

2023

# City of West Linn Water Quality Facility





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## **Acronyms and Abbreviations**

BMP	Best Management Practices
CWA	Clean Water Act
CWS	Clean Water Services
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESD	Environmental Services Division
GIS	Geographical Information System
MEP	Maximum Extent Practical
MS4	Multiple Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
0&M	Operations and Maintenance
PC BMP	Pollution Control Best Management Practices
QAQC	Quality Assurance and Quality Control
SWMP	Stormwater Management Plan
TMDL	Total Maximum Daily Load
TMDL IP	Total Maximum Daily Load Implementation Plan
WQ	Water Quality
WQF	Water Quality Facility

## Section 1

# Introduction and Purpose

The development of this program is driven by measurable goals in the City of West Linn's (City's) 2022 Stormwater Management Program Document (SWMP) to address the 2021 National Pollutant Discharge Elimination System (NPDES) municipal separate storm sewer (MS4) Permit and TMDL Implementation Plan. This document outlines the process the City implements to:

- Require new private water quality facilities to submit maintenance agreements to the City.
- Require submittal of annual reports related to inspection and maintenance activities for private Water Quality Facilities (WQFs).
- Provide technical assistance and formalized inspection and maintenance guidance on WQLs, to ensure long-term functionality.
- Conduct inspection and maintenance activities for public WQFs.

#### 1.1 Purpose

To develop standardized protocols for inspections of public and private WQFs within West Linn's jurisdiction. This guidance manual provides procedures, methods, and criteria for assessing a facility's function and appearance. This manual allows inspector(s) to evaluate and record conditions of WQFs and for the City to notify facility owners of compliance issues.

#### 1.2 Regulatory Context

State and Federal regulations require West Linn to protect water quality within its jurisdiction. The Clean Water Act (CWA) and Endangered Species Act (ESA) are two such regulations.

The City has developed a Stormwater Management Program Document (SWMP) under the NPDES MS4 regulatory umbrella to provide strategies, goals and actions that comply with the CWA and ESA. The City's SWMP includes BMPs that require mapping and inventory of public and private WQFs and implementation of an inspection and maintenance program.

### Section 2

# **Private Water Quality Facilities**

There are currently over 150 of private WQFs in West Linn. The City of West Linn has provisions in its Municipal Code (Section 4.070) and Public Works Standards requiring private facility owners to submit maintenance agreements to the City to ensure ongoing maintenance of these private water quality facilities. Such private WQFs tracked by the City include rain gardens, swales, ponds pollution control manholes, filters, and detention tanks.

New WQFs are required to submit a maintenance agreement to the City that requires owner to conduct annual inspection and maintenance activities and verify (by a maintenance contractor or other) that maintenance was conducted. When new maintenance agreements are submitted, the City maps the facility location and contributing drainage area.

The City mails letters annually (March timeframe) to known private WQF owners, requesting annual inspection and maintenance reports for the facilities. Annual reports are maintained on file at the City. Appendix A includes the Private Facility Inspection, Maintenance and Reporting form mailed annually to private WQF owners.

The City collects annual inspection and maintenance reports for existing WQFs, including those that do not currently have maintenance agreements on file. In addition, the City inspects approximately 25% of all recorded, private WQFs annually. For these facilities, an inspection report is drafted following inspection and sent to the owners. In this report, any actions the owner needs to implement to maintain the health and function of their facility are included.

Appendix B includes the Private Corrective Maintenance Form and Work Plan for private WQF owners.

#### 2.1 Private WQF Inventory

The private WQF inventory is maintained by the City and is developed based on received site plans, asbuilts, and field data. WQF information is scanned into the City's computer system and mapped by the GIS Division of Public Works. Each WQF mapped has attribute data attached to record the details of the facility including year constructed, size of the facility, type of facility and how it's connected to the City's stormwater system. All the information is available to city personnel and citizens alike on the City's utility mapping system, West Linn Maps.

The WQF inventory is compiled in a Microsoft Excel database to inform inspection efforts. The database is updated periodically and provides baseline information for each facility. Once the facility has been inventoried and logged into the inspection database, an inspection address list will be generated. The address list will be used to send the Private Facility Inspection, Maintenance and Reporting form annually (Appendix A), as well as notifications prior to City inspection of facilities.

New facilities built or installed go through an approval process by Engineering Department. After the facility has been signed off and finalized, ESD is notified when there is a new water quality facility now in use. It is then added into the inventory and inspection rotation process. As newly built facilities become known to Environmental Services Division (ESD) staff, they are added to the inventory queue and asbuilt and/or site plan information is gathered and placed into the City's GIS inventory.

### 2.2 Private WQF Inspections

WQF inspections are required to be performed by the WQF owner or other responsible party. The WQF owner is mailed a Private Facility Inspection, Maintenance and Reporting form each spring (Appendix A). Completed inspection forms are to be returned to Public Works by June 1<sup>st</sup>.

Private WQF that haven't been inspected by their owners (and documentation returned) will be identified for inspection by Environmental Services Division (ESD). No early notification of City inspection is provided to private WQF owners.

The City will prioritize private WQF inspections as follows:

- 1. Owners who have not returned their inspection forms
- 2. WQFs located on high pollutant generating surfaces (i.e., commercial and industrial property)
- 3. Facilities installed two years ago (such that their maintenance warranty period is expired)
- 4. Facilities that have been inspected/maintained and records have been sent to the City.

The City will approximately 25% (or up to 40) private WQFs annually. Following the private WQF inspection effort, the Environmental Technician at ESD will create a Stormwater Project Status Report that includes the following materials (See Appendix B):

- Information sheets and inspection sheets for each type of facilities that they own.
- A corrective actions list and compliance schedule (for non-functional facilities).
- WQF Work Plan to correct deficiencies (for non-functional facilities).

