

Thurston County Proposed Changes					
Brief Description of Change	Reason for Change	Document Section Being Updated	Text as Written in 2016 and/or Applicable Sections	Proposed Text to 2022 Update	
Changed the term impervious surfaces to hard surfaces.	Changed language to match 2019 SWMMWW.	Throughout entire manual	"Impervious"	"Hard"	
Added clarifying language.	Staff requested change.	Preface and TOC, Stormwater Management Approach	Limit impervious surface to minimum necessary and implement source control measures to prevent contact of stormwater with pollutant generating sources.	Limit impervious surface to the fullest extent feasible for the subject project and implement source control measures to prevent contact of stormwater with pollutant generating sources.	
Added new plus replaced, changed impervious to hard, and added lawn.	Changed language to match 2019 SWMMWW.	Volume I, Chapter 2, 2.1.2	"The determination of thresholds for a project site shall be based on the total new or replaced surfaces and the conversion of native vegetation to landscape area or pasture..."	"The determination of thresholds for a project site shall be based on the total new, replaced, or new plus replaced hard surfaces and the conversion of native vegetation to lawn , landscape area, or pasture that have occurred within the previous five years..."	
Added exempt pavement maintenance practice.	Changed to match 2019 SWMMWW.	Volume I, Chapter 2, 2.2.3	(Not previously included)	"Pavement preservation activities that do not expand the road prism"	
Added clarifying language and changed the term impervious to hard.	Changed language to match 2019 SWMMWW.	Volume I, Chapter 2, 2.2.3	" Removing and replacing a paved surface to base course or lower, or repairing the roadway base If impervious surfaces are not expanded, Core Requirements #1 through #5 apply."	" Removing and replacing a paved surface to base course or lower, or repairing the roadway base: These are considered replaced hard surfaces. If hard surfaces are not expanded, Core Requirements #1 through #5 apply."	
Reworded to clarify pavement types.	Changed language to match 2019 SWMMWW.	Volume I, Chapter 2, 2.2.3	" Resurfacing by upgrading from dirt to gravel, a bituminous surface treatment ("chip seal"), asphalt, or concrete; upgrading from gravel to chip seal, asphalt, or concrete; or upgrading from chip seal to asphalt or concrete"	" Resurfacing by upgrading from dirt to gravel, a bituminous surface treatment ("chip seal"), asphalt, or concrete; upgrading from gravel to chip seal, asphalt, or concrete; or upgrading from chip seal to asphalt or concrete."	
Removed reference to utility projects being linear in nature.	Changed language to match 2019 SWMMWW.	Volume I, Chapter 2, 2.2.4	"Underground utility projects that are linear in nature and replace the ground surface with in-kind material or materials with similar runoff characteristics are only subject to Core Requirement #2, Construction Stormwater Pollution Prevention."	"Underground utility projects that are linear in nature and replace the ground surface with in-kind material or materials with similar runoff characteristics are only subject to Core Requirement #2, Construction Stormwater Pollution Prevention."	
Add clarifying language regarding core requirement applicability.	Added language to match 2019 SWMMWW.	Volume I, Chapter 2, 2.3	"If your project is not exempt, you must determine which Core Requirement apply to it. Use the flowcharts in Figure 2 1 and Figure 2 2 and the discussion in this section to help determine which Core Requirement apply to your project. The Core Requirement themselves are presented in Section 2.4."	"If your project is not exempt, you must determine which Core Requirement apply to it. Not all of the Core Requirements apply to every new development or redevelopment project. The applicability varies depending on the project type and size. This section identifies thresholds that determine the applicability of the Core Requirements to projects. Use the flowcharts in Figure 2 1and Figure 2 2 and the discussion in this section to help determine which Core Requirement apply to your project. The Core Requirement themselves are presented in Section 2.4."	
Added Core Requirement thresholds to section.	Added language to match 2019 SWMMWW.	Volume I, Chapter 2, 2.3	(Not previously included)	Add verbatim: I-3.3 Applicability of the Minimum Requirements, Minimum Requirements Thresholds from Ecology's 2019 SWMMWW.	
Added term "native".	Added language to match 2019 SWMMWW.	Volume I, Chapter 2, 2.3.1 and 2.3.2	"Converts 2.5 acres or more of vegetation to pasture."	"Converts 2.5 acres or more of native vegetation to pasture."	
Changed thresholds for residential subdivisions	Added language to match 2019 SWMMWW.	Volume I, Chapter 2, 2.3.1.1	"For each lot less than less than 1 acre, assume 4,200 square feet of hard surface (1,000 square feet of which is considered pollution generating). For each lot 1 acre or greater, assume 8,000 square feet of hard surface (2,500 square feet of which is considered pollution generating) or the maximum impervious (or hard) coverage permitted by Thurston County code, whichever is less."	For each lot less than less than 5 acres , assume 4,000 square feet of hard surface, For each lot 5 acres or greater, assume 8,000 square feet of hard surface or the maximum impervious (or hard) coverage permitted by Thurston County code, whichever is less.	
Changed date and added adopted basin plans.	Updated to make current.	Volume I, Chapter 2, 2.3.3	"As of February 2014..." (Not previously included)	"As of October 2021 ..." • Nisqually River Basin (East and Southeast of Lacey, along the Nisqually River and its tributaries) • Chehalis River Basin (Southwest of Olympia, along the Chehalis River and its tributaries)	
Changed date and revised TMDL's in place.	Updated to make current.	Volume I, Chapter 2, 2.3.3.1	"As of February 2014, the following basins in Thurston County have an approved TMDL in place:" • Henderson Inlet (Woodland and Woodard Creek). • Nisqually River • Chehalis/Black River [Note: A TMDL for the Deschutes River is currently being developed. Any requirements related to stormwater management established by the final approved Deschutes TMDL will be subject to additional requirements.]	"As of October 2021 , the following areas in Thurston County have an EPA approved TMDL in place :" • Henderson Inlet Watershed • Nisqually Watershed • Upper Chehalis River Basin • Deschutes River and its Tributaries • Bottom/Eld Inlets Tributaries [Note: A TMDL for the Deschutes River is currently. Any requirements related to stormwater management established by the final approved Deschutes TMDLs will be subject to additional requirements.]	
Added Ecology figure showing example threshold discharge area delineations	To provide clarification of TDAs.	Volume I, Chapter 2, 2.4.1 - Figure 2-3 Example TDA Delineation	(Not previously included)	(See Tracked Changes version for Figure 2-3 Example TDA Delineation)	

Removed language referencing project size	Site larger than 1 acre may still be required to obtain permit coverage	Volume I, Chapter 2, 2.4.3	"...under Ecology's NPDES Stormwater Construction permit program for project sites greater than 1-acre, the applicant shall provide a copy of the Notice of Intent..."	"...under Ecology's NPDES Stormwater Construction permit program for project sites greater than 1-acre , the applicant shall provide a copy of the Notice of Intent..."
Revised language and added section describing when discharge requirements apply	Added language to match 2019 SWMMWW.	Volume I, Chapter 2, 2.4.5	"If flows for a given channel....." (Not previously included)	"Where no conveyance system exists at the adjacent downstream property line and the discharge was previously unconcentrated flow or significantly lower concentrated flow, then measures must be taken to prevent downgradient impacts." Added verbatim: I-3.4.4 MR4: Preservation of Natural Drainage Systems and Outfalls, Supplemental Guidelines Starting at "The following discharge requirement is recommended:" through c.
Revised language to include clarification of compliance options and revised LID options.	Added and revised language to match 2019 SWMMWW.	Volume I, Chapter 2, 2.4.6	"Core Requirement #5 (described in Chapter 2) . All projects, including those not meeting the thresholds of Chapter 2, shall use on-site measures to the maximum extent practicable for the control of stormwater. Projects qualifying as flow control exempt in accordance with Section 2.4.8 Flow Control, do not have to achieve the LID performance standard, nor consider bioretention, rain gardens, permeable pavement, and full dispersion if using List 1 or List 2. However, these projects must implement the following LID BMPs if feasible: • Restore native vegetation (BMP LID.01) • Post-Construction Soil Quality and Depth (BMP LID.02) – All disturbed areas of the project to be landscaped shall implement BMP LID.02 to restore soil quality and depth. • Downspout Dispersion (BMP LID.05, LID.06, and/or LID.07) "	All projects that require Core Requirement #5 (as described in Chapter 2) must employ stormwater management BMPs as described below. The compliance options for the project depend on the amount of improvements proposed, the location of the project, the size of the parcel the project is on, and whether or not the project is flow control exempt. All projects, including those not meeting the thresholds of Chapter 2, shall use on-site measures to the maximum extent practicable for the control of stormwater. Projects qualifying as flow control exempt in accordance with Section 2.4.8 Core Requirement #7: Flow Control, do not have to achieve the LID performance standard, nor consider bioretention, rain gardens, permeable pavement, and full dispersion BMPs. However, these projects must implement the following LID BMPs if feasible: • Post-Construction Soil Quality and Depth (BMP LID.02) – All disturbed areas of the project to be landscaped shall implement BMP LID.02 to restore soil quality and depth. • Downspout dispersion or infiltration, and/or perforated stub-out connections (BMP LID.05, LID.06 and/or LID.04) • Concentrated flow dispersion (BMP LID.07) or sheet flow dispersion (BMP LID.06)
Replaced Figure 2-3 Flow Chart for Determining LID Core Requirement #5.	Revised to match 2019 SWMMWW.	Volume 1, Chapter 2, 2.4.6 - Figure 2-3	See Figure 2-3.	Added verbatim: Flow Chart for Determining MR#5 Requirements (revised March 2019) from Ecology's 2019 SWMMWW. *Note carried over from 2016 DDECM
Revised language for project triggers and replace table for Core Requirement #5	Revised to match 2019 SWMMWW.	Volume I, Chapter 2, 2.4.6	See strikethrough and Table 2-1.	Add verbatim (except replacing "Minimum Requirement" with "Core Requirement") : Table I-3.1: Minimum Requirement #5 Compliance Option for Projects Triggering Minimum Requirements #1-#9
Revised Thresholds to clarify the use of TDAs.	Revised to match language in 2019 SWMMWW.	Volume I, Chapter 2, 2.4.7.1	2.4.7.1 Thresholds (see Tack Changes version for original text)	Added "The project proponent must demonstrate that the TDA does not meet either of the following thresholds for Runoff Treatment BMPs to not be required for that TDA." Added "Note that it is possible for a project that requires Core Requirement #6 with multiple TDAs to not need Runoff Treatment BMP(s) in one or more individual TDAs. If a TDA does not trigger the TDA threshold for Runoff Treatment BMPs, then the designer must document the areas within the TDA used to determine that the TDA threshold was not met. This documentation will demonstrate compliance with Core Requirement #6 for the TDA."
Removed "Exempt Waterbodies", replaced "projects" with TDAs, and added through MS4	Language revised to match Ecology's 2019 SWMMWW	Volume I, Chapter 2.4.8.1 Applicability	Exempt Waterbodies Flow Control is not required for projects that discharge directly to, or indirectly to the following waters of Thurston County:	Flow Control is not required for TDAs that discharge directly to the following waters of Thurston County:
Revise applicability for Core Requirement #11.	Revised to match language in 2019 SWMMWW.	Volume I, Chapter 2, 2.4.12.1	Core Requirement #11 applies to those projects meeting the thresholds outlined in Chapter 2. The Project Engineer or applicant (for abbreviated plans) shall submit an off-site analysis that assesses the potential off-site impacts of the project's stormwater discharge.	Core Requirement #11 applies to those projects meeting the thresholds outlined in Chapter 2. The Project Engineer or applicant (for abbreviated plans) shall submit an off-site analysis report for projects that discharge stormwater off-site that assesses the potential off-site water quality, erosion, slope stability, and drainage impacts associated with the project, and proposed appropriate mitigation for those impacts. The report should also assess the amount of off-site run-on from upstream off-site areas that may affect the site design.
Revise requirements for Core Requirement #11.	Revised to match language in 2019 SWMMWW.	Volume I, Chapter 2, 2.4.12.2	All projects shall perform a qualitative analysis downstream from the site to the receiving water up to one mile, whichever is less, even if 100 percent infiltration is proposed. If the receiving water is within one-quarter mile, the analysis shall extend within the receiving water to one-quarter mile from the project site. The analysis shall extend one-quarter mile beyond any improvements proposed as mitigation. The analysis must extend upstream to a point where any backwater effects created by the project cease. The analysis shall meet the requirements in Chapter 3.	The initial qualitative analysis shall extend along the flow path from the project site to the receiving water, for a distance up to one mile. If the receiving water is within one-quarter mile from the project site, the analysis shall extend within the receiving water to one-quarter mile from the project site. The analysis shall extend one-quarter mile beyond any improvements proposed as mitigation. The analysis must extend upstream from the project site to a point where there are no backwater effects created by the project, and the designer can determine all areas contributing run-on to the project . The analysis shall meet the requirements in Chapter 3.
Removed requirement for Short Form Construction SWPPP	Staff requested change.	Volume I, Chapter 3, 3.1	Short Form Construction Stormwater Pollution Prevention Plan	N/A
Add note regarding scoping meeting exemption for some single family residential projects	Referencing existing memo.	Volume I, Chapter 3, 3.2.2	(Not previously included)	Note: Single Family Residential projects that exceed the thresholds in Chapter 2 and trigger Core Requirements #6: Runoff Treatment and #7: Flow Control, but do not reasonably expect to need to install these BMPs to meet those requirements are exempt from the requirement to submit a Drainage Scoping Report. See the Administrator Memo titled Drainage Scoping Report Submittal Requirements – Clarification for Single Family Residential Projects on the DDECM website: https://www.thurstoncountywa.gov/sw/Pages/dm-current-2016.aspx .

