

Chapter 2 Treatment Facility Menus

This chapter identifies the treatment facility menus. The menus in this chapter are as follows:

- Oil Control Menu, Section 2.1
- Phosphorus Treatment Menu, Section 2.2
- Enhanced Treatment Menu, Section 2.3
- Basic Treatment Menu, Section 2.4

Performance goals apply to the water quality design storm volume or flowrate, whichever is applicable, and apply on an average annual basis to the entire annual discharge volume (treated plus bypassed). The incremental portion of runoff in excess of water quality design flowrate can be routed around the facility (offline treatment facilities) or can be passed through the facility untreated (online treatment facilities) provided a net pollutant reduction is maintained. All performance goals apply to stormwater typically found in Pacific Northwest maritime climates, where long duration, low intensity storms predominate and stormwater contains mostly silt-sized particles.

2.1 Oil Control Menu

This menu is applicable in addition to facilities required by other treatment menus.

2.1.1 Performance Goal

The oil control menu facility options should achieve the goals of no ongoing or recurring visible sheen, and to have a 24-hour average Total Petroleum Hydrocarbon (TPH) concentration no greater than 10 mg/l, and a maximum of 15 mg/l for a discrete sample (grab sample).

2.1.2 Options

Oil control options include facilities that are small, treat runoff from a limited area, and require frequent maintenance as well as facilities that treat runoff from larger areas and generally require less frequent maintenance.

- **API-Type Oil/Water Separator** – See Chapter 11
- **Coalescing Plate Oil/Water Separator** – See Chapter 11
- **Linear Sand Filter** – See Chapter 8

The linear sand filter is used in the Basic, Enhanced, and Phosphorus Treatment menus also. If used to satisfy one of those treatment requirements, the same facility shall not also be used to satisfy the oil control requirement unless enhanced maintenance is assured. This is to prevent clogging of the filter by oil so that it will function for suspended solids and other pollutant removal as well. Quarterly cleaning is required when used as a combination facility.

- **Emerging Stormwater Treatment Technologies for Oil Treatment** – See Chapter 12

2.1.3 Application on the Project Site

Place oil control facilities upstream of other facilities, as close to the source of oil generation as practical. For high-use sites located within a larger commercial center, only the impervious surface associated with the high-use portion of the site is subject to oil treatment requirements. If common parking for multiple businesses is provided, treatment shall be applied to the number of parking stalls required for the high-use business only. If the treatment collection area also receives runoff from other areas, the treatment facility must be sized to treat all water passing through it.

High-use roadway intersections shall treat lanes where vehicles accumulate during the traffic signal cycle, including left and right turn lanes and through lanes, from the beginning of the left turn pocket. If no left turn pocket exists, the treatable area shall begin at a distance equal to three car lengths from the stop line. If runoff from the intersection drains to more than two collection areas that do not combine within the intersection, treatment may be limited to any two of the collection areas.

2.2 Phosphorus Treatment Menu

2.2.1 Performance Goal

The phosphorus menu facility choices should achieve a goal of 50% total phosphorus removal for a range of influent concentrations between 0.1 – 0.5 mg/l. The phosphorus menu facility choices must achieve basic treatment goals in addition to phosphorus.

2.2.2 Options

Any one of the following options may be chosen to satisfy the phosphorus treatment requirement.

- **Infiltration with appropriate pretreatment** – See Chapter 7.
 - ***Infiltration Treatment*** - If infiltration is through soils meeting the minimum site suitability criteria for infiltration treatment (see Chapter 7), a presettling basin or a basic treatment facility can serve for pretreatment.
 - ***Infiltration Preceded by Basic Treatment*** - If infiltration is through soils that do not meet the soil suitability criteria for infiltration treatment, treatment must be provided by a basic treatment facility unless the soil and site fit the description in the next option below.
 - ***Infiltration Preceded by Phosphorus Treatment*** - If the soils do not meet the soil suitability criteria **and** the infiltration site is within ¼ mile of a phosphorus-sensitive receiving water, or a tributary to that water, treatment must be provided by one of the other treatment facility options listed below.
- **Large Sand Filter** – See Chapter 8
- **Large Wetpond** – See Chapter 10
- **Emerging Stormwater Treatment Technologies for Phosphorus Treatment** – See Chapter 12
- **Two-Facility Treatment Trains** – See Table 5 - 1