All inspection records are recorded in the inspection database. All field sheets and paper information pertaining to the site are scanned and saved in digital project folders by facility site location/name. Paper files are kept for follow up re-inspections in a file cabinet. For any private facility that has compliance issues all enforcement and corrective actions will be tracked using the cities internal server.

#### 2.2.1 City-initiated private WQF inspection activities

When possible, City-initiated private WQF inspections will be completed in the summer months starting early July and continuing through August/September. Field crews will wear personal protective clothing such as boots and safety vests. Crews will have a first aid kit, cell phone and drinking water either on their person or in the vehicle. Additional field materials such as clip board, gloves, hooks, rulers, stadia rod, digital camera, GPS, pH meter or strips should be readied in advance.

Field crews will be responsible for producing pre-printed field sheets and field maps from the inspection database and digital files. Field staff will be responsible for entering the data into the database for each facility that they inspect by the end of each day. Any GPS points or photos taken will also be downloaded by the field staff at the end of the day and recorded appropriately. If for some reason the data entry was not able to be completed at the end of the day, staff will complete it the following morning before heading out into the field.

Table 1 outlines the process for inventory and inspection activities for private WQFs.

#### 2.2.2 City-initiated inspection documentation

For each site multiple forms may be completed. The forms are intended to assess the functions of the facility and are based on the type of facility.

For each function there are basic description criteria of the condition being assessed. Each inspector will review the inspection criteria and its description so that there is a consistent evaluation of facilities among inspectors.

City facilities are inspected based on <u>standardized criteria</u>. Functions and attributes such as BMP performance, properly functioning treatment pathways, inlets and outlets, adequate sizing, the integrity of filter media, vegetation, maintenance, pollution, and sediment buildup are assessed.

Condition scoring is a Pass or Fail grading system. Results are entered into the inspection database and a condition report is generated. If the facility component receives a "Fail" status rating, a Water Quality Deficiency & Corrective Action list (Appendix B) will then be completed and for private facilities, resubmitted to the property owner for resolution. Once the data entry and any inventory corrections are complete, an inspection report is produced.

Currently ESD staff is maintaining all records and data on the P drive  $\rightarrow$  Operations  $\rightarrow$  Environmental Services  $\rightarrow$  NPDES  $\rightarrow$  8.b. Stormwater Mgmt. O & M Private.

Section 2

	Table 1 – Inventory and Inspection Process (Private Facilities)						
Step 1 Inventory & (who is responsible)	Step 2 Address list	Step 3 Owner notification	Step 4 Ready field materials & Inspection	Step 5 Reporting & owner notification			
<ul> <li>Sign off and certification. (Engineering Staff)</li> <li>Certification &amp; inventory information passed on to inventory staff. (GIS)</li> <li>System inventoried and information added to inspection database. (Operations)</li> </ul>	<ul> <li>Develop mailing list for facilities older than 2 years. Note the taxlot owner(s).</li> <li>The number of sites/ addresses will be determined each year.</li> </ul>	<ul> <li>Send notification letter with WQF information in early April. (see Appendix A)</li> </ul>	<ul> <li>Pre-printed forms and maps.</li> <li>Field tools and safety supplies readied.</li> <li>Perform inspection.</li> </ul>	<ul> <li>Complete data entry and download photos daily.</li> <li>Complete an inspection report and if required prepare the Deficiency/Corrective Action List.</li> <li>Send Deficiency/ Corrective Action List and Work Plan (Appendix B) as well as Reporting Form (Appendix A) to owner.</li> <li>Note on MS Calendar that a Work Plan for compliance is expected within 60 days.</li> <li>Send 2nd notice letter if there is no response within 60 days.</li> <li>Send facility to code enforcement under WMC 4.070</li> </ul>			

# Section 3 Public Water Quality Facility

West Linn owns or operates a variety of public structural WQFs, including detention/water quality ponds, pollution control manholes, detention tanks, swales, raingardens, and proprietary water quality treatment devices, i.e. filter systems.

Public WQFs are inspected annually and cleaned and maintained per inspection results. Public WQF inspections and are completed using field inspection sheets (Appendix C) and logged on the City's internal server.

#### 3.1 Inventory and Mapping

All public WQFs and associated drainage areas are mapped on West Linn Maps. New public WQFs are added by the GIS Division of Public Works as they are brought on-line and corrections are made when any discrepancy in mapping is discovered.

#### 3.2 Inspection, Operations and Maintenance Criteria

Routine inspections and/or maintenance of public WQFs varies depending on the type of facility. Maintenance requirements are determined by the inspector based on the condition of the facility at the time of inspection.

Per Appendix C, for each WQF function there are basic description criteria of the condition being assessed. Background information related to inspection needs is documented separately but available for inspector reference. Each inspector will review the inspection criteria and its description so that there is a consistent evaluation of facilities among inspectors.

Detention/water quality ponds (including private ponds for residential areas that are publicly maintained), swales, detention tanks, rain gardens and pollution manholes are inspected annually. They are checked for accumulated sediment and debris, indication of illegal dumping and any structures in need of repair or replacement. Repair and/or maintenance are scheduled as needed, based on inspections. Maintenance performed includes mowing and string trimming, shrub and tree care, leaf removal and trash pick-up and repair to inlet and outlet structures. Specific activities and frequencies are outlined below.

- Public pollution control manholes are inspected annually and cleaned when standing sediment occludes more than 1/3 of the sump depth.
- Public detention tanks are inspected annually and cleaned as required.
- Public proprietary water quality treatment devices (i.e. filter systems) are inspected annually and cleaned in accordance with the manufacturer's recommendations.
- Headwalls are inspected as needed and after any major rain event.
- Off road Manholes are inspected annually.
- Water Quality Stream/Outfall locations are inspected at least twice a year.
- Catch basins are inspected during the dry weather season annually and cleaned if the accumulated sediment gets to a depth of 6 inches.

