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UNIVERSITY OF MONTANA

STORM WATER MANAGEMENT PROGRAM

Permit Number: MTR040012

Permit Years: 2017–2021

Updated: February 2021

University of Montana • 32 Campus Drive • Missoula, Montana 59812

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List of Abbreviations

ARM	Administrative Rules of Montana
BMP	Best Management Practice
Campus	University of Montana Mountain Campus
CFC	College of Forestry & Conservation
City	City of Missoula
CMMS	Computerized Maintenance Management System
CWA	Clean Water Act
DEQ	Montana Department of Environmental Quality
EPA	Environmental Protection Agency
ERP	Enforcement Response Plan
IDDE	Illicit Discharge Detection and Elimination
LEED	Leadership in Energy and Environmental Design
LID	Low-impact Development
MCM	Minimum Control Measure
MOU	Memorandum of Understanding
MPDES	Montana Pollutant Discharge Elimination System
MS4	Municipal Separate Storm Sewer System
SOP	Standard Operating Procedure
SWMP	Storm Water Management Program
SWMT	Storm Water Management Team
Team	Storm Water Management Team
TMDL	Total Maximum Daily Load
UM	University of Montana
WLA	Waste Load Allocation
WQD	Missoula Valley Water Quality District

1 INTRODUCTION

1.1 MS4 Program Purpose and Background

Storm water runoff can contain a variety of pollutants such as sediment, nutrients, chlorides, pathogens, metals, and trash. This is especially true in urban settings given the extent of impervious surfaces that can increase the rate and volume of storm water flow from the landscape. If not properly managed, storm water runoff in urban areas can result in increased pollution and degradation of receiving waterbodies.

Storm water management and conveyance systems in urban areas include features such as storm sewers, roads with drainage systems, gutters, ditches, catch basins, and man-made channels. These systems are collectively referred to as *municipal separate storm sewer systems* (MS4s). MS4s can consist of, but are not limited to cities, military bases, universities, large hospitals or prison complexes, and highways. In an effort to protect Waters of the United States, storm water discharges from MS4s are subject to regulation under the Clean Water Act (CWA).

The University of Montana's (UM or University) storm drainage system is considered an MS4 and is therefore subject to MS4 regulations and permitting requirements under the CWA. The General Permit for Storm Water Discharges Associated with Small MS4's, Permit Number MTR040000 (General Permit) regulates Montana's MS4s. The General Permit is administered by the Montana Department of Environmental Quality (DEQ) under the Montana Pollutant Discharge Elimination System (MPDES) Program. The General Permit requires MS4s to develop, document, and maintain a Storm Water Management Program (SWMP) which includes management practices, control techniques, systems, designs, good standard engineering practices, and such other provisions necessary to reduce the discharge of pollutants from the permitted Small MS4 to the maximum extent practicable.

This SWMP describes the UM's MS4 compliance program, which is being developed and implemented to reduce the discharge of pollutants from the MS4 and comply with the requirements of the General Permit.

1.2 SWMP Development Status

On December 10 and 11, 2019, DEQ conducted an inspection of UM's SWMP to assess compliance with the General Permit. On February 6, 2020, DEQ issued a violation letter and attendant report to document the findings from the inspection, which included violations in several sections of the General Permit.

In response to DEQ's letter, UM developed a compliance schedule to address each violation and agreed to develop an updated and comprehensive SWMP (this submittal) to include a plan and schedule for addressing all General Permit requirements over the remainder of the permit term. A progress update is provided in Section 8. This SWMP document will be updated and submitted with each future annual report to document progress.

1.3 MS4 Permit Regulated Area and Receiving Waterbodies

The UM is located within the City of Missoula (City), which is a designated MS4-regulated area. UM serves a population of approximately 13,000 people when school is in session, with annual enrollment of over 10,000 students. UM's MS4-regulated area is the Mountain Campus, which consists of approximately 156

acres of urbanized area south of the Clark Fork River. A map of UM's MS4-regulated area is provided in **Figure 1**. References to the "Campus" in the remainder of this document refer to the Mountain Campus.

Approximately 65 of the 156 acres within the Campus generates storm water runoff that discharges to the Clark Fork River, the UM's only receiving waterbody, through two outfalls; the remaining 90 acres and associated storm water runoff is managed through dry wells. Land use in UM's MS4-regulated area consists of sporting fields, green space, parking lots, student housing, buildings for administration, maintenance, food services, and the different colleges. Collectively, there are over 60 buildings and a football stadium within UM's MS4-regulated area. Associated activities that occur within the Campus include student activities and projects, community activities, sporting events, and support services.

As a public institution, UM is considered a non-traditional MS4 (Montana Department of Environmental Quality, February 6, 2020).

