigation project.

The system identifies a relative value for vegetated wetlands and is intended primarily for use with the Clean Water Act definition of wetlands. It does not include mudflats, streambeds, beach substrates, and other ecologically valuable aquatic areas. However, we have included eelgrass beds and kelp beds at the request of State agencies. The system was designed to be used with the 1989 *Federal Manual for Identifying and Delineating Jurisdictional Wetlands.* Use of this system with a different delineation manual may require modifications to certain criteria in order to retain its accuracy.

An essential question is whether or not the rating system will help to protect the public resource value of wetlands. The system is designed to assist local and state governmental agencies that have legal jurisdiction over wetlands. As a tool for protection its success will depend on how it is used.

In fine-tuning the system, Ecology is aware that many local governments are either using, or in the process of developing and adopting systems for determining the value of individual wetlands. The Departments intention in completing this document has been to maintain existing distinctions between the four wetland categories, while adding refinement and predictability.

The rating system is neither considered perfect nor the final answer; however, it is based upon the best information available at this time. Advances in wetlands science will bring further understanding to the valuation of wetlands. We anticipate that this rating system methodology will be farther modified over time as we increase our understanding of wetland systems and improve on our ability to measure wetland functions and values.

Summary of Rationale for the Categories

This rating system was designed to differentiate between wetlands based on their sensitivity to disturbance, rarity, irreplaceability, and the functions they provide. The rating categories are intended to be used with a management plan similar to that outlined in Appendix 6. Use of these management standards with this rating system should result in adequate protection of most wetland resources. Use of less stringent standards, however, may result in a loss of wetland functions and values.

At first glance, it may appear that this rating system is weighted toward wildlife habitat functions and values provided by wetlands with little attention devoted to hydrologic and water quality functions. Rating of the hydrologic and water quality functions provided by wetlands is inherent in many of the factors assessed, such as connection to streams and vegetation interspersion. Indicators of significant hydrologic functions are more complex and costly to assess and were considered inappropriate to use in this context.

Finally, the assumption is made that the management standards will address many concerns regarding loss of hydrologic functions. For example, most wetlands providing important hydrologic functions would fall in Categories I, II, or III, and thus would only be altered if there were no practicable alternative and would receive buffers greater than 50 feet. The only wetlands falling in Category IV would be small, isolated wetlands which provide minimal hydrologic functions which can be replicated in most cases.

It is important to understand that this rating system is not intended to substitute for a detailed functional assessment of a wetland where that is appropriate.

The development of the rating system methodology involved the review of draft documents by two teams, a Technical Review Team and an Implementation Review Team. Details of the review process and the members of the teams are provided in Appendix 4.

The following description of each of the categories summarizes the rationale for each category. As a general principle, it is important to note that all of the categories have valuable functions in the landscape, and all are worthy of inclusion in wetlands protection programs.

Category I

These wetlands are the "cream of the crop." Generally, these wetlands are not common and would make up a small percentage of the wetlands in the state. These are wetlands that: 1) provide a life support function for threatened or endangered species that has been documented, and the wetland is on file in databases maintained by state agencies; 2) represent a high quality example of a rare wetland type; 3) are rare within a given region; or, 4) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime, if at all. We cannot afford the risk of any degradation to these wetlands. Examples of the latter are mature forested wetlands that may take a century to develop, and bogs and fens with their special plant populations that have taken centuries to develop.

Category II

These wetlands are those that: 1) provide habitat for very sensitive or important wildlife or plants; 2) are either difficult to replace; or 3) provide very high functions, particularly for wildlife habitat. These wetlands occur more commonly than Category I wetlands, but still need a high level of protection.

Category III

These wetlands provide important functions and values. They are important for a variety of wildlife species and occur more commonly throughout the state than either Category I, or II wetlands. Generally these wetlands will be smaller, less diverse, and/or more isolated in the landscape than Category II wetlands. They occur more frequently, are difficult to replace, and need a moderate level of protection.

Category IV

These wetlands are the smallest, most isolated, and have the least diverse vegetation. These are. wetlands that we should be able to replace and, in some cases, be able to improve from a habitat standpoint. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands do provide important functions and values, and should to some degree be protected. In some areas, these wetlands may be providing groundwater recharge and water pollution prevention functions and, therefore, may be more important from a local point of view. Thus, regional differences may call for a more narrow definition of this category.

Overview for Users

When to Use the Wetlands Rating System

The system is designed to determine wetlands categories for users of the Department of Ecology's Model Wetland Protection Ordinance, for agencies developing agency procedures for wetlands protection, and for local regulatory programs being developed or revised that address wetland protection.

This rating system was developed to be used with the management protection standards given in Appendix 6 (or similar standards). The use of lesser protection standards with this rating system may result in inadequate protection of wetlands functions and values. The rating system does not try to establish the values present in a wetland; it only helps to identify the levels of protection needed.

It is important to understand that regional differences may need to be accounted for in rating wetlands. Two versions of the Rating System have been designed: an Eastern Washington version and a Western Washington version. This broad division of the state into east and west may not reflect all regional differences at a fine enough scale and it may, therefore, be necessary to modify the criteria or sub-criteria. Use of the wetlands of local significance concept on p. 50 is recommended where local governments need to provide a level of protection to local wetlands that would not be otherwise provided by the rating system.

How the Wetlands Rating System Works

The system requires that specific criteria be confirmed on a Wetlands Rating Office Data Form from state agency sources or by the application of a field methodology before a particular wetland is assigned to a category. The field methodology consists of a Wetlands Rating Field Data Form and detailed guidance.

A summary of the sources of data and criteria to rate individual wetlands according to each category is shown in Table 1 .

The Wetlands Rating Office Data Form on p. 10 is a step-by-step method for determining the category of wetland using information from agency sources. We recommend using the Wetlands Rating Office Data Form before completing the Wetlands Rating Field Data Form. However, please note that the Office Data Form will not provide a rating in most cases and you will need to use the Field Data Form. This is because state agency inventories are not complete.

The Wetlands Rating Field Data Form on p. 25 is also a step-by-step method. We recommend careful reading of the guidance.

TABLE 1: Summary of Criteria by Category and Data Sources	
Criteria for Each Category	**Data Sources**
Category I Wetlands are: (i) Those that have a documented occurrence in the wetland of a federal or state listed endangered, threatened plant …. Animal …….. Or fish species; or……. ii) High quality native wetland communities which qualify for inclusion in the Natural Heritage Information System; or (iii) Documented as regionally significant waterfowl or shorebird concentration areas; or (iv) Wetlands with irreplaceable ecological attributes; or (v) Documented wetlands of local significance.	DNR – Natural Heritage Prog. WA Department of Wildlife WA Department of Fisheries DNR – Natural Heritage Prog. WA Department of Wildlife Field Data Form Local Government
Category II Wetlands satisfy no Category I Criteria, <u>and</u> are: (i) Those that have a documented occurrence in the wetland of a federal or state listed sensitive plant …… animal …… or fish species; or…… (ii) Those that contain priority species or habitats recognized by state agencies; or (iii) Wetlands with significant functions which may not be adequately replicated through creation or restoration; or (iv) Wetlands with significant habitat value of 22 or more points; or (v) Documented wetlands of local significance.	DNR – Natural Heritage Prog. WA Department of Wildlife WA Department of Fisheries WA Department of Wildlife Field Data Form Field Data Form Local Government

TABLE 1 (Continued): Summary of Criteria by Category and Data Sources	
Criteria for Each Category	**Data Sources**
Category III Wetlands satisfy no Category I, II or IV Criteria and are: (i) Wetlands with significant habitat value of 21 points or less; or	Field Data Form
(ii) Documented wetlands or local significance.	Local Government
Category IV Wetlands satisfy no Category I, II or III criteria, and are: (i) Wetlands less than 1 acre and, hydrologically isolated and, comprised of one vegetated class that is dominated (> 80% areal cover) by one species from the list in Table 4; or,	Field Data Form
(ii) Wetlands less than two acres and, hydrologically isolated, with one vegetated class, and > 90% of areal cover is any combination of species from the list in Table 3.	Field Data Form
(iii) Wetlands that are ponds excavated from uplands and are smaller than 1 acre without a surface water connection to streams, lakes, rivers, or other wetlands throughout the year; and that have less than 1/10 acre of vegetation.	

How to Use the Rating System

Instructions

==========

1) Read guidance for using the Wetlands Office Data Form on page 9, and the Wetland Rating Field Data Form on page 12.

2) Obtain a copy of map(s) showing the boundaries of the wetland you are rating. Use delineated boundaries where possible.

3) Send letters to state agencies requesting information. See the sample letters in Appendices 1-3. Attach a copy of the map(s).

4) When agencies return the information, complete the Wetland Rating Office Data Form (on page 10).

5) In necessary, go to the wetland and complete the Wetland Rating Field Data Form (on page 25).

6) Attach the Field Data Form to the Office Data Form. This is your record of the rating.

==========

Guidance for the Wetlands Rating Office Data Form

Delineation:

The first step is to determine the location and boundaries of wetlands that you are rating. You will need to know the location and boundaries so you can send an accurate map to agencies. For regulatory purposes it is assumed that wetland locations are accurately known before categories are determined. This does not mean that delineation of wetlands must always be undertaken before a meaningful determination of category can be made. However, the wetland boundary is an important factor in determining some rating criteria and a rough assessment may result in inaccuracies in rating.

Rating wetlands that are divided by human made features:

See the general guidance on p. 12 and Appendix 5.

Rating wetlands contiguous with large areas of open fresh water or streams:

See the general guidance in Appendix 5.

Completing the wetlands rating office data form:

Complete the background information. Put names of rater(s), organization, date etc., the location of the wetland using Section, Township and Range coordinates and your sources of information in the spaces provided.

Answer the questions beginning at the top of the form.

Copies of sample letters to state agencies that can help with the data are included in Appendices 1-3. Send the letters to the addresses shown, or make phone calls if your matter is urgent. Use the questions in the letters as guidance if you are making phone calls. A fee may be charged for searches of agency databases. Searches for public agencies (i.e. local governments) and nonprofit organizations are discounted. *NOTE:* It may take up to three weeks to obtain these data, so allow time for this in your assessment.

Complete the Office Data Form when you have answers from the agencies. In most cases the Office Data Form will not provide a rating, so fieldwork will be necessary. Nevertheless it is important to get the agency data and complete the rating form before completing detailed fieldwork. This will save you time and effort should there already be a record of the wetland with the agency.

When you have completed the questions you may have circled higher and lower categories. In this case the highest category applies.

Wetlands Rating Office Data Form

Background Information:

Name of Rater:_____ Affiliation:_____ Date:_____

Name of wetland (if known):_____

Government Jurisdiction of wetland:_____

Location: 1/4 S:_____ of 1/4 S:_____SEC:_____ TWNSHP:_____ RNGE:_____

SOURCES OF INFORMATION: (Check all sources that apply)

Site visit: ___USGS Topo Map: ___ NWI map: ___ Aerial Photo: ___ Soils survey: ____

Other: _____ Describe: _____

When office and/or field data forms are completed enter Category here:

ANSWER ALL QUESTIONS BELOW. If the source agency identifies the wetland as satisfying any of the questions below, circle the category in "CATEGORY" column.	Data Source	Category (the highest qualifies)
Category I Questions		
A. Is the wetland in a Section and Subsection that has been documented as a habitat that performs a life support function for any State or Federally listed Threatened or Endangered plant or animal species? For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. NOTE: The rating of a wetland is incomplete in most cases without this documentation	DNR–– Natural Heritage; and WDW	Yes: Next Question No: Go to Question D
B. Does the wetland contain individuals of Federal or State-listed Threatened or Endangered plant species; OR Does the wetland contain documented occurrences of federal or state-listed Threatened or Endangered wildlife and species managed by the Washington Department of Wildlife?	DNR-Natural Heritage WDW	Yes: Category I No: Next Question
C. Does the wetland contain documented occurrences of State or Federally listed Threatened or Endangered fish species, OR races of fish, managed by the Washington Department of Wildlife or the Washington Department of Fisheries?	WDW; WDF	Yes: Category I No: Next Question

Wetlands Rating Office Data Form (continued)		
D. Is the wetland already on record with the Washington Natural Heritage Program as a high quality native wetland?	DNR-Natural Heritage	Yes: Category I No: Next Question
E. Does the wetland contain documented regionally significant waterfowl or shorebird concentration areas?	WDW	Yes: Category I No: Next Question
F. Is the wetland documented as a Category I Wetland of Local Significance?	Local Government	Yes: Category I No: Next Question
Category II Questions		
G. Is the wetland in a Township, Section and Subsection that has been documented as a habitat for any State listed Sensitive plant or animal species?	DNR-Natural Heritage Program; and WDW	Yes: Next Question NO – Go to Question K
H. Does the wetland contain individuals of State-listed Sensitive plant species?	DNR Natural Heritage	Yes: Cat. II No: Next Question
I. Does the wetland contain documented occurrences of federally or state-listed sensitive wildlife species?	WDW	Yes: Cat. II No: Next Question
J. Does the wetland contain documented occurrences of state or federally listed Sensitive fish species?	WDF WDW	Yes: Cat. II No: Next Question
K. Does the wetland contain priority species or habitats documented by Washington Department of Wildlife's Priority Habitats and Species Program?	WDW	Yes: Cat. II No: Next Question
L. Is the wetland documented as a Category II Wetland of Local Significance?	Local Government	Yes: Cat. II No: Next Question
Category III Questions		
M. Is the wetland documented as a Category III wetland of local significance.	Local Government	Yes: Cat. III No: go to Rating Field Data Form

General Guidance for the Wetland Rating Field Data Form

Land-owner's permission:

It is important to obtain permission from landowners before going on their property.

Time involved:

The field-time necessary to rate wetlands will vary from as little as fifteen minutes to many hours, or possibly days. Larger sites with dense brush may involve strenuous effort. Several of the rating questions would be best answered by using aerial photographs or other documents or a combination of these resources with field observations.

What experience and qualifications are needed?

It is important that the person completing the field method has experience and/or education in the identification of natural wetland features, particularly vegetation classes and plant species. The more experience one has in wetland fieldwork the quicker and more accurate the result will be. We recommend that qualified wetland staff or consultants be used for most sites, particularly the larger and more complex ones.

Identifying the boundaries of the wetland to be rated:

It is possible to complete the field method with a more rudimentary delineation based on inventory maps and aerial photographs. It should be recognized, however, that a delineation that is not verified by a field survey might result in a different rating. This is especially true in forested wetlands where the boundaries are difficult to determine from aerial photographs.

Wetlands that are not small and isolated often form large contiguous areas, which can extend over hundreds of acres. This is especially true in river valleys where there is some surface water connection between all areas of the floodplain. The primary criterion that should be used to identify wetland boundaries is the water regime. Boundaries between contiguous or connected wetlands should be set at the point where either the volume, flow, or velocity of the water changes significantly. General guidelines to be used for identifying the boundaries of the wetland to be rated are as follows:

1. Identify the wetland area of interest. This may be the site of a proposed impact, a mitigation site, conservation site, etc.

2. Identify the locations where there is physical evidence that the water regime (i.e. hydrology) changes rapidly (see figure 1). Evidence includes both natural and man-made:

    a. constrictions (such as berms, dikes, etc)

    b. points where the water velocity changes rapidly (such as rapids, falls)

    c. points of significant inflow (such as major tributaries)

    d. other factors that limit hydrologic interaction (such as dams and weirs).

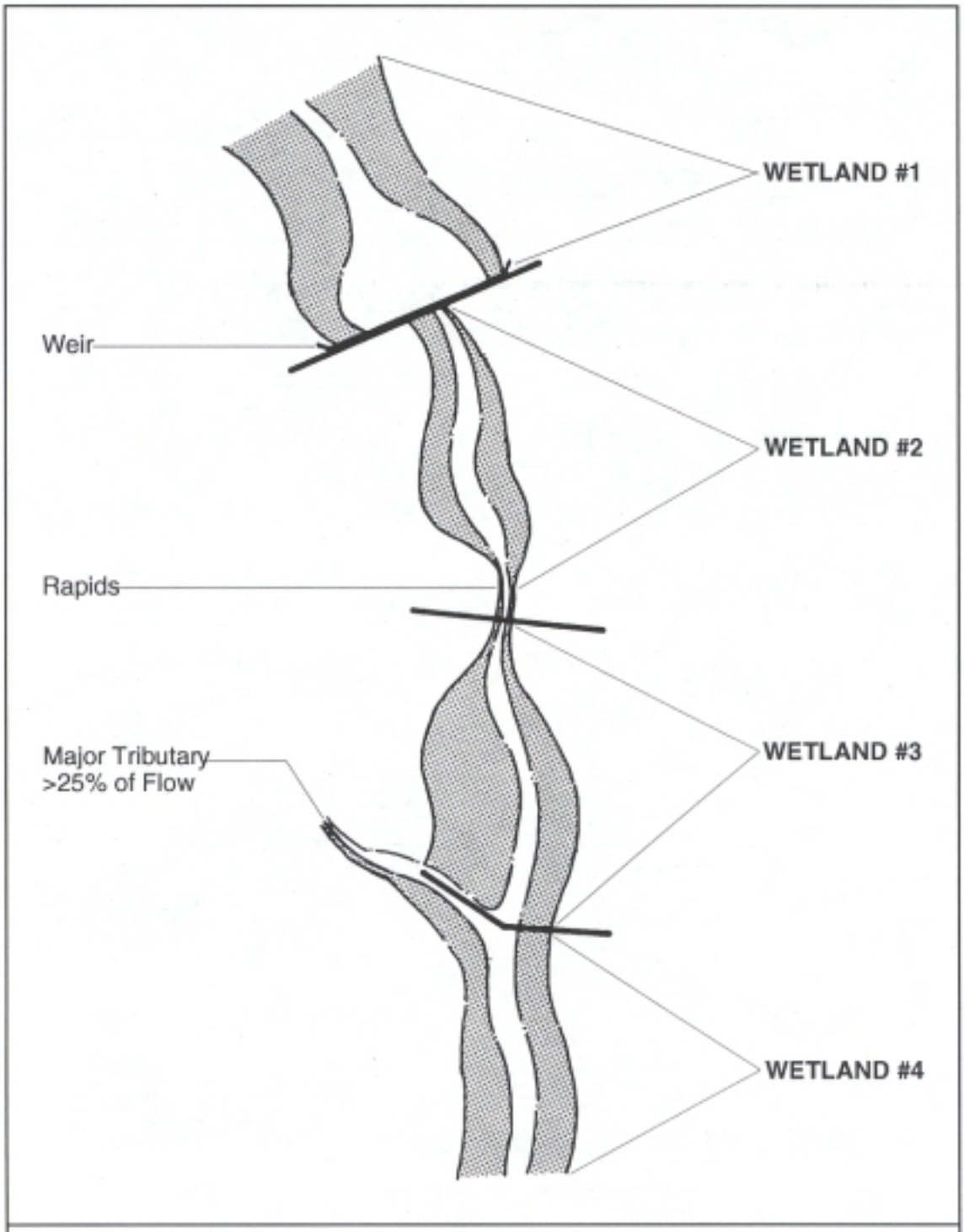


Figure 1. Boundaries for contiguous wetlands along a stream corridor or floodplain

3. Delineate the boundary of the wetland to be rated to include all wetland areas of interest that are contiguous and that are within the areas where the hydrology does not change significantly (i.e. areas with a high degree of hydrologic interaction).

> ***NOTE:*** Property lines should not be used as wetland boundaries for assessment unless they coincide with changes in hydrology.

In some cases it may be difficult to establish the boundaries of wetlands to be rated based on the criteria mentioned above. Common problem cases include:

1. Wetlands divided by artificial boundaries such as property fences, roads, or railroad embankments.
2. Wetlands contiguous with large areas of open freshwater, streams, or rivers.
3. Wetlands that form a patchwork on the landscape.
4. Estuarine wetlands.

Appendix 5 describes some criteria that can be used for the cases listed above. If, however, you have any question on where the boundary of an assessment area should be placed, please contact the Department of Ecology, Wetlands Section. Phone (206) 493-9406.

How to rate wetlands where only part of the wetland is Category I:

Large wetlands often contain areas that would be rated as Category I because they contain special features, such as bogs, that cover a smaller area, but the rest would be rated as Category II or III. In such cases the options are:

1. Rate the entire wetland as a Category I wetland, or
2. Give the wetland a dual rating as a I/II, or a I/III.

To establish a dual rating you will need to establish a boundary within the wetland being rated that clearly establishes the area that is Category I. This will be difficult, and in some cases may not be possible. Dual ratings are NOT acceptable for wetlands that are Category I because they are 1) estuarine, 2) eel grass or kelp beds, 3) high quality native wetlands which qualify for inclusion in the Natural Heritage Information System, or 4) documented wetlands of regional or local significance.

The criteria to be used in establishing the boundary between a Category I area of a wetland and those that are either Category II or III are as follows:

1. For wetland areas that are Category I as a result of the presence of endangered or threatened animal species the boundary between categories should be set at the edge of the specific habitats used by that species. For example, if an occurrence of the western Pond Turtle has been documented in a wetland, the Category I area should include all the habitats used by the turtle (including open water, aquatic bed vegetation, etc.). Consult with Department of Wildlife staff for assistance in determining which habitats to include.

2. For wetland areas that are Category I as a result of the occurrence of an endangered or threatened plant species the boundary between categories should be set at the edge of the vegetation class in which the plant is found. Consult with Department of Natural Resources staff for assistance in determining which habitats to include.

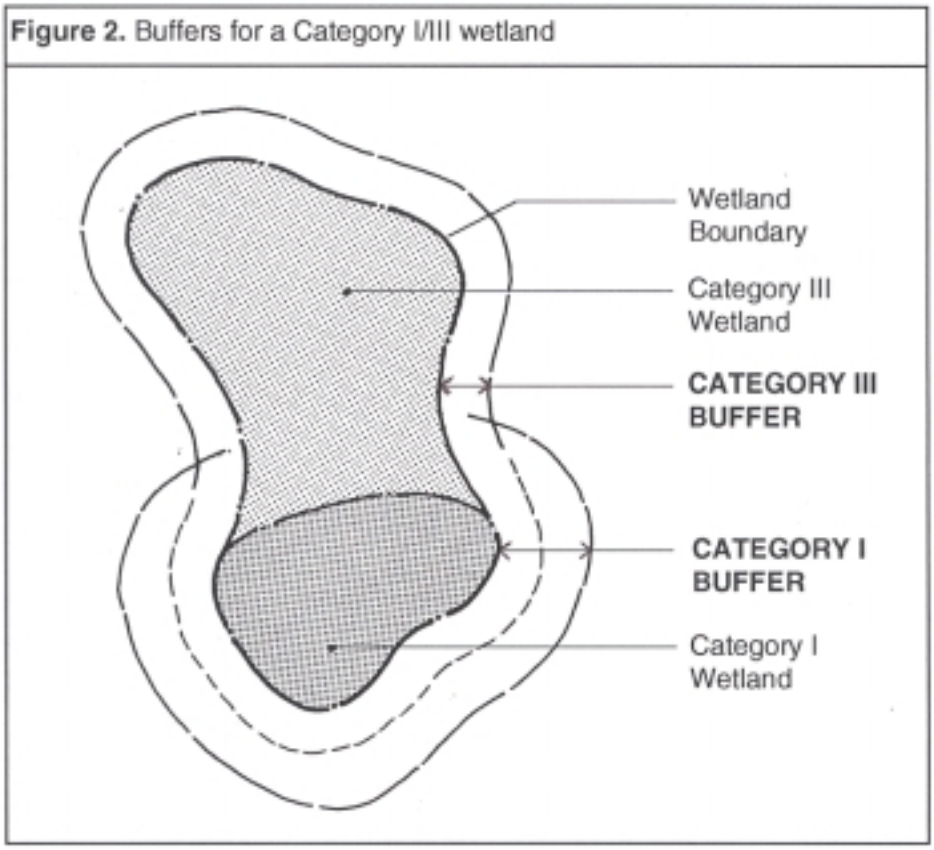
3. For wetland areas that are Category I as a result of the presence of a mature forest, the boundary between categories should be set at the edge (drip line) of the mature forested area (i.e. conifers > 80 years or deciduous older than 50 years).

4. For wetland areas that are Category I because they are bogs and fens, the boundary between categories should be set where the characteristic bog/fen vegetation changes (i.e. most of the plants that are specifically adapted to bogs and fens are replaced with the more common wetland species) and where the organic soils become shallow (less than 16 inches).

In making management decisions regarding development in the wetlands that have dual ratings it will be necessary to show that the category I system is adequately protected from adverse impacts. For example, the model ordinance suggests a 200-300' buffer around a Category I wetland. This buffer should be maintained even if the Category I wetland is surrounded by wetlands of a lower rating and its correspondingly narrower buffer. . Figure 2 gives an example of how buffers should be drawn for a wetland with a dual rating. For assistance in evaluating protective standards for dual rated wetlands, contact the agencies noted above.

Dual ratings of Category II wetlands, however, are not acceptable (i.e. Category II/III).

Figure 2. Buffers for a Category I/III wetland



Detailed Guidance for the Wetland Rating Field Data Form

Background Information:

Put names of rater(s), organization, date etc., the location of the wetland using Section, Township and Range coordinates, and sources of your information in the spaces provided.

Question 1. High Quality Native Wetlands:

During the site visit, assess the extent of damage to the natural system by human caused disturbance. If lack of disturbance is indicated based on question 1, contact staff of the Washington Natural Heritage Program.

Note: evidence of human-caused disturbance is often obscured or not evident from a single site visit or without additional research. Aerial photographs, however, can be useful in assessing recent site disturbance.

In general, if you find any of the following conditions the wetland is probably disturbed to the extent that it would not be classified as a high quality native wetland. If there is any doubt, however, regarding the quality of the native wetland please contact the Washington Natural Heritage Program.

Indicators of Human Caused Disturbances:

1. The watershed "upstream" of the wetland has more than 12% impervious surfaces.
2. The wetland has been ditched, and the ditches are free flowing and not obstructed.
3. The wetland has areas where the cover of nonnative species is greater than 10%.
4. The wetland has been graded, filled, or logged.
5. The wetland contains dikes that control or divert water, or whose water regime is controlled by dikes, either upstream or downstream.

Question 2. Irreplaceable ecological attributes

Question 2a: Undisturbed Bogs and Fens

Bogs and fens are rare, sensitive habitats with an irregular distribution in Western Washington. The chemistry of these wetlands is such that changes to the hydrology or water quality of the wetland can easily alter its ecosystem. Immediate changes in the composition of the plant community often occur after the hydrology changes. Once disturbed, the water chemistry that is so characteristic of the bog and fen hydrology is difficult, if not impossible, to reestablish.

Bogs are low nutrient, acidic wetlands that have organic soils, and whose hydrology is based on precipitation. As a result, there is a characteristic flora and fauna associated with bogs that is easy to recognize. Fens are wetlands that have organic soils, receive ground water or surface runoff, and are somewhat less acidic than bogs. Fens, however, are also characterized by a specialized plant community consisting of herbaceous vegetation. Both bogs and fens have undrained organic soils that are inundated or saturated for most of the year in Western Washington.

For the purpose of this rating system, bogs and fens are identified by the presence of a deep layer of organic soils (> 16 inches) and either the presence of a sphagnum moss understory or a cover of certain herbaceous plants without shrubs or trees.

Most bogs and fens are found on organic soils called peats in which much of the organic matter produced by the mosses and other plants has not decomposed. If more than two-thirds of the soil material consists of plant fibers that are still identifiable as fibers the soil is called a peat by the Soil Conservation Service (SCS). If less than two-thirds of the soil material is identifiable, the soil is called a muck. Most bogs and fens are found on peat soils, although you may find cases where these wetlands are found on mucks as defined by the SCS. If you find peat or muck soils it is important that you determine whether the wetland can be categorized as a bog or fen.

Although many common wetland plant species are found in bogs and fens, there are some species that are characteristic of these wetlands in Washington and can be used as indicators of these habitats (Table 2). ***Note:*** Some sphagnum bogs in Washington State are forested, and the sphagnum ground cover is not easily seen. If you are rating a mature forested wetland, always check the soil to determine whether you are on a sphagnum peat. Fens are generally dominated by grasses, rushes, or other herbaceous species. For the purpose of this rating system any emergent wetland with more than 16 inches of peat or muck soils that contains at least one species from table 2 and less than 30% sphagnum species is a fen.

If in doubt it is important to consult someone with expertise in identifying bogs and fens. The intent of the criteria is to include in Category I those bogs and fens which have at least 1/2 acre of relatively undisturbed native plant communities. Bogs and fens that are ¼ - ½ acre in size are included in Category II.

Bogs and fens are considered to be relatively undisturbed if they have not been physically disturbed (drained, ditched, filled, cultivated, mined, etc.), have not had their nutrient status significantly altered, have an undeveloped buffer and have less than a 10% cover of invasive species (see Table 3 for a list of invasive species in western Washington). If you are rating a bog of fen that you suspect should not be rated as a Category I because it is heavily disturbed or in a transition state please contact the Department of Ecology Wetland Section for help in rating.

Table 2. Characteristic plants of bogs and fens	
Andromeda polifolia	Bog rosemary
Betula glandulosa	Bog birch
Carexpauciflora	Few-flower sedge
Carexpluriflora	Several-flowered sedge
Carex rostrata	Beaked sedge
Cladina rangiferina	Reindeer lichen
Drosera rotundifolia	Sundew
Empetrum nigrum	Black crowberry
Eriophorum chamissonis	Cottongrass
Kalmia occidentalis	Bog Laurel
Ledum groenlandicum	Labrador Tea
Myrica gale	Sweetgale
Picea sitchensis	Sitka spruce
Rhynchospora alba	White beakrush
Sphagnum spp.	Sphagnum moss
Vaccinium oxycoccos	Bog Cranberry

Question 2b. A Mature Forested wetland class:
A forested wetland should be rated as a Category I if the woody vegetation (such as alder, cedar, hemlock, cottonwood, and some willow species, etc.) that provides the canopy over the wetland is over 20 ft. tall and at least 50 years old for deciduous trees and 80 years old for evergreens. To qualify for a Category I, there has to be at least 1/4 acre of the Forested class that meets the size and age criteria. To determine age, the best methods are to use a tree corer, or to gather historical data (e.g. aerial photos, land use records, permits, etc.) to determine when the area was last logged.

Question 2c. Estuarine Wetlands:
Areas where salt tolerant plant species are found and the hydrology are influenced by tidal action. The wetlands are usually partially enclosed by land with open or partially obstructed access to the ocean. In areas where freshwater wetlands grade into estuarine ones, the boundary of the latter extends to an area where the salinity is less than 0.5 ppt during the period of average annual low flow.

"Minimum disturbance" in estuarine wetlands means that the plant community, soils, and hydrology are generally undisturbed. Structures (e.g., fences, broken tide gates, etc.) or activities that have not visibly changed the plant community, soils, or hydrology (e.g. low level grazing or isolated occurrences of filling or draining), are considered a minimum disturbance.

Question 3. Category IV wetlands.

Hydrologically isolated wetland means: those regulated wetlands which:
1) have no surface water connection to a lake, river. or stream during any part of the year;
2) are outside of and not contiguous to any 100-yr floodplain of a lake, river, or stream; and
3) have no contiguous hydric soil between the wetland and any lake, river or stream.
4) may be a pond excavated from uplands with no surface water connection to a stream, lake, or other wetland.

Use the following lists when answering Q.3a and 3b:

Table 3 List of invasive/exotic plant species for question 2a.1 (peat wetlands), Question 2b.3, (mature forested wetlands), and Question 3.2 (Category IV wetlands)	
Scientific Name	**Common Name**
Agropyron repens	Quackgrass
Alopecuruspratensis, A. aequalis	Meadow Foxtail
Arcticum minus	Burdock
Brumus tectorum, B. rigidus, B. brizaeformis, B. secalinus	Bromes
B. japonicus, B. mollis, B. commutatus, B. inermis, B. erectus	
Cenchrus longispinus	Sandbur
Centaurea solstitialis, C. repens, C cyanus, C maculosa	Knapweeds
C diffusa	
Cirsium vulgare, C arvense	Thistles
*Cynosursus cristasus, C echinatus*l	Dogtail
Cytisus scoparius	Scot's Broom
Dactylis glomerata	Orchardgrass
Dipsacus sylvestris	Teasel
Digitaria sanguinalis	Crabgrass
Echinochloa crusgalli	Barnyard Grass
Elaeagnus augustifolia	Russian Olive
Euphorbiapeplus, E. esula	Spurge
Festuca arundinacea, F. pratensis	Fescue
Holcus lanatus, H. mollis	Velvet Grass
Hordeumjubatum	Foxtail Barley
Hypericumperforatum	St. John's Wort
Iris pseudacorus	Yellow Iris
Loliumperenne, L multiflorum, L temulentum	Ryegrass
Lotus corniculatus	Birdsfoot Trefoil
Lythrum salicaria	Purple Loosestrife
Matricaria matricarioides	Pineapple Weed
Medicago sativa	Alfalfa
Melilotus alba, M. officinalis	Sweet Clover
Phalris arundinacae	Reed Canarygrass
Phleum pratense	Timothy
Phragmites australis	Reed
Poa compressa, P. palustris, P. pratensis	Bluegrass
Polygonium aviculare, P. convolutus, P. cuspidatum	Knotweeds
P. lapathifolium, P. persicaria	
Ranunculus repens	Creeping Buttercup
Rubus discolor, R. laciniatus, R. vestitus, R. macrophyllus	Non-native Blackberries
Salsola kali	Russian Thistle
Setaria viridis	Green Bristlegrass
Sisymbrium altissimum, S. loeselii, S. officinale	Tumblemustards
Tanacetum vulgare	Tansy
Trifolium dubium, T. pratense, T. repens, T. Arvense	Clovers
T. subterraneum, T. hybridium	
Cultivated species:	Wheat, Corn, Barley, Rye, etc.

Table 4. List of native species for rating Category IV wetlands	
Scientific Name	**Common Name**
Juncus effusus	Soft Rush
Spirea douglasii	Hard Hack, Buck Brush
Typha latifolia	Cattail

Question 4. Significant habitat value:

4a. Total Wetland Acreage:
Use aerial photographs or NWI maps to measure and/or visually estimate acreage. Cite the source used. Unless you have considerable experience, visual estimation of acreage is unreliable. Use the guidance in Appendix 5 when the wetland is contiguous with large areas of open fresh water and/or streams.

Using areal measurements:
Areal measurements are those made as if the site were being viewed from the air. They are best made from recent air-photographs, if available, or derived from maps drawn from on the ground measurement. The latter method is time consuming and, unless the measurements are extensive, not as accurate. On the ground visual estimates can also be made. However, unless the rater has considerable experience these estimates are likely to be inaccurate.

The term "areal cover": means the % of the ground surface covered by vegetation. The % cover of plant species within a specific class is used to decide what classes are present in the wetland. Figure 3 gives a graphic example of a wetland with different classes and how the % cover might be distributed.

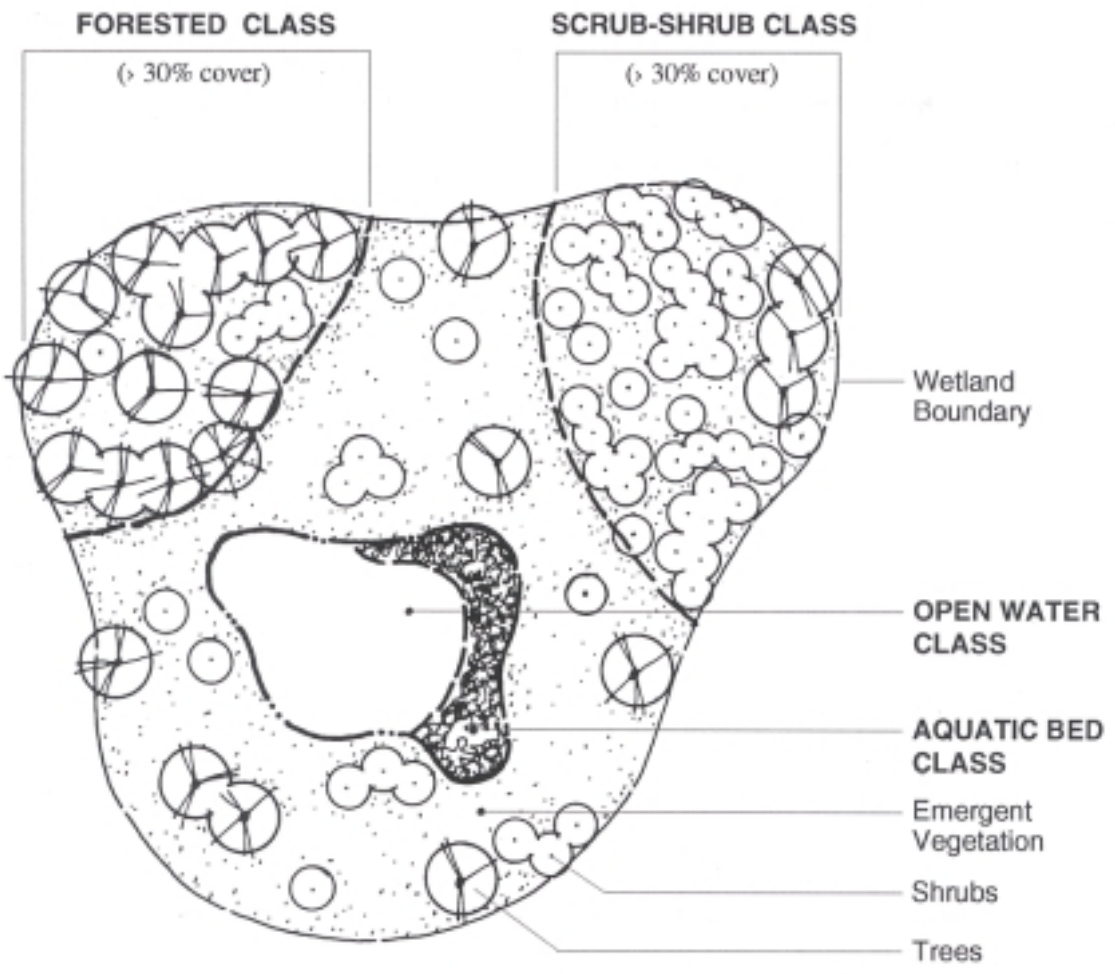
4b. Wetland Vegetation Classes:
Vegetation in wetlands is generally distinguished by its life form. Characteristics such as "herbaceous", "scrub-shrub", and "forest" are easy to distinguish and do not require extensive biological knowledge to determine.

To answer question 4b you will need to identify the classes of vegetation that are found in the wetland. This will involve walking through the wetland and developing a rough sketch of the distribution of plant life forms on a map. From this it will then be possible to estimate the area covered by each vegetation class.

Deciding on Classes present in the wetland:
The following criteria are used in the rating system to determine whether or not wetland classes are present at all, and if wetland classes are present, whether there is enough area of a wetland class to score points. For example, the presence of a few trees scattered in a wetland is not enough for the wetland to qualify as having a forested wetland class or to score points.

First decide which classes of vegetation are present using the definitions listed below. Identify all areas that you would consider to be forested, scrub-shrub, emergent, open water, or aquatic bed and sketch them on a map of the site. Within these areas then estimate whether the plants that fall into that class cover at least 30% of the ground. Finally estimate whether the class covers at least 1/4 acre of the wetland (see Figure 3). A wetland class qualifies for points in the rating system only if it is larger than 1/4 acre. If the entire wetland is smaller than 1/4 acre or if there are several vegetation classes present but none is greater than 1/4 acre SCORE a ZERO for this question.

Figure 3. Boundaries between vegetation classes in a wetland with a mixture of classes



***Note*: The **Emergent Class** is the wetland area where emergents cover › 30% of the ground, but does not meet forested or scrub/shrub wetland class criteria.**

Specific criteria for wetland classes:

Aquatic Bed: An Aquatic Bed wetland class is any area(s) of open water with rooted aquatic plants such as lily pads, pondweed, etc. Aquatic Bed vegetation does not always reach the surface and care must be taken to look into the water.

An Aquatic Bed class qualifies for points in the rating system if the total area of Aquatic Beds is at least 1/4 acre of the total area (not necessarily contiguous) of open water in the entire wetland being rated.

Open Water: An open water wetland class is any area of standing water present for more than one month at any time of the year without emergent, scrub-shrub or forested vegetation. The open water Class may include "aquatic bed" plant species. At certain times of year it may be difficult to determine if open water (with or without aquatic beds) is present. Use aerial photographs, talk with landowners or neighbors, look for dried or muddy areas without vegetation which indicate that open water was present earlier in the year, or in past years. Cite your source of information for making this determination.

The presence of an open water class qualifies for points in the rating system if the contiguous area of the Open Water class is at least 1/4 acre.

Emergent: An emergent wetland class is any area of the wetland where non-woody vegetation (such as cattail, grasses, sedges, etc.) cover at least 30% of the ground.

Note: If, however, the same area also contains scrub-shrub or forest vegetation that also cover more than 30% of the ground the class is determined on the basis of the life form of the plants that constitute the uppermost layer of vegetation (i.e. If an area contains a 60% cover of emergent species and a 35% cover of forest species the class would be Forested).

The presence of an emergent class qualifies for points in the rating system if the contiguous area of the emergent wetland class (i.e. the area where emergent plant species cover more than 30% of the ground) is at least 1/4 acre in size.

Scrub-shrub: A scrub-shrub wetland class is any area of vegetated wetland where woody vegetation less than 20 ft. tall (such as most willow species, hardhack, dogwood, salmonberry, etc.) comprises at least 30% of the areal cover.

A scrub-shrub vegetation class qualifies for points in the rating system if the contiguous area of the scrub-shrub wetland class (i.e. the area where scrub/shrub species cover more than 30% of the ground) is at least 1/4 acre in size.

Forested: A forested wetland class is any area of vegetated wetland where woody vegetation over 20 ft. tall (such as alder, cedar, hemlock, cottonwood, and some willow species, etc.) comprises at least 30% of the areal cover.

A forested wetland class qualifies for points in the rating system if the contiguous area of the forested wetland class (i.e. the area where forest species cover more than 30% of the ground) is at least 1/4 acre in size.

Note: Whenever more than one vegetated wetland class is present on the same area the tallest class prevails. In the example above, if there is more than 30% scrub-shrub species and more than 30% emergent species on the same area of wetland, that area would be called a scrub-shrub class. Similarly, a forested class would prevail over a scrub-shrub class.

4c. Plant Species diversity: Count the number of different plant species you can find within each vegetated wetland class. To qualify for points, however, each species you find must cover at least 5% of the ground within the area covered by that class. This does not mean you have to name the species. For example, you find three species in an area that can be classified as "emergent": A grass has a cover of 80%, a sedge covers 20%, and there are only a few plants of a rush. Since only the grass and sedge have covers greater than 5%, only these two species quality for points under this question. Note: Any plant species with a cover of more than 5% qualifies for points within a class (even those that are not of the dominant class).

4d. Structural diversity: Because question 4b in the rating system gives priority to the tallest vegetation class, question 4d is designed to recognize the underlying structural diversity. For example, emergent vegetation (covering 30% of the ground) under a forested canopy > 50' tall would score 2 points.

4e. Interspersion: Is a measure of the complexity of wetland classes. Select the drawing, which most closely approximates the distribution of vegetative classes, open water and aquatic beds in the wetland.

4f. Habitat features:

Beaver usage. Look for signs of current beaver activity (fresh cuttings, maintained dam or lodges). Note whether ponded water is a result of beaver activity.

Snags and downed logs should be in or adjacent to the wetland.

Open water: Try to determine whether there are areas (vegetated or unvegetated) within the wetland which are inundated for at least 4 months out of the year, and the wetland has not met the other criteria for open water in Question 4b. The availability of open or standing water (vegetated or unvegetated), however small is important to a variety of species. Frogs, salamanders, insects, crustaceans, and molluscs rely on areas of permanent or seasonal ponding to grow and reproduce, but the area required can be very small.

4g. Connection to streams:

A wetland is connected if some part of the wetland boundary has a surface water connection to seasonal or perennial flowing surface water (including floodwater) by way of a channel (natural or man-made) or an area of open water. The connection could be through a culvert, or a series of culverts, for example. To qualify for points you need to have firm evidence, which you can document on your data sheet, that the connection exists at some time during the year for at least one-month. In order to get the full 6 points; the channel has to be deep enough to permit access for fish if the connection is to a fish-bearing stream. If the connection is to a non-fish-bearing stream there has to be firm evidence that the surface water connection has a flow in it, and thus can export organic matter out of the wetland. The surface water connection can be at any time of the year and does not have to be present at the time a site is rated.

A connection could be shown by drift lines, sediment deposits or material such as grass wrapped on branches at higher flood levels. Determine if the flow between the wetland and the stream is perennial or seasonal and whether or not the stream contains fish at any time of the year. It may require careful work to determine if a connection exists.

A stream is a watercourse where there is at least a seasonal flow of water that is predominantly in one direction and there is a defined bank or series of banks containing the water.

4h. Buffers:
The wetlands rating system assigns points for wetland buffers according to three variables: The type of vegetation in the buffer, the distance (as measured on a horizontal plane) from the edge of the wetland to the upland edge of the buffer (i.e., line where the vegetation changes or the land use changes), and the percentage of the wetland boundary which adjoins buffered areas. The field form gives four descriptions of buffers and assigns scores to them. Select the description, which best matches the existing buffers. If the buffers do not match the descriptions exactly, score either a point higher or lower than the description that best matches actual conditions. The choice of a higher or lower score will depend on whether the buffer provides more or less buffering function than the description on the form.

Note: Roads, buildings and parking lots are not assigned a value as buffers.

4i. Connection to other habitat areas:
A riparian corridor as used in this rating system is defined as a moist vegetated area connecting two or more wetlands or areas of open water. It is characterized by the presence of vegetation that tolerates moist conditions and, usually, periodic free-flowing water such as a stream or river even though the area does not meet the three criteria defining a regulated wetland. The varied vegetation cover, food sources, and availability of water found in riparian corridors are very important to wildlife, especially since they permit relatively undisturbed movement of wildlife between wetlands. ***Note:*** This definition is only one of several that are in common usage. The one used was chosen to best meet the intent of the habitat questions.

Significant Habitat Area means a high quality natural upland or open water area such as a park, reserve, forest, lake, or other area that is essentially undisturbed and "natural" (or has been undisturbed for at least 10 years). Such areas outside the wetland boundary provide important habitat for some species that need a variety of habitats to meet their needs. For the purpose of scoring a significant habitat, the upland connected to the wetland has to be natural and at least 300 yards in its narrowest dimension (i.e. diameter or width). For open water the size is larger than 20 acres. In assessing the size of the "Significant Habitat Area" existing natural buffers around the wetland may be included as long as they are relatively, undisturbed.

Habitat Area means any vegetated area (forested, shrub, or herbaceous) that might provide habitat for species using both wetland and upland ecosystems. Developed or heavily disturbed areas such as farmed, urban, or residential lands are not generally considered to be habitat areas, except in special circumstances (i.e. grazed wetlands that provide overwintering for migratory waterfowl). For the purpose of scoring, a Habitat Area has to be at least 50 yards in its narrowest dimension (diameter or width). Buffers may be used in the areal estimate if they remain relatively undisturbed.

Upland Corridor means a vegetated, relatively undisturbed connection between two or more wetlands, or the wetland and habitat area. A relatively undisturbed wetland buffer that extends into habitat areas is to be considered as an upland corridor.

Wetlands Rating Field Data Form

Background Information:

Name of Rater:_____ Affiliation:_____ Date:_____

Name of wetland (if known):_____

Government Jurisdiction of wetland:_____

Location: 1/4 Section:_____ of 1/4 S:_____ Section:_____ Township:_____ Range:_____

Sources of Information: (Check all sources that apply)

Site visit:____ USGS Topo Map:____ NWI map:_____ Aerial Photo:____ Soils survey:_____

Other:_____ Describe:_____

When The Field Data form is complete enter Category here:

Q.1. High Quality Natural Wetland	Circle Answers
Answer this question if you have adequate information or experience to do so. If not find someone with the expertise to answer the questions. Then, if the answer to questions 1a, 1b and 1c are all NO, contact the Natural Heritage program of DNR.	
1a. Human caused disturbances.	
Is there significant evidence of human-caused changes to topography or hydrology of the wetland as indicated by any of the following conditions? Consider only changes that may have taken place in the last 5 decades. The impacts of changes done earlier have probably been stabilized and the wetland ecosystem will be close to reaching some new equilibrium that may represent a high quality wetland.	
1a.1 Upstream watershed > 12% impervious.	Yes: go to Q.2
1a2. Wetland is ditched and water flow is not obstructed.	Yes: go to Q.2
1a3. Wetland has been graded, filled, logged.	Yes: go to Q.2
1a4. Water in wetland is controlled by dikes, weirs, etc.	Yes: go to Q.2
la5. Wetland is grazed.	Yes: go to Q.2
1a6. Other indicators of disturbance (list below)	No: go to 1b.
_____	
_____	
_____	
_____	

1b Are there populations of non-native plants which are currently present, cover more than 10% of the wetland, and appear to be invading native populations? Briefly describe any non-native plant populations and Information source(s):_____ _____	YES: go to Q.2 No: go to 1c.
1c. Is there evidence of human-caused disturbances which have visibly degraded water quality. Evidence of the degradation of water quality include: direct (untreated) runoff from roads or parking lots; presence, or historic evidence, of waste dumps; oily sheens; the smell of organic chemicals; or livestock use. Briefly describe: _____ _____	YES: go to Q.2 NO: Possible Cat. I Contact DNR
Q.2. Irreplaceable Ecological Functions: Does the wetland: have at least 1/4 acre of organic soils deeper than 16 inches and the wetland is relatively undisturbed; OR [If the answer is NO because the wetland is disturbed briefly describe: Indicators of disturbance may include: - Wetland has been graded, filled, logged; - Organic soils on the surface are dried-out for more than half of the year; - Wetland receives direct stormwater runoff from urban or agricultural areas.]; OR have a forested class greater than 1 acre; OR have characteristics of an estuarine system; OR have eel grass floating or non-floating kelp beds?	(NO to all: go to Q.3) YES go to 2a YES: Go to 2b Yes: Go to 2c Yes: Go to 2d
2a. Bogs and Fens Are any of the three following conditions met for the area of organic soil? 2a.1. Are Sphagnum. mosses a common ground cover (>30%) and the cover of invasive species (see Table 3) is less than 10%? Is the area of sphagnum mosses and deep organic soils > 1/2 acre? Is the area of sphagnum mosses and deep organic soils ¼-1/2 acre? 2a.2. Is there an area of organic soil which has an emergent class with at least one species from Table 2, and cover of invasive species is < 10% (see Table 3)? Is the area of herbaceous plants and deep organic soils > 1/2 acre? Is the area of herbaceous plants and deep organic soils 1/4-1/2acre?	 YES: Category I YES: Category II NO: Go to 2a.3 YES: Category I YES: Category II NO: Go to 2a.3

2a.3. Is the vegetation a mixture of only herbaceous plants and Sphagnum mosses with no scrub/shrub or forested classes? Is the area of herbaceous plants, Sphagnum, and deep organic soils > 1/2 acre? Is the area of herbaceous plants, Sphagnum, and deep organic soils ¼-1/2 acre?	YES: Category I YES: Category II NO: Go to Q.3.
Q.2b. Mature forested wetland.	
2b.1. Does 50% of the cover of upper forest canopy consist of evergreen trees older than 80 years or deciduous trees older than 50 years? ***Note:*** The size of trees is often not a measure of age, and size cannot be used as a surrogate for age (see guidance).	YES: Category I NO: Go to 2b.2
2b.2. Does 50% of the cover of forest canopy consist of evergreen trees older than 50 years, AND is the structural diversity of the forest high as characterized by an additional layer of trees 20'-49' tall, shrubs 6'- 20', tall, and a herbaceous groundcover?	YES: Go to 2b.3 NO: Go to Q.3
2b.3. Does < 25% of the areal cover in the herbaceous/groundcover or the shrub layer consist of invasive/exotic plant species from the list on p. 19?	YES: Category I NO: Go to Q.3
Q.2c. Estuarine wetlands.	
2c.l. Is the wetland listed as National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park, or Educational, Environmental or Scientific Reserves designated under WAC 332-30-151?	YES: Category I NO: Go to 2c.2
2c.2. Is the wetland > 5 acres; .....…….. ***Note:*** If an area contains patches of salt tolerant vegetation that are 1) less than 600 feet apart and that are separated by mudflats that go dry on a Mean Low Tide, or 2) separated by tidal channels that are less than 100 feet wide; all the vegetated areas are to be considered together in calculating the wetland area.	YES: Category I
or is the wetland 1-5 acres; ……	YES: Go to 2c.3
or is the wetland < 1 acre? …….	YES: Go to 2c.4

2c.3. Does the wetland meet at least 3 of the following 4 criteria: ……. - minimum existing evidence of human related disturbance such as diking, ditching, filling, cultivation, grazing or the presence of non-native plant species (see guidance for definition); - surface water connection with tidal saltwater or tidal freshwater; - at least 75% of the wetland has a 100 buffer of ungrazed pasture, open water, shrub or forest; - has at least 3 of the following features: low marsh; high marsh; tidal channels; lagoon(s);woody debris; or contiguous freshwater wetland. 2c.4. Does the wetland meet all of the four criteria under 2c3? (above)?	YES: Category I NO Category II YES: Category II NO: Category III
Q.2d. **Eel Grass and Kelp Beds.** 2d.1. Are eelgrass beds present? …….. 2d.2. Are their floating or non-floating kelp bed(s) present with greater than 50% macro algal cover in the month of August or September?……	YES: Category I NO: go to 2d.2 YES: Category I NO: Category II
Q.3. Category IV wetlands. 3a. Is the wetland: less than 1 acre <u>and</u>, hydrologically isolated <u>and</u>, comprised of one vegetated class that is dominated (> 80% areal cover) by one species from Table 3 (page 19) or Table 4 (page 20) 3b. Is the wetland: less than two acres and, hydrologically isolated, with one vegetated class, and > 90% of areal cover in any combination of species from Table 3 (page 19) 3c. Is the wetland excavated from upland <u>and</u> a pond smaller than 1 acre without a surface water connection to streams, lakes, rivers, or other wetland, and has < 0.1 acre of vegetation.	YES: Category IV NO: go to 3b YES: Category IV NO: go to 3c YES: Category IV NO: go to Q.4

Q.4. Significant habitat value.
Answer all questions and enter data requested.

4a. Total wetland area

Estimate area, select from choices in the near-right column, and score in the far column:

Enter acreage of wetland here:_____acres, and source:_____

Circle scores that qualify

acres	points
>200	6
40-200	5
10-40	4
5-103	
1-5	2
0.1-1	1
<0.10	

4b. Wetland classes: Circle the wetland classes below that qualify:

Open Water: if the area of open water is > 1/4 acre

Aquatic Beds: if the area of aquatic beds > 1/4 acre,

Emergent: if the area of emergent class is > 1/4 acre,

Scrub-Shrub: if the area of scrub-shrub class is > 1/4 acre,

Forested: if area of forested class is > 1/4 acre,

Add the number of wetland classes, above, that qualify, and then Score according to the columns at right.

e.g. If there are 4 classes (aquatic beds, open water, emergent & Scrub-shrub), you would circle 8 points in the far right column.

#of classes	Points
1.....	0
2.....	3
3.....	6
4.....	8
5.....	10

4c. Plant species diversity.

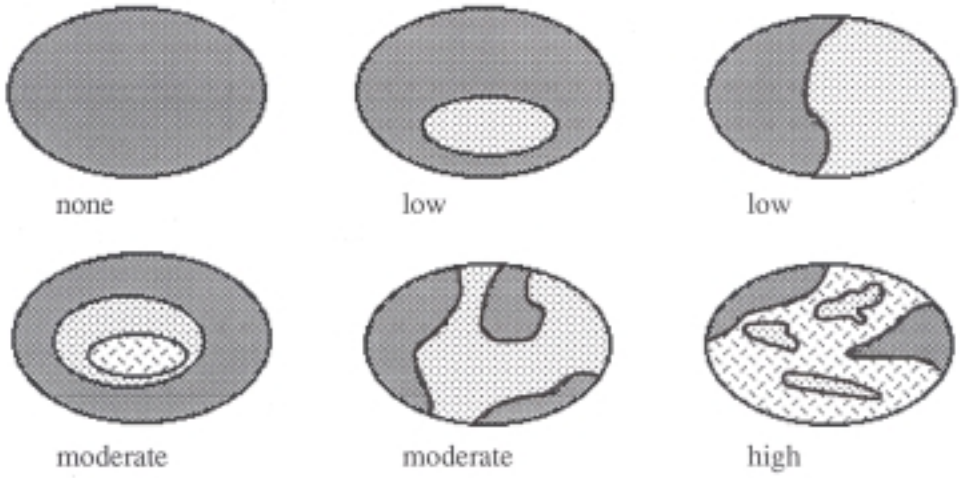
For each wetland class (at right) that qualifies in 4b above, count the number of different plant species you can find that cover more than 5% of the ground. You do not have to name them.

Score in column at far right:

e.g. If a wetland has an aquatic bed class with 3 species, an emergent class with 4 species and a scrub-shrub class with 2 species you would circle 2, 2, and 1 in the far column.

Note: Any plant species with a cover of > 5% qualifies for points within a class, even those that are not of that class.

Class	# species in class	Points
Aquatic	1	0
	2	1
	3	2
	>3	3
Emergent	1	0
	2-3	1
	4-5	2
	>5	3
Scrub-Scrub	1	0
	2	1
	3-4	2
	>4	3
Forested	1	0
	2	1
	3-4	2
	.>4	3

4d. Structural diversity. If the wetland has a forested class, add 1 point if each of the following Classes is present within the forested class and is <u>larger than 1/4 acre</u>: -trees > 50' tall……. -trees 20'- 49' tall…… -shrubs…… -herbaceous ground cover……. Also add 1 point if there is any "open water" or "aquatic bed" class Immediately next to the forested area (i.e. there is no scrub/shrub or emergent vegetation between them).	 YES - 1 YES - 1 YES – 1 YES – 1 YES – 1
4e. Decide from the diagrams below whether interspersion between wetland classes is high, moderate, low or none? If you think the amount of interspersion falls in between the diagrams score accordingly (i.e. a moderately high amount of interspersion would score a 4, while a moderately low amount would score a 2)	High – 5 Moderate – 3 Low – 1 None – 0
 	
4f Habitat features. Answer questions below, circle features that apply, and score to right: Is there evidence that the open or standing water was caused by beavers Is a heron rookery located within 300'? Are raptor nest/s located within 300'? Are there at least 3 standing dead trees (snags) per acre greater than 10" in diameter at "breast height" (DBH)? Are there at least 3 downed logs per acre with a diameter > 6" for at least 10' in length? Are there areas (vegetated or unvegetated) within the wetland that are ponded for at least 4 months out of the year, and the wetland has not qualified as having an open water class in Question 4b. ?	 YES = 2 YES = 1 YES = 1 YES = 1 YES = 1 YES = 2

4g. Connection to streams. (Score one answer only.) 4g.l. Does the wetland provide habitat for fish at any time of the year AND does it have a perennial surface water connection to a fish-bearing stream.	YES = 6
4g.2 Does the wetland provide fish habitat seasonally AND does it have a seasonal surface water connection to a fish-bearing stream.	YES = 4
4g.3 Does the wetland function to export organic matter through a surface water connection at all times of the year to a perennial stream.	YES = 4
4g.4 Does the wetland function to export organic matter through a surface water connection to a stream on a seasonal basis?	YES = 2
4h. Buffers. Score the existing buffers on a scale of 1-5 based on the following four descriptions. If the condition of the buffers do not exactly match the description, score either a point higher or lower depending on whether the buffers are less or more degraded.	
Forest, scrub, native grassland or open water buffers are present for more than 100'around 95% of the circumference.	Score = 5
Forest, scrub, native grassland, or open water buffers wider than 100' for more than 1/2 of the wetland circumference, or a forest, scrub, grasslands, or open water buffers for more than 50' around 95 % of the circumference.	Score = 3
Forest, scrub, native grassland, or open water buffers wider than 100' for more than 1/4 of the wetland circumference, or a forest, scrub, native grassland, or open water buffers wider than 50' for more than 1/2 of the wetland circumference.	Score = 2
No roads, buildings or paved areas within 100' of the wetland for more than 95% of the wetland circumference.	Score = 2
No roads, buildings or paved areas within 25' of the wetland for more than 95% of the circumference, or No roads buildings or paved areas within 50' of the wetland for more than 1/2 of the wetland circumference.	Score = 1
Paved areas, industrial areas or residential construction (with less than 50' between houses) are less than 25 feet from the wetland for more than 95 % of the circumference of the wetland.	Score = 0

4i. Connection to other habitat areas: Select the description, which best matches the site being evaluated. -Is the wetland connected to, or part of, a riparian corridor at least 100' wide connecting two or more wetlands; or, is there an upland connection present >100' wide with good forest or shrub cover (>25% cover) connecting it with a Significant Habitat Area?	YES = 5
-Is the wetland connected to any other Habitat Area with either 1) a forested/shrub corridor < 100' wide, or 2) a corridor that is > 100' wide, but has a low vegetative cover less than 6 feet in height?	Yes = 3
-Is the wetland connected to, or a part of, a riparian corridor between 50 - 100' wide with scrub/shrub or forest cover connection to other wetlands?	Yes = 3
- Is the wetland connected to any other Habitat Area with narrow corridor (<100') of low vegetation (< 6' in height)?	Yes = 1
- Is the wetland and its buffer (if the buffer is less than 50' wide) completely isolated by development (urban, residential with a density greater than 2/acre, or industrial)?	Yes = 0

Now add the scores circled (for Q.5a – Q.5i above) to get a total.
Is the Total greater than or equal to 22 points? **YES = Category II**
NO = Category III

Criteria for Wetland Categories

Category I Wetlands

Note: A wetland is considered Category I if it meets any one of the following five criteria.

Criterion 1

Wetlands that have documented occurrences recognized by federal or state agencies of Threatened or Endangered species of plant, wildlife, or, fish species.

Criterion 1a: Plant Species

The wetland contains individuals of Federal or State-listed Threatened or Endangered plant species.

Source of Information
Contact the Washington Natural Heritage Program by mail to determine if any plant species of concern have been located in or near the study area. A sample letter is included in Appendix 1. Send a map of the study area along with township, range, and section information. A fee may be charged for a search of the Natural Heritage Program database. Searches for public agencies (i.e. local governments) and non-profit organizations are discounted.

Washington Natural Heritage Program
Department of Natural Resources
Division of Land and Water Conservation
P.O. Box 47047
Olympia, Washington 98504-7047

The Washington Natural Heritage Program maintains a comprehensive database of site-specific information on reported occurrences of Sensitive, Threatened, Endangered and known historic occurrences of Possibly Extinct or Extirpated plant species in Washington. At the time of writing most wetlands in Washington have not been surveyed for the occurrence of State Sensitive, Threatened, Endangered plant species.

> ***Note:*** Unidentified plant species collected during site visits should be identified only by qualified botanists familiar with the Pacific Northwest flora. If the study site is an historic collection site for a Possibly Extinct or Extirpated plant species or is within 1/2 mile of such a site, then a rare plant survey by a qualified botanist familiar with the Pacific Northwest flora should be conducted to determine the presence of the species of concern.

Justification
Some species of Threatened or Endangered plants are found in wetland habitats and need to be protected. An example is *Howellia aquatilis* in Clark and Spokane Counties. Table 5. lists State-listed Threatened and Endangered species that may be found in wetlands. ***Note:*** This list is continually changing, and if there are any questions the user should check with the Natural Heritage Program.

Table 4. State-listed Threatened & Endangered plant species that may be found in wetlands (from Washington Natural Heritage Program 1990)	
Threatened Species	
Scientific Name	Common Name
Calamagrostis crassiglumis	Thick-glume Reedgrass
Corydalis aquae-gelidae	Clackamas Corydalis
Lobelia kalmii	Kalm's Lobelia
Platanthera chorisiana	Choriso Bog Orchid
Sisyrinchium sarmentosum	Pale Blue-eyed Grass
Endangered Species	
Scientific Name	Common Name
Cypripedium calceolus var. *parviflorum*	Yellow Lady's Slipper
Delphinium viridescens	Wenatchee Larkspur
Howellia aquatilis	Howellia
Liparis loeselii	Twayblade
Polemonium pectinatum	Washington Polemonium
Rorippa columbiae	Persistentsepal Yellowcress

Criterion 1b: Animal Species

The wetland contains documented occurrences of Federal and State- listed Threatened or Endangered wildlife species managed by the Washington Department of Wildlife.

Sources of Information

Contact the Department of Wildlife by mail to determine if occurrences of any federal or state listed species has been documented in or near the wetland being studied. A sample letter is included in Appendix 2. Send a map showing the location of the wetlands along with township, range and section information. A fee will be charged for a search of the Washington Department of Wildlife database.

The Department of Wildlife maintains a database of the locations of use areas for wildlife designated as priority species in Washington. The database includes documented breeding sites, colonial or communal roosts, areas of regular concentration and/or locations of individual observations. This information is mapped in a geographic information system. All federally listed or proposed Threatened and Endangered wildlife species occurring in Washington also have State-listed status. There is relatively complete information on occurrences for state-listed or Endangered or Threatened wildlife.

Washington Department of Wildlife
PHS Program, Mail Stop GJ- 11
600 Capital Way North
Olympia, Washington 98501-1091
(206) 664-9476

Justification

There are few listed State Endangered or Threatened species that are confined to wetland habitats. One of the few examples is the Western Pond Turtle *Clemmys marmorata*, a State-listed Threatened species. However, the Peregrine Falcon *Falco peregrinus* and Columbian White-tailed Deer O*docoileus virginianus leucurus*, both State Endangered species, use wetlands as well as other habitats.

Criteria 1c: Fish Species

The wetland contains documented occurrences of State or Federally listed Threatened or Endangered fish species, or races of fish, managed by the Washington Department of Wildlife or the Washington Department of Fisheries.

Sources of Information
Washington Department of Wildlife
PHS Program, Mail Stop GJ-11
600 Capital Way North
Olympia, Washington 98501-1091
(206) 664-9476

Washington Department of Fisheries
115 General Administration Building
Olympia, Washington 98504
(206) 753-6650

Presence of these species is indicated by identifying that river drainage's in which these species are found. Distribution tables or maps can serve as a primary method for determining if wetlands areas are potentially used by listed Threatened or Endangered species. This information can be sought from the Washington River Information System (WARIS), a GIS-based database which provides information on distributions of anadromous fish resident fish and species of concern. Information is available for all Washington rivers and streams at 1:100,000 scale. Information from this database can be acquired from the Washington Department of Wildlife, PHS Program in Olympia. Information on the races of salmon listed as threatened and endangered must be obtained from Washington Department of Fisheries.

Justification
These are wetlands that contain individuals, populations, or priority habitat of State or Federally listed Threatened or Endangered fish species, or races of fish, managed by the Washington Department of Wildlife or the Washington Department of Fisheries.

Criterion 2

Examples of High Quality Native Wetland Communities:

1). The wetland is already on record with the Washington Natural Heritage Program as a high quality native wetland;
OR
2). There is no significant evidence of human-caused changes to topography or hydrology of the wetland (significant changes include clearing, grading, filling, logging of the wetland or its immediate buffer, or culverts, ditches, dredging, diking or drainage of the wetland);
AND,
there are no populations of non-native plants which are currently present and appear to be invading
AND,
there is no significant evidence of human-caused degradation of the water quality of the system.

Source of Information

1). Contact the Washington Natural Heritage Program by mail to determine if a high quality native wetland has been identified in or in the vicinity of the project. A sample letter is provided in Appendix 1. The Washington Natural Heritage Program maintains a data system on high quality wetland systems. The data set is not complete but is well developed for the lowlands west of the Cascade Mountains.

Washington Natural Heritage Program
Department of Natural Resources
Division of Land and Water Conservation
P.O. Box 47047
Olympia, Washington 98504-7047

and/or

2). Site examination as in Field Data Form. Answer the questions if you have adequate information or experience to do so. If not, find someone with the expertise to answer the questions. Then, if the wetland has very little disturbance based on the questions in the Field Data Form contact the Natural Heritage program of DNR.

Justification

Despite the relative abundance of certain types of wetlands, extremely high quality, undisturbed examples of those wetlands are rare. This subcriteria attempts to identify and to afford a high level of protection to the undisturbed character of remaining extremely high quality wetlands in the State.

Criterion 3

Wetlands that are documented as regionally significant waterfowl or shorebird concentration areas.

Source

Contact the Department of Wildlife by mail to determine if the wetland is documented as a regionally significant waterfowl or shorebird concentration area. A sample letter is included in Chapter 2. Send a map showing the location of the wetlands along with township, range and section information.

Washington Department of Wildlife
PHS Program, Mail Stop GJ-11
600 Capitol Way North
Olympia, Washington 98501-1091
(206) 664-9476

Justification

Some wetland areas are of particular importance in the life cycles of migratory birds. The birds use them as breeding sites, as resting or feeding sites along migratory routes or as sites for shelter during storms. Because of the recognized national importance of migratory birds and international obligations it is important to afford these areas high levels of protection.

Criterion 4

Wetlands with irreplaceable ecological functions.

Criterion 4a: Bogs and Fens.

Does the wetland have at least 1/2 acre of contiguous relatively undisturbed bog or fen with a cover of invasive species that is less than 10%;

Source
Wetlands Rating Field Data Form.

Justification
Bogs and fens are distinct wetland types, which are very sensitive to disturbance. Bogs and fens form when organic material accumulates faster than it decomposes. Bog/fen systems, however, form extremely slowly, with organic soils forming at rates approximating one inch per 40 years in western Washington.

Bogs are hydrologically closed systems without flowing water. They are extremely acidic and low in nutrients and the plants which grow in them are specifically adapted to such conditions. Fens normally support a greater diversity of plant species and have greater amounts of available nutrients and a higher pH than bogs. A variety of specialized plants live in bogs and fens. Thus, minor changes in the hydrology or nutrient levels in these systems can have major adverse impacts on the plant communities. Peat systems also provide significant habitat for a variety of wildlife species and perform important hydrologic functions including groundwater and stream recharge.

The majority of the bogs/fens observed in western Washington have been degraded through hydrologic modification and reduction in species diversity and integrity. All remaining relatively undisturbed ones need a high level of protection. In addition, there is no known technology for replicating or creating a bog/fen.

Criterion 4b: Mature Forested Wetlands

Forested wetlands qualify as mature forested wetlands when at least 50% of the forest canopy contains evergreen trees that are more than 80 year old, or deciduous trees that are older than 50 years;
OR
50% of the forest canopy consist of trees taller than 50', and the structural diversity is high as characterized by a multi-layer community of trees > 50' tall and trees 20'-49'tall and shrubs and herbaceous groundcover;
AND
< 25 % of the cover in the herbaceous/ground cover or shrub class are invasive exotic plant species listed in Table 3.

Source
Wetlands Rating Field Data Form.

Justification
Forested wetlands are important because of the variety of functions that these wetlands provide and the very long time that they take to develop. Mature forested wetlands require at least 50 years to develop and are very valuable for wildlife habitat when left undisturbed.

Forested wetlands have exceptionally high functional values for wildlife habitat due to the multiple layers of vegetation which provide a variety of food, breeding and nesting sites, and thermal and hiding cover. Some forested wetlands are associated with standing water during all or part of the year, which makes them extremely valuable, especially when the surrounding area is arid or semi-arid. Birds, mammals, and amphibians often reach their greatest densities and diversity within forested wetlands.

The tree canopy moderates the temperature within the wetland so that it is cooler in summer and warmer in winter than surrounding open areas and this reduces energy needs for wildlife. Trees may shade open water providing cover for fish, and downed trees provide large organic debris essential for fish habitat structure in streams. Leaves and insects which are important in the aquatic food chain drop into the water from overhanging trees.

Riparian forested wetlands are those forested wetlands along streams and rivers. Riparian forests may contain both wetland and non-wetland forest components. Non-wetland riparian forests are extremely important as a transition between wetland and upland. Floodwaters are slowed and diminished as they spread out in riparian-forested wetlands and the trees and other vegetation trap sediments from the floodwaters. Sediments, shorelines and streamsides are stabilized by the extensive root systems and protected from erosion by vegetative cover.

Criterion 4c: Estuarine Wetlands

1. Wetlands listed as National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park, or Educational, Environmental or Scientific Reserves designated under WAC 332-30-151.

2. Estuarine wetlands > 5 acres;

3. Estuarine wetlands 1-5 acres that meet any 3 of the following 4 criteria:

- at least two estuarine wetland habitat classes (Dethier, 1990);
- minimum existing evidence of human related physical alteration such as diking, ditching, filling, cultivation, grazing or the presence of non-native plant species;
- surface water connection with tidal saltwater or tidal freshwater;
- at least 75% of the wetland has a 100' buffer of ungrazed pasture, open water, shrub or forest.

Source
Wetlands Rating Field Data Form

Justification
Estuaries are among the most highly productive and complex ecosystems where tremendous quantities of sediments, nutrients and organic matter are exchanged between terrestrial, freshwater and marine communities. This availability of resources benefits an enormous variety of plants and animals. Fish, shellfish and birds are the most visible along with emergent plants. However, there are also a high variety of other life forms, for example; diatoms, algae and invertebrates.

Estuarine systems have substantial economic value as well as environmental value. All Washington State estuaries have been modified to some degree, bearing the brunt of development pressures through filling, drainage, port development and disposal of urban and industrial wastes. The over-harvest of certain

selected economic species has also modified the natural functioning of estuarine systems. Many Puget Sound estuaries such as the Duwamish, Puyallup, Snohomish and Skagit have been extensively modified. Up to 99% of some estuarine wetland areas have been lost.

Criterion 4d: Eelgrass and Kelp Beds

1) When an Eel grass bed is present;
OR
2) When a floating or non-floating kelp bed is present which has > 50% macro algal cover in the month of August or September.

Source
Wetlands Rating Field Data Form

Justification
Broad bladed eelgrass Zostera *marina* is a vascular plant, which grows in the marine environment. Together with floating kelp beds *Nereocycstis leutkeana* and *Macrocystis integrifolia* as well as other non-floating kelp species, these plants provide some of the most highly productive and unique habitats in the marine environment.

The importance of these plants in the ecosystem fall primarily into four areas: productivity, habitat, hydrodynamics and exploitative. Marine plants, particularly kelps, provide a major input of detritus and dissolved organic matter to the food web. They provide a significant habitat for a number of organisms as a place of refuge and a substrate for reproduction. Eelgrass and kelp beds reduce current flow and wave action, creating a protected environment and influencing beach slope stability. Finally, seaweeds are a source of human food, fodder, fertilizer and valuable extracted chemicals, (Mumford, 1988).

Criterion 5

Documented Wetlands of Local Significance (see page 47)

Category II Wetlands

***NOTE*:** A wetlands is considered Category II if it meets none of the Category I criteria and it meets any one of the following five criteria.

Criterion 1

Documented occurrences of sensitive species of plant, animal or fish recognized by federal or state agencies.

Criterion 1a: Plant Species

Wetlands that contain individuals of State-listed Sensitive plant species.

Sources of Information
Contact the Washington Natural Heritage Program by mail to determine if any plant species of concern have been located in or near the study area. A sample letter is included in Appendix 1. Send a map of the study area along with township, range and section information. A fee may be charged for a search of the Natural Heritage Program database. Searches for public agencies (i.e. local governments) and non-profit organizations are free.

> Washington Natural Heritage Program
> Department of Natural Resources
> Division of Land and Water Conservation
> P.O. Box 47047
> Olympia, Washington 98504-7047

The Washington Natural Heritage Program maintains a comprehensive database of site-specific information on reported occurrences of Sensitive, Threatened, and Endangered plant species in Washington. Unidentified plant species collected during site visits should be identified by qualified botanists familiar with the Pacific Northwest flora. Most wetlands in Washington have not been surveyed for the occurrence of State Sensitive, Threatened, and Endangered plant species.

Justification
Some species of Sensitive plants are found exclusively or predominantly in wetland habitats. Examples include interrupted sedge *Carex interrupta* scattered throughout Washington, and swamp gentian *Gentiana douglasiana* in Clallam and King Counties. Table 6. lists State-listed Sensitive species that may be found in wetlands.

TABLE 6. State-listed Sensitive plant species that may be found in wetlands. (From Washington Natural Heritage Program 1990).

Scientific name	Common name
Adiantum pedatwn ssp. *subpumilum*	dwarf maidenhair fern
Aster junciformis	rush aster
Bolandra oregana	bolandra
Botrychium lanceolatum	lance-leaved grape-fern
Botrychium lunaria	moonwort
Botrychium minganense	Victorin's grape-fern
Botrychium pinnatum	St. John's moonwort
Botrychium simplex	little grape-fern
Carex aenea	bronze sedge
Carex anthoxanthea	yellow-flowered sedge
Carex atrata var. atrosquama	blackened sedge
Carex atrata var. erectaerect	blackened sedge
Carex buxbaumii	Buxbaum's sedge
Carex comosa	bristly sedge
Carex densa	dense sedge
Carex hystricina	porcupine sedge
Carex interrupta	green-fruited sedge
Carex macrochaeta	large-awn sedge
Carex norvegica	Scandanavian sedge
Carex pauciflora	few-flowered sedge
Carex paupercula	poor sedge
Carex pluriflora	several-flowered sedge
Carex saxatilis	russet sedge
Carex scirpoidea var. scirpoidea	Canadian single-spike sedge
Carex scopulorum var. prionophylla	saw-leaved sedge
Carex stylosa	long-styled sedge
Carex sychnocephala	many-headed sedge
Chrysosplenium tetrandum	northern golden-carpet
Cicuta bulbifera	bulb-bearing water-hemlock
Cimicifuga elata	tall bugbane
Coptis asplenifolia	gold-thread
Cyperus rivularis	shining flatsedge
Dodecatheon pulchellum	few-flowered shooting star
Eleocharis rostellata	beaked spike-rush
Epipactis gigantea	giant helleborine
Eriophorum viridicarinatum	green-keeled cotton-grass
Erythronium revoluttun	pink fawn-lily
Fritillaria camschatcensis	black lily
Gentiana douglasiana	swamp gentian
Gentiana tenella	slender gentian
Geum rivale	water avens
Illiamna longisepala	longsepal globemallow
Isoetes nuttallii	Nuttall's quillwort
Juncus kelloggi	Kellogg's rush
Limosella acaulis	southern mudwort
Listera borealis	northern twayblade
Lobelia dortmanna	water lobelia

TABLE 6. Continued:

Scientific name	Common name
Lycopodium inundatum	bog clubmoss
Meconella oregana	meconella
Mimulus pulsiferae	Pulsifer's monkeyflower
Mimulus suksdorfii	Suksdorf's monkeyflower
Montia diffusa	branching montia
Muhlenbergia glomerata	Marsh muhly
Oryzopsis hendersonii	Henderson's ricegrass
Parnassia fimbriata var hoodiana	fringed grass-of-Parnassus
Parnassia kotzebuei	Kotzebue's grass-of-Parnassus
Parnassia palustris	northern grass-of-Parnassus
Pedicularis rainierensis	Mt. Rainier lousewort
Platanthera obtusata	small northern bog-orchid
Platanthera sparsiflora	canyon bog-orchid
Potamogeton obtusifolius	blunt-leaved pondweed
Puccinellia nutkaensis	Alaska alkaligrass
Ranunculus longirostris	long-beaked water buttercup
Salix candida	hoary willow
Salix maccalliana	MacCall's willow
Salix sessilifolia	soft-leaved willow
Salix tweedyi	Tweedy's willow
Samolus parviflorus	water pimpernel
Sanicula marilandica	black snake-root
Sanguisorba menziesd	Menzies' burnet
Saxifraga integrifolia var. apetala	swamp saxifrage
Sisyrinchium septentrionale	blue-eyed grass
Spartina pectinata	prairie cordgrass
Spiraea densiflora var. splendens	subalpine spirea
Teucrium canadense ssp. viscidum	woodsage
Thalictrum dasycarpum	purple meadowrue
Tillaea aquatica	pygmy-weed
Tillaea erecta	erect pygmy-weed
Utricularia intermedia	flat-leaved bladderwort
Vaccinium myrtilloides	blueberry

Criterion 1b: Animal Species

Does the wetland contain documented occurrences of Federal or State- listed sensitive wildlife species managed by the Washington Department of Wildlife?

Sources of Information

Washington Department of Wildlife
PHS Program, Mail Stop GJ-11
600 Capital Way North
Olympia, Washington 98501-1091
(206) 664-9476

Justification
Some State-listed Sensitive species are confined to wetland habitats and others use wetlands for some essential life needs and other habitats for other essential life needs.

Criterion 1c: Fish Species
The wetland contain documented habitats of State or Federally-listed Sensitive fish species managed by the Washington Department of Wildlife or the Washington Department of Fisheries.

Sources of Information

Washington Department of Wildlife
PHS Program, Mail Stop GJ-11
600 Capital Way North
Olympia, Washington 98501-1091
(206) 664-9476

Washington Department of Fisheries
115 General Administration Building
Olympia, Washington 98504
(206) 753-6650

Justification
At the time of this publication, no fish species or races are currently listed State or Federal Sensitive species.

Criterion 2

Documented priority habitats and species recognized by state agencies.

Criterion 2a: Wildlife Species
The wetland contains priority habitats and species documented by Washington Department of Wildlife's Priority Habitats and Species Program.

Sources of Information

Washington Department of Wildlife
PHS Program, Mail Stop GJ- 11
600 Capitol Way North
Olympia, Washington 98501-1091
(206) 664-9476

The Washington Department of Wildlife, through its Priority Habitats and Species Programs has established a database documenting locations of priority species use areas and priority habitats with a diversity of wildlife.

Contact the Department of Wildlife by mail to determine if a priority habitat or species has been documented in or near the wetland being studied. A sample letter is included in Appendix 2. Send a map showing the location of the wetlands along with township, range and section information. A fee will be charged for a search of the database. Department of Wildlife considers all wetlands a priority and has National Wetland Inventory Maps in their database. Unless special request is made, the total National Wetland Inventory map information is not provided. Information is provided on wetlands that overlap with maps of priority species or other priority habitats to provide a subset of wetlands that meet Category 11(ii) requirements.

Criterion 2b: Fish Species

Does the wetland provide habitat for priority fish species managed by the Washington Department of Wildlife?

Source of Information
The presence of a priority fish species in a river or stream reach can be identified from the Washington Department of Wildlife's WARIS database, or by consulting Washington Department of Wildlife biologists. A list of priority fish species is provided in Table 7.

Washington Department of Wildlife
PHS Program, Mail Stop GJ-11
600 Capital Way North
Olympia, Washington 98501-1091
(206) 664-9476

Washington Department of Fisheries
115 General Administration Building
Olympia, Washington 98504
(206) 753-6650

Table 7. Priority fish species managed by Washington Department of Wildlife that are dependent upon vegetated wetlands

Scientific Name	Common Name	Special Designation
Salvelinus confluentus	Bull Trout	FC2
Salvelinus malma	Dolly Varden	
Oncorhynchus nerca	Kokanee Salmon	
Catostomus platyrhynchus	Mountain Sucker	SC
Prosopium williamsoni	Mountain Whitefish	
Pronopium coulteri	Pygmy Whitefish	SC
Oncorhynchus mykiss	Rainbow & Steelhead Trout	
Oncorhynchus clarki	Cutthroat Trout	

SC = State Species of Concern
FC2 = Proposed Federal Threatened, Candidate 2 status

Criterion 3

Wetlands with significant functions which may not be adequately replicated through creation or restoration.

Criterion 3a: Estuarine Wetlands

Estuarine wetlands 1-5 acres not meeting the criteria for Category I;

OR

Estuarine wetlands < 1 acre and meeting all the following 4 criteria:

-at least two estuarine wetland habitat classes (Dethier, 1990);

AND

-minimum existing evidence of human related physical alteration such as diking, ditching, filling, cultivation, grazing or the presence of non-native plant species);

AND

-surface water connection with tidal saltwater or tidal freshwater;

AND

-at least 75% of the wetland has a 100' buffer of ungrazed pasture, open water, shrub or forest.

Criterion 3b - Bogs and Fens

Bogs and fens that are 1/4 - 1/2 acre in size (see discussion of bogs and fens under Category 1).

Criterion 4

Freshwater wetlands with significant habitat value (Greater than or equal to 22 points).

Sources of Information

Wetlands Rating Field Data Form.

Justification

The detailed system of assessing significant habitat value was developed to identify wetlands, which have characteristics that provide high levels of wetland functions.

Criterion 5

Wetlands of Local Significance (see page 47).

Category III Wetlands

Note: A wetland is considered Category III if it meets none of the Category I or Category II criteria and meets any one of the following three criteria.

Criteria:

1). Wetlands where the habitat score for significant habitat value is less than or equal to 21 points;
OR
2). Wetlands identified as Category III wetlands of local significance;
OR
3). Estuarine wetlands less than 1 acre which fail to meet all four of the criteria listed under 3a (pg.).

Sources of Information

i). Wetlands Rating Field Data Form; or
ii). Local Government; or
iii). Wetlands Rating Field Data Form.

Justification
These wetlands provide important functions and values. They are important for a wide variety of wildlife species. Generally these wetlands will be smaller, have less diverse vegetation. They can often be more isolated than Category II wetlands.

Category IV Wetlands

Criteria
i). Wetlands less than 1 acre and, hydrologically isolated and, comprised of one vegetated class that is dominated (> 80% areal cover) by one species from the list in Table 4;
OR
ii). Wetlands less than two acres and, hydrologically isolated, with one vegetated class, and > 90% of areal cover is any combination of species from the list in Table 3;
OR
(iii) Wetlands that are ponds smaller than 1 acre and excavated from uplands, without a surface water connection to streams, lakes, rivers, or other wetlands.

Source of Information
Wetlands Rating Field Data Form.

Justification
These wetlands are the smallest and have the least diverse vegetation. These are wetlands that we should be able to replace, and in some cases be able to improve from a habitat standpoint. However, these wetlands do provide important functions and values, and should to some degree be protected. In some areas, for example on islands, these wetlands may be providing important groundwater recharge and water pollution prevention functions, and therefore may be more important from a local point of view. They may also be providing important flood storage capacity, and therefore be important in reducing both the extent and frequency of flood events. Thus, regional differences may call for a more narrow definition of this category.

Wetlands of Local Significance

Criteria

Any wetland, identified and adopted by a local government as part of it's planning process, following public review and appeals, and satisfying sub-criteria such as those listed below:

a) Wetland is locally rare;

OR

b) is documented as a groundwater recharge area, or contributes functional value to a local government water quality or flood mitigation program;

OR

c) provides habitat for fish and wildlife that is considered important by the local community;

OR

d) is a recognized or planned educational site;

OR

e) is part of a recognized or planned recreation resource;

OR

f) is part of an open space or planned open space resource;

OR

g) is planned for restoration or enhancement as a part of a local government protection program;

OR

h) is part of a wildlife corridor or connects wetland areas of greater value;

OR

i) is recognized and valued as a part of the local landscape;

OR

j) is considered sensitive to development or disturbance;

OR

k) is considered irreplaceable;

OR

1) is a buffer area for a growth management boundary;

OR

m) is an integral part of a wetland system that would benefit from better overall protection;

OR

n) satisfies other criteria developed by local government in its comprehensive planning process.

Source of Information

The use of the wetland of local significance concept should be fully described within the planning documents of the local jurisdiction. To be recognized as WOLS, each wetland should be specifically identified and adopted as a "wetland of local significance" under local government legal authorities. The WOLS concept is intended to provide local government flexibility in integrating the local government model ordinance for wetlands with the requirements of local governments to protect critical areas, including wetlands, under the Growth Management Act.

Justification

The purpose of criteria for wetlands of local significance (WOLS) is to provide ways for local government to protect wetlands within the wetlands rating system to a degree higher than that afforded by strict application of the other state criteria. It may be that particular local wetlands require more protection than that afforded by a strict application of rating criteria. For example wetlands may be critical to a local water supply, or provide for storage capacity for floodwaters. The wetlands may provide a combination of values that, when considered together require a higher level of protection.

By using the WOLS concept a local government could: promote an otherwise Category IV wetland to Category III, II or I protection levels, promote an otherwise Category III wetland to Category II or I protection levels, or promote an otherwise Category II wetland to Category I protection levels.

WOLS could also be identified and categorized on the basis of inter-local agreements where local government boundaries arbitrarily divide a wetland. This would be essential when additional protection of a watershed-wide wetland function was sought (i.e. flood-storage capacity) and the watershed is divided by multiple jurisdictions.

For inventory purposes, WOLS would be identified on the basis of strict application of the criteria, regardless of the level of protection afforded them. Local Government inventories should record both ratings. The WOLS concept is not intended to allow a reduction of protection to wetlands where protection is already required by local, state, or federal laws.

Glossary

Aquatic bed wetland class: Means any area of open water with rooted aquatic plants such as lily pads, pondweed, etc. Aquatic bed vegetation does not always reach the surface, and care must be taken to look into the water.

Areal cover: Means the % of vegetation covering any area of vegetated wetland. It is used to decide what classes are present in the wetland. Areal measurements are those made as if the wetland were being viewed from the air.

Bogs: A type of wetland found on organic soils, usually peat, that is nutrient poor, has a low pH (acidic), and whose major source of water is rainfall rather than streams or groundwater. True bogs are formed by the accumulation of organic matter produced by Sphagnum mosses, and are often characterized by the highly specialized plant species that grow there.

Connection to a stream (Q.4g.): A wetland is connected if some part of the wetland boundary has a surface water connection to seasonal or perennial flowing surface water, including floodwater, via natural or man-made channel, or an area of open water. The connection could be through a culvert, or a series of culverts.

Emergent wetland class: any area of vegetated wetland where non-woody vegetation (such as cattail, grasses, sedges, etc.) comprises at least 30% of area] cover.

Fen: A type of wetland found on organic soils, usually peat, where herbaceous hydrophytes are the dominant vegetation present. Nutrients in fens range from rich to poor and may have a low pH.

Forested wetland class: Means any area of vegetated wetland where woody vegetation over 20 ft. (such as alder, cedar, hemlock, cottonwood, and some willow species, etc.) comprises at least 30% of the areal cover.

Habitat area (Q4i): Means any forested, shrub and herbaceous areas that could be used by wildlife species that use wetlands to provide a part of their life cycle needs. Developed areas such as farming and urban landscapes would not generally be considered as habitat areas. However, there are important areas within urban areas and farming landscapes that are connected to wetlands by corridors, and these areas function to provide life cycle needs to some wildlife.

Hydrologically isolated wetland (for the determination of Category IV wetlands): Means those regulated wetlands which 1) have no surface water connection to a lake, river or stream; 2) are outside of and not contiguous to any 100-yr floodplain of a lake, river, or stream; and 3) have no contiguous hydric soil between the wetland and any surface water.

Open water wetland class: Means any area of standing water present for more than one month at any time of the year without emergent, scrub-shrub or forested vegetation. Open water includes any aquatic beds that are smaller than 1/4 acre. At certain times of year it may be difficult to determine if open water (with or without aquatic beds)are present. Use aerial photographs, talk with landowners or neighbors, look for dried or muddy areas without vegetation which indicate that open water was present earlier in the year, or in past years. Estimate the acreage of open water or the pct. of total acreage. Cite your source of information for making this determination.

Priority Habitat: An area associated with a given species, and which, if altered, may reduce the likelihood that the species will maintain or increase population over the long term. These might include areas of high relative density, breeding habitat, winter range, and movement corridors. Priority habitats might also include areas that are of limited availability or high vulnerability to alteration, such as cliffs, talus, wetlands, etc.

Priority Species: Animal species that are of concern due to their low population and/or their sensitivity to habitat manipulation. This includes all federal or state listed or candidate threatened, endangered, or sensitive species.

Riparian corridor (Q.4i): Means an area between aquatic and terrestrial ecosystems defined by the presence of vegetation that requires moist conditions and, usually, periodic free flowing water. The benefits of vegetation cover and food sources and the availability of water in riparian corridors means that they are likely to be preferentially used by wildlife and enable wildlife movement between wetlands.

Scrub-shrub wetland class: Means any area of vegetated wetland where woody vegetation less than 20 ft. tall (such as most willow species, hardhack, dogwood, salmonberry, etc.) comprises at least 30% of the areal cover.

Significant Habitat area (Q.4i): Means large, high-quality natural land or water areas such as parks, reserves and forests, or areas in essentially natural condition that could be used by wildlife species that use wetlands to provide a part of their life cycle needs.

State Endangered Species: are those species that are seriously threatened with extirpation throughout all or a significant portion of their range within Washington.

State Sensitive Species: Animal and plant species that could become threatened in Washington due to limited population size and distribution, sensitivity to disturbance during critical stages in their life cycle, or dependence on a very specific habitat type.

State Threatened Species: Means Animal and Plant species that are not presently Endangered in Washington but could become so in the foreseeable future.

Stream: Means there is at least a seasonal flow of water that is in one predominant direction and there is a defined bank or series of banks containing the water.

Appendix 1

Sample Letter to Washington Natural Heritage Program Requesting Information

_____199__

Environmental Review Coordinator
Washington Natural Heritage Program
Department of Natural Resources
P.O. Box 47047
Olympia, WA 98504-7047

To Whom This Concerns:

_____ is planning to_____ in
(describe activity)

Section _____, Township_____, Range_____,

in the_____drainage, approximately ____ miles (insert directions) of the town of _____. The area of the proposed activity contains a wetland(s). (Include a brief description of the proposed activity.)

In order to assist us in evaluating this/these wetland(s). We request the following information:

In the vicinity of the proposed activity:

* Is there any record of the presence of wetland/s considered to be a high quality native wetland by the Washington Natural Heritage Program?

* Is there any record of the presence of plant taxa which are Federally listed as Endangered or Threatened, or which are candidates for listing?

* Is there any record of the presence of plant taxa which are listed by the Washington Natural Heritage Program as Endangered, Threatened, or Sensitive in Washington?

Enclosed are maps of the proposed activity and the location of the wetland(s). We understand that we may be billed and must remit payment prior to receiving the results of the data search. If you have any questions, please contact _____ at (__)_____.

Thank you for your assistance.

Sincerely,

enclosures: Map of _____

Appendix 2

Sample letter to Washington Department of Wildlife to request information.

_____ 199__
Washington Department of Wildlife
PHS Program, Mail Stop GJ-11
600 Capitol Way North
Olympia, Washington 98501-1091

To Whom This Concerns:

_____is planning a (_____) in the _____
(describe activity)
drainage, approximately _____miles ___(direction)_____ of the town of _____.
Sec.____, T._____, R.____, ____W.M., _____ County. (Include a brief description of the proposed activity.)

Please provide us with the data necessary to rate this wetland using Department of Ecology's system. Those data should include:

- occurrences of State or Federal listed candidate, Threatened, Endangered, and Sensitive fish or wildlife.

- documented regionally significant waterfowl or shorebird concentration areas.

- documented priority habitats or species areas.

Enclosed are maps of the proposed activity and the location of the wetland(s). We understand that we may be billed for this data upon request. If you have any questions, please contact Lea Knutson at (206) 664-9476.

Thanks in advance for your help.

Sincerely,

enclosure: Map of_____

Appendix 3

Sample letter to Washington Department of Fisheries to request information.

_____1991

Data Base Manager
Washington Department of Fisheries
115 General Administration Building
Olympia, Washington 98504

To Whom This Concerns:

_____ is planning a (_____) in the _____
(describe activity)
drainage, approximately _____ miles (direction) of the town of _____, (Sec. __, T. ___, R. ___). The area of the proposed activity contains (a) wetland(s). (Include a brief description of the proposed activity.)

Therefore we are requesting that WDF answer and document the following questions for this/these wetland(s):

*Does the wetland contain documented habitats of State or Federally listed or State or Federal candidate Threatened or Endangered fish species, or races of fish, managed by the Washington Department of Wildlife or the Washington Department of Fisheries?

*Does the wetland contain documented habitats of State or Federally listed or candidate Sensitive fish species managed by the Washington Department of Wildlife or the Washington Department of Fisheries?

Enclosed are maps of the proposed activity and the location of the wetland(s). We understand that we may be billed and must remit payment prior to receiving the results of the data search. If you have any questions, please contact _____at (___)_____.

Thanks in advance for your help.

Sincerely,

enclosure: Map of_____

Appendix 4

The Review Process: Wetlands Rating System Technical and Implementation Review Teams

Known wetlands specialists were contacted by phone in April 1991 to determine whether they were willing to review draft documents. A team of about 35 Technical Reviewers (those marked by an asterisk in the list below) was established and a draft technical review of the rating system was sent out for comment. Following consideration of comments from the Technical Review Team, a field methodology was developed. In May 1991 copies of the draft wetlands rating system, including a revised draft field methodology were sent to an Implementation Review Team. The Implementation Review Team comprised the members of the Technical Review Team plus about 20 other people involved in developing local government wetlands plans.

All members of the Implementation Review Team were invited to review, and if possible, field-test the draft wetlands rating system. The Department of Ecology undertook in-house field-testing and in some cases was able to field test the system with members of the Implementation Team. Where possible, all comments from reviewers were taken into account in preparing the methodology and the final document.

WETLANDS RATING SYSTEM TECHNICAL AND IMPLEMENTATION REVIEW TEAMS.

Paul Adamus*
USEPA
Corvalis OR

Laura Arnold
San Juan County Planning Department
Friday Harbor

John Andrews*
Washington Department of Wildlife
Spokane

Dennis Beich
City of Everett
Everett

Ken Bierly*
Oregon Division of State Lands
Salem OR

Jim Blake
Soil Conservation Service
Republic

Marc Boule*
Shapiro and Associates
Seattle

Steve Campbell
Soil Conservation Service
Spokane

Sue Comis
Pierce County Planning
Tacoma

Sarah Cooke*
c/- PENTEC
Edmonds

Rex Crawford*
DNIZ Natural Heritage Program
Olympia

Paula Ehlers
Thurston County Planning
Olympia

Mike Erkkinen
Pierce County Planning
Tacoma

Banks Evans
Tacoma City Planning and Development
Tacoma

Carol Burnthall
Island County Planning Department
Coupeville

Joel Fordenthal
Clallam County Division of Water Quality
Sequim

Marilyn Freeman
Snohomish County Planning
Everett

Bob Frenkel*
Department of Geoscience
Oregon State University
Corvallis OR

Bob Furstenburg*
King County Storm Water Management
Seattle

Phil Gaddis
Clark County Dept. of Public Service
Vancouver

Terry Galvin
Whatcorn County Planning
Bellingham

Jim Good*
College of Oceanography
Oregon State University
Corvalis OR

Rich Horner*
Center for Urban Water Resources Mgt.
University of Washington
Seattle

Lou Jurs*
Bureau of Land Management
Spokane

Will Keller*
Soil Conservation Service
Okanogan

Mike Folsom*
Department of Geography
Eastern Washington University
Cheney

Kathy Kunz*
US Army Corps of Engineers
Seattle

Linda Kunze
DNR
Olympia

Ivan Lines*
Soil Conservation Service
Spokane

Tina Miller*
King County Building & Land
Development
Bellvue

Steve Morrison
Thurston County Planning
Olympia

Tom Mumford*
Department of Natural Resources
Olympia

Kerry Paul-Reese
College of Forestry
University of Idaho
Moscow ID

Jim Pearson
Jefferson County
Port Townsend

Chuck Perry*
Washington Department of Wildlife
Moses Lake

Doug Pineo*
Department of Ecology
Spokane

Mary Kentula*
USEPA
Corvalis OR

Bud Kovalchik*
U.S. Forest Service
Colville

Dave Kaumheimer*
USF&WS
Moses Lake

Betty Roderick*
Washington Department of Wildlife
Olympia

Emily Roth
Oregon State Department of Lands
Salem OR

Dyanne Sheldon*
Sheldon and Associates
Seattle

Billy Sornorall
Grant County Planning
Ephrata

Robert Steele
Washington Department of Wildlife
Omak

Richard Sumner
USEPA
Corvalis OR

Ron Thom
Marine Sciences Laboratory
Sequirn

Alisa Ralph*
USF&WS
Olympia

Brent Renfrow*
Washington Department of Wildlife
Yakima

Carol Richmond
Department of Natural Resources
Olympia

Gary Voerman
USEPA
Seattle

Steve Wells
Washington State DCD
Olympia

Paul Wilson
Pend Oreille County Planning Dept.
Newport

Al Wald*
Department of Ecology
Olympia

Bob Zeigler*
Washington Department of Wildlife
Olympia

Gordy Zillges*
Washington Department of Fisheries
Olympia

Ryan Zulauf
Dept. Urban and Regional Planning
Eastern Washington University
Cheney

Appendix 5

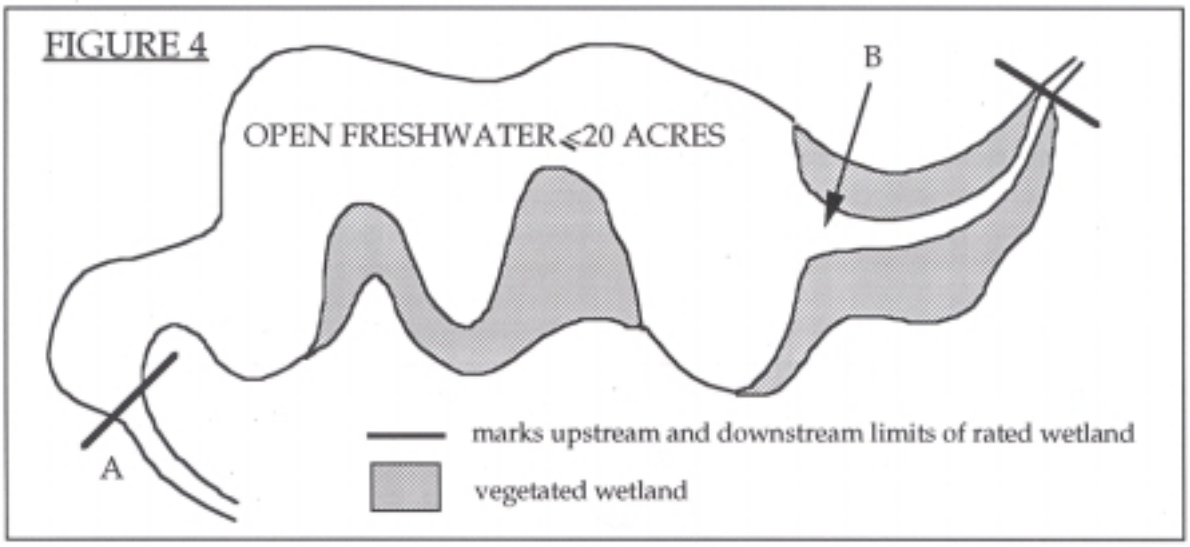
Note: This appendix describes the criteria to be used for establishing wetland boundaries for rating in several situations where they are not obvious.

Wetlands divided by artificial boundaries such as property lines, roads, or railroad embankments:

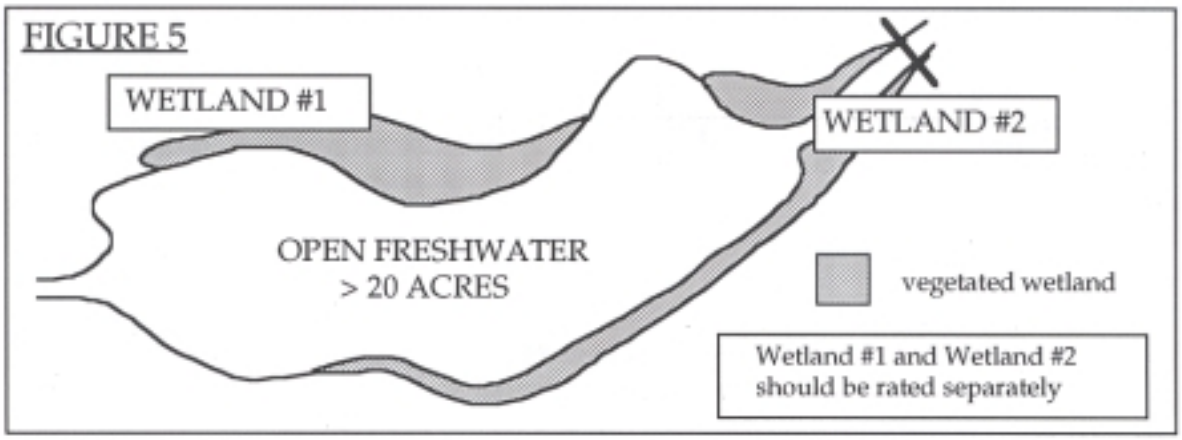
Wetlands should be rated without regard to property boundaries. When a wetland is divided by a man made feature, for example a road embankment, the wetland should be rated as if it is not divided provided there is a LEVEL surface water connection between the two parts of the wetland that permits flow of water, fish, or other organisms in both directions. For example, if there are wetlands on either end of a culvert under a road, and both sides of the culvert are partially or completely underwater, the wetland should be rated as one. Culverts are sometimes diff1cult to locate, especially where they are below the surface of the water. Engineering drawings of constructed roads or other human made features should be consulted to locate surface water connections where there is doubt.

Wetlands contiguous with a larger area of open freshwater, stream, or river:

1) If any part of a vegetated wetland is contiguous with an area of open freshwater less than or equal to 20 acres, rate the entire area including all of the open water and any other wetlands that are contiguous with the open water. This is shown in Figure 4. The boundary of the open water is set at "A" where a stream begins (i.e. there is at least a seasonal flow of water that is predominantly in one direction and there is a defined bank or series of banks containing the water). At "B" there is a similar delineation between open water and stream. Where wetlands are adjacent to open water and streams, they are rated with the open water.

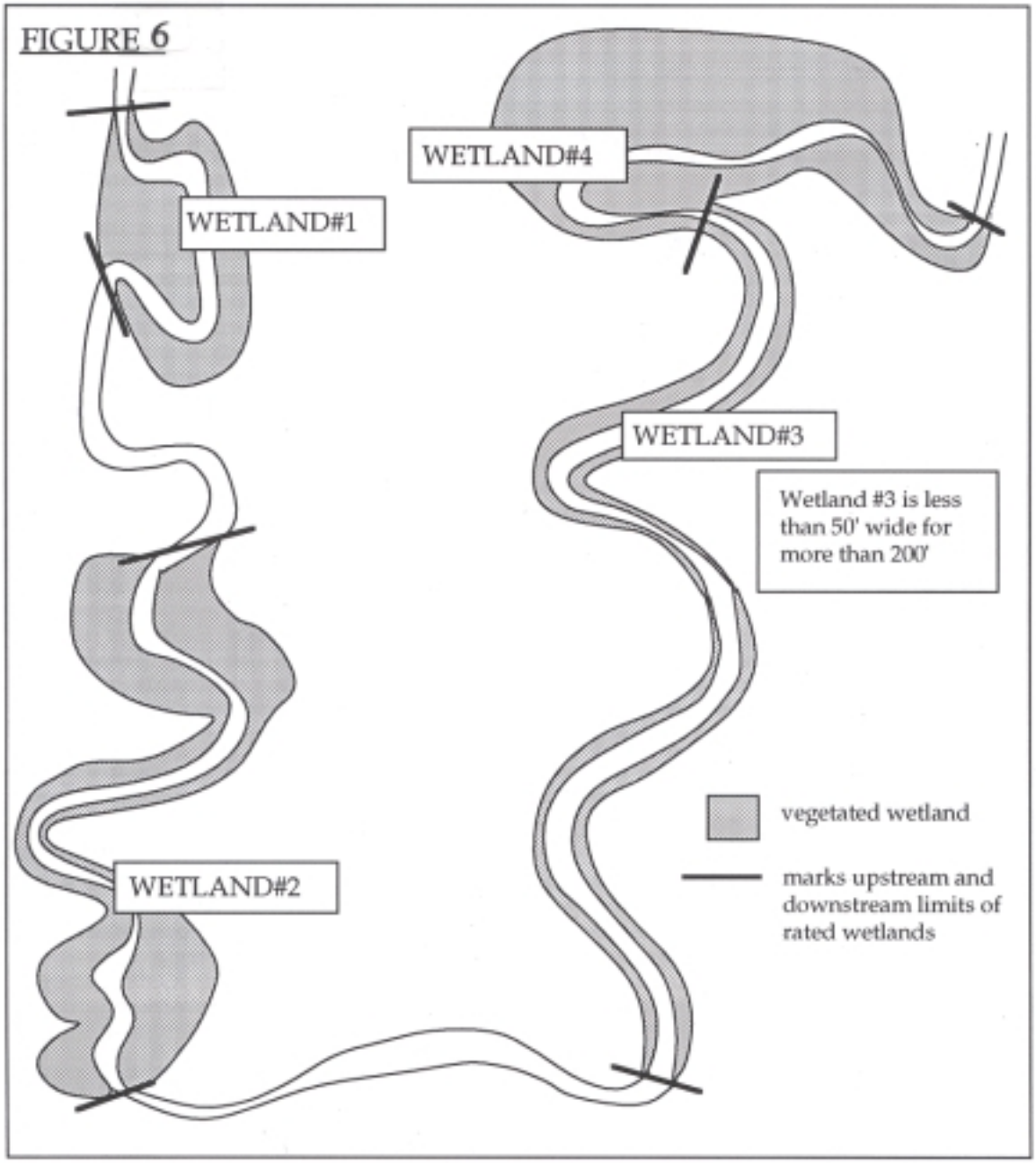


2) If any part of a vegetated wetland(s) is contiguous with an area of open freshwater greater than 20 acres, rate the wetland(s) separately from the open fresh water area. See Figure 5. You should add 1/2 acre for open water, where it applies to each separate wetland you are rating. For example, if the wetland area that you are rating is 4.6 acres and is contiguous with 25 acres of open fresh water you should score the wetland as 4.6 acres plus 1/2 acre = 5.1 acres. Aquatic beds may also be present in the adjacent open water and if present would score points as a wetland class. Where a wetland is contiguous with open water and a stream, i.e. Wetland #2 below, first priority should be given to rating the wetland in relation to the open freshwater area.



3) Any vegetated wetland that is contiguous with a stream may be rated separately when it is separated from any other vegetated wetland by a wetland corridor that is less than 50 feet wide (including the stream channel) for at least 200 feet. See Figure 6.

Wetlands on opposite sides of a stream or river are rated as one wetland, together with the area of the stream itself if the streambed, or its meander channel, averages less than 200 feet in width. If the streambed or its meander channel is more than 200 feet wide then rate each wetland separately with the deepest portion of the stream as the boundary on one side.



Wetlands that form a patchwork on the landscape:

If the wetland is less than one acre but is part of a patchwork or mosaic of wetlands on the landscape that are less than 100 feet apart (on the average), the entire patchwork is to be considered as one wetland if the area of wetlands is more than 50% of the total area of both wetlands and uplands. If these criteria are not met, the wetland is to be considered as an individual wetland. See figure 7.

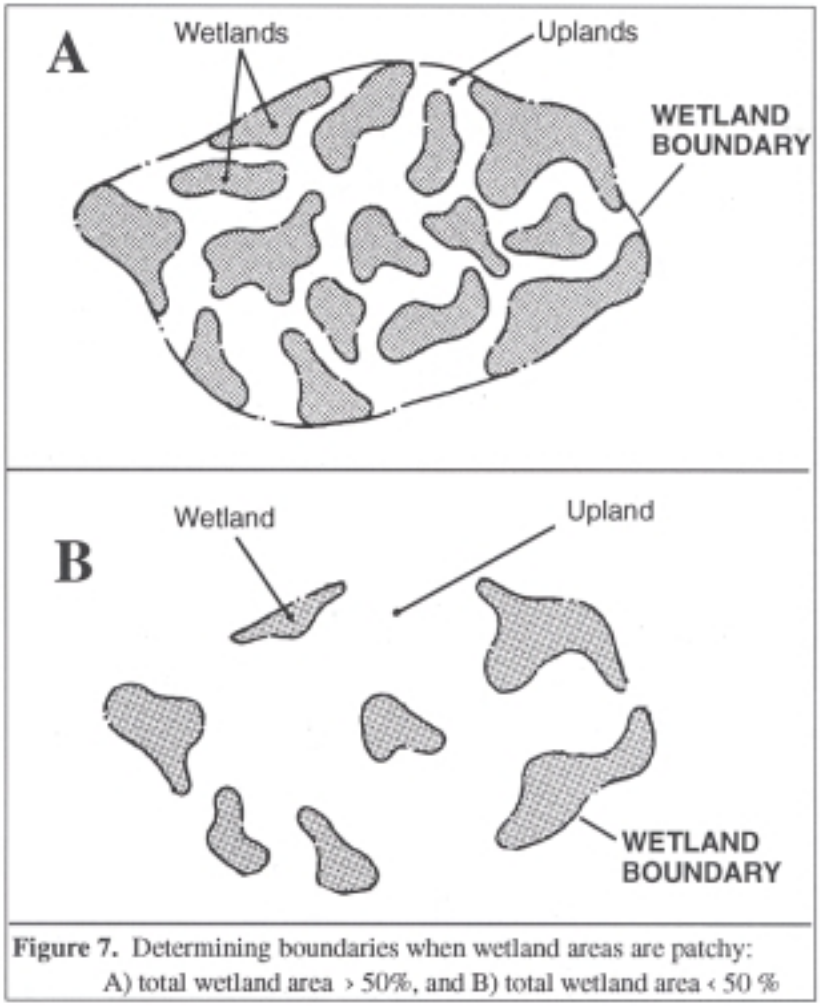


Figure 7. Determining boundaries when wetland areas are patchy: A) total wetland area › 50%, and B) total wetland area ‹ 50 %

Estuarine Wetlands:

For the purpose of this rating system, estuarine wetlands are defined as vegetated areas that are dominated by salt tolerant plants. The size of the vegetated area is to be used in establishing the size of the estuarine wetland in answering the questions on the rating form. By definition, therefore, the rating system is applicable only to some of the important estuarine habitats. Estuarine mudflats, tidal channels and tidal inlets are not rated because their relative value and sensitivity is based on a different set of variables than for vegetated wetlands.

If an area contains patches of salt tolerant vegetation that are 1) less than 600 feet apart and that are separated by mudflats that go dry on a Mean Low Tide, or 2) separated by tidal channels that are less than 100 feet wide; all the vegetated areas are to be considered together in calculating the wetland area.

Appendix 6

Recommended Protection Standards for Use with the Wetland Rating System

Category	I	II	III	IV
Avoidance Criteria	No Practicable Alternative And No Reasonable Use of Property	No Practicable Alternative		No Reasonable Alternative
Replacement Ratios	6 : 1	Forested 3 : 1 Scrub/Shrub 2 : 1 Emergent 2 : 1		1.25 : 1
Buffers	200’ – 300’	100’ – 200’	50’ – 100’	25’ – 50’

Title 50--Wildlife and Fisheries

CHAPTER I--UNITED STATES FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

PART 17--ENDANGERED AND THREATENED WILDLIFE AND PLANTS

17.1 Purpose of regulations.

17.2 Scope of regulations.

17.3 Definitions.

17.4 Pre-Act wildlife.

17.5 Alaska natives.

17.7 Raptor exemption.

17.8 Permit applications and information collection requirements.

17.11 Endangered and threatened wildlife.

17.11 Endangered and threatened wildlife.

17.12 Endangered and threatened plants.

17.12 Endangered and threatened plants.

17.12 Endangered and threatened plants.

17.21 Prohibitions.

17.22 Permits for scientific purposes, enhancement of propagation or survival, or for incidental taking.

17.23 Economic hardship permits.

17.31 Prohibitions.

17.32 Permits--general.

17.40 Special rules--mammals.

17.41 Special rules--birds.

17.42 Special rules--reptiles.

17.43 Special rules--amphibians.

17.44 Special rules--fishes.

17.46 Special rules--crustaceans.
17.50 General.
17.51 Treatment as endangered or threatened.
17.52 Permits--similarity of appearance.
17.61 Prohibitions.
17.62 Permits for scientific purposes or for the enhancement of propagation or survival.
17.63 Economic hardship permits.
17.71 Prohibitions.
17.72 Permits--general.
17.80 Definitions.
17.81 Listing.
17.82 Prohibitions.
17.83 Interagency cooperation.
17.84 Special rules--vertebrates.
17.85 Special rules--invertebrates.
17.94 Critical habitats.
17.95 Critical habitat--fish and wildlife.
17.95 Critical habitat--fish and wildlife.
17.96 Critical habitat--plants.
17.96 Critical habitat-plants.
17.100 Purpose.
17.101 Scope.
17.102 Definitions.
17.103 Establishment of protection areas.
17.104 Prohibitions.
17.105 Permits and exceptions.
17.106 Emergency establishment of protection areas.

17.107 Facilitating enforcement.

17.108 List of designated manatee protection areas.

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Species of Concern

State Species of Concern

Include those species listed as State Endangered, State Threatened, State Sensitive, or State Candidate, as well as species listed or proposed for listing by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

Search Species Lists

SORT RESULTS BY:

- (•) Common Name
- ( ) Scientific Name
- ( ) Animal Type

Search Listings

Advanced Search

Species of Concern Lists

- Endangered Species
- Threatened Species
- Sensitive Species
- State Candidate Species

- Complete SOC List
- Main SOC Page

Status Codes:

EX: Extirpated
FE: Federal Endangered
FT: Federal Threatened
FC: Federal Candidate
FCo: Federal Species of Concern
SE: State Endangered
ST: State Threatened
SC: State Candidate
SS: State Sensitive
SM: State Monitor
None: No listing status
None*: This species has no state listing status, but it is classified as protected wildlife.

Species of Concern in Washington State

Current through June, 2002

COMMON NAME	SCIENTIFIC NAME	ANIMAL TYPE	STATE STATUS	FEDERAL STATUS
CASCADE TORRENT SALAMANDER	*RHYACOTRITON CASCADAE*	Amphibian	SC	none
CASCADES FROG	*RANA CASCADAE*	Amphibian	SM	FCo
COLUMBIA SPOTTED FROG	*RANA LUTEIVENTRIS*	Amphibian	SC	FCo
COLUMBIA TORRENT SALAMANDER	*RHYACOTRITON KEZERI*	Amphibian	SC	FCo
COPE'S GIANT SALAMANDER	*DICAMPTODON COPEI*	Amphibian	SM	none
DUNN'S SALAMANDER	*PLETHODON DUNNI*	Amphibian	SC	none
LARCH MOUNTAIN SALAMANDER	*PLETHODON LARSELLI*	Amphibian	SS	FCo
NORTHERN LEOPARD FROG	*RANA PIPIENS*	Amphibian	SE	none
OLYMPIC TORRENT SALAMANDER	*RHYACOTRITON OLYMPICUS*	Amphibian	SM	none
OREGON SPOTTED FROG	*RANA PRETIOSA*	Amphibian	SE	FC
TAILED FROG	*ASCAPHUS TRUEI*	Amphibian	SM	FCo
TIGER SALAMANDER	*AMBYSTOMA TIGRINUM*	Amphibian	SM	none
VAN DYKE'S SALAMANDER	*PLETHODON VANDYKEI*	Amphibian	SC	FCo
WESTERN TOAD	*BUFO BOREAS*	Amphibian	SC	FCo
WOODHOUSE'S TOAD	*BUFO WOODHOUSII*	Amphibian	SM	none
BELLER'S GROUND BEETLE	*AGONUM BELLERI*	Beetle	SC	FCo
COLUMBIA RIVER TIGER BEETLE	*CICINDELA COLUMBICA*	Beetle	SC	none
HATCH'S CLICK BEETLE	*EANUS HATCHII*	Beetle	SC	FCo
LONG-HORNED LEAF BEETLE	*DONACIA IDOLA*	Beetle	SC	none
MANN'S MOLLUSK-EATING GROUND BEETLE	*SCAPHINOTUS MANNII*	Beetle	SC	none
ACORN WOODPECKER	*MELANERPES FORMICIVORUS*	Bird	SM	none
ALEUTIAN CANADA GOOSE	*BRANTA CANADENSIS LEUCOPAREIA*	Bird	ST	none
AMERICAN PEREGRINE FALCON	*FALCO PEREGRINUS ANATUM*	Bird	SE	FCo
AMERICAN WHITE PELICAN	*PELECANUS ERYTHRORHYNCHOS*	Bird	SE	none
ARCTIC PEREGRINE FALCON	*FALCO PEREGRINUS TUNDRIUS*	Bird	SE	FCo
ARCTIC TERN	*STERNA PARADISAEA*	Bird	SM	none
ASH-THROATED FLYCATCHER	*MYIARCHUS CINERASCENS*	Bird	SM	none
BALD EAGLE	*HALIAEETUS LEUCOCEPHALUS*	Bird	ST	FT
BLACK SWIFT	*CYPSELOIDES NIGER*	Bird	SM	none
BLACK TERN	*CHLIDONIAS NIGER*	Bird	SM	FCo
BLACK-BACKED WOODPECKER	*PICOIDES ARCTICUS*	Bird	SC	none
BLACK-CROWNED NIGHT-HERON	*NYCTICORAX NYCTICORAX*	Bird	SM	none
BLACK-NECKED STILT	*HIMANTOPUS MEXICANUS*	Bird	SM	none
BOBOLINK	*DOLICHONYX ORYZIVORUS*	Bird	SM	none
BOREAL CHICKADEE	*POECILE HUDSONICUS*	Bird	SM	none
BOREAL OWL	*AEGOLIUS FUNEREUS*	Bird	SM	none
BRANDT'S CORMORANT	*PHALACROCORAX PENICILLATUS*	Bird	SC	none
BROWN PELICAN	*PELECANUS OCCIDENTALIS*	Bird	SE	FE
BURROWING OWL	*ATHENE CUNICULARIA*	Bird	SC	FCo
CASPIAN TERN	*STERNA CASPIA*	Bird	SM	none
CASSIN'S AUKLET	*PTYCHORAMPHUS ALEUTICUS*	Bird	SC	FCo
CLARK'S GREBE	*AECHMOPHORUS CLARKII*	Bird	SM	none
COMMON LOON	*GAVIA IMMER*	Bird	SS	none
COMMON MURRE	*URIA AALGE*	Bird	SC	none
FERRUGINOUS HAWK	*BUTEO REGALIS*	Bird	ST	FCo
FLAMMULATED OWL	*OTUS FLAMMEOLUS*	Bird	SC	none
FORSTER'S TERN	*STERNA FORSTERI*	Bird	SM	none
GOLDEN EAGLE	*AQUILA CHRYSAETOS*	Bird	SC	none
GRASSHOPPER SPARROW	*AMMODRAMUS SAVANNARUM*	Bird	SM	none

GRAY FLYCATCHER	*EMPIDONAX WRIGHTII*	Bird	SM	none
GREAT BLUE HERON	*ARDEA HERODIAS*	Bird	SM	none
GREAT EGRET	*ARDEA ALBA*	Bird	SM	none
GREAT GRAY OWL	*STRIX NEBULOSA*	Bird	SM	none
GREEN HERON	*BUTORIDES VIRESCENS*	Bird	SM	none
GREEN-TAILED TOWHEE	*PIPILO CHLORURUS*	Bird	SM	none
GYRFALCON	*FALCO RUSTICOLUS*	Bird	SM	none
HORNED GREBE	*PODICEPS AURITUS*	Bird	SM	none
LESSER GOLDFINCH	*CARDUELIS PSALTRIA*	Bird	SM	none
LEWIS' WOODPECKER	*MELANERPES LEWIS*	Bird	SC	none
LOGGERHEAD SHRIKE	*LANIUS LUDOVICIANUS*	Bird	SC	FCo
LONG-BILLED CURLEW	*NUMENIUS AMERICANUS*	Bird	SM	none
MARBLED MURRELET	*BRACHYRAMPHUS MARMORATUS*	Bird	ST	FT
MERLIN	*FALCO COLUMBARIUS*	Bird	SC	none
NORTHERN GOSHAWK	*ACCIPITER GENTILIS*	Bird	SC	FCo
NORTHERN WATERTHRUSH	*SEIURUS NOVEBORACENSIS*	Bird	SM	none
OREGON VESPER SPARROW	*POOECETES GRAMINEUS AFFINIS*	Bird	SC	FCo
OSPREY	*PANDION HALIAETUS*	Bird	SM	none
PEALE'S PEREGRINE FALCON	*FALCO PEREGRINUS PEALEI*	Bird	SE	FCo
PEREGRINE FALCON	*FALCO PEREGRINUS*	Bird	SS	FCo
PILEATED WOODPECKER	*DRYOCOPUS PILEATUS*	Bird	SC	none
PRAIRIE FALCON	*FALCO MEXICANUS*	Bird	SM	none
PURPLE MARTIN	*PROGNE SUBIS*	Bird	SC	none
RED-NECKED GREBE	*PODICEPS GRISEGENA*	Bird	SM	none
SAGE GROUSE	*CENTROCERCUS UROPHASIANUS*	Bird	ST	FC
SAGE SPARROW	*AMPHISPIZA BELLI*	Bird	SC	none
SAGE THRASHER	*OREOSCOPTES MONTANUS*	Bird	SC	none
SANDHILL CRANE	*GRUS CANADENSIS*	Bird	SE	none
SHARP-TAILED GROUSE	*TYMPANUCHUS PHASIANELLUS*	Bird	ST	FCo
SHORT-TAILED ALBATROSS	*PHOEBASTRIA ALBATRUS*	Bird	SC	FPE
SLENDER-BILLED WHITE-BREASTED NUTHATCH	*SITTA CAROLINENSIS ACULEATA*	Bird	SC	FCo
SNOWY OWL	*NYCTEA SCANDIACA*	Bird	SM	none
SNOWY PLOVER	*CHARADRIUS ALEXANDRINUS*	Bird	SE	FT
SPOTTED OWL	*STRIX OCCIDENTALIS*	Bird	SE	FT
STREAKED HORNED LARK	*EREMOPHILA ALPESTRIS STRIGATA*	Bird	SC	FC
SWAINSON'S HAWK	*BUTEO SWAINSONI*	Bird	SM	none
THREE-TOED WOODPECKER	*PICOIDES TRIDACTYLUS*	Bird	SM	none
TUFTED PUFFIN	*FRATERCULA CIRRHATA*	Bird	SC	FCo
TURKEY VULTURE	*CATHARTES AURA*	Bird	SM	none
UPLAND SANDPIPER	*BARTRAMIA LONGICAUDA*	Bird	SE	none
VAUX'S SWIFT	*CHAETURA VAUXI*	Bird	SC	none
WESTERN BLUEBIRD	*SIALIA MEXICANA*	Bird	SM	none
WESTERN GREBE	*AECHMOPHORUS OCCIDENTALIS*	Bird	SC	none
WHITE-HEADED WOODPECKER	*PICOIDES ALBOLARVATUS*	Bird	SC	none
YELLOW-BILLED CUCKOO	*COCCYZUS AMERICANUS*	Bird	SC	FC
AFRANIUS' DUSKYWING	*ERYNNIS AFRANIUS*	Butterfly	SM	none
ALPINE CHECKERED SKIPPER	*PYRGUS CENTAUREAE LOKI*	Butterfly	SM	none
AMERICAN PAINTED LADY	*VANESSA VIRGINIENSIS*	Butterfly	SM	none
ARBORVITAE HAIRSTREAK	*MITOURA ROSNERI ROSNERI*	Butterfly	SM	none
ARCTIC SKIPPER	*CARTEROCEPHALUS PALAEMON MANDAN*	Butterfly	SM	none
ASTARTE FRITILLARY	*BOLORIA ASTARTE*	Butterfly	SM	none
BONNEVILLE SKIPPER	*OCHLODES SYLVANOIDES BONNEVILLA*	Butterfly	SM	none
BRAMBLE GREEN HAIRSTREAK	*CALLOPHRYS DUMETORUM DUMETORUM*	Butterfly	SM	none
BRANDED AZURES	*CELASTRINA ARGIOLUS ECHO*	Butterfly	SM	none
CALIFORNIA SISTER	*ADELPHA BREDOWII CALIFORNICA*	Butterfly	SM	none
CANYON GREEN HAIRSTREAK	*CALLOPHRYS SHERIDANII NEOPERPLEXA*	Butterfly	SM	none
CHECKERED WHITE	*PIERIS (PONTIA) PROTODICE*	Butterfly	SM	none
CHINQUAPIN HAIRSTREAK	*HABRODAIS GRUNUS HERRI*	Butterfly	SC	none
CHRYXUS ARCTIC	*OENEIS CHRYXUS CHRYXUS*	Butterfly	SM	none

COASTAL WOODLAND SKIPPER	*OCHLODES SYLVANOIDES ORECOASTA*	Butterfly	SM	none
COMPTON TORTOISESHELL	*NYMPHALIS VAU-ALBUM WATSONI*	Butterfly	SM	none
CORAL HAIRSTREAK	*HARKENCLENUS TITUS IMMACULOSUS*	Butterfly	SM	none
DREAMY DUSKYWING	*ERYNNIS ICELUS*	Butterfly	SM	none
DUN SKIPPER	*EUPHYES VESTRIS VESTRIS*	Butterfly	SM	none
EASTERN TAILED BLUE	*EVERES COMYNTAS COMYNTAS*	Butterfly	SM	none
EASTERN TIGER SWALLOWTAIL	*PAPILIO GLAUCUS CANADENSIS*	Butterfly	SM	none
EDITH'S COPPER	*LYCAENA EDITHA EDITHA*	Butterfly	SM	none
EGLEIS FRITILLARY	*SPEYERIA EGLEIS MCDUNNOUGHI*	Butterfly	SM	none
EGLEIS FRITILLARY	*SPEYERIA EGLEIS OWENI*	Butterfly	SM	none
FREYA'S FRITILLARY	*BOLORIA FREIJA FREIJA*	Butterfly	SM	none
GARITA SKIPPERLING	*OARISMA GARITA*	Butterfly	SM	none
GREAT ARCTIC	*OENEIS NEVADENSIS GIGAS*	Butterfly	SC	none
HIGH MOUNTAIN BLUE	*AGRIADES GLANDON MEGALO*	Butterfly	SM	none
HOARY ELFIN	*INCISALIA POLIA OBSCURA*	Butterfly	SM	none
HYDASPE FRITILLARY	*SPEYERIA HYDASPE RHODOPE*	Butterfly	SM	none
IMMACULATE GREEN HAIRSTREAK	*CALLOPHRYS AFFINUS AFFINIS*	Butterfly	SM	none
ISLAND OCHRE RINGLET	*COENONYMPHA "TULLIA" INSULANA*	Butterfly	SM	none
JOHNSON'S HAIRSTREAK	*MITOURA JOHNSONI*	Butterfly	SC	none
JUBA SKIPPER	*HESPERIA JUBA*	Butterfly	SM	none
JUNIPER HAIRSTREAK	*MITOURA GRYNEA BARRYI*	Butterfly	SC	none
KIOWA SKIPPER	*EUPHYES VESTRIS KIOWA*	Butterfly	SM	none
LABRADOR SULPHUR	*COLIAS NASTES STRECKERI*	Butterfly	SM	none
LONG-DASH SKIPPER	*POLITES MYSTIC SSP.*	Butterfly	SM	none
LUSTROUS COPPER	*LYCAENA CUPREA HENRYAE*	Butterfly	SM	none
MAKAH (QUEEN CHARLOTTE) COPPER	*LYCAENA MARIPOSA CHARLOTTENSIS*	Butterfly	SC	FCo
MARDON SKIPPER	*POLITES MARDON*	Butterfly	SE	FC
MEADOW FRITILLARY	*BOLORIA BELLONA SSP.*	Butterfly	SM	none
MELISSA ARCTIC	*OENEIS MELISSA BEANII*	Butterfly	SM	none
MOSS ELFIN	*INCISALIA MOSSII MOSSII*	Butterfly	SM	none
NEVADA SKIPPER	*HESPERIA NEVADA*	Butterfly	SM	none
NEVADA VICEROY	*LIMENITIS ARCHIPPUS LAHONTANI*	Butterfly	SM	none
NORTHERN CHECKERSPOT	*CHLOSYNE PALLA PALLA*	Butterfly	SM	none
NORTHERN CLOUDY WING	*THORYBES PYLADES*	Butterfly	SM	none
OREAS ANGLEWING	*POLYGONIA OREAS*	Butterfly	SM	none
OREGON BRANDED SKIPPER	*HESPERIA COMMA OREGONIA*	Butterfly	SM	none
OREGON GREEN HAIRSTREAK	*CALLOPHRYS DUMETORUM OREGONENSIS*	Butterfly	SM	none
OREGON SILVERSPOT BUTTERFLY	*SPEYERIA ZERENE HIPPOLYTA*	Butterfly	SE	FT
PACUVIUS' DUSKYWING	*ERYNNIS PACUVIUS LILIUS*	Butterfly	SM	none
PALE CRESCENT	*PHYCIODES PALLIDUS BARNESI*	Butterfly	SM	none
PASCO PEARL CRESCENT	*PHYCIODES "THAROS" PASCOENSIS*	Butterfly	SM	none
PERDICCAS CHECKERSPOT	*EUPHYDRYAS CHALCEDONA PERDICCAS*	Butterfly	SM	none
PERSIUS' DUSKYWING	*ERYNNIS PERSIUS*	Butterfly	SM	none
PROPERTIUS' DUSKYWING	*ERYNNIS PROPERTIUS*	Butterfly	SM	none
PUGET BLUE	*PLEBEJUS ICARIOIDES BLACKMOREI*	Butterfly	SC	none
PUGET SOUND SILVERSPOT	*SPEYERIA CYBELE PUGETENSIS*	Butterfly	SM	none
PURPLISH COPPER	*LYCAENA HELLOIDES*	Butterfly	SM	none
ROADSIDE SKIPPER	*AMBLYSCIRTES VIALIS*	Butterfly	SM	none
RUDDY COPPER	*LYCAENA RUBIDA PERKINSORUM*	Butterfly	SM	none
SHELTON PINE ELFIN	*INCISALIA ERYPHON SHELTONENSIS*	Butterfly	SM	none
SHEPARD'S PARNASSIAN	*PARNASSIUS CLODIUS SHEPARDI*	Butterfly	SC	none
SILVER-BORDERED FRITILLARY	*BOLORIA SELENE ATROCOSTALIS*	Butterfly	SC	none
SILVER-SPOTTED SKIPPER	*EPARGYREUS CLARUS CALIFORNICUS*	Butterfly	SM	none
SNOWBERRY CHECKERSPOT	*EUPHYDRYAS CHALCEDONA WALLACENSIS*	Butterfly	SM	none
SONORA SKIPPER	*POLITES SONORA SIRIS*	Butterfly	SM	none
SONORA SKIPPER	*POLITES SONORA SONORA*	Butterfly	SM	none
SYLVAN HAIRSTREAK	*SATYRIUM SYLVINUM SYLVINUM*	Butterfly	SM	none
SYLVAN HAIRSTREAK	*SATYRIUM SYLVINUM PUTNAMI*	Butterfly	SM	none
TAWNY-EDGED SKIPPER	*POLITES THEMISTOCLES*	Butterfly	SM	none

TAYLOR'S (WHULGE) CHECKERSPOT	*EUPHYDRYAS EDITHA TAYLORI*	Butterfly	SC	FC
THICKET HAIRSTREAK	*MITOURA SPINETORUM SPINETORUM*	Butterfly	SM	none
VALERATA ARCTIC	*OENEIS CHRYXUS VALERATA*	Butterfly	SM	none
VALLEY SILVERSPOT	*SPEYERIA ZERENE BREMNERII*	Butterfly	SC	FCo
WESTERN SULPHUR	*COLIAS OCCIDENTALIS OCCIDENTALIS*	Butterfly	SM	none
YELLOWPATCH SKIPPER	*POLITES CORAS*	Butterfly	SM	none
YUMA SKIPPER	*OCHLODES YUMA*	Butterfly	SC	none
BLACK ROCKFISH	*SEBASTES MELANOPS*	Fish	SC	none
BOCACCIO ROCKFISH	*SEBASTES PAUCISPINIS*	Fish	SC	none
BROWN ROCKFISH	*SEBASTES AURICULATUS*	Fish	SC	none
BULL TROUT	*SALVELINUS CONFLUENTUS*	Fish	SC	FT
BULL TROUT (COASTAL/PUGET SOUND)	*SALVELINUS CONFLUENTUS*	Fish	SC	FT
BULL TROUT (COLUMBIA BASIN)	*SALVELINUS CONFLUENTUS*	Fish	SC	FT
CANARY ROCKFISH	*SEBASTES PINNIGER*	Fish	SC	none
CHINA ROCKFISH	*SEBASTES NEBULOSUS*	Fish	SC	none
CHINOOK SALMON (LOWER COLUMBIA)	*ONCORHYNCHUS TSHAWYTSCHA*	Fish	SC	FT
CHINOOK SALMON (PUGET SOUND)	*ONCORHYNCHUS TSHAWYTSCHA*	Fish	SC	FT
CHINOOK SALMON (SNAKE R. FALL)	*ONCORHYNCHUS TSHAWYTSCHA*	Fish	SC	FT
CHINOOK SALMON (SNAKE R. SP/SU)	*ONCORHYNCHUS TSHAWYTSCHA*	Fish	SC	FT
CHINOOK SALMON (UPPER COLUMBIA SP)	*ONCORHYNCHUS TSHAWYTSCHA*	Fish	SC	FE
CHUM SALMON (HOOD CANAL SU)	*ONCORHYNCHUS KETA*	Fish	SC	FT
CHUM SALMON (LOWER COLUMBIA)	*ONCORHYNCHUS KETA*	Fish	SC	FT
COPPER ROCKFISH	*SEBASTES CAURINUS*	Fish	SC	none
EULACHON	*THALEICHTHYS PACIFICUS*	Fish	SC	none
GREENSTRIPED ROCKFISH	*SEBASTES ELONGATUS*	Fish	SC	none
KOKANEE (LANDLOCKED SOCKEYE)	*ONCORHYNCHUS NERKA*	Fish	SC	FT
LAKE CHUB	*COUESIUS PLUMBEUS*	Fish	SC	none
LEOPARD DACE	*RHINICHTHYS FALCATUS*	Fish	SC	none
MARGINED SCULPIN	*COTTUS MARGINATUS*	Fish	SS	FCo
MOUNTAIN SUCKER	*CATOSTOMUS PLATYRHYNCHUS*	Fish	SC	none
NOOKSACK DACE	*RHINICHTHYS CATARACTAE SSP.*	Fish	SM	none
OLYMPIC MUDMINNOW	*NOVUMBRA HUBBSI*	Fish	SS	none
PACIFIC COD (S&C PUGET SOUND)	*GADUS MACROCEPHALUS*	Fish	SC	none
PACIFIC HAKE (C. PUGET SOUND)	*MERLUCCIUS PRODUCTUS*	Fish	SC	FC
PACIFIC HERRING (CHERRY POINT)	*CLUPEA PALLASI*	Fish	SC	FC
PACIFIC HERRING (DISCOVERY BAY)	*CLUPEA PALLASI*	Fish	SC	FC
PIUTE SCULPIN	*COTTUS BELDINGI*	Fish	SM	none
PYGMY WHITEFISH	*PROSOPIUM COULTERI*	Fish	SS	none
QUILLBACK ROCKFISH	*SEBASTES MALIGER*	Fish	SC	none
REDSTRIPE ROCKFISH	*SEBASTES PRORIGER*	Fish	SC	none
RETICULATE SCULPIN	*COTTUS PERPLEXUS*	Fish	SM	none
RIFFLE SCULPIN	*COTTUS GULOSUS*	Fish	SM	none
RIVER LAMPREY	*LAMPETRA AYRESI*	Fish	SC	FCo
SALISH SUCKER	*CATOSTOMUS SP.*	Fish	SM	none
SAND ROLLER	*PERCOPSIS TRANSMONTANA*	Fish	SM	none
SLIMY SCULPIN	*COTTUS COGNATUS*	Fish	SM	none
SOCKEYE SALMON (SNAKE R.)	*ONCORHYNCHUS NERKA*	Fish	SC	FE
STEELHEAD (LOWER COLUMBIA)	*ONCORHYNCHUS MYKISS*	Fish	SC	FT
STEELHEAD (MIDDLE COLUMBIA)	*ONCORHYNCHUS MYKISS*	Fish	SC	FT
STEELHEAD (SNAKE RIVER)	*ONCORHYNCHUS MYKISS*	Fish	SC	FT
STEELHEAD (UPPER COLUMBIA)	*ONCORHYNCHUS MYKISS*	Fish	SC	FE
TIGER ROCKFISH	*SEBASTES NIGROCINCTUS*	Fish	SC	none
UMATILLA DACE	*RHINICHTHYS UMATILLA*	Fish	SC	none
WALLEYE POLLOCK (SO. PUGET SOUND)	*THERAGRA CHALCOGRAMMA*	Fish	SC	none
WIDOW ROCKFISH	*SEBASTES ENTOMELAS*	Fish	SC	none
YELLOWEYE ROCKFISH	*SEBASTES RUBERRIMUS*	Fish	SC	none
YELLOWTAIL ROCKFISH	*SEBASTES FLAVIDUS*	Fish	SC	none
BLACK RIGHT WHALE	*BALAENA GLACIALIS*	Mammal	SE	FE
BLACK-TAILED JACK RABBIT	*LEPUS CALIFORNICUS*	Mammal	SC	none

BLUE WHALE	*BALAENOPTERA MUSCULUS*	Mammal	SE	FE
BRUSH PRAIRIE POCKET GOPHER	*THOMOMYS TALPOIDES DOUGLASI*	Mammal	SC	none
CATHLAMET POCKET GOPHER	*THOMOMYS MAZAMA LOUIEI*	Mammal	SC	FC
COLUMBIAN WHITE-TAILED DEER	*ODOCOILEUS VIRGINIANUS LEUCURUS*	Mammal	SE	FE
DALL'S PORPOISE	*PHOCOENOIDES DALLI*	Mammal	SM	none
FIN WHALE	*BALAENOPTERA PHYSALUS*	Mammal	SE	FE
FISHER	*MARTES PENNANTI*	Mammal	SE	FCo
FRINGED MYOTIS	*MYOTIS THYSANODES*	Mammal	SM	FCo
GRAY WHALE	*ESCHRICHTIUS ROBUSTUS*	Mammal	SS	none
GRAY WOLF	*CANIS LUPUS*	Mammal	SE	FE
GRAY-TAILED VOLE	*MICROTUS CANICAUDUS*	Mammal	SC	none
GRIZZLY BEAR	*URSUS ARCTOS*	Mammal	SE	FT
HARBOR SEAL	*PHOCA VITULINA*	Mammal	SM	none
HUMPBACK WHALE	*MEGAPTERA NOVAEANGLIAE*	Mammal	SE	FE
KEEN'S MYOTIS	*MYOTIS KEENII*	Mammal	SC	none
KILLER WHALE	*ORCINUS ORCA*	Mammal	SC	none
KINCAID'S MEADOW VOLE	*MICROTUS PENNSYLVANICUS KINCAIDI*	Mammal	SM	FCo
LONG-EARED MYOTIS	*MYOTIS EVOTIS*	Mammal	SM	FCo
LONG-LEGGED MYOTIS	*MYOTIS VOLANS*	Mammal	SM	FCo
LYNX	*LYNX CANADENSIS*	Mammal	ST	FT
MAZAMA (WESTERN) POCKET GOPHER	*THOMOMYS MAZAMA*	Mammal	SC	FC
MERRIAM'S SHREW	*SOREX MERRIAMI*	Mammal	SC	none
NORTHERN BOG LEMMING	*SYNAPTOMYS BOREALIS*	Mammal	SM	none
NORTHERN GRASSHOPPER MOUSE	*ONYCHOMYS LEUCOGASTER*	Mammal	SM	none
OLYMPIC POCKET GOPHER	*THOMOMYS MAZAMA MELANOPS*	Mammal	SC	FC
ORD'S KANGAROO RAT	*DIPODOMYS ORDII*	Mammal	SM	none
PACIFIC HARBOR PORPOISE	*PHOCOENA PHOCOENA*	Mammal	SC	none
PACIFIC TOWNSEND'S BIG-EARED BAT	*CORYHORHINUS TOWNSENDII TOWNSENDII*	Mammal	SC	FCo
PACIFIC WATER SHREW	*SOREX BENDIRII*	Mammal	SM	none
PALLID BAT	*ANTROZOUS PALLIDUS*	Mammal	SM	none
PALLID TOWNSEND'S BIG-EARED BAT	*CORYHORHINUS TOWNSENDII PALLESCENS*	Mammal	SC	FCo
PREBLE'S SHREW	*SOREX PREBLEI*	Mammal	SM	FCo
PYGMY RABBIT	*BRACHYLAGUS IDAHOENSIS*	Mammal	SE	FE
PYGMY SHREW	*SOREX HOYI*	Mammal	SM	none
RED BAT	*LASIURUS BOREALIS*	Mammal	SM	none
RED-TAILED CHIPMUNK	*TAMIAS RUFICAUDUS*	Mammal	SM	none
SAGEBRUSH VOLE	*LAGURUS CURTATUS*	Mammal	SM	none
SEA OTTER	*ENHYDRA LUTRIS*	Mammal	SE	none
SEA OTTER	*ENHYDRA LUTRIS LUTRIS*	Mammal	SE	none
SEI WHALE	*BALAENOPTERA BOREALIS*	Mammal	SE	FE
SHELTON POCKET GOPHER	*THOMOMYS MAZAMA COUCHI*	Mammal	SC	FC
SMALL-FOOTED MYOTIS	*MYOTIS CILIOLABRUM*	Mammal	SM	FCo
SPERM WHALE	*PHYSETER MACROCEPHALUS*	Mammal	SE	FE
SPOTTED BAT	*EUDERMA MACULATUM*	Mammal	SM	none
STELLER SEA LION	*EUMETOPIAS JUBATUS*	Mammal	ST	FT
TACOMA POCKET GOPHER	*THOMOMYS MAZAMA TACOMENSIS*	Mammal	EX	none
TOWNSEND'S BIG-EARED BAT	*CORYHORHINUS TOWNSENDII*	Mammal	SC	FCo
TOWNSEND'S GROUND SQUIRREL	*SPERMOPHILUS TOWNSENDII*	Mammal	SM	none
WASHINGTON GROUND SQUIRREL	*SPERMOPHILUS WASHINGTONI*	Mammal	SC	FC
WESTERN GRAY SQUIRREL	*SCIURUS GRISEUS*	Mammal	ST	FCo
WESTERN PIPISTRELLE	*PIPISTRELLUS HESPERUS*	Mammal	SM	none
WHITE SALMON POCKET GOPHER	*THOMOMYS TALPOIDES LIMOSUS*	Mammal	SM	none
WHITE-TAILED JACK RABBIT	*LEPUS TOWNSENDII*	Mammal	SC	none
WOLVERINE	*GULO GULO*	Mammal	SC	FCo
WOODLAND CARIBOU	*RANGIFER TARANDUS*	Mammal	SE	FE
YELM POCKET GOPHER	*THOMOMYS MAZAMA YELMENSIS*	Mammal	SC	FC
CALIFORNIA FLOATER	*ANODONTA CALIFORNIENSIS*	Mollusk	SC	FCo
GIANT COLUMBIA RIVER LIMPET	*FISHEROLA NUTTALLI*	Mollusk	SC	none
GIANT COLUMBIA SPIRE SNAIL	*FLUMINICOLA COLUMBIANA*	Mollusk	SC	FCo

NEWCOMB'S LITTORINE SNAIL	*ALGAMORDA SUBROTUNDATA*	Mollusk	SC	FCo
NORTHERN ABALONE	*HALIOTIS KAMTSCHATKANA*	Mollusk	SC	none
OLYMPIA OYSTER	*OSTREA LURIDA*	Mollusk	SC	none
CALIFORNIA MOUNTAIN KINGSNAKE	*LAMPROPELTIS ZONATA*	Reptile	SC	none
GREEN SEA TURTLE	*CHELONIA MYDAS*	Reptile	ST	FT
LEATHERBACK SEA TURTLE	*DERMOCHELYS CORIACEA*	Reptile	SE	FE
LOGGERHEAD SEA TURTLE	*CARETTA CARETTA*	Reptile	ST	FT
NIGHT SNAKE	*HYPSIGLENA TORQUATA*	Reptile	SM	none
PACIFIC GOPHER SNAKE	*PITUOPHIS CATENIFER CATENIFER*	Reptile	SM	none
RINGNECK SNAKE	*DIADOPHIS PUNCTATUS*	Reptile	SM	none
SHARPTAIL SNAKE	*CONTIA TENUIS*	Reptile	SC	none
SOUTHERN ALLIGATOR LIZARD	*ELGARIA MULTICARINATA*	Reptile	SM	none
STRIPED WHIPSNAKE	*MASTICOPHIS TAENIATUS*	Reptile	SC	none
WESTERN POND TURTLE	*CLEMMYS MARMORATA*	Reptile	SE	FCo

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WAC 222-16-030 Water typing system. Until the fish habitat water type maps described below are adopted by the board, the Interim Water Typing System established in WAC 222-16-031 will continue to be used. The department in cooperation with the departments of fish and wildlife, and ecology, and in consultation with affected Indian tribes will classify streams, lakes and ponds. The department will prepare water type maps showing the location of Type S, F, and N (Np and Ns) Waters within the forested areas of the state. The maps will be based on a multiparameter, field-verified geographic information system (GIS) logistic regression model. The multiparameter model will be designed to identify fish habitat by using geomorphic parameters such as basin size, gradient, elevation and other indicators. The modeling process shall be designed to achieve a level of statistical accuracy of 95% in separating fish habitat streams and nonfish habitat streams. Furthermore, the demarcation of fish and nonfish habitat waters shall be equally likely to over and under estimate the presence of fish habitat. These maps shall be referred to as "fish habitat water typing maps" and shall, when completed, be available for public inspection at region offices of the department.

Fish habitat water type maps will be updated every five years where necessary to better reflect observed, in-field conditions. Except for these periodic revisions of the maps, on-the-ground observations of fish or habitat characteristics will generally not be used to adjust mapped water types. However, if an on-site interdisciplinary team using nonlethal methods identifies fish, or finds that habitat is not accessible due to naturally occurring conditions and no fish reside above the blockage, then the water type will be immediately changed to reflect the findings of the interdisciplinary team. The finding will be documented on a water type update form provided by the department and the fish habitat water type map will be updated as soon as practicable. If a dispute arises concerning a water type the department shall make available informal conferences, as established in WAC 222-46-020 which shall include the departments of fish and wildlife, and ecology, and affected Indian tribes and those contesting the adopted water types.

The waters will be classified using the following criteria:

*(1) **"Type S Water"** means all waters, within their bankfull width, as inventoried as "shorelines of the state" under chapter 90.58 RCW and the rules promulgated pursuant to chapter 90.58 RCW including periodically inundated areas of their associated wetlands.

*(2) **"Type F Water"** means segments of natural waters other than Type S Waters, which are within the bankfull widths of defined channels and periodically inundated areas of their associated wetlands, or within lakes, ponds, or impoundments having a surface area of 0.5 acre or greater at seasonal low water and which in any case contain fish habitat or are described by one of the following four categories:

(a) Waters, which are diverted for domestic use by more than 10 residential or camping units or by a public accommodation facility licensed to serve more than 10 persons, where such diversion is

determined by the department to be a valid appropriation of water and the only practical water source for such users. Such waters shall be considered to be Type F Water upstream from the point of such diversion for 1,500 feet or until the drainage area is reduced by 50 percent, whichever is less;

(b) Waters, which are diverted for use by federal, state, tribal or private fish hatcheries. Such waters shall be considered Type F Water upstream from the point of diversion for 1,500 feet, including tributaries if highly significant for protection of downstream water quality. The department may allow additional harvest beyond the requirements of Type F Water designation provided the department determines after a landowner-requested on-site assessment by the department of fish and wildlife, department of ecology, the affected tribes and interested parties that:

(i) The management practices proposed by the landowner will adequately protect water quality for the fish hatchery; and

(ii) Such additional harvest meets the requirements of the water type designation that would apply in the absence of the hatchery;

(c) Waters, which are within a federal, state, local, or private campground having more than 10 camping units: Provided, That the water shall not be considered to enter a campground until it reaches the boundary of the park lands available for public use and comes within 100 feet of a camping unit, trail or other park improvement;

(d) Riverine ponds, wall-based channels, and other channel features that are used by fish for off-channel habitat. These areas are critical to the maintenance of optimum survival of fish. This habitat shall be identified based on the following criteria:

(i) The site must be connected to a fish habitat stream and accessible during some period of the year; and

(ii) The off-channel water must be accessible to fish.

(3) **"Type Np Water"** means all segments of natural waters within the bankfull width of defined channels that are perennial nonfish habitat streams. Perennial streams are waters that do not go dry any time of a year of normal rainfall. However, for the purpose of water typing, Type Np Waters include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow. If the uppermost point of perennial flow cannot be identified with simple, nontechnical observations (see board manual, section 23), then Type Np Waters begin at a point along the channel where the contributing basin area is:

(a) At least 13 acres in the Western Washington coastal zone (which corresponds to the Sitka spruce zone defined in Franklin and Dyrness, 1973);

(b) At least 52 acres in other locations in Western Washington;

(c) At least 300 acres in Eastern Washington.

(4) **"Type Ns Water"** means all segments of natural waters within the bankfull width of the defined channels that are not Type S, F, or Np Waters. These are seasonal, nonfish habitat streams in which surface flow is not present for at least some portion of a year of normal rainfall and are not located downstream from any stream reach that is a Type Np Water. Ns Waters must be physically connected by an above-ground channel system to Type S, F, or Np Waters.

*(5) For purposes of this section:

(a) "Residential unit" means a home, apartment, residential condominium unit or mobile home, serving as the principal place of residence.

(b) "Camping unit" means an area intended and used for:

(i) Overnight camping or picnicking by the public containing at least a fireplace, picnic table and access to water and sanitary facilities; or

(ii) A permanent home or condominium unit or mobile home not qualifying as a "residential unit" because of part time occupancy.

(c) "Public accommodation facility" means a business establishment open to and licensed to serve the public, such as a restaurant, tavern, motel or hotel.

(d) "Natural waters" only excludes water conveyance systems which are artificially constructed and actively maintained for irrigation.

(e) "Seasonal low flow" and "seasonal low water" mean the conditions of the 7-day, 2-year low water situation, as measured or estimated by accepted hydrologic techniques recognized by the department.

(f) "Channel width and gradient" means a measurement over a representative section of at least 500 linear feet with at least 10 evenly spaced measurement points along the normal stream channel but excluding unusually wide areas of negligible gradient such as marshy or swampy areas, beaver ponds and impoundments. Channel gradient may be determined utilizing stream profiles plotted from United States geological survey topographic maps (see board manual section 23).

(g) "Intermittent streams" means those segments of streams that normally go dry.

(h) "Fish habitat" means habitat which is used by any fish at any life stage at any time of the year, including potential habitat likely to be used by fish which could be recovered by restoration or management and includes off-channel habitat.

[Statutory Authority: Chapter 34.05 RCW, RCW 76.09.040,[76.09.]050 , [76.09.]370, 76.13.120(9). 01-12-042, § 222-16-030, filed 5/30/01, effective 7/1/01. Statutory Authority: RCW 76.09.040 and chapter 34.05 RCW. 97-24-091, § 222-16-030, filed 12/3/97, effective 1/3/98. Statutory Authority: RCW 76.09.040, 76.09.170 and chapter 34.05 RCW. 94-01-134, § 222-16-030, filed 12/20/93, effective 1/1/94. Statutory Authority: RCW 76.09.040, 76.09.050 and chapter 34.05 RCW. 92-15-011, § 222-16-030, filed 7/2/92, effective 8/2/92. Statutory Authority: RCW 76.09.040. 87-23-036 (Order 535), § 222-16-030, filed 11/16/87, effective 1/1/88; Order 263, § 222-16-030, filed 6/16/76.]

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WAC 222-16-031 Interim water typing system. Until the fish habitat water type maps mentioned above are available, waters will be classified according to the interim water typing system described below. If a dispute arises concerning a water type, the department shall make available informal conferences, which shall include the departments of fish and wildlife, ecology, and affected Indian tribes and those contesting the adopted water types. These conferences shall be established under procedures established in WAC 222-46-020.

For the purposes of this interim water typing system see the following table:

Water Type Conversion Table

Permanent Water Typing	Interim Water Typing
Type "S"	Type 1 Water
Type "F"	Type 2 and 3 Water
Type "Np"	Type 4 Water
Type "Ns"	Type 5 Water

*(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 and the rules promulgated pursuant to chapter 90.58 RCW, but not including those waters' associated wetlands as defined in chapter 90.58 RCW.

*(2) **"Type 2 Water"** means segments of natural waters which are not classified as Type 1 Water and have a high fish, wildlife, or human use. These are segments of natural waters and periodically inundated areas of their associated wetlands, which:

(a) Are diverted for domestic use by more than 100 residential or camping units or by a public accommodation facility licensed to serve more than 10 persons, where such diversion is determined by the department to be a valid appropriation of water and only considered Type 2 Water upstream from the point of such diversion for 1,500 feet or until the drainage area is reduced by 50 percent, whichever is less;

(b) Are diverted for use by federal, state, tribal or private fish hatcheries. Such waters shall be considered Type 2 Water upstream from the point of diversion for 1,500 feet, including tributaries if highly significant for protection of downstream water quality. The department may allow additional harvest beyond the requirements of Type 2 Water designation provided by the department of fish and wildlife, department of ecology, the affected tribes and interested parties that:

(i) The management practices proposed by the landowner will adequately protect water quality for the fish hatchery; and

(ii) Such additional harvest meets the requirements of the water type designation that would apply in the absence of the hatchery;

(c) Are within a federal, state, local or private campground having more than 30 camping units: Provided, That the water shall not be considered to enter a campground until it reaches the boundary of the park lands available for public use and comes within 100 feet of a camping unit.

(d) Are used by fish for spawning, rearing or migration. Waters having the following characteristics are presumed to have highly significant fish populations:

(i) Stream segments having a defined channel 20 feet or greater within the bankfull width and having a gradient of less than 4 percent.

(ii) Lakes, ponds, or impoundments having a surface area of 1 acre or greater at seasonal low water; or

(e) Are used by fish for off-channel habitat. These areas are critical to the maintenance of optimum survival of fish. This habitat shall be identified based on the following criteria:

(i) The site must be connected to a fish bearing stream and be accessible during some period of the year; and

(ii) The off-channel water must be accessible to fish through a drainage with less than a 5% gradient.

*(3) **"Type 3 Water"** means segments of natural waters which are not classified as Type 1 or 2 Waters and have a moderate to slight fish, wildlife, and human use. These are segments of natural waters and periodically inundated areas of their associated wetlands which:

(a) Are diverted for domestic use by more than 10 residential or camping units or by a public accommodation facility licensed to serve more than 10 persons, where such diversion is determined by the department to be a valid appropriation of water and the only practical water source for such users. Such waters shall be considered to be Type 3 Water upstream from the point of such diversion for 1,500 feet or until the drainage area is reduced by 50 percent, whichever is less;

(b) Are used by fish for spawning, rearing or migration. The requirements for determining fish use are described in the board manual section 13. If fish use has not been determined:

(i) Waters having the following characteristics are presumed to have fish use:

(A) Stream segments having a defined channel of 2 feet or greater within the bankfull width in Western Washington; or 3 feet or greater in width in Eastern Washington; and having a gradient of 16 percent or less.

(B) Stream segments having a defined channel or 2 feet or greater within the bankfull width in Western Washington; or 3 feet or greater within the bankfull width in Eastern Washington, and having a gradient greater than 16 percent and less than or equal to 20 percent, and having greater than 50 acres in contributing basin size in Western Washington or greater than 175 acres contributing basin size in Eastern Washington, based on hydrographic boundaries;

(C) Ponds or impoundments having a surface area of less than 1 acre at seasonal low water and having an outlet to a fish stream;

(D) Ponds of impoundments having a surface area greater than 0.5 acre at seasonal low water.

(ii) The department shall waive or modify the characteristics in (i) of this subsection where:

(A) Waters have confirmed, long term, naturally occurring water quality parameters incapable of supporting fish;

(B) Snowmelt streams have short flow cycles that do not support successful life history phases of fish. These streams typically have no flow in the winter months and discontinue flow by June 1; or

(C) Sufficient information about a geomorphic region is available to support a departure from the characteristics in (i) of this subsection, as determined in consultation with the department of fish and wildlife, department of ecology, affected tribes and interested parties.

*(4) **"Type 4 Water"** means all segments of natural waters within the bankfull width of defined channels that are perennial nonfish habitat streams. Perennial streams are waters that do not go dry any

time of a year of normal rainfall. However, for the purpose of water typing, Type 4 Waters include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow. If the uppermost point of perennial flow cannot be identified with simple, nontechnical observations (see board manual, section 23), then Type 4 Waters begin at a point along the channel where the contributing basin area is:

(a) At least 13 acres in the Western Washington coastal zone (which corresponds to the Sitka spruce zone defined in Franklin and Dyrness, 1973);

(b) At least 52 acres in other locations in Western Washington;

(c) At least 300 acres in Eastern Washington.

*(5) **"Type 5 Waters"** means all segments of natural waters within the bankfull width of the defined channels that are not Type 1, 2, 3, or 4 Waters. These are seasonal, nonfish habitat streams in which surface flow is not present for at least some portion of the year and are not located downstream from any stream reach that is a Type 4 Water. Type 5 Waters must be physically connected by an above-ground channel system to Type 1, 2, 3, or 4 Waters.

*(6) For purposes of this section:

(a) "Residential unit" means a home, apartment, residential condominium unit or mobile home, serving as the principal place of residence.

(b) "Camping unit" means an area intended and used for:

(i) Overnight camping or picnicking by the public containing at least a fireplace, picnic table and access to water and sanitary facilities; or

(ii) A permanent home or condominium unit or mobile home not qualifying as a "residential unit" because of part time occupancy.

(c) "Public accommodation facility" means a business establishment open to and licensed to serve the public, such as a restaurant, tavern, motel or hotel.

(d) "Natural waters" only excludes water conveyance systems which are artificially constructed and actively maintained for irrigation.

(e) "Seasonal low flow" and "seasonal low water" mean the conditions of the 7-day, 2-year low water situation, as measured or estimated by accepted hydrologic techniques recognized by the department.

(f) "Channel width and gradient" means a measurement over a representative section of at least 500 linear feet with at least 10 evenly spaced measurement points along the normal stream channel but excluding unusually wide areas of negligible gradient such as marshy or swampy areas, beaver ponds and impoundments. Channel gradient may be determined utilizing stream profiles plotted from United States geological survey topographic maps. (See board manual section 23.)

[Statutory Authority: Chapter 34.05 RCW, RCW 76.09.040,[76.09.]050 , [76.09.]370, 76.13.120(9). 01-12-042, § 222-16-031, filed 5/30/01, effective 7/1/01.]

Title 8

HEALTH AND WELFARE

CHAPTERS:

8.01 USE OF 9-1-1 TELEPHONE NUMBER IN ADVERTISEMENTS.
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8.08 PUBLIC NUISANCES.
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Chapter 8.01

USE OF 9-1-1 TELEPHONE NUMBER IN ADVERTISEMENTS

Sections:

8.01.010 Limiting Use of 9-1-1 Telephone Number in Advertisements.
8.01.020 Penalty.

8.01.010 Limiting Use of 9-1-1 Telephone Number in Advertisements.

Any advertisement, brochure, pamphlet, telephone label, or related public notice which is printed or published regarding citizen access to police, fire or emergency medical assistance which bears the 9-1-1 emergency telephone number or logo shall not include any other telephone number or recommend the use of any particular commercial establishment or business when using the 9-1-1 telephone system. (Ord. 85-187 § 1 (part), 1986)

8.01.020 Penalty.

Any person, firm or corporation convicted for violation of or failure to comply with any provision of this Chapter shall be guilty of a misdemeanor. Each day or a portion thereof upon which a violation occurs constitutes a separate offense. (Ord. 85-187 § 1 (part), 1986)

Chapter 8.04

FEES FOR HEALTH SERVICES

Section:

8.04.010 Copies on File.

8.04.010 Copies on File.

Fees for health services as established and revised pursuant to Article 16 and the procedures of the agreement between Pierce County and the City of Tacoma relating to the establishment of the Tacoma-Pierce County Health Department shall be kept on file and available to interested parties at the offices of the Tacoma-Pierce County Health Department. (Prior Code § 20.26.010)

Chapter 8.08

PUBLIC NUISANCES

Sections:

8.08.010 Nuisances Affecting Public Health.
8.08.020 Yard Maintenance.
8.08.030 Vacant Lot or Building.
8.08.040 Authority of Board of Health.
8.08.050 Serving of Orders.
8.08.060 Contents of Order.
8.08.070 Inspections.
8.08.080 Severability.

8.08.010 Nuisances Affecting Public Health.

The following specific acts, omissions, places, conditions and things are declared to be nuisances: the erecting, maintaining, using, placing, depositing, causing, allowing, leaving, or permitting to be or remain in or upon any private lot, building, structure, or premises, or in or upon any street, avenue, alley, park, parkway, or other public or private place in the County, any one or more of the following places, conditions, things or acts to the prejudice, danger, or annoyance of others:

A. Privies, vaults, cesspools, sumps, pits, wells or cisterns or like places which are not securely protected from flies or rats;
B. Filthy, littered or trash-covered premises, including all buildings and structures thereon and areas adjacent thereto;
C. Tin cans, bottles, glass, cans, ashes, small pieces of scrap iron, wire, metal, articles, bric-a-brac, broken stone or cement, broken crockery, broken glass, broken plaster and all other trash or abandoned material unless the same are kept in covered bins or metal receptacles approved by the Health Officer;
D. Trash, litter, rags, accumulations of empty barrels, boxes, crates, packing cases, mattresses, bedding, excelsior, packing hay, straw, or other packing material, lumber not neatly piled, scrap iron, tin and other metal not neatly piled which provides harborage for rodents;
E. Any unsightly and dangerous building, billboard or structure;
F. All places used or maintained as junkyards or dumping grounds, or for the wrecking, disassembling, repair or rebuilding of automobiles, trucks, tractors or machinery of any kind, or for the storing or leaving of worn out, wrecked or abandoned automobiles, trucks, tractors or machinery of any kind or of any of the parts thereof, or for the storing or leaving of any machinery or equipment used by contractors or builders or by other persons, which places are kept or maintained so as to provide harborage for rodents excluding properly zoned and licensed wrecking yards, junkyards or machinery being used;
G. Garbage disposed of in any manner other than provided in the Sanitary Code;
H. Garbage cans which are not impervious to rodent gnawing or do not have tight-fitting lids;

I. Any putrid, unsound or unwholesome bones, meat, hides, skins or the whole or any part of any dead animal, fish or fowl, butchers' trimmings and offal, or any waste vegetable or animal matter in any quantity, garbage, human excreta or other offensive substance; provided, nothing in this subsection shall prevent the temporary retention of waste in a manner approved by the Health Officer;

J. Blackberry vines or any tall grass or weeds over two feet in height which is rodent infested;

K. Grass clippings, cut brush or cut weeds which may create a fly or rodent harborage.

L. Nests, colonies, hives or apiaries of bees, Africanized honey bees, yellow jacket, hornets or wasps which are not in full compliance with Chapter 8.94 Pierce County Code, Chapter 15.60 RCW or Chapter 16-602 WAC.

(Ord. 94-108 § 2, 1994; Prior Code § 20.24.120)

8.08.020 Yard Maintenance.

Every occupant of a dwelling unit located in close proximity to another occupied dwelling unit shall keep the yard space thereof reasonably neat and clean and free of uncut grass, blackberry vines, bushes and debris if a rodent infestation exists. (Prior Code § 20.24.130)

8.08.030 Vacant Lot or Building.

Every owner of a vacant lot or building located in close proximity to another occupied dwelling unit shall keep the premises reasonably neat and clean and free of uncut grass, blackberry vines, bushes and debris if a rodent infestation exists. (Prior Code § 20.24.140)

8.08.040 Authority of Board of Health.

Whenever any declared nuisance, source of filth or cause or probable cause of injury to health shall be found by the Health Officer to exist on any private or public property, he shall have the power and authority to order verbally and/or in writing the owner or occupant or user thereof, by appropriate action, at the expense of such owner, occupant, or user to correct and remove such nuisance, source of filth or cause or probable cause of injury to health within such time as the Health Officer may order. In the event of the refusal or failure to remove such nuisance within said time, the Health Officer may cause such nuisance to be abated at the expense of such person or persons, which cost may be recovered by the Board of Health from such person or persons in an action brought in the name of the Board of Health to recover the same in any court of competent jurisdiction. (Prior Code § 20.24.150)

8.08.050 Serving of Orders.

A. Any order described in Section 8.08.040 required to be served on a person, owner, agent or occupant of a premises, shall be deemed to have been served under any of the following conditions:

1. Such order is delivered to such person by any authorized representative of the Health Officer;
2. Such order is mailed (by registered mail) to the owner, representative of the owner, or the last known occupant of the premises;
3. Such order, properly signed, is posted by an authorized representative of the Health Officer upon any portion of such premises visible from a public place.

B. If the whereabouts of such persons are unknown and the same cannot be ascertained by the Health Officer in the exercise of reasonable diligence and the Health Officer shall make an affidavit to that effect, then the order shall be served by publishing the same twice, once each week for two consecutive weeks, in a newspaper published in Tacoma or Pierce County.

(Prior Code § 20.24.160)

8.08.060 Contents of Order.

The order shall contain, among other things, the following information:

A. Name of owner or other persons interested;
B. Street address and legal description of the premises;
C. General description of the premises considered a nuisance;
D. A statement or list of items in violation of this Chapter;
E. A reasonable time for correction of the violation;
F. A copy of the order shall be filed with the County Auditor, which filing shall have the same force and effect as other lis pendens orders provided by law.

(Prior Code § 20.24.170)

8.08.070 Inspections.

The Director of Health and all inspectors or employees of the Department of Public Health of the County shall at all reasonable times have and be granted access to any premises, dock, building, storeroom, warehouse or residence for the purpose of inspecting same and of ascertaining whether the provisions of this Chapter have been complied with. (Prior Code § 20.24.180)

8.08.080 Severability.

If any provision of this Chapter or its application to any person or circumstance is held invalid, the remainder of the Chapter or the application of the provision to other persons or circumstances shall not be affected. (Ord. 89-155 § 10, 1989)

Chapter 8.12

FOOD SERVICE SANITATION

Sections:

8.12.010 Regulations Adopted by Reference.
8.12.020 Authority of Health Department.

8.12.010 Regulations Adopted by Reference.

The Washington Administrative Code 248-84, Rules and Regulations of the State Board of Health for Food Service Sanitation, attached to Ordinance 85-30 and identified as Exhibit "B", is adopted by reference. A copy of WAC 248-84 shall be kept on file in the Tacoma-Pierce County Health Department and the office of the Pierce County Council. (Ord. 85-30 § 2 (part), 1985)

8.12.020 Authority of Health Department.

The Tacoma-Pierce County Health Department is empowered and shall write rules and regulations not inconsistent herewith relative to this Chapter. (Ord. 85-30 § 2 (part), 1985)

Chapter 8.16

SMOKING IN PUBLIC PLACES

Sections:

8.16.010 Definitions.
8.16.020 Prohibitions - Public Places.
8.16.030 Prohibitions - Restaurants.
8.16.040 Designation of Smoking Areas.
8.16.050 Criteria in Determining Smoking Areas.
8.16.060 Single Room Public Place.
8.16.070 Duties of Proprietors, Employers, and Other Persons Having Control.
8.16.090 County Workplaces and Non-County Office Workplaces to Adopt Smoking Policies.
8.16.100 Unlawful to Remove Signs.
8.16.110 Health Department Adoption of Rules and Regulations.
8.16.120 Penalties and Enforcement.
8.16.130 Private Actions.
8.16.140 Severability.
8.16.150 Retaliation Prohibited.
8.16.160 Violation - Retaliation.
8.16.170 Severability.

8.16.010 Definitions.

As used in this Chapter, the following terms have the meanings indicated unless the context clearly requires otherwise:

A. "Cocktail lounge" means that portion of an establishment holding a current and valid Class H license issued by the State of Washington Liquor Control Board which is specifically set aside for the sale and consumption of liquor by the glass and separated by a divider from that portion of the establishment principally serving meals on a regular basis to the public.

B. "County workplace" means a workplace lawfully occupied by County employees for the conduct of the business of any of Pierce County's elected or appointed officials and under the authority of such official.

C. "Employee" means any person who is employed by any employer in consideration for direct or indirect monetary wages or profit.

D. "Employer" means any person who pays another person direct or indirect monetary wages or profit in consideration for such other person providing services on the premises of the employer.

E. "Office workplace" means any enclosed area of a structure or portion thereof intended for occupancy by business or governmental entities which provide primarily clerical, professional, or business services of the business entity, or which provide primarily clerical, professional or business services to other business entities or to the public, at that location. "Office workplace" includes, but is not limited to, office spaces in office buildings, medical offices, libraries, museums, hospitals, and nursing homes and all other entities included in definitions E. and F. of this Section, but excluding:

1. Private, enclosed offices occupied exclusively by smokers even though such offices may be visited by nonsmokers;
2. A private home which may serve as an office workplace;
3. Any property owned or leased by state or federal entities.

F. "Public meeting" includes all meetings open to the public pursuant to RCW 42.30.010 et seq.

G. "Public place" means any enclosed indoor area or vehicle used by and open to, the public regardless of whether such building or vehicle is owned in whole or in part by a private person or entities or by Pierce County or other public entity, and regardless of whether a fee is charged for admission to the place. It includes, but is not limited to: elevators, public conveyances, museums, concert halls, theaters, hallways, auditoriums, exhibition halls, indoor sports arenas, bowling centers, hospitals, nursing homes, medical, dental, or health care facilities, enclosed shopping centers, retail stores, retail service establishments, financial institutions, educational facilities, public meetings or hearings, public transportation facilities, ticket areas, public restrooms, libraries, restaurants, waiting areas, lobbies, and reception areas.

H. "Restaurant" means any building, structure, or area used as, maintained as, or advertised as, or held out to the public to be an enclosure where meals, for consideration of payment, are made available to be consumed on the premises.

I. "Smoke" or "smoking" includes the carrying or smoking of a lighted pipe, cigar, cigarette, or any other lighted smoking equipment.

J. "Tavern" means any establishment or portion of an establishment where one can purchase and consume alcoholic beverages, but excluding any such establishment or portion of the establishment having tables and seating facilities for serving meals and where, in consideration of payment, meals are served on a regular basis to the public.

(Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.010)

8.16.020 Prohibitions - Public Places.

No person shall smoke in a public place, County workplace, or at a public meeting except in designated smoking areas. This prohibition does not apply in the following cases:

A. Where an entire room or hall is used for a private social function and seating arrangements are under the control of the sponsor of the function and not of the proprietor or person in charge of the place;

B. Chartered buses for private hire and taxicabs clearly designated by the operator to permit smoking.

(Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.015(A))

8.16.030 Prohibitions - Restaurants.

Restaurants shall provide food service seating areas where smoking will not be permitted. No person shall smoke in restaurants in a "no smoking designated area." (Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code 20.10.015(B))

8.16.040 Designation of Smoking Areas.

Smoking areas may be designated in public places, and County workplaces, by the proprietor or other person in charge of the place except that designated smoking areas shall not be allowed in:

A. Elevators, public conveyances, health care clinics, public meetings or libraries that are open to the public; or
B. Other places already prohibited by other rule, ordinance or regulation.

(Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.020(A))

8.16.050 Criteria in Determining Smoking Areas.

Where smoking areas are designated, existing physical barriers and ventilation systems shall be used to minimize the toxic effect of smoke in adjacent nonsmoking areas. The size of the designated smoking area shall not be more than proportionate to the preference of the users specifically requesting the smoking area, as can be demonstrated by the proprietor or other person in charge. (Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.020(B))

8.16.060 Single Room Public Place.

In the case of public places consisting of a single room, the provisions of this law shall be considered met if a portion of the room is reserved and posted as a Designated Smoking Area. No public place, restaurant or County workplace, other than a cocktail lounge, tavern, or bowling center, shall be designated as a smoking area in its entirety. If a cocktail lounge, tavern, or bowling center is designated as a smoking area in its entirety, this designation shall be posted conspicuously on all entrances normally used by the public. (Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.020(C))

8.16.070 Duties of Proprietors, Employers, and Other Persons Having Control.

Proprietors, employers, or other persons having control of a place regulated under this Chapter shall make every reasonable effort to prohibit smoking in public places, County workplaces, public meetings and no smoking areas in restaurants by:

A. Posting signs prohibiting or permitting smoking as appropriate under this Chapter. Signs shall be posted conspicuously at each entrance and in prominent locations throughout the place. The boundary between a regular and Smoking Designated Area shall be clearly designated so that persons may differentiate between the two areas;
B. Proprietors and employees of restaurants shall make every reasonable effort to inform patrons that designated nonsmoking areas are available for their preference, including but not limited to posting signs not less than three inches by eight inches in a conspicuous place in the reception area informing patrons of dining areas available for nonsmokers;
C. Requesting that persons smoke only in Smoking Designated Areas;
D. Asking smokers to refrain from smoking upon request of a client, patron, or employee suffering discomfort from the smoke;
E. Informing the public and/or employees orally that separate smoking and nonsmoking sections are available; or
F. Any other means which may be appropriate.

(Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.025(A))

8.16.090 County Workplaces and Non-County Office Workplaces to Adopt Smoking Policies.

A. Each non-County employer who operates a workplace in unincorporated Pierce County and each of Pierce County's elected and appointed officials shall, within three months of adoption of the ordinance codified in this Chapter, adopt, implement and maintain a written smoking policy which shall be conspicuously posted in all workplaces under the employer's jurisdiction and which shall contain, at a minimum, the following provisions and requirements:

1. Any nonsmoking employee may object to his or her employer about smoke in his or her workplace. The employer shall attempt to reach reasonable accommodation, insofar as possible, between the preferences of nonsmoking and smoking employees. However, an employer is not required by this ordinance to make any expenditures or structural changes to accommodate the preferences of nonsmoking and smoking employees.
2. If an accommodation which is satisfactory to all affected nonsmoking employees cannot be reached in any given office workplace, the preferences of nonsmoking employees shall prevail and the employer shall prohibit smoking in the workplace of the affected nonsmoking employees to the end that those employees may work in a smoke-free environment. Where the employer prohibits smoking in a non-County office workplace, the area in which smoking is prohibited shall be clearly marked with signs.

B. The smoking policy shall be announced within three weeks of adoption to all employees working in non-County office workplaces in unincorporated Pierce County and County workplaces as defined in Section 8.16.010 B. of this Chapter. The policy shall be posted conspicuously in all workplaces under the employer's or official's jurisdiction.

(Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.030)

8.16.100 Unlawful to Remove Signs.

It is unlawful for any person to remove, deface, or destroy any sign posted in compliance with this Chapter. (Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.035)

8.16.110 Health Department Adoption of Rules and Regulations.

The Tacoma-Pierce County Board of Health shall adopt rules and regulations necessary and reasonable to implement the provisions of this Chapter. (Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.040)

8.16.120 Penalties and Enforcement.

A. Warnings and Civil Fines. When violations of this Chapter occur, a warning shall first be given to the person or persons violating this Chapter. Any subsequent violation shall subject the offender to a civil fine as provided for in this Section.

Any person violating this Chapter by smoking in a place in which smoking is prohibited herein or by removing, defacing or destroying any sign posted in compliance with this Chapter is subject to a civil fine of up to $100.00. The Pierce County Sheriff's Department shall enforce this Section by issuing a notice of infraction to be assessed in the same manner as traffic infractions.

1. The provisions contained in RCW Chapter 46.63 for the disposition of traffic infractions apply to the disposition of infractions for violations of this subsection except as follows:
   a. The provisions in RCW Chapter 46.63 relating to the provision of records to the Department of Licensing in accordance with RCW 46.20.270 are not applicable to this Chapter; and
   b. The provisions in RCW Chapter 46.63 relating to the imposition of sanctions against a person's driver's license or vehicle license are not applicable to this Chapter;
   c. The form for the notice of infraction for a violation of this subsection shall be prescribed by rule of the Supreme Court.
2. Any proprietor, employer, or other person intentionally violating this act by not complying with its Section may be subject to a civil fine of up to $500.00, which penalty shall be assessed and recovered in a civil action brought in the name of the people of the County of Pierce in any court of competent jurisdiction. Each day upon which a violation occurs or is permitted to continue constitutes a separate violation. The Tacoma-Pierce County Health Department shall enforce this Chapter by either of the following actions:
   a. Serving notice requiring the correction of any violation;
   b. Calling upon the County Prosecutor to maintain an action to assess and recover a civil penalty for the violation.

B. Enforcement. The Tacoma-Pierce County Health Department shall have primary compliance and enforcement responsibility for the provisions of this Chapter and shall coordinate compliance and enforcement with the Pierce County Fire Marshal when necessary.

C. In undertaking the enforcement of this Chapter, Pierce County is assuming and undertaking only to promote the general welfare. It is not assuming, nor is it imposing on its officers and employees, an obligation for breach of which it is liable in money damages to any person who claims that such breach proximately caused injury.

(Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.045)

8.16.130 Private Actions.

Nothing in this Chapter shall be construed as prohibiting a private person or organization from bringing an action to enjoin violations of this Chapter. (Ord. 86-36 § 1 (part), 1986; Ord. 84-155 § 1 (part), 1984; prior Code § 20.10.050)

8.16.140 Severability.

If any provision of this Chapter or its application to any person or circumstance is held unconstitutional or invalid for any reason, the remainder of the Chapter or the application of the provision to other persons or circumstances shall not be affected. (Ord. 86-36 § 1 (part), 1986)

8.16.150 Retaliation Prohibited.

It shall be unlawful for an employer, proprietor, County or other person having control of a place regulated under this Chapter to retaliate against any member of the general public or an employee or applicant for employment of the employer, proprietor, County or other person having control because such person seeks enforcement of the provisions of this Chapter. (Ord. 86-36 § 1 (part), 1986)

8.16.160 Violation - Retaliation.

Violation of any of the provisions of this Chapter shall be remedied through appropriate private civil action filed in a court of competent jurisdiction against persons who commit the violations for injunctive or other appropriate relief. (Ord. 86-36 § 1 (part), 1986)

8.16.170 Severability.

If any provision of this Chapter or its application to any person or circumstance is held invalid, the remainder of the Chapter or the application of the provision to other persons or circumstances shall not be affected. (Ord. 89-155 § 11, 1989)

Chapter 8.20

RODENT CONTROL

Sections:

8.20.010 Compliance Required.
8.20.020 Construction Requirements.
8.20.030 Sanitation Requirements.
8.20.040 Rat Traps.
8.20.050 Poisons.
8.20.060 Protection of Food Products.
8.20.070 Protection of Docks.
8.20.080 Watercraft to be Breasted - Rat Guard Use.
8.20.090 Gangplanks to be Withdrawn - Exception.
8.20.100 Responsibility of Officer in Charge of Watercraft.
8.20.110 Slaughterhouses.
8.20.120 Inspections.
8.20.130 Violation - Penalty.

Cross-reference: Chapter 17.16 RCW

8.20.010 Compliance Required.

It is unlawful for any person to keep, store or expose for sale any food products or other goods, or to occupy or maintain any dock, building, storeroom or warehouse or to reside in any residence without complying with the provisions of this Chapter. (Prior Code § 20.24.010)

8.20.020 Construction Requirements.

All basements and walls of all buildings, storerooms, warehouses and residences within the County shall be so constructed, or repaired by the use of screens, nettings, cement or other material or materials approved by the Director of Health as to prevent rats from gaining entrance to or harboring beneath the same. (Prior Code § 20.24.020)

8.20.030 Sanitation Requirements.

All docks, buildings, storerooms, warehouses and residences within the County shall be forthwith placed in a clean and sanitary condition and rendered free from rats. It shall be the duty of the owner, lessee or occupant thereof to take all necessary steps to that end. (Prior Code § 20.24.030)

8.20.040 Rat Traps.

All docks, buildings, storerooms, warehouses and residences shall be provided by the owner, lessee or occupant thereof with such number of rat traps of a pattern approved by the Director of Health as may be ordered by the Director of Health and shall be inspected by the owner, lessee or occupant daily and any rat or rats caught therein removed therefrom. (Prior Code § 20.24.040)

8.20.050 Poisons.

Poisons, suitable for the extermination of rats, will be placed at or in docks, buildings, storerooms, warehouses and residences when the Director of Health shall determine that a need exists for the placing of such poisons. It shall be the duty of each owner, lessee, or occupant of such dock, building, storeroom, warehouse or residence to comply with all orders and directives of the Director of Health regarding the placing of poisons and the type to be used. (Prior Code § 20.24.050)

8.20.060 Protection of Food Products.

All food products or other goods, whether kept for sale or for any other purpose, shall be so protected as to prevent rats from gaining access thereto or coming in contact therewith. (Prior Code § 20.24.060)

8.20.070 Protection of Docks.

All public and private docks in the County shall be protected by wire screens or netting, or other materials approved by the Director of Health, and so installed as to prevent rats from gaining entrance thereto, at either high or low tide, from vessels anchored or moored alongside, or from other sources, and all food products stored therein shall be so kept and stored as to prevent rats from gaining access thereto or coming in contact therewith. (Prior Code § 20.24.070)

8.20.080 Watercraft to be Breasted - Rat Guard Use.

All watercraft while lying at any dock or wharf in the County shall, except when loading or unloading, be breasted off from such dock or wharf at least six feet and so remain; and while so remaining metal rat guards shall be placed and kept on each and every line or spar passing from such watercraft to such dock or wharf. (Prior Code § 20.24.080)

8.20.090 Gangplanks to be Withdrawn - Exception.

All gangplanks, slings and other appliances running from such watercraft to such dock or wharf whereby rats might pass from such watercraft to such dock or wharf, shall be withdrawn when not in actual use in loading or unloading freight or passengers, or shall be suitably guarded to prevent the passage of rats; provided, that watercraft plying between ports in the State of Washington only need not comply with the requirements of this Section when at such dock or wharf for less than one hour between the hours of 7 a.m. and 6 p.m. (Prior Code § 20.24.090)

8.20.100 Responsibility of Officer in Charge of Watercraft.

The captain or other officer in control of such watercraft, and the owner, lessee, manager or other person in charge of such dock or wharf, shall be responsible for the breasting of such watercraft and the placing of such rat guards and for the compliance of such watercraft with all the provisions of this Chapter. (Prior Code § 20.24.100)

8.20.110 Slaughterhouses.

All slaughterhouses in the County shall be so protected by wire screens or netting or cement, as to prevent rats from gaining access to the building or buildings thereof and all holes and openings in the building or basement walls shall be thoroughly stopped with cement, or

other approved material, and all food products stored in slaughterhouses shall be so kept as to prevent rats from gaining access thereto or coming in contact therewith. (Prior Code § 20.24.110)

8.20.120 Inspections.

The Director of Health and all inspectors or employees of the Department of Public Health of the County shall at all reasonable times have and be granted access to any premises, dock, building, storeroom, warehouse or residence for the purpose of inspecting same and of ascertaining whether the provisions of this Chapter have been complied with. (Prior Code § 20.24.180)

8.20.130 Violation - Penalty.

Any person violating any of the provisions of this Chapter shall be guilty of a misdemeanor and upon conviction thereof shall be fined in any sum not exceeding $300.00 or imprisoned in the County jail for a term not exceeding 90 days, or both, in the discretion of the court. (Prior Code § 20.24.200)

Chapter 8.24

WEED CONTROL

Sections:

8.24.010 Activation of Weed Control Board.
8.24.020 Jurisdictional Boundaries.
8.24.030 County Divided into Sections.
8.24.040 Selection of Board Members.
8.24.050 Official Business of Board.
8.24.060 Submission of Budget.
8.24.070 Collection of Real Property Lien - Interest.

Cross-references: Chapters 17.10, 84.64 RCW

8.24.010 Activation of Weed Control Board.

The Pierce County Noxious Weed Control Board is activated, pursuant to RCW 17.10.040. (Ord. 84-92 § 2 (part), 1984; prior Code § 20.20.010)

8.24.020 Jurisdictional Boundaries.

The jurisdictional boundaries of the Noxious Weed Control Board shall be coextensive with the boundaries of the County, pursuant to RCW 17.10.020. (Ord. 84-92 § 2 (part), 1984; prior Code § 20.20.020)

8.24.030 County Divided into Sections.

Pierce County is divided into five sections pursuant to RCW 17.10.050, as shown on Exhibit "B" attached to Ordinance 84-92 and by this reference incorporated in this Chapter. A map and legal description designating the boundaries of the five sections shall be kept on file in the office of the Noxious Weed Control Board. (Ord. 84-92 § 2 (part), 1984; prior Code § 20.20.030)

8.24.040 Selection of Board Members.

The Board shall consist of five voting and one nonvoting member. One voting member shall be elected from each of the five sections. The nonvoting member shall be the Chief County Extension Agent or an Extension Agent appointed by the Chief County Extension Agent. (Ord. 84-92 § 2 (part), 1984; prior Code § 20.20.040)

8.24.050 Official Business of Board.

The Noxious Weed Control Board shall conduct its official business in accordance with RCW 17.10 and other applicable laws. (Ord. 84-92 § 2 (part), 1984; prior Code § 20.20.050)

8.24.060 Submission of Budget.

The Board shall submit a budget for the operation of the Pierce County Noxious Weed Control Program each year in accordance with regular County budget procedures. (Ord. 84-92 § 2 (part), 1984; prior Code § 20.20.060)

8.24.070 Collection of Real Property Lien - Interest.

A. Every real property lien created under RCW 17.10.170(3) shall be collected by the Assessor-Treasurer in the same manner as a delinquent real property tax according to RCW Chapter 84.64, if within 30 days from the date the owner is sent notice of the lien, including the amount thereof, the lien remains unpaid and an appeal has not been made pursuant to RCW 17.10.180.

B. Liens treated as delinquent taxes shall bear interest at the rate of 12 percent per annum and such interest shall accrue as of the date notice of the lien is sent to the property owner.

(Ord. 89-164S § 3, 1989)

Chapter 8.26

RECYCLED PAPER AND PAPER PRODUCTS PROCUREMENT PROGRAM

Sections:

8.26.010 Purpose.
8.26.020 Definitions.
8.26.030 Goals and Procedures to Maximize Use of Products.
8.26.040 Minimum Content Standards.
8.26.050 Adjustments to Bid Price for Evaluation of Individual Product Meeting Minimum Content Standards.
8.26.060 Annual Report.
8.26.070 Responsibilities and Reporting Requirements of County Departments.
8.26.080 Responsibilities of the Solid Waste Division of the Utilities Department.
8.26.090 Responsibilities of the Purchasing Agent.
8.26.100 Exemptions.
8.26.110 Severability.

8.26.010 Purpose.

In order to stimulate the demand for and development of markets for recycled paper and paper products, Pierce County establishes purchasing requirements for paper and paper products by County departments and contractors, as defined in this Chapter. (Ord. 90-129S § 1 (part), 1990)

8.26.020 Definitions.

The following definitions shall apply to this Chapter:

A. "Contractor" means any person, group of persons, association, partnership, corporation, or other type of business entity which has a contract with Pierce County or which serves in a subcontracting capacity with an entity having a contract with Pierce County for the provision of goods and/or services.

B. "Department" shall refer to any department as defined by Pierce County ordinance or other applicable law and shall include all County agencies not associated with a department. These agencies shall similarly discharge those duties this Chapter requires of departments and shall include the Pierce County Prosecuting Attorney, the Pierce County Assessor-Treasurer, the Pierce County Auditor, and the Pierce County Council.

C. "Director" means the director of a County department or his or her designee.

D. "Paper and paper products" means all items manufactured from paper or paperboard.

E. "Post-consumer paper material" means paper, paperboard and fibrous wastes, including corrugated boxes, newspapers, magazines, mixed waste paper, tabulating cards, and used cordage from places such as retail stores, office buildings, and homes after the point at which they have passed through their end use as consumer items.

F. "Purchasing contract" means any contract or bid which is awarded by the County for the purchase of tangible goods.

G. "Recovered paper material" means paper waste generated after completion of a paper-making process, such as post-consumer material, envelope cuttings, bindery trimmings, printing waste, cutting and other converting waste, butt rolls, and mill wrappers, obsolete inventories, and rejected unused stock. Recovered paper material, however, shall not include fibrous waste generated during the manufacturing process such as fibers recovered from waste water or trimmings of paper machine rolls (mill broke), or fibrous by-products of harvesting, extractive or woodcutting processes, or forest residue such as bark.

H. "Recycled paper and paper products" means paper and paper products containing a specified minimum percentage content of recovered paper material and/or post-consumer paper material as determined by the Director of Utilities.

(Ord. 90-129S § 1 (part), 1990)

8.26.030 Goals and Procedures to Maximize Use of Products.

A. Pierce County's goal for the procurement of recycled paper and paper products by County departments (expressed as a percentage of the total dollar volume of paper and paper products purchased by County departments) shall be: not less than 10 percent by the end of 1991, not less than 20 percent by the end of 1992, and not less than 60 percent by the end of 1995. Each County department shall be responsible for making its best effort to meet or exceed these goals.

B. All County departments must use recycled paper when ordering printed letterhead, envelopes, and business cards.

C. Departments shall publicize the County's use of recycled paper by printing the words, "Recycled Paper", in a highly visible place and in conjunction with the recycling logo, on all forms, reports, and other informational materials printed on recycled paper.

D. To reduce the volume of paper purchased, departments shall use both sides of paper sheets whenever practicable.

E. Pierce County shall encourage all contractors who have contracts with the County to use, whenever practicable, recycled paper and paper products, and shall request that all reports and documentation submitted to the County in fulfillment of contract obligations be printed on recycled paper whenever practicable.

F. Invitations to bid issued by the County 30 days after the effective date of this Chapter, for the purchase of tangible goods, shall contain no terms, requirements, or specifications prohibiting or discouraging the use of recycled paper and paper products unless it is clearly documented that the use of such products would be unacceptable for a specific situation.

(Ord. 90-129S § 1 (part), 1990)

8.26.040 Minimum Content Standards.

The Director of Utilities or the director's designee shall adopt minimum content standards for recycled paper and paper products. (Ord. 90-129S § 1 (part), 1990)

8.26.050 Adjustments to Bid Price for Evaluation of Individual Product Meeting Minimum Content Standards.

The County Purchasing Agent or his/her designee shall use a percentage factor of 10 percent in the process of determining the lowest responsive and responsible bid using the following procedures and evaluation criteria for purchase of paper products pursuant to invitations for bids issued 30 days after the effective date of this Chapter:

A. An item is qualified for the 10 percent price-preference if:
   1. The bidder requested a price preference for the item(s) on the bid; and
   2. The bidder has submitted a statement from the manufacturer certifying the recycled content of each product for which a preference is requested; and
   3. The recycled content meets the standards set forth by the Director of Utilities for minimum content of recycled paper and paper products.

B. Bids will be evaluated as follows:
   1. For each item that qualifies for price preference, subtract 10 percent to arrive at an "evaluated price" for that item; and
   2. Re-total the bid for that item substituting the "evaluated prices" for the bid prices; and
   3. Use the new total to determine the lowest price bid submitted. Ties are awarded to the recycled product.

C. Nothing contained in this Chapter shall preclude user departments from requiring post-consumer or recovered material content as a bid specification.

(Ord. 90-129S § 1 (part), 1990)

8.26.060 Annual Report.

The Solid Waste Division of the Utilities Department shall submit a report to the Executive and Council on an annual basis. This report shall include, at a minimum, a description of the procurement program for recycled paper and paper products, and an analysis of the ability of the program to meet the goals set forth in Section 8.26.030. (Ord. 90-129S § 1 (part), 1990)

8.26.070 Responsibilities and Reporting Requirements of County Departments.

All departments shall report to the Solid Waste Division of the Utilities Department the amount of recycled paper and paper products acquired annually. (Ord. 90-129S § 1 (part), 1990)

8.26.080 Responsibilities of the Solid Waste Division of the Utilities Department.

In addition to its other duties and responsibilities, the Solid Waste Division of the Utilities Department shall provide the following assistance to County departments, to other government agencies, and the public:

A. Provide information and technical assistance to local governments, schools, colleges, and other public and private organizations interested in purchasing recycled products;

B. Assist County departments in resolving issues concerning recycled paper, paper product performance, and marketability of the paper after use.

(Ord. 90-129S § 1 (part), 1990)

8.26.090 Responsibilities of the Purchasing Agent.

The Purchasing Agent is responsible for revising and/or amending standard bid documents and contract language where necessary to implement this Chapter. (Ord. 90-129S § 1 (part), 1990)

8.26.100 Exemptions.

Nothing in this Chapter shall be construed as a requirement that a department procure recycled paper and paper products which do not meet necessary time lines, or do not perform adequately for their intended use, or are not available at a price which conforms to the requirements of this Chapter. (Ord. 90-129S § 1 (part), 1990)

8.26.110 Severability.

Should any Section, subsection, paragraph, clause or phrase of this Chapter be declared unconstitutional or invalid for any reason, such decision shall not affect the validity of the remaining portion of this Chapter. (Ord. 90-129S § 1 (part), 1990)

Chapter 8.28

SOLID WASTE MANAGEMENT

Sections:

8.28.010 Adoption of Comprehensive Solid Waste Management Plan.
8.28.020 Review and Revision.
8.28.030 Copies Available.

Cross-reference: Chapter 70.95 RCW

8.28.010 Adoption of Comprehensive Solid Waste Management Plan.

Pursuant to the provisions of RCW Chapter 70.95, the Year 2000 Update to the Tacoma-Pierce County Solid Waste Management Plan is hereby adopted as the County's comprehensive solid waste management plan. (Ord. 2000-47s § 3 (part), 2000; Ord. 92-130 § 2 (part), 1992; Ord. 87-196 § 2 (part), 1989)

8.28.020 Review and Revision.

The Tacoma-Pierce County Solid Waste Management Plan shall be maintained, reviewed and revised as required periodically by RCW Chapter 70.95. All revisions for Pierce County shall be adopted by and through the ordinance procedure of the Pierce County Council. (Ord. 92-130 § 2 (part), 1992; Ord. 87-196 § 2 (part), 1989)

8.28.030 Copies Available.

The most recent version of the Tacoma-Pierce County Solid Waste Management Plan shall be available for inspection and copying at the offices of the Solid Waste Division of the Pierce County Department of Public Works & Utilities during normal business hours or shall be available for purchase for the cost of printing or as determined by the Pierce County Executive. (Ord. 2000-47s § 3 (part), 2000; Ord. 92-130 § 2 (part), 1992; Ord. 87-196 § 2 (part), 1989)

Chapter 8.30

SOLID WASTE HANDLING SYSTEM

Sections:

8.30.010 Definitions.
8.30.020 System of Solid Waste Handling Established and Authorization to Designate Sites.
8.30.030 Disposal of Solid Waste.
8.30.040 Regulations, Consistency and Procedure.
8.30.050 Unlawful Disposal of Solid Waste - Misdemeanor.
8.30.060 Severability.

8.30.010 Definitions.

As used in this Chapter, the following definitions shall apply:

A. "Cities" means the cities and towns within Pierce County that have authorized the County to designate Solid Waste Handling Facilities for Solid Waste that originates within those cities and towns.

B. "Comprehensive Solid Waste Management Plan" or "Plan" means the Tacoma-Pierce County Solid Waste Management Plan adopted by Pierce County by Ordinance No. 87-196, as it may be amended or superseded from time to time. The Plan is incorporated herein by this reference.

C. "County" means Pierce County, Washington.

D. "Director" means the Pierce County Director of Utilities or his/her successor in that position or in the position that is subsequently entrusted with substantially all of the responsibilities of the Director of Utilities. With respect to infectious waste, sludge, and septage, the term "Director" shall mean the Director of the Tacoma-Pierce County Health Department.

E. "Disposal Site" means disposal site as defined by RCW 70.95.030 and including but not limited to landfill, composting, and energy recovery sites.

F. "Hazardous Waste" means any waste, material, or substance that now or hereafter:

1. Is required to be handled as hazardous waste under regulations promulgated by the U.S. Environmental Protection Agency at 40 CFR part 261; or
2. Contains a radioactive material, the storage or disposal of which is regulated by state or federal law or regulation; or
3. Is designated a "dangerous waste" through application of regulations adopted pursuant to Chapter 70.105 RCW; and is not excluded from regulation as "hazardous waste" or "dangerous waste" by application of hazardous waste or dangerous waste regulations adopted by U.S. Environmental Protection Agency or Washington State Department of Ecology. Certain Solid Waste which is not as of the effective date of this Chapter within one or more of subparagraphs 1.-3. above, may after that date come within the scope of one or more of those subparagraphs as determined by a governmental entity with jurisdiction; certain other Solid Waste which is within one of those subparagraphs similarly may cease to be recognized as a Hazardous Waste as defined herein. Accordingly, any waste, material, or substance shall be deemed Hazardous Waste only so long as and to the extent that it is included in at least one of subparagraphs 1.-3. above.

G. "Operator" means any Person with whom the County contracts for the design, construction, ownership, operation, or maintenance of any Solid Waste Handling Facility.
H. "Person" means an individual, firm, association, partnership, political subdivision, government agency, municipality, public or private corporation, cooperative, or any other entity whatsoever.
I. "Recyclable Materials" means recyclable materials as defined by RCW 70.95.030.
J. "Recycling" means Recycling as defined by RCW 70.95.030.
K. "Solid Waste" means solid waste as defined by RCW 70.95.030, with the exception of Hazardous Waste.
L. "Solid Waste Handling," "Handling" or "Handled" means solid waste handling as defined by RCW 70.95.030.
M. "Solid Waste Handling Facility" or "Facility" means any facility for Solid Waste Handling, including but not limited to Recycling drop-off and/or buy-back centers, processing facilities, composting sites, drop boxes, transfer stations, landfills, waste-to-energy facilities and other processing sites, disposal sites and facilities. This term does not include and this Chapter shall not be applicable to: (1) vehicles or other equipment used in the transportation of Solid Waste, or (2) transfer stations that are not open to the public and that are owned and/or operated by and utilized exclusively by a Solid Waste Collection Company for its own vehicles or operations. However, Solid Waste emanating from such transfer stations shall be subject to this Chapter.
N. "System" means the system of Solid Waste Handling established by Pierce County Code 8.30.020.
O. "Washington Utilities and Transportation Commission" or "WUTC" means the Washington Utilities and Transportation Commission created under Chapter 81.01 RCW.

(Ord. 90-4 § 1 (part), 1990)

8.30.020 System of Solid Waste Handling Established, and Authorization to Designate Sites.

A. This Chapter establishes a System of Solid Waste Handling for all unincorporated areas of the County in accordance with RCW 36.58.040 and the Comprehensive Solid Waste Management Plan. In accordance with that Plan, the System includes the reduction, processing, recycling, and disposal of Solid Waste as well as Solid Waste Handling Facilities and the designation of Facilities as disposal sites. The System may include the Handling of some or all of the Solid Waste originating in Cities or outside the County. The System shall not include the disposal of hazardous waste.
B. The System includes, but is not limited to, the following Solid Waste Facilities, strategies, and programs:
    1. Waste Reduction, including education, legislative changes, rate policies aimed at reducing the Solid Waste stream, on-site yard waste composting, and other elements consistent with the Comprehensive Solid Waste Management Plan.
    2. Recycling, including education, curbside collection, yard waste composting, drop-off and buy-back facilities, processing systems, market development, and other elements consistent with the Comprehensive Solid Waste Management Plan.
    3. Solid Waste Collection, including municipal collection, municipally-regulated private collection, and WUTC-regulated private collection, as applicable.

4. Solid Waste processing technologies including, where appropriate, waste-to-energy and composting facilities located in the County.
5. Transfer and long haul, including intra-County transfer and, when other disposal options are limited or unavailable, out-of-County long haul and disposal.
6. Landfilling and volume reduction.
7. Enforcement and Administration by the County to manage the system in a cost-effective and environmentally sound manner.
8. Special waste stream management, including special facilities or other methods of handling the following special wastes:
   a. sludge
   b. septic tank pumpings
   c. demolition wastes
   d. wood wastes
   e. industrial wastes
   f. waste tires
   g. litter
   h. infectious wastes
   i. dredge spoils
   j. ash
   k. gypsum
   l. appliances
   m. waste oil
   n. auto batteries
   o. dry cell household batteries
   p. plastics
   q. plastics
   r. textiles
   s. refuse derived fuel
9. Other Facilities, strategies, and programs consistent with this Chapter and the Comprehensive Solid Waste Management Plan.

C. Each element of the System shall be implemented in accordance with the Comprehensive Solid Waste Management Plan, ordinances and resolutions enacted by the Council to further implement that Plan, applicable contracts heretofore or hereafter entered into between or among the County, Cities, other governmental entities and Operators, and applicable local, state, and federal law. In addition, the System and each element thereof, shall be implemented, as applicable, in accordance with the priorities set forth in RCW 70.95.010, as it may hereafter be amended, currently:
   1. Waste reduction;
   2. Recycling, with source separation of recyclable materials as the preferred method;
   3. Energy recovery, incineration, or landfill of separated waste;
   4. Energy recovery, incineration, or landfilling of mixed wastes.

D. The Director shall designate Solid Waste Handling Facilities for Solid Waste that:
   1. Originates within the unincorporated areas of the County (except McChord Air Force Base and the Fort Lewis Military Reservation);
   2. Originates within a City that has authorized the County to designate Solid Waste Handling Facilities for that City's Solid Waste; or
   3. Originates outside the County and is allowed to be Handled in the unincorporated area of the County by applicable ordinance, regulation, contract with an Operator, or the Director's emergency authorization, as provided in Section 8.30.020 E.
      The designation by the Director of each such Facility shall specify:
      a. The location of the Facility and the name and address of the Person operating the Facility;
      b. the type, origin, and volume of Solid Waste which shall or may be Handled at such Facility;
      c. the Persons who may deliver Solid Waste to each such Facility; and

d. the manner of conveyance and time for delivery of Solid Waste to each such Facility.

If the owner or operator of the Facility is an Operator as defined in this Chapter, the designation shall be as required by, or otherwise be consistent with, the County's contract with the Operator.

The Director may designate a Solid Waste Handling Facility prior to its construction or receipt of permits necessary for its operation, except that the provisions of Section 8.30.030 shall not be effective with respect to that Facility unless and until it is capable of Handling Solid Waste. Furthermore, no such designation shall release any Operator from the responsibility of complying with all applicable local, state, and federal laws and regulations.

E. Upon a finding that it is necessary for the immediate preservation of the public health or safety, the Director shall immediately notify the Chair of the County Council of such emergency, and may, for periods no longer than 60 consecutive days, designate additional or alternative Facilities that do not comply with all of the requirements of this Chapter. The authority of the Director to so designate additional or alternative Facilities under this subsection, and the exercise of that authority, shall not excuse any breach of the terms or conditions of any applicable contract with an Operator.

F. Except as provided in 8.30.020 E., Solid Waste referred to in 8.30.020 D.1., 2. or 3., shall not be diverted from the Solid Waste Handling Facilities designated by the Director, or handled at any other location or Facility, unless that diversion or Handling is made by an Operator, a City or other governmental entity or as otherwise approved by the Director in accordance with any contract between the County and the Operator of the Facility from which Solid Waste is being diverted.

G. An operator may require as a condition to the delivery or disposal of Solid Waste that a Person delivering or disposing of Solid Waste at that Operator's Facility enter into an agreement with the Operator which concerns the following:

1. The nature of the Solid Waste to be Handled;
2. The time, means, and manner of delivery;
3. The prohibition of delivery or disposal of Hazardous Waste or other Solid Waste or materials not permitted to be Handled at that Facility;
4. The manner in which any Hazardous Waste or other non-permitted Solid Waste or materials shall be handled if delivered;
5. The cleanup of improperly Handled Solid Waste; the payment of fees and charges for services provided by that Facility;
6. Any financial security for payment (including but not limited to deposits, performance bonds or letters of credit) and the compliance with the Operator's rules;
7. And such other matters as may be approved by the Director or authorized by applicable contract with an Operator.

Any such agreement between an Operator and the user of that Operator's Facility shall be subject to any applicable contract between the County and that Operator and, further, subject to the approval of the Director unless the terms of such agreement have been approved by the County in connection with that Operator's contract with the County, in which case the approval of the Director shall not be required.

This subsection 8.30.020 G. does not limit the ability of an Operator to set fees and charges for the Handling of Solid Waste which is permitted but not required to be disposed of at such Facility except as may be provided in a contract between such Operator and the County.

H. An Operator may impose such rules and regulations as it deems necessary and appropriate governing the Handling of Solid Waste at its Facility and the price, terms, method, and time of payment for services and other relevant matters, including but not limited to those matters described in 8.30.020 G.

I. All persons disposing of or otherwise delivering Solid Waste at a Solid Waste Handling Facility shall pay, when due to the Operator of that Facility, the fees or charges established under the applicable contract between that Operator and the County and shall comply with the rules established by the Operator under 8.30.020 H. Subject to applicable law and any contract with the County, an Operator may, after giving reasonable notice to the County, take such actions as it deems necessary and appropriate to enforce those rules and collect those fees and charges, including prohibiting any Person from using that Facility due to nonpayment or noncompliance with the Operator's rules.

J. Facilities that Handle Recyclable Materials shall not be subject to the designation requirements of this Chapter unless such a facility is designated as a disposal site. However, Recyclable Material that is delivered initially to such a Facility and that ultimately is not recycled shall be subject to this Chapter. (Ord. 90-4 § 1 (part), 1990)

8.30.030 Disposal of Solid Waste.

A. It is unlawful for any Person to dispose of or otherwise Handle within the County any Solid Waste originating in the County or elsewhere, unless such disposal or Handling is
   1. consistent with and permitted by the Director's specific designation of the Facility disposing of or Handling such Solid Waste or is;
   2. expressly allowed by County ordinance or a contract between the County and an Operator, a City comprehensive solid waste management plan, or an interlocal agreement or;
   3. exempt pursuant to 8.30.020 J.

B. It is unlawful for any Person to deliver any material, article or substance which is not Solid Waste to any Facility for disposal or other Handling.

C. To the extent permitted by applicable law and in addition to the penalties and remedies provided herein, violation of the provisions of this Chapter shall also be grounds for revocation of licenses and permits, equitable relief, or such other remedies or actions necessary to carry out the purpose of this Chapter.

D. The appropriate officers and employees of the County are authorized to take all lawful actions reasonably available to enforce in a timely manner the provisions of Sections 8.30.020 and 8.30.030 against any Person violating the provisions of those Sections, including but not limited to,
   1. bringing a civil and/or criminal action against that Person and providing testimony and cooperation in the prosecution of that action;
   2. barring that Person from use of a Solid Waste Handling Facility;

3. requesting that the WUTC revoke that Person's certificate to collect or transport Solid Waste or Recyclable Material;
4. seeking equitable relief against that Person; and
5. any other legal remedy.

E. Nothing in this Section shall prohibit an individual from disposing of Solid Waste originating at his or her place of residence by his or her own activities onto or under the surface of ground owned or leased by him or her so long as that disposal does not violate any local, state, or federal law, or create a nuisance.

(Ord. 90-4 § 1 (part), 1990)

8.30.040 Regulations, Consistency and Procedure.

A. The Director is authorized to propose, in ordinance form, such regulations as he or she deems necessary to carry out the purposes of this Chapter.

B. The authority to propose regulations in ordinance form and to designate facilities provided to the Director in this Chapter shall be exercised consistent with the Comprehensive Solid Waste Management Plan, ordinances and resolutions enacted by the Council, contracts heretofore or hereafter entered into between or among the County, Cities, other governmental entities and Operators, and applicable local, state and federal law.

C. The Director shall use reasonable methods to inform the public and the Operator of the Facility and allow opportunity to comment upon proposed decisions to designate Facilities. The Director shall publish notices of proposed decisions to designate Facilities in a newspaper of general circulation in the County, City, or general area where the Facility is located, at least once a week for two consecutive weeks. The notices shall include the information described in 8.30.020 D. and a statement that the public is invited to comment on the proposed decision for a period of 30 days following the date of the last publication of notice and that the Director's proposed decision shall become final upon the expiration of the 30 day comment period unless modified by the Director within such comment period. If, for any reason, the Director modifies the proposed decision to designate during the comment period, notice of the modified decision shall be published in the same manner described in this Section and shall allow a 30 day comment period from the date of the last publication of notice of the modified decision. Upon expiration of the 30 day comment period, the Director shall file a record of the final decision to designate Facilities and proof of publication of notice with the County Auditor and with the Director of the Tacoma-Pierce County Health Department.

