



Sustainable Action Plan Stormwater Management Plan

2019

Facilities Services and Design and Construction
Contact: Phil Carroll, Sarah Follett



Executive Summary

The University of Oregon owns and maintains a significant stormwater management system across campus. The system includes over 49 miles of stormwater pipe and over 4400 stormwater structures. This document describes the university's stormwater facilities, records management, and maintenance practices.

Background

Stormwater management at the University of Oregon is driven by compliance with City of Eugene development code and regulations and the university's goal of protecting water quality in our watershed as outlined in the Operations and Maintenance portion of the university's [Comprehensive Environmental Policy](#). The University of Oregon's main campus falls under the jurisdiction of the City of Eugene's municipal stormwater discharge permit. This plan details management that fulfills the goals of both the City of Eugene requirements and related areas of the UO's Comprehensive Environmental Policy. The Facilities Services unit of Campus Planning and Facilities Management (CPFM) maintains this plan.

City of Eugene Stormwater Standards

The City of Eugene's [Stormwater Master Plan](#) identifies conveyance systems within the city that may be deficient and requirements for meeting certain stormwater flow control standards. The City of Eugene's development code and stormwater management manual dictate stormwater treatment requirements. The university registers any stormwater treatment facilities installed as part of a building with the city and they must receive regular maintenance and inspection. See Appendix A for the City of Eugene's development code and standards related to stormwater.

University of Oregon Comprehensive Environmental Policy

The University of Oregon first established the comprehensive environmental policy (CEP) in 1997 and updated the policy in 2011. The CEP includes seven guiding principles, with a mandate to create implementation plans for each principle. The Stormwater Management Plan addresses a portion of principle 2 – Operations and Maintenance: The university will implement conservation and efficiency strategies that reduce consumption of energy, water, and other resources without compromising high quality learning environments.

Plan Objectives

The primary focus of this stormwater management plan is to define maintenance practices. Effective maintenance begins with having a clear understanding of our stormwater system and facilities, and of how they function. Effective maintenance also identifies and tracks elements in need of improvement. This plan breaks this pathway down into the following objectives:

- Understanding existing conditions,
- Maintaining accurate maps and records,
- Defining inspection and maintenance practices (to stay in compliance with city reporting),
- Identifying deficiencies and opportunities for improvement.

Existing Conditions on Campus

The main campus of the University of Oregon in Eugene spans approximately 309 acres in the Willamette River watershed. Of those 309 acres, building rooftops make up roughly 75 acres, other impervious surfaces 94 acres, and pervious surfaces the remaining 140 acres.

Stormwater Outfalls

Approximately 80% of the stormwater runoff from campus discharges into the Millrace. The Millrace is owned by the university as it transverses university property. As it leaves the university campus on the west side, its ownership changes to the City of Eugene and adjacent private property owners. There are several outfalls from the university into the Millrace, some of which the university owns, while the city owns and maintains others. The City of Eugene's Stormwater Master Plan does not indicate any conveyance deficiencies from campus to the Millrace.

Approximately 10% of the stormwater runoff from the main campus discharges into Amazon Creek through the city's piped infrastructure. See Appendix B for basin mapping.

Treatment

The University of Oregon has over 20 building sites with city-registered, vegetated stormwater treatment facilities. This number is increasing each year as the university builds new structures on campus. The number of individual stormwater treatment facilities on a building site varies, based on design decisions made during the planning phase of each site.

In addition to stormwater treatment facilities registered with the city, the university has several other facilities that intend to treat stormwater but may or may not meet city standards. These facilities were designed and installed out of a desire to improve stormwater treatment on campus, but are not held to the same inspection and maintenance standards as those registered with the city.

Both the city and the university prioritize vegetated stormwater treatment facilities over mechanical treatment. However, where building sites are constrained for space the university uses mechanical treatment. The university has eight mechanical stormwater treatment facilities.

A stormwater treatment facility map showing all the facilities mentioned above is included in Appendix B.

Conveyance

The university owns and maintains an extensive conveyance system. The age and condition of the system varies greatly across campus. In older portions of campus, there are clay drainage tiles while everything built in the last 15 years is PVC piping.

CPFM maintains GIS mapping of the university's stormwater conveyance system.

Maps and Records

Record Keeping

Design documents, maintenance manuals and logs, stormwater reports, and any other relevant management information are the responsibility of the Environmental Services division within the Facilities Services department and the Design and Construction department.

Mapping

The university maps its stormwater facilities on Campus GIS. The Engineering and Utilities group within the Design and Construction department will be responsible for maintaining accurate maps of stormwater conveyance and treatment infrastructure on campus. We will use as-built maps from newly completed

projects and stormwater reports to edit the GIS mapping database. Mapping is a crucial piece of our improved record-keeping processes.

Maintenance Procedures

Stormwater System

Regular inspections are the foundation of maintaining campus stormwater facilities to ensure proper flow, treatment, and storage. The inspection process identifies shortcomings that then become corrective work orders. To maintain this foundation, the relevant teams perform the following inspections and maintenance actions on a consistent and effective schedule:

Annually: Engineered below-ground facilities ('stormwater quality manholes') that have been installed to meet water quality and flow control standards. University staff generally clean and inspect these facilities prior to the wet season.