2 STORM WATER MANAGEMENT TEAM

2.1 Storm Water Management Team Members and Responsibilities

UM's storm water management team (SWMT, or Team), primarily composed of staff members from the Facilities Services department, is responsible for development and implementation of the SWMP. Members of the SWMT are identified in the organizational chart provided in **Figure 2**.

The five team members identified in the organizational chart complete the majority of the minimum control measure (MCM) related-work, reporting, and planning; however, UM recognizes that storm water management and pollution prevention requires assistance from a larger group of team members. For example, the SWMT routinely coordinates with additional Facilities Services staff members to assist with storm water management activities as needed (e.g., Custodial, Labor and Grounds Maintenance personnel who maintain interior and exterior facilities on Campus).

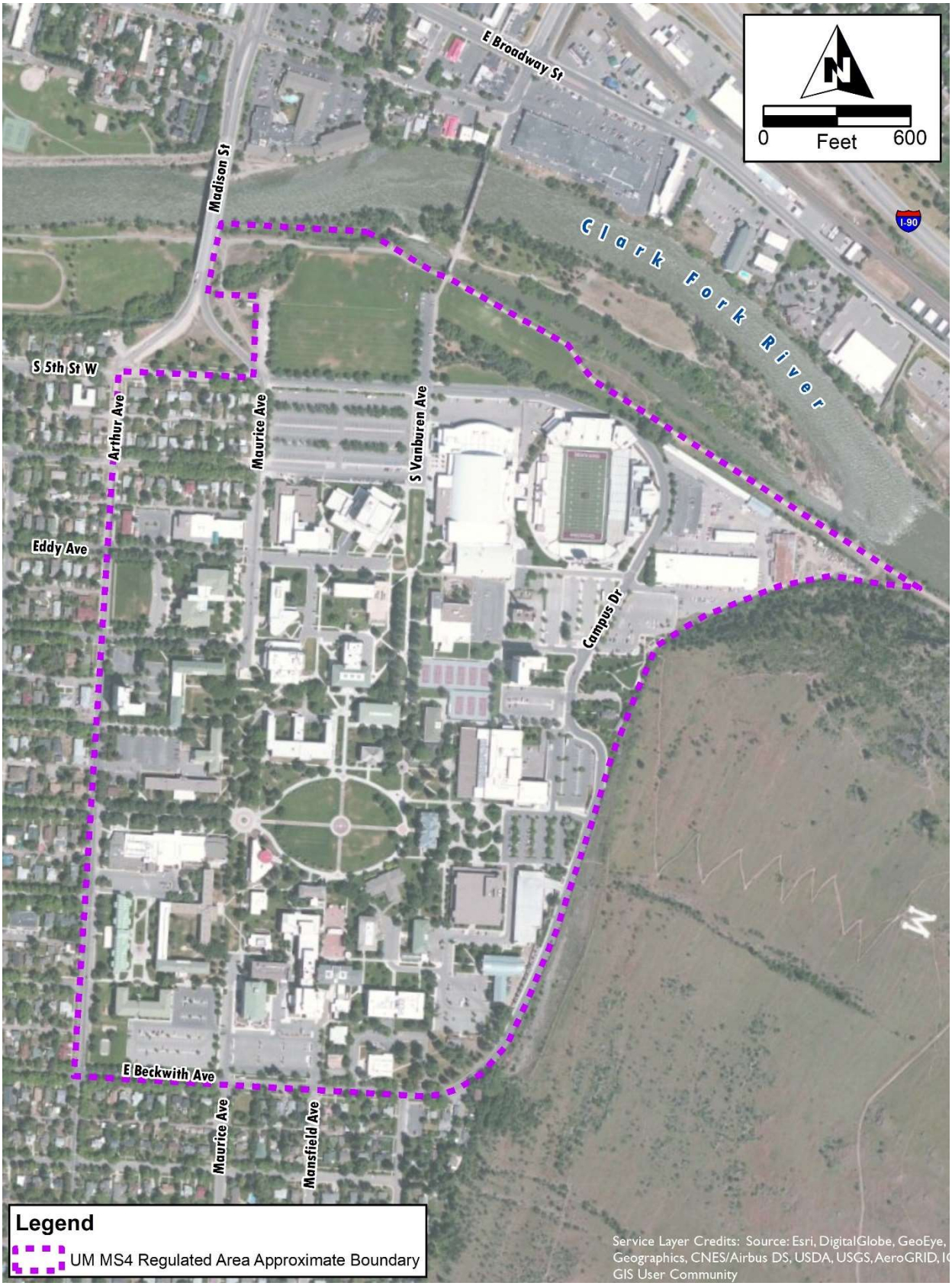


Figure 1. UM MS4-Regulated Area

Figure 2. SWMT Organizational Chart[1]