Revised requirement for Drainage Scoping Report	Clarified requirement.	Volume I, Chapter 2, 3.2.2	"A written description of the project including overall stormwater management strategy proposed for the site including a strategy for meeting Core Requirement #5, i.e., will the project use the BMP menu approach, the LID Flow Duration Standard, or LID is infeasible on the site"	A written description of the project including overall stormwater management strategy proposed for the site including a strategy for meeting Core Requirement #5, i.e., will the project use the List Approach , the LID Performance Standard, or LID is infeasible on the site
Revised requirements for project acceptance for those filing drainage and erosion control plans.	Staff requested change.	Volume I, Chapter 3, 3.2.5	Construction Inspection Report and as-built drawings in electronic format (PDF and CAD) Filing of covenants on lots, the POA articles of incorporation and CC&R's, maintenance agreements, easements, agreements with adjacent property owners, conservation easements, and similar documents as required in the Drainage and Erosion Control Plan and Thurston County Code.	Construction Inspection Report and as-built drawings in electronic format (PDF and CAD). It is preferred that CAD files utilize Washington State Plane South, NAD83 HARN, U.S. Survey Feet coordinate system. Filing of covenants on lots, the POA articles of incorporation and CC&R's, maintenance agreements, easements, agreements with adjacent property owners, conservation easements, and similar documents as required in the Drainage and Erosion Control Plan and Thurston County Code. Documents requiring recording shall meet the Washington State formatting requirements. Contact the Thurston County Auditor's Office at recording@co.thurston.wa.us for additional information about recording documents.
Remove requirement for recording 8.5x11" version of Abbreviated or Engineered Abbreviated Drainage Plan	Staff requested change.	Volume I, Chapter 3, 3.2.5	An 8½ x 11" version of the Abbreviated or Engineered Abbreviated Drainage Plan showing the location of drainage structures, conveyances, drywells, and dispersion areas shall be created and recorded with the Thurston County Auditor for the subject property.	N/A
Remove requirement for Short for Construction SWPPP	Staff requested change.	Volume I, Chapter 3, 3.4	Projects that may submit an Abbreviated Drainage Plan or an Engineered Abbreviated Drainage Plan may have additional submittal requirements (e.g., a Short Form Construction SWPPP and Source Control Plan) if they are subject to Core Requirement #2 or #3. These submittals are briefly described below.	Projects that may submit an Abbreviated Drainage Plan or an Engineered Abbreviated Drainage Plan may have additional submittal requirements (e.g., a Construction SWPPP and Source Control Plan) if they are subject to Core Requirement #2 or #3. These submittals are briefly described below.
Change requirement for Short Form Construction SWPPP	Staff requested change.	Volume I, Chapter 3, 3.4 (Figure 3.2 - Flow Chart for Determining Submittal Requirement)	Complete Construction Short Form SWPPP	Complete Construction SWPPP
Revised thresholds for Core Requirement #2.	Changed language to match 2019 SWMMWW.	Volume I, Chapter 3, 3.4 (Figure 3.2 - Flow Chart for Determining Submittal Requirement)	Is your project required to meet Minimum Requirement #2? Projects with greater than 2,000 square feet of new impervious or 7,000 square feet of land disturbing activity.	Is your project required to meet Core Requirement #2? Projects resulting in 2,000 square feet, or more, of new plus replaced hard surface area or 7,000 square feet or more total of land disturbing activity.
Revised table title and added abbreviation key.	Title was incomplete and Key was missing	Volume I, Chapter 3, 3.4 - Table 3.1 Thresholds for Abbreviated Plans, Stormwater Pollution Prevention Plans, and Drainage Control Plans	Table 3.1 Thresholds for Abbreviated Plans, Stormwater Pollution Prevention Plans, and Drainage Control Plans Subdivision, Short Plats, Large Lots, one-Lot Subdivisions	Table 3.1 Thresholds for Abbreviated Plans, Construction Stormwater Pollution Prevention Plans, and Drainage and Erosion Control Plans Subdivision, Short Plats, and Large Lots AP = Abbreviated Plan DECP = Drainage Control Plan SWPPP = Construction Stormwater Pollution Prevention Plan
Revised language to include new plus replaced hard surface areas.	Changed language to match 2019 SWMMWW.	Volume I, Chapter 3, 3.4.2 and 3.4.3	3.4.2 Abbreviated Drainage Plan 3.4.3 Engineered Abbreviated Drainage Plan (see Tracked Changes version for original text)	Add new plus replaced hard surface areas.
Added location of potable water infrastructure.	Staff requested change.	Volume I, Chapter 3, 3.5.1	(Not previously included)	Location of potable water infrastructure
Removed requirement for recording as-built.	Staff requested change.	Volume I, Chapter 3, 3.5.1	All changes from the original plot plan shall be recorded and a record drawing (as-built) prepared showing the final constructed improvements. This as-built shall be submitted to Thurston County prior to final project acceptance.	N/A
Removed requirement for Short Form Construction SWPPP	Staff requested change.	Volume I, Chapter 3, 3.6	3.6 Short Form Construction SWPPP A Short Form Construction SWPPP is provided for projects with a disturbed area of less than 1 acre that are eligible for the Abbreviated Drainage Plan or Engineered Abbreviated Drainage Plan and are required to meet Core Requirement #2, i.e., projects with greater than 2,000 square feet of new impervious or 7,000 square feet of land disturbing activity. The template for the short form Construction SWPPP, which includes an abbreviated erosion and sediment control plan, is provided in Volume II.	N/A
Revised contour elevation to maintain consistency.	Revised for consistency.	Volume I, Chapter 3, 3.8.1.2.1	"Prepare a topographic drawing of the site to show existing contour elevations at intervals of 1 to 5 feet..."	"Prepare a topographic drawing of the site to show existing contour elevations at intervals of 1 to 10 feet..."
Impervious and pervious area tabulations revised to match Ecology language.	Revised to match 2019 SWMMWW.	Volume I, Chapter 3, 3.8.1.8.1	"Existing impervious surfaces Converted pervious surface Replaced impervious surface" New impervious surface	" Effective impervious surfaces Converted vegetated areas Replaced pollution-generating hard surfaces New pollution-generating hard surfaces
Added requirement for proposed LID BMPs.	Revised to match language in 2019 SWMMWW.	Volume I, Chapter 3, 3.8.1.8.2	(Not previously included)	Provide a description of areas of disturbed soils to be amended. (Note: All lawn and landscaped areas to meet BMP LID.02: Post-Construction Soil Quality and Depth. Use of compost is one way to meet the requirement.)

Revised to match Ecology requirements for offsite analysis.	Revised to match 2019 SWMMWW.	Volume I, Chapter 3, 3.8.1.8.3	3.8.1.8.3 Offsite Analysis (see Track Changes version for original text)	Projects that discharge stormwater off-site shall submit an off-site analysis report as described by Core Requirement #11: Off-site Analysis and Mitigation. The existing or potential impacts to be evaluated and mitigated should include: • Conveyance system capacity problems; • Localized flooding; • Erosion, including landslide hazards and erosion along streambanks and at the outfall location;
Revised maximum contour intervals for the site plan.	Revised to match 2019 SWMMWW.	Volume I, Chapter 3, 3.8.3.3.2	Contour intervals on site plan shall be as follows: • 0 to 15 percent slope: 2 foot contour intervals. • 16 to 40 percent slope: 5 foot contour intervals. • 40 percent slope: 10 foot contour intervals.	Maximum contour intervals on the site plan shall be as follows: • Up to 10 percent slopes: 2-foot contour intervals. • Over 10 percent to less than 20 percent slopes: 5- foot contour intervals. • 20 percent or greater slopes: 10- foot contour intervals. • Elevations shall be at 25-foot intervals.
Revised the step-by-step BMP selection process to match Ecology requirements for selection of runoff treatment BMPs.	Revised to match 2019 SWMMWW.	Volume I, Chapter 4, 4.2	4.2 Step-by-Step BMP Selection Process Figure 4-1 Stormwater BMP Selection Flow Chart Figure 4-2 Stormwater BMP Selection Process Flow Chart, Flow Control and Runoff Treatment Figure 4-3 Stormwater BMP Selection Flow Chart, Flow Control Figure 4-4 Stormwater BMP Selection Process Flow Chart, Runoff Treatment (see Track Changes version for original text)	Add verbatim: III-1.2 Choosing Your Runoff Treatment BMPs from Ecology's 2019 SWMMWW. (Exception: Thurston County Section 305(b) lakes) Add Runoff Treatment BMP Selection Flow Chart (revised January 2019) form Ecology's 2019 SWMMWW.
Added Flow Control BMP Selection Process.	Added language to match 2019 SWMMWW.	Volume I, Chapter 4, 4.4	(not previously included)	Add verbatim: III-1.3 Choosing Your Flow Control BMPs from Ecology's 2019 SWMMWW.
Added explanations for general information on the existing site and project to be included in Construction SWPPP narrative.	Added language to match 2019 SWMMWW.	Volume II, Chapter 2, 2.3.3	2.3.3 Step 3 - Development and Implementation of the Construction SWPPP, Detailed Components of SWPPP Narrative, 5. Narrative Discussion, a) General Information on the Existing Site and Project (see Track Changes version for original text)	Added "1) Project description: Describe the nature and purpose of the construction project. Include the total size of the area, any increase in existing impervious area; the total area expected to be disturbed by clearing, grading, excavation or other construction activities, including off-site borrow and fill areas; and the volumes of grading cut and fill that are proposed. 2) Existing site conditions: Describe the existing topography, vegetation, and drainage. Include a description of any structures or development on the parcel including the area of existing impervious surfaces. 3) Soils: Describe the soil on the site, including information such as soil names, mapping unit, erodibility, settleability, permeability, depth, depth to ground water, texture, and soil structure. 4) Critical Areas: Describe areas on-site or adjacent to the site that are classified as critical areas, including critical areas up to ¼ mile away that receive runoff from the site. Describe special requirements for working near or within these areas. This may include federal, state, and/or local permit requirements. 5) Adjacent Areas: Describe adjacent areas, including streams, lakes, wetlands, residential areas, and roads that the construction project might affect. Provide a description of the upstream drainage leading to the site and the downstream drainage leading from the site to the receiving body of water. 6) Potential erosion problem areas: Describe areas on the site that have potential erosion problems. b) 13 Elements: Describe how the Construction SWPPP addresses each of the 13 required elements. Include the type and location of BMPs used to satisfy the required element. If an element is not applicable to a project, provide a written justification for why it is not necessary. If a permanent BMP is proposed to be used as temporary storage, provide the plan to return the BMP to the designed condition prior to leaving the site."
Added exclusion of recycled concrete for BMP C105.	Staff requested changes.	Volume II, Chapter 3, 3.1, BMP C105: Stabilized Construction Entrance / Exit	"Do not use crushed concrete, cement, or calcium chloride for construction entrance stabilization because these products raise pH levels in stormwater and concrete discharge to surface waters of the State is prohibited."	Do not use crushed concrete, recycled concrete, cement, or calcium chloride for construction entrance stabilization because these products raise pH levels in stormwater and concrete discharge to surface waters of the State is prohibited.
Revised conditions of use for BMP C106.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C106: Wheel Wash	"Discharge wheel wash or tire bath wastewater to a separate on-site treatment system that prevents discharge to surface water, such as a closed-loop recirculation or upland application or to the sanitary sewer with local sewer district approval.	Wheel wash wastewater is not stormwater. It is commonly called process water, and must be discharged to a separate on-site treatment system that prevents discharge to surface water, such as a closed-loop recirculation system to conserve water use, or to the sanitary sewer with local sewer district approval.
Revised conditions of use for BMP C106.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C106: Wheel Wash	(Not previously included)	Added "• When practical, the wheel wash should be placed in sequence with BMP C105: Stabilized Construction Entrance/Exit. Locate the wheel wash such that vehicles exiting the wheel wash will enter directly onto BMP C105: Stabilized Construction Entrance/Exit. In order to achieve this, BMP C105: Stabilized Construction Entrance/Exit may need to be extended beyond the standard installation to meet the exit of the wheel wash."
Revised conditions of use and general design and installation specifications.	Revised to match language in 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C120: Temporary and Permanent Seeding	BMP C120: Temporary and Permanent Seeding, Conditions of Use BMP C120: Temporary and Permanent Seeding, Design and Installation Specifications, General (see Track Changes version for original text)	Added "• The optimum seeding windows for western Washington are April 1 through June 30 and September 1 through October 1. • Between July 1 and August 30 seeding requires irrigation until 75 percent grass cover is established. • Between October 1 and March 30 seeding requires a cover of mulch or an erosion control blanket until 75 percent grass cover is established. General
Added application rate of wet area seed mix	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C120: Temporary and Permanent Seeding	BMP C120: Temporary and Permanent Seeding, Design and Installation Specifications, Seeding and Seed Mixtures (see Track Changes version for original text)	Added "Apply the wet area seed mix at a rate of 60 pounds per acre."

Added additional conditions of use.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C121: Mulching	BMP C121: Mulching, Conditions of Use (see Track Changes version for original text)	Added "Recycled cellulose may contain polychlorinated biphenyl (PCBs). Ecology recommends that products should be evaluated for PCBs prior to use. Refer to BMP C126: Polyacrylamide (PAM) for Soil Erosion Protection for conditions of use. PAM shall not be directly applied to water or allowed to enter a water body."
Added additional conditions of use.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C122: Nets and Blanket	BMP C122: Nets and Blankets, Conditions of Use (see Track Changes version for original text)	Added "Erosion control netting and blankets shall be made of natural plant fibers unaltered by synthetic materials."
Added additional conditions of use and maintenance standard.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C123: Plastic Covering	BMP C123: Plastic Covering, Conditions of Use (see Track Changes version for original text)	Added "• Plastic sheeting may result in increased runoff volumes and velocities, requiring onsite measures to counteract the increases. Creating a trough with wattles or other material can convey water away from these areas. • To prevent undercutting, trench and backfill rolled plastic covering products." "• Dispose of old tires used to weight down plastic sheeting appropriately."
Added additional conditions of use.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C125: Topsoiling / Composting	BMP C125: Topsoiling / Composting, Conditions of Use (see Track Changes version for original text)	Added "• Areas to be permanently landscaped shall provide a healthy topsoil that reduces the need for fertilizers, improves overall topsoil quality, provides for better vegetal health and vitality, improves hydrologic characteristics, and reduces the need for irrigation. This is required for most project and shall be completed in accordance with the requirements of BMP LID.02: Post-Construction Soil Quality and Depth (Volume V of DDECMM). • Areas that already have healthy topsoil, such as undisturbed areas, do not require soil amendments."
Added additional design and installation specifications.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C125: Topsoiling / Composting	BMP C125: Topsoiling / Composting, Design and Installation Specifications (see Track Changes version for original text)	Added "• Maximize the depth of the topsoil wherever possible to provide the maximum possible infiltration capacity and beneficial growth medium. Topsoil shall have: o A minimum depth of 8-inches. Scarify subsoils below the topsoil layer at least 4 inches with some incorporation of the upper material to avoid stratified layers, where feasible. Ripping or restructuring the subgrade may also provide additional benefits regarding the overall infiltration and interflow dynamics of the soil system. o A minimum organic content of 10 percent dry weight in planting beds, and 5 percent organic matter content in turf areas. Incorporate organic amendments to a minimum 8-inch depth except where tree roots or other natural features limit the depth of incorporation. o A pH between 6.0 and 8.0 or matching the pH of the undisturbed soil. o If blended topsoil is imported, then fines should be limited to 25 percent passing through a 200 sieve. • Mulch planting beds with 2 inches of organic material. • Do not place topsoil while in frozen or muddy condition, when the subgrade is excessively wet, or when conditions exist that may otherwise be detrimental to proper grading or proposed sodding or seeding."
Added disposal options for concrete in order of preference.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C151: Concrete Handling	BMP C151: Concrete Handling, Conditions of Use (see Track Changes version for original text)	Added "Disposal options for concrete, in order of preference are: 1. Off-site disposal locations 2. Concrete wash-out areas (see BMP C154: Concrete Washout Area) 3. De minimus washout to formed areas awaiting concrete"
Revised language and added specification.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C151: Concrete Handling	BMP C151: Concrete Handling, Design and Installation Specifications (see Track Changes version for original text)	Added "• At no time shall concrete be washed off into the footprint of an area where an infiltration feature will be installed." Revised to "• Washout of concrete trucks drums at an approved off-site location or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground (including formed areas awaiting concrete), or into storm drains, open ditches, streets, or streams. Refer to BMP C154 for information on concrete washout areas. • Small concrete handling equipment (e.g., Hand tools, screeds, shovels, rakes, floats, trowels, and wheelbarrows) shall be washed into designated concrete washout areas or into formed areas awaiting concrete pour. • Equipment that cannot be easily moved, such as concrete paving machines, shall only be washed in areas that do not directly drain to natural or constructed stormwater conveyances or potential infiltration areas. • Do not allow washwater from areas, such as concrete aggregate driveways, to drain directly (without detention or treatment) to natural or constructed stormwater conveyances. • When no designated concrete washout areas (or formed areas, allowed as described above) are available, contain washwater and leftover product in a lined container. Lining shall be a minimum of 10-mil polyethylene sheeting and shall be free of holes, tears, or other defects that compromise the impermeability of the material. Dispose of contained concrete and concrete washwater (process water) in a manner that does not violate groundwater or surface water quality standards."
Added maintenance standards	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C153: Material Delivery, Storage and Containment	(Not previously included)	Added "Maintenance Standards • Secondary containment facilities shall be maintained free of accumulated rainwater and spills. In the event of spills or leaks, accumulated rainwater and spills shall be collected and placed into drums. These liquids shall be handled as hazardous waste unless testing determines them to be non-hazardous. • Re-stock spill kit materials as needed."

Added methods for calculating design of BMP C200.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C200: Interceptor Dike and Swale	BMP C200: Interceptor Dike and Swale, Design and Installation Specifications (see Track Changes version for original text)	<ul style="list-style-type: none"> Design the dike and/or swale to contain flows calculated by one of the following methods: Single Event Hydrograph Method: The peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10 year, 24 hour frequency storm for the worst-case land cover condition. OR <ul style="list-style-type: none"> Continuous Simulation Method: The 10 year peak flow rate, as determined by an approved continuous runoff model with 15 minute time step for the worst-case land cover condition. For conveyance systems that will also serve on a permanent basis see design standards in Volume III, Chapter 3. Added "Worst-case land cover conditions (i.e., producing the most runoff) should be used for analysis (in most cases, this would be the land cover conditions just prior to final landscaping)."
Added methods for calculating design of BMP C201.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C201: Grass-Lined Channels	BMP C201: Grass-Lined Channels, Design and Installation Specifications (see Track Changes version for original text)	<ul style="list-style-type: none"> The maximum design velocity shall be based on soil conditions, type of vegetation, and method of revegetation, but at no times shall velocity exceed 5 feet/second. The channel shall not be overtopped by the peak volumetric flow rate calculated by one of the following methods: Single Event Hydrograph Method: The peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10 year, 24 hour frequency storm for the worst-case land cover condition. OR <ul style="list-style-type: none"> Continuous Simulation Method: The 10 year peak flow rate, as determined by an approved continuous runoff model with a 15 minute time step for the worst-case land cover condition. Worst-case land cover conditions (i.e., producing the most runoff) should be used for analysis (in most cases, this would be the land cover conditions just prior to final landscaping)."
Revised name of BMP C122	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C202: Channel Lining	BMP C202: Channel Lining	"BMP C202: Riprap Channel Lining"
Added BMP C122 as an alternative to C202	Added language to match 2019	Volume II, Chapter 3, 3.1, BMP C202: Channel Lining	(not previously included)	Added "• An alternative to riprap channel lining is BMP C122: Nets and Blankets."
Removed two conditions of use.	Language not consistent with 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C202: Channel Lining	(see Track Changes version for original text)	N/A
Added maintenance standards	Added language to match 2019	Volume II, Chapter 3, 3.1, BMP C202: Channel Lining	(Not previously included)	Added "Maintenance Standards Replace riprap as needed."
Added methods for calculating design of BMP C204.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C204: Pipe Slope Drains	BMP C204: Pipe Slope Drains, Design and Installation Specifications (see Track Changes version for original text)	<ul style="list-style-type: none"> Size the pipe to convey the flow. The capacity for temporary drains shall be sufficient to handle flows calculated by one of the following methods: Single Event Hydrograph Method: The peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 10 year, 24 hour frequency storm for the worst-case land cover condition. OR <ul style="list-style-type: none"> Continuous Simulation Method: The 10 year peak flow rate, as determined by an approved continuous runoff model with a 15 minute time step for the worst-case land cover condition. "Worst-case land cover conditions (i.e., producing the most runoff) should be used for analysis (in most cases, this would be the land cover conditions just prior to final landscaping)."
Removed BMPs included in conditions of use.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C208: Triangular Silt Dike (TSD) (Geotextile-Encased Check Dam)	BMP C208: Triangular Silt Dike (TSD) (Geotextile-Encased Check Dam) (see Track Changes version for original text)	N/A
Added additional information for an alternative design to block and gravel drop inlet protection and changed name.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C220: Storm Drain Inlet Protection	BMP C220: Storm Drain Inlet Protection, Block and gravel Drop Inlet Protection (see Track Changes version for original text)	"Block and Gravel Filter" <ul style="list-style-type: none"> An alternative design is a gravel berm surrounding the inlet, as follows: <ul style="list-style-type: none"> Provide a slope of 3H:1V on the upstream side of the berm. Provide a slope of 2H:1V on the downstream side of the berm. Provide a 1-foot wide level stone area between the gravel berm and the inlet. Use stones 3 inches in diameter or larger on the upstream slope of the berm. Use gravel ½ - to ¾-inch at a minimum thickness of 1-foot on the downstream slope of the berm.
Added additional conditions of use.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C232: Gravel Filter Berm	"Where temporary measures are needed to retain sediment from rights-of-way or in traffic areas on construction sites."	<ul style="list-style-type: none"> Use a gravel filter berm where temporary measures are needed to retain sediment from construction sites. Do not place gravel filter berms in traffic areas; gravel filter berms are not intended to be driven over. Place gravel filter berms perpendicular to the flow of runoff, such that the runoff will filter through the berm prior
Added restriction to design and installation specification.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C232: Gravel Filter Berm	(Not previously included)	Added "Do not use crushed concrete."
Revised name of BMP C235	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C235: Straw Wattles	"BMP C235: Straw Wattles"	"BMP C235: Wattles"
Added condition of use.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C235: Straw Wattles	(Not previously included)	Wattles shall consist of cylinders of plant material such as weed-free straw, coir, wood chips, excelsior, or wood fiber or shavings encased with netting made of natural plant fibers unaltered by synthetic materials.
Added condition of use.	Added language to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C236: Vegetative Filtration	(Not previously included)	Added "• On large projects that phase the clearing of the site, areas retained with native vegetation may be used as a temporary vegetative filtration area."
Revised conditions of use.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C240: Sediment Trap	(see Track Changes version for original text)	N/A

Revised calculations for sediment trap and added depth.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C240: Sediment Trap	BMP C240: Sediment Trap, Design and Installation Specifications (see Track Changes version for original text)	Q2 = o Option 1 – Single Event Hydrograph Method: Q2 = Peak volumetric flow rate calculated using a 10-minute time step from a Type 1A, 2-year, 24-hour frequency storm for the developed condition. The 10-year peak volumetric flow rate shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection. o Option 2 – For construction sites that are less than 1 acre, the Rational Method may be used to determine Q2. Added "• Sediment trap depth shall be 3.5 feet minimum from the bottom of the trap to the top of the overflow weir."
Revised to match Ecology requirements.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C250: Construction Stormwater Chemical Treatment	BMP C250: Construction Stormwater Chemical Treatment (see Track Changes version for original text)	Updated to match requirements of Ecology's 2019 SWMMWW BMP 250: Construction Stormwater Chemical Treatment.
Revised sizing and maintenance standards to match Ecology requirements.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C251: Construction Stormwater Filtration	BMP C251: Construction Stormwater Filtration, Design and Installation Specifications (see Track Changes version for original text)	Added verbatim: BMP C251: Construction Stormwater Filtration, Design and Installation Specifications, Sizing. Added maintenance standard "• Screen, bag, and fiber filters must be cleaned and/or replaced when they become clogged." • Disposal of filtration equipment must comply with applicable local, state, and federal regulations."
Revised to match Ecology requirements.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C252: High pH Neutralization Using CO ₂	BMP C252: High pH Neutralization Using CO ₂ (see Track Changes version for original text)	Updated to match requirements of Ecology's 2019 SWMMWW BMP 252: Treating and Disposing of High pH Water.
Removed BMP.	Revised to match 2019 SWMMWW.	Volume II, Chapter 3, 3.1, BMP C253: pH Control for High pH Water	(see Track Changes version for original text)	N/A
Removed Appendix II-B.	Information moved to main text and revised to match 2019 SWMMWW.	Volume II, Appendix II-B Background Information on Chemical Treatment.	(see Track Changes version for original text)	N/A
Added to match Ecology requirements.	Added language to match 2019 SWMMWW.	Volume III, Chapter 2, 2.3 Western Washington Hydrology Model, Hydrologic Analysis of Runoff Treatment BMPs	(Not previously included)	Added "Sizing Runoff Treatment BMPs Size Runoff Treatment BMPs for the entire area that drains to them, even if some of those areas are not pollution-generating. Runoff Treatment BMPs are sized by using either a volume (the Water Quality Design Volume) or a flow rate (the Water Quality Design Flow Rate), depending on the Runoff Treatment BMP selected. Refer to the selected Runoff Treatment BMP to determine whether the BMP is sized based on a volume or a flow rate. See below for details about the Water Quality Design Volume and the Water Quality Design Flow Rate used to size Runoff Treatment BMPs."
Removed Infiltration Facilities for Runoff Treatment	Section not appropriate.	Volume III, Chapter 2, 2.3 Site Suitability and Hydrologic Analysis of Infiltration Facilities, Infiltration Facilities for Runoff Treatment	(see Track Changes version for original text)	N/A
Added surface feature to characterization documentation requirements.	Added language to match 2019 SWMMWW.	Volume III, Chapter 2, 2.3 Site Suitability and Hydrologic Analysis of Infiltration Facilities, Step 1: General Surface Characterization	(see Track Changes version for original text)	Added "7. Location of areas known to have contaminated soils."
Added subsurface characterization.	Added language to match 2019 SWMMWW.	Volume III, Chapter 2, 2.3 Site Suitability and Hydrologic Analysis of Infiltration Facilities, Step 1: General Surface Characterization	(see Track Changes version for original text)	Add verbatim: V-5.5 Site Characterization Criteria for Infiltration, Subsurface Characterization from Ecology's 2019 SWMMWW.
Added site suitability criteria.	Added language to match 2019 SWMMWW.	Volume III, Chapter 2, 2.3 Site Suitability and Hydrologic Analysis of Infiltration Facilities, Step 2: Evaluate Core Requirements for Infiltration Facilities	(see Track Changes version for original text)	Added "Criteria that must be considered for siting infiltration BMPs is provided below. When a site investigation reveals that any of the applicable site suitability criteria cannot be met, appropriate mitigation measures must be implemented so that the infiltration BMP will not pose a threat to safety, health, and the environment. For site selection and design decisions, a geotechnical and hydrogeologic report should be prepared by a licensed engineer in the state of Washington with geotechnical and hydrogeologic experience, or a licensed geologist, hydrogeologist, or engineering geologist. The designer may utilize a team of certified or registered professionals in soil science, hydrogeology, geology, and other related fields." Add verbatim: V-5.6 Site Suitability Criteria (SSC), SSC-2 Ground Water Protection Areas, SSC-3 High Vehicle Traffic Areas, SSC-4 Soil Infiltration Rate/Drawdown Time, SSC-5 Depth to Bedrock, Water Table, or Impermeable Layer, SSC-6 Soil Physical and Chemical Suitability for Treatment, SSC-7 Seepage Analysis and Control, and SSC-8 Cold Climate and Impact of Roadway Deicers from Ecology's 2019 SWMMWW.

Added information to be included in geotechnical report for infiltration receptor characterization.	Added language to match 2019 SWMMWW.	Volume III, Chapter 2, 2.3 Site Suitability and Hydrologic Analysis of Infiltration Facilities, Step 3: Infiltration Receptor Characterization, Document Characterization.	(see Track Changes version for original text)	Added "• The information obtained from ground water monitoring in #4 of the Subsurface Characterization above. • An estimate of the volumetric water holding capacity of the infiltration receptor soils. The volumetric water holding capacity is the storage volume in the soil layer directly below the infiltration facility and above the seasonal high groundwater mark, bedrock, hardpan, or other low permeability layer. Conduct this analysis at a conservatively high infiltration rate based on vadose zone porosity, and the Water Quality Design Volume to be infiltrated. This, along with an analysis of ground water movement, will be useful in determining if there are volumetric limitations that would adversely affect drawdown, and if a ground water mounding analysis should be conducted. • An assessment of the ambient ground water quality, if that is a concern."
Revised method to match Ecology's simplified approach.	Added language to match 2019 SWMMWW.	Volume III, Chapter 2, 2.3 Site Suitability and Hydrologic Analysis of Infiltration Facilities, Step 4: Determine Method of Analysis, Simple Method	(see Track Changes version for original text)	Added " The simplified approach was derived from high ground water and shallow pond sites in western Washington, and in general will produce conservative designs. This approach can be used when determining the trial geometry of the infiltration BMP, and for small BMPs serving short plats or commercial developments with less than one acre of contributing area. Designs of infiltration BMPs for larger projects should use the detailed approach (as described below) and may have to incorporate the results of a ground water mounding analysis as described above. Note: A ground water mounding analysis is advisable for BMPs with drainage areas smaller than 1 acre if the depth to a low permeability layer (e.g., less than 0.1 inches per hour) is less than 10 feet. "
Moved procedure to different heading.	Added language to match 2019 SWMMWW.	Volume III, Chapter 2, 2.3 Site Suitability and Hydrologic Analysis of Infiltration Facilities, Step 5: Conduct Simple or Detailed Analysis, Determine Design Infiltration Rate	(see Track Changes version for original text)	Add verbatim: V-5.4 Determining the Design Infiltration Rate of the Native Soils, How to Calculate the Design Infiltration Rate of the Native Soils from Ecology's 2019 SWMMWW.
Revised design criteria for sizing infiltration BMPs.	Revised to match 2019 SWMMWW.	Volume III, Chapter 2, 2.3 Site Suitability and Hydrologic Analysis of Infiltration Facilities, Step 5: Conduct Simple or Detailed Analysis, Design Criteria -	(see Track Changes version for original text)	Add verbatim: V-5.3 General Design Criteria for Infiltration BMPs, Sizing Infiltration BMPs and Treatment Prior to Infiltration BMPs in Ecology's 2019 SWMMWW.
Removed exception for single family residences to discharge directly onto County roads or MS4 without prior approval.	Staff requested change.	Volume III, Chapter 3, 3.12 Private Drainage Systems, Discharge Locations	Stormwater cannot discharge directly onto County roads or into a County system without prior County approval , with the exception of single family residences.	Stormwater cannot discharge directly onto County roads or into a County system without prior County approval.
Added language for catch basin and manholes frames in curbs.	Staff requested change.	Volume III, Chapter 3, 3.7 Pipe System Design Criteria, Pipe Structure Criteria, Catch Basins and Manholes	(Not previously included)	Added "Catch basin and manhole frames installed in the curb shall not exceed 2 percent."
Added language for catch basin and manholes frames in curbs.	Staff requested change.	Volume III, Chapter 3, 3.7 Pipe System Design Criteria, Pipe Structure Criteria, Catch Basins and Manholes	(Not previously included)	Added "Concrete collars shall be installed around cleanouts and manholes in paved areas, or areas to be paved."
Add requirement for locking lid on drainage structures outside of traveled roadways and sidewalks.	Staff requested change.	Volume III, Chapter 3, 3.7 Pipe System Design Criteria, Pipe Structure Criteria, Catch Basins and Manholes	Locking lids will be installed on all structures containing restrictor or flowdevices.	Added "Locking lids shall be installed on all drainage structures not located within a traveled roadway or sidewalk, and structures containing restrictor or flow control devices. Locking lids shall use WSDOT Standard Plan B-30.70-01 with the lettering of "STORM" or other county pre-approved design."
Remove requirement for asphalt berm and replace with combination inlet frame, hood, and directional grate.	Staff requested change.	Volume III, Chapter 3, 3.7 Pipe System Design Criteria, Pipe Structure Criteria, Catch Basins and Manholes	When the road profile equals or exceeds 6 percent between structures, an asphalt berm shall be installed around the inlet of the structure or the catch basin may be recessed into the curb per Figure 3.1 and Figure 3.2	Added "When the road profile equals or exceeds 6 percent between structures, install combination inlet frame, hood, and directional grate."
Remove Figure 3-1 Asphalt Inlet Berm	Staff requested change.	Volume III, Chapter 3, Figure 3-1	(see Track Changes version for original text)	N/A
Remove Figure 3-2 Recessed Curb Inlet	Staff requested change.	Volume III, Chapter 3, Figure 3-2	(see Track Changes version for original text)	N/A
Added image of diffuser Tee	Image missing.	Volume III, Chapter 3, 3.8	(Not previously included)	(Added image to go with Figure 3.9 Diffuser TEE (an example of energy dissipating end feature)

Revised methods for determining design infiltration rates.	Revised to match 2019 SWMMWW.	Appendix III-A Methods for Determining Design Infiltration Rates	(see Track Changes version for original text)	<p>Added "A crucial element to infiltration BMP design is the long term (design) infiltration rate of the native soils. In order to determine the design infiltration rate, the designer must first determine the measured (initial) saturated hydraulic conductivity (Ksat) of the native soils.</p> <p>This appendix provides details on each method for determining initial Ksat. A safety/correction factor is applied to the initial rate to determine the design infiltration rate. Note that the subgrade safety/correction factors in this appendix may not apply to bioretention, permeable pavement, and rain gardens. Refer to individual BMPs in Volume V for additional guidance. The methods described include:</p> <p>Method 1 – Field Testing Procedures (must incorporate safety factor)</p> <ul style="list-style-type: none"> o U.S. EPA Falling Head Percolation Test Procedure (as Modified for Thurston County). This test applies to all infiltration facilities, but may not be used to demonstrate infeasibility of bioretention, permeable pavement, or rain gardens in meeting Core Requirement #5. o Large-Scale Pilot Infiltration Test (PIT). This test applies to infiltration facilities with drainage areas greater than one acre and may be used to demonstrate infeasibility of bioretention, permeable pavement, or rain gardens in meeting Core Requirement #5. o Small-Scale (PIT). This test applies to infiltration facilities with drainage areas less than one acre and may be used to demonstrate infeasibility of bioretention, permeable pavement, or rain gardens in meeting Core Requirement #5. <ul style="list-style-type: none"> • Method 2 – Soil Property Relationships (USDA Soil Textural Classification). This method only applies to project sites inside the County's municipal stormwater permit (NDPES) boundary that trigger Core Requirement #1 through #5 or any project outside the NDPES boundary, and that are underlain by hydrologic soil group A soils (as defined by the NRCS Web Soil Survey and filed verified by a qualified professional). This method may not be used to demonstrate infeasibility of bioretention, permeable pavement, or rain gardens in meeting Core Requirement #5. • Method 3 – Soil Grain Size Analysis. This method applies to project sites that are underlain by type A soils (as defined by the NRCS Web Soil Survey and filed verified by a qualified professional), and may not be used to demonstrate infeasibility of bioretention, permeable pavement, or rain gardens in meeting Core Requirement #5."
Revised Method 1.	Revised to match 2019 SWMMWW.	Appendix III-A Methods for Determining Design Infiltration Rates, Simple Method 1 - Field Testing Procedures (In-Situ)	(see Track Changes version for original text)	<p>Added "1. Excavate to the bottom elevation of the proposed infiltration facility. Measure the infiltration rate of the underlying soil using either the EPA falling head percolation test procedure as modified for Thurston County (described below), the double ring infiltrometer test (ASTM D3385, not described in this appendix), or the Department of Ecology large and small scale Pilot Infiltration Test (PIT) described below and presented in the 2019 Ecology Stormwater Management Manual for Western Washington.</p> <p>4. See individual BMP descriptions for requirements related to the number and location of tests required."</p>
Revised infiltration test procedure of large-scale Pilot Infiltration Test	Revised to match 2019 SWMMWW.	Appendix III-A Methods for Determining Design Infiltration Rates, Simple Method 1 - Field Testing Procedures (In-Situ), Washington Department of Ecology Infiltration PIT Method, Infiltration Test	(see Track Changes version for original text)	<p>Added "1. Testing should occur between December 1 and April 1.</p> <p>2. The horizontal and vertical locations of the PIT shall be surveyed by a licensed land surveyor and accurately shown on the design drawings.</p> <p>3. Excavate the test pit to the estimated elevation of the proposed infiltration into the native soil. Note that for some proposed BMP, such as bioretention and permeable paving, this will be below the proposed finished grade. If the native soils will to meet a minimum subgrade compaction requirement, compact the native soil to that requirement prior to testing. Lay back the slopes sufficiently to avoid caving and erosion during the test. Alternatively, consider shoring the sides of the test pit.</p> <p>Add water to the pit at a rate that will maintain a water level between 6 and 12 inches above the bottom of the pit. A rotameter can be used to measure the flow rate into the pit.</p> <p>Note: For infiltration facilities serving large drainage areas, designs with multiple feet of standing water can have infiltration tests with greater than 1 foot of standing water. However, the depth must not exceed the proposed maximum depth of water expected in the completed facility.</p> <p>7. Every 15 to 30 minutes, record the cumulative volume and instantaneous flow rate in gallons per minute necessary to maintain the water level at the same point (between 3 and 4 feet) on the measuring rod.</p> <p>9. After the flow rate has stabilized for at least 1 hour, turn off the water and record the rate of infiltration (the drop rate of the standing water) in inches per hour from the measuring rod data, until the pit is empty. Consider running this falling head phase of the test several times to estimate the dependency of infiltration rate with head."</p>
Revised infiltration test procedure of small-scale Pilot Infiltration Test	Revised to match 2019 SWMMWW.	Appendix III-A Methods for Determining Design Infiltration Rates, Simple Method 1 - Field Testing Procedures (In-Situ).	(see Track Changes version for original text)	<p>Added "8. At the conclusion of testing, over-excavate the pit to see if the test water is mounded on shallow restrictive layers or if it has continued to flow deep into the subsurface. The depth of excavation varies depending on soil type and depth to the hydraulic restricting layer, and is determined by the engineer or certified soils professional. The soils professional should judge whether a mounding analysis is necessary."</p>
Revised BMP name.	Revised to match 2019 SWMMWW.	Appendix III-D - On-Site Stormwater Management BMP Infeasibility Criteria	"Soil Preservation and Amendment"	"Post-Construction Soil and Depth"
Revised infeasibility criteria for downspout infiltration systems under roofs.	Revised to match language in 2019 SWMMWW.	Appendix III-D - On-Site Stormwater Management BMP Infeasibility Criteria	"There is not at least 12 inches or more of permeable soil from the proposed bottom (final grade) of the infiltration system to the seasonal high groundwater table"	<p>"There is not at least 3 feet or more of permeable soil from the proposed bottom (final grade) of the infiltration system to the seasonal high groundwater table."</p> <p>Added "• There is not at least 1-foot of clearance from the expected bottom elevation of the infiltration trench or dry well to the seasonal high ground water table."</p>

Revised infeasibility criteria for sheet flow dispersion under other hard surfaces.	Revised to match language in 2019 SWMMWW.	Appendix III-D - On-Site Stormwater Management BMP Infeasibility Criteria	(Not previously included)	Added "Erosion or flooding of downstream properties may result."
Revised infeasibility criteria for concentrated flow dispersion under other hard surfaces.	Revised to match language in 2019 SWMMWW.	Appendix III-D - On-Site Stormwater Management BMP Infeasibility Criteria	"* A minimum 3 foot length of rock pad and 50-foot flowpath for every 700 sf of drainage area followed with applicable setbacks cannot be achieved."	"* A minimum 3 foot length of rock pad and 50-foot flowpath for every 700 sf of impervious area followed with applicable setbacks cannot be achieved." Added " * Erosion or flooding of downstream properties may result." * A vegetated flow path of at 25 feet between the discharge point and any property line, structure, steep slope, stream, wetland, lake, or other impervious surface cannot be maintained."
Revised table with added BMPs.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 3 - Commercial and Industrial Activities Worksheet	(see Track Changes version for original text)	Added "A3.12Nurseries and Greenhouses *Applies to commercial contain plant, greenhouse grown, and cut foliage production operations. A3.13Irrigation *Includes businesses involved in landscaping and managing vegetation. A3.14Fertilizer Application *Includes businesses involved in landscaping, applying fertilizers, and managing vegetation. A7.16Streets and Highways *Includes maintenance and deicing/anti-icing of streets and highways A7.17Maintenance and Repair of Vehicles and Equipment A7.18Well, Utility, Directional and Geotechnical Drilling *Includes drilling water wells and utilities, environmental protection and monitoring wells, and geotechnical borings using machinery A7.19Roof Vents *Includes process that vent emissions to the roof"
Revised A1.3 Washing, Pressure Washing, and Steam Cleaning of Vehicles/Equipment/Building Structures required and suggested BMPs.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A1 Cleaning or Washing Activities	(see Track Changes version for original text)	Added " * Convey the washwater to a sump (like a grit separator) and then to a sanitary sewer (if allowed by the your sewer service provider), or other appropriate wastewater treatment or recycle system. The containment sump must have a positive control outlet valve for spill control with live containment volume, and oil/water separation. Size the minimum live storage volume to contain the maximum expected daily washwater flow plus the sludge storage volume below the outlet pipe. Shut the outlet valve during the washing cycle to collect the washwater in the sump. The valve should remain shut for at least two hours following the washing operation to allow the oil and solids to separate before discharge to a sanitary sewer. * Use a two way valve for discharges from the containment pad. This valve should normally be switched to direct
Revised A2.2 Fueling at Dedicated Stations required BMPs.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A2 Transfer of Liquid or Solid Materials	(see Track Changes version for original text)	Added " * Substantial remodeling includes (but is not limited to) replacing the canopy, or relocating or adding one or more fuel dispensers in such a way that modifies the Portland cement concrete (or equivalent) paving in the fueling area. *For new or substantially remodeled fueling stations: *Design the fueling island to: oMinimize stormwater contamination. oControl spills (dead-end sum or spill control separator in compliance with the UFC or IFC). o Collect stormwater and/or wastewater and direct it to an appropriate treatment system. * Drains form containment pads must have a normally closed shutoff valve. The valve may be opened to convey contaminated stormwater to oil removal treatment such as an API or CP oil/water separator, catch basin insert, or equivalent treatment, and then to a basic treatment BMP (as described in Volume I, 4.2 Step-by-Step Runoff Treatment BMP Selection Process) or to a sanitary sewer, if approved by the sewer authority. Discharges from treatment systems to storm sewer or surface water or to the ground must not display ongoing or recurring visible sheen and must not contain a significant amount of oil and grease. * The spill control capacity must be sized in compliance with Section 7901.8 of the UFC. The spill control capacity may be acquired by either an underground system including a sump, or an above ground containment area consisting of a containment pad with berms. * The fueling island may be designed as a spill containment pad with a sill or berm raised to a minimum of 4 inches (or in accordance with the applicable fire code) to prevent the runoff of spilled liquids and to prevent run-on of stormwater from the surrounding area. All stormwater collected on the containment pad must discharge to treatment with a normally closed valve downstream of the treatment. * The fueling island must have a roof or canopy to prevent the direct entry of precipitation onto the spill containment pad (Figure 4.7). The roof or canopy shall, at a minimum, cover the spill containment pad (within the grade break or fuel dispensing area) and preferably extend 3 feet on each side for roofs and canopies 10 feet or less in height and 5 feet on each side for roofs and canopies greater than 10 feet in height to reduce the introduction of windblown rain. Measure the overhang relative to the berm or other hydraulic grade break for the spill
Revised A3.5 Commercial Composting required and suggested BMPs.	Revised to match language in 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A3 Production and Application Activities	(see Track Changes version for original text)	Added " * Screen incoming wastes for dangerous materials and solid waste. These materials may not be accepted for composting and must be properly disposed of per federal, state, and/or local requirements. * Locate composting areas on impervious surfaces. * Collect the leachate with a dike or berm, or with intercepting drains placed on the down slope side of the compost area. * Direct outside runoff away from the composting areas. * Cleanup debris from yard areas as needed to prevent stormwater contamination. * Install catch basin inserts to collect excess sediment and debris if necessary. Inspect and maintain catch basin inserts to ensure they are working correctly."

Revised A3.6 Landscaping and Lawn/Vegetation Management	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A3 Production and Application	(see Track Changes version for original text)	Updated to include all requirements for S411 BMPs for Landscaping and Lawn / Vegetation Management from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)
Added suggested BMPs for A3.7 Painting, Finishing, and Coating of Vehicles, Boats, Buildings, and Equipment	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A3 Production and Application Activities	(Not previously included)	Added "• Purchase recycled paints, paint thinner, solvents, and other products, if feasible."
Added required BMP for A3.8 Commercial Printing Operations	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A3 Production and Application Activities	(Not previously included)	Added "• Regularly inspect all stormwater management devices and maintain as necessary per DDECM standards."
Added required BMPs and removed suggested BMPs for	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial	(Not previously included)	Added "• Maintain drainage areas in and around storage of solid materials with a minimum slope of 1.5 percent to prevent pooling and minimize leachate formation. Areas should be sloped to drain stormwater to the perimeter for collection or to internal drainage "alleyways" where no stockpiled material exists.
A4.5 Recycler and Scrap Yards revised to match Ecology requirements.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A4 Storage and Stockpiling Activities	(Not previously included)	Added "• Check incoming scrap materials, vehicles, and equipment for potential fluid contents and batteries. • Drain and transfer fluids from vehicles and other equipment only in a designated areas with a waste collection system or over drip pans. • Remove batteries and store on the ground in a leak-proof container and under cover. • Cover and raise any materials that may contaminate stormwater. A tarp and pallet are acceptable. • Cover and contain any stockpiles of any material that has the potential to contaminate stormwater runoff. • All containers used to store fluids must comply with federal, state, and/or local secondary containment requirements. Storage of flammable and combustible materials must comply with the appropriate fire codes. • Inspect storage areas regularly and promptly clean up any leaks, spills, or contamination. • Sweep scrap storage areas as needed. Do not hose down anything to a storm drain.☒ • Keep spill cleanup materials in a location known to all. Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures. • Install catch basin inserts to collect excess sediment and debris if necessary. Inspect and maintain catch basin inserts to ensure they are working correctly. • Conduct automobile/vehicle metal-shredding inside enclosed building with HEPA air filtration systems to prevent the fugitive release of heavy metals and other potentially hazardous materials into the air. "
Revised required BMPs for A4.7 Storage of Liquid or Dangerous Waste Containers	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A4 Storage and Stockpiling Activities	(Not previously included)	Added "• Label all containers appropriately. Store containers so that the labels are clearly visible. • Have spill kits or cleanup materials near container storage areas. • Clean up all spills immediately. • When collection trucks directly pick up roll-containers, ensure a file is on both sides of the curb to facilitate moving the dumpster. "
Revised required BMPs for A4.8 Storage of Liquids in Permanent Aboveground Tanks	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A4 Storage and Stockpiling Activities	(Not previously included)	Added "• Depending on the kind of liquid being stored, the potential and type of stormwater contamination will vary and may require specialized treatment."

Revised pollutant control approach, required BMPs, and suggested BMPs for A4.8 Storage of Liquids in Permanent Aboveground Tanks.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A4 Storage and Stockpiling Activities	(Not previously included)	<p>Added "Pollutant Control Approach: If the parking lot meets the site use thresholds to determine if the site is expected to generate high concentrations of oil as defined in Step 2: Determine if an Oil Control BMP is Required in Volume I, Section 4.2.2, provide oil removal equipment for the contaminated stormwater runoff.</p> <ul style="list-style-type: none"> Do not hose down the area to a storm drain or receiving water. Vacuum sweep parking lots, storage areas, and driveways regularly to collect dirt, waste, and debris. Mechanical or hand sweeping may be necessary for areas where a vacuum sweeper cannot reach. Clean up vehicle and equipment fluid drips and spills immediately. Place drip pans below leaking vehicles (including inoperative vehicles and equipment) in a manner that catches leaks or spills, including employee vehicles. Drip pans must be managed to prevent overflowing and the contents disposed of properly. Establishments subject to high-use intensity are significant sources of oil contamination of stormwater. Examples of potential high use areas include customer parking lots at fast food stores, grocery stores, taverns, restaurants, large shopping malls, discount warehouse stores, quick-lube shops, and banks. Refer to Step 2: Determine if an Oil Control BMP is Required in Volume I, Section 4.2.2 for the site use thresholds that determine if an oil control BMP is required, and for a list of oil control BMPs. Encourage employees to repair leaking personal vehicles. Encourage employees to carpool or use public transit through incentives. Encourage customers to use public transit by rewarding valid transit pass holder with discounts. Install catch basin inserts to collect excess sediment and oil if necessary. Inspect and maintain catch basin inserts to ensure they are working correctly."
Added required BMPs for A6.1 Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A6 Dust Control and Soil and Sediment Control	(Not previously included)	<p>Added "• Protect inlets/catch basins during application of dust suppressants.</p> <ul style="list-style-type: none"> Street gutters, sidewalks, driveways, and other paved surfaces in the immediate area of the activity must be swept regularly to collect and properly dispose of dust, dirt, loose debris, and garbage. Install catch basin filter socks on site and in surrounding catch basins to collect sediment and debris. Maintain the filters regularly to prevent plugging."
Revised required and suggested BMPs for A6.2 Dust Control at Manufacturing Sites.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A6 Dust Control and Soil and Sediment Control	(Not previously included)	<p>Added "• Use dust filtration/collection systems such as bag house filters or cyclone separators to control vented dust emissions that could contaminate stormwater. Control of zinc dusts in rubber production is one example.</p> <ul style="list-style-type: none"> Maintain on-site controls to prevent vehicle track-out Maintain dust collection devices on a regular basis. Use in the recommended manner, approved dust suppressants such as those listed in Ecology publication No. 96-433 Methods for Dust Control (Ecology 1996). Application of some products may not be appropriate in close proximity to receiving waters or conveyances close to receiving waters. For more information, check with the Ecology Southwest Regional Office or Thurston County."
Revised required BMPs for A6.3 Soil Erosion and Sediment Control at Industrial Sites.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A6 Dust Control and Soil and Sediment Control	(Not previously included)	<p>Added "• Limit the exposure of erodible soil.</p> <ul style="list-style-type: none"> Stabilize entrances/exits to prevent track-out. See BMP C105: Stabilized Construction Entrance/Exit Stabilize or cover erodible soil to prevent erosion. Apply one or more of the following cover practices: <ul style="list-style-type: none"> If stabilizing or covering the erodible soil is not possible, then apply one or more of the following structural practices to control sediment: <ul style="list-style-type: none"> Paving"
Added required BMPs for A7.1 Commercial Animal Handling Areas.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A7 Other Activities	(Not previously included)	<p>Added "• For outside surface areas that must be disinfected, use an unsaturated mop to spot clean the areas. Do not allow wastewater runoff to enter the drainage system.</p> <ul style="list-style-type: none"> Do not stockpile manure in areas where runoff is allowed to flow into a storm drain or to nearby receiving waters or wetlands. "

<p>Revised requirements for A7.4 Boat Building, Mooring, Maintenance, and Repair</p>	<p>Revised to match 2019 SWMMWW.</p>	<p>Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A7 Other Activities</p>	<p>(see Track Changes version for original text)</p>	<p>Added "NPDES Permit Requirements: Ecology's statewide Boatyard General Permit applies to boatyards that discharge stormwater runoff from areas with industrial activity directly to the ground, to a surface waterbody, or to a storm sewer system that drains to a surface waterbody. This general permit also regulates wastewater form pressure washing in boatyards. All boatyards in the state must apply for coverage under this permit and must comply with all conditions specified in this permit, as applicable to their facility, unless exempted. Ecology may require coverage under an individual NPDES permit for large boatyards and shipyards in Washington State not covered by the Boatyard General Permit or Industrial Stormwater General Permit (ISGP).</p> <ul style="list-style-type: none"> • Clean regularly all accessible work, service, and storage areas to remove debris, spend sandblasting material, and any other potential stormwater pollutants. • Immediately repair leaking connections, valves, pipes, hoses, and other equipment that may cause the contamination of stormwater. • Use drip pans, drop cloths, tarpaulins, or other protective device in all paint mixing and solvent operation unless carried out in impervious contained and covered areas. • Convey sanitary sewage to pump-out stations, portable on-site pump-outs, commercial mobile pump-out facilities, or other appropriate onshore facilities. • Prohibit uncontained spray painting, blasting or sanding activities during windy conditions that render containment ineffective. • Do not dump or pour waste materials down floor drains, sinks, or outdoor storm drain inlets that discharge to surface water. Plug floor drains connected to storm drains or to surface water. If necessary, install a regularly operated sump pump. • Do not burn paint and/or use spray guns on topsides or above decks. • Enclose, cover, or contain blasting and sanding activities to the maximum extent practicable to prevent abrasives, dust, and paint chips, from reaching storm sewers or receiving waters. Use plywood and /or plastic sheeting to cover open areas between decks when sandblasting (scuppers, railings, freeing ports, ladders, and doorways). Move the activity indoors if possible. See Chapter 7 for details on Olympic Region Clean Air Agency (ORCAA) limitations. • Prohibit uncontained spray painting, blasting or sanding activities over open water. • Use plastic or tarpaulin barriers beneath the gull and between the hull and dry dock walls to contain and collect waste and spent materials. Clean and sweep regularly to remove debris. Ground cloths must be used for collection of drips and spills in painting and finishing operations, and paint chips and used blasting sand from sand blasting (Figure 4.22). • Use fixed platforms with appropriate plastic or tarpaulin barriers as work surfaces and for containment when performing work on a vessel in the water to prevent blast material or paint overspray from contacting stormwater or the surface water. Keep the use of such platforms to a minimum, and to not perform extensive repair, modification, surface preparation, or coating while the boat is in the water (anything in excess of 25 percent of the surface area of the vessel above the waterline). • Store cracked batteries in covered secondary containers. • Maintain automatic bilge pumps in a manner that will prevent automatic pumping of waste material into surface water. • Whenever the boat is in the water, avoid the use of soaps, detergents, and other chemicals that need to be rinsed or hosed off. If necessary, consider applying sparingly so that a sponge, towel or rag can be used to remove residuals. Consider instead washing the boat in a suitable controlled area while it's out of the water. • Direct deck drainage to a collection system sump for settling and/or additional treatment. • Immediately clean up any spillage on the pier, wharf, boat, ship deck, or adjacent surface areas and dispose of the wastes properly. • Apply source control BMPs for other activities conducted at the marina, boat yard, shipyard, or port facility (see A2.2 Fueling at Dedicated Stations, A1.3 Washing, Pressure Washing, and Steam Cleaning of Vehicles/Equipment/Building Structures, and A7.15 Spills of Oil and Hazardous Substances). Comply with BMP A2.3 and A4.2 if engine repair and maintenance are conducted."
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Revised requirements for A7.7 Swimming Pool and Spa Cleaning and Maintenance and included hot tubs and fountains.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A7 Other Activities	(see Track Changes version for original text)	<p>Added "Dispose of pool or spa water to the sanitary sewer after getting preapproval from the LOTT Alliance Industrial Pretreatment Program at (360) 528-5708 or your local sewer service provider or to a storm sewer following the conditions outlined below. Do not discharge to a septic system, since it may cause the system to fail.</p> <ul style="list-style-type: none"> • Clean the pool, spa, hot tub, or fountain regularly. Maintain proper chlorine levels per manufacturer's recommendations, and maintain water filtration and circulation. Doing so will limit the need to drain the facility. • Manage pH and water hardness to reduce copper pipe corrosion that can stain the facility and pollute receiving waters. • Before using copper algaecides, try less toxic alternatives. Only use copper algaecides if the other alternatives do not work. Ask a maintenance service or pool chemical supplier for help resolving persistent algae problems without using copper algaecides. • Develop, implement, and regularly update a facility maintenance plan that follows all discharge requirements. • Dispose of unwanted chemicals properly. Many of them are hazardous wastes when discarded. • Discharge waters originating from a pool, spa, hot tub, or fountain to a sanitary sewer, if approved by the local sewer authority. Do not discharge waters containing copper-based algaecides to storm sewer systems. • If discharge to the sanitary sewer is not possible, pool and spa water may be discharged to a ditch or stormwater drainage system. Do not discharge water directly from a pool, spa, hot tub, fountain, process wastes, or wastewaters into storm drains except if the discharge water is: <ul style="list-style-type: none"> ☑ Free from sodium chloride. ☑ pH-adjusted if necessary. ☑ Reoxygenated, if necessary. ☑ Free of any coloration, dirt, suds, or algae. • Bag diatomaceous earth (pool filtering agent) and dispose at a landfill."
Moved deicing BMPs for streets to own BMP.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A7 Other Activities	(see Track Changes version for original text)	N/A
Added required BMP for A7.9 Roof and Building Drains at Manufacturing and Commercial Buildings.	Added language to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A7 Other Activities	(Not previously included)	<p>Added "• Treat runoff from roofs to the appropriate level. The facility may use Enhanced Treatment BMPs as described in Volume I. Some facilities regulated by the Industrial Stormwater General Permit may have requirements that cannot be achieved with Enhanced Treatment BMPs. In these cases, additional treatment measures may be required. A treatment method for meeting stringent requirements such as Chitosan-Enhanced Sand Filtration may be appropriate."</p>
Revised required BMPs and added suggested BMPs for A7.11 Railroad Yards.	Added language to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A7 Other Activities	(Not previously included)	<p>Added "• When undergoing routine maintenance, discharge locomotive cooling systems only after the locomotive has stopped and at a location where the coolant can be collected, managed, and then disposed of properly.</p> <ul style="list-style-type: none"> • Handle wastes generated from large-scale equipment cleaning, such as locomotive, track equipment, or axle cleaning operations, properly to avoid harming the environment and to comply with state and federal environmental regulations. • Store any metal scrap generated from metal punching or other mechanical operations out of contact with stormwater. For larger metal scrap, see suggested BMPs below. • Do not dump, drain, or allow the discharge of any water-based coolant form multi-punch presses into storm drains. • Place track mats under each rail/flange lubricator that is in service where track mats can be safely installed and maintained without danger to rolling stock or personnel. • Select cost-effective rail/flange lubricant that provides safe and effective rail operation while considering adverse environmental impact. Consider both the chemical composition of the lubricant and the likelihood of transfer off of the rail during rain events. • Inspect and replace track mats, as necessary. Routinely inspect all track mats for tears or saturation, and replace as necessary. • Install spill containment pans/trays or track mat at designated locomotive and railcar maintenance facilities and fixed fueling areas, to reduce environmental impacts from potential spills under locomotives and other track equipment. Direct spill containment pans/trays to an oi/water separator where feasible for treatment or collect spilled chemicals for proper disposal. • During locomotive fueling operations use drip pans or secondary containment to capture any fuel or oil seepage. • Install track mats at designated Engine Tie-Up and/or outdoor locomotive parking locations (e.g., service tracks) located in SWPPP permitted areas where locomotives are unattended and idle for extended periods of time. • Do not conduct heavy/major locomotive engine repairs on the rail line. Conduct heavy/major engine repairs at an established railroad maintenance facility. • Store creosote-treated railroad ties in locations that reduce the potential to impact stormwater runoff. • At each rail/flange lubricator that is in service use rain sensors to adjust the lubrication cycle accordingly to limit

					<p>the amount of lubricant exposed to stormwater.</p> <ul style="list-style-type: none"> • Store large metal scrap and materials that cannot be stored in covered areas because of their size, volume, and/or weight (for example rail and tie plates) in locations where stormwater runoff is managed, controlled, and directed to a Runoff Treatment BMP that meets the Enhanced Treatment Performance Goal."
Added BMP A7.16 Streets and Highways	Added language to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A7 Other Activities	(Not previously included)		<p>Added verbatim: S406 BMPs for Streets and Highways in Ecology's 2019 SWMMWW.</p>
Added BMP A7.17 Maintenance and Repair of Vehicles and Equipment.	Added language to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A7 Other Activities	(Not previously included)		<p>Added verbatim: S414 BMPs for Maintenance and Repair of Vehicles and Equipment in Ecology's 2019 SWMMWW.</p>
Revised index of BMP descriptions to include new BMPs.	Revised to match 2019 SWMMWW.	Volume IV, Chapter 5, 5.1 Index of BMP Descriptions	(see Track Changes version for original text)		<p>Added "S.10 Labeling Storm Drain Inlets On Your Property S.11 Color Events S.12 Goose Waste"</p>
Removed Appendix IV-B.	Moved information into BMP A3.11 to match 2019 SWMMWW.	Volume IV, Chapter 4 - Best Management Practices for Commercial and Industrial Activities, Section A3 Production and Application Activities	(see Track Changes version for original text)		<p>See revised BMP A3.11 Pesticides and an Integrated Pest Management Program.</p>
Revised TC stormwater BMPs table.	Added new BMPs.	Volume V, Chapter 1, Table 1-1 Thurston County Stormwater BMPs	(see Track Changes version for original text)		<p>Added "LID.04A Perforated Stub-out Connections LID.08A Rain Gardens LID.16 Rainwater Harvesting IN.03 Infiltration Vault and Drywells BF.05 Compost-Amended Vegetated Filter Strip (CAVFS)"</p>
Revised LID.04 Downspout Infiltration Systems requirements.	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	<p>2.2.1.1 Applicability 2.2.1.2 Limitations 2.2.1.6 Geometry 2.2.1.7 Other Design Criteria 2.2.1.7.1 Design Criteria for Infiltration Drywell Systems (see Track Changes version for original text)</p>		<p>Added "Downspout infiltration systems are used for infiltrating runoff from roof downspout drains and include infiltration trenches and drywells. They are not designed to directly infiltrate runoff from pollutant generating impervious surfaces. Runoff surfaces that comply with this BMP are considered to be "fully infiltrated" (i.e., zero percent effective imperviousness). • Downspout infiltration can be used to help meet the flow control standards of Core Requirement #7. • When used in combination with other onsite stormwater management BMPs, downspout infiltration can also help achieve compliance with Core Requirement #5. Downspout infiltration systems are not allowed for properties along the Marine Bluff without special acceptance. All infiltration facilities must be at least 50 feet from the top of any slope over 40 percent. This setback may be reduced to 15 feet based on a geotechnical evaluation, but in no instances may it be less than the buffer width. All infiltration system should be at least 10 feet from any structure, property line, or sensitive area (except slopes over 40%). For sites with septic systems, infiltration systems must be downgradient of the drainfield unless the site topography clearly prohibits subsurface flows from intersecting the drainfield. 2.2.1.4.1 Runoff Model Representation Roof areas served by downspouts that drain to infiltration dy wells or infiltration trenches that are sized in accordance with this BMP do not have to be entered into the runoff model. They are presumed to fully infiltrate the roof runoff." Added verbatim: BMP T5.10A: Downspout Full Infiltration, Procedure for Evaluating Feasibility from Ecology's 2019 SWMMWW. Added "• Silt and clay type soils have a saturated hydraulic conductivity that is too small for adequate infiltration and are infeasible for downspout infiltration trenches. • Infiltration trenches shall not be built on slopes steeper than 25 percent (4:1). A geotechnical analysis and report may be required on slopes over 15 percent or if the proposed trench is located within 200 feet of the top of a slope steeper than 40 percent, or in a geologic hazard area. • Infiltration trenches may be located under pavement if a small yard drain or catch basin with grate cover is placed at the end of the trench pipe such that overflow would occur out of the catch basin at an elevation at least one foot</p>

					below that of the pavement, and in a location which can accommodate the overflow without creating a significant adverse impact to downhill properties or drainage systems. This is intended to prevent saturation of the pavement in the event of a system failure. Two alternatives are available for infiltration drywells, Figure 2.4 presents the design of a typical downspout infiltration drywell system. When located in coarse sands and cobbles, drywells must contain a volume of gravel equal to or greater than 60 cubic feet per 1,000 square feet of impervious surface for either medium sands or coarse sands served. When located in medium sands, drywells must contain at least 90 cubic feet of gravel per 1,000 square feet of impervious surface served. Downspout infiltration drywells must not be built on slopes greater than 25 percent (4H:1V). Drywells may not be placed on or above a landslide hazard area or on slopes greater than 15 percent without evaluation by a licensed engineer in the state of Washington with geotechnical expertise, or a licensed geologist, hydrogeologist, or engineering geologist, and with Thurston County acceptance from the DDECM Administrator."
Made perforated stub-out connection its own BMP.	To maintain consistency with Ecology's 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	(Not previously included)		Add verbatim: BMP T5.10C: Perforated Stub-out Connections from Ecology's 2019 SWMMWW.
Revisions to LID.05 Downspout Dispersion systems.	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	2.2.3.1 Applicability 2.2.3.2 Limitations 2.2.3.4.2 Splash Blocks (see Track Changes version for original text)		Added "Have a geotechnical engineer or a licensed geologist, hydrogeologist, or engineering geologist evaluate runoff discharged towards landslide hazard areas. Do not place the discharge point form splashblocks or dispersion trenches on or above slopes greater than 15% or above erosion hazard areas without evaluation by a licensed engineer in the state of Washington with geotechnical expertise or a licensed geologist, hydrogeologist, or engineering geologist, and with Thurston County acceptance from the DDECM Administrator." Add verbatim: BMPT5.10B: Downspout Dispersion System, Runoff Model Representation and BMP T5.10B: Downspout Dispersion System, Design Criteria, Design Criteria for Splashblocks from Ecology's 2019 SWMMWW.
Revise hydrologic and hydraulic design considerations for LID.06 Sheet Flow Dispersion	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	"Flow Credit for Sheet Flow Dispersion" (see Track Changes version for original text)		Added " Runoff Model Representation Where sheet flow dispersion is used to disperse runoff into an undisturbed native landscape area, or an area that meets the requirements of BMP LID.02; "Soil Amendments, Quality and Depth", the impervious area should be modeled as a lateral flow impervious area. Do this in the WWHM on the Mitigated Scenario scree by connecting the lateral flow impervious area element (representing the area that is dispersed) to the lawn/landscape lateral flow soil basin element (representing the area that will be used for dispersion). Sheet flow dispersion may not be appropriate where the drainage discharges toward slopes steeper than 20 percent or geologic hazard areas as defined by TCC 17.15 or TCC Title 24. The Administrator or designee may require a geotechnical report to evaluate whether a slope exceeding 20 percent is a landslide hazard area. Increased setbacks or prohibition of dispersion toward the slope may result from this report. The geotechnical analysis and report shall address the potential impact of dispersion on the slope. For sites with septic systems, the discharge area must be 10 feet downgradient of the drainfield primary and reserve areas (WAC 246-272A-0210). Thurston County may waive this requirement if site topography clearly prohibits flow from intersecting the drainfield. "
Revise BMP LID.07 Concentrated Flow Dispersion.	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	2.2.5.2 Limitations 2.2.5.4.1 Flow Credit for Concentrated Flow Dispersion 2.2.5.5 Design Criteria (see Track Changes version for original text)		Added "Runoff discharged towards landslide hazard areas must be evaluated by a geotechnical engineer or qualified geologist. Do not place the discharge point on or above slopes greater than 20%, or above erosion hazard areas, without assessment by a geotechnical engineer or qualified geologist and with Thurston County acceptance from the DDECM Administrator." Add verbatim: BMP T5.11: Concentrated Flow Dispersion, Runoff Model Representation in Ecology's 2019 SWMMWW. Added "Maintain a vegetated flow path of at least 25 feet between the discharge point and any property line, structure, steep slope, stream, wetland, lake, or other impervious surface. • If the vegetated flow path is 25 – 50 ft, the design must include a dispersion trench prior to discharge over the vegetated flow path. • If the vegetated flow path is 50 ft or more, the design may use either a dispersion trench or pad of crushed rock (as described below) prior to discharge over the vegetated flow path."
Revised BMP LID.08 Bioretention Cells, Swales, and Planter Boxes.	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	2.2.6.1 Description 2.2.6.2 Applications and Limitations 2.2.6.4 Modeling and Sizing 2.2.6.5.1 Determining Design Infiltration Rate 2.2.6.6 Bioretention Design Criteria (see Track Changes version for original text)		Updated to include all requirements for BMP T7.30: Bioretention from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)
Added language to include the use of high performance bioretention soil mix.	Consistency with public comment regarding the use of high performance bioretention soil mix near phosphorus-sensitive waterbodies.	Volume V, Chapter 2, 2.2.5.6.1 Setbacks and Site Constraints	(see Track Changes version for original text)		Added "For bioretention BMPs located near phosphorus-sensitive waterbodies, see Ecology's Publication 21-10-023: Guidance on using new high performance bioretention soil mixes for requirements."