D. Any person who made a written request for designation of a Solid Waste Handling Facility and who was denied designation by a final decision of the Director made under 8.30.040 C. and who feels aggrieved by the Director's final decision may appeal that final decision as provided in this subparagraph.

1. Any appeal under this subparagraph shall be commenced by service of notice upon the Director within 15 days of the filing of the final decision. The notice must be a written, signed and notarized notice of appeal which sets forth the relevant facts. An appeal fee in the amount of $500.00 must be paid to the County at the time of service of a notice of appeal.

2. Any appeal under this subparagraph shall be heard by the Pierce County Hearing Examiner. The Examiner shall convene a hearing on the appeal at a time to be fixed at the Examiner's discretion, but no later than 60 days after service of the notice of appeal. The Director, or the Director's designee, shall receive documents from the appellant and shall prepare a report of the Director's final decision under appeal, shall prepare such additional materials as are relevant, and shall provide these materials to the Examiner five days prior to the hearing date.
3. The Examiner's written decision shall be final and conclusive unless an aggrieved party files an appropriate action in Superior Court and serves all necessary parties within 30 days of the Examiner's final decision. The Examiner's decision shall not be subject to reconsideration or to appeal to the County Council.

(Ord. 90-4 § 1 (part), 1990)

8.30.050 Unlawful Disposal of Solid Waste - Misdemeanor.

Every person who knowingly violates or fails to comply with Pierce County Code Chapter 8.30 is guilty of a misdemeanor. (Ord. 90-4 § 1 (part), 1990)

8.30.060 Severability.

If any provision of this Chapter or its application to any person or circumstances is held invalid, the remainder of the Chapter or the application of the provision to other persons or circumstances is not affected. (Ord. 90-4 § 1 (part), 1990)

Chapter 8.31

LITTER AND CLEAN-UP DISPOSAL CREDIT

Sections:

8.31.010 Purpose and Intent.
8.31.020 Definitions.
8.31.030 Implementation.
8.31.040 Eligibility and Uses.
8.31.050 Litter and Clean-Up Waste from County Departments, Cities, and Towns.
8.31.060 Litter Collected by Volunteer Organizations and Individuals.
8.31.070 Reporting.
8.31.080 Severability.

8.31.010 Purpose and Intent.

It is the purpose and intent of the Pierce County Council to establish a Pierce County Litter and Clean-Up Disposal Credit. This Credit will supplement existing litter control efforts of the Pierce County Department of Public Works and Utilities by enabling County Departments, Cities, Towns, and authorized individuals and groups to deliver Litter and Clean-Up Waste to Pierce County Disposal Sites free of charge. This partnership among the County, volunteer organizations, individuals, municipal agencies, and the County's solid waste handling vendor is intended to reduce litter and build civic pride in attaining the goal of a litter-free Pierce County. (Ord. 99-36S § 1 (part), 1999)

8.31.020 Definitions.

A. "Authorization Form" means a document prepared by the Solid Waste Division and completed and signed by the Solid Waste Manager and an Authorized Volunteer Organization or Individual which governs participation in the Credit authorized by this Chapter.

B. "Authorized Volunteer Organization or Individual" means an organization empowered by law to enter into contractual agreements, or an individual that has been deemed eligible by the Solid Waste Manager, pursuant to the requirements of this Chapter, to receive the Credit for Litter delivered to a Disposal Site.

C. "Clean-Up Waste" means Litter collected and disposed of per this Chapter by City or Towns or Contracted Solid Waste Haulers on behalf of Cities and Towns, and Solid Waste collected in Cities and Towns through special collection events which may be designated in a contract between a City or Town and its Contracted Solid Waste Hauler, but excludes Special Materials.

D. "Contracted Solid Waste Hauler" means a firm which collects and disposes of Solid Waste under contract with a City or Town.

E. "Credit" means the Litter and Clean-Up Disposal Credit whereby a portion of solid waste tipping fees is dedicated to paying for the disposal of Litter and Clean-up Waste.

F. "Disposal Site" means the Hidden Valley Transfer Station or the Purdy Transfer Station.

G. "Litter" means Solid Waste collected and disposed per this Chapter which includes packaging, glass, plastic, bottles, cans, and paper, and other materials commonly discarded on the roadside, but excludes waste generated by a household, business, or industry, and excludes Special Materials (as defined by this Chapter).
H. "Pierce County Solid Waste Disposal Services Area" means unincorporated Pierce County and any City or Town within Pierce County which has signed an Interlocal Agreement that allows Pierce County to designate waste disposal sites.
I. "Right-of-Way" means a strip of land held in an easement or separate tract which is occupied or dedicated to be occupied by a publicly or privately dedicated street, walkway, sidewalk, bikeway, equestrian trail, and other similar uses, but for the purposes of this Chapter, excludes railroads and property reserved for utilities and transmission lines.
J. "Solid Waste" means the same as in Chapter 70.95 RCW.
K. "Solid Waste Division" means the Solid Waste Division of the Department of Public Works and Utilities, or successor organization, responsible for solid waste management planning pursuant to Chapter 70.95 RCW.
L. "Solid Waste Manager" means the Manager of the Solid Waste Division, or designee.
M. "Special Materials" means the following types of Solid Waste: hazardous wastes, chemicals, and paint; automobile hulks; large appliances, furniture, and other items that are too bulky or too heavy to fit into a 30-gallon garbage bag; yardwaste, brush, leaves, and limbs; asbestos; industrial wastes not covered by Pierce County's Waste Handling Agreement; similarly named or characterized waste; and other Solid Waste designated by the Solid Waste Manager.
N. "Waste Handling Agreement" means a contract between Pierce County and another party that arranges for the disposal of Solid Waste generated within the Pierce County Solid Waste Disposal Services Area.

(Ord. 99-36S § 1 (part), 1999)

8.31.030 Implementation.

A. The Solid Waste Division will be the lead County Department to administer this Chapter.
B. The Solid Waste Division, when negotiating a Waste Handling Agreement, shall provide for the dedication of a portion of tipping fees to pay for the Credit.
C. The Solid Waste Manager shall monitor the amount of available Credit and authorize participation subject to the amount of available Credit and the requirements of this Chapter.
D. In authorizing use of the Credit, the Solid Waste Manager may place limits on the tonnage eligible to receive the Credit. The Solid Waste Manager may authorize use of the Credit for all, or only part, of the disposal cost of Litter or Clean-Up Waste delivered to Disposal Sites.
E. This Chapter does not authorize the Solid Waste Division to collect Litter or Clean-Up Waste, to enter into contracts for collection programs, or to fund the collection of Litter or Clean-Up Waste.

(Ord. 99-36S § 1 (part), 1999)

8.31.040 Eligibility and Uses.

A. The primary use of the Credit shall be to fund the disposal of Litter and Clean-Up Waste collected as part of the following programs: the Pierce County Adopt-a-Road, Adopt-a-Trail, and Adopt-a-Park Programs; Adopt-a-Stream Programs located in unincorporated Pierce County; Litter removal programs conducted or coordinated by any Pierce County agency or by a City or Town; Clean-Up programs conducted for a City or Town by its Contracted Solid Waste Hauler; and other similar programs as designated by the Solid Waste Manager. Use of the Credit to fund the disposal of Litter and Clean-Up Waste from these programs is subject to the requirements of PCC 8.31.050.

B. The secondary use of the Credit shall be to fund the disposal of Litter collected by an Authorized Volunteer Organization or Individual from unincorporated Pierce County, subject to the requirements of PCC 8.31.060.

(Ord. 99-36S § 1 (part), 1999)

8.31.050 Litter and Clean-Up Waste from County Departments, Cities, and Towns.

A. The Solid Waste Division shall enter into a written agreement, which may be in the form of a letter from the Solid Waste Manager, with the County agencies that coordinate the Adopt-a-Road, Adopt-a-Trail, and Adopt-a-Parks programs and with those agencies which conduct roadside and right-of-way litter removal activities. This agreement shall ensure that wastes delivered to Disposal Sites meet the definition of Litter as provided in this Chapter and that the Credit is properly applied to those wastes. This agreement shall include procedures to handle requests forwarded by the Solid Waste Division pursuant to PCC 8.31.060 D.1. and may include tonnage limits pursuant to PCC 8.31.030 D.

B. The Solid Waste Division shall enter into a written agreements, which may be in the form of a letter from the Solid Waste Manager, with each City or Town. These agreements shall ensure that wastes delivered to Disposal Sites meet the definition of Clean-Up Waste as provided in this Chapter and that the Credit is properly applied to those wastes. These agreements may include tonnage limits pursuant to PCC 8.31.030 D. Cities and Towns shall designate a City or Town agency or the Contracted Solid Waste Hauler to act as liaison with the Solid Waste Division to carry out the responsibilities outlined in this Chapter.

(Ord. 99-36S § 1 (part), 1999)

8.31.060 Litter Collected by Volunteer Organizations and Individuals.

A. To implement this Chapter in unincorporated Pierce County, the Solid Waste Division shall provide standardized application forms which shall notify prospective participants of the risks and responsibilities of the County and of the volunteer groups, and shall include a copy of this Chapter.

B. Upon receiving a request from an applicant seeking to be named as an Authorized Volunteer Organization or Individual, and before granting such authorization, the Solid Waste Manager will determine whether:

1. the applicant has complied with the terms of any previous Authorization Forms (those that have not shall not be eligible for a period of three years);
2. there is sufficient credit available to provide for disposal of the estimated volume of Litter to be collected; and

3. the location of the proposed Litter collection activity meets the priorities established in PCC 8.31.060 C.

C. The Solid Waste Manager will authorize requests based upon the location of the Litter and the priorities set in this subsection. The Solid Waste Manager will authorize Priority 2 and 3 locations only if it can be determined that sufficient resources exist to meet all estimated annual volumes for Priority 1 locations.
   1. Priority 1: The Right-of-Way, as defined in this Chapter, and other County-owned or maintained properties.
   2. Priority 2: Other public properties, such those owned by schools; except those properties excluded in PCC 8.31.060 C.4.
   3. Priority 3: Private properties that are open and available for public use if the Solid Waste Manager determines there is a definable public purpose to having the Credit fund disposal, such as addressing an immediate threat to human health or the environment, and there is no other legal means to fund disposal; except those properties excluded in PCC 8.31.060 C.4.
   4. Priority 2 and 3 locations exclude properties owned, managed, administered, controlled, or maintained by: public or private utilities; public and quasi-public corporations which charge rents, levy taxes, or charge fees for admission or service; any City, Town, State or Federal government agency; timber resource companies; or railroads.

D. After considering the requirements of PCC 8.31.060 A. through C., the Solid Waste Manager may identify an applicant as an Authorized Volunteer Organization or Individual.
   1. If the applicant seeks to remove Litter from a Priority 1 site, the request shall be forwarded to the County agency which controls or manages the property. That agency is responsible for approving or denying the request, for monitoring the activities of the Authorized Volunteer Organization or Individual, and for arranging for the delivery of the Litter to Disposal Sites.
   2. If the applicant seeks to remove Litter from a Priority 2 or 3 site, the Solid Waste Division and the Authorized Volunteer Organization or Individual shall comply with the requirements of PCC 8.31.060 E. and F.

E. The Solid Waste Division shall:
   1. Require one designated leader for each Authorized Volunteer Organization or Individual.
   2. Require all volunteers to be at least 12 years of age, require written parental consent for all participating minors, and require at least one adult supervisor for every four minors. The Solid Waste Manager may waive the minimum age requirement provided the safety of minors is assured by the level of supervision provided and the location of the proposed litter collection activity;
   3. Require proof of automobile liability insurance for any vehicle to be used to haul litter to a disposal site;
   4. Provide safety information and training aids to the designated leaders for their use in training of their participants;
   5. Annually publish a list of Authorized Volunteer Organizations or Individuals that perform a Litter removal activity and comply with the terms of the Authorization Form, but excluding organizations whose names endorse or oppose a candidate for

public office, advocate a position on a specific political issue, initiative, referendum, or piece of legislation, or contain the name of, or reference to, a political party.

F. Authorized Volunteer Organizations and Individuals shall:
   1. Name a designated volunteer leader;
   2. Submit to the Solid Waste Division written parental consent for participating minors;
   3. Provide proof of automobile liability insurance for any vehicle to be used to haul litter to a disposal site;
   4. Ensure that all participants receive safety training and provide participants with tools and equipment needed for the task;
   5. Gain written permission to collect Litter from the property owner or manager and release the County from any liability associated with collecting Litter on that property;
   6. Deliver waste to a disposal site as directed on the Authorization Form; and
   7. Comply with all other terms and conditions of the Authorization Form.

(Ord. 99-36S § 1 (part), 1999)

8.31.070 Reporting.

The County Executive shall annually prepare a report to the County Council on activities relating to this Chapter. At a minimum, the report shall include: the number of tons of Litter and Clean-Up Waste removed and disposed under this Chapter by each relevant County department and city and town; the cost savings to participants; the locations of areas cleaned up; and recommendations for changes in the Credit, funding, or this Chapter. This report shall coincide with the annual review of solid waste tipping fees. (Ord. 99-36S § 1 (part), 1999)

8.31.080 Severability.

If any provision of this Chapter, or its application to any person or legal entity or circumstance is held invalid, the remainder of this Chapter or the application of its provisions to other persons or legal entities or circumstances shall not be affected. (Ord. 99-36S § 1 (part), 1999)

Chapter 8.32

SOLID WASTE COLLECTION AND DISPOSAL REGULATIONS

Sections:

8.32.010 Purpose.
8.32.020 Unlawful Dumping - Misdemeanor.
8.32.030 Registration Certificate Required - Firms.
8.32.040 Registration Certificate Required - Persons.
8.32.050 Application for Registration Certificate.
8.32.060 Registration Certificate - Issuance.
8.32.070 Application for Registration Certificate - Duty to Act Upon.
8.32.080 Registration and Inspection Fee.
8.32.090 Effective Date - Expiration of Registration Certificates.
8.32.100 Terms and Conditions of Registration Certificates - Statement Required.
8.32.110 Change of Address of Registrant.
8.32.120 Revocation of Registration Certificate.
8.32.130 Violations Constitute Misdemeanor.
8.32.140 Severability.

Cross-references: Chapters 36.58, 36.58A RCW

8.32.010 Purpose.

For the purpose of protecting the life, health, safety, welfare and convenience of the inhabitants of Pierce County, it is necessary to establish rules and regulations pertaining to the collecting of garbage, and the disposal thereof; providing for a registration and inspection fee; and prescribing penalties for its violation. (Res. 1988 § 1, 1945; prior Code § 95.08.010)

8.32.020 Unlawful Dumping - Misdemeanor.

Every person who places, deposits or dumps, or who causes to be placed, deposited or dumped, any sewage, sludge, accumulation of human excrement or garbage in or upon any street, alley, public highway or road in common use, or upon any public park or other public property other than property designated or set aside for such purpose by the governing board or body having charge thereof, or upon any private property into or upon which the public is admitted by easement or license, or on any private property without the consent of the owner, is guilty of a misdemeanor. (Res. 1988 § 2, 1945; prior Code § 95.08.020)

8.32.030 Registration Certificate Required - Firms.

It is unlawful for any person or firm to carry on or engage in the business of garbage collection unless he or it holds an unrevoked registration certificate issued by the Pierce County Health Officer or his duly authorized representative for the carrying on of the business. (Res. 1988 § 3, 1945; prior Code § 95.08.040)

8.32.040 Registration Certificate Required - Persons.

It is unlawful for any person to collect garbage on behalf of any person or firm engaged in the business of garbage collection unless the person or firm holds an unrevoked registration certificate as provided in this Chapter. (Res. 1988 § 4, 1945; prior Code § 95.08.050)

8.32.050 Application for Registration Certificate.

All applications for registration under this Chapter shall be filed with the County Health Officer. The application shall state the name in full; if a partnership, then names of each of the partners, the relation of the applicant to the firm or partnership, the place of business and place of residence of the applicant for registration and of each of the partners in the business, if a partnership. The application shall be signed by the authorized officer of a corporation, if a corporation, or by the managing partner, if a partnership. (Res. 1988 § 5, 1945; prior Code § 95.08.060)

8.32.060 Registration Certificate - Issuance.

Registration shall be issued only after a satisfactory examination by the County Health Officer or his duly authorized representative covering the equipment to be used, the applicant's knowledge of sanitary principles and of the laws and ordinances affecting public health and nuisances, and the reliability of the applicant in observing sanitary laws, ordinances and directions, and in selecting laborers and employees who may collect garbage without endangering human health or comfort; and only after examination of the place or places and manner of disposal proposed by the applicant. (Res. 1988 § 6, 1945; prior Code § 95.08.070)

8.32.070 Application for Registration Certificate - Duty to Act Upon.

The County Health Officer or his designee shall be required to act upon each application in a timely manner. (Ord. 84-67 § 1 (part), 1984; Res. 1988 § 7, 1945; prior Code § 95.08.080)

8.32.080 Registration and Inspection Fee.

There shall be a registration and inspection fee to defray expenses incurred by the Tacoma-Pierce County Health Department in issuing registration certificates, conducting inspections and otherwise administering this Chapter. (Ord. 84-67 § 1 (part), 1984; Res. 13437 § 6, 1969; Res. 8644, 1961; Res. 1988 § 8; prior Code § 95.08.090)

8.32.090 Effective Date - Expiration of Registration Certificates.

Registration shall be only for the unexpired portion of the calendar year in which application is made, and at the end of the calendar year all registrations shall become void and of no effect. (Ord. 84-67 § 1 (part), 1984; Res. 1988 § 9, 1945; prior Code § 95.08.100)

8.32.100 Terms and Conditions of Registration Certificates - Statement Required.

Applicants may be registered under such terms, conditions, orders and directions as the County Health Officer or his duly authorized representative may deem necessary for the protection of human health and comfort. The County Health Officer and his duly authorized representatives are empowered to require any and all persons who are registered with him to collect garbage, to file with the Health Officer at any time and at such frequency or intervals as he may desire, a statement giving the name and address of the owner or tenant of each and every one of the premises where garbage is collected by the registrant or his employees or by others on his behalf, and the statement shall also describe in precise terms the place where the garbage shall have been disposed of and by whom. The County Health Officer is empowered to require such statements to be sworn to before a notary public. (Res. 1988 § 10, 1945; prior Code § 95.08.110)

8.32.110 Change of Address of Registrant.

A change of address of any registrant, including a member of a partnership which is registered and of the place of business thereof, shall be reported in writing by registered mail by the registrant within five days after the change of address. (Res. 1988 § 11, 1945; prior Code § 95.08.120)

8.32.120 Revocation of Registration Certificate.

Any registration certificate issued under this Chapter may be revoked for cause by the issuing Health Officer on ten days' notice to registrant, which notice shall be served by registered mail or in person at the latest place of residence or of business reported by the registrant. (Res. 1988 § 12, 1945; prior Code § 95.08.130)

8.32.130 Violations Constitute Misdemeanor.

Violation of any of the provisions of this Chapter or of any order or orders of the Health Officer made pursuant to this Chapter for the protection of human health and comfort shall constitute a misdemeanor. (Res. 1988 § 13, 1945; prior Code § 95.08.140)

8.32.140 Severability.

If any provision of this Chapter or its application to any person or circumstance is held invalid, the remainder of the Chapter or the application of the provision to other persons or circumstances shall not be affected. (Ord. 89-155 § 12, 1989)

Chapter 8.33

SOLID WASTE DISPOSAL - UNSECURED LOAD FEES

Sections:

8.33.010 Definition.
8.33.020 Unsecured Load Fee.
8.33.030 Exemptions.
8.33.040 Effective Date.

8.33.010 Definition.

"Unsecured loads" means a shipment of solid waste in or on a vehicle that is not covered, protected, or otherwise secured or tied down by safety chains or other fastening devices in a manner that will prevent waste materials from spilling, escaping, falling, or being blown or deposited outside the vehicle while the vehicle is in motion. (Ord. 94-109 § 1 (part), 1994)

8.33.020 Unsecured Load Fee.

Except for vehicles that are exempted as provided in Section 8.33.030, no vehicles transporting waste materials to any landfill or transfer station located in the County shall contain Unsecured Loads. In the event the operator of any landfill or transfer station located in the County, including the Hidden Valley Landfill, the Purdy Transfer Station, the Anderson Island Transfer Station, the Key Center Transfer Station, and the Prairie Ridge Transfer Station, determines that a vehicle arriving at such facility contains an Unsecured Load and is not exempted under Section 8.33.030, the landfill or transfer station operator shall collect from the driver of the vehicles transporting the Unsecured Load the following fee:

A. $5.00 per yard for vehicles that are charged by the yard at the applicable landfill or transfer station; and
B. $10.00 per ton for all other vehicles.

Unsecured Load fees collected pursuant to this Section shall be deposited each calendar quarter with the Pierce County Solid Waste Division for the purposes of solid waste reduction and recycling.
(Ord. 94-109 § 1 (part), 1994)

8.33.030 Exemptions.

Unless also transporting solid waste for disposal, the following vehicles and vehicle operators shall be exempt from the requirements and fees set forth in Section 8.33.020:

A. Vehicles transporting sand, dirt, or gravel in accordance with the provisions of RCW 46.61.655;
B. Vehicles transporting separated yard and garden debris to any solid waste facility located in the County that accepts such yard and garden debris;
C. Vehicles transporting separated recyclable materials to any solid waste facility located in the County that accepts such recyclable materials.

(Ord. 94-109 § 1 (part), 1994)

8.33.040 Effective Date.

The requirements of this Chapter shall be effective, and the operators of landfills and transfer stations in the County shall begin collecting the Unsecured Load fee, on November 1, 1994. Prior to November 1, 1994, the drivers of all vehicles arriving at any landfill or transfer station in the County, except exempt vehicles as set forth in Section 8.33.030, shall be issued written notices informing the drivers of the requirements of this Chapter. (Ord. 94-109 § 1 (part), 1994)

Chapter 8.34

UNDERGROUND STORAGE TANKS

Sections:

8.34.010 Definitions.
8.34.020 Authority.
8.34.030 Permits.
8.34.040 Application For a Permit.
8.34.050 Underground Storage Tank Removals.
8.34.060 Penalties.
8.34.070 Appeals.
8.34.080 Severability.

8.34.010 Definitions.

A. “Board of Health" means the Tacoma-Pierce County Board of Health as established pursuant to RCW 70.05.

B. "Clean fill" means a fill material which contains no contaminants beyond what would normally be expected for that material and meets other federal, state, and local fill guidelines, if applicable.

C. "Contamination" means the degradation of any component of the environmental by a release in sufficient quantity to impair its usefulness as a resource.

D. "Department" means the Tacoma-Pierce County Health Department.

E. "Director" means the Director of the Department or his/her authorized representative.

F. "Facility" means all structures, contiguous land, appurtenances, and other improvements on the land used for recycling, reusing, reclaiming, transferring, storing, treating, disposing of, or otherwise handling hazardous material. Use of the term "facility" as described herein includes underground tanks, including facilities which otherwise handle, use, dispose of, or store hazardous materials in containers or bulk. For purposes of this Chapter, an existing facility means a facility which has been constructed prior to the effective date of this ordinance.

G. "Groundwater" means any water found beneath the surface.

H. "Hazardous material" means any liquid, solid, gas, or sludge which, when accidentally or deliberately released or when improperly used, stored, or disposed of, creates a condition which presents or could present a potential risk to human health or the environment.

I. "Operator" means the person who is responsible for the facility or his/her authorized representative.

J. "Person" means any individual, corporation, company, association, society, firm, partnership, joint stock company, or any public entity.

K. "Release" means any spilling, leaking, emitting, or discharging of a hazardous material from a facility or other operation or activity into or onto soil, air, water, groundwater, or other natural or man-made structures or materials.

L. "Tank" means a stationary device designed to contain an accumulation of hazardous material which is constructed of non-earthen materials (steel, plastic, concrete, etc.) which provide structural support.

M. "Underground storage tank" means any one or a combination of tanks, including underground pipes connected thereto, which is used to contain or disperse an accumulation of hazardous materials, the volume of which, including the volume of underground pipes connected thereto, is 10 percent or more beneath the surface of the ground; however, the following do not fall under the definition of underground storage tank:
    l. Farm or residential tanks of l,l00 gallons or less capacity used for storing motor fuel for non-commercial purposes.
    2. Tanks of l,l00 gallons or less capacity used for storing heating oil for consumption on the premises where stored.
    3. Any tank which forms an integral part of an industrial or commercial process (flow-through process tank) through which there is a steady or uninterrupted flow of materials during the operation of the process, subject to proper spill and management practices.
    4. Any on-site sewage disposal system or holding tank which serves as a method of storage, conveyance, treatment, or disposal of human or animal wastes.

(Ord. 88-134 § 1 (part), 1988)

8.34.020 Authority.

A. The Director shall enforce this Chapter and any standards promulgated by the Board of Health relative to this Chapter. The Board of Health is empowered to and shall write standards necessary for implementation of this Chapter, consistent herewith.
B. The Director may, with the consent of the occupant thereof, or pursuant to a lawfully issued warrant, enter any building or premises at any reasonable time to perform any of the duties imposed on him/her by this Chapter and the Board of Health standards established in accordance herewith.

(Ord. 88-134 § 1 (part), 1988)

8.34.030 Permits.

A. No person shall remove or cause to be removed any underground storage tank which has contained a hazardous material without first obtaining a valid permit issued by the Director. The Pierce County Fire Protection Bureau, or where appropriate, the local Fire Department also specifically regulates and authorizes permits for underground storage tanks, pursuant to the Fire Code.
B. Permits shall be valid for 180 days from the date of issuance.
C. Notification by the permit holder shall be given to the Director at least five days prior to tank removal.

(Ord. 88-134 § 1 (part), 1988)

8.34.040 Application For a Permit.

A. An application shall be made in writing on forms provided by the Department, and shall be accompanied by a fee in accordance with the fee schedule adopted by the Board of Health.
B. The application shall contain the following information, as well as any other information the Director deems necessary:
    l. The address and parcel number of the facility;
    2. The name, address, and telephone number of the operator;

3. The name, address, and telephone number of the person performing the tank removal;
4. The estimated age, dimensions, and gallonage of the tank and a description of the tank's contents;
5. The use of the facility, past, present, and future;
6. A plot plan with the general facility layout;
7. The approximate date of tank removal.

(Ord. 88-134 § 1 (part), 1988)

8.34.050 Underground Storage Tank Removals.

A. The Director shall be present at the facility during any or all of the tank and contamination removal process.
B. The operator shall provide safe access in accordance with Washington State Department of Labor and Industry standards to all areas of the facility necessary for inspection of the tank's removal.
C. The operator of the facility shall demonstrate to the satisfaction of the Director that no contamination has occurred. The Director shall inspect for signs of current or historical contaminant release, such as, but not limited to: holes, punctures, or cracks in the tank, soil staining, discoloration, or sheen. Soil samples shall be taken by the operator upon the direction of the Director, and shall be analyzed for all constituents of the previously-stored hazardous materials and their transformation or breakdown products.
D. If the Director finds the facility to be:
    l. Free of contaminants, the operator shall backfill the tank hole with clean fill material as defined by the Department.
    2. Unacceptable, due to contamination, the operator shall be responsible for additional soil and/or water testing, the removal of contaminated soil and its proper disposal, and the treatment of contaminated groundwater, as required by the Director.

(Ord. 88-134 § 1 (part), 1988)

8.34.060 Penalties.

Anyone violating or failing to comply with any of the provisions of this Chapter or lawful order of the Director shall, upon conviction, be deemed guilty of a misdemeanor and be punished by a fine in any sum not exceeding $5,000.00, or by imprisonment in the Pierce County Jail for a term not exceeding one year, or by both such fine and imprisonment. Anyone found guilty of a violation shall be deemed guilty of a separate offense for every day during any portion of which any violation of any provision of this Chapter is committed, continued, or permitted. Nothing herein shall prevent the Director from utilizing civil remedies available to him/her under state law for enforcement of this Chapter. (Ord. 88-134 § 1 (part), 1988)

8.34.070 Appeals.

` Procedures for appeals to the Hearings Examiner or Board of Health from any ruling or decision of the Health Department shall be taken in accordance with Sections 5.02.160 and 5.02.180 of the Official Code of the City of Tacoma. (Ord. 88-134 § 1 (part), 1988)

8.34.080 Severability.

The provisions of this Chapter are hereby declared to be separate and severable, and the invalidity of any clause, sentence, paragraph, subdivision, Section, or portion of this Chapter or the invalidity of the application thereto to any person or circumstance shall not affect the validity of its application to other persons and circumstances. (Ord. 88-134 § 1 (part), 1988)

Chapter 8.36

ON-SITE SEWAGE DISPOSAL SYSTEMS

Sections:

8.36.010 Definitions.
8.36.020 Rules and Regulations.
8.36.030 Enforcement.
8.36.040 Scope of the Rules and Regulations.
8.36.050 General Requirements of the Rules and Regulations.
8.36.060 Permits.
8.36.070 Designer and Installer Certification.
8.36.080 Design.
8.36.090 System Construction.
8.36.100 Domestic Water Source.
8.36.110 Density and Minimum Lot Size.
8.36.120 Septage Haulers.
8.36.130 Appeals.
8.36.140 Penalties.
8.36.150 Severability.

Cross-reference: Chapter 248-96 WAC

8.36.010 Definitions.

Certain words and phrases used in this Chapter, unless otherwise clearly indicated by their context, shall mean as follows:

A. "Approved" means accepted in writing by the Health Officer and, where required, by the Washington State Department of Social and Health Services (DSHS).

B. "Board of Health" means the Tacoma-Pierce County Board of Health as established pursuant to RCW 70.05.

C. "Certificate of competency" means a certificate to engage in specific work indicated by the certification as granted by the Tacoma-Pierce County Health Department and to be defined in the Board of Health Rules and Regulations.

D. "Department" means the Tacoma-Pierce County Health Department.

E. "Health Officer" means the Director of the Tacoma-Pierce County Health Department or his/her authorized representative.

F. "On-site sewage disposal system" means any system of piping, treatment devices, or other facilities that convey, store, treat, or dispose of sewage on the property where it originates or an adjacent or nearby property under control of the user where the system is not connected to a public sewer system.

G. "Person" means any individual, corporation, company, association, society, firm, partnership, joint stock company, or any branch of federal, state, or local government.

H. "Sewage" means the water-carried human or domestic waste from residences, buildings, industrial establishments or other facilities, together with such ground water infiltration, that may be present.

I. "WAC 248-96" means Washington Administrative Code Chapter 248-96; the Washington State Board of Health Rules and Regulations for on-site sewage disposal.

(Ord. 86-125 § 1 (part), 1986)

8.36.020 Rules and Regulations.

The Board of Health is empowered to and may write Rules and Regulations not inconsistent herewith relative to this Chapter. (Ord. 86-125 § 1 (part), 1986)

8.36.030 Enforcement.

The Health Officer shall enforce this Chapter and the Rules and Regulations of the Board of Health. The Board of Health shall establish such enforcement procedures as are necessary to ensure proper enforcement of the Rules and Regulations adopted pursuant to this Chapter. The Board shall also establish an appeals procedure for persons who feel aggrieved by any final order or decision of the Health Officer. (Ord. 86-125 § 1 (part), 1986)

8.36.040 Scope of the Rules and Regulations.

The Board of Health Rules and Regulations shall apply to all on-site sewage disposal systems except the following:

A. A site application for new construction that was approved prior to the Rules and Regulations and is still valid. The regulations in effect at the time of approval shall apply, except where portions of the new Rules and Regulations are less stringent;
B. An extension, alteration, or replacement necessitated by the failure of an existing on-site sewage system. In such cases, the repair shall comply to the maximum extent possible to the Rules and Regulations as is permitted by that site; except no work or repair shall create a potential health hazard;
C. Facilities constructed or operated in accordance with a permit or approval issued by the Washington State Department of Ecology or the Washington State Department of Social and Health Services.

(Ord. 86-125 § 1 (part), 1986)

8.36.050 General Requirements of the Rules and Regulations.

The Board of Health shall address the following areas of general concern:

A. Establish requirements for the review and approval of on-site sewage disposal systems. These requirements shall be applicable to residences, places of business, and other buildings or places where persons congregate, reside or are employed;
B. Prohibit the discharge of sewage, from any source, into surface water or upon the surface of the ground, and not allow any potential health hazard to exist as a result of improper wastewater management;
C. Establish criteria whereby connection of a premises to a public sewer system, when available, would be required rather than the construction or repair of an on-site sewage disposal system.

(Ord. 86-125 § 1 (part), 1986)

8.36.060 Permits.

A. No person shall install or cause to be installed a new on-site sewage disposal system, or perform any alterations, extensions or relocations or connections to an existing system without a valid permit issued by the Health Officer. Application for such a

permit shall be made in writing on forms provided by the Health Officer and shall be accompanied by a fee as adopted by the Board of Health.

B. The Board of Health shall establish the different types of permits required (eg. new construction, repairs, remodels, etc.) and the guidelines for review and approval of each.

(Ord. 86-125 § 1 (part), 1986)

8.36.070 Designer and Installer Certification.

A. Designers.
   1. The Board of Health shall establish criteria for engaging in the business of a sewage disposal system designer and it shall be unlawful to engage in that business without a valid Sewage Disposal System Designer's Certificate of Competency as to be issued by the Department.
   2. The Health Officer may suspend or revoke any Sewage Disposal System Designer's Certificate of Competency, after written notice to or informal conference with the designer, if the Health Officer finds incompetency, negligence, misrepresentation, or failure on the part of the designer to comply with the Rules and Regulations of the Board of Health.

B. Installers.
   1. The Board of Health shall establish criteria for engaging in the business of installing, altering or repairing any on-site sewage disposal system and it shall be unlawful to engage in that business without a valid certificate issued by the Department.
   2. The Health Officer may suspend or revoke any installer's certification after written notice to or informal conference with the installer, if the Health Officer finds incompetency, negligence, misrepresentation, and/or failure to comply with the Rules and Regulations of the Board of Health.

(Ord. 86-125 § 1 (part), 1986)

8.36.080 Design.

A. The Board of Health shall establish the design criteria for the submittal of all on-site sewage disposal applications.

B. On-site sewage disposal systems shall be designed by a sewage disposal system designer, certified as provided for in Section 8.36.070 of this Chapter and the Rules and Regulations as adopted by the Board of Health.

C. The Board of Health shall establish guidelines for design application renewals and application extensions.

D. Design for an on-site sewage disposal system shall be made to the Health Officer who must deny the application if the design is not adequate for safe and healthful operation of the system and/or does not meet the requirements of this Chapter, the Rules and Regulations of the Board of Health, and WAC 248-96.

E. Design of on-site sewage disposal systems shall be such as to accommodate all sewage from the building and premises to be served.

(Ord. 86-125 § 1 (part), 1986)

8.36.090 System Construction.

A. The Board of Health shall establish criteria and requirements concerning the design and installation of any on-site sewage disposal system.

B. No disposal field shall be constructed unless there has first been actual tests conducted on the site in a manner as described by the Health Officer to determine the feasibility of an on-site system and the absorption area that would be required.

(Ord. 86-125 § 1 (part), 1986)

8.36.100 Domestic Water Source.

A. The Board of Health shall establish such requirements as deemed necessary to ensure each application will be provided with potable water from an individual source of water or an approved public water supply.

B. The Board of Health shall establish such requirements as are deemed necessary for the protection of potable water sources.

(Ord. 86-125 § 1 (part), 1986)

8.36.110 Density and Minimum Lot Size.

On-site sewage disposal systems shall be installed on lots, parcels, or tracts that have a sufficient amount of area with proper soils in which sewage can be retained and treated properly on-site. In this regard, the Board of Health shall establish the maximum allowable density and minimum lot sizes for future development proposals. The Board shall also establish guidelines to set such limits. (Ord. 86-125 § 1 (part), 1986)

8.36.120 Septage Haulers.

A. The Board of Health shall establish guidelines and criteria for engaging in the business of septage hauling and it shall be unlawful for any person to carry on or engage in the business of cleaning of septic tanks, cesspools, grease traps, seepage pits, vault privies, chemical toilets and other receptacles of human sewage or to transport over the highways or to dispose of the cleanings therefore in Pierce County unless they hold a valid registration and license issued by the Health Officer for carrying on such business.

B. Application for registration and license shall be filed with the Health Officer, and shall be consistent with the requirements established by the Board of Health.

C. Any registration certificate issued under this Section may be suspended immediately when a potential health hazard exists and may be revoked for cause by the Health Officer.

(Ord. 86-125 § 1 (part), 1986)

8.36.130 Appeals.

Any person aggrieved by any decision or final order of the Health Officer shall have the right to appeal such decision or order. Such appeals shall follow the procedures as outlined by the Board of Health. (Ord. 86-125 § 1 (part), 1986)

8.36.140 Penalties.

Any person violating or failing to comply with any of the provisions of this Chapter, the Board of Health Rules and Regulations, or any lawful order of the Health Officer shall upon conviction be deemed guilty of a misdemeanor. Any person found guilty of a violation shall be deemed guilty of a separate offense for every day during any portion of which any violation of any provision of this Chapter, or Board of Health Rules and Regulations, or any lawful order of the Health Officer is committed, continued, or permitted. (Ord. 86-125 § 1 (part), 1986)

8.36.150 Severability.

The provisions of this Chapter are hereby declared to be separate and severable and the invalidity of any clause, sentence, paragraph, subdivision, Section or portion of this Chapter or the invalidity of the application, thereof, to any person or circumstance shall not affect the validity of the remainder of this Chapter or the validity of its application to other persons and circumstances. (Ord. 86-125 § 1 (part), 1986)

Chapter 8.38

INFECTIOUS WASTE MANAGEMENT

Sections:

8.38.010 Authority and Purpose.
8.38.020 Definitions.
8.38.030 Applicability.
8.38.040 Types of Infectious Waste Generators.
8.38.050 Requirements and Standards for Infectious Waste Generators.
8.38.060 Residential Sharps Waste.
8.38.070 Requirements and Standards for Transporters.
8.38.080 Requirements and Standards for Storage and Treatment Facilities.
8.38.090 Requirements and Standards for Treatment Methods of Infectious Waste.
8.38.100 Requirements and Standards for Treatment of Specific Types of Infectious Waste.
8.38.110 Requirements and Standards for Spill Management of Infectious Waste.
8.38.120 Requirements and Standards for Record Keeping.
8.38.130 Requirements and Standards for Infectious Waste Permits.
8.38.140 Permit Suspension and Revocation.
8.38.150 Service of Notices.
8.38.160 Hearings.
8.38.170 Inspection.
8.38.180 Penalties.
8.38.190 Appeals.
8.38.200 Severability.

8.38.010 Authority and Purpose.

This Chapter is promulgated under the authority of Chapter 70.05 of the Revised Code of Washington to protect public health and the environment, and prevent the spread of any dangerous, contagious, or infectious diseases. The purposes of this Chapter are to:

A. Provide broad powers of regulation to the Health Department and its appointed Health Officer, relating to the management of infectious waste.
B. Designate those infectious wastes which are dangerous to the public health and environment.
C. Provide the rules necessary to establish an infectious waste management plan.
D. Establish the operation and monitoring requirements for infectious waste generators, transporters, storage, and treatment facilities.
E. Establish and administer a program for permitting infectious waste generators, transporters, storage, and treatment facilities.
F. Provide for surveillance and monitoring of infectious wastes until they are rendered non-infectious and disposed of properly.

(Ord. 89-54S § 1 (part), 1989)

8.38.020 Definitions.

A. **Board of Health:** The Tacoma-Pierce County Board of Health.

B. **Chemical Disinfection:** An infectious waste treatment and decontamination method which utilizes appropriately formulated chemical solutions to disinfect infectious waste and contaminated areas.

C. **Container:** Any portable device in which materials are stored, transported, treated, disposed of, or otherwise handled.

D. **Collection:** The removal and transportation of infectious waste from the generator, transfer station, or pickup station.

E. **Contamination:** The transfer of disease organisms from one material or object to another.

F. **Contingency Plan:** The document setting forth an organized, planned, and coordinated course of action to be followed in the event of a fire, explosion, equipment malfunction or breakdown, or release of infectious waste constituents which could threaten human health or the environment.

G. **Director:** The Director of the Health Department or his/her authorized representative.

H. **Decontamination:** The elimination of contamination through cleansing and disinfection of an area, object, or person soiled by contact with infectious waste.

I. **Facility:** Any place where infectious waste activity occurs as defined by this Chapter.

J. **Gas/Vapor Sterilization:** An infectious waste treatment technique, only for use under very controlled circumstances, that uses gases or vaporized chemicals as sterilizing agents.

K. **Generator:** Any person whose act or process produces infectious waste as defined in this Chapter.

L. **Handling:** Direct physical management of infectious waste.

M. **Health Department or Department:** The Tacoma-Pierce County Health Department.

N. **Health Officer:** The appointed official representative of the Tacoma-Pierce County Health Department.

O. **Incineration:** A processing method using an engineered apparatus capable of withstanding heat and having as its purpose the efficient thermal oxidation and/or conversion of combustible material into noncombustible residues (ash) and product gases.

P. **Infectious Agent:** A type of microorganism, helminth, or virus that causes, or significantly contributes to the cause of, increased morbidity or mortality of human beings or animals.

Q. **Infectious Waste**, Biomedical Waste, or Biohazardous Waste are synonymous terms for untreated solid waste capable of causing an infectious disease via exposure to a pathogenic organism of sufficient virulence and dosage, through a portal of entry in a susceptible host. For the purposes of this Chapter, the following types of wastes will be referred to as infectious waste:

1. Animal Waste: Waste animal carcasses, body parts, body substances, and bedding of animals that are known to be infected with, or that have been inoculated with, pathogenic microorganisms infectious to humans.

2. Biosafety Level 4 Disease Waste: Waste contaminated with blood, excretions, exudates, or secretions from humans or animals which are isolated to protect others from highly communicable infectious diseases that are identified as pathogenic organisms assigned to Biosafety Level 4 by the Centers for Disease Control, National Institute of Health, Biosafety in Microbiological and Biomedical Laboratories (current edition).
3. Cultures and Stocks of Infectious Agents: Wastes infectious to humans and includes specimen cultures, cultures and stocks of etiologic agents, wastes from the production of biologicals and serums, discarded live and attenuated vaccines, and laboratory waste that has come into contact with cultures and stocks of etiologic agents or blood specimens. Examples include, but are not limited to, culture dishes, blood specimen tubes, specimen containers, slides and cover slips, and devices used to transfer, inoculate, and mix cultures.
4. Human Blood and Blood Products: Waste human blood, blood products, blood components, and materials that contain amounts of blood capable of creating droplets or pooling in collection containers. Examples include, but are not limited, whole blood, serum, plasma, blood derived products, and saturated gauze pads.
5. Pathological Waste: Waste human source biopsy materials, tissues, and anatomical parts that emanate from surgery, obstetrical procedures, and autopsy. Pathological waste does not include teeth, humancorpses, remains, and anatomical parts that are intended for interment or cremation.
6. Sharps Waste: All hypodermic needles, syringes with needles attached, IV tubing with needles attached, scalpel blades, and lancets that have been removed from their original sterile packages.
7. Miscellaneous Contaminated Items: Waste items not included in the above definitions that have come into contact with human or animal body substances or other sources which may contain pathogenic organisms of sufficient concentration that exposure to the waste directly or indirectly creates a significant risk of disease transmission. These items shall be determined as infectious waste by and solely at the discretion of the infectious waste generator's infection control staff/committee.

R. **Infectious Waste Management Permit:** The permit issued by the Tacoma-Pierce County Health Department for the generation, transportation, storage, and/or treatment of infectious waste under the conditions specified in the permit section of this Chapter.

S. **Infectious Waste Management Plan:** A written and implemented system for the safe handling of infectious waste throughout the entire process of generation, segregation, packaging, storage, collection, transportation, treatment, and disposal.

T. **Irradiation:** The use of ionizing radiation for the treatment of infectious waste.

U. **Off-site:** A facility or area for the storage, treatment, and/or disposal of infectious waste which is not on the generator's site (e.g. "on-site"), or a facility or area which receives infectious waste for storage or treatment, when that waste has not been generated "on-site" at that facility.

V. **Operator:** A person who operates a facility or part of a facility.

W. **Owner:** A person who owns a facility or part of a facility.

X. **Pathogen:** A biological agent that causes disease.

Y. **Person:** An individual, trust, firm, joint stock company, corporation, partnership, association, state, county, commission, political subdivision of a state, an interstate body, or the federal government or an agency of the federal government.

Z. **Personnel:** All persons who work at or oversee the operations of a facility involved in infectious waste activity.

AA. **Sharps Waste Container:** A leak-proof, rigid, puncture-resistant, red container that is taped closed or tightly lidded to prevent the loss of contents.

BB. **Steam Sterilization:** A treatment method for infectious waste, utilizing saturated steam within a pressure vessel (known as a steam sterilizer, autoclave, or retort), at time lengths and temperatures sufficient to kill infectious agents within the waste.

CC. **Storage:** The containment of infectious waste, beyond the nine days allowed prior to treatment, in accordance with the standards outlined in this Chapter, in such a manner as not to constitute disposal of infectious waste.

DD. **Storage Facility:** A facility authorized and permitted to store infectious waste.

EE. **Transporter:** A person engaged in the off-site transportation of infectious waste by air, rail, highway, or water.

FF. **Treatment:** Any method, technique, or process designed to change the biological character or composition of infectious waste to render it non-infectious.

GG. **Treatment Facility:** Any facility approved and permitted by the Department for the treatment of infectious waste.

HH. **Vehicle:** Any motor vehicle, rail car, water craft, trailer, or motorized or non-motorized cargo-carrying body used for the movement of infectious waste.

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.030 Applicability.

This Chapter shall apply to all infectious waste facilities and transporters without regard to quantity of infectious waste handled per month.

Infectious waste generated and disposed of with residential wastes from a single family residence or single family dwelling unit shall be exempt from this Chapter, except (1) where such infectious waste is generated from commercial or professional offices, or (2) residential sharps waste as described in Section 8.38.060. (Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.040 Types of Infectious Waste Generators.

Designated infectious waste generators shall include, but not be limited to, the following types of facilities:

A. General Acute Care hospitals.
B. Skilled Nursing Care Facilities or Convalescent Hospitals.
C. Health Maintenance Organizations.
D. Acute Psychiatric Facilities.
E. Intermediate Care Facilities.
F. In-patient Medical, Surgical, or Treatment Facilities.
G. In-patient Care Facilities for the Developmentally Disabled.
H. Out-patient Medical, Surgical, or Treatment Care Facilities.
I. Physicians Offices.
J. Medical Buildings.
K. Dental Offices.

L. Animal Experimentation Units.
M. Community Clinics.
N. Employee Clinics.
O. Dialysis Clinics.
P. Blood Banks.
Q. Plasma Centers.
R. Commercial Diagnostic Laboratories.
S. Medical, Research, Industrial, and Educational Laboratories.
T. Home Health Agencies.
U. Hospice Agencies.
V. Residential Congregate Care Facilities.
W. Funeral Homes and Mortuaries.

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.050 Requirements and Standards for Infectious Waste Generators.

A. **Applicability**. The requirements of this Section shall apply to all infectious waste generators without regard to the quantity of infectious waste produced per month.
B. **Permit Required**. Any person who owns or operates a facility that generates infectious waste shall have a valid and appropriate Class I infectious waste management permit (IWMP) issued by the Tacoma-Pierce County Health Department.
C. **Infectious Waste Management Plan**. Each facility shall designate a responsible person or committee who shall prepare a written infectious waste management plan that includes specific policies and procedures including no less than the following:
    l. Facilities involved in infectious waste activity shall provide all employees, staff, housekeeping, and janitorial personnel who are involved in the generation and/or handling of infectious waste with infectious waste management training. Such training shall include, but not be limited to, the following:
        a. A definition and identification of infectious waste being generated at the facility.
        b. An explanation of the facility's infectious waste management plan that includes the requirements of this Chapter in relation to handling, treatment, transportation, storage, and disposal of infectious waste.
        c. Assignment of roles and responsibilities for implementation of the plan.
        d. Implementation of training when the infectious waste management plan is first developed and instituted; when new employees are hired; and when management procedures are changed.
        e. Continuing education shall be provided annually or more often if needed and shall be oriented to refresh and maintain personnel awareness of potential hazards as well as reinforce policies and procedures that are detailed in the infectious waste management plan.
    2. Segregation and Containment of Infectious Waste.
        a. Infectious waste shall be segregated from other waste at the point of origin in the generating facility and managed by persons trained in the safe handling of infectious waste.
        b. Infectious waste with multiple hazards, (e.g. toxic, radioactive, or other hazardous chemicals) shall be segregated from the general infectious waste stream when additional or alternative treatment is required, or in cases where the wastes are regulated under state or federal authority.

c. Containment of infectious waste shall be in a manner and at a location which affords protection from unauthorized persons, animals, rain, and wind, and does not provide a breeding place or a food source for insects or rodents.
d. Waste sharps shall be contained for storage, transportation, treatment, and disposal in sharps waste containers.
e. Infectious waste, except for sharps capable of puncturing or lacerating, shall be contained in red or orange colored disposable plastic bags, which are impervious to moisture and have strength sufficient to preclude ripping, tearing, or bursting under normal conditions of usage and handling. The bags shall be securely tied or taped so as to prevent leakage or expulsion of solid or liquid wastes during storage, handling, or transport.
f. All bagged infectious waste and sharps waste containers shall be placed for storage or handling in disposable or reusable pails, cartons, drums, dumpsters or portable bins. The containment system shall be leak-proof and kept clean and in good repair. The containers may be of any color and shall be conspicuously labeled with the words "INFECTIOUS WASTE", "BIOMEDICAL WASTE", or "BIOHAZARDOUS WASTE", or the international biohazard symbol on the lid and sides so as to be readily visible from any lateral direction when the container is upright.
g. Infectious waste contained according to requirements of this Section, may share a common in-house transfer cart or portable bin with bagged non-infectious wastes during transportation within a facility to a storage or treatment area. Common transfer carts used to transport contained infectious with non-infectious wastes shall be conspicuously labeled with the words "INFECTIOUS WASTE", "BIOMEDICAL WASTE", or "BIOHAZARDOUS WASTE", or the international biohazard symbol on the sides so as to be readily visible from any lateral direction. In the event of an infectious waste spill within an in-house transfer cart or portable bin that also contains non-infectious waste, all waste items within the transfer cart shall be considered infectious waste and shall be subject to infectious waste and spill management requirements of this Chapter.
h. Reusable pails, drums, dumpsters, or bins used for containment of infectious waste shall not be used for the containment of waste to be disposed of as non-infectious, or for other purposes, except after being decontaminated. Approved methods of decontamination include, but are not limited to, agitation to remove visible soil combined with one of the following procedures:
    (l) Exposure to hot water of at least 82° C (180° F) for a minimum of 15 seconds.
    (2) Exposure to a chemical or hospital grade disinfectant effective against mycobacteria and viruses by rinsing or immersion as directed by manufacturer.
        i. Compactors, grinders, or pulverizers shall not be used to process infectious waste until after the waste has been rendered non-infectious. Infectious waste shall not be placed for storage or transport in a portable mobile trash compactor.
    j. Trash chutes shall not be used to transfer infectious waste.

3. Storage of Infectious Waste
   a. Designated areas for storage of infectious waste shall be segregated from other wastes.
   b. Storage areas, enclosures, or containers used for the containment of infectious waste shall be so secured as to deny access to unauthorized persons and shall be marked with prominent warning signs on, or adjacent to, the exterior of entry doors, gates or lids. Wording of warning signs shall state "CAUTION - INFECTIOUS (or BIOMEDICAL or BIOHAZARDOUS) WASTE STORAGE AREA" and shall be accompanied by the international biohazard symbol. Warning signs shall be readily legible from a distance of at least 25 feet.
   c. Floors of storage areas shall be of impervious material to prevent saturation of liquid and semi-liquid substances, and a perimeter curb is recommended to contain spills. Storage areas shall also be well lighted and ventilated.
   d. Storage time of infectious waste before treatment shall be kept to a minimum if not treated the same day as generated.
   e. Filled infectious waste containers, including sharps waste containers, shall be stored for no longer than seven days prior to treatment or collection for treatment. Infectious waste being transported or stored after the seven-day storage period at the generating facility shall have 48 hours to be treated and rendered non-infectious or shall be kept at temperature between 1° C to 7° C (34° F to 45° F) for up to 7 days, or at or below 0° C (32° F) up to a maximum of 90 days. Facilities storing infectious waste after the initial nine-day storage and transportation period shall be required to obtain a permit from the Department as a Class III storage facility.
4. Contingency Plan. All generators of infectious waste shall develop a contingency plan to provide for emergency situations. Provisions shall be made for an alternate treatment plan in the event of equipment breakdown with an incinerator, autoclave, or other approved method for rendering waste non-infectious prior to disposal.
5. Temporary Transportation Permit. If equipment breakdown occurs and transportation of infectious waste becomes a necessity, a 10-day Temporary Emergency Transportation Permit shall be required to transport infectious waste to an off-site treatment facility. The Temporary Emergency Transportation Permit shall be issued after the Health Officer has been notified and a determination has been made that vehicles utilized to transport infectious waste conform to the requirements for transporters in Section 8.38.070 of this Chapter. This subsection applies solely to I-C generators.
6. Spill Management of Infectious Waste (see Section 8.38.110 of this Chapter).
7. Record Keeping (see Section 8.38.120 of this Chapter).
8. Disposal of Infectious Waste. Infectious waste shall not be disposed of prior to treatment, as described in Section 8.38.100 of this Chapter. Once infectious waste has been rendered non-infectious through an approved treatment method, it may be disposed of at any permitted solid waste disposal facility.