[1] *Note: UM would like to include an Industrial Hygienist as a member of the SWMT. The UM Industrial Hygienist position has yet to be filled.*

2.2 SWMP Team Communication

The SWMT communicates regularly to facilitate implementation of the SWMP and to work towards compliance with the General Permit. Formal mechanisms of communication used by the Team are as follows:

- Weekly SWMT meetings. An agenda is developed prior to each meeting to facilitate a productive meeting and verify that the SWMT is working towards compliance with the General Permit. Meeting notes are also developed and distributed to the SWMT to document meeting discussions, decisions, and action items.
- Quarterly stakeholder meetings with members from diverse sectors of Campus and the community, including faculty, students, sustainability representatives, City of Missoula, and Missoula County. These meetings provide opportunities for some target audiences (faculty and staff) to participate in the development and implementation of the SWMP.
- Direct communication between Team members via emails, phone calls, text messages, and additional meetings.
- Use of a shared Box folder for SWMT members (Box is a cloud-based file sharing system). The folder contains SWMP information. The root folder structure has the following sub-folders:
  - Agreements
  - Annual Reports
  - DEQ Audit
  - DEQ Submittals
  - Edited Responses
  - Example Plans
  - Forms
  - Monitoring
  - NewFields
  - Photos
  - Presentations
  - Stormwater Docs for Legal Review
  - Supporting Docs
  - SWMP Document
  - SWMT Communications
  - Training
  - WGM

  Additional folders will be added if necessary, in the future.

3 MINIMUM CONTROL MEASURE PROGRAM

The General Permit requires development, implementation, and management of best management practices (BMPs) in accordance with six MCMs:

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination

4. Construction Site Storm Water Management
5. Post-Construction Site Storm Water Management in New and Redevelopment
6. Pollution Prevention/Good Housekeeping for Permittee Operations

The following sections provide a description of each MCM along with the completed, ongoing, and planned activities associated with implementation of the SWMP.

3.1 Public Education and Outreach & Public Involvement and Participation (MCM 1 & 2)

Public education and outreach are required by Part II.A.1 of the General Permit, and public involvement and participation are required by Part II.A.2. These measures aim to raise awareness about potential pollutants within storm water discharges, educate and involve key audiences, and involve the public in development and implementation of the SWMP. Education and outreach activities are used to encourage audiences to change behaviors and reduce pollution within the MS4. Public involvement helps foster public support for the SWMP, which in turn increases the success of BMPs. This section describes the University's public education, outreach, involvement, and participation program.

3.1.1 Target Audiences

Part II.A.1.a.i of the General Permit requires an evaluation to determine common sources of illicit discharges, spills, and dumping. The SWMT conducted an evaluation in 2017 and concluded that there are no activities and behaviors on Campus that are *common* sources of illicit discharges, spills, and dumping; however, the SWMT does acknowledge that there are daily activities occurring on Campus which could result in intermittent illicit discharges, spills, and dumping. Key target audiences have been identified based on these activities and other factors, each of which are described in **Table 1**.

Table 1. Key Target Audiences

Key Target Audience	Description	Rationale	Potential Pollutants
Students – Focus on College of Forestry & Conservation (CFC) Students for this Permit Cycle [a]	UM students in the CFC program	▪ While CFC students are not likely associated with illegal discharges and improper disposal of waste to the MS4, they are interested in environmental issues and especially ground water management and infiltration concepts and could help with SWMP implementation ▪ These students could pursue careers in the ground water field and could benefit the future of storm water management from knowing more about the MS4 program and storm water pollution prevention via infiltration	Not applicable

Key Target Audience	Description	Rationale	Potential Pollutants
Facilities Services Staff	Employees of UM Facilities Services	▪ Facilities Services staff have access to and use fertilizers and chemicals that may be spread on Campus grounds in typical grounds-keeping tasks ▪ Smaller category of Campus users who mostly commute by motor vehicles	Fertilizers (nutrients), pesticides, herbicides, metals, deicer and winter traction materials, and vehicle fluids[b]
Faculty and Staff	UM educators, researchers, and scholars who work on Campus	▪ Large contingent of Campus users ▪ Most commute by motor vehicles	Vehicle fluids[b]
Visitors	Visitors to Campus or Missoula residents who use Campus grounds for recreational activities	▪ Visitors may travel to Campus by motor vehicles ▪ Visitors with pets may leave pet waste that could contribute to pollution within storm water runoff ▪ Visitors may leave other debris on Campus, especially during special events	Vehicle fluids[b], trash and debris, pet waste

[a] The SWMT will focus on CFC students during this permit cycle (as opposed to all students) because we believe successful engagement of a focused group of CFC students could provide significant assistance with implementation of the SWMP. The UM student group at-large was determined to be too large of a population to include as a key target audience at this time. The Geography and Geosciences Department has also expressed interest in potential student learning opportunities, such as the design of infiltration gardens. The SWMT will further explore these options with faculty from the department throughout 2021.