	Added language to include the use of high performance bioretention soil mix.	Response to public comment.	Volume V, Chapter 2, 2.2.6.2 Applications and Limitations.	(Not previously included)	Added "In May of 2021, Ecology released <i>publication 21-10-023: Guidance on using new high performance bioretention soil mixes</i> . This report provides information on a new alternative bioretention soil mix (BSM) that can be used in locations near phosphorus-sensitive waterbodies. The report provides the specifications for the new BSM, the treatment performance of the new BSM, and the regulatory status of the new BSM in the municipal stormwater NPDES permit program. Refer to the report for projects which plan to include bioretention BMPs in locations near phosphorus-sensitive waterbodies."
	Remove reference to the use of rock or other erosion protection material in the channel entrance of curb cuts.	Staff requested change.	Volume V, Chapter 2, 2.2.5.6.2 Flow Entrance/Presettling	Drainage curb cuts for roadside, driveway, or parking lot areas – curb cuts shall include rock or other erosion protection material in the channel entrance to dissipate energy. Curb cuts shall be according Thurston County Standard Plan.	Drainage curb cuts for roadside, driveway, or parking lot areas – curb cuts shall be according Thurston County Standard Plans (see Figure 2.1 - Curb Cut Inlet), or as described below with approval from the County.
	Remove allowance for river rock with curb cuts.	Staff requested change.	Volume V, Chapter 2, 2.2.5.6.2 Flow Entrance/Presettling	Avoid the use of angular rock or quarry spalls and instead use round (river) rock if needed.	Avoid the use of angular rock or quarry spalls.
	Revised requirement for projects subject to CR#5 and choosing to use the List Approach.	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2.5.6.3 Ponding Area	For projects subject to Minimum Requirement #5 and choosing to use List #1 or List #2 of that requirement, the bioretention area shall have a horizontally projected surface area below the overflow which is at least 5 percent of the the total impervious surface area draining to it. If lawn/landscape areas will also be draining to the bioretention area, the horizontally projected surface area below the overflow be increased by 2 percent of the lawn/landscape area.	For projects subject to Minimum Requirement #5 and choosing to use The List Approach of that requirement, the bioretention area shall have a horizontally projected surface area below the overflow which is at least 5 percent of the the total area draining to it.
	Revised overflow section for BMP LID.08 Bioretention	Staff requested change/Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2.5.6.5 Overflow	(see Track Changes version for original text)	An overflow route must be identified for stormwater flows that overtop the bioretention area when infiltration capacity is exceeded or the facility becomes plugged and fails. The overflow route must be able to convey the 100-year recurrence interval developed peak flow to the downstream conveyance system or other acceptable discharge point without posing a health or safety risk or causing property damage. Surface overflow can be provided by vertical stand pipes that are connected to underdrain systems, by horizontal drainage pipes or armored overflow channels installed at the designed maximum ponding elevations. Overflow can also be provided by a curb cut at the down-gradient end of the bioretention area to direct overflows back to the street. Overflow conveyance structures are necessary for all bioretention BMPs to safely convey flows that exceed the capacity of the BMP and to protect downstream natural resources and property.
	Added language to include the use of high performance bioretention soil mix.	Consistency with public comment regarding the use of high performance bioretention soil mix.	Volume V, Chapter 2, 2.2.5.6.6 Bioretention Soil Mix	Projects can either use a default bioretention soil mix or can create a custom bioretention soil mix	Projects can either use a default bioretention soil mix, high performance bioretention soil mix, or can create a custom bioretention soil mix
	Added language to include the use of high performance bioretention soil mix.	Consistency with public comment regarding the use of high performance bioretention soil mix.	Volume V, Chapter 2, 2.2.5.6.6 Bioretention Soil Mix	(Not previously included)	Added "See Ecology's Publication 21-10-023: Guidance on using new high performance bioretention soil mixes for projects which use the high performance bioretention soil mix."
	Added TC road standard for curb cut inlet.	Staff requested change.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	(Not previously included)	(see Tracked Changes version for Figure 2.12 Curb Cut Inlet)
	Made rain gardens its own BMP.	To maintain consistency with Ecology's 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	(Not previously included)	Add verbatim: BMP T5.14: Rain Gardens from Ecology's 2019 SWMMWW.
	Revised BMP LID.09 Permeable Paving.	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	2.2.8.1 Applicability 2.2.8.2 Limitations 2.2.8.4 Hydrologic and Hydraulic Design Considerations	Updated to include all requirements for BMP T5.15: Permeable Pavements from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)

Revised BMP LID.10 Vegetated Roofs.	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	2.9 LID.10 Vegetated Roofs 2.2.9.1 Applicability 2.2.9.2 Limitations 2.2.9.4 Hydrologic and Hydraulic Design Considerations 2.2.9.5 Design Considerations (see Track Changes version for original text)	Added "Vegetated roofs can provide multiple benefits, including stormwater volume reduction and flow attenuation, resulting in some amount of Flow Control. The range of benefits for a green roof depends on a number of design factors such as plant selection, depth and composition of soil mix, location of the roof, orientation and slope, weather patterns, and the maintenance plan. " While vegetated roofs can be installed on slopes up to 40 degrees, slopes between 5 and 20 degrees (1:12 and 5:12) are most suitable and can provide natural drainage by gravity. Roofs with slopes greater than 10 degrees (2:12) require an analysis of engineered slope stability. Vegetated roofs are not included as an option in the List Approach within Core Requirement #5: Onsite Stormwater Management. However, they are an option available to project designers who want to use other methods to meet the LID Performance Standard within Core Requirement #5 or the Flow Control Performance Standard within Core Requirement #7: Flow Control. When modeling the project using an approved continuous runoff model, use the element intended by the modeling software to represent a vegetated roof. If using WWHM2012, this is the "green roof" element. The user specifies the media thickness, vegetation type, roof slope, and length of drainage within the model. See the Low Impact Development Technical Guidance Manual for Puget Sound (Hinman and Wulkan, 2012) for a more detailed description of the components of and design criteria for vegetated roofs. It also includes references to other sources of information and design guidance. Note that the Low Impact Development Technical Guidance Manual for Puget Sound (Hinman and Wulkan, 2012) is for additional informational purposes only. You must follow the guidance within this manual if there are any discrepancies between this manual and the Low Impact Development Technical Guidance Manual for Puget Sound (Hinman and Wulkan, 2012)."
Revised BMP LID.11 Full Dispersion	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	(see Track Changes version for original text)	Revised verbatim: BMP T5.30 Full Dispersion from Ecology's 2019 SWMMWW.
Added modeling requirement for BMP LID.14 Tee Planting and	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	(Not previously included)	Added " Runoff Model Representation If the design criteria for this BMP are followed, the total impervious/hard surface areas entered into the runoff model may be reduced by the amount indicated in the design criteria above."
Revised BMP LID.15 Minimal Excavation Foundation Systems.	Revised to match 2019 SWMMWW.	Volume V, Chapter 2, 2.2 LID Stormwater Management BMPs.	(see Track Changes version for original text)	Revised verbatim: BMP T5.19: Minimal Excavation Foundations from Ecology's 2019 SWMMWW.
Added language for UIC program.	Added to provide guidance location for UIC program.	Volume V, Chapter 3, 3.1 General Considerations	"The following information on Underground Injection Control (UIC) is excerpted from the 2006 Department of Ecology document Guidance for UIC Wells that Manage Stormwater. This document is available online at: < http://www.ecy.wa.gov/biblio/0510067.html >" "All stormwater UICs must be registered with Ecology, except residential UICs used for roof runoff control."	Added "The following information on Underground Injection Control (UIC) is excerpted from the 2006 Department of Ecology document Guidance for UIC Wells that Manage Stormwater. This document has been incorporated into Ecology's 2019 Stormwater Management Manual for Western Washington (SWMMWW), and the UIC BMPs in the 2019 stormwater manual supersedes the 2006 Guidance for UIC wells that manage stormwater. See I-4 UIC Program in the SWMMWW for requirements and information pertaining to the design, construction, operation and maintenance, and management of new and existing UIC wells. All stormwater UICs must be registered with Ecology, except UICs wells at single-family homes (or duplexes) receiving only residential roof runoff used to collect stormwater runoff from roof surfaces on an individual home (or duplex) or for basement flooding control."
Revised BMP IN.01 Infiltration Basins.	Revised to match 2019 SWMMWW.	Volume V, Chapter 3, 3.2 Infiltration BMPs.	3.2.1.4 Pretreatment 3.2.2.6 Design Criteria (see Track Changes version for original text)	Added "If this BMP is proposed to be used for Runoff Treatment, the design must show that the criteria for Runoff Treatment in Volume III, Site Suitability Criteria (SSC) are met. Refer to the guidance in Volume III for information pertinent to all infiltration BMPs.
Revised BMP IN.02 Infiltration Trenches.	Revised to match 2019 SWMMWW.	Volume V, Chapter 3, 3.2 Infiltration BMPs.	"With the exception of clean runoff water from roofs or other non-pollution generating pervious or impervious surfaces, all stormwater shall pass through a designed biofiltration swale system, basic filter strip or presetting basin for water quality treatment (see BMP BF.01, BMP BF.04 and BMP WP.05) prior to discharge to an infiltration trench." "The surface of the trench can be covered with grating, or consist of stone, gabion, sand, or a grassed covered area with a surface inlet."	Added "With the exception of clean runoff water from roofs or other non-pollution generating pervious or impervious surfaces, all stormwater shall pass through a designed basic treatment BMP or pretreatment BMP prior to discharge to an infiltration trench. The surface of the trench can be covered with grating, and/or consist of stone, gabion, sand, or a grassed or asphalt covered area with a surface inlet. Where perforated pipe is not used, UIC regulations do not apply."
Revised BMP INO.3 to include drywells.	To maintain consistency with Ecology's 2019 SWMMWW.	Volume V, Chapter 3, 3.2 Infiltration BMPs.	(see Track Changes version for original text)	Added "Drywells and infiltration vaults should not be built on slopes greater than 25% (4:1). Drywells and infiltration vaults may not be placed on or above a landslide hazard area or slopes greater than 15% without evaluation by a licensed engineer in the state of Washington with geotechnical expertise or licensed geologist and acceptance from Thurston County's DDECM Administrator. Drywells: Drywell bottoms should be a minimum of 5 feet above season high groundwater level or impermeable soil layers. Drywell are typically a minimum of 48 inches in diameter and approximately 5 to 10 feet deep, or more. Drywells should be no closer than 30 feet center to center or twice the depth, whichever is greater. Drywells: Filter fabric (geotextile) should be placed on top of the drain rock and on trench or drywell sides prior to backfilling to prevent migration of fines into the drain rock, depending on local soil conditions."
Revised general hydraulic design considerations for BMP D.01 Detention Ponds.	Revised to match 2019 SWMMWW.	Volume V, Chapter 4, 4.1 Detention Facility BMPs	"Detention ponds must be designed as flow-through systems and a design that maximizes the flow path between inlet and outlet is recommended to promote sedimentation."	Added "Detention ponds must be designed as flow-through systems (however, parking lot storage may be utilized through a back up system). Developed flows must enter through a conveyance system separate from the control structure and outflow conveyance system. Maximize the distance between the inlet and outlet to promote sedimentation.