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.060 Residential Sharps Waste.

A. **Applicability.** Residential sharps waste is sharps waste generated and prepared for disposal at a residence, apartment, dwelling, or other non-commercial habitat.

B. **Disposal.** The following standards apply to the disposal of residentially generated sharps waste:

1. Sharps waste must be contained in sharps waste containers.
2. Sharps waste may not be disposed of in any recycling container unless the container is specifically designated for sharps waste.
3. Sharps waste may not be disposed of in refuse collection containers (e.g. trash cans, trash bags, dumpsters, etc.) if a source-separated collection service is provided for residential sharps waste by the public or private solid waste collection service provider.
4. Providers of source-separated residential sharps collection shall be in compliance with the standards of 70.95K RCW.

(Ord. 94-99 § 1 (part), 1994)

8.38.070 Requirements and Standards for Transporters.

A. **Applicability.** The requirements of this Section apply to all transportation of infectious waste over roads or highways, by railroad, or by water conveyance. No person shall transport or receive for transport any infectious waste that is not in accordance with this Chapter.

B. **Permit Required.** Any person who transports infectious waste shall have a valid and appropriate infectious waste management permit (IWMP) Class II issued by the Tacoma-Pierce County Health Department, as well as a transportation permit from the Washington Utilities and Transportation Commission, where required.

A generator of infectious wastes holding a valid IWMP Class I-A or I-B, who transports only infectious wastes generated at the premises owned or operated by the generator, is exempt from the Class II permit fee and requirements of this Section.

C. **Labeling and Placards of Infectious Waste Transport Vehicles.**

l. The access doors to any area holding infectious waste in transport shall have a warning sign legible at a distance of 25 feet that indicates that the cargo is infectious waste.
2. Vehicles transporting infectious waste shall be identified on each side of the vehicle with the name or trademark of the transporter, the Health Department permit number, city or place in which the vehicle is customarily based, and conspicuously-displayed signs or decals with the words "INFECTIOUS WASTE" or "BIOMEDICAL WASTE", or with the international biohazard symbol and the word "Biohazard". Such identifying labeling shall be on a background of contrasting color and shall be readily legible during daylight from a distance of 50 feet.

D. **Receipt and Transfer of Infectious Waste to Off-site Facilities.**

l. An infectious waste transporter shall not receive custody of infectious wastes from a facility not possessing a valid and appropriate infectious waste management permit.
2. Infectious waste shall be transported to an off-site facility in a leak-proof, fully enclosed container or vehicle compartment.

3. Infectious waste, other than that generated in and disposed with residential solid wastes from single-family dwelling units, where allowable, shall not be transported in the same container or vehicle compartment with other wastes.
4. Infectious waste shall not be stored more than 48 hours at any off-site location or facility, except at a waste storage or treatment facility or other facility for which there is a valid and appropriate Class III infectious waste management permit. At such a facility, the infectious waste shall be kept in a secured area separate from other wastes.
5. Infectious waste shall be delivered for treatment or disposal only to a facility for which there is a valid permit to handle such wastes.
6. Persons manually loading or unloading containers of infectious waste to or from transport vehicles shall be provided by their employer, and required to wear, gloves that are impermeable to liquids, clean protective clothing, and face shields. Respirators may be required, where appropriate.
7. Surface areas of equipment used to transport infectious waste must be clean and impermeable to liquids, if those areas are involved with the management of waste. Porous floor coverings shall not be used. Vermin and insects shall be controlled. Surfaces of transport vehicles that have contacted spilled or leaked infectious waste shall be decontaminated by procedures as described in Section 8.38.050(C)(2)(h) of this Chapter. All drainage shall discharge directly to, or through a holding tank to, a permitted sanitary sewer system.

E. **Management of Infectious Waste Spills.**
   l. In the event of a spill, spilled waste must be immediately removed according to procedures listed in Section 8.38.110 of this Chapter using the spill containment and cleanup equipment and materials to effect decontamination.
   2. All spills must be reported by personnel to employer, and records of spills must be kept for three years. Any spill that has a volume greater than 32 gallons of solid waste or one liter of liquid waste must be reported to the Department by phone call, within 48 hours, describing the spill and cleanup.
   3. The Tacoma-Pierce County Health Department shall be contacted immediately when a spill in transit occurs within Tacoma-Pierce County via the Pierce County Department of Emergency Management.

F. **Compaction of Infectious Waste.** Under no circumstances shall infectious wastes be compacted prior to or during transport unless wastes have been rendered non-infectious by methods described in this Chapter.

G. **Temperature Controlled Storage Period.**
   l. Any infectious waste being transported or stored after a seven-day storage period at the generating facility shall have 48 hours to be treated and rendered non-infectious or shall be subject to the following transportation and storage temperature requirements:
      a. Refrigeration at a temperature between 1° C to 7° C (34° F to 45° F) for up to seven days.
      b. Refrigeration at a temperature at or below 0° C (32° F) for periods up to 90 days.
      c. Daily temperature logs shall be maintained.

H. **Record Keeping** (see Section 8.38.120 of this Chapter).

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.080 Requirements and Standards for Storage and Treatment Facilities.

A. **Applicability.** The requirements of this Section shall apply to all infectious waste storage and treatment facilities.

B. **Permit Required.** Any person who owns or operates a facility for storage or treatment of infectious waste shall have a valid and appropriate Class III infectious waste management permit issued by the Tacoma-Pierce County Health Department.

C. **Management/Operation Plan.** The owner and/or operator of any infectious waste storage and/or treatment facility shall have and adhere to a management/operation plan which shall include but not be limited to the following requirements:

1. A method of receiving wastes which ensures that infectious wastes are handled separately from other waste until treatment is accomplished and which prevents unauthorized persons from having access to or contact with the wastes.
2. A method of unloading and processing infectious wastes which limits the number of persons handling the wastes and minimizes the possibility of exposure of employees and public to infectious waste.
3. A method of decontaminating, by use of procedures as described in this Chapter, emptied reusable infectious waste containers, transport vehicles, or facility equipment contaminated with infectious waste.
4. The provision of and required use of clean gloves and uniforms, along with other protective clothing, face masks, or eye protection, as appropriate, to provide protection of employees against exposure to infectious waste. Decontamination or proper disposal of the soiled protective gear shall be done at the facility.
5. Decontamination of any person having bodily contact with infectious waste.
6. A spill management plan as described in Section 8.38.110 of this Chapter.
7. A quantification of the maximum amount of infectious waste to be stored, treated, or disposed of per month.
8. A contingency plan as described in Section 8.38.050 C.4. of this Chapter.

D. **Temperature Controlled Storage Period.** Any infectious waste being transported or stored after a 7-day storage period at the generating facility shall have 48 hours to be treated and rendered non-infectious or shall be subject to the following transportation and storage temperature requirements:

1. Refrigeration at a temperature between l° C to 7° C (34° F to 45° F) for up to seven days.
2. Refrigeration at a temperature at or below 0° C (32° F) for up to 90 days.
3. Daily temperature logs shall be maintained.

E. **Record Keeping** (see Section 8.38.120 of this Chapter).

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.090 Requirements and Standards for Treatment Methods of Infectious Waste.

All treatment methods used for infectious waste shall comply with the following:

A. Steam sterilization/autoclave operating procedures shall include, but not be limited to, the following:

l. Adoption of standard written operating procedures for each steam sterilizer including time, temperature, pressure, type of waste, type of container(s), closure on container(s), pattern of loading, water content, and maximum load quantity.

2. Check of recording and/or indicating thermometers during each complete cycle to ensure the attainment of a temperature and time duration sufficient to achieve sterilization of the entire load. Thermometers shall be checked for calibration at least annually.
3. Use of heat sensitive tape or other device for each container to indicate that the container has been autoclaved.
4. Use of a biological indicator placed at the center of a representative load processed under standard operating conditions, at least monthly for Class I-A and I-B generators and at least weekly for Class I-C generators and Class III treatment facilities, to confirm the attainment of adequate sterilization conditions.
5. Spore tests shall be verified by a third party, certified laboratory at least once per quarter.
6. Maintenance of records of procedures specified in l, 2, 4, and 5 above for a period of not less than one year.

B. Incineration operating standards shall include, but not be limited to, the following:
   l. Infectious waste incinerators shall maintain all necessary permits and be in compliance with the standards of the Puget Sound Air Pollution Control Agency.
   2. Infectious waste incinerators should be multi-chambered and designed to provide complete combustion for the type of waste introduced into the incinerator.
   3. Waste destruction efficiency. All non-metal and glass waste shall be converted by the incineration process into ash that is not recognizable as to its former character. Any partially combusted material shall be removed and re-burned.
   4. Unloading operations. Persons required to handle packages of infectious waste shall be provided with clean protective clothing and equipment including overalls, gloves, and eye protection.

C. Alternative treatment methods include, but are not limited to: chemical disinfection, thermal inactivation, gas/vapor sterilization, and irradiation. Any person seeking approval of an alternative treatment method must demonstrate to the Health Officer that the proposed method is capable of rendering infectious waste non-infectious prior to disposal. Also, the proposed method must be in compliance with State and Federal regulations relative to employee safety.

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.100 Requirements and Standards for Treatment of Specific Types of Infectious Waste.

A. Applicability. All infectious waste shall be treated or disposed of in accordance with the methods set forth in this Section.

B. Approved treatment methods requiring an IWMP Class III shall include incineration, steam sterilization, and alternative treatment methods.

C. Treatment of infectious waste shall include any alternate treatment methods, where reviewed and approved by the Department, in addition to the following:
   l. Sharps waste, shall be contained in sharps waste containers and treated by steam sterilization or incineration.
   2. Human blood and blood products shall be treated by steam sterilization or incineration. In addition, blood and blood products may also be discharged directly to the sanitary sewer.

3. Cultures and stocks of infectious agents shall be treated by steam sterilization or incineration.
4. Human pathological waste shall be treated by incineration or may be transferred to a mortician for burial or cremation.
5. Contaminated animal carcasses, body parts, and substances shall be treated by incineration.

   Substances in liquid or semi-liquid form may be discharged to the sanitary sewer. Chemical decontamination of contaminated bedding by a hospital grade disinfectant of 1:10 solution of 3-5% sodium hypochlorite to water is acceptable, provided that saturation of bedding material is sufficient.
6. Biosafety level 4 disease wastes shall be treated by steam sterilization or incineration.
7. Miscellaneous contaminated items shall be treated by steam sterilization or incineration.

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.110 Requirements and Standards for Spill Management of Infectious Waste.

A. Applicability. This Chapter shall apply to all facilities and transporters handling infectious waste.

   Written policies and procedures for spill management of infectious waste of any quantity shall be developed by each facility and transporter.

B. The policies and procedures for spill management of infectious waste shall include, but not be limited to, the following:
   l. Spill containment and cleanup equipment shall be kept in areas, or immediately available to areas, utilized for the collection, storage, transportation, or treatment of infectious waste. Containment and cleanup equipment shall include at least the following items:
      a. Disposable absorbent material for spilled liquids.
      b. Chemical or hospital grade disinfectant, effective against mycobacteria and viruses, to decontaminate area of spill.
      c. Red or orange plastic infectious waste bags.
      d. Disposable, moisture-resistant or moisture-proof protective clothing, gloves, boots, and caps. Minimum protective breathing devices shall be surgical masks. Protective eye wear shall be included.
      e. Janitorial equipment, (e.g. dust pans, mops, brooms, etc.) for physical cleanup of infectious waste. This equipment must be capable of being decontaminated or shall be disposed of in accordance with this Chapter as infectious waste.
   2. Containment and cleanup procedures. Following a spill of infectious waste, or its discovery, the following minimum procedures shall be implemented:
      a. The cleanup personnel will don the appropriate protective clothing and gear, and secure the spill area.
      b. Apply absorbent material as necessary and apply disinfectant to contaminated items and area.
      c. Place spilled items inside infectious waste bags and secure.
      d. Clean and disinfect non-disposable items.

e. Remove cleanup clothing and gear and place disposable items inside infectious waste bags and secure.
f. Replenish used items.
g. Practice good personal hygiene by washing hands or showering after spill cleanup.

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.120 Requirements and Standards for Record Keeping.

All transporters and infectious waste facilities shall maintain the following records and assure that they are accurate and current:

A. A current list of the infection control committee and/or personnel responsible for compliance with this Chapter.
B. The date, time, persons involved, and description of events of infectious waste spills involving more than 32 gallons of solid waste or one liter of free liquid. The date, persons involved, and description of events of all transport spills.
C. Treatment method of infectious waste, if applicable.
D. A log of infectious waste management training, with complete names and positions of participants.
E. Type and amount of infectious waste produced, transported, stored, and/or treated per month.
F. A file containing the adopted infectious waste management plan, policies, and procedures of the facility for dealing with infectious waste.
G. Daily temperature logs for refrigerated, stored infectious waste.
H. Records shall be maintained for a minimum period of three years. This period is automatically extended if the facility is involved in an enforcement action.

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.130 Requirements and Standards for Infectious Waste Permits.

This Section requires an infectious waste management permit (IWMP) for the generation, transportation, storage, or treatment of any infectious waste unless specifically excluded by this Chapter. Persons required to have infectious waste management permits shall have such permits during the active life of the facility. A permit may be issued or denied for one or more activities without simultaneously issuing or denying a permit for all activities.

A. **Infectious Waste Management Permit (IWMP) Classifications.**
   1. IWMP Class I (Generators):
      a. IWMP Class I-A: An Infectious Waste Management Permit Class I-A shall be required for all generators of less than 50 lbs of infectious waste per month.
      b. IWMP Class I-B: An Infectious Waste Management Permit Class I-B shall be required of generators of 50 to 100 lbs of infectious waste per month.
      c. IWMP Class I-C: An Infectious Waste Management Permit Class I-C shall be required of generators of more than 100 lbs of infectious waste per month.
   2. IWMP Class II (Transporters): An Infectious Waste Management Permit Class II shall be required of all transporters of infectious waste, (e.g. infectious waste disposal companies).

3. IWMP Class III (On/Off-site Storage and/or Treatment Facilities): An IWMP Class III shall be required for the operation of any facility that stores and/or treats infectious waste that is generated on-site (waste generated on the premises owned or operated by the generator), or off-site (waste generated off the premises owned or operated by the generator).

B. **Exemptions.**

Class I-A or I-B generators who transport only infectious wastes generated at the premises owned or operated by the generators are exempt from the Class II permit fee and regulation requirements for transporters of infectious waste. Class I-A or I-B generators that treat infectious waste at the premises owned or operated by the generators, shall be exempt from the Class III permit fee, but shall be responsible for compliance with Chapter requirements applicable to treatment methods for infectious waste.

Class III on/off-site storage and/or treatment facilities that are also Class I-C generators, and/or Class II transporters of infectious waste shall be exempt from the Class I-C and Class II permit fees, but shall be responsible for compliance with ordinance or Code requirements applicable to infectious waste generators and transporters.

C. **Effective Dates.** The effective dates are as follows:

1. The permit requirements of this Section apply to existing infectious waste facilities and transporters 90 days after the effective date of the implementing ordinance of this Chapter.
2. Between the effective date of the implementing ordinance and 90 days thereafter, existing facilities and transporters will operate under the terms and conditions of existing permits valid on the effective date of the implementing ordinance.
3. New and expanded waste handling facilities shall meet the requirements of this Section on the effective date of the implementing ordinance.

D. **Procedures for Permits.**

1. Any owner or operator subject to the permit requirements who intends to operate a facility must apply for a permit with the Department. Filing shall not be complete until the application has been signed by the owner and operator and received by the Department.
2. Applications for a permit must contain the information set forth in subsection 3. of this Section.
3. The Department shall review every application within a reasonable period of time to determine whether the facilities meet and conform with the approved infectious waste ordinance or Code.
4. The Board of Health may establish reasonable fees for permits and renewal of permits.
5. When the Department has evaluated all pertinent information, it may issue a permit. Every completed infectious waste management permit application shall be approved or disapproved within 90 days after its receipt by the Department or the applicant shall be informed as to the status of the application.
6. All new, expanded, or altered Class III treatment facilities shall file an environmental checklist as required under the State Environmental Policy Act rules, Chapter 197-11 of the Washington Administrative Code.

7. The owner or operator of a facility shall apply for renewal of the facility's permit annually. The Department shall annually:
   a. Review the original application for compliance with this Chapter.
   b. Review information collected from annual inspections, complaints, or known changes in the operations.
   c. Collect the renewal fee.
   d. Renew the permit.
   e. File the renewed permit no more than seven days after the date of issuance.
   f. Inform facilities regarding permit expiration and renewal date.

E. **Permit application contents for existing, new, or expanded facilities.**
   1. The permit application shall include the following information submitted on a form available from the Department for each IWMP Class:
      a. A general description of the facility or operation, including name, mailing address, and location of facility, or area served, if a transporter.
      b. The address(es) and phone number(s) of the person(s) or committee(s) responsible for implementing infectious waste management policies and procedures.
      c. The name, address, and telephone number of the owner/operator and/or administrator of the facility or operation, and indication of the status as federal, state, private, public, or other entity.
      d. An indication of whether the facility is new or existing.
      e. A listing of relevant state and local environmental permits.
      f. The types and maximum amount of infectious waste generated, transported, stored, and/or treated monthly.
      g. An applicable infectious waste management plan as described in 8.38.080 C.
      h. A statement certifying that the applicant understands and will comply with the applicable requirements of this Chapter.
   2. In addition to the above requirements, the following information will be required for Class II and III permits.
      a. IWMP Class II
         (1) A list of all vehicles and reusable transport containers. The vehicles listed must be registered to the applicant pursuant to a lease or contract and included in applicant's required insurance coverage.
         (2) Proof, via annual inspection, that all trucks, trailers, semi-trailers, vacuum tanks, cargo tanks, and containers which are used by the applicant for transportation of infectious waste on highways are in compliance with the provisions of this Chapter.
         (3) Possession of a permit for transportation of infectious waste on highways from the Washington Utilities and Transportation Commission (WUTC), except where exempt by the WUTC.
      b. IWMP Class III
         (1) A description of the processes to be used for storing and/or treating infectious waste.
         (2) A description of the containment and refrigeration systems.

F. **Record Keeping.** Applicants shall keep records of all data used to complete permit applications, and any supplemental information submitted for a period of at least three years from the date the application is signed.

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.140 Permit Suspension and Revocation.

A. **Applicability.** This Section applies to all permitted infectious waste facilities and transporters.

B. **Suspension of Permit.** For major infractions of the terms of the permit, that would be considered a public health threat, the Health Officer may suspend the permit and require the following:

1. The operator to cease generating, transporting, storing, treating, and/or disposal of infectious waste, or;
2. The operator to agree to a caretaker management of operations involving infectious wastes. The caretaker management shall be selected by the Health Department from the following:
    a. Operators or personnel acting under supervision of the Department, or;
    b. Independent management firm operating under Department supervision.

    The total cost of the caretaker management shall be borne by the operator, by revenues from operation.
3. If the operator does not voluntarily agree to the caretaker management, appropriate legal action shall be taken by the Department to institute the management operations to protect the public interest. Any person whose permit has been suspended, may at any time make application for a reinspection for the purpose of reinstatement of the permit. Within two working days following receipt of a written request for inspection, including a statement signed by the applicant that in his/her opinion the conditions causing suspension of the permit have been corrected, the Health Officer shall make a reinspection. If the applicant is in compliance with the requirements of this Chapter, the permit shall be reinstated.

C. **Revocation of Permit.** The Health Officer may, after providing opportunity for hearing, revoke a permit for serious or repeated violations of any of the requirements of this Chapter, or for interference with the Health Officer in the performance of duty. The permit shall remain in effect, pending the hearing decision, unless it is determined by the Health Officer that continued operation activity is a danger to public health. Upon the Health Officer's determination of danger to public health, all operation activity shall cease until further notice from the Department.

Prior to revocation, the Health Officer shall notify, in writing, the holder of the permit, or the person in charge, of the specific reasons(s) for which the permit is to be revoked and that the permit shall be revoked at the end of the ten days following service of such notice unless a written request for hearing is filed with the Health Officer by the holder of the permit within such ten-day period. If no request for hearing is filed within the 10-day period, the revocation of the permit becomes final.

Any person whose permit has been revoked may make a written application for the purpose of obtaining a new permit after a 6-month probation period. A hearing will be provided before the Health Officer to determine if a new permit shall be issued.

(Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.150 Service of Notices.

A notice provided for in this Chapter is properly served when it is delivered to the holder of the permit, or the person in charge, or when it is sent by registered or certified mail, return receipt requested, to the last known address of the holder of the permit. A copy of the notice shall be filed in the records of the Health Officer. (Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.160 Hearings.

The hearings provided for in this Chapter shall be conducted by the Health Officer or his/her designee at a time and place designated by him/her. The Health Officer or designee shall make a final finding based upon the complete hearing record and shall sustain, modify, or rescind any notice or order considered in the hearing. A written report of the hearing decision shall be furnished to the holder of the permit by the Health Officer or designee. (Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.170 Inspection.

The Health Officer shall have the authority to enter any infectious waste generating facility, transporter, and storage and/or treatment facility, at any reasonable time, for the purpose of evaluating the facility's written infectious waste management plan, and to determine if infectious waste is being managed in accordance with this Chapter. (Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.180 Penalties.

Anyone violating or failing to comply with any of the provisions of this Chapter or lawful order of the Director shall, upon conviction, be deemed guilty of a gross misdemeanor and be punished by a fine in the sum not exceeding 5,000.00, or by imprisonment in the Pierce County Jail for a term not exceeding one year, or by both such fine and imprisonment. Anyone found guilty of a violation shall be deemed guilty of a separate offense for every day during any portion of which any violation of any provision of this Chapter is committed, continued, or permitted. Nothing herein shall prevent the Director from utilizing civil remedies available to him/her under state law for enforcement of this Chapter. (Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.190 Appeals.

Any person aggrieved by any decision or final order of the Health Officer shall have right to appeal such a decision or order. Such appeals shall follow the procedure outlined in Resolution 791 of the Tacoma-Pierce County Board of Health. (Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

8.38.200 Severability.

The provisions of this Chapter are hereby declared to be separate and severable, and the invalidity of any clause, sentence, paragraph, subdivision, Section, or portion of this Chapter or the invalidity of the application thereto to any person or circumstance shall not affect the validity of its application to other persons and circumstances. (Ord. 94-99 § 1 (part), 1994; Ord. 89-54S § 1 (part), 1989)

Chapter 8.40

PUBLIC WATER SYSTEMS

Sections:

8.40.010 Adoption of Regulations.
8.40.020 Definitions.
8.40.030 Amendments.
8.40.040 Establishment of Approval Requirements for Existing Nonexpanding Class IV Water Systems.
8.40.050 Establishment of Approval Requirements for New and Existing Expanding Systems.
8.40.060 Fees.
8.40.070 Enforcement.
8.40.080 Severability.

8.40.010 Adoption of Regulations.

The 1978 Edition of Rules and Regulations of the State Board of Health regarding public water systems as amended in this Chapter are adopted as the Pierce County Code regulating public water systems. (Ord. 84-68 § 1 (part), 1984; prior Code § 20.05.010)

8.40.020 Definitions.

A. "Compliance program" means a schedule in writing, documenting the public water systems deficiencies, recommended improvements and a schedule for completion.
B. "Existing expanding systems" means a public water system now in existence that intends to expand or make changes in said system during the calendar year. This definition includes an existing private system that will be expanded to become a public water system.
C. "New system" means a water system that is newly developed to serve water to the public which shall include existing wells.
D. "Water system plan of operation" means the plan of operation between the State of Washington and the Tacoma-Pierce County Health Department delineating the respective responsibilities for each agency regarding the enforcement of the provisions of this Chapter.

(Ord. 84-68 § 1 (part), 1984; prior Code § 20.05.020)

8.40.030 Amendments.

The Rules and Regulations of the State Board of Health regarding public water systems are amended and changed in the following respects:

A. WAC 248-54-740(4)(a)(v) is amended as follows:
(1) For Class IV systems, the number of routine samples shall be a minimum of one (1) per calendar quarter. Upon compliance with the maximum contaminant levels for four (4) consecutive sampling quarters, sampling frequency may be reduced to one (1) per annum.

B. WAC 248-54-740 (9)(a) is amended as follows:
(1) Monitoring of secondary contaminants by Class I and II systems shall be at the same frequency as required for inorganic chemicals. Class III and IV systems shall monitor the following secondary contaminants prior to system approval: color, iron, and manganese. Other secondary contaminants shall be monitored as required by the department.

C. WAC 248-54-810 is amended as follows:
(1) The department or Health Officer, as determined by the joint plan of operation developed in accordance with WAC 248-54-570, shall conduct a sanitary survey of all public water systems at intervals necessary to assure the availability of a safe and potable water supply to all consumers of the water delivered by the public water system. A sanitary survey shall be performed at least once every five (5) years.

(Ord. 84-68 § 1 (part), 1984; prior Code § 20.05.030)

8.40.040 Establishment of Approval Requirements for Existing Nonexpanding Class IV Water Systems.

A. Any existing Class IV water system not having approval of the Health Officer, shall complete the information requested in the Class IV design requirements for existing water systems within the intent and purpose of the applicable provisions of the following Sections of the Rules and Regulations Regarding Public Water Systems:
WAC 248-54-600, 248-54-620, 248-54-630, 248-54-640 under the terms of the Water System Plan of Operation provided for in WAC 248-54-570, 248-54-660, 248-54-680, 248-54-700, 248-54-710, 248-54-740, 248-54-780 and 248-54-790.

B. Any one of the above factors found to be out of compliance shall be grounds for denying approval. If approval is denied, the Health Officer and the purveyor shall develop a compliance program to bring the system to approved standards. Approval shall not be granted until such time as the purveyor shall have developed compliance as acceptable to the Health Officer.

(Ord. 84-68 § 1 (part), 1984; prior Code § 20.05.040)

8.40.050 Establishment of Approval Requirements for New and Existing Expanding Systems.

Every purveyor, before obtaining approval to install for the purpose of operating any new or any portion of a Class IV water system, or additions, extensions, alterations of an existing Class IV water system, shall complete the information requested in the Class IV design requirements for new and expanding systems within the intent and purposes of the applicable provisions of the following Sections of Rules and Regulations Regarding Public Water Systems:

WAC 248-54-600, 248-54-620, 248-54-630, 248-54-640 (under the terms of the Water System Plan of Operation provided for in WAC 248-54-570), 248-54-660, 248-54-680, 248-54-700, 248-54-710, 248-54-740, 248-54-780 and 248-54-790.

(Ord. 84-68 § 1 (part), 1984; prior Code § 20.05.050)

8.40.060 Fees.

A fee for administration of these rules may be required in the amount established by the Board of Health in the Tacoma-Pierce County Health Department annual fee schedule. (Ord. 84-68 § 1 (part), 1984; prior Code § 20.05.060)

8.40.070 Enforcement.

If after investigation the Health Officer or his designated representative finds that any public water system fails to comply with this Chapter, the Health Officer may send a compliance letter to the purveyor of the public water system, which letter shall include the following: specifications of the areas where the public system fails to meet the requirements of this Chapter; and specifications of time deadlines for submission of any steps designed to bring the public water system into compliance with this Chapter. In the event the purveyor fails to comply with the compliance letter, the Tacoma-Pierce County Health Department may take appropriate action to require such compliance. (Ord. 84-68 § 1 (part), 1984; prior Code § 20.05.070)

8.40.080 Severability.

If any provision of this Chapter or its application to any person or circumstance is held invalid, the remainder of the Chapter or the application of the provision to other persons or circumstances shall not be affected. (Ord. 89-155 § 13, 1989)

Chapter 8.44

SWIMMING POOLS

Sections:

8.44.010 Definitions.
8.44.020 Rules and Regulations.
8.44.030 Enforcement.
8.44.040 Retroactivity.
8.44.050 Permit Required.
8.44.060 Suspension of Permit.
8.44.070 Reinstatement of Permit.
8.44.080 Revocation of Permits.
8.44.090 Hearings.
8.44.100 Service of Notice.
8.44.110 Appeals.
8.44.120 Plans and Specifications for Construction, Alteration or Renovations.
8.44.130 Responsibility for Maintenance.
8.44.140 Water Quality.
8.44.150 Disinfection.
8.44.160 Recirculation and Filtration.
8.44.170 Waste.
8.44.180 Cross-Connections.
8.44.190 Operating Records.
8.44.200 Alternate Materials, Equipment or Procedures.
8.44.210 Violation - Penalty.
8.44.220 Severability.

8.44.010 Definitions.

Certain words and phrases used in this Chapter, unless otherwise clearly indicated by their context, shall mean as follows:

A. "Approved" means approved in writing by the Health Officer.

B. "Board of Health" means the Tacoma-Pierce County Board of Health.

C. "Health Officer" means the Director of the Tacoma-Pierce County Health Department or his authorized representative.

D. "Permit holder" means a person to whom a permit is issued or his/her authorized agent.

E. "Person" means any individual, firm, partnership, company, corporation, trustee, association or any public or private entity.

F. "Private pool" means any swimming pool, wading pool or spray pool maintained by an individual, the use of which is confined to members of his/her family or invited guests. Private pools are not subject to the provisions of this Chapter.

G. "Public swimming pool" means any pool together with buildings and appurtenances in connection therewith which is available to the general public with or without payment of an admission charge for the use of same; and shall include any swimming pool

where the same is 1,500 square feet or more in surface area whether or not available to the general public; or any swimming pool not otherwise defined in this Section.

H. "Semipublic swimming pool" means any swimming pool provided for and used by numbers of persons or multiple family or cooperative groups such as, but not limited to, hotels, motels, condominiums, trailer parks, apartments, subdivisions, community clubs, private clubs, institutions, or schools, the use of which is limited to such groups and their invited guests and where the same is less than 1,500 square feet in surface area.

I. "Spray pool" means any pool or artificially constructed depression intended for use by children, into which water is sprayed but is not allowed to pond in the bottom of the pool.

J. "Swimming pool" means any structure, basin, chamber, spa, or tank containing an artificial body of water for swimming, diving, or recreational bathing and having a depth of two feet or more at any point and including all facilities incident thereto.

K. "Wading pool" means any artificial pool of water intended and constructed for wading purposes which is not over two feet in depth at any point.

(Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.010)

8.44.020 Rules and Regulations.

The Tacoma-Pierce County Board of Health is empowered and shall write rules and regulations necessary for implementation of this Chapter and consistent herewith. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.020)

8.44.030 Enforcement.

The Health Officer shall enforce this Chapter and the rules and regulations of the Board of Health. The Health Officer may with the consent of the occupant thereof or pursuant to a lawfully issued warrant enter any building or premises at any reasonable time to perform any of the duties imposed on him/her by this Chapter and the Board of Health rules and regulations established in accordance herewith. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.030)

8.44.040 Retroactivity.

The provisions of this Chapter shall apply equally to new and existing public or semipublic swimming pools, wading pools and spray pools; provided, that it shall not make unlawful an existing pool heretofore lawfully designed, constructed and equipped which is maintained and operated in compliance with this Chapter. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.040)

8.44.050 Permit Required.

It shall be unlawful for any person to open or use, or allow or cause to be used any public or semipublic swimming pool for swimming or bathing purposes without having a current, valid permit to operate issued by the Health Officer. Application for such a permit shall be accompanied by an annual fee as adopted by the Tacoma-Pierce County Board of Health. Applications shall be made in writing to the Health Officer on a form to be provided by the department; provided, that the fee for any initial permit to operate shall be prorated on the basis of one-twelfth the annual fee for each remaining month in the year. The Health Officer shall inspect the proposed public or semipublic swimming pool and upon determination that

such swimming pool complies with applicable rules and regulations and the provisions of this Chapter shall issue a permit to operate to such applicant. Permits to operate shall expire on December 31 of the year for which issued and shall be renewable upon like application and payment of the annual fee. Permits shall be valid only for the swimming pool for which issued, but upon application may be transferred without charge from person to person. Permits shall be posted conspicuously on the premises for which issued and shall be protected from the weather. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.050(A))

8.44.060 Suspension of Permit.

A. First Notice - Corrective Action. Any permit may be suspended temporarily whenever the Health Officer finds that a violation of this Chapter or of the rules and regulations established in accordance herewith, has created or is creating an insanitary or hazardous condition. He/she shall cause to be issued and served upon the permit holder or posted on the premises an order setting forth the violations creating such sanitary or hazardous condition, specifying the corrective action to be taken, and the period of time within which such violations shall be corrected. Any permit holder to whom such an order is issued shall, upon written petition to the Health Officer within five days after the issuance of such order, be afforded a hearing thereon within five days of the filing of such petition.

B. Second Notice - Suspension. Upon failure of the permit holder to comply with any order issued in accordance with the provisions of this Chapter, the Health Officer shall cause to be issued and served upon the permit holder or posted on the premises a notice that such permit is suspended effective upon such service or posting, and that a hearing on such suspension will be provided if a written request therefor is filed, within five days after the issuance of such notice by the permit holder, with the Health Officer. Upon suspension of any permit in accordance with the provisions of this Chapter, all use of the swimming pool for which such permit has been issued shall cease.

C. Immediate Closure. Notwithstanding any other provision of this Chapter, whenever the Health Officer finds an insanitary or hazardous condition constituting so serious a hazard to health or safety as to require immediate closure of the swimming pool, he/she may, without a hearing, suspend, with immediate effect, the permit to operate such swimming pool, and all use of such swimming pool shall cease immediately; provided, that any person whose permit is so suspended shall, upon written petition to the Health Officer filed within five days after such suspension, be afforded a hearing within five days of the filing of such petition.

(Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.050(B))

8.44.070 Reinstatement of Permit.

Any person whose permit to operate has been suspended may, at any time make written application for reinstatement of such permit. Such application shall include a reinstatement fee as adopted by the Tacoma-Pierce County Board of Health and a statement, signed by the applicant that conditions causing such suspension have been corrected. Within five days after receipt of such application, the Health Officer shall inspect such swimming pool and if she/he finds that such swimming pool complies with the provisions of this Chapter and the rules and regulations established in accordance herewith, he/she shall reinstate such permit to operate. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.050(C))

8.44.080 Revocation of Permits.

For serious or repeated violations of any of the requirements of this Chapter or of the rules and regulations established in accordance herewith, or for interference with the Health Officer in the performance of his/her duties, or for failure to comply with any lawful order issued in accordance with the provisions of this Chapter, the Health Officer may revoke any permit to operate by issuing and causing to be served upon the permit holder a notice in writing setting forth the reasons for such revocation and advising that such permit shall be revoked effective five days after service of such notice unless a written request for hearing is filed with the Health Officer within such 5-day period. A permit may be suspended for cause pending its revocation or a hearing relative thereto. Any person whose permit is revoked shall not be eligible to obtain a swimming pool permit for two years from the date of revocation. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.050(D))

8.44.090 Hearings.

Hearings provided by this Chapter on the suspension or revocation of a permit and/or regarding an order of the Health Officer shall be conducted by the Health Officer at such time and place as the Health Officer shall designate. At any such hearing, the permit holder may appear in person, or through a representative, and may testify, call witnesses and cross-examine witnesses testifying against him/her. The Health Officer shall make findings and shall sustain, modify or rescind any official notice or order considered at such hearing, and shall furnish a copy of his/her written decision to the permit holder within five working days. (Ord. 84-114 § 1 (part), 1984; prior Code 20.03.050(E))

8.44.100 Service of Notice.

Notices provided by this Chapter to be served on the permit holder shall be deemed served when delivered personally to the permit holder or his agent, or when sent by certified and regular mail to the address given on the permit or any changes thereto. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.050(F))

8.44.110 Appeals.

A. A permit holder aggrieved by the final decision of the Health Officer may appeal the decision to the Pierce County Hearing Examiner who shall review and examine available relevant information, conduct a public hearing, cause preparation of a record thereof and prepare and enter findings and conclusions.
B. The Examiner's decision on all matters is final and conclusive, provided that appeals from the Examiner's decision may be taken to the County Council.
C. The Examiner shall conduct the hearing in accordance with the relevant procedures contained in Pierce County Code Sections 2.36.090 through 2.36.130 except that "Health Department" shall be substituted for all references to "Planning Department."

(Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.060)

Code Revisor's Note: Sections 2.36.090 through 2.36.130 have been recodified and amended. See Chapter 1.22 PCC.

8.44.120 Plans and Specifications for Construction, Alteration or Renovations.

A. No person shall construct, alter or renovate, or commence construction, alteration or renovation of any public or semipublic swimming pool, wading pool, spray pool, or appurtenances thereto, without first having obtained the approval of the Health Officer

of plans and specifications for any such construction, alteration or renovation. Such plans and specifications shall be submitted to the Health Officer in duplicate and in the case of new pools shall be prepared by an architect or professional engineer qualified in the proposed work and licensed to practice such profession under the laws of the State of Washington. Such plans shall be accompanied by a plan review fee as adopted by the Tacoma-Pierce County Board of Health.

B. Plans shall be drawn to scale and accompanied by specifications containing details on all recirculation and chemical equipment, including pumps, disinfection equipment, chemical feeders, filters, meters, strainers, overflow channels and/or skimming facilities and related equipment so as to enable a comprehensive engineering review of such plans and specifications including piping and hydraulic details. If upon examination of such plans and specifications the Health Officer finds that the proposed construction, alteration or renovation will comply with the provisions of this Chapter and applicable rules and regulations established in accordance herewith, he/she shall approve the same; provided that such approval may be conditioned upon the making of such modifications in such plans and specifications as public health or safety may require.

C. The construction, alteration or renovation of any public or semipublic swimming pool, wading pool, spray pool, or appurtenances thereto shall be made in accordance with approved plans and specifications therefor; provided that changes or modifications in such plans and specifications consistent with public health and safety may be made with the written approval of the Health Officer. Upon completion of any such construction, alteration or modification, the owner or operator of such pool, or the agent of either, shall notify the Health Officer of its readiness for inspection and no such pool shall be opened for use or allowed or cause to be used until inspection by the Health Officer and found to be in compliance with the provisions of this Chapter and applicable rules and regulations established in accordance herewith.

(Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.070)

8.44.130 Responsibility for Maintenance.

All public or semipublic swimming pools, spray pools, wading pools and all components thereof and appurtenances thereto and the premises thereof, shall be maintained in a clean and sanitary condition at all times such pool is open to bathers. The permit holder shall be responsible for the maintenance, operation and use of the public or semipublic swimming pool for which such permit is issued, and shall provide one or more operators or attendants at such times as shall be necessary for the maintenance and operation of such swimming pool in compliance with the provisions of this Chapter and applicable rules and regulations established in accordance herewith. All such operators and attendants shall be familiar with the equipment and appurtenances of such swimming pool and the principles of pool operation. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.080(A))

8.44.140 Water Quality.

The water in all public or semipublic swimming, wading, and spray pools shall meet such standards of chemical, physical and bacteriological quality as the Board of Health shall establish to ensure that persons using such pools shall not be exposed to toxic or irritating chemical conditions, or disease-producing organisms. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.080(B))

8.44.150 Disinfection.

A disinfecting process or procedure providing a minimum free chlorine residual or such other process or procedure established by the Board of Health shall be used in all public or semipublic swimming and wading pools. The disinfecting process or procedure must be capable of adequate and continuous disinfection of water throughout the pool during the period such pool is in use. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.080(C))

8.44.160 Recirculation and Filtration.

Recirculation and filtration equipment shall be adequate to recirculate and filter the entire volume of water as established by the Board of Health. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.080(D))

8.44.170 Waste.

All water from backwash, filter residues and other waste in any public or semipublic swimming pool, wading pool or spray pool shall be disposed of in a safe and sanitary manner approved by the Health Officer. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.080(E))

8.44.180 Cross-Connections.

No piping arrangement shall be installed or used in any public or semipublic swimming pool, wading pool or spray pool, which under any condition will permit sewage or waste water to enter the recirculation system or the pool, or which will permit water from the recirculation system or the pool to enter the potable water supply or make-up water supply. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.080(F))

8.44.190 Operating Records.

At all public or semipublic swimming pools and wading pools, complete daily records shall be kept of the times each filter is backwashed or cleaned, and of the results of all tests made as to water quality and disinfectant residual. Such records shall be made available at any reasonable time for examination by the Health Officer. (Ord. 84-114 § 1 (part), 1984; prior Code 20.03.080(G))

8.44.200 Alternate Materials, Equipment or Procedures.

For the purpose of evaluating equipment, materials or procedures, or to meet any temporary emergency condition, the Health Officer may, consistent with the public health and safety, permit the use of materials, equipment and procedures not specifically prescribed by this Chapter or rules and regulations established in accordance herewith. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.080(H))

8.44.210 Violation - Penalty.

Anyone violating or failing to comply with any of the provisions of this Chapter or lawful order of the Health Officer shall upon conviction thereof be punishable by a fine of not to exceed $300.00. Anyone found guilty of a violation shall be deemed guilty of a separate offense for every day during any portion of which any violation of any provision of this Chapter is committed, continued or permitted. (Ord. 84-114 § 1 (part), 1984; prior Code § 20.03.090)

8.44.220 Severability.

If any provision of this Chapter or its application to any person or circumstance is held invalid, the remainder of the Chapter or the application of the provision to other persons or circumstances shall not be affected. (Ord. 89-155 § 14, 1989)

Chapter 8.50

PIERCE COUNTY DETENTION AND CORRECTIONS CENTER STANDARDS

Section:

8.50.010 Standards Adopted by Reference.

8.50.010 Standards Adopted by Reference.

The Custodial Care Standards and New Facility Plant Standards for the Pierce County Detention and Corrections Center, as contained in Exhibit "B" of Ordinance No. 87-187S, are hereby adopted by reference. Copies of the standards shall be kept on file and shall be made available to interested parties at the Pierce County Sheriff's Department. (Ord. 87-187S § 1, 1987)

Chapter 8.64

ALARM SYSTEMS

Sections:

8.64.010 Definitions.
8.64.020 Permit Requirements.
8.64.030 Permit Revocation.
8.64.040 Permit Reinstatement.
8.64.050 Service Charges.
8.64.060 Additional Duties of Permittee and/or Agents of Permittee.
8.64.070 Unlawful Systems and Uses.
8.64.080 Violation - Penalty.
8.64.090 Severability.

8.64.010 Definitions.

A. "Alarm System" means any system, device, or mechanism which, when activated, transmits a telephone message to a private monitoring company or some other number, or emits an audible or visible signal that can be heard or seen by persons outside the protected premises, or transmits a signal beyond the premises in some other fashion, except any system, device, or mechanism primarily protecting a motor vehicle.

B. "Burglary Alarm System" means an alarm system designed or used for detecting and reporting an unauthorized entry or attempted unauthorized entry upon real property protected by the system.

C. "Robbery Alarm System" means an alarm system designed or used for alerting others of a robbery or other crime in progress which involves potential serious bodily injury or death.

D. "Department" means the Pierce County Sheriff's Department.

E. "False Alarm" means the activation of any burglary and/or robbery alarm system when no crime is being committed or attempted on the premises. An alarm shall be presumed to be false if the police officers responding do not locate any evidence of an intrusion or commission of an unlawful act or emergency on the premises which might have caused the alarm to sound. Alarms caused by earthquakes, hurricanes, tornadoes, or other violent acts of nature shall not be deemed to be false alarms.

F. "Permittee" means the person(s), corporation, or other business entity to whom a permit has been issued under this Chapter.

G. "Premises" means any area and any portion of any area protected by an alarm system.

H. "System Subscriber" means person(s), corporation(s), or other business entity who purchased or contracted for any alarm system.

(Ord. 92-170 § 2 (part), 1993)

8.64.020 Permit Requirements.

A. Permit Required. From and after July 1, 1993, no person shall operate or use an alarm system on any premises within unincorporated Pierce County under that person's control without first having obtained from the Sheriff's Department a separate permit for each premise protected by an alarm system. The Department need not

respond to any alarm system for which a permit has not first been obtained. For the purposes of this Section, a person shall be deemed to be an operator or user of an alarm system if:

1. The person controls both the alarm system and the premises upon which it is installed, or
2. The person controls the premises and is the subscriber, client, or tenant of the system subscriber, or
3. The person is the system subscriber.

B. Application. All persons required to obtain a permit must complete a permit application form. Information required to be provided on the permit application form includes, but is not necessarily limited to:

1. Subscriber's name, address, and telephone number(s);
2. Names and telephone numbers of three additional persons who will respond in the event of alarm activation in the absence of the subscriber;
3. The electrical inspection permit number;
4. Name of the alarm company responsible for regular maintenance and that company's electrical contractor's license number;
5. The information required in Paragraphs 3 and 4 of this subsection shall not apply to:
   a. alarms which are installed by the homeowner/tenant;
   b. existing alarms; or
   c. alarms which are installed in multiple-tenant buildings.

   Failure to complete the required information will result in automatic denial of the permit.

C. Permit Fee. Each permit shall be given a unique number which shall not be transferable. The Department shall charge a $20.00 application fee, except that no fee shall be charged for alarms installed prior to the effective date of this Chapter, if a permit application for such existing alarm system is filed with the Department before July 1, 1993. Permit fees shall be deposited into the Alarm Systems Permits Account in the General Fund, to be used exclusively for the administration of this Chapter.

D. Any person who owns, operates, or possesses any alarm system within unincorporated Pierce County which does not conform to the requirements of this Chapter shall disconnect that alarm and render it inoperable or alter it in accordance with this Chapter no later than December 31, 1993.

(Ord. 99-122 § 1 (part), 1999; Ord. 92-170 § 2 (part), 1993)

8.64.030 Permit Revocation.

A. Grounds. The Sheriff may revoke a permit of any permittee:

1. Whose alarm system has resulted in more than five false alarm responses by the Department within a 6-month period, or
2. Who has failed to pay a service charge, as set forth in Section 8.64.050 of this Chapter, within 60 days of billing.

B. Notice of Revocation. The Sheriff shall notify such permittee in writing by first class mail of the revocation of his/her alarm permit and the grounds therefor.

The notice shall specify the specific date of revocation, which shall be no sooner than ten days after the notice is deposited in the mail, and that the Department may discontinue responding to alarms which occur at the premises described in the revoked permit after the date of revocation.

C. Appeal. The permittee may appeal the intended or actual revocation pursuant to the provisions of the Hearing Examiner Code, Chapter 2.36 PCC.

(Ord. 92-170 § 2 (part), 1993)

Code Revisor's Note: Chapter 2.36 PCC has been recodified and amended. See Chapter 1.22 PCC.

8.64.040 Permit Reinstatement.

A. Reinstatement of the permit may be made upon receipt by the Department of either:
   1. A letter from a licensed alarm company that the alarm system is operating properly and/or the permittee's agents are properly trained in the alarm system operation; or
   2. Documentation from an owner/tenant who has personally installed the alarm system.

B. The County shall not be responsible for any costs incurred by the permittee to qualify for reinstatement.

C. Reinstated permittees will be billed for any false alarm responses after reinstatement, and will be subject to further revocation after three more false alarm responses during the remainder of the 6-month period.

D. Permits will not be reinstated if there are any outstanding fees or service charges due.

(Ord. 92-170 § 2 (part), 1993)

8.64.050 Service Charges.

A. A service charge of $75.00 shall be billed to and paid by the permittee for each false alarm response in excess of two responses during a 6-month period.

B. Service charges shall be deposited into the Alarm Systems Permits Account in the General Fund, to be used for the administration and enforcement activities associated with this Chapter.

(Ord. 99-122 § 1 (part), 1999; Ord. 92-170 § 2 (part), 1993)

8.64.060 Additional Duties of Permittee and/or Agents of Permittee.

A. The permittee shall display the permit at or near the main entrance of the premises in such a manner that the permit is clearly visible and readable from the exterior of the premises.

B. The permittee shall display the street address at or near the front of the premises and at other places where access is available, such as from an alley or parking lot. The street address shall be clearly visible and readable from the exterior of the premise.

C. All telephone calls from a private monitoring company requesting the Department response shall include the permit number for that premises, and the Department need not respond if the permit number is not provided.

D. The permittee or his/her designee shall respond to a premises following activation of an alarm system for which a permit has been issued. The response shall be made within a reasonable time, and in any event within one hour after being requested to do so by the Department.

(Ord. 92-170 § 2 (part), 1993)

8.64.070 Unlawful System and Uses.

A. No person shall operate or use an alarm system which emits an audible sound where such emission does not automatically cease within 15 minutes.

B. No person shall use an alarm system to protect more than one licensed business and/or private residence without receiving a separate permit for such licensed business and/or private residence to be protected.
C. No person shall operate or use any alarm system for which the permit has been revoked by the Department.
D. No person shall operate or use any alarm system which automatically dials the Department directly and delivers a prerecorded message.

(Ord. 92-170 § 2 (part), 1993)

8.64.080 Violation - Penalty.

In addition to the penalties and regulations provided herein, any person who violates any provisions of this Chapter shall be guilty of a misdemeanor. (Ord. 92-170 § 2 (part), 1993)

8.64.090 Severability.

If any provision of this Chapter or its application to any person or circumstance is held invalid, the remainder of the Chapter or the application of the provision to other persons or circumstances is not affected. (Ord. 92-170 § 2 (part), 1993)

Chapter 8.68

FAIR HOUSING REGULATIONS

Sections:

8.68.010 Short Title.
8.68.020 Declaration of Policy.
8.68.030 Definitions.
8.68.040 Unlawful Discriminatory Practices.
8.68.050 Practices Not Prohibited.
8.68.060 Adjustment and Settlement of Complaints.
8.68.070 Community Development Agency to Adopt Rules and Procedures.

8.68.010 Short Title.

This Chapter may be cited as the "Pierce County fair housing ordinance." (Ord. 84-102 § 1 (part), 1985; Ord. 81-120 § 1 (part), 1982; prior Code § 10.34.010)

8.68.020 Declaration of Policy.

It is the policy of Pierce County, through fair, orderly and lawful procedures, to promote the opportunity for each person to obtain decent, safe and affordable housing without regard to race, color, religion, sex, marital status, national origin, or the presence of sensory, mental or physical handicap. This policy is founded upon a recognition of the right of each person to have access to adequate housing of the person's choice. It is recognized that the denial of this right because of race, color, religion, sex, marital status, age, national origin, or the presence of any sensory, mental or physical handicap is detrimental to the health, safety and welfare of the residents of the County and constitutes an unjust deprivation of rights. It is further recognized that such an unjust deprivation of rights is within the power and proper responsibility of government to protect. (Ord. 84-102 § 1 (part), 1985; Ord. 81-120 § 1 (part), 1982; prior Code § 10.34.020)

8.68.030 Definitions.

A. "Age" refers to persons 18 years of age and older and otherwise legally able to contract.
B. "Agency" means the Community Development Agency of Pierce County.
C. "City" means the Executive Director of the Human Rights Department of the City of Tacoma and the Tacoma Human Rights Department staff.
D. "Charging party" includes any individual alleging on his/her own behalf to have been personally aggrieved by an unlawful discriminatory practice.
E. "Conciliation" means a written settlement generally providing full relief for the charging party after a determination of reasonable cause has been accepted. Such agreement requirds the signatures of the respondent and a city representative. The charging party may also be signatory to such an agreement.
F. "Housing accommodation" means any building, structure or part thereof which is used or occupied, or is intended, arranged or designed to be used or occupied, as a residence, home or place of habitation of one or more human beings, including a mobile home or a trailer and any land for sale, lease or use as a site for a building,

structure, or part thereof intended or designed to be used or occupied as a residence, home, or place of habitation of one or more human beings, including a mobile home park or a trailer camp.

G. "Marital status" includes being married, separated, divorced, widowed or single.

H. "Negotiated settlement" means a signed agreement between the charging party and the respondent in a particular case prior to a finding on the merits of the charge. The city may also be signatory to such an agreement. A negotiated settlement should not be taken as evidence that the respondent has or has not engaged in any unlawful discriminatory activity.

I. "Person" includes one or more individuals, partnerships, associations, corporations, organizations, cooperatives, legal representatives, trustees, and receivers or any group of persons; it includes any owner, lessee, proprietor, manager, agent or employee, whether one or more natural persons; and further includes Pierce County and any political or civil subdivisions thereof and any agency or instrumentality of Pierce County or any political or civil subdivision thereof.

J. "Reasonable cause" means that a determination has been made that the evidence produced by the City staff's investigation is adequate to support a reasonable conclusion that unlawful discrimination has occurred or is occurring. Such determination allows for the continuance of the administrative process including, but not limited to, attempts at conciliation.

K. "Religion" includes all aspects of religious observance and practice, including belief.

L. "Respondent" includes any person or entity against whom a complaint or charge of unlawful practice is filed with the City.

M. "Sensory, mental or physical handicap" means any condition or characteristic that renders a person a "handicapped person." A "handicapped person" should be defined as any person who:

1. Has a sensory, physical or mental impairment which substantially limits one or more major life activities;
2. Has a record of such an impairment; or
3. Is regarded as having such an impairment.