[b] Vehicle fluids include antifreeze, windshield washing fluid, brake fluid, motor and transmission oil, and gasoline.

3.1.2 Outreach Strategies and Activities

Outreach strategies and planned activities for each key target audience are presented below. The SWMT will evaluate these approaches at the end of 2021 when considering future strategies going into the next permit cycle. Previous outreach activities that UM has implemented are listed in **Table 2**.

- **College of Forestry and Conservation (CFC) Students**
  - **Strategy and Distribution Channels:** The SWMT believes there is an opportunity to involve CFC students in the development and implementation of the SWMP over the coming years to help understand and implement infiltration options across campus. The initial outreach strategy is to pursue a relationship with the CFC professors and offer instructive real-world opportunities for students, such as developing an understanding of storm water pollution prevention and providing opportunities for students to participate in implementation of storm water management activities. The methods of student engagement will be field mapping, infiltration testing, design, data analysis, and constructive input to design and implementation of storm water management solutions.

- **Planned Activities for 2021:**
  - Contact the professors (Anna Klene, Kevin McManigal, Payton Gardner, Kelsey Jencso) to request an opportunity to discuss UM's SWMP.
  - Conduct a student service day during the Fall 2021 semester to re-stencil storm drain inlets.
  - Coordinate with the professors to develop a student engagement and involvement plan and schedule that could include classroom presentations, development of a SWMP engagement group, and exploring opportunities for including storm water management curriculum in CFC classes.
  - Initiate implementation of the student engagement and involvement plan.

- **Facilities Services Staff**
  - **Strategy and Distribution Channels:** The SWMT will educate the facilities services staff about the potential for contributing pollution to the MS4 and Clark Fork River associated with Campus operations and maintenance activities and will train the staff on BMPs to be employed to reduce the potential for pollution. Education and training will primarily be conducted through use of storm water pollution prevention standard operating procedures (SOPs) and training sessions.
  - **Planned Activities for 2021:**
    - Conduct quarterly storm water awareness trainings.
    - Develop and implement storm water pollution prevention SOPs.
    - Conduct trainings on SOPs developed in 2021.

- **Faculty and Staff**
  - **Strategy and Distribution Channels:** Faculty and staff are educated about the storm water pollution prevention through virtual and/or in person presentations and writing publications. Faculty and staff will be invited to attend quarterly stakeholder meetings if they are interested in development and implementation of the SWMP. The SWMT will also point faculty and staff to the storm water website to submit comments or request inclusion in development of the SWMP.
  - **Planned Activities for 2021:**
    - Publish article in UM Today newsletter in February.
    - Post storm water educational content on Instagram throughout the year.
    - Include storm water awareness in sustainability presentations to Faculty and Staff Senates. Solicit input during the presentation and encourage interested faculty and staff to attend quarterly stakeholder meetings.

- **Visitors**
  - **Strategy and Distribution Channels:** Visitors are mostly transient guests with little opportunity for active engagement; however, there are visitors who routinely cross Campus to exercise, many with their pets. Maintaining pet stations, aquifer notifications on parking signs, and sidewalk stenciling will provide pollution prevention educational opportunities.
  - **Planned Activities for 2021:**
    - Ongoing maintenance of UM's four pet wastes stations

- Re-stenciling storm drain inlets will be conducted as a student service day activity for Fall semester, 2021.

Table 2: Previously Implemented Outreach Activities

Outreach Strategy	Description	Target Audience(s)	Date Implemented	Distribution Channel
Presentation at Staff Senate	Discussed MS4 permit and storm system. Showed examples of turbid construction runoff.	Staff	April 11, 2018	In-person presentation
Presentation at Student Senate	Same as above	Students	April 25, 2018	In-person presentation
Presentations in Classrooms	Gave above presentation in *Energy and Climate* and *Environmental Science* courses	Students, faculty	Fall 2018 (2 presentations)	In-person presentation
Public Notices	Stenciling to educate Campus visitors	Visitors	Annually during Fall semester	Visual educational notices
Trainings	SWMP trainings	Facilities Services staff	2017 Storm Water Training 2020 Storm Water Training	In-person training
Website	UM Storm Water Website (see *Section 3.1.3*)	Students, faculty, staff, visitors	Updated annually	Online

3.1.3 Storm Water Website

In accordance with Part II.A.1.a.ii and II.A.1.b, UM maintains a designated storm water website that can be accessed by target audiences, the general public, and any interested stakeholders. The website includes the following:

- Summary of UM storm water BMPs
- Summary of potential storm water pollutants
- Procedures for reporting illicit discharges and construction site concerns
- Contact information for Facilities Services
- Copy of the General Permit
- UM's General Permit application
- Link to Montana DEQ's storm water website

- Link to EPA's storm water website
- UM's MS4 Annual Reports
- Outreach event information
- The updated SWMP
- Solicitations for input from key target audiences, interested stakeholders, and the general public
- Outreach materials and messages that promote the benefits of non-polluting behaviors
- Information on how to identify illicit discharges
- Summary of requirements for covered construction activities
- Link to UM's Environmental Health website.

The address is http://www.umt.edu/facilities/Energy%20and%20Utilities/Storm%20Water%20.php.

3.2 Illicit Discharge Detection and Elimination (MCM 3)

Storm water conveyance systems often receive discharges from non-storm water sources that pollute receiving waterbodies (i.e., illicit discharges[2]). Example sources of these discharges include, but are not limited to landscaping waste, irrigation runoff, vehicle fluids, pet waste, and sewage. In accordance with part II.A.3 of the General Permit, the University is required to develop and implement a program to detect and eliminate illicit discharges. This section describes UM's current illicit discharge detection and elimination (IDDE) program.

3.2.1 IDDE Program Development and Implementation Summary

The SWMT has separated the General Permit's IDDE requirements into two categories: (1) non-regulatory-related requirements, and (2) regulatory-related requirements. Non-regulatory related requirements are internal program development and management activities that can be implemented by the SWMT without development of regulatory mechanisms, policies, or procedures; whereas regulatory-related requirements require development of regulatory mechanisms, policies, or procedures to implement. A summary of the General Permit's categorized IDDE requirements is presented below:

Non-Regulatory-Related Requirements

- Evaluate non-storm water discharges
- Place controls on significant non-storm water discharges
- Develop storm sewer inventory and associated map
- Inspect and screen outfalls
- Identify high priority outfalls
- Document IDDE investigations

Regulatory-Related Requirements

- Prohibit illicit discharges
- Partner with neighboring MS4(s)
- Develop and implement IDDE enforcement response plan (ERP)
- Develop and implement IDDE Investigation and Corrective Action Plan

[2] Per Administrative Rules of Montana (ARM) 17.30.1102, an illicit discharge is any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to an MPDES permit (other than the MPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from firefighting activities.

The SWMT's strategies for development and implementation of the non-regulatory related requirements are discussed in detail in *Sections 3.2.2* through *3.2.4*, below. The SWMT is in the midst of conducting investigations and considering strategies for compliance with the IDDE regulatory-related requirements; a brief description of potential strategies is provided in *Section 3.2.5*.

3.2.2 Non-Storm Water Discharge Evaluations

Part II.A.3.a.i of the General Permit requires UM to annually evaluate whether the allowable non-storm water discharges or flows (as identified in ARM 17.30.1111(6)(c)(iii)) are significant contributors of pollutants to the MS4, and identify occasional incidental non-stormwater discharges that will not be addressed as illicit discharges.

The SWMT conducted these evaluations in May 2020 and reviewed the evaluations on December 9, 2020. The Team determined that none of the allowable non-storm water discharges or flows were significant contributors of pollutants to the MS4 in 2020 and are not anticipated to be significant contributors of pollutants in 2021. The detailed evaluation is provided in **Tables B-1 and B-2** of **Appendix B**.

The SWMT identified the following occasional incidental non-storm water discharges as potential contributors of pollutants to the MS4:

- Ground water well testing
- Hydrant flushing
- Emergency water main breaks
- Sculpture studio washing
- Large Campus events.

None of the above occasional incidental non-storm water discharges will be addressed as illicit discharges; however, the SWMT recognizes the importance of mitigating the potential for pollution associated with these activities. **Table B-2** in **Appendix B** provides a list of controls that are planned or have already been implemented to reduce the potential for pollution associated with these activities.

During these evaluations, the SWMT also identified pigeon excrement at the stadium and on some roofs as a potential contributor of pollutants to the MS4. This debris will not be classified as a non-storm water discharge because it is not human caused; however, the SWMT has developed a schedule to clean, bag, and remove the debris annually.

3.2.3 Storm Sewer System Inventory and High Priority Areas

The University's storm water conveyance system primarily consists of dry wells, deep sump catch basins, subsurface pipes, and outfalls. The SWMT has developed and maintained an inventory of UM's Campus storm water conveyance system within an AutoCAD file. The map is regularly updated with new storm sewer infrastructure upon conclusion of projects using construction as-built drawings as reference.

The UM MS4 has two outfalls, both of which discharge to the Clark Fork River. The outfall locations are described in **Table 3** and shown in **Figure C-1** in **Appendix C**.