#### 3.3 Responsibility

Inspections and maintenance is performed by the West Linn ESD. Seasonal employees and contracted landscape maintenance personnel are sometimes employed depending on workload and financial considerations.

## 3.4 Tracking Mechanism

All inspection and maintenance activities are tracked by the ESD of Public Works in the City's computer system on the P drive.

## Appendix A: Private Facility Inspection, Maintenance and Reporting Form



#### **Private Stormwater Facility Inspection, Maintenance & Reporting Form**

#### Complete & Return to:

West Linn Public Works - ESD Private W.Q.F. Management Program 4100 Norfolk Street West Linn, OR 97068 Or Fax to: (503) 657-3237 Or email to: dnorton@westlinnoregon.gov If you have questions call either: Dan Norton (503) 742-6078 or Mike Cardwell (503) 742-8620 (Supervisor)

Facility Site Address:					
Business or Owner Name:					
Mailing Address:					
Phone:	Email:				
Inspector & Title:	Date of Inspection: / / 20				

*Please indicate what types of Stormwater Facilities are present, how many, when* & *what maintenance was performed or if the facility listed is non-applicable or N/A.* 

How many or N/A	Stormwater Facilities	Maintenance Required?		Date & Description of Maintenanc Performed
	*Rain Gardens, Ponds, & Swales (*see back)	No 🔿	Yes 🔿	
	Catch Basins, or Inlets Structures	No 🔿	Yes 🔿	
	Pollution & Sediment Control Manholes	No	Yes 🔿	
	Conveyance Pipes & Ditches (size, length in feet):	No 🔿	Yes 🔿	
	Debris Barriers, Grates, or Racks	No 🔿	Yes 🔿	
	Drywells or French Drains	No 🔿	Yes 🔿	
	Dissipaters, or Outfall Structures	No	Yes 🔿	
	Fencing, Shrubbery Screens, Gates	No	Yes 🔿	
	Proprietary Media Filters <sup>1</sup>	No	Yes 🔿	
	Control Structures & Flow Restrictors	No 🔿	Yes 🔿	
	Underground Detention Systems	No	Yes 🔿	

1. For proprietary or manufactured stormwater technology, please include the model number and manufacturer in the provided maintenance information.

Telephone: (503) 656-6081

# West Linn

Maintenance Indicator	Corrective Action
Clogged catch basin inlets or outlets	Remove sediment and debris from catch basins, trench drains, curb inlets, and pipes to maintain at least 50% conveyance capacity at all times.
Broken inlets or outlets	Repair or replace broken downspouts, curb cuts, standpipes, and screens as needed.
Cracked or exposed drain pipes	Repair/seal cracks. Replace when repair is insufficient. Cover with 6 inches of growing medium to prevent freeze/thaw and UV damage.
Check Dams missing, scattered or with gaps	Maintain rock check dams as per standard details.
Vegetation shall cover 75% of facility	Replant per original planting plan.
Dead or Strained vegetation	Irrigate as needed. Mulch as needed. DO NOT apply fertilizers, herbicides, or pesticides.
Tall grass and vegetation	Prune to allow sight lines and foot traffic. Prune to ensure inlets and outlets freely convey stormwater into and out of facility.
Erosion and or exposed soils	Fill-in and lightly compact areas of erosion with soil mix. Stabilize soils with plants.
Scouring at the inlet(s)	Replace splash blocks or inlet gravel/rock.
Ponding stormwater	Remove the top 2-4 inches of sediment at the end of the downspout extension and replace with soil mix. Rake, till or amend with soil mix to restore infiltration rate.
Slope slippage	Stabilize 3:1 slopes/banks with plantings.

#### Annual Maintenance Schedule

Summer: Make structural repairs. Improve filter medium as needed. Clear drains. Irrigate as needed.

Fall: Replant exposed soil and replace dead plants. Remove sediment and plant debris.

Winter: Monitor infiltration/flow through rates. Clear inlets and outlets/overflows to maintain conveyance.

**Spring:** Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch as needed, but do not block the inlets, outlets, or flow path with mulch.

**Maintenance Records:** All facility operators are required to keep an annual inspection and maintenance log. Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

Access: Maintain ingress/egress to design standards and for city inspectors to be able to inspect the facility.

**Infiltration/Flow Control:** All facilities shall drain within 48 hours. Record time/date, weather, and site conditions when ponding occurs. Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover.

**Pollution Prevention:** All sites shall implement Best Management Practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Record the time/date, weather, and site conditions if site activities contaminate stormwater. Record the time/date and description of corrective action taken.

**Vectors (Mosquitoes and Rodents):** Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control at (503) 655-8394 for immediate assistance to eradicate vectors. Record the time/date, weather, and site conditions when vector activity is observed.

# Appendix B: Private Corrective Maintenance Form and Work Plan

#### Water Quality Facility Deficiency & Corrective Action List

Facility Owner:

Site Address: \_\_\_\_\_

The Water Quality Facilities (WQF) that are listed below were inspected by the City of West Linn's stormwater environmental technician of the Environmental Service Division (ESD) of Public Works. Your facility was designed to meet Water Quality Standards required by Oregon State law and to comply with the City's Municipal Stormwater (MS4) Permit. By properly maintaining your WQF you are protecting water resources by stopping stormwater pollution from entering the local waterways as well as improving the appearance of vegetative types of facilities. The Deficiencies Summary column below indicates the deficiencies that *must* be fixed in order for your WQF to be in compliance. The Corrective Actions column indicates what is needed to correct the deficiencies. Along with this report, you will receive a WQF Work Plan. You are required to fill out the Work Plan and return it to our office within 60 days of receiving it. We are committed to answering your questions, providing technical support and discussing your plans to correct the deficiencies noted in this report. Please contact Dan Norton (stormwater environmental technician) at 503-742-6078 or ESD Supervisor at 503-742-6072 when you need assistance and when work is complete.