Revised BMP D.02 Detention Tanks.	Revised to match 2019 SWMMWW.	Volume V, Chapter 4, 4.1 Detention Facility BMPs	"The volume and outflows design for detention tanks must comply with both Core Requirement #7: Flow Control in Volume I and hydrologic analysis and design methods described in Volume III." "Tanks may be designed as flow-through systems or may be designed as backup systems if preceded by water quality facilities, since little sediment should reach the inlet/control structure and low head losses can be expected because of the proximity of the inlet/control structure to the tank."	Added "Design volumes and outflows for detention tanks to meet the performance standards as required in Core Requirement #5: Onsite Stormwater Management, Core Requirement #7: Flow Control, and/or Core Requirement #8: Wetlands Protection, and the hydrologic analysis and design methods described in Volume III. Design guideline for control structures are given in Appendix V-A." Tanks may be designed as flow-through systems with manholes in line to promote sediment removal and facilitate maintenance, or may be designed as backup systems if preceded by water quality facilities, since little sediment should reach the inlet/control structure and low head losses can be expected because of the proximity of the inlet/control structure to the tank. Where other metal (such as aluminum or stainless steel) or plastics are available, they should be used. Note: Control structures and access manholes should have additional ladder rungs to allow ready access to all detention tank access pipes when the catch basin sump is filled with water "
Revised detention volume and outflow for BMP D.03 Detention Vaults.	Revised to match 2019 SWMMWW.	Volume V, Chapter 4, 4.1 Detention Facility BMPs	(not previously included)	Added "Design the volumes and outflows for detention vaults to meet the performance standards as required in Core Requirement #5: Onsite Stormwater Management, Core Requirement #7: Flow Control, and/or Core Requirement #8: Wetlands Protection, and the hydrologic analysis and design methods described in Volume III. Design guideline for control structures are given in Appendix V-A."
Revised introduction to biofiltration BMPs.	Revised to match 2019 SWMMWW.	Volume V, Chapter 4, 5.1 Biofiltration BMPs.	"A biofilter can be used as a basic treatment BMP for stormwater runoff from roadways, driveways, parking lots, and other pollution generating pervious and impervious surfaces. It can also be used as the first stage of a treatment train, multiple BMPs in a series for treating contaminated stormwater runoff. Placement of the biofilter "off-line" is preferred to on-line applications to avoid flattening of the vegetation and the erosive effects of high flows." "BF.05 Narrow Area Filter Strip"	Added "A biofilter can be used as a basic treatment BMP for stormwater runoff from roadways, driveways, parking lots, and other pollution generating pervious and impervious surfaces. It can also be used as the first stage of a treatment train, multiple BMPs in a series for treating contaminated stormwater runoff. In cases where hydrocarbons, high TSS, or debris would be present in the runoff, as such as high-use sites, a pretreatment system for those components would be necessary. Placement of the biofilter "off-line" is preferred to on-line applications to avoid flattening of the vegetation and the erosive effects of high flows. Consider biofiltration BMPs in retrofit situations where appropriate (Center for Watershed Protection, 1998). Target pollutants are amenable to biofiltration treatment If the biofilter within the biofiltration BMP can be impacted by snowmelts and ice, refer to (Caraco and Claytor, 1997) for additional design criteria BF.05 Compost-Amended Vegetated Filter Strips (CAVFS) "
Revised BMP BF.01 Basic Biofiltration Swale.	Revised to match 2019 SWMMWW.	Volume V, Chapter 4, 5.1 Biofiltration BMPs.	(see Track Changes version for original text)	Updated to include all requirements for BMP T9.10: Basic Biofiltration Swale from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)
Revised BMP BF.02 Wet Biofiltration Swale.	Revised to match 2019 SWMMWW.	Volume V, Chapter 4, 5.1 Biofiltration BMPs.	"Vegetation for wet biofiltration swales, however, is specifically adapted to withstand saturated soil conditions."	Added "Thus, use vegetation specifically adapted to withstand saturated soil conditions. Different vegetation in turn requires modification of several of the design parameters for BMP BF.01: Basic Biofiltration Swale. Wet biofiltration swales are Runoff Treatment BMPs that remove low concentrations of pollutants such as TSS, heavy metals, nutrients, and petroleum hydrocarbons. Many native Juncus species remain green throughout the winter; therefore, fall harvesting of Juncus species is not recommended."
Revised BMP BF.04 Basic Filter Strip.	Revised to match 2019 SWMMWW.	Volume V, Chapter 4, 5.1 Biofiltration BMPs.	(see Track Changes version for original text)	Added "Runoff treatment is provided by passage of water over the surface and through grass. 1 inch. (Below the design water depth install an erosion control blanket, at least 4" of topsoil, and the selected biofiltration seed mix. Above the water line use a straw mulch or sod.) 0.5 feet per second @ K multiplied by the WQ Design Flow Rate."
Made compost-amended vegetated filter strip its own BMP.	To maintain consistency with Ecology's 2019 SWMMWW.	Volume V, Chapter 5, 5.1 Biofiltration BMPs.	(Not previously included)	Add verbatim: BMP T7.40: Compost-Amended Vegetated Filter Strip (CAVFS) from Ecology's 2019 SWMMWW.
Revised BMP BF.04 Basic Filter Strip.	Staff requested change.	Volume V, Chapter 5, 5.1.4.5.1	(Not previously included)	If flow spreading and energy dissipation is included in the design (see Figure 5.7), a minimum 1-foot wide strip of crushed rock or gravel should be placed between the contributing drainage area and filter strip.
Revised BMP WP.01 Stormwater Treatment Wetlands.	Revised to match 2019 SWMMWW.	Volume V, Chapter 6, 6.1 Wet Pool BMPs.	(see Track Changes version for original text)	Updated to include all requirements for BMP T10.30 Stormwater Treatment Wetlands from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)
Revised BMP WP.02 Wet Ponds.	Revised to match 2019 SWMMWW.	Volume V, Chapter 6, 6.1 Wet Pool BMPs.	(see Track Changes version for original text)	Updated to include all requirements for BMP T10.10: Wetponds - Basic and Large from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)
Revised BMP WP.03 Wet Vaults.	Revised to match 2019 SWMMWW.	Volume V, Chapter 6, 6.1 Wet Pool BMPs.	(see Track Changes version for original text)	Updated to include all requirements for BMP T10.20: Wetvaults from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)
Revised BMP WP.04 Combined Detention and Wet Pool Facilities.	Revised to match 2019 SWMMWW.	Volume V, Chapter 6, 6.1 Wet Pool BMPs.	(see Track Changes version for original text)	Updated to include all requirements for BMP T10.40: Combined Detention and Weetpool Facilities from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)
Revised BMP WP.05 Presettling Basins & Pretreatment.	Revised to match 2019 SWMMWW.	Volume V, Chapter 6, 6.1 Wet Pool BMPs.	(see Track Changes version for original text)	Updated to include all requirements for BMP T6.10 Presettling Basin from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)
Revised BMP MF.01 Sand Filter Basin.	Revised to match 2019 SWMMWW.	Volume V, Chapter 7, 7.1 Media Filtration Design BMPs	(see Track Changes version for original text)	Updated to include all requirements for BMP T8.10: Basic Sand Filter Basin and BMP T8.11: Large Sand Filter Basin from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)
Revised BMP MF.04 Media Filter Drain.	Revised to match 2019 SWMMWW.	Volume V, Chapter 7, 7.1 Media Filtration Design BMPs	(see Track Changes version for original text)	Updated to include all requirements for BMP T8.40: Media Filter Drain from Ecology's 2019 SWMMWW. (see Tracked Changes version for revisions)

Removed BMP OW.03 Oil Containment Booms.	To maintain consistency with Ecology's 2019 SWMMWW.	Volume V, Chapter 8, 8.1 Oil and Water Separation BMPs	(see Track Changes version for original text)	N/A
Revised BMP OW.01 API (Baffle Type) Separator Bay	Revised to match 2019 SWMMWW.	Volume V, Chapter 8, 8.1 Oil and Water Separation BMPs	"The separator shall be located off-line receiving only the water quality design storm flows. If it is necessary to locate the separator on-line, try to minimize the size of the area needing oil control, and use the online Water Quality Design Flow Rate multiplied by the ratio indicated in Figure 5.1b (if hydrologic calculations are being performed using a continuous hydrologic model)."	Added "Without intense maintenance, oil and water separator BMPs may not be sufficiently effective in achieving oil and TPH removal down to the required levels. A pretreatment BMP should be considered if the level of TSS in the inlet flow would cause clogging or otherwise impair the long-term efficiency of the oil and water separator BMP. The separator shall be located off-line, and bypass the incremental portion of flows that exceed the off-line, 15-minute Water Quality Design Flow Rate multiplied by the ratio indicated by Figure 5.2. If it is necessary to locate the separator on-line, try to minimize the size of the area needing oil control, and use the Water Quality Design Flow Rate multiplied by the ratio indicated in Figure 5.1. For Stormwater Inflow from Drainages More than 2 acres • Determine Vt based on above criteria Use absorbents and/or skimmers in the afterbay as needed."
Added limitation to BMP OW.02 Coalescing Plate (CP) Separator Bay.	Revised to match 2019 SWMMWW.	Volume V, Chapter 8, 8.1 Oil and Water Separation BMPs	(Not previously included)	Added "Without intense maintenance, oil and water separator BMPs may not be sufficiently effective in achieving oil and TPH removal down to the required levels."
Added description of TAPE program to background.	Revised to match 2019 SWMMWW.	Volume V, Chapter 9 - Emerging Technologies	(see Track Changes version for original text)	Added "Traditional BMPs such as wet ponds and biofiltration swales may not be appropriate in many situations due to size and space restraints or their inability to remove target pollutants. Because of this, the stormwater treatment industry emerged to develop new manufactured treatment devices. Manufactured treatment devices are emerging technologies that are new to the stormwater treatment marketplace. These devices include both permanent and construction site treatment technologies. Many of these devices have not undergone complete performance testing, so their performance claims cannot be verified. Ecology has established a program, the Technology Assessment Protocol – Ecology (TAPE), to evaluate the capabilities of manufactured treatment devices. Manufactured treatment devices that have been evaluated by TAPE are approved at some level of use designated under specified conditions. Their use is restricted in accordance with their evaluation as explained in V-10.3 Approval Process for Manufactured Treatment Devices of Ecology's 2019 Stormwater Management Manual for Western Washington. The recommendations for use of individual manufactured treatment devices may change as Ecology collects more data on their performance. Updated recommendations on their use are posted to Ecology's TAPE website at the following address: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Emerging-stormwater-treatment-technologies "
Revised Ecology role in evaluating emerging technologies.	Revised to match 2019 SWMMWW.	Volume V, Chapter 9 - Emerging Technologies	(see Track Changes version for original text)	Add verbatim: V-10.3 Approval Process for Manufactured Treatment Devices, Ecology's Role in Evaluating Manufactured Treatment Devices from Ecology's 2019 SWMMWW.
Revised heading	Clarification	Volume V, Appendix V-C Maintenance Guidelines	Instructions for Use of Maintenance Checklists	"BMP Maintenance Tables"
Added safety warning	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	(Not previously included)	Added "Safety Warning: Per OSHA regulations and for your safety, you should never stick your head or any part of your body into a manhole, catch basin, vault, or other type of confined space . NO PART OF YOUR BODY SHOULD BREAK THE PLANE OF THE OPEN HOLE."
Added corresponding BMP number where applicable	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	(Not previously included)	Added "BMP D.01, BMP IN.01, BMP IN.02, BMP D.02, BMP D.03, BMP BF.01, BMP BF.02, BMP BF.03, BMP BF.04, BMP BF.05, BMP WP.02, BMP WP.03, BMP OW.01, BMP OW.02, BMP WP.01, BMP MF.04, BMP LID.08, BMP LID.16, BMP LID.10, BMP LID.09, BMP LID.08A, BMP LID.04"
Revised titles from checklist to standards.	Clarification	Volume V, Appendix V-C Maintenance Guidelines	Maintenance Checklist	"Maintenance Standards"
Revised guidance to contact Thurston County for technical assistance.	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	If you are unsure whether a problem exists, contact a professional engineer.	"If you are unsure whether a problem exists, please contact Thurston County for technical assistance."
Revised maintenance standard for Detention Ponds	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Any trash and debris which exceed five cubic feet per 1,000 square feet. If less than threshold, all trash and debris will be removed as part of next scheduled maintenance.	Any trash and debris, including yard wastes such as grass clipping and tree branches, which exceed five cubic feet per 1,000 square feet. If less than threshold, all trash and debris will be removed as part of next scheduled maintenance.
Revised maintenance standard for Detention Ponds	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Tree growth and dense vegetation impedes inspection, maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements).	Trees growing on pond bottom or side slopes. Tree growth and dense vegetation impedes inspection, maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements).
Revised maintenance standard for Detention Ponds	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Trees and vegetation do not hinder inspection or maintenance activities.	Trees removed from facility bottom, side slopes, and maintenance access areas. Species removed that are not part of the planting plan.
Revised maintenance standard for Detention Ponds	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	(Not previously included)	Added "Storage Area / Vegetation / Grass cutting unnecessary unless maintaining scotch broom, blackberries, or other nuisance vegetation, or dictated by aesthetics / Vegetation mowed or nuisance vegetation removed"

Revised maintenance standard for Infiltration Basins and Trenches	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Any trash and debris which exceed five cubic feet per 1,000 square feet. If less than threshold, all trash and debris will be removed as part of next scheduled maintenance.	Any trash and debris, including yard wastes such as grass clipping and tree branches , which exceed five cubic feet per 1,000 square feet. If less than threshold, all trash and debris will be removed as part of next scheduled maintenance.
Revised maintenance standard for Infiltration Basins and Trenches	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Exceeds 18 inches. Grass or groundcover mowed to a height no greater than 6 inches.	When grass becomes excessively tall. When nuisance weeds and other vegetation take over. Vegetation mowed or nuisance vegetation removed so that flow is not impeded. Grass or groundcover mowed to a height of 3 to 4 inches. Removed clippings.
Revised maintenance standard for Infiltration Basins and Trenches	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Tree growth and dense vegetation which impedes inspection, maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). Trees and vegetation do not hinder inspection or maintenance activities. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood).	Trees growing on pond bottom or side slopes. Tree growth and dense vegetation which impedes inspection, maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). Trees removed from facility bottom, side slopes, and maintenance access areas. Species removed that are not part of recorded planting plan. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood).
Revised maintenance standard for Energy Dissipaters	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	Sediment (in the basin) that exceeds 1/3 of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.
Revised maintenance standard for Basic and Compost-Amended Biofiltration Swales	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Inlet/outlet areas clogged with sediment and/or debris. Inlet and outlet areas clear of sediment and debris. Material clogging or blocking the inlet/outlet area removed.	Inlet/outlet areas impacted by with sediment, vegetation , and/or debris. Inlet and outlet areas clear of sediment, vegetation , and debris.
Revised maintenance standard for Wet and Continuous Inflow Biofiltration Swales	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Inlet/outlet area clogged with sediment and/or debris. Inlet and outlet areas clear of sediment and debris.	Inlet/outlet area impacted by sediment, vegetation , and/or debris. Inlet and outlet areas clear of sediment, vegetation , and debris.
Revised maintenance standard for Wet Ponds	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	(Not previously included)	Added " Vegetation / When nuisance weeds and other vegetation take over. Cattail covers more than 25% of the pond. / Vegetation mowed or nuisance vegetation removed so that flow is not impeded "
Revised maintenance standard for Wet Ponds	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	(Not previously included)	Added " Tree Growth /Trees growing in pond bottom or side slopes. Tree growth and dense vegetation which impedes inspection, maintenance access, or interferes with maintenance activity (e.g., slope mowing, silt removal, vactoring, or equipment movements). / Trees removed from facility bottom, side slopes, and maintenance access areas. "
Revised maintenance standard for Wet Ponds	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Trees do not hinder maintenance activities. Harvested trees should be recycled into mulch or other beneficial uses (e.g., firewood or construction).	Added " Trees removed from facility bottom, side slopes, and maintenance access areas. Species removed that are not part of the recorded planting plan. "
Revised maintenance standard for Fencing/Shrubbery Screen/Other Landscaping	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Shrubbery is growing out of control or is infested with weeds. See also Thurston County Noxious weeds list. Shrubbery is trimmed and weeded to provide appealing aesthetics. Do not use chemicals to control weeds.	Added " Shrubbery, including blackberries and scotch broom, is growing out of control or is infested with weeds. See also Thurston County Noxious weeds list. " Shrubbery is trimmed and weeded. Use Thurston County Integrated Pest Control methods when applicable.
Revised maintenance standard for Grounds (Landscaping)	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Insect Hazard	Added " Insect Hazard/Vegetation (poisonous) "
Revised maintenance standard for Bioretention	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Basin	Replaced with " Facility "
Revised maintenance standard for Bioretention	Staff requested change.	Volume V, Appendix V-C Maintenance Guidelines	Trees and shrubs do not hinder facility performance or maintenance activities. Prune or remove large trees and shrubs.	Trees and shrubs do not hinder facility performance or maintenance activities. Species removed that are not part of the recorded planting plan.