Table 3. UM MS4 Outfalls

Name	Location	Type	Receiving Waterbody
East Outfall	Latitude: 46.864888° N Longitude: 113.980524° W	Concrete pipe	Clark Fork River
West Outfall	Latitude: 46.866459° N Longitude: 113.984491° W	Concrete pipe	Clark Fork River

The General Permit requires UM to identify high priority areas, which are areas that could be more prone to occurrences of illicit discharges (when compared to the remainder of the MS4 regulated area). The SWMT has identified three high priority areas, described in **Table 4** and show in **Figure C-1** in **Appendix C**. The SWMT has designated both outfalls as high priority.

Table 4. UM MS4 High Priority Areas

Name	Discharge Location	Description/Location	Rational
Facilities Services Compound	East Outfall	Approximately 6-acre facility along the northeast boundary of Campus, east of Campus Drive	This area houses facilities services, the grounds shop, the motor vehicle shop, and vehicle and material storage areas. The activities conducted within these facilities have the potential to release contaminants to the MS4 and Clark Fork River.
Parking Lot P	West Outfall	Approximately 4-acre parking lot near the northern boundary of Campus, between S 5th St E and S 6th St E	Lot P is one of UM's largest parking lots and is one of the closer parking lots to the Clark Fork River. Sand from winter maintenance activities and leaked automotive fluids could discharge to the Clark Fork River if not contained and cleaned up.
Parking Lot U	East Outfall	Approximately 1.3-acre parking lot southeast of Washington Grizzly Stadium, east of Campus Drive	This lot is near the Clark Fork River and is heavily used not only by students but also visitors as they recreate by taking the nearby trailhead to Mt. Sentinel hiking paths. Several vehicle fluid spills have been reported in this lot.

UM uses a Computerized Maintenance Management System (CMMS) to track maintenance activities and work orders. The SWMT plans to add storm sewer system facilities as assets to the CMMS; however, prior to adding facilities to the CMMS the SWMT is conducting a field investigation to verify the locations, obtain GPS coordinates and confirm the connections of the conveyance facilities. The existing storm sewer system inventory map (**Figure C-1** in **Appendix C**) will be updated following results of the field investigation.

3.2.4 Storm Sewer System Outfall Dry Weather Screenings

One tool used by the SWMT to identify potential illicit discharges is to conduct outfall inspections (screenings) during dry weather because discharges observed during dry weather indicate presence of a non-storm water discharge to the MS4. The SWMT conducts annual dry weather screenings at both

outfalls. During the 2020 screenings conducted in March, the west outfall showed nothing of concern but the east outfall had a trickle of flow. The flow was thought to be attributed to cooling system discharge in the Facilities Services compound. The cooling system discharge was disconnected from the storm drain and re-routed to the sanitary sewer system. The observed flow was greatly reduced, though some intermittent flow may still be occurring. The investigation into the source of this discharge is still ongoing. Completed dry weather screening forms for 2020 and previous years are provided in **Appendix C**.

3.2.5 Regulatory-Related Requirements

The UM is located within the jurisdiction of the Missoula Valley Water Quality District (WQD) and the City. As such, the WQD and City have jurisdiction to regulate illicit discharges and implement enforcement mechanisms for noncompliance on Campus. For instance:

- Title 13.27.200 and 13.27.210 of the Missoula Municipal Code prohibits illicit discharges, identifies non-storm water discharges that are exempt from the requirement, and prohibits illicit connections.
- The WQD responds to illicit discharge complaints and conducts illicit discharge investigations within the WQD boundary (WQD boundary includes the University's Campus).

Considering this information, the SWMT is conducting ongoing research and coordinating with the City and WQD to better understand their respective IDDE programs prior to further developing UM's IDDE program to address regulatory-related requirements. UM may consider developing a memorandum of understanding (MOU) with the City and WQD to better define roles and responsibilities relating to IDDE program implementation within UM's MS4-regulated area. The SWMT's planned activities to further develop the IDDE program is provided in **Table J-3** of **Appendix J**.

3.3 Construction Site Storm Water Management (MCM 4)

Proper management of construction sites is a critical component of SWMPs because these sites often have exposed earth that is susceptible to discharge of large volumes of sediment and other pollutants during rainfall and snowmelt events. Part II.A.4 of the General Permit requires the development, implementation, and enforcement of a program to reduce pollutants in storm water runoff from construction activities that result in land disturbance of greater than or equal to one acre occurring within the MS4. This section describes the status of the University's construction site storm water management program.