WQF Component Name	WQF Address/Location	Tax Lot Number	Inspection Date	Deficiencies Summary	Corrective Actions
				<u> </u>	

Water Quality Fac	ility Work Plan				
Facility Name:					
Site Address:					
Submitted by:	Title:				
Work performed by:					
Work Start Date:	Work End Date:				
These dates are estimated and may change due to weather or immediately at <b>503-742-6078</b> of any changes to this plan. <b>Ch</b>					
Structures have been/ will be cleaned between the dates of_	and				
Water Quality Manhole Outfall Structure Catch Basins Filter Vault Other:	Inlet Structure Closed Detention System Grease Trap Tanks Trash Bins & Oil Receptacles				
Vegetation Management has occurred/ will occur between the	ne dates of				
Pruning of desirable vegetation Other:	Removal of invasive vegetation				
Other issues to be resolved have occurred/ will occur betwee	n the dates of and				
Water Quality Sign to be installed New lock installed on Pond Gate and Ke Catch Basin(s) repaired Litter removed Cigarette Receptacle installed Other:	y given to West Linn ESD				
<ul> <li>Please send in copies of receipts of work completed by contractors.</li> <li>Mail this form back to: West Linn Public Works, 4100 Norfolk St. West Linn, OR 97068</li> <li>or Email form and any correspondence to: dnorton@westlinnoregon.gov</li> <li>Notify the City at 503-742-6078 immediately if any changes to this plan are needed.</li> <li>Notify the City when all work is complete.</li> </ul>					
Signature and Title:	Date:				
Property Manager Notes:					

# Appendix C: Inspection Sheets for Each Type of WQ Facility

Catch Basin Inspection Sheet			Please indic	Please indicate how many catch basins are at this site:		
Drainage		Conditions When Maintenance Is Needed	Check if OK √	Dreferred Conditions and Operations 9	Maintenance Performed & Date it was done	
System Feature	Potential Problem	Inspect catch basin for these conditions:	Circle if needs work	Preferred Conditions and Operations & Maintenance Practices		
		Trash or debris which is located immediately in front of the catch basin opening or is blocking inletting capacity of the basin by more than 10%.		No Trash or debris located immediately in front of catch basin or on grate opening.		
General	Trash and Debris	Trash or debris (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 six inches clearance from the debris surface to the invert of the lowest pipe.		No trash or debris in the catch basin.		
		Trash or debris in any inlet or outlet pipe blocking more than 1/3 of its height.		Inlet and outlet pipes free of trash or debris.		
		Dead animals or vegetation that could generate odors that could cause complaints or dangerous gases (e.g., methane).		No dead animals or vegetation present within the catch basin.		
	Sediment	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.		No sediment in the catch basin.		
	Structure Damage to Frame and /or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch. (The intent is to make sure no material is running into the catch basin.)		Top slab is free of holes and cracks.		
General		Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached.		Frame is sitting flush on the riser rings or top slab and firmly attached.		
		Maintenance person judges that structure is unsound.		Basin replaced or repaired to design standards.		
	Cracks in Basin Wall/bottom	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.		Pipe is re-grouted and secure at basin wall.		

#### Catch Basin Inspection Sheet cont.

Drainage	Deterriel Decklere	Conditions When Maintenance Is Needed	Check if OK √	Preferred Conditions and Operations & Maintenance Practices	Maintenance Performed &
System Feature	Potential Problem	Inspect catch basin for these conditions:	Circle if needs work		Date it was done
	Settlement/	If failure of basin has created a safety, function,		Basin replaced or repaired to design	
	Misalignment	or design problem.		standards.	
		Vegetation growing across and blocking more than 10% of the basin opening.		No vegetation blocking opening to basin.	
General	Vegetation	Vegetation growing in inlet/outlet pipe joints that is more than six inches tall and less than six inches apart.		No vegetation or root growth present.	
	Contaminants & Pollution	Any evidence of oil, gasoline, contaminants or other pollutants (Coordinate removal/cleanup with local water quality response agency).		No contaminants or pollutants present.	
	Cover Not in Place	Cover is missing or only partially in place. Any open catch basin requires maintenance.		Catch basin cover is closed.	
Catch Basin Cover	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch thread.		Mechanism opens with proper tools.	
	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure (Intent is to keep cover from sealing off access to maintenance).		Cover can be removed by one maintenance person.	
Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.		Ladder meets design standards and allows maintenance person safe access.	
Metal grates	Grate opening Unsafe	Grate with opening wider than 7/8 inch.		Grate opening meets design standards.	
(if applicable)	Trash and Debris	Trash and debris that is blocking more than 20 % of grate surface inletting capacity.		Grate is free of trash and debris.	
	Damaged or Missing	Grate missing or broken members of the grate.		Grate is in place and meets design standards.	
Notes:					