(Ord. 84-102 § 1 (part), 1985; Ord. 81-120 § 1 (part), 1982; prior Code § 10.34.030)

8.68.040 Unlawful Discriminatory Practices.

A. Discrimination in Housing Accommodations. It shall be an unlawful discriminatory practice for an owner, lessee, sublessee, managing agent of, real estate broker, real estate salesperson, or any other person having the right to sell, rent or lease any property, or any agent or employee of any of these:

1. To refuse to sell, rent or lease, to offer for sale, rental or lease, or otherwise deny or withhold any housing accommodation to or from any person, or to refuse to negotiate for the sale, rental or lease of any housing accommodation to any person because of race, color, religion, sex, marital status, national origin, age or presence of sensory, mental or physical handicap;
2. To represent that housing accommodations are not available for inspection, sale, rental or lease when in fact they are so available or otherwise deny or withhold any housing accommodations or any facilities of housing accommodations to or from any person because of race, color, religion, sex, marital status, national origin, age or presence of sensory, mental or physical handicap;

3. To discriminate against any person in the terms, conditions or privileges of the sale, rental or lease of housing accommodations or in furnishing of facilities or services in connection therewith because of the person's race, color, religion, sex, marital status, national origin, age or presence of sensory, mental or physical handicap; or
4. To print, circulate or post or cause to be printed, circulated or posted, any advertisement or sign, or use any form of application for the purchase, rental or lease of any housing accommodation, or make any record or inquiry in connection with the prospective purchase, rental or lease of any housing accommodation, which expresses directly or indirectly any limitation, specification or discrimination as to race, color, religion, sex, marital status, national origin, age or presence of sensory, mental or physical handicap.

B. Discriminatory Representation by Real Estate Brokers or Real Estate Salespersons. It shall be an unlawful discriminatory practice for any real estate broker or real estate salesperson, or any agent or employee thereof, for the purpose of inducing a real property transaction from which such person, that person's firm, or any of its members may benefit financially, to represent that a change has occurred or will or may occur in the composition with respect to race, color, religion, sex, marital status, national origin, age or presence of sensory, mental or physical handicap of the owners or occupants in the block, neighborhood or area in which the real property is located. It shall also be an unlawful discriminatory practice to represent directly or indirectly that this change will or may result in undesirable consequences in the block, neighborhood or area in which the real property is located, including, but not limited to, the lowering of property values, an increase in criminal or antisocial behavior, or a decline in the quality of schools or other public facilities.

C. Retaliation. It is an unlawful practice for any property owner, real estate broker or agent thereof or financial institution to expel, penalize, or otherwise discriminate against any person because that person has opposed any practice forbidden by this Chapter, whether or not such practice in fact exists, or because that person has filed a charge, testified or assisted in any proceeding under this Chapter.

(Ord. 84-102 § 1 (part), 1985; Ord. 81-120 § 1 (part), 1982; prior Code § 10.34.040)

8.68.050 Practices Not Prohibited.

A. Nothing in this Chapter shall prohibit a religious organization, association or society, or any nonprofit institution or organization operated, supervised or controlled by or in conjunction with a religious organization, association or society, from limiting the sale, rental or occupancy of dwellings which it owns or operates for other than a commercial purpose to persons of the same religion, or from giving preference to such persons, unless membership in such religion is restricted on account of race, color, sex or national origin. Nor shall anything in this Chapter prohibit a private club not in fact open to the public, which as an incident to its primary purpose or purposes provides lodging which it owns or operates for other than a commercial purpose, from limiting the rental or occupancy of such lodgings to its members or from giving preference to its members.

B. This Chapter does not require that an owner make accessible any housing accommodation which is not otherwise physically accessible to the physically or sensorially handicapped unless so required by a federal, state, city or county statute, ordinance or regulation.

C. This Chapter shall not prohibit the owner, lessee, sublessee, managing agent, real estate broker, real estate salesperson, or any other person having the right to sell, rent or lease property or any agent or employee thereof of housing accommodations from requiring the same financial obligations of all prospective tenants regardless of their race, color, religion, sex, marital status, national origin, age or the presence of any sensory, mental or physical handicap. Discrimination in the amount or manner of payment of said financial obligations shall be an unlawful discriminatory practice.

D. Housing accommodations in which there are common lavatory or sleeping facilities, shared by any number of persons, may give preference on the basis of sex in offering and providing those accommodations to the public.

(Ord. 84-102 § 1 (part), 1985; Ord. 81-120 § 1 (part), 1982; prior Code § 10.34.050)

8.68.060 Adjustment and Settlement of Complaints.

A. Initiation of Review of Violation. Review of alleged violations of this Chapter shall be initiated by filing a written, notarized complaint alleging that an unlawful discriminatory practice has occurred or is occurring. Such complaint shall be filed with the City, which has entered into an interlocal agreement with the County to act as its agent in reviewing the complaints, and shall be filed no later than six months after the occurrence of the alleged prohibited activity. The City shall conduct a prompt investigation of the complaint. During the course of the investigation, the City may attempt to resolve the dispute between the charging party and the respondent by means of a negotiated settlement. If, upon the completion of such investigation, it is determined that insufficient evidence exists to support a reasonable finding that an unlawful discriminatory practice has occurred or is occurring, such determination shall be filed in writing with the Agency and the case shall be administratively closed. If a determination of reasonable cause is found, however, the City shall attempt to mediate and resolve the dispute between the charging party and the alleged violator by means of conciliation.

B. Administrative Closure. The charging party may file a request with the Agency for reconsideration of the City's decision to administratively close its case. Upon receipt of such a request, the Agency shall independently review the record compiled by the City to determine if reasonable cause exists. If the Agency finds such reasonable cause to exist or that this record is substantially incomplete or inadequate, it shall return the case to the City for further action.

C. Conciliation Failure. If the complained-of prohibited activity cannot be eliminated through conciliation, the City's finding of reasonable cause shall be reported to the Agency, accompanied by a recommendation by the City either to take or not to take the unresolved case to a public hearing before the County Hearing Examiner, based upon the City's evaluation as to which course of action will best effectuate the purposes of this Chapter. Cases not recommended for hearing before the County Hearing Examiner may be administratively closed by the Agency. Cases recommended for hearing shall be forwarded by the Agency to the office of the County Hearing Examiner after review by the Prosecuting Attorney's Office.

1. The case in support of the Agency's finding of reasonable cause shall be presented at hearing by a County representative; provided, however, that the charging party may retain independent counsel and submit testimony and be fully heard.

2. The respondent shall have the right to file a written answer to the charge and to appear at the hearing with or without counsel, submit testimony and be fully heard, and to examine and cross-examine witnesses.
3. The Hearing Examiner shall not be bound by the strict rules of evidence prevailing in courts of law or equity. The testimony taken at the hearing shall be under oath, and shall be recorded.
4. If, upon all the evidence presented, the Hearing Examiner finds that the respondent has not engaged in an unlawful discriminatory practice, the Hearing Examiner shall issue an order dismissing the complaint.
5. If, upon all the evidence presented, the Hearing Examiner finds that the respondent has engaged or is engaging in an unlawful discriminatory practice, the Examiner shall issue an order which shall effectuate the purposes of this Chapter. Such order shall require the respondent to cease and desist from such unlawful discriminatory practice and to take such affirmative action as is necessary to effectuate the purposes of this Chapter. An order may include the selling, renting or leasing of a housing accommodation or housing accommodations upon equal terms and conditions and with equal facilities, services and privileges; and any other order which, in the judgment of the Hearing Examiner, will effectuate the purposes of this Chapter and is warranted by the facts presented at the hearing, including a requirement for report of the manner of compliance. The Hearing Examiner may, in addition to other relief authorized under this Chapter, award the complainant up to $1,000.00 for loss of the right or rights secured by this Chapter. Such orders shall also include terms requiring performance of such action within 30 days after receipt of notice by the respondent of the entry of such order.

D. Civil Violation. A respondent who has not complied with the terms of an order mandating relief as described above within 30 days of receiving notice of the entry of such order shall be deemed guilty of a civil violation against Pierce County and shall be liable to the County in an amount not to exceed $100.00 to be levied by the district Court of Pierce County for each day in excess of the 30 days provided for in this Chapter on which such respondent has failed to comply with an order rendered by the Hearing Examiner or to seek Superior Court review of such order.

E. Appeal from Orders of Hearing Examiner. Any respondent or charging party aggrieved by a final order of the Hearing Examiner may obtain a review of such order on the record by the County Council by filing with the Clerk of the Council, within 30 days from the date of receipt of such order, a written petition praying that such order be modified or set aside. The Hearing Examiner shall then cause to be filed with the council a tape recording and summary of the entire record of the proceedings, including the pleadings, testimony and order. The County Council shall have jurisdiction to grant to any party such relief as it deems just and equitable. Council review of an order of the Hearing Examiner shall be recorded on tape and in accordance with the Permanent Rules of the County Council. Filing of a petition seeking Council review of an order of the Hearing Examiner shall operate as a stay of such order.

F. Council Decision is Final. The decision of the County approving, amending or rejecting a decision of the Examiner is final and conclusive unless within 30 days from the date of the resolution setting forth the Council's decision an aggrieved party files an appropriate action in Superior Court for purpose of review of the Council decision, and serves all necessary parties.

G. Court Enforcement of Orders. The Agency may petition the Superior Court of Washington for Pierce County for enforcement of any order of the Hearing Examiner or of the Council which has not been complied with during the 30-day period of performance prescribed in such order. The Agency, through the Prosecuting Attorney or his Deputy, shall certify and file in Superior Court a transcript of the entire record of the proceedings, including the pleadings and testimony upon which such order was made and the findings and orders of the Hearing Examiner or Council. Within five days after filing such petition in Court, the Agency shall cause a notice of the petition to be personally served upon all parties or their representatives. Such review shall be in accordance with the provisions set forth at RCW 49.60.260.

(Ord. 84-102 § 1 (part), 1985; Ord. 81-120 § 1 (part), 1982; prior Code § 10.34.060)

8.68.070 Community Development Agency to Adopt Rules and Procedures.

The Community Development Agency shall prescribe such additional rules and procedures not inconsistent with the provisions of this Chapter as may be necessary to implement the enforcement procedures contained in this Chapter. (Ord. 84-102 § 1 (part), 1985; Ord. 81-120 § 1 (part), 1982; prior Code § 10.34.070)

Chapter 8.72

MOTOR VEHICLE, PUBLIC DISTURBANCE, AND PUBLIC NUISANCE NOISE

Sections:

8.72.010 Purpose and Findings of Special Conditions.
8.72.020 Definitions.
8.72.030 Sounds Created by Operation of Motor Vehicles.
8.72.040 Mufflers.
8.72.050 Modification of Motor Vehicles.
8.72.060 Tire Noise.
8.72.070 Exhaust System.
8.72.080 Sale of New Motor Vehicles Which Exceed Limits.
8.72.090 Public Disturbance Noises.
8.72.100 Public Nuisance Noises.
8.72.110 Exemptions.
8.72.120 Enforcement.
8.72.130 Violation - Penalty.
8.72.140 Severability.

8.72.010 Purpose and Findings of Special Conditions.

A. The purpose of this Chapter is to regulate excessive intermittent noises that interfere with the use, value and enjoyment of property and which pose a hazard to the public health, safety and welfare.

B. This Chapter is not intended to regulate the content of any form of speech or expression.

C. Findings of Special Conditions. The problem of noise in Pierce County has been observed by the Pierce County Council and county staff and is documented by the complaints received and logged in the Sheriff's Department. On the basis of these observations and complaints, the Pierce County Council finds that special conditions exist within the County which make necessary any and all differences between this Chapter and the regulations adopted by the Washington State Department of Ecology.

(Ord. 93-89S § 1 (part), 1994; Ord. 82-69 (part), 1982; prior Code § 35.14.010)

8.72.020 Definitions.

A. "dB(A)" means the sound level measured in decibels using the "A" weighing network.

B. "Motorcycle" means any motor vehicle having a saddle for the use of a rider and designed to travel on not more than three wheels in contact with the ground; except that farm tractors and vehicles powered by engines of less than five horsepower shall not be included.

C. "Motor vehicle" means any vehicle which is self-propelled, used primarily for transporting persons or property upon public highways and required to be licensed under RCW 46.16.010.

D. "Motor vehicle racing event" means any competition between motor vehicles and/or off-highway vehicles under the auspices of a sanctioning body licensed by Pierce County.

E. "Muffler" means a device consisting of a series of chambers or other mechanical designs for the purpose of receiving exhaust gas from an internal combustion engine and effective in reducing sound resulting therefrom.
F. "Off-highway vehicle" means any self-propelled motor-driven vehicle not used primarily for transporting persons or property upon public highways not required to be licensed under RCW 46.16.010. "Off-highway vehicle" shall include dirt bikes and all-terrain vehicles, but shall not include special construction vehicles.
G. "Person" means any individual, firm, association, partnership, corporation or any other entity, public or private.
H. "Property boundary" means the surveyed line at ground surface, which separates the real property owned, rented or leased by one or more persons, from that owned, rented or leased by one or more other persons, and its vertical extension.
I. "Real property" means an interest or aggregate of rights in land which is guaranteed and protected by law. "Real property" includes a leasehold interest.
J. "Receiving property" means any real property within which sound originating from sources outside the property is received.
K. "Sound level meter" means a device which measures sound pressure levels and conforms to Type 1, S1A, 2 or S2A, as specified in the American National Standards Institute Specifications.
L. "Special construction vehicle" means any vehicle which is designed and used primarily for grading, paving, earth moving, and other construction work; and which is not designed or used primarily for the transportation of persons or property on a public highway, and which is only incidentally operated or moved over the highway.
M. "Warning device" means any device intended to provide warning of potentially hazardous, emergency or illegal activities including but not limited to an alarm system or vehicle back-up signal.

(Ord. 82-69 (part), 1982; prior Code § 35.14.020)

8.72.030 Sounds Created by Operation of Motor Vehicles.

It is unlawful for any person to operate upon any public road any motor vehicle or any combination of motor vehicles under any conditions of grade, load, acceleration or deceleration in such manner as to exceed the following maximum permissible sound levels for the category of vehicle, as measured at a distance of 50 feet from the center of the land of travel within the speed limits specified by measurement procedures established by the State Commission on Equipment.

TABLE A

Vehicle Category	35 MPH or Less	Over 35 MPH
Motor vehicles over 10,000 pounds GVWR or (GCWR)	86 dB(A)	90 dB(A)
Motorcycles	80 dB(A)	84 dB(A)
All other motor vehicles	76 dB(A)	80 dB(A)

(Ord. 82-69 (part), 1982; prior Code § 35.14.030(A) (part))

8.72.040 Mufflers.

It is unlawful for any person to operate, or for any owner to permit any person to operate, any motor vehicle or motorcycle upon the public highways which is not equipped with a muffler in good working order and in constant operation. (Ord. 82-69 (part), 1982; prior Code § 35.14.030(A)(1))

8.72.050 Modification of Motor Vehicles.

It is unlawful for any person to modify or change any part of a motor vehicle or motorcycle, or install any device thereon in any manner that permits sound to be emitted by the motor vehicle or motorcycle in excess of the limits prescribed by this Chapter. It is unlawful for any person to remove or render inoperative, other than for purposes of maintenance, repair or replacement, any muffler or sound dissipated device on a motor vehicle or motorcycle. (Ord. 82-69 (part), 1982; prior Code § 35.14.030(A)(2))

8.72.060 Tire Noise.

It is unlawful for any person to operate a motor vehicle or motorcycle in such manner as to cause or allow to be emitted squealing, screeching or other such sound from the tires in contact with the ground because of rapid acceleration or excessive speed around corners or other such reason; provided, that sound resulting from emergency braking to avoid imminent danger shall be exempt from this Chapter. (Ord. 82-69 (part), 1982; prior Code § 35.14.030(A)(3))

8.72.070 Exhaust System.

It shall be unlawful for any person to operate any motor vehicle upon any public highway if the vehicle exhaust system exceeds the maximum permissible sound levels set forth below for the category of vehicle, as measured at a distance of twenty inches (0.5 meter) from the exhaust outlet under procedures established by the State of Washington in Washington Administrative Code Chapter 173-58-080, "Close Proximity Exhaust System Sound Level Measurement Procedure."

TABLE B

IN USE MOTOR VEHICLE EXHAUST SYSTEM NOISE PERFORMANCE STANDARDS MEASURED AT 20 INCHES (0.5 METER)

Vehicle Category	Maximum Sound Level
Motorcycles	99 dB(A)
Automobiles, light trucks, and all other motor vehicles 10,000 pounds or less	95 dB(A)

(Ord. 82-69 (part), 1982; prior Code § 35.14.030(A)(4))

8.72.080 Sale of New Motor Vehicles Which Exceed Limits.

It is unlawful for any person to sell or offer for sale a new motor vehicle, which produces a maximum sound level exceeding the following maximum permissible sound levels at a distance of 50 feet, by acceleration test procedures established by the State Commission on Equipment and set forth in Washington Administrative Code Chapter 204-56, "Procedures for Measuring Motor Vehicle Sound Levels."

TABLE C	
Vehicle Category	**Maximum Sound Level**
Motorcycles manufactured after 1975	83 dB(A)
Any motor vehicle over 10,000 pounds GVWR manufactured after 1975 and prior to 1978	83 dB(A)
Any motor vehicle over 10,000 pounds GVWR manufactured after 1978	83 dB(A)
All other motor vehicles	80 dB(A)

(Ord. 82-69 (part), 1982; prior Code § 35.14.030(A)(5))

8.72.090 Public Disturbance Noises.

It is unlawful for any person to cause, or for any person in possession of property to allow to originate from the property, a public disturbance noise. The following sounds are public disturbance noises:

A. Frequent, repetitive, or continuous sounds made by any animal which unreasonably disturb or interfere with the peace, comfort, and repose of property owners or possessors, except that such animal sounds which are made in animal shelters, commercial kennels, veterinary hospitals, pet shops, or pet kennels, licensed under Title 5 PCC are exempt from this subsection. Notwithstanding any other provision of this Chapter, if the owner or other person having custody of the animal cannot, with reasonable inquiry, be located by the investigating officer or if the animal is a repeated violator of this subsection, the animal shall be impounded subject to redemption in the manner provided by Sections 6.02.070 and/or 6.02.080;

B. The frequent, repetitive, or continuous sounding of any horn or siren attached to a motor vehicle, except as a warning of danger or as specifically permitted or required by law;

C. Frequent, repetitive, or continuous sounds from starting, operating, repairing, rebuilding, or testing of any motor vehicle, motorcycle, dirt bike, or other off-highway vehicle, or any internal combustion engine, within a rural or residential district, including vacant property adjacent thereto, so as to unreasonably disturb or interfere with the peace, comfort, and repose of owners or possessors of real property;

D. The use of a sound amplifier or other device capable of producing or reproducing amplified sound upon public streets for the purpose of commercial advertising or sales or for attracting the attention of the public to any vehicle, structure, or property or the contents therein except as permitted by law, and except that vendors whose sole method of selling is from a moving vehicle shall be exempt from this subsection;

E. Any loud and raucous sound made within one thousand feet of any school, hospital, sanitarium, nursing or convalescent facility;

F. Any loud and raucous sound made by use of a musical instrument, whistle, sound amplifier, or other device capable of producing or reproducing sound which emanates frequently, repetitively, or continuously from any building, structure or property, such as sound originating from a band session, tavern operation, or social gathering and which unreasonably disturb or interfere with the peace, comfort, and repose of owners or possessors of real property in the area affected by such noise;

G. Yelling, shouting, hooting, whistling, or singing so as to unreasonably disturb or interfere with the peace, comfort, and repose of owners or possessors of property in the area affected by such noise;

H. Public disturbance noise from portable or motor vehicle audio equipment: While in park areas, residential or commercial zones, or any area where residences, schools, human service facilities, or commercial establishments are in obvious proximity to the source of the sound, it is unlawful for any person to negligently cause, make, or allow to be made from audio equipment under such person's control or ownership the following:
   1. Sound from a motor vehicle sound system, such as a tape player, radio, or compact disc player, which is operated at such a volume that it could be clearly heard by a person of normal hearing at a distance of 50 feet or more from the vehicle itself;
   2. Sound from audio equipment such as a tape player, radio, or compact disc player, which is operated at such a volume that it could be clearly heard by a person of normal hearing at a distance of 50 feet or more from the source of the sound;
   3. This Section shall not apply to persons operating portable audio equipment within a public park pursuant to an event sanctioned by a responsible authority under valid permit or license.

(Ord. 93-89S § 1 (part), 1994; Ord. 82-69 (part), 1982; prior Code § 35.14.040)

8.72.100 Public Nuisance Noises.

It is unlawful for any person to cause or allow to be emitted a Public Nuisance Noise. A Public Nuisance Noise is any noise which unreasonably annoys, injures, interferes with, or endangers the comfort, repose, health or safety of three or more persons residing within separate residences in the same community or neighborhood, although the extent of the damage may be unequal. (Ord. 93-89S § 1 (part), 1994)

8.72.110 Exemptions.

A. Between the hours of 7 a.m. and 10 p.m., the following shall be exempt from this Chapter; however, other state and local restrictions may apply:
   1. Sounds originating from residential property as a result of temporary projects for the construction, maintenance, or repair of homes, grounds, and appurtenances;
   2. Sounds created by the discharge of firearms on authorized shooting or firing ranges;
   3. Sounds created by blasting;
   4. Sounds created by aircraft engine testing and maintenance not related to flight operations; provided, that aircraft testing and maintenance shall be conducted at remote sites whenever possible;
   5. Sounds created by the installation or repair of essential utility services;
   6. Sounds created by the discharge of legal fireworks are exempt from this Chapter only during the specific days, times, and in the locations where discharge is allowable pursuant to existing state and local law (e.g. Chapter 5.08 PCC);
   7. Sounds originating from temporary, non-residential construction sites as a result of construction activity are exempt from this Chapter (although they are not similarly exempted from Chapter 8.76);
   8. Sounds originating from forestry activities (although they are not similarly exempted from Chapter 8.76)

B. The following shall be exempt from this Chapter:
   1. Sounds from electrical substations and existing stationary equipment used in the conveyance of water or wastewater by a utility;
   2. Sounds from existing industrial installations which exceed the standards contained in these regulations and which, over the previous three years, have consistently operated in excess of 15 hours per day as a consequence of process necessity and/or demonstrated routine normal operation. Changes in working hours which would effect exemptions under this regulation require approval of the Tacoma-Pierce County Health Department.
   3. Sounds commonly associated with an existing commercial operation which has been approved through a public hearing process and is operating in compliance with any permit conditions;
   4. Sounds commonly associated with an existing commercial operation which was established prior to the effective date of any land use regulation(s) and is thereby non-conforming;
   5. Sounds originating from aircraft in flight and sounds that originate at airports which are directly related to flight operations;
   6. Sounds created by surface carriers engaged in interstate commerce by railroad;
   7. Sounds created by warning devices not operated continuously for more than five minutes (bells, chimes, and carillons);
   8. Sounds created by safety and protective devices where noise suppression could defeat the intent of the device or is not economically feasible;
   9. Sounds created by emergency equipment and work necessary in the interests of law enforcement or for health, safety, or welfare of the community;
   10. Sounds originating from motor vehicle or motorcycle racing events at existing authorized facilities, or being sanctioned by a responsible authority under valid permit or license;
   11. Sounds originating from officially-sanctioned parades and other public events under valid permit or license;
   12. Sounds emitted from petroleum refinery boilers during startup of said boilers; provided, that the startup operation is performed during daytime hours whenever possible;
   13. Sounds created by the discharge of firearms in the course of hunting.

(Ord. 93-89S § 1 (part), 1994; Ord. 82-69 (part), 1982; prior Code § 35.14.050)

8.72.120 Enforcement.

A. The County Sheriff's Office shall enforce the provisions of this Chapter.

B. Enforcement On Complaint Only.
   1. For public disturbance noise that is not related to motor vehicles and noise emanating from vehicles, enforcement shall be undertaken only upon receipt of a complaint made by a person who resides, owns or rents property, or is employed in the area affected by the public disturbance noise, except as provided in Section 8.72.090 H.
   2. For public nuisance noise, enforcement shall be undertaken only upon receipt of complaint or complaints of three or more persons residing within separate residences in the same community or neighborhood.

C. The Sections of this Chapter relating to motor vehicles and noise emanating from vehicles, shall be subject to enforcement proceedings with or without a citizen's complaint.
D. With the exception of motor vehicle noise, noise created by industrial areas is to be regulated by the State of Washington.
E. In addition to other enforcement provided in Section 8.72.120 A., Animal Control Officers appointed pursuant to RCW 16.52.025 shall enforce the provisions of this Chapter related to animal noises.

(Ord. 98-5 § 1, 1998; Ord. 93-89S § 1 (part), 1994; Ord. 82-69 (part), 1982; prior Code § 35.14.060)

8.72.130 Violation - Penalty.

A. Any person violating any motor vehicle performance standard of this Chapter, or who shall create, keep, maintain, or allow to occur any noise related to motor vehicle performance standards, as defined herein, shall be guilty of a misdemeanor.
B. Any person violating any of the provisions of this Chapter other than motor vehicle performance standards, or who shall create, keep, maintain, or allow to occur any public disturbance noise or public nuisance noise as defined herein, shall be subject to a civil infraction citation as provided for in Chapter 1.16 PCC.
    1. A first violation shall be a Class 3 civil infraction.
    2. A second violation shall be a Class 2 civil infraction.
    3. Any subsequent violations shall be Class 1 civil infractions.
C. Each act herein prohibited of continuing nature shall be considered a separate offense.

(Ord. 93-89S § 1 (part), 1994; Ord. 82-69 (part), 1982; prior Code § 35.14.070)

8.72.140 Severability.

If any provision of this Chapter or its application to any person or circumstance is held invalid, the remainder of the Chapter or the application of the provision to other persons or circumstances shall not be affected. (Ord. 93-89S § 1 (part), 1994; Ord. 89-155 § 16, 1989)

Chapter 8.76

NOISE POLLUTION CONTROL

Sections:

8.76.010 Scope and Authority.
8.76.020 Definitions.
8.76.030 Noise Control Officer - Creation.
8.76.040 Noise Control Officer - Powers and Duties.
8.76.050 Identification of Environments.
8.76.060 Maximum Permissible Environmental Noise Levels.
8.76.070 Exemptions.
8.76.080 Noise Control Hearings Board.
8.76.090 Variances and Implementation Schedules.
8.76.100 Enforcement Policy.
8.76.110 Appeals.
8.76.120 Violation - Penalty.
8.76.130 Other Rights, Remedies, Powers, Duties and Functions.

8.76.010 Scope and Authority.

This Chapter shall apply to the control of all sound originating within the unincorporated areas of Pierce County and is adopted pursuant to RCW Chapter 70.107, the Noise Control Act of 1974, in order to establish maximum noise levels permissible in identified environments, and to provide use standards relating to the reception of noise within such environments. (Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.010)

8.76.020 Definitions.

As used in this Chapter, unless the context or subject matter clearly requires otherwise, the following words or phrases shall have the following meanings:

A. "Background sound level" means the level of all sounds in a given environment, independent of the specific source being measured.
B. "dBA" means the sound pressure level, in decibels measured using the "A" weighting network on a sound level meter. The sound pressure level, in decibels, of a sound is 20 times the logarithm to the base 10 of the ratio of the pressure of sound to a reference pressure of 20 micropascals.
C. "EDNA" means the environmental designation for noise abatement, being an area of zone (environment) within which maximum permissible noise levels are established.
D. "Health Department" means the Tacoma-Pierce County Health Department.
E. "Health Officer" means the Director of the Tacoma-Pierce County Health Department, or his authorized representative.
F. "Multi-family units" includes, but is not limited to, duplexes, triplexes, apartment houses and condominiums. The property lines of such units shall include the wall, ceilings and floors of each unit.
G. "Noise" means the intensity, duration and character of sounds, from any and all sources.

H. "Noise Control Hearing Board" means a Board which is designated by the Health Department to hear and decide noise variance cases.
I. "Noise Control Office" means that division of the Health Department which has the duties and powers established by this Chapter.
J. "Owner" includes the owner or owners of the premises or lesser estate therein, a mortgage or vendee in possession, an assignee for rents, receiver, executor, trustee or other person, firm or corporation in control of a building or property.
K. "Person" means any individual, corporation, partnership or association and the agents, employees, servants and legal successors thereof; or agency of state, county or municipal government; or agency of the federal government which is subject to the jurisdiction of the State of Washington.
L. "Property boundary" means the surveyed line at ground surface, which separates the real property owned, rented, or leased by one or more persons, from that owned, rented, or leased by one or more other persons, and its vertical extension.
M. "Racing event" means any motor vehicle competition conducted under a permit issued by a governmental authority having jurisdiction or, if such permit is not required, then under the auspices of a recognized sanctioning body.
N. "Receiving property" means real property within which the maximum permissible noise levels specified herein shall not be exceeded from sources outside such property.
0. "Shoreline" means the existing intersection of water with the ground surface or with any permanent shore connected facility.
P. "Sound level meter" means a device which measures sound pressure levels and conforms to Type 1, S1A, 2 or S2A as specified in the American national Standards Institute Specifications.

(Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.020)

8.76.030 Noise Control Officer - Creation.

There is created a position of Noise Control Officer within the Health Department. (Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.030)

8.76.040 Noise Control Officer - Powers and Duties.

In order to implement this Chapter, the Noise Control Officer or his designee shall:

A. Conduct, or cause to be conducted, research, monitoring and other studies related to sound;
B. Conduct programs or public education related to causes, effects and methods to abate and control noise;
C. Encourage the participation of public interest groups in such public information efforts;
D. Coordinate with the noise control activities of all County departments;
E. Cooperate with all appropriate state and federal agencies;
F. Draft needed noise control regulations;
G. Enter into contracts with the approval of the Health Officer and the County Executive for providing technical and enforcement services;
H. Review public and private projects and advise whether such projects are likely to cause violations of this Chapter;
I. Require the owner or operator of any commercial or industrial activity to establish and maintain records regarding noise emissions and make such reports as the Noise Control Officer may reasonably prescribe;

J. Require the owner or operator of any commercial or industrial activity to measure the sound level from any source in accordance with the methods and procedures and at such locations and times as the Noise Control Officer may reasonably prescribe and to furnish reports of the results of such measurements to the Noise Control Officer. The Noise Control Officer may require the measurements to be conducted in the presence of his enforcement officials;

K. Delegate functions, where appropriate under this Chapter, to personnel within the Health Department and to other agencies or departments, subject to approval of the Health Officer;

L. Administer noise program grants and other funds and gifts from public and private sources;

M. Evaluate and report to the Health Officer every year following the effective date of this Chapter on the effectiveness of the County Noise Control Program and make recommendations for any legislative or budgetary changes necessary to improve the program.

(Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.040)

8.76.050 Identification of Environments.

A. The EDNA of any property shall be based on the following typical uses:

1. Class A EDNA. Lands where human beings reside and sleep. Typically, Class EDNA will be the following types of property used for human habitation:
   a. Residential;
   b. Multiple-family living accommodations;
   c. Recreational and entertainment (e.g., camps, parks, camping facilities and resorts);
   d. Community service (e.g., orphanages, homes for the aged, hospitals, health and correctional facilities);
2. Class B EDNA. Lands involving uses requiring protection against noise interference with speech. Typically, Class B EDNA will be the following types of property:
   a. Commercial living accommodations;
   b. Commercial dining establishments;
   c. Motor vehicle services;
   d. Retail services;
   e. Banks and office buildings;
   f. Miscellaneous commercial services;
   g. Recreation and entertainment; property not used for human habitation (e.g., theaters, stadiums, fairgrounds and amusement parks);
   h. Community services; property not used for human habitation (e.g., educational, religious, governmental, cultural and recreational facilities).
3. Class C EDNA. Lands involving economic activities of such a nature that higher noise levels than experienced in other areas are to be anticipated. Persons working in these areas are normally covered by noise control regulations or the Department of Labor and Industries. Uses typical of Class A EDNA are generally not permitted within such areas. Typically, Class C EDNA will be the following types of property:
   a. Storage, warehouse and distribution facilities;

b. Industrial property used for the production and fabrication of durable and nondurable manmade goods;
c. Agricultural and silvicultural property used for the production of crops, wood products or livestock.

B. Subject to subsection D. of this Section, EDNA land classification shall conform with the County zoning codes as follows:
1. Zones primarily utilized for residential purposes in the County include: RE, SR, ST, RR, RML, RM, RMH, RMP and SA - Class A EDNA. Any future zoning change will also control the EDNA classification, i.e., if zoned R-2 is changed to M-1, the M-1 EDNA would apply.
2. Zones primarily utilized for commercial purposes in the County include: C-1, C-2, C-3, PS-1, PS-2, PSC, FS, HAS and PE - Class B EDNA.
3. Zones primarily utilized or potentially utilized for industrial purposes in the County include: M-1, M-2, MP, A - Class C EDNA. EDNA designations shall be amended as necessary to conform to zone changes under the zoning ordinance.
4. The general use zone in the County shall be governed on the basis of current use; therefore, if a residential area abuts an industrial or commercial use, it will be considered a Class A EDNA.

C. Subject to subsection D. of this Section, in areas not covered by a local zoning ordinance but within the coverage of an adopted Pierce County comprehensive plan, EDNA's shall conform with the comprehensive plan as follows:
1. Primarily residential areas - Class A EDNA;
2. Primarily commercial areas - Class B EDNA;
3. Primarily industrial areas - Class C EDNA. EDNA designations shall be amended as necessary to conform to changes in the comprehensive plan.

D. Where in the County there is neither a zoning ordinance in effect nor an adopted comprehensive plan, the Health Department shall designate EDNA's which conform to the criteria in subsections A.1., 2. and 3. of this Section.

E. Where no specific prior designation of EDNA's has been made, the appropriate EDNA for properties involved in any enforcement activity will be made by the Noise Control Officer on the basis of the criteria of subsections A.1., 2. and 3. of this Section.

F. The Health Department may make special designations of lands where serenity, tranquility or quiet are essential to the quality of the environment and serves an important public need. If so approved, such designation will not be effective until approved by the County Executive and the Washington State Department of Ecology and until maps of such designations are available for public inspection in the Health Department.

(Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.050)

8.76.060 Maximum Permissible Environmental Noise Levels.

A. No person shall cause or permit noise to intrude into the property of another person which noise exceeds the maximum permissible noise levels set forth in subsection B. of this Section.

B. 1. The noise limitations established are as set forth in the following table after any applicable adjustments provided for in this Chapter are applied.

EDNA of Noise Source	EDNA of Receiving Property		
	Class A	**Class B**	**Class C**
Class A	55 dBA	57 dBA	60 dBA
Class B	57 dBA	60 dBA	65 dBA
Class C	60 dBA	65 dBA	70 dBA

2. Between the hours of 10 p.m. and 7 a.m., the noise limitations of the foregoing table shall be reduced by 10 dBA for receiving property within Class A EDNA's.
3. At any hour of the day or night the applicable noise limitations in subsections B.1. and 2. of this Section may be exceeded for any receiving property by no more than:
   a. 5 dBA for a total of 15 minutes in any 1-hour period; or
   b. 10 dBA for a total of 5 minutes in any 1-hour period; or
   c. 15 dBA for a total of 1.5 minutes in any 1-hour period.

(Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.060)

8.76.070 Exemptions.

A. The following shall be exempt from Section 8.76.060 between the hours of 7 a.m. and 10 p.m.:
   1. Sounds originating from residential property relating to temporary projects for the construction, maintenance or repair of homes, grounds and appurtenances;
   2. Sounds created by the discharge of firearms on authorized shooting or firing ranges;
   3. Sounds created by blasting;
   4. Sounds created by aircraft engine testing and maintenance not related to flight operations, provided that aircraft testing and maintenance shall be conducted at remote sites whenever possible;
   5. Sounds created by the installation or repair of essential utility services.

B. The following shall be exempt from subsection B.2. of Section 8.76.060:
   1. Noise from electrical substations and existing stationary equipment used in the conveyance of water or wastewater by a utility;
   2. Noise from existing industrial installations which exceed the standards contained in these regulations and which, over the previous three years, have consistently operated in excess of 15 hours per day as a consequence of process necessity and/or demonstrated routine normal operation. Changes in working hours which would effect exemptions under this regulation require approval of the Noise Control Officer.

C. The following shall be exempt from Section 8.76.060, except insofar as such provisions relate to the reception of noise within Class A EDNA's between the hours of 10 p.m. and 7 a.m.:
   1. Sounds originating from temporary construction sites as a result of construction activity;
   2. Sounds originating from forest harvesting and silvicultural activity.

D. The following shall be exempt from Section 8.76.060:
   1. Sounds created by motor vehicles when regulated by WAC Chapter 173-62;
   2. Sounds originating from aircraft in flight and sounds that originate at airports which are directly related to flight operations;
   3. Sounds created by surface carriers engaged in interstate commerce by railroad;
   4. Sounds created by warning devices not operated continuously for more than five minutes or bells, chimes and carillons;
   5. Sounds created by safety and protective devices where noise suppression could defeat the intent of the device, or is not economically feasible;
   6. Sounds created by emergency equipment and work necessary in the interests of law enforcement or for health, safety or welfare of the community;
   7. Sounds originating from motor vehicle or motorcycle racing events at existing authorized facilities, or being sanctioned by a responsible authority;
   8. Sounds originating from officially sanctioned parades and other public events;
   9. Sounds emitted from petroleum refinery boilers during startup of said boilers; provided, that the startup operation is performed during daytime hours whenever possible;
   10. Sounds created by the discharge of firearms in the course of hunting;
   11. Sounds caused by natural phenomena and unamplified human voices;
   12. Animal noises which are already regulated;
   13. Sounds created by motor vehicles, licensed or unlicensed, when operated off public highways except when such sounds are received in Class A EDNA's;
   14. Sounds created by watercraft are excluded from this Chapter when regulated by Chapter 8.88 of this Code.

(Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.070)

8.76.080 Noise Control Hearings Board.

The Board of Health shall designate an Appeal Board which shall hear and decide requests for noise variance cases. The Appeal Board may also hear appeals from rulings of the Noise Control Officer. Subject to approval of the Health Officer, the Board shall adopt such rules and regulations as may be necessary to administer its responsibility. (Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.100)

8.76.090 Variances and Implementation Schedules.

A. Variances may be granted to any person from any other particular requirement of this Chapter if findings are made by the Appeal Board that immediate compliance with such requirements cannot be achieved because of special circumstances rendering immediate compliance unreasonable in light of economic or physical factors, encroachment upon an existing noise source, or because of nonavailability of feasible technology or control methods. Any such variance or renewal thereof shall be granted only for the minimum time period found to be necessary under the facts and circumstances.
B. An implementation schedule for achieving compliance with this Chapter shall be incorporated into any variance issued.
C. Variances shall be issued only upon application in writing and after providing such information as may be requested. No variance shall be issued for a period of more than 30 days except upon due notice to the public with opportunity to comment.

D. Sources of noise, subject to this Chapter, upon which construction begins after the effective date of the ordinance codified in this Chapter, shall immediately comply with the requirements of this Chapter, except in extraordinary circumstances where overriding considerations of public interest dictate the issuance of a variance.

(Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.110)

8.76.100 Enforcement Policy.

Noise measurement for the purposes of enforcing the provisions of Section 8.76.060 shall be measured in dBA with a sound level meter with the point of measurement being at any point within the receiving property. Such enforcement shall be undertaken only upon receipt of a complaint made by a person who resides, owns property, or is employed in the area affected by the noise complained of, except for parks, recreational areas and wildlife sanctuaries. (Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.120)

8.76.110 Appeals.

Any person aggrieved by any decision of the Noise Control Officer in relation to the enforcement of the maximum permissible noise levels provided for in this Chapter or the granting or denial of a variance may appeal to the Appeals Board. (Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.130)

8.76.120 Violation - Penalty.

For enforcement purposes, each day is defined as the 24-hour period beginning at 12:01 a.m., in which violation of this Chapter occurs, and shall constitute a separate violation. Any violation of this Chapter shall be punishable by a fine not to exceed $500.00 for each violation. (Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.140)

8.76.130 Other Rights, Remedies, Powers, Duties and Functions.

A. Nothing in this Chapter shall be construed to deny, abridge or alter alternative right of action or remedies in equity or under common law or statutory law, criminal or civil.

B. Nothing in this Chapter shall deny, abridge or alter any powers, duties and functions relating to noise abatement and control now or hereafter vested in any State agency, nor shall this Chapter be construed as granting jurisdiction over the industrial safety and health of employees in work places, as now or hereafter vested in the Department of Labor and industries.

(Ord. 81-52 § 1 (part), 1981; prior Code § 66.10.150)

Chapter 8.80

SWIMMING, JUMPING, AND/OR FISHING PROHIBITED IN CERTAIN AREAS

Sections:

8.80.005 Definition.
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8.80.020 Bridge Over Spanaway Lake to Enchanted Island.
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8.80.040 Fox Island Bridge.
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8.80.060 Home Bridge.
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8.80.080 Anderson Island Ferry Bridge and Waiting Facility.
8.80.090 Ketron Island Ferry Landing Bridge.
8.80.100 Violation - Civil Infraction.

8.80.005 Definition.

"Fishing" or "To Fish" and their derivatives means an effort to kill, injure, harass or catch fish or shellfish. (Ord. 99-27 § 1 (part), 1999; Ord. 89-214S § 1 (part), 1990)

8.80.010 Bridge Over Sumner-Tapps Highway East.

It shall be unlawful for anyone to fish or swim from Bridge No. 8205-A which spans a canal on Sumner-Tapps Highway East in Section 8, Township 20 North, Range 5 East, W.M. (Ord. 99-27 § 1 (part), 1999; Ord. 82-123 § 2 (part), 1982; Ord. 82-122 § 2 (part), 1982; prior Code § 35.02.040(a))

8.80.020 Bridge Over Spanaway Lake to Enchanted Island.

It shall be unlawful for anyone to fish from Bridge No. 20193-B which spans Spanaway Lake to Enchanted Island in Section 20, Township 19 North, Range 3 East, W.M. (Ord. 99-27 § 1 (part), 1999; Ord. 89-214S § 1 (part), 1990; Ord. 82-123 § 2 (part), 1982; Ord. 82-122 § 2 (part), 1982; prior Code § 35.02.040(c))

8.80.030 Bridge Over Lake Tapps to Bankers Island.

It shall be unlawful for anyone to swim or jump from Bridge No. 16205-A which spans Lake Tapps to Bankers Island in Section 16, Township 20 North, Range 5 East, W.M. (Ord. 99-27 § 1 (part), 1999; Ord. 89-214S § 1 (part), 1990)

8.80.040 Fox Island Bridge.

It shall be unlawful to swim, jump or fish from Bridge No. 26211-A, the Fox Island Bridge, in Section 26, Township 21 North, Range 1 East, W.M. (Ord. 99-27 § 1 (part), 1999)

8.80.050 Rosedale Bay Bridge.

It shall be unlawful to swim, jump or fish from Bridge No. 10211-A, the Rosedale Bay Bridge, in Section 10, Township 21 North, Range 1 East, W.M. (Ord. 99-27 § 1 (part), 1999)

8.80.060 Home Bridge.

It shall be unlawful to swim or jump from Bridge No. 35210-A, the Home Bridge, in Section 35, Township 21 North, Range 1 East, W.M. (Ord. 99-27 § 1 (part), 1999)

8.80.070 Steilacoom Ferry Landing Bridge and Waiting Facility.

It shall be unlawful to swim, jump or fish from Bridge No. 31202-A, the Steilacoom Ferry Landing Bridge, and the ancillary Steilacoom Ferry Landing Waiting Facility located in Section 31, Township 20 North, Range 2 East, W.M. (Ord. 99-27 § 1 (part), 1999)

8.80.080 Anderson Island Ferry Bridge and Waiting Facility.

It shall be unlawful to swim, jump or fish from Bridge No. 33201-A, the Anderson Island Ferry Landing Bridge, and the Anderson Island Ferry Landing Waiting Facility located in Section 33, Township 20 North, Range 1 East, W.M. (Ord. 99-27 § 1 (part), 1999)

8.80.090 Ketron Island Ferry Landing Bridge.

It shall be unlawful to swim, jump or fish from Bridge No. 1191-A, the Ketron Island Ferry Landing Bridge, located in Section 1, Township 19 North, Range 1 East, W.M. (Ord. 99-27 § 1 (part), 1999)

8.80.100 Violation - Civil Infraction.

A violation of this Chapter constitutes a Class 3 civil infraction under Chapter 1.16 PCC. (Ord. 99-27 § 1 (part), 1999; Ord. 89-214S § 1 (part), 1990)

Chapter 8.88

WATERCRAFT REGULATIONS

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8.88.500 Saltwater Areas.
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8.88.520 Testing Areas and Times.

ARTICLE V. PENALTIES

8.88.600 Penalties Designated.

ARTICLE I. GENERAL REGULATIONS

8.88.010 Authorization.

The County of Pierce, in the exercise of its police powers, assumes control and jurisdiction over all lakes, rivers and all other waters within unincorporated areas inside its geographical boundaries. (Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.010)

8.88.020 Applicability.

A. Except as noted, the provisions of this Chapter shall be applicable to all vessels which are operated within the geographical jurisdiction of the County.
B. Titles 33 and 46 CFR, Chapter 88.12 RCW, Chapter 352-60 WAC and any amendments thereto, are hereby adopted by reference as PCC 8.88.020 B.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.020)

8.88.030 Responsibility.

A. Nothing in this Chapter shall exonerate the owner, master, or crew of any vessel from the consequences of any failure to comply with these rules or of the failure of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

B. In construing and complying with this Chapter, due regard shall be given to all dangers of navigation and collision and to any special circumstances, including the limitations of the vessels involved, which may make a departure from these rules necessary to avoid immediate danger.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.030)

8.88.040 Definitions.

As used in this Chapter, unless the context or subject matter clearly requires otherwise, the following words or phrases shall have the following meanings:

A. "Aquatic event" means any organized water event of limited duration.
B. "Authorized emergency vessel" means any designated and/or marked patrol vessel.
C. "Department" means the Pierce County Sheriff's Department.
D. "Diver's flag" means a red flag, not less than 10 inches on the hoist by 12 inches on the fly, with a white stripe of one inch crossing the red diagonally and a stiffener to make it stand out from the pole or mast, or a rigid replica of the International Code flag "A" (Alpha pennant) not less than one meter in height.
E. "Obstruction" means any vessel or any matter which may in any way impede navigation or endanger any vessel.
F. "Person" means an individual, firm, partnership, corporation, company, association, or other legal entity.
G. "Personal watercraft" means a vessel of less than 16 feet that uses a motor powering a water jet pump, as its primary source of motive power and that is designed to be operated by a person sitting, standing, or kneeling on, or being towed behind the vessel, rather than in the conventional manner of sitting or standing inside the vessel.
H. "Pier, dock, or gangway" means any permanent wharf, dock, float, gridiron, or other structure to promote the convenient loading or unloading of a vessel.
I. "Restricted or designated areas" means an area that has been marked to be used for, or closed to, certain designated purposes.
J. "Restricted visibility" means any condition in which visibility is restricted by fog, mist, falling snow, heavy rainstorms, sandstorms, or any other similar causes.
K. "Scuba diver" means any free-swimming person who uses an artificial or mechanical means to replace air.
L. "Skin diver" means any free-swimming person who does not use an artificial or mechanical means to replace air.
M. "Sunrise" means the time when the sun appears above the sensible horizon as a result of the earth's rotation which may be shown by a sunrise chart for Tacoma or an area of Pierce County, Washington.
N. "Sunset" means the time when the sun disappears below the sensible horizon as a result of the earth's rotation which may be shown by a sunrise chart for Tacoma or an area of Pierce County, Washington.
O. "Towboat" means any vessel engaged in towing or pushing another vessel or anything other than a vessel.
P. "Waters of Pierce County" means all unincorporated water within the geographical boundaries of the County.

(Ord. 96-89S § 2 (part), 1997; Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.040)

8.88.050 Rules of the Road.

Except as otherwise specified in this Chapter, the 72 COLREGS shall apply on all waters of Pierce County, as such rules are now or may hereafter from time to time be amended or adopted; and it is further provided that sailing vessels or other vessels, while engaged in a sanctioned or authorized race, predicted log race, regatta or similar event shall be subject to the applicable rules for such event including, but not limited to, differing right-of-way rules.

A violation of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.100)

8.88.060 Lights and Shapes.

72 COLREGS, WAC 352-60-060 and any future amendments thereto are adopted by reference as PCC 8.88.060, "Lights and Shapes". (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.110)

8.88.070 Prohibited Sound and Light Signals.

It is unlawful for the master, owner, or any person in charge of any vessel, while lying at any pier or while navigating in the waters of Pierce County, unnecessarily to cause any whistle or siren to be blown or sounded, nor shall any person flash the rays of a searchlight or other blinding light onto the bridge or into the pilot house of any vessel under way for any purpose other than those authorized by law. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.120)

8.88.080 Distinctive Blue Light Authorized For Use by Law Enforcement Vessels.

A. The use of a distinctive blue light is authorized for law enforcement vessels, and may be displayed during the day or night, whenever the vessel may be engaged in direct law enforcement activities where identification of the law enforcement vessel is desirable or where necessary for safety reasons. This light, when used, would be in addition to prescribed lights and all signals required by law or regulations in this part.
B. The distinctive blue light may be displayed by law enforcement vessels of the County Sheriff's Department or other enforcement vessels authorized by the County Sheriff's Department.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.130)

8.88.090 Exemptions for Racing Motor-Powered Vessels.

The provisions of this Chapter shall not apply to motor-powered vessels while competing in any race previously arranged, approved and announced, or if such boats are designed and intended solely for racing, while engaged in such navigation as is incidental to the tuning up of the boats and engines for the race. (Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.140)

8.88.100 Fire Extinguishers.

Fire extinguishing equipment shall be required as provided in 46 CFR Subchapter C, Subpart 25.30 and WAC 352-60-080. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.200)

8.88.110 Personal Flotation Devices.

A. Every child 12 years of age or younger shall wear a Coast Guard approved personal flotation device that is in serviceable condition and the appropriate size while on board any vessel, except while in a cabin.

B. All vessels of all classes shall carry on board, one Coast Guard-approved personal flotation device in good and serviceable condition for each person on board, provided that racing shells, when competing in a sanctioned race and accompanied by a chase boat, shall be exempt from this requirement, provided that one approved personal flotation device, Class I, II, III, or IV shall be carried on board the chase boat for every person in the racing shell.

C. 33 CFR Part 175, Subpart B, 46 CFR Subchapter C, Subpart 25.25 and WAC 352-60-030 and any future amendments thereto are adopted by reference as subsection C. of Pierce County Code 8.88.110, "Personal Flotation Devices."

(Ord. 96-89S § 2 (part), 1997; Ord. 87-226 § 1 (part), 1987; Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.210)

8.88.120 Equipment and Numbering.

All vessels shall carry the equipment and be numbered or designated as required by Chapter 88.02 RCW, Chapter 308-93 WAC, and applicable laws of the United States and any future amendments thereto. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.02.220)

ARTICLE II. OPERATION REGULATIONS

8.88.130 Applicability.

The provisions of this Chapter shall be applicable to all vessels operated on lakes, rivers, and all other water within the geographical jurisdiction of Pierce County. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.010)

8.88.140 Manner of Operation.

A. A vessel shall be operated in a careful and prudent manner and at a speed no greater than is reasonable and proper under the conditions at the time and place of operation, taking into account the amount and character of traffic, size of the waters, freedom from obstruction to view ahead, and so as not to unreasonably endanger persons or property or other rights of any person entitled to the use of such waters.

The operator of any vessel shall be responsible for any damage or injuries caused by the wake from the vessel.

B. A violation of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.012)

8.88.150 Speed Limits - Fresh Water.

It shall be unlawful to operate a vessel at a rate of speed greater than will permit the operator in the exercise of reasonable care to bring the vessel to a stop within the assured clear distance ahead; provided, however, it shall be unlawful to operate vessels in excess of five miles per hour, or at a speed which produces a damaging wake, within 200 feet of any shore, dock, bridge or

public swimming area, or within 100 feet of swimmers or of any vessel, or within 300 feet of any public boat launch; provided further, that it shall be unlawful to operate vessels in excess of eight miles per hour after legal sunset in waters not regulated by the five miles per hour law.

A violation of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC. (Ord. 96-89S § 2 (part), 1997; Ord. 90-105 § 2, 1990; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.014)

8.88.151 Speed Limits - Salt Water.

It shall be unlawful to operate a vessel at a rate of speed greater than will permit the operator in the exercise of reasonable care to bring the vessel to a stop within the assured clear distance ahead; provided, however, it shall be unlawful to operate vessels in excess of five miles per hour, or at a speed which produces a damaging wake, within 200 feet of any shoreline or public swim area, or within 100 feet of swimmers or of any vessel or docks, or within 300 feet of any public boat launch.

For the purpose of taking off or landing water-skiers from personal property: Taking off shall be done perpendicular or as near to perpendicular as possible, and at no time less than a 45 degree angle to any shore or dock. Landing shall be done not less than at a 45 degree angle to same. This includes personal watercraft.
(Ord. 96-89S § 3, 1997)

8.88.160 For Vessels Engaged in Taking Off and Landing - With or Without Water-Skiers.

A. Taking off shall be done perpendicular or as near to perpendicular to shore, dock or other launching facilities, whichever shall permit the vessel and skier, if any, safe passage to open water; provided, that at no time shall the taking off angle be less than a 45 degree angle to shore, dock, or other launching facility.
B. Landing of vessels and skiers shall be done not less than at a 45 degree angle to the shore, dock, or other landing facilities.
C. At no time shall taking off or landing of water-skier give the towing vessel special privileges over any other vessels, under the rules of the road, and at no time shall such acts of skiing cause undue risk to persons or property.
D. A violation of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.016)

8.88.170 Reckless Operation.

It shall be unlawful to operate any vessel in a reckless manner upon any waters within the County. For the purpose of this Chapter, to operate in a reckless manner means the operation of a vessel upon waters within the County in such a manner as to endanger or be likely to endanger any persons or property. Actions that constitute prima facie evidence of reckless operation are:

A. Operating within 100 feet of shore unless taking off or landing as provided in Section 8.88.160, or in designated swimming areas;
B. Over loading;
C. Operating while under the influence of alcohol or drugs and recognizable by erratic operation;

D. Excessive speed in violation of Sections 8.88.140 or 8.88.150;
E. Operating in clearly dangerous areas;
F. Operating without proper lights at night;
G. Bow, seat back, gunwale or transom riding, when operating in excess of five miles per hour unless seating is specifically designed for that location;
H. Continued use or refusal to terminate use of boat after being ordered to correct an especially hazardous condition by law enforcement officer.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.018)

8.88.180 Hazardous Conditions.

If a law enforcement officer observes any unsafe condition and determines that an "especially hazardous condition" exists, he may direct the operator to take immediate steps to correct the condition, including returning and mooring. Unsafe conditions or hazardous conditions shall include, but not be limited to, the following:

A. Insufficient personal floatation devices (PFD);
B. Insufficient firefighting devices;
C. Overload conditions;
D. Improper navigation light display;
E. Fuel leakage;
F. Fuel in bilges;
G. Improper ventilation;
H. Improper backfire flame control.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.020)

8.88.190 Designated Areas.

It shall be unlawful to operate any vessel within 100 feet of a public or private bathing or swimming area, which is marked by buoys or some other distinguishing device.

A violation of this Section constitutes a Class 4 infraction under Chapter 1.16 PCC.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.022)

8.88.200 Direction of Travel.

Except as provided for in Section 8.88.160, all vessels shall keep the closest shore on the operator's starboard or right-hand side at all times except on Puget Sound.

A violation of this Section constitutes a Class 4 infraction under Chapter 1.16 PCC.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.024)

8.88.210 Water-Skiers.

It shall be unlawful to operate a vessel towing a person on water skis, aquaplane, or surfboard, inner tube, or other similar device unless the following conditions are strictly followed:

A. The vessel shall be operated by a competent person who must be attentive to the duties of operating a vessel.
B. Vessels shall carry a competent skier-observer who must be facing the skier at all times, and at such time as a skier(s) is down in the water, an orange flag, not less than one foot square, visible 360 degrees, shall be displayed on the towing boat.

C. The provisions of subsection B. of this Section shall not apply in the case of a vessel that is so constructed as to be unable to carry the operator or any other person in or on the same, and is actually operated by the person or persons being towed and is equipped with an automatic engine throttle return device which will cause the engine to slow instantly when the skier is disengaged from the control handles of the vessel.

D. No vessel shall follow behind a vessel towing a person on water skis closer than 300 feet, or cross the bow of a towing boat closer than 200 feet, or pass alongside a towing boat closer than 100 feet. A vessel towing a skier is not a privileged boat, and must conform to the rules of the road.

E. It shall be unlawful to water ski from sunset to sunrise. A violation of this subsection constitutes a misdemeanor.

F. It shall be unlawful to waterski within 300 feet of any public boat launching area, or within 300 feet of any dock used for fueling any vessel, or within 300 feet of any dock or designated swimming area at a public park, or a private designated swimming area. This provision shall apply to the taking off and landing of a water-skier in any of the described areas.

G. A violation of subsections A., D. and F. of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC.

(Ord. 96-89S § 2 (part), 1997; Ord. 96-90 § 1 (part), 1996; Ord. 87-226 § 1 (part), 1987; Ord. 86-80 § 2, 1986; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.028)

8.88.230 Testing.

A. When testing, as authorized in this Chapter, the provisions of RCW 88.12.089(4) shall apply to vessels designed for racing that are properly registered with the American Power Boat Association or an affiliate group, and when their registration numbers are plainly visible on the vessel. A helmet and American Power Boat Association approved jacket must be worn by the driver and mechanic if the craft is designed to carry a mechanic. Testing may be done on specific waters at specific times only. (See Section 8.88.590 for areas open and the times allowed.)

B. Vessels testing under the provisions specified in this Chapter shall maintain a distance of 400 feet from the shore or another vessel while speed is in excess of five miles per hour. A vessel testing for a race must follow the rules of the road and the general rules herein.

C. No unauthorized person shall operate a vessel or swim, or skin dive, within a testing course during permitted testing operations while an authorized vessel is in the testing course.

D. While testing, there must be an accompanying safety vessel in the water, with rescue personnel on board, to warn unauthorized vessels of the test. The safety vessel shall have on board fire fighting and rescue equipment.

(Ord. 96-89S § 2 (part), 1997; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.030)

8.88.240 Legal Age of Operation.

It shall be unlawful for any person under the age of 16 to operate any vessel powered by a motor or motors generating a total horsepower in excess of 10 horsepower; except, it shall be lawful for a person under the age of 16 to operate a vessel powered by a motor or motors generating a total horsepower of more than 10 horsepower as long as they are under the direct supervision of a parent or legal guardian in the vessel. (Ord. 86-80 § 3, 1986; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.032)

8.88.250 Obstructions.

When any sunken or drifting, and unattended vessel(s) or object(s) obstruct or create a hazard to the operation of vessels on the waters of the County, the County Sheriff shall order the owner or person in charge thereof to remove or restrain the vessel or object. Upon failure of such person to do so, or inability of the Sheriff to determine the ownership of the vessel or object, the Sheriff may take custody of the vessel or object and may take such reasonable steps as are needed to clear the waters of the obstruction or hazard. Expenses reasonably incurred by the Sheriff in removing and relocating a vessel or other object shall be recovered from the owner thereof, as a condition precedent to restoring the vessel or object to the owner. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.034)

8.88.260 Prohibited Operations.

A. It shall be unlawful for any person who is under the influence, or affected by intoxicating liquor, narcotic or other drugs, to operate or be in actual physical control of any vessel.
B. It shall be unlawful for the owner of any vessel or any person having such, in charge or in control, to authorize or knowingly permit the same to be operated by any person who is under the influence or affected by intoxicating liquor, narcotic, or other drugs.
C. It shall be unlawful for the owner of any vessel, or any person having such, in charge or in control, to authorize or knowingly permit the same to be operated by any person who, by reason of physical or mental disability, is incapable of operating such vessel under the prevailing circumstances.
D. It shall be unlawful for the owner of any vessel, or any person having such, in charge or in control, to authorize or knowingly permit the same to be operated by any person who is under the legal age of operation, as specified in Section 8.88.240.

(Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.036)

8.88.270 Boating Accident Reports.

A. The operator of any vessel involved in an accident resulting in an injury or death to any person, or in damage to property, shall immediately stop such vessel at the scene of such accident and shall give his name, address, and the name and/or number of his vessel, the name and address of the owner, to the person struck or the operator or occupants of the vessel collided with or property damaged, and shall render to any person injured in such an accident, reasonable assistance.
B. The master, owner, or operator of any vessel involved in an accident within the County, and where death or personal injury requiring medical treatment or property damage in excess of $500.00 occurs, shall file a written accident report within 48 hours of said accident with the County Sheriff's Department.
C. All required accident reports and supplemental reports or copies thereof shall be without prejudice to the individual so reporting, shall be for the confidential use of the Sheriff's Department, Prosecuting Attorney, or other peace and enforcement officers as provided in this Chapter, except that any such officer may disclose the identity of a person reported as being involved in an accident when such identity is not otherwise known or when such person denies his presence at such accident. No such accident report or copy thereof shall be used as evidence in trial, civil, or criminal, arising out of an accident, except that any officer above-named for receiving such accident reports shall furnish

upon demand of any person who has or who claims to have made such a report or demand of any court, a certificate showing that a specified accident report has or has not been made to the Sheriff, solely to prove a compliance or failure to comply with the requirements that such a report be made in the manner required by law.

(Ord. 96-90 § 1 (part), 1996; Ord. 87-226 § 1 (part), 1987; 86-80 § 4, 1986; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.038)

8.88.310 Skin/Scuba Diving.

A. Skin/scuba diving shall be prohibited within 300 feet of an active ferry slip, public boat ramp, public fishing pier, or an area generally used and recognized as the entry or exit to any regularly established marina, yacht club, or boathouse; provided, that in the event skin or scuba divers are engaged in an aquatic event, then the restriction shall not apply for the duration of the aquatic event. Skin diving shall be prohibited unless the diver shall be accompanied by a vessel displaying an appropriate diver's flag, or the diving area is marked by an adequately displayed diver's flag.

B. Subsection A. shall not apply to skin/scuba diving that directly involves the repair, maintenance, survey, or other authorized activity related to an active ferry slip, public boat ramp, public fishing pier, or that area generally used and recognized as the entry or exit to any regularly established marina, yacht club, or boathouse.

C. It shall be illegal for vessels to approach closer than 300 feet of any diver's flag raised from a vessel or float without reducing their speed to five miles per hour.

D. A violation of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.046)

8.88.320 Posting of Regulations.

A. The Director of the Pierce County Parks and Recreation Services Department shall cause to be posed at all public boat accesses within County parks, the specific rules for each body of water as set forth in this Chapter.

B. Owners and proprietors of private boat access to waters in the County shall cause to be posted within 25 feet of the ramp, a copy of the specific rules as given above.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.048)

8.88.330 Swimming and Flotation Devices.

A. Swimming shall be confined to:
   1. Restricted swimming areas; or
   2. Within a distance of 100 feet from shore, unless the swimmer is accompanied by a vessel.

B. All bathers and swimmers shall confine air mattresses, inner tubes, and other similar devices to within 100 feet of shore unless they are accompanied by a vessel.

C. All vessels accompanying swimmers beyond 100 feet from shore shall have a personal flotation device on board for each swimmer in addition to one for each person on board.

D. A violation of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.050)

8.88.340 Unlawful Dumping.

It shall be unlawful for any person while on any vessel on the waters of the County, to throw or discard into the waters any waste, debris, refuse, oil, garbage, or other fluid or solid material which may pollute the water, or which may create or aggravate any conditions deleterious to the public health. (Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.052)

8.88.350 Unsafe Piers - Fresh Water Only.

Any pedestrian pier, gangway, dock, or portion thereof leading to or on fresh water which, by reason of inadequate maintenance, dilapidation, obsolescence, or damage, poses a risk of injury to person or damage to property is for the purpose of this Section deemed unsafe. All such unsafe piers, gangways, and docks are declared to be public nuisances and shall be abated by repair, demolition, or removed or barricaded with proper fencing until such time as all repairing thereto is made. Upon notification of this condition, the Building Official shall take corrective action under the provisions of Uniform Building Code Section 203. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.04.054)

ARTICLE III. VESSEL REGULATIONS

8.88.360 Personal Watercraft.

A. A person shall not operate a personal watercraft unless each person aboard that personal watercraft is wearing a personal flotation device approved by the State of Washington. Except as provided for in RCW 88.12.015, a violation of this subsection is a Class 4 civil infraction under Chapter 1.16 PCC.

B. A person operating a personal watercraft equipped by the manufacturer with a lanyard-type engine cutoff switch shall attach the lanyard to his or her person, clothing, or personal flotation device as appropriate for the specific vessel. It is unlawful for any person to remove or disable a cutoff switch that was installed by the manufacturer.

C. A person shall not operate a personal watercraft during darkness.

D. A person under the age of 16 shall not operate a personal watercraft on the waters of unincorporated Pierce County unless they are under direct supervision of a parent or legal guardian that are also on board that vessel.

E. A person shall not operate a personal watercraft in a reckless manner, including recklessly weaving through congested vessel traffic, recklessly jumping the wake of another vessel within 100 yards of the vessel or when visibility around the vessel is obstructed, or recklessly swerving at the last possible moment to avoid collision. In addition, when operating on saltwater, non-destination-bound repetitive maneuvers including, but not limited to, erratic speed and course changes, tight turns, and race course ovals and figure eights can only be done when in an area that is at least 500 yards from any shoreline.

F. A person shall not lease, hire, or rent a personal watercraft to a person under the age of 16.

G. A personal watercraft operator shall obey Sections 8.88.150 and 8.88.151, Speed Limits, which includes:
   1. 5 mph speed within 200 feet of shoreline.
   2. 5 mph speed limit within 100 feet of any vessel moored or underway.
   3. 5 mph speed limit within 100 feet of swimmers.
   4. 5 mph speed limit within 100 feet of a dock.

5. A personal watercraft operator shall not exceed 5 mph, do donuts, or create any wake within 300 feet of any boat launch.

H. Subsections A. through G. of this Section shall not apply to a performer engaged in a professional exhibition or a person participating in a regatta, race, marine parade, tournament, or exhibition authorized or otherwise permitted by the appropriate agency having jurisdiction and authority to authorize such events.

I. Violations of subsections B. through F. of this Section constitute a misdemeanor.

(Ord. 99-30 § 1, 1999; Ord. 96-89S § 3, 1997)

8.88.370 Safety Devices.

Every owner, agent, or lessee having charge of any commercial or public pier shall furnish and keep for use on such pier, at least one serviceable 30-inch ring life buoy for every 300 lineal feet of mooring/docking space. Attached to said life buoy shall be at least 200 feet of suitable line. Each ring buoy and line attached thereto shall be kept in a suitable box on the pier for the use of the public in case of accident. The box shall be labeled and be at all times kept clear of obstructions. It shall be unlawful to take away, damage, disturb, or destroy said buoy or box except for use in saving life and property. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.06.012)

8.88.380 Vessel Rental Period.

A. The owner or proprietor of a vessel rental or charter operation shall cause to be kept a record of the names and addresses of person or persons hiring any vessel, the identification number of such vessel, the departure date and the time, and the date and time of the return of such vessel. Such record shall be preserved for not less than six months after the departure date of such vessel and shall be kept available for inspection by any duly authorized agency or authority.

B. It shall be unlawful for the owner or proprietor of a vessel rental or charter operation to allow any vessel under his charge to depart from the premises without all the equipment required by this Chapter.

C. The owner or proprietor of a vessel rental or charter operation shall make known to all persons hiring a vessel the rules and regulations of this Chapter pertaining to the operation of a vessel on the waters of Pierce County.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.06.014)

8.88.390 Regattas, Races, or Aquatic Events.

A. "Regatta" or "race" or "aquatic event" means an organized water event of limited duration, which is conducted according to a prearranged schedule.

B. An individual or organization planning to hold a regatta, race, or aquatic event which by its nature, circumstances, or location may introduce extra or unusual hazards to the safety of life on the waters of the County, shall submit an application to the County Sheriff's Department, which shall be reviewed by the Sheriff, Parks and Recreation Services Department, and Risk Management for approval of application, which shall be sent to the County Executive for final approval.

C. Where such events are to be held regularly or repeatedly in a single area by an individual or organization, the County Executive may, subject to conditions set from time to time by him, grant a permit for such series of events for a fixed period of time, not to exceed one year.

D. The application shall be submitted no less than 90 days prior to the start of the event.

E. The application shall include the following details:
   1. The name and address of sponsoring organization;
   2. The name and address and telephone number of person or persons in charge of the event;
   3. Nature and purpose of event;
   4. Information as to general interest;
   5. Estimated number and types of vessels participating;
   6. Estimated number of spectator vessels;
   7. Estimated number of persons, participants, and all others;
   8. Minimum number of vessels and persons furnished by sponsoring organization to patrol event;
   9. A time schedule and description of events.
   10. A section of a chart or scale drawing showing the boundaries of the event, various water courses or areas to be utilized by participants, officials, and spectators.

F. Upon receiving an application to hold a regatta, race, or aquatic event, the County Sheriff's Department and the County Parks and Recreation Services Department shall take the following actions or make the following determinations:
   1. That the proposed regatta, race, or aquatic event may be held at the proposed location with safety to life;
   2. That the interest of safety of life and property requires changes in the application before it can be approved;
   3. That the event requires no regulation or patrol at the proposed location;
   4. That the application is to be recommended for approval or rejection by the County Executive for stated reasons;
   5. The application shall be sent with recommendations to the County Executive not less than 30 days prior to event.

G. The County Executive may, before taking action on the application, require the sponsoring organization to petition or poll the property owners on the lake which would be affected by the event. The County Executive may also require that the sponsoring group post notice in the local paper and/or at the proposed site of the event, prior to taking action on the application.

H. The County Executive may close for general use any part or whole of a lake for the purpose of the event; provided, the approval of the application is on the condition that all terms specified in the application are met by the sponsoring group.

I. If the County Sheriff's Department deems safety requires, one or more Sheriff's Department vessels may be assigned to the event for the purpose of enforcing not only the event regulations, but also for assistance work and the enforcement of laws generally.

   The Sheriff may charge a fee for services provided under this Section. Such fee shall be from a fee schedule approved by the County Council.

J. Nothing in the provisions of this Chapter shall be construed to mean that the operator of a vessel competing in a race or regatta or trials therefor which has been duly authorized by the County Executive, or an operator engaged in industrial development and testing of experimental and product vessels, shall be prohibited from attempting to obtain high

speed on racing and testing courses duly designated by the County Executive nor while so engaged, shall such vessels or operators be required to comply with RCW 88.12.085.

K. The person or organization sponsoring the race or event or testing vessel shall, prior to obtaining authorization from the County Executive, provide a certificate of insurance showing that the person has obtained public liability and property damage insurance in amounts not less than the minimum set by the County Executive. Pierce County shall be named as an additional insured and shall be notified by the insurer at least 20 days prior to any cancellation of this insurance.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.06.016)

8.88.400 Emergency Vessels.

The provisions of this Chapter shall be applicable to the operation of any and all vessels in the waters of the County, except that they shall not apply in the following cases:

To any authorized emergency vessel actually responding to an emergency call or in immediate pursuit of an actual or suspected violator of the law, within the purpose for which such emergency vessel has been authorized. The provisions of this Section shall not relieve the operator of an authorized emergency vessel of the duty to operate with due regard for the safety of all persons, nor shall it protect the operator of any such emergency vessel from the consequences of a reckless disregard for the safety of others. The provisions of this Section shall in no event extend any special privilege or immunity in the operation of an authorized emergency vessel for any purpose other than that authorized.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.06.018)

8.88.410 Directing Traffic Emergency Powers.

The Sheriff is authorized to direct all waterborne traffic, either in person or by means of visible or audible signal. Where necessary to expedite waterborne traffic, to prevent or eliminate congestion, or to safeguard persons or property, authorized officers of appropriate governmental agencies may direct waterborne traffic as conditions may require. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.06.020)

8.88.420 Restricted Areas.

In the interest of life, safety, and the protection of property, the Sheriff shall designate restricted areas. No person shall operate a vessel within a restricted area except the patrol of rescue craft or authorized emergency vessel, or when engaged in the activity to which the area is restricted or in the case of an emergency. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.06.022)

8.88.430 Marker and Regulatory Buoys.

A. Marker buoys, approved by the County Sheriff, may be placed as authorized indicating the area of waters of the County within which it shall be unlawful to operate a vessel in excess of the speed limit. The County Sheriff or authorized persons may place, move, remove, or replace marker buoys when deemed necessary by the Sheriff.

B. It shall be unlawful for any unauthorized person to deliberately damage, place, move, or remove any marker or regulatory buoy or distinguishing device.

C. It shall be unlawful to moor any vessel or tie any object up to any regulatory buoy.

(Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.06.024)

8.88.440 Boating Advisory Commission.

A. There is established a Boating Advisory Commission composed of 15 members selected by the County Executive for the purpose of advising the Sheriff, the Executive, and the Council on matters relating to boating conditions and safety. The Boating Advisory Commission shall:
   1. Serve as a continuing advisory board;
   2. Review County watercraft regulations to determine adequacy and consistency with Coast Guard and other federal regulations;
   3. Recommend amendments to County watercraft laws; and
   4. Hold meetings and receive public input as necessary and appropriate on matters coming before them.

B. The first appointment shall be for five positions for terms of one year each, and five positions for terms of three years each. Thereafter, five members shall be appointed annually to serve for five years. Vacancies shall be filled for expired terms as soon as possible in the manner in which members of the Commission are regularly chosen. Commission members shall not receive a salary or other compensation for their services. The Sheriff or designated appointee, a member of the Sheriff's Office, shall be the Chair of the Commission and shall furnish from regular staff the necessary staff support and materials required by the Commission. The Chair shall have the power of one vote only in such cases where the vote of the Commission is tied.

(Ord. 96-90 § 1 (part), 1996; Ord. 87-50 § 1, 1987; 84-62 § 1 (part), 1984; prior Code § 43.06.026)

8.88.450 Aiding and Abetting Violation.

It is unlawful to counsel, aid, or abet the violation of, or failure to comply with, any of the provisions of this Chapter. (Ord. 96-90 § 1 (part), 1996; Ord. 84-62 § 1 (part), 1984; prior Code § 43.06.028)

ARTICLE IV. SPECIFIC RULES FOR LAKES AND OTHER AREAS

8.88.460 Class "A" Lakes.

All lakes which are 500 acres or more are Class "A" lakes. The Class "A" lakes are: Lake Tapps, Alder Lake, and Lake Kapowsin.

A. **Special Restrictions for Class "A" Lakes.**
   1. It shall be unlawful to operate a motor-powered vessel in excess of five miles per hour between sunset and sunrise on any Class "A" lake.

B. **Regulations for Specific Lakes.**
   1. **Lake Tapps.**
      a. It shall be unlawful to operate a motor-powered vessel in excess of five miles per hour within the area known as the Lake Ridge Cove except for the purpose of taking off and landing water-skiers (or other pulled or propelled water device) from the property along the cove, provided that:
         (1) The vessels enter the cove only if they approach the entrance to the cove at a right angle for a distance of not less than 200 feet from the cove entrance on either side;
         (2) Vessels coming out of the cove have priority over vessels coming into the cove;

(3) A clear water area shall exist prior to any entry into the cove;
(4) The vessels shall be kept on the right half of the cove;
(5) The skiers shall stay directly behind the vessel when entering or exiting the cove;
(6) A distance of 200 feet shall be kept behind all other vessels traveling in the same direction;
(7) In the event the channel is obstructed, unsafe, or unlawful to proceed, the vessels shall come to a full stop and bring the skier aboard.

b. It shall be unlawful to wade, swim, take off, or land water-skiers from the beaches at the entrance to the Lake Ridge Cove, for a distance of 100 feet in either direction from the narrowest point of the entrance to Lake Ridge Cove.

c. It shall unlawful to operate a vessel in excess of five miles per hour within the channels between Lake Ridge Addition and Deer Island, or Deer Island and Island 21, except for the purpose of taking off and landing water-skiers from the property along the channels or the adjacent coves, provided the vessels shall:
(1) Keep the vessel on the right half of the channel;
(2) Keep the skier directly behind the vessel;
(3) Keep a distance of 200 feet behind all other vessels traveling in the same direction;
(4) Not to pass another vessel in the channel traveling in the same direction;
(5) Come to a full stop and bring the skier aboard in the event that the channel is obstructed or unsafe or unlawful to proceed.

d. It shall be unlawful for any person to willfully cause the channels to become obstructed or cause a hazard to safety.

2. **Alder Lake.** It shall be unlawful to operate any vessel or swim within 200 feet of any log boom located at or on Alder Lake.

3. **Lake Kapowsin.**

a. **Restricted Activities and Vessels.** Except for coaching and safety launches, operating under the auspices of the Kapowsin Rowing Center Authority, it shall be unlawful to operate any vessel at a speed in excess of five miles per hour, or to create a wake greater than three inches in height, or to water ski, operate a personal watercraft or similar vessel, or take off or land an airplane on Lake Kapowsin.

b. **Restricted Areas.** Training lanes, designated by lines of buoys, shall be set aside for the exclusive use of rowing shells and/or flat water racing canoes or kayaks, and accompanying launches. Other vessels shall confine their activities to the other areas of the lake.

c. **Regattas, Races, and Other Aquatic Events.** Events on the Lake will be approved and regulated by the Board of Directors of the Kapowsin Rowing Center Authority. The Kapowsin Rowing Center Authority Board of Directors is hereby granted the authority to close only those portions of the lake and public areas maintained by the Kapowsin Rowing Center Authority for events if, in the sole opinion of the Kapowsin Rowing Center Authority Board, the safety of participants, spectators, or others or the well being of the facilities warrants such

a closure; PROVIDED, that any such proposed closure shall be acted upon by the Kapowsin Rowing Center Authority Board of Directors at one of its regular or special meetings. For purposes of this Section, "event" shall mean rowing races and regattas that require the use of four or more racing lanes.

B. A violation of any provision of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC.

(Ord. 96-89S § 3, 1997)

8.88.470 Class "B" Lakes.

All lakes which are 100 acres or greater but less than 500 acres are Class "B" lakes. The Class "B" lakes are: Spanaway Lake, Ohop Lake, Lake Tanwax, Clear Lake, Bay Lake, Harts Lake, and Silver Lake.

A. **Special Restrictions for Class "B" Lakes.**
   1. It shall be unlawful to operate any vessel in excess of five miles per hour between sunset and sunrise on any Class "B" lake.
   2. It shall be unlawful to operate any vessel in excess of 40 miles per hour on any Class "B" lake.

B. **Regulations for Specific Lakes.**
   1. **Spanaway Lake.**
      a. It shall be unlawful to operate a vessel in excess of five miles per hour or at any other speed less than five miles per hour which produces a damaging wake within the area formed by drawing an imaginary line from the northernmost part of the Spanaway park boathouse to the nearest point of land on Enchanted Island and then extending said line north to the Enchanted Island Bridge. Waterskiing in this area is prohibited.
      b. It shall be unlawful to operate a vessel in excess of five miles per hour within 200 feet of the Enchanted Island Bridge.
      c. It shall be unlawful to operate a vessel in excess of five miles per hour within the Northwest Cove, from the southernmost point of Enchanted Island as described in paragraph a., and extending southwesterly to the shoreline of Spanaway Lake unless the operator of the vessel is dropping off or picking up a skier from property within the cove.
      d. It shall be unlawful for any boat longer than 22 feet or one 22 feet or less which can cause a damaging wake to launch at the Spanaway Park boat launch without a permit issued by the Sheriff's Department.
      e. There is a maximum of two major racing events per year. A major racing event is one that will have a significant impact on the lake and severely restrict usage of the lake. The event will not occur on a weekend involving a major holiday. Each event can only be of a one day duration. The event sponsor shall pay for the cost of the law enforcement needed for the event. The event sponsors shall provide prior notice of each event to the Spanaway Lake Improvement Club.
   2. **Clear Lake.** It shall be unlawful to operate any boat that is greater than 22 feet in length or 22 feet or less which can cause a damaging wake on Clear Lake without a permit issued by the Sheriff's Department.

3. **Ohop Lake.** It shall be unlawful to operate a vessel on the waters of Ohop Lake at a rate of speed in excess of eight miles per hour, or at a slower speed that produces a damaging wake, except between the hours of 11:00 a.m. and 3:30 p.m., or legal sunset, whichever comes first, each day.

C. A violation of any provision of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC.

(Ord. 96-89S § 3, 1997)

8.88.480 Class "C" Lakes.

All lakes which are 25 acres or greater but less than 100 acres are Class "C" lakes. The Class "C" lakes are: Lake Florence, Lake Rapjohn, Crescent Lake, Lake Louise, Lake Whitman, Twin Lakes, Jackson Lake, Palmer Lake, Lake Josephine, and Lake Holiday.

A. **Special Restrictions for Class "C" Lakes.**
   1. It shall be unlawful to operate any vessel in excess of five miles per hour between sunset and sunrise on any Class "C" lake.
   2. It shall be unlawful to operate any vessel in excess of 35 miles per hour on any Class "C" lake.

B. **Regulations for Specific Class "C" Lakes.**
   1. **Jackson Lake.** It shall be unlawful to operate a motor-powered vessel on the waters of Jackson Lake.
   2. **Lake Holiday.** It shall be unlawful to operate a motor-powered vessel on the waters of Lake Holiday.
   3. **Crescent Lake.** It shall be unlawful to operate a vessel on the waters of Crescent Lake at a speed in excess of five miles per hour, or at such a slower speed that produces a damaging wake, except between the hours of 11 a.m. and 7 p.m. or legal sunset, whichever comes first, each day.

C. A violation of any provision of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC.

(Ord. 96-89S § 3, 1997)

8.88.490 Class "D" Lakes.

All lakes which are smaller than 25 acres are Class "D" lakes.

A. **Special Restrictions for Class "D" Lakes.** It shall be unlawful to operate any vessel in excess of five miles per hour on any Class "D" lake.

B. A violation of any provision of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC.

(Ord. 96-89S § 3, 1997)

8.88.500 Saltwater Areas.

A. **Special Restrictions for Saltwater areas.** [Reserved]

B. **Regulations for Specific Saltwater areas.**
   1. **Amsterdam Bay.** It shall be unlawful to operate a vessel on the waters within Amsterdam Bay and its Cove at a rate of speed in excess of five miles per hour, or at such a slower speed that produces a damaging wake.

2. **Day Island Lagoon.** It shall be unlawful to operate a vessel on the waters of Day Island Lagoon or within 200 feet of the entrance to Day Island Lagoon at a rate of speed in excess of five miles per hour or at such a slower speed that produces a damaging wake.
3. **Gig Harbor.** It shall be unlawful to operate a vessel on the waters of Gig Harbor or within 200 feet of the entrance to Gig Harbor at a rate of speed in excess of five miles per hour or at such a slower speed that produces a damaging wake.
4. **Lay Inlet.** It shall be unlawful to operate a vessel on the inner waters of Lay Inlet at a rate of speed in excess of five miles per hour or at such a slower speed that produces a damaging wake.

C. A violation of any provision of this Section constitutes a Class 4 civil infraction under Chapter 1.16 PCC.

(Ord. 96-89S § 3, 1997)

8.88.510 Rivers, Launching and Fishing.

A. **Puyallup and Carbon Rivers.** Members of the public may fish and launch boats from those portions of the banks and beds of the Puyallup and Carbon Rivers which are owned by Pierce County for flood control purposes, insofar as such activities do not interfere with flood control facilities and activities.

B. **Facilities - Interference with Flood Control.** The Washington State Department of Fish and Wildlife may establish and maintain vehicle parking and boat launching facilities along and upon those portions of the banks and beds of the Puyallup and Carbon Rivers which are owned by the County for flood control purposes, insofar as the establishment and maintenance of such facilities do not interfere with flood control facilities and activities.

C. **Puyallup and White Rivers.** Members of the public may fish and launch boats from these portions of the banks and beds of the Puyallup and White Rivers which are owned by King County and Pierce County for intercounty river improvement purposes, insofar as such activities do not interfere with river improvement facilities and activities.

D. **Facilities - Interference with Improvements.** The Washington State Department of Fish and Wildlife may establish and maintain vehicle parking and boat-launching facilities along and upon those portions of the banks and beds of the Puyallup and White Rivers which are owned by King County and Pierce County for intercounty river improvement purposes, insofar as the establishment and maintenance of such facilities do not interfere with river improvement facilities and activities.

(Ord. 96-89S § 2 (part), 1997; Ord. 84-62 § 1 (part), 1984; prior Code § 43.08.034)

8.88.520 Testing Areas and Times.

Testing areas and allowed times for registered race boats as mentioned in Section 8.88.230 are as follows:

A. **American Lake.** Saturday from 10 a.m. to 1 p.m.; Wednesday from 4 p.m. to 7 p.m. Testing course is located on the west side of Silcox Island, starting from the National Guard beach area and extending to the easternmost point of the Veterans Hospital grounds.

B. **Lake Tapps.** Saturday from 10 a.m. to 1 p.m.; Wednesday from 4 p.m. to 7 p.m. Testing course is located on the north side of an imaginary line drawn from the northernmost part of the Pierce County Park boat launching ramp and extending due west to Tacoma Point.

C. **Closures.** Both lakes are closed for testing from December 1 to the last day in February.

(Ord. 96-89S § 2 (part), 1997; Ord. 84-62 § 1 (part), 1984; prior Code § 43.08.036)

ARTICLE V. PENALTIES

8.88.600 Penalties Designated.

It shall be unlawful for any person to violate any provision of this Chapter and unless specifically designated as a civil infraction, any violation shall constitute a misdemeanor. (Ord. 96-90 § 1 (part), 1996; Ord. 90-22S § 1, 1990; Ord. 84-62 § 1 (part), 1984; prior Code § 43.10.010)

Chapter 8.92

DISPOSITION OF THE REMAINS OF INDIGENT DECEDENTS

Sections:

8.92.010 Purpose and Intent.
8.92.020 Definitions.
8.92.030 Payment Authorized.
8.92.040 Administration.

8.92.010 Purpose and Intent.

A. The purpose and intent of this Chapter is to comply with RCW 36.39.040 in providing for the disposition of the remains of any indigent person including a recipient of public assistance who dies within the county and whose body is unclaimed.

B. It shall be the responsibility of the Pierce County Department of Aging and Long Term Care to develop and administer a program to accomplish the purpose and intent of this Chapter.

(Ord. 93-112 § 1 (part), 1993)

8.92.020 Definitions.

A. "Disposition" means the minimum services necessary to legally bury or cremate human remains.

B. "Indigent" means the decedent was on public assistance at the time of death, or the decedent's estate is valued at less than $2,500.00.

C. "Unclaimed" means there is no relative who can be located within the state and who is liable for disposition costs pursuant to RCW 68.50.160, nor is there any other person or entity, excepting funeral homes and/or cemeteries/crematories, or the Medical Examiner, who makes any claim to the remains, or who exerts or attempts to exert any influence over the disposition of the remains.

(Ord. 93-112 § 1 (part), 1993)

8.92.030 Payment Authorized.

A. The Department is authorized to reimburse a licensed funeral home and/or cemetery/crematory for the minimum services set out below when such funeral home and/or cemetery/crematory has made a proper showing, according to rules devised by the Department, that:

1. it has, or will lawfully bury or cremate an indigent decedent, and
2. it made a diligent effort to locate relatives who may choose or are required to provide for the disposition, and
3. it made a diligent effort to ascertain the extent of the decedent's estate, and
4. the decedent was at the time of death located in Pierce County, and
5. the decedent was indigent and the body is unclaimed; PROVIDED, that each such reimbursement shall be conditioned upon a promise by the funeral home and/or cemetery/crematory to reimburse the County dollar for dollar from any funds it may subsequently acquire from any other source for the disposition services performed by it.

B. The following are the services and rates for which reimbursement may be made:

BURIAL

1. Mortuary services . . . . . $ 301.00
2. Cemetery costs . . . . . $ 435.00

CREMATION

1. Mortuary services . . . . . $ 301.00
2. Cremation disposition . . . . . $ 267.00

C. The Department shall provide reimbursement for disposition at the rates above; PROVIDED that reimbursement for cremation shall be provided only upon a proper showing that legal authorization has been obtained. The Director or Director's designee may request the Medical Examiner to provide authorization to cremate.

(Ord. 93-112 § 1 (part), 1993)

8.92.040 Administration.

A. The Department shall develop rules and procedures for the implentation of this Chapter. The rules and procedures shall at a minimum include:

1. process for obtaining cremation authorization from the Medical Examiner when there is no other person authorized to do so;
2. procedures for tracing and recovering from decedents' estates after reimbursement has been made, if and when it is cost-effective for the County to do so;
3. guidelines for the showing required in Section 8.92.030 A., including due diligence in locating persons required or willing to provide for disposition;
4. procedures for verifying decedents' indigency; and all other rules and procedures which may be necessary and prudent to effectively implement this Chapter.

(Ord. 93-112 § 1 (part), 1993)

CHAPTER 8.94

BEEKEEPING/APIARIES

Sections:

8.94.010 Policy and Purpose.
8.94.020 Definitions.
8.94.030 Beekeeping - Maintenance of Colonies.
8.94.040 Hive Placement.
8.94.050 Nuisance Declared.
8.94.060 Enforcement and Entry - Right of Entry for Inspection.
8.94.070 Violation - Penalty.
8.94.080 Severability.

Cross references: Chapter 15.60 RCW, Chapter 8.08 PCC

8.94.010 Policy and Purpose.

A. It is the declared policy of this County to enhance and encourage beekeeping and agricultural pollination operations within the County. It is the further intent of this County to provide to the residents of this County proper notification of the County's recognition and support, through this Chapter, of those persons' and/or entities' rights to keep bees, and to set forth concomitant responsibilities in beekeeping.

B. Where non-agricultural land uses extend into agricultural areas or exist side by side, beekeeping occasionally becomes the subject of nuisance complaints. It is an intent of this Chapter to clarify the circumstances under which beekeeping shall be considered a nuisance.

C. Further it is intended that this Chapter is supplemental to, and not in conflict with, the provisions of Chapter 15.60 RCW.

(Ord. 95-11 § 1 (part), 1995; Ord. 94-108 § 1 (part), 1994)

8.94.020 Definitions.

As used in this Chapter, the following definitions shall apply.

A. "Abandoned hive(s)" means any hive with or without bees, that evidences a lack of being properly managed in that it has not been supered in the spring, except nucs, or unsupered in the fall, or is otherwise not managed and/or left without authorization on the property of another, or on public land.

B. "Apiary" means a site where hives of bees or hives are kept or found.

C. "Colony" means a natural group of bees having a queen(s).

D. "Fence" means any obstruction through which bees will not readily fly.

E. "Health Department" means the Tacoma-Pierce County Health Department.

F. "Hive(s)" means a manufactured receptacle or container prepared for the use of bees, including movable frames, combs, and substances deposited into the hive by bees.

G. "Honey bee(s)" means any life stages of the species Apis Mellifera.

H. "Sheriff" means the Pierce County Sheriff's Department.

(Ord. 95-11 § 1 (part), 1995; Ord. 94-108 § 1 (part), 1994)

8.94.030 Beekeeping - Maintenance of Colonies.

A. Honey bee colonies shall be maintained in the following condition:
   1. All honey bee hives shall be registered with the Washington State Department of Agriculture and comply with Chapter 15.60 RCW and Rules adopted thereunder.
   2. Colonies shall be maintained in movable-frame hives, unless exempted by the Washington State Department of Agriculture as an educational exhibit.
   3. Adequate handling techniques, such as requeening, should be employed, and adequate space in the hive should be maintained to minimize swarming.
   4. Apiaries shall be managed and kept in a clean and orderly condition.
   5. An apiary(s) shall be marked in full compliance with WAC 16-602-040.

B. It shall be the duty of any person having honey bees on his or her property to prevent diseased hives as defined in RCW 15.60.005(13) and (16).

C. 1. The Tacoma-Pierce County Health Department shall refer complaints of possible violations of Chapter 15.60 RCW to the State Department of Agriculture.
   2. The Tacoma-Pierce County Health Department shall consult with the State Department of Agriculture on concerns regarding the maintenance of honey bee colonies.

(Ord. 95-11 § 1 (part), 1995; Ord. 94-108 § 1 (part), 1994)

8.94.040 Hive Placement Requirements.

Hives in all areas of Pierce County shall adhere to the following:

A. Hives shall be at least 25 feet from a property line, with the hive(s) entrance(s) facing away from or parallel to the nearest property line.

B. Hives may be less than 25 feet from a property line if placed behind a 6-foot high fence, which shall extend at least 25 feet beyond the hive(s) in both directions. The fence shall direct bee flight into the air at least six feet before the bees cross the property line. The fence or obstruction may occur on the adjoining property, provided that bee flight is not directed in the vicinity of recreational decks or entrances to housing or buildings on adjoining properties. In lieu of a fence, the hive(s) may be placed at least eight feet above adjacent ground level, provided that all other requirements of this Section are met.

C. A hive(s) adjacent to public roads shall comply with A. and B. so as to direct bee flight at least 20 feet into the air over the road surface. In lieu of this requirement, a hive(s) shall be placed at least 100 feet from the road rights-of-way, with the entrance(s) parallel thereto.

D. The number of hives within urban residential areas shall be limited as follows:

Parcel Size (Square footage)	# Hives
6,000 to 10,000	2
10,001 to 20,000	4
20,001 to 43,560 (.46 to 1 acre)	10

Exception: Residential limitations shall not apply when a parcel is contiguous to an open area, such as, but not limited to, wetlands, fish and game preserves and/or hatcheries, and military reservations. Such open areas shall be at least two acres in size.

E. The number of hives may not be restricted on parcels of land over one acre in size;
   1. During times of the year when there is minimal bee flight or activity (October - March); or
   2. The parcel is in a rural or agricultural area; or
   3. The hives with bees are being used for agricultural crop pollination; and
   4. A public nuisance is not created; and
   5. All other requirements of this Chapter are met.

F. In addition to the above production hives, a person may maintain a minimum of one, or up to 10 percent of their production hives, of single-story Langstrogh deep hives with colonies, in each apiary, for requeening purposes. Such hives shall conform to all placement and management requirements and restrictions.

G. A consistent source of water shall be provided as appropriate at the apiary. This requirement is intended to discourage bee visitation at swimming pools, hose bibs, animal watering sources, bird baths, or where people congregate.

(Ord. 95-11 § 1 (part), 1995; Ord. 94-108 § 1 (part), 1994)

8.94.050 Nuisance Declared.

It shall be the duty of all persons keeping hives of honey bees or having other stinging insects as described below, in or upon their property or premises, to prevent the following:

A. Colonies of bees which are defensive or exhibit objectionable behavior, or which interfere with the normal use of property, or the enjoyment of persons, animals, or adjacent property.

B. Hives of bees which do not conform to PCC 8.94.040.

C. An abandoned hive(s).

D. All other nests (colonies) of stinging insects such as yellow jackets, hornets, and wasps which exhibit objectionable behavior or interfere with normal use of property, or the enjoyment of persons, animals, or adjacent property.

E. All nests, hives, or colonies of Africanized honey bees (Apis mellifera Scutellata), except those which are permitted under RCW 15.60.140.

Each of the above described conditions shall constitute a nuisance pursuant to PCC 8.08.010, and shall be abated by the Health Department, pursuant to PCC 8.08.040, et seq.

(Ord. 95-11 § 1 (part), 1995; Ord. 94-108 § 1 (part), 1994)

8.94.060 Enforcement and Entry - Right of Entry for Inspection.

The Health Department and the Sheriff shall enforce this Chapter. (Ord. 95-11 § 1 (part), 1995; Ord. 94-108 § 1 (part), 1994)

8.94.070 Violation - Penalty.

A. Any person, firm, or corporation in violation of any provision of this Chapter, shall, upon conviction thereof, be guilty of a misdemeanor, and be punished by imprisonment in the County jail for a maximum term fixed by the court of not more than 90 days, or by a fine in an amount fixed by the court of not more than $1,000.00, or by both such imprisonment and fine.

B. Any violation of any provision of this Chapter shall constitute a class 1 civil infraction pursuant to PCC 1.16.120. Authorized officials of the Health Department shall issue notices of civil infraction to enforce the provisions of this Chapter, effective upon the date of amendment of the Health Department interlocal agreement granting such authority.

(Ord. 95-11 § 1 (part), 1995; Ord. 94-108 § 1 (part), 1994)

8.94.080 Severability.

If any provision of this Chapter or its application to any person or circumstance is held invalid, the remainder of the Chapter or the application of the provision to other persons or circumstances shall not be affected. (Ord. 95-11 § 1 (part), 1995; Ord. 94-108 § 1 (part), 1994)

Chapter 8.96

PARKING AND CAMPING PROHIBITED

Sections:

8.96.010 Definitions.
8.96.020 Parking and Camping Prohibited.
8.96.030 Enforcement.
8.96.040 Violation - Civil Infraction.

8.96.010 Definitions.

For purposes of this Chapter, the following definitions apply:

A. "Camp" means erecting a tent or shelter or arranging bedding or both, for the purpose of, or in such a way that permits, remaining overnight, or parking a trailer, camper, or other vehicle for the purpose of remaining overnight.

B. "County property" means any County-owned real property excluding County parks.

C. "Vehicle" means every device capable of being moved upon a public highway and in, upon, or by which any person or property is or may be transported or drawn upon a public highway. Bicycles shall not be considered vehicles for purposes of this Chapter.

(Ord. 99-29 § 1 (part), 1999)

8.96.020 Parking and Camping Prohibited.

It shall be unlawful for any person to park or camp on any County property except in areas specifically designated and posted for those purposes. (Ord. 99-29 § 1 (part), 1999)

8.96.030 Enforcement.

The Pierce County Sheriff's Department shall enforce the provisions of this Chapter. (Ord. 99-29 § 1 (part), 1999)

8.96.040 Violation - Civil Infraction.

Any violation of this Chapter constitutes a Class 3 civil infraction under Chapter 1.16 PCC. (Ord. 99-29 § 1 (part), 1999)

HEC can not provide user assistance or support for this software to non-Corps users. See the software vendor list to locate organizations that provide the program, documentation, and support services for a fee.

Downloading this software indicates full acceptance of your responsibility in the use of this program.

HEC-RAS, River Analysis System, Version 3.1

The HEC-RAS system is intended for calculating water surface profiles for both steady and unsteady gradually varied flow. The system can handle a full network of channels, a dendritic system, or a single river reach.

THE FOLLOWING FILES CONTAIN THE HEC-RAS PACKAGE & INSTALLATION FILES:

Program files
Download the file onto your hard drive. Execute this file and follow setup prompts to install.

RAS31.exe (18.6 MB)

Sample Data Files
The sample data files are in two self-extracting zip files, one for the steady flow examples and another for the unsteady flow examples. Download these files onto your hard drive. Execute both files to extract all sample data into their subdirectories. (typcially "C:\HEC Data\RAS\Steady Flow Examples" and "C:\HEC Data\RAS\Unsteady Flow Examples")

Steady.exe (1.21 MB)
Unsteady.exe (6.61 MB)

Documentation The documentation for HEC-RAS consists of a User's Manual which describes how to use the interface; a Hydraulic Reference Manual which describes the data required, equations used, solution techniques, and modeling advice; and an Applications Guide which contains 17 example applications of using various aspects of HEC-RAS. All three documents are in PDF format and can be viewed online or downloaded. The Adobe Acrobat files require version 5.0 or higher of the Acrobat reader for viewing. To view online or download individual chapters, go to the manual's individual page with the links below.

HEC-RAS User's Manual
HEC-RAS Hydraulic Reference Manual
HEC-RAS Applications Guide

The WhatsNewInRas31.pdf file contains a list of the new features that were added from the previous version to the current version. Additionally, it lists all the bugs that have been fixed from the previous version.

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Federal Emergency Management Agency

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· Other Important Info
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Flood Hazard Mapping

Flood Hazard Mapping

Guidelines and Specifications for Study Contractors (Including Appendix 4B)

Please consult the Guidelines and Specifications for Flood Hazard Mapping Partners dated February 2002 for the most current technical requirements, product specifications for Flood Hazard Maps and related National Flood Insurance Program products, and associated coordination and documentation activities. These *Guidelines* supersede certain guidance documents, including *Flood Insurance Study Guidelines and Specifications for Study Contractors* (FEMA 37, January 1995), *Guidance for Scoping Flood Mapping Projects*, the *DFIRM Graphic Specifications* (November 2000), *the DFIRM Base Map Standards* (November 1998), and the *Standard DFIRM Database Guidelines and Specifications* (May 2001). Please see the Guidelines and Specifications for Flood Hazard Mapping Partners page for more detailed information.

These are the guidelines that define technical policy and procedures to be followed by FEMA Study Contractors in the preparation of Flood Insurance Studies (FISs).

Study Contractors must provide to FEMA specific data involving flood hazard evaluation and revision; this data will include hydrologic and hydraulic modeling, flood profiles, topographic mapping, etc. The essential product of the data is the Flood Insurance Rate Map (FIRM), which is used to establish actuarial insurance rates. The Study Contractor Guidelines and Specifications are provided as a .Zip file below.

As part of its Map Modernization Plan, FEMA is performing an assessment of advanced technologies for possible use in the preparation of National Flood Insurance Program (NFIP) maps and related products. In April 1999, FEMA completed Appendix 4B of the Flood Insurance Study Guidelines and Specifications for Study Contractors. Appendix 4B presents the guidelines and specifications that must be used for the application of Airborne LIght Detection And Ranging (LIDAR) systems for gathering the data necessary to create digital elevation models (DEMs), digital terrain maps, and other NFIP products. Appendix 4B is provided as a Zip and PDF file below. A link is also provided to an HTML version of this document.

Portions of the PDF file may not display correctly with older versions of Adobe Acrobat Reader. For best results, it is recommended that **Adobe Acrobat Reader Version 5.1** (the latest version of the reader) be used to view this file. Click on any of the links below to download the files. Click on the "More Info"

icons if you need additional information about how to obtain and use the Adobe Acrobat Reader or WinZip.

Download .Zip Archives

Study Contractor Guidelines and Specifications (302 KB)

Appendix 4B: Airborne LIght Detection And Ranging (LIDAR) Systems (18 KB)

Download .PDF File

Appendix 4B: Airborne LIght Detection And Ranging (LIDAR) Systems (31 KB)

View HTML version of Appendix 4B.

Last Updated: Script to automatically update the last time this page was modified.

FEMA 500 C Street, SW Washington, D.C. 20472 Phone: (202) 566-1600

Includes an Acrobat Reader Version Detection Script

PUBLICATIONS--"Guidelines for Determining Flood Flow Frequency," Revised Bulletin 17B of the Hydrology Committee, U.S. Water Resources Council

In Reply Refer To:
EGS-Mail Stop 415

October 16, 1981

SURFACE WATER BRANCH TECHNICAL MEMORANDUM NO. 82.04

Subject: PUBLICATIONS--"Guidelines for Determining Flood Flow Frequency," Revised Bulletin 17B of the Hydrology Committee, U.S. Water Resources Council

Attached are the new Water Resources Council (WRC) guidelines that supersede WRC Bulletin 17A as the standards by which Federal Agencies are to compute flood-peak-frequency curves from gaging-station records. This is the second revision of the original Bulletin 17 that was published in March 1976. The WRC work group that produced the present guidelines (Bulletin 17B) has been dissolved and there are no plans for further revision of the guidelines.

Changes of Bulletin 17A are indicated by asterisk (*) marks in the text of Bulletin 17B. The pages that were revised are summarized on page v of the Foreword. These changes were discussed in Surface Water Branch Technical Memorandum No. 81.06 that documented the changes in flood-frequency analysis program J407. The revised guidelines in Bulletin 17B were incorporated into computer program J407 on August 7, 1981. The only revision in Bulletin 17B that will be discussed here is the new procedure for weighting station and generalized skew. Please refer to Surface Water Branch Technical Memorandum 81.06 for information on the other revisions. Station and generalized skew are now weighted inversely proportional to their mean square errors. The standard error (square root of the mean square error) of the generalized skew must be input to program J407 unless the generalized skew map in Bulletin 17B is used. If no value for the standard error of the generalized skew is input to the program, the value from the Bulletin 17B map (0.55) is automatically used. Please refer to the WATSTORE User's Guide Volume 4, Chapter I, Section C (dated June 1981) for the changes in data input format for computer program J407. The change in the skew weighting is the one revision which will cause the greatest difference in flood-frequency estimates computed using Bulletin 17A versus Bulletin 17B. This change in skew weighting reduces the influence of generalized skew and will produce a frequency curve which, on the average, agrees more closely with the station data than the same frequency curve computed from Bulletin 17A.

Note that an errata sheet has been included with Bulletin 17B. Please make the necessary pen and ink changes to your copy of Bulletin 17B. Any questions or problems in interpreting the new guidelines should be directed to Will Thomas (FTS 928-6837) in the Surface Water Branch.

Marshall E. Moss
Acting Chief, Surface Water Branch

Attachment

WRD Distribution: A, S, FO, PO

"This memorandum does not supersede any existing SWB memorandum."

To view some documents on this site, you will need **Adobe Acrobat reader**.

Edgewood Staff

Meeting Notice
Employment
Edgewood Police
Edgewood Fire Dept
Council
Staff
Planning & Land Use
Finance Department
Utilities Information
Our Vision Statement
City History
Comprehensive Plan

Henry Lawrence, City Manager
henry@ci.edgewood.wa.us

Roger Toles, Police Chief
chief@ci.edgewood.wa.us

Terri Berry, City Clerk/Information Systems Manager
terri@ci.edgewood.wa.us

Bonnie Valens, Human Resources Manager
bonnie@ci.edgewood.wa.us

Julie Bennett, Receptionist
julie@ci.edgewood.wa.us

Janet Caviezel, Senior Accountant
janet@ci.edgewood.wa.us

Amy Keeney, Accounting Clerk/Senior Clerical
amy@ci.edgewood.wa.us

Chuck Johnson, Building Inspector
chuck@ci.edgewood.wa.us

Paulette Neal, Permit Coordinator
paulette@ci.edgewood.wa.us

Dan Carnrite, Associate Planner
dan@ci.edgewood.wa.us

Doc Williams, Associate Planner
doc@ci.edgewood.wa.us

Council/General City Hall Mail Box
cityhall@ci.edgewood.wa.us

To tour the new "Safer Journey" pedestrian safety presentation, click here. Police Chief Toles recommends you view it with your children.

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