3.3.1 UM Construction Site Storm Water Management Program Status and Considerations

The General Permit requires the following for non-traditional MS4s:

- Require that all regulated construction projects submit a construction storm water management plan prior to construction that is consistent with state and local requirements;
- Adopt formal policies or other mechanisms to the extent allowable, and consider and document private development projects regardless of legal authority;
- Develop and implement a formal ERP to ensure compliance with the construction storm water management regulatory mechanisms on regulated projects including private property;
- Develop and implement a plan review checklist which documents the requirements described in the Non-Numeric Technology-Based Effluent Limits of the most current Montana DEQ General Permit for Storm Water Discharges Associated With Construction Activity;

- Conduct inspections of construction storm water management controls, using an inspection form or checklist, to ensure they are installed, operated, and maintained in order to function as designed;
- Develop and maintain a regulated project inventory; and
- Develop an inspection frequency determination protocol based on the priority of the project.

Construction and land development activities that occur on Campus are under the jurisdiction of the City. Construction storm water management controls are required under Article IV of Chapter 13.27 of the Missoula Municipal Code; however, the City and UM SWMT have yet to determine how the General Permit's construction site storm water management requirements will be implemented on the Campus. The UM SWMT will coordinate with the City and WQD to consider and determine this in 2021. A list of planned activities is provided in **Table J-3** of **Appendix J**.

The SWMT will update this section of the SWMP when the City and UM come to an agreement regarding how planned construction activities on the Campus will be reviewed, approved, and monitored for compliance.

3.4 Post-Construction Site Storm Water Management in New and Redevelopment

Land development activities typically cause increased impervious area which often results in increased pollutant loads within storm water runoff. Post-construction storm water management refers to implementing and maintaining permanent storm water management controls that detain, infiltrate, and/or treat storm water runoff to prevent or minimize water quality impacts associated with land development activities. Part II.A.5 of the General Permit requires the permittee to develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre. The program must include requirements for post-construction storm water management controls, enforcement actions, and inspection protocols to evaluate whether controls are functioning as intended. The goal of the program is to prevent or minimize impacts to water quality from land development activities.

3.4.1 Post-Construction Storm Water Management Control Requirements and Plan Reviews

As discussed in *Section 3.3* above, construction and land development activities that occur on Campus are under the jurisdiction of the City. Post-construction storm water management controls are required under Article IV of Chapter 13.27 of the Missoula Municipal Code. The City and UM SWMT have yet to determine how the General Permit's post-construction site storm water management requirements will be implemented on the Campus, specifically with regard to reviewing and approving plans and development and implementation of an enforcement response plan (ERP). The SWMT will update this section of the SWMP when the City and UM come to an agreement regarding how planned construction activities on the Campus will be reviewed, approved, and monitored for compliance. A list of planned activities to make progress in this regard is provided in **Table J-3** of **Appendix J**.

3.4.2 Operation and Maintenance of Post-Construction Storm Water Management Controls

UM's post-construction storm water controls consist of dry wells and deep sump catch basins. A detailed inventory of these facilities is provided in **Appendix D**. The SWMT uses the Dry Well and Deep Sump Catch Basin Inspection Form to evaluate the condition and performance of these facilities. Inspections are conducted by SWMT members or trained personnel and the frequency of inspections are based on the

potential impact to receiving water bodies. High priority post-construction storm water management controls are inspected at least annually. The Inspection Frequency Determination Protocol is used to establish the frequency that each post-construction storm water control is inspected. These forms are included in **Appendix D**. Additional inspection forms will be developed as needed if additional post-construction storm water controls are implemented.

3.4.3 Low-Impact Development Considerations

Low-impact development (LID) and green development are terms often used to describe development practices aimed at reducing impacts to the environment. With regard to storm water management, LID concepts often include implementing design strategies and storm water management facilities that reduce impervious areas and promote infiltration to mimic runoff patterns observed on undeveloped lands.

The SWMT and UM staff from the planning, development and construction, Campus architect, engineering, information technology, and grounds operations departments convened a discussion in December 2020 to discuss policy barriers to implementing LID on Campus and opportunities for implementation of LID practices. The meeting attendees did not identify any policy barriers that inhibit the use of LID practices. Notes from the meeting are included in **Appendix D**.

UM recognizes the importance of reducing and mitigating the potentially negative effects that development activities have on our environment. According to Montana University System policy, every new building project at a Montana public university costing over $3 million must be at least Leadership in Energy and Environmental Design (LEED) Silver certified. LEED is a rating system developed by the U.S. Green Building Council that provides a framework for healthy, highly efficient, and cost-saving green buildings. A key feature of the LEED certification program is to strive to replicate natural hydrology processes and retain runoff from local rainfall events on site. Since 2009 when the Payne Family Native American Center (LEED Platinum certified) was completed, every building constructed on Campus has been certified at least as LEED Gold.