Close	ed Detention	Systems (Tanks/Vaults)		Number of Tanks:	
	Potential Problem	Conditions When Maintenance Is Needed Inspect Tank/vault for these conditions:	Check if OK V Circle if needs work	Preferred Conditions and Operations & Maintenance Practices	Maintenance Performed & Date Maintenance Performed
	Plugged Vents	One-half of the cross section of a vent is blocked at any point or the vent is damaged.		Vents open and functioning.	
s	Debris and Sediment	Accumulated sediment depth exceeds 10% of the diameter of the storage area for 1/2 length of storage vault or any point depth exceeds 15% of diameter. (Example: 72 inch storage tank would require cleaning when sediment reaches depth of 7 inches for more than 1/2 length of tank.)		All sediment and debris removed from storage area.	
t o r a	Joints between Tank/pipe Section	Any openings or voids allowing material to be transported in facility. (will require engineering analysis to determine structural stability).		All joint between tank/pipe sections are sealed.	
g e A	Tank Pipe Bent out of shape	Any part of tank/pipe is bent out of shape more is bent out of shape more than 10% of its design shape. (Review required by engineer to determine structural stability).		Tank/pipe repaired or replaced to design.	
r e a	Vault Structure Includes Cracks in Wall,	Cracks wider than 1/2-inch and any evidence of soil particles entering the structure through the crack, or maintenance/inspection personnel determines that the vault is not structurally sound.		Vault replaced or repaired to design specifications and is structurally sound.	
	Bottom, Damage to Frame and/or Top Slab	Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or any evidence of soil particles entering the vault through the walls.		No cracks more than 1/4-inch wide at the joint of the inlet/outlet pipe.	

Closed Detention Systems (	(Tanks/Vaults) cont.
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	Potential Problem	Conditions When Maintenance Is Needed Inspect Tank/vault for these conditions:	Check if OK V Circle if needs work	Preferred Conditions and Operations & Maintenance Practices	Maintenance Performed & Date Maintenance Performed
	Cover Not in Place	Cover is missing or only partially in place. Any open manhole requires maintenance.		Manhole is closed.	
M a n	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread (may not apply to self-locking lids).		Mechanism opens with proper tools.	
h O I e	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. Intent is to keep cover from sealing off access to maintenance.		Cover can be removed and reinstalled by one maintenance person.	
e	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, misalignment, not securely attached to structure wall, rust or cracks.		Ladder meets design standards. Allows maintenance person safe access.	
Note	25:				

Name and Address of Facility:

Porous P	avement Inspect	tion Sheet	Approximate square feet of area:		
Drainage		Conditions When Maintenance Is Needed	Check if OK ✔		Maintenance Performed & Date it was done.
System Feature	Potential Problem	Inspect catch basin for these conditions:	Circle if needs work	Preferred Conditions and Operation & Maintenance Practices	
Structural	Water infiltrates unevenly across surface or ponds in low areas.	Clogged surface.		Water infiltrates evenly across surface; recommend vacuum sweep at least twice per year and power wash annually or as needed; do not use surfactants.	
components	Cracked or moving edge constraints; cracked or settled pavement.	Cracked or moving edge constraints, or cracked or settled pavement that affects overall performance.		Repair all cracks, settlement or other defects that affect performance per manufactures' specifications.	
	Leaf litter deposition on surface.	Leaf litter that could affect stormwater infiltration through pavement.		Sweep leaf litter and sediment to prevent surface clogging and ponding.	
Vegetation	Weeds.	Weeds that cover 10 % of surface area.		Remove weeds by hand, or use a herbicide approved for use around sensitive areas; refer to West Linn's Integrated Pest Management guidance documents.	
Filter medium between pavers	Aggregate loss in pavers from settling and power washing	Settling of pavers or lack of aggregate around pavers.		Reset pavers and replace pore space with aggregate from original design.	
Notes:					·

Baffle Oil &	Water Separator (API Type)	Inspection Date:			
Potential	Conditions When Maintenance Is Needed	Check if OK √	Preferred Conditions and Operation &	Maintenance Performed and Date it	
Problem	Inspect Oil/water Separator for these conditions:	Circle if needs work	Maintenance Practices	was Performed	
Monitoring	Inspection of discharge water for signs of poor water quality (i.e. obvious oil or other contaminants present).		Effluent discharge from vault should be clear without thick visible sheen.		
Sediment Accumulation	Sediment depth in bottom of vault exceeds 6-inches in depth and or visible signs of sediment on plates.		No sediment deposits on vault bottom that would impede flow through the vault and reduce separation efficiency.		
Trash and Debris Accumulation	Trash and debris accumulation in vault, or pipe inlet/outlet, floatables and non-floatables.		Trash and debris removed from vault, and inlet/outlet piping.		
Oil Accumulation	Oil accumulations that exceed 1-inch, at the surface of the water.		Extract oil from vault by vactoring. Disposal in accordance with state and local rules and regulations.		
Damaged Pipes	Inlet or outlet piping damaged or broken and in need of repair.		Pipe repaired or replaced.		
Access Cover Damaged/Not Working	Cover cannot be opened, corrosion/deformation of cover.		Cover repaired to proper working specifications or replaced.		
Baffles	Baffles corroding, cracking, warping and/or showing signs of failure as determined by maintenance/inspection person.		Baffles repaired or replaced to specifications.		
Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks, and misaligned.		Ladder replaced or repaired and meets specification, and is safe to use as determined by inspection personnel.		

Potential Problem	Conditions When Maintenance Is Needed	Check if OK √	Dustanual Canditians and Operation 8	Maintenance Performed and Date it
	Inspect Oil/water Separator for these conditions:	Circle if needs work	Preferred Conditions and Operation & Maintenance Practices	was Performed
	Top slab has holes larger than 2 square inches or cracks wider than 1/4 inch. (Intent is to make sure no material is running into basin).		Top slab is free of holes and cracks.	
Vault Structure Damage -	Frame not sitting flush on top slab, i.e., separation of more than 3/4 inch of the frame from the top slab. Frame not securely attached.		Frame is sitting flush on the riser rings or top slab and firmly attached.	
Includes cracks in walls or bottom. Damage to frame and/or top slab	Maintenance person judges that structure is unsound.		Vault replaced or repairs made so that vault meets design specifications and is structural sound.	
	Grout fillet has separated or cracked wider than 1/2 inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.		Pipe is regrouted and secure at basin wall.	
	Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.		Vault repaired so that no cracks exist wider than 1/4 inch at the joint of the inlet/outlet pipe.	
Notes:				

Coalescing Oil,	/Water Separator Inspection Sheet	Number of O/W Separators:			
Potential	Conditions When Maintenance Is Needed	Check if OK ✔	Preferred Conditions and Operations &	Maintenance Performed &	
Problem	Inspect Oil/water separator for these conditions:	Circle if needs work	Maintenance Practices	Date Performed	
Monitoring	Inspection of discharge water has obvious signs of poor water quality (i.e. Obvious oil or other contaminants present).		Effluent discharge from vault should be clear with no thick visible sheen.		
Sediment Accumulation	Sediment depth in bottom of vault exceeds 6-inches in depth and/or visible signs of sediment on plates		No sediment deposits on vault bottom and plate media, which would impede flow through the vault and reduce separation efficiency.		
Trash and Debris Accumulation	Trash and debris accumulation in vault, or pipe inlet/outlet, floatables and non-floatables.		Trash and debris removed from vault, and inlet/out piping.		
Oil Accumulation	Oil accumulation that exceeds 1 inch at the water surface.		Oil is extracted from vault using vactoring methods. Disposal in accordance of state and local rules and regulations.		
Damaged Coalescing Plates	Plate media broken, deformed, cracked and or showing signs.		A portion of the media pack or the entire plate pack is replaced depending on the severity of failure.		
Damaged Pipes	Inlet or outlet piping damaged or broken and in need of repair.		Pipe repaired or replaced.		
Baffles	Baffles corroding, cracking, warping and/or showing signs of failure as determined by a maintenance/inspection person.		Baffles repaired or replaced to specifications.		
Vault Structure Damage	Cracks wider than 1/2" at the joint of any inlet/outlet pipe or evidence of soil particles entering through the cracks.		Vault repaired so that no cracks exist wider than 1/4" at the joint of the inlet/outlet pipe.		
Access Ladder Damaged	Ladder is corroded or deteriorated, not functioning properly, not securely attached to structure wall, missing rungs, cracks and misaligned.		Latter replaced or repaired and meets specifications, and is safe to use as determined by inspection personnel.		

Detention P	ond Inspection Sheet	Approx. Sq.ft:		
Potential Problem	Conditions when maintenance is needed Inspect Detention Pond for these Conditions:	Check if OK V Circle if needs work	Preferred Conditions and Operation & Maintenance Practices	Maintenance Performed and Date it was Performed
Trash and Debris	Any trash and debris which exceed 5 cubic feet per 1,000 square feet (this is about equal to the amount of trash it would take to fill up one standard size garbage can). In general, there should be no visual evidence of dumping. If less than threshold all trash and debris will be removed as part of next scheduled maintenance.		Trash and debris cleared from site.	
Poisonous Vegetation and Noxious Weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined by State or local regulations. (Apply requirements of adopted IPM policies for the use of herbicides).		No danger of poisonous vegetation where maintenance personnel or the public might normally be. (Coordinate with Public Works Department). Complete eradication of noxious weeds may not be possible. Compliance with State or local eradication policies are required.	
Contaminants & Pollution	Any evidence of oil, gasoline, contaminants or other pollutants.		No contaminants or pollutants present.	
Rodent Holes	Any evidence of rodent holes if facility is acting as a dam or berm, or any evidence of water piping through dam or berm via rodent holes.		Rodents destroyed and dam or berm repaired. Coordinate with Public Works.	
Beaver Dams	Dam results in change or function of the facility.		Facility is returned to design function. (Coordinate trapping of beavers and removal of dams with appropriate permitting agency.)	
Insects	Insects such as wasps and hornets interfere with maintenance activities.		Insects destroyed or removed from site. Apply insecticide in compliance to West Linn Operations Policies.	

#### **Detention Pond Inspection Sheet**

Approx. Sq.ft:

Potential Problem	Conditions when maintenance is needed Inspect Detention Pond for these Conditions:	Check if OK √ Circle if needs work	Preferred Conditions and Operation & Maintenance Practices	Maintenance Performed and Date it was Performed
Tree Growth and Hazard Trees	Tree growth does not allow maintenance access or interferes with maintenance activity (i.e., slope mowing, silt removal, vactoring, or equipment movements). If dead, diseased or dying trees are identified us a certified Arborist to determine health of three or removal requirements.		Trees do not hinder maintenance activities. Harvested trees should be recycled into mulch or other beneficial uses (e.g., alders for firewood). Remove hazard trees	
Erosion of side slopes and pond	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted berm embankment.		Slopes should be stabilized using appropriate erosion control measures(s); e.g. rock reinforcement, planting of grass, compaction. If erosion is occurring on compacted berms a licensed civil engineer should be consulted to resolve source of erosion.	
Storage area Sediment	Accumulated sediment that exceeds 10% of the designed pond depth unless otherwise specified or affects inletting or out letting condition of the facility.		Sediment cleaned out to designed pond shape and depth; pond reseeded if necessary to control erosion.	
Liner (lf Applicable)	Liner is visible and has more than three 1/4-inch holes in it.		Liner repaired or replaced. Liner is fully covered.	
Pond Berms (Dikes) Settlements	Any part of berm which has settled 4 inches lower than the design elevation. If settlement is apparent, measure berm to determine amount of settlement. Settling can be an indication of more severe problems with the berm or outlet works. A licensed civil engineer should be consulted to determine the source of the settlement.		Dike is built back to the design elevation.	