Table 5 - 1: Treatment Trains for Phosphorus Removal

First Basic Treatment Facility	Second Treatment Facility
Biofiltration Swale	Basic Sand Filter or Sand Filter Vault
Filter Strip	Linear Sand Filter (no presettling needed)
Linear Sand Filter	Filter Strip
Basic Wetpond	Basic Sand Filter or Sand Filter Vault
Wetvault	Basic Sand Filter or Sand Filter Vault
Stormwater Treatment Wetland	Basic Sand Filter or Sand Filter Vault
Basic Combined Detention and Wetpool	Basic Sand Filter or Sand Filter Vault

2.3 Enhanced Treatment Menu

2.3.1 Performance Goal

The enhanced treatment facility choices should provide a higher rate of removal of dissolved metals than basic treatment facilities. The performance goal assumes that the facility is treating stormwater with influent dissolved copper ranging from 0.003 to 0.02 mg/l, and dissolved zinc ranging from 0.02 to 0.3 mg/l. Enhanced treatment facilities must achieve basic treatment goals in addition to enhanced treatment goals.

2.3.2 Options

Any one of the following options may be chosen to satisfy the enhanced treatment requirement:

- **Infiltration with appropriate pretreatment** – See Chapter 7
 - ***Infiltration Treatment*** - If infiltration is through soils meeting the minimum site suitability criteria for infiltration treatment (see Chapter 7, a presettling basin or a basic treatment facility can serve for pretreatment.
 - ***Infiltration Preceded by Basic Treatment*** - If infiltration is through soils that do not meet the soil suitability criteria for infiltration treatment, treatment must be provided by a basic treatment facility unless the soil and site fit the description in the next option below.
 - ***Infiltration Preceded by Enhanced Treatment*** - If the soils do not meet the soil suitability criteria **and** the infiltration site is within ¼ mile of a fish-bearing stream, a tributary to a fish-bearing stream, or a lake, treatment must be provided by one of the other treatment facility options listed below.
- **Large Sand Filter** – See Chapter 8
- **Stormwater Treatment Wetland** – See Chapter 10
- **Two Facility Treatment Trains** – See Table 5 - 2
- **Compost-Amended Filter** – See Chapter 9
- **Bioretention/rain garden** – See Volume 6

- **Emerging Stormwater Treatment Technologies for Enhanced Treatment** – See Chapter 12

Table 5 - 2: Treatment Trains for Enhanced Treatment

First Basic Treatment Facility	Second Treatment Facility
Biofiltration Swale	Basic Sand Filter or Sand Filter Vault or Media Filter ^a
Filter Strip	Linear Sand Filter with no presettling cell needed
Linear Sand Filter	Filter Strip
Basic Wetpond	Basic Sand Filter or Sand Filter Vault or Media Filter ¹
Wetvault	Basic Sand Filter or Sand Filter Vault or Media Filter ¹
Basic Combined Detention/Wetpool	Basic Sand Filter or Sand Filter Vault or Media Filter ¹
Basic Sand Filter or Sand Filter Vault with a presettling cell if the filter isn't preceded by a detention facility	Media Filter ¹

a. The media must be of a type approved for use by Ecology. Refer to Ecology's website.

2.4 Basic Treatment Menu

2.4.1 Performance Goal

The basic treatment menu facility options should achieve 80% removal of total suspended solids (TSS) for influent concentrations ranging from 100 to 200 mg/L. For influent concentrations greater than 200 mg/l, a higher treatment goal is appropriate. For influent concentrations less than 100 mg/l, the facilities should achieve an effluent goal of 20 mg/l total suspended solids.

2.4.2 Options

Any one of the following options may be chosen to satisfy the basic treatment requirement:

- **Infiltration** – See Chapter 7
- **Sand Filters** – See Chapter 8
- **Biofiltration Swales** – See Chapter 9
- **Filter Strips** – See Chapter 9
- **Basic Wetpond** – See Chapter 10

- **Wetvault** – See Chapter 10

A wetvault may be used for commercial, industrial, or road projects if there are space limitations. The use of wetvaults is discouraged for residential projects. Combined detention/wetvaults are allowed.

- **Stormwater Treatment Wetland** – See Chapter 10
- **Combined Detention and Wetpool Facilities** – See Chapter 10
- **Bioretention/Rain Garden** – See Volume 6
- **Emerging Stormwater Treatment Technologies for Basic Treatment** – See Chapter 12