3.5 Pollution Prevention / Good Housekeeping for Permittee Operations

UM's facilities and activities within the MS4-regulated area have both the potential to release contaminants to the MS4 and pollute receiving waterbodies. Per Part II.A.6 of the General Permit, the SWMT is implementing a pollution prevention and good housekeeping program to reduce the potential for pollution within storm water discharges from UM facilities and activities. This program consists of the following components:

- An inventory of UM owned and operated facilities and activities that have the potential to release contaminants to the MS4;
- A map showing locations of these facilities[3];
- Storm water pollution prevention SOPs for facilities and activities; and
- A training program to promote proper implementation of storm water pollution prevention SOPs.

[3] UM's activities are generally associated with each facility, as shown on **Table 5**.

This section presents the inventory and map of facilities and activities, as well as the development strategy for SOPs and related trainings.

3.5.1 Facilities Inventory

UM facilities that have the potential to release contaminants to the MS4 are shown in **Figure E-1 (Appendix E)**. These facilities are divided into two categories:

- **Primary Facilities** are sited in a centralized location, where the potentially pollutant-producing activities are limited to, or contained within, the facility boundary. Primary facilities include the Facilities Services Compound, the Motor Vehicle Shop, and the Grounds and Labor Shop. Activities taking place at UM's primary facilities are listed in **Table 5**. A separate storm water pollution prevention SOP will be developed for each primary facility.
- **Dispersed Facilities** are spread throughout UM's MS4-regulated area. These facilities include Parks and Open Spaces, Streets and Parking Lots, and Snow Storage Areas. Activities taking place at UM's dispersed facilities are listed in **Table 5** and a complete list of dispersed facilities is provided in **Appendix E**. A storm water pollution prevention SOP will also be developed for each dispersed facility category.

Each facility SOP, whether primary or dispersed, will include a description of the facility or facility category, the person and department responsible for pollution prevention, potential sources of storm water pollutants, and appropriate storm water control measures. Each SOP will also include (attached) activity-based SOPs that are relevant to that particular facility/facility category (discussed further in *Section 3.5.2*).

Table 5: Facilities Inventory

Facility Name/Category	Person Responsible for Pollution Prevention		Activities with Potential to Release Contaminants (SOP Category)[a]	Trash	Sediment	Vehicle Fluids	Herbicides/Pesticides	Organics	Nutrients	Bacteria	Metals	Hazardous Waste
	Department	Position										
Primary Facilities												
Facilities Services Compound	Facilities Services	John Grasso	Building Maintenance	X	X			X	X	X	X	X
			Snow Storage and Disposal	X	X			X	X		X	
			Storage of Hazardous Chemicals									X
			Storage of Salt/Sand		X						X	
			Waste Handling and Disposal	X		X					X	X
Motor Vehicle Shop	Facilities Services	Bob Peterson	Building Maintenance	X	X			X	X	X	X	X
			Vehicle and Equipment Storage			X						X
			Vehicle Maintenance		X	X					X	X
Grounds Shop	Facilities Services	Ben Carson	Building Maintenance	X	X			X	X	X	X	X
			Ground Maintenance	X		X	X	X	X			
			Equipment Storage and Maintenance		X	X	X	X			X	
Dispersed Facilities												
Parks and Open Spaces	Facilities Services	Ben Carson	Ground maintenance	X	X	X	X	X	X	X	X	X
Streets and Parking Lots	Facilities Services	Mick Alva	Street and Parking Lot Maintenance	X	X	X		X	X	X	X	X
			Winter Street and Parking Lot Maintenance	X	X	X		X	X		X	
Snow Storage Areas	Facilities Services	Mick Alva	Snow Storage	X	X			X	X		X	

[a] Activities listed are generalized activities that occur at each facility. See Table 6 for a more complete list of activities associated with each SOP category.

3.5.2 Activities Inventory and Storm Water Pollution Prevention SOPs

Table 6 identifies a range of activities performed by UM employees that have the potential to release contaminants to the MS4. These activities are grouped into 15 general categories for which storm water pollution prevention SOPs will be developed. Several of the activities/activity categories occur at the primary and dispersed facilities identified in **Table 5.** Given this, the SOPs developed for applicable activity categories will be referenced and attached to the facility SOPs to avoid duplication.

Table 6: Activities and Potential Contaminants

SOP Category	Associated Activities with the Potential to Generate and/or Release Contaminants to the MS4	Potential Contaminants									
		Trash	Sediment	Vehicle Fluids	Herbicides/Pesticides	Organics	Nutrients	Bacteria	Chlorine	Metals	Hazardous Waste
Building Maintenance	Dumpster and Trash Receptacle Management	X				X	X	X		X	X
	Pigeon cleanup					X		X			
	Recycling	X				X				X	
	Sidewalk Snow Removal	X	X								
Equipment Storage and Maintenance	Equipment Fueling			X							X
	Equipment Storage and Maintenance		X	X	X	X				X	
	Storage and Disposal of