Potential Problem	Conditions when maintenance is needed Inspect Detention Pond for these conditions:	Check if OK √ Circle if needs work	Preferred Conditions and Operation & Maintenance Practices	Maintenance Performed and Date it was Performed
Tree Growth for Emergency Overflow or Spillway and Berms over 4 feet in Height.	Tree growth on emergency spillways creates blockage problems and may cause failure of the berm due to uncontrolled overtopping. Tree growth on berms over 4 feet in height may lead to piping through the berm which could lead to failure of the berm.		Trees should be removed. If root system is small (base less than 4 inches) the root system may be left in place. Otherwise the roots should be removed and the berm restored. A licensed civil engineer should be consulted for proper berm/spillway restoration.	
Pond Piping	Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue. (Recommend a Geotechnical engineer be called in to inspect and evaluate condition and recommend repair of condition).		Piping eliminated. Erosion potential resolved.	
Piping for Emergency Overflow / Spillway & Berms Over 4 ft. in Height	Discernable water flow through pond berm. Ongoing erosion with potential for erosion to continue. (Recommend a Geotechnical engineer be called in to inspect and evaluate condition and recommend repair of condition).		Piping eliminated. Erosion potential resolved.	
Rocks Missing in Emergency Overflow or Spillway	Only one layer of rock exists above native soil in area five square feet or larger, or any exposure of native soil at the top of outflow path of spillway. (Rip-rap on inside slopes need not be replaced).		Rocks and pad depth are restored to design standards.	
Erosion at Emergency Overflow/Spillw ay	Eroded damage over 2 inches deep where cause of damage is still present or where there is potential for continued erosion. Any erosion observed on a compacted berm embankment.		Slopes should be stabilized using appropriate erosion control measures(s); e.g. rock reinforcement, planting of grass, compaction. If erosion is occurring on compacted berms a licensed civil engineer should be consulted to resolve source of erosion.	

Control Structure/Flow Restrictor Inspection Sheet Page 1 of 2					
Drainage	Potential	Conditions When Maintenance Is Needed		Preferred Conditions and Operation &	Maintenance
System Feature	Problem	Inspect Structure for these conditions:	Circle if needs work	Maintenance Practices	Performed & Date it was Performed
	Trash and Debris (includes sediment)	Material exceeds 25% of sump depth or 1 foot below orifice plate.		Control structure orifice is not blocked. All trash and debris removed.	
Conord		Structure is not securely attached to manhole wall.		Structure securely attached to wall and outlet pipe.	
General	Structural Damage	Structure is not in upright position (allow up to 10 % of plumb.		Structure in correct position.	
		Connections to outlet pipe are not watertight and show signs of rust.		Connections to outlet pipe are water tight; structure repaired or designed.	
		Any holesother than designed holesin the structure.		Structure has no holes other than designed holes.	
		Cleanout gate is not watertight or is missing.		Gate is watertight and works as designed.	
Cleanout	Damaged or	Gate cannot be moved up and down by one maintenance person.		Gate moves up and down easily and is watertight.	
Gate	Missing	Chain/rod leading to gate is missing or damaged.		Chain is in place and works as designed.	
		Gate is rusted over 50% of its surface area.		Gate is repaired or replaced to meet design standards.	
Orifice Plate	Damaged or Missing	Control device is not working properly due to missing, out of place or bent orifice plate.		Plate is in place and works as designed.	
	Obstructions	Any trash, debris, sediment, or vegetation blocking the plate.		Plate is free of all obstructions and works as designed.	

Page 2 of 2

Drainage System Feature	Potential Problem	Conditions When Maintenance Is Needed Inspect Structure for these conditions:	Check if OK V Circle if needs work	Preferred Conditions and Operation & Maintenance Practices	Maintenance Performed & Date it was Performed
Overflow Pipe	Obstructions	Any trash or debris blocking (or having the potential of blocking) the overflow pipe.		Pipe is free of all obstructions and works as designed.	
	Cover Not in Place	Cover is missing or only partially in place. Any open manhole requires maintenance.		Manhole is closed.	
	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than 1/2 inch of thread (may not apply to self-locking lids.)		Mechanism opens with proper tools.	
Manhole	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. Intent is to keep cover from sealing off access for maintenance.		Cover can be removed and reinstalled by one maintenance person.	
	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, misalignment, not securely attached to structure wall, rust or cracks		Ladder meets design standards. Allows maintenance person safe access.	
Notes:	Notes:				

Typical Bio-Filtration/Rain Garden Inspection Sheet Inspection Date: Pa					
Potential Problem	Conditions When Maintenance Is Needed Check Rain Garden for these conditions:	Check if OK V Circle if needs work	Preferred Conditions and Operation & Maintenance Practices	Maintenance Performed and Date it was Performed	
Sediment Accumulation on Grass	Sediment depth exceeds 2 inches.		Remove sediment deposits on grass treatment area of the bio-swale. When finished, swale should be level from side to side and drain freely toward outlet. There should be no areas of standing water once inflow has ceased.		
Standing Water	When water stands in the swale between storms and does not drain freely.		Any of the following may apply: remove sediment or trash blockages, improve grade from head to foot of swale, remove clogged check dams, add underdrains or convert to a wet bio filtration swale.		
Flow spreader	Flow spreader uneven or clogged so that flows are not uniformly distributed through entire swale width.		Level the spreader and clean so that flows are apread evenly over entire swale width.		
Constant Baseflow	When small quantities of water continually flow through the swale, even when it has been dry for weeks, and an eroded, muddy channel has formed in the swale bottom.		Add a low-flow pea-gravel drain the length of the swale or by-pass the baseflow around the swale.		
Poor Vegetation Coverage	When grass is sparse or bare or eroded patches occur in more than 10% of the swale bottom.		Determine why grass growth is poor and correct that condition. Replant with plugs of grass from the upper slope: plant in the swale bottom at 8" intervals. Or reseed into loosened fertile soil.		
Vegetation	When the grass becomes excessively tall (greater than 10-inches); when nuisance weeds and other vegetation starts to take over.		Mow vegetation or remove nuisance vegetation so that flow not impeded. Grass should be mowed to a height of 3 to 4 inches. Remove grass clippings.		

Page 2 of 2

Typical Bio-Filtration/Rain Garden Inspection Sheet continued

Potential Problem	Conditions When Maintenance Is Needed Check Rain Garden for these conditions:	Check if OK V Circle if needs work	Preferred Conditions and Operation & Maintenance Practices	Maintenance Performed and Date it was Performed
Excessive Shading	Grass growth is poor because sunlight does not reach swale.		If possible, trim back over-hanging limbs and remove brushy vegetation on adjacent slopes.	
Inlet/Outlet	Inlet/outlet areas clogged with sediment and/or debris		Remove material so that there is no clogging or blockage in the inlet and outlet area.	
Trash and Debris Accumulation	Trash and debris accumulated in the bio-swale.		Remove trash and debris from bioswale.	
Erosion/Scouring	Eroded or scoured swale bottom due to flow channelization or higher flows		For ruts or bare areas less than 12 inches wide, repair the damaged area by filling with crushed gravel. If bare areas are large, generally greater than 12" wide, the swale should be regraded and reseeded. For smaller bare areas, over seed when bare spots are evident, or take plugs of grass from the upper slope and plant in the swale bottom at 4 inch intervals.	
Notes:		•		

StormFilter <sup>®</sup> Inspection Sheet						
Model Number:						
# of Cartridges			Cartridge Filtration Rate			
Drainage System Feature	Potential Problem	Conditions When Maintenance Is Needed	Check if OK V Circle if needs work ()	Results Expected When Maintenance Is Performed Or Not Needed	Maintenance Performed & Date it was Performed.	
Fore bay	Sediment Accumilation	Sediment accumulation exceeds 6 inches or 1/3		Sediment accumulation less than 6 inches.		
	Sediment	Sediment depth exceeds 0.25-inches on top of		No sediment deposits on top of cartridges.		
	Accumulation	filter cartridges.		Sediment on cartridges likely indicates that		
	on Top of			cartridges are plugged and require maintenance.		
	Filter			No sediment deposits which would impede		
	Cartridges.			permeability of the compost media.		
	Sediment	Sediment depth exceeds 4		Sediment in vault should be removed.		
	Accumulation	inches in first chamber. Look for other		Cartridges should be checked and replaced or serviced		
		indicators of clogged		as needed. No sediment deposits in vault		
Media •	in Vault	cartridges or overflow.		bottom of first chamber.		
	Trash and Floatable	Trash and floatable debris				
	Debris Accumulation	accumulated in vault.		No trash or floatable debris in filter vault.		
	Sediment in	When drain pipes, clean- outs, become full with		Sediment and debris removed.		
	Drain Pipes/Clean-	sediment and/or debris.				
	Outs					

	StormFilter <sup>®</sup> Inspection Sheet					
Model						
Number: # of Cartridges			Cartridge Filtration Rate			
Drainage System Feature	Potential Problem	Conditions When Maintenance Is Needed	Check if OK √ Circle if needs work ◯	Results Expected When Maintenance Is Performed Or Not Needed	Maintenance Performed & Date it was Performed.	
	Damaged	Any part of the pipes that are crushed or		Pipe repaired and/or replaced.		
	Pipes	damaged due to corrosion and/or settlement.				
	Access	Cover cannot be opened; one person cannot		Cover repaired to proper working specifications		
	Damaged/Not	open the cover using normal lifting pressure,		or replaced.		
	Working	corrosion/deformation of cover.				
	Vault	Cracks wider than 1/2-inch or evidence of soil		Vault replaced or repairs made so that vault		
	Structure	particles entering the structure through the cracks, or		meets design specifications and is structurally		
	Includes	maintenance/inspection personnel		sound.		
	Cracks in	determine that the vault is not structurally sound.				
	Wall, Bottom, Damage to Frame and/or					
	Top Slab	Cracks wider than 1/2-inch at the joint of any inlet/outlet pipe or evidence of soil particles		Vault repaired so that no cracks exist wider than 1/4-inch at the joint of the inlet/outlet pipe.		
		entering through the cracks.				
	Baffles	Baffles corroding, cracking warping, and/or		Baffles repaired or replaced to specifications.		

	StormFilter <sup>®</sup> Inspection Sheet					
Model Number:						
# of Cartridges			Cartridge Filtration Rate			
Drainage System Feature	Potential Problem	Conditions When Maintenance Is Needed	Check if OK √ Circle if needs work ◯	Results Expected When Maintenance Is Performed Or Not Needed	Maintenance Performed & Date it was Performed.	
		showing signs of failure as determined by maintenance/inspection person.				
	Access	Ladder is corroded or deteriorated, not		Ladder replaced or repaired and meets		
	Ladder	functioning properly, not securely attached to		specifications, and is safe to use as determined		
	Damaged	structure wall, missing rungs, cracks, and misaligned.		by inspection personnel.		
Below	Compost	Drawdown of water through the media takes		Media cartridges replaced.		
Ground Cartridge	Media	longer than 1 hour, and/or overflow occurs frequently.				
Туре	Short	Flows do not properly enter filter cartridges.		Filter cartridges replaced.		
	Circuiting					
	Filter	Filter vault does not drain within 24 hours		Filter media checked and replaced if needed. If		
	cartridges	following storm. Look for evidence of		cartridges are plugged with oil, additional		
	Submerged.	submergence due to backwater or excessive hydrocarbon loading.		treatment or source control BMP may be needed.		

	StormFilter <sup>®</sup> Inspection Sheet					
Model Number:						
# of Cartridges			Cartridge Filtration Rate			
Drainage System Feature	Potential Problem	Conditions When Maintenance Is Needed	Check if OK √ Circle if needs work ◯	Results Expected When Maintenance Is Performed Or Not Needed	Maintenance Performed & Date it was Performed.	