Annually: Catch basins on campus are also cleaned and inspected. Sediment from water quality manholes and catch basins is disposed of in accordance with guidelines.

Twice annually: Vegetated facilities are inspected twice per year, once in the summer and once in the wet season. The form used to record the findings is in Appendix C. As well, university staff clean and weed vegetated facilities on an on-going basis alongside the rest of the campus landscape, but targeted inspections ensure that we remove sediment, vegetation meets minimum coverage requirements, inlets and overflows are clear, and erosion is monitored.

Additional maintenance activities include:

- Regular sweeping of streets and parking lots;
- Trash and litter removal from curbs, drains, and streamsides;
- Camera analysis of pipes on a rotating basis;
- Leaf collection.

As relevant, we will make amendments to this schedule and related tasks to ensure efficient and effective stormwater management.

General Landscape Maintenance

Programs and procedures that minimize the application of chemicals guide landscape and pavement maintenance practices campus-wide. These programs and practices limit the amount of chemicals that may run off in storm events or that may enter the groundwater to emerge further downstream in the Millrace or Willamette River.

Pesticide applications comply with our [Integrated Pest Management plan \(IPM\)](#). The IPM plan identifies evaluative and corrective steps to manage landscape pests, with chemical control being only one of several options. [Environmental Health and Safety](#) reviews and approves chemicals used on campus, including pesticides, for both environmental and health impact. Any pesticides applied on campus comply with procedures that ensure safety and the minimum amount of chemical used to achieve a desired result. The university applies fertilizers on campus on an as-needed basis, rather than according to a pre-set schedule. Therefore, we apply nitrogen, minerals, and inert ingredients at the lowest possible level based on

particular circumstances while maintaining the landscape for plant health and the safety and utility of campus users.

To manage pavement snow and ice clearance, we primarily use mechanical means such as sweeping and sanding. During ice accumulation events, the university applies de-icer in formulations and amounts that have the least potential for harm to the landscape and groundwater while maintaining safe passage through campus.

Identifying Deficiencies and Opportunities for Improvement

As the university both develops new projects on campus that add stormwater facilities to the system and continues to maintain the existing storm system, we can also begin to identify deficiencies and opportunities for capital improvements.

Capital Improvements

As with any significant stormwater system, we must replace broken or old pipe runs and address drainage problems with capital improvement projects. Staff identify and group these projects into four categories: routine maintenance, apparent issues such as flooding or ponding, age and condition, and significant upgrades to the main conveyance system. Campus Planning and Facilities Management (CPFM) then prioritizes these projects based on impacts to campus operations, potential damage to existing campus structures and grounds, and availability of funding. Facilities Services implements corrective actions and Design and Construction handles projects done outside of general maintenance.

Opportunities Assessments

Areas of campus developed prior to city stormwater treatment requirements may provide opportunities to increase stormwater treatment on campus. These areas have little or no stormwater treatment. Stormwater treatment for impervious areas such as parking lots, streets, and access roads would likely provide the most impactful results. CPFM will maintain a short list of these areas and their stormwater treatment feasibility. Identifying and maintaining a list of these opportunities is the first step to strategically determining when to address them. Funding to make these improvements may come from several budget areas and will be determined based on the current or immediate needs of the university.

Appendices

Appendix A

- City of Eugene [Stormwater Basin Master Plan](#)
- City of Eugene Development Code, [Chapter 9 – “land use”](#)
- [University of Oregon Design Standards](#)

Appendix B

- Basin Mapping
- Stormwater Treatment Facilities - Examples

Appendix C

Inspection Log Template

Stormwater Treatment Facility Inspection Checklist

Facility Location: _____

Inspection Date: _____ Time: _____ Inspected by: _____

Facility Type: _____ Current Weather: _____

Approximate Date/Time of Last Significant Rainfall: _____

Inspection Items	Yes / No and/or Amount	Notes & Action Needed
<i>Ponding and Water Quality</i>		
Standing water?	Yes: _____ (in.) / No	
Oil sheen present?	Yes / No	
Noticeable odors?	Yes / No	
<i>Sediment Accumulation and Erosion</i>		
Over 1" sediment throughout facility?	Yes / No	
Sediment level at inlets:	(in.)	
Channeling present?	Yes / No	
Animal burrows/other holes?	Yes / No	
Steep slopes?	Yes / No	
Other erosion issues?	Yes: _____ / No	
<i>Vegetation Conditions</i>		
Wanted-vegetation coverage:	%	
Dead plants?	Yes: _____ (amount) / No	
Weeds present?	High / Medium / Low / None	
Grasses height: (if applicable)	(in.)	
Insect damage?	High / Medium / Low / None	
Plants trampled?	High / Medium / Low / None	
Plant debris (leaves, etc.)?	High / Medium / Low / None	
Trash present?	High / Medium / Low / None	
Pruning required?	Yes / No	
Mulch level:	(in.)	
<i>Hardscaping Conditions</i>		
Overflow drain blocked?	Yes / No	
Inlets blocked?	Yes / No	
Facility accessible?	Yes / No	

Damage to planter walls?	Yes: _____ / No
--------------------------	-----------------

Any other notable concerns?

Actions to take:	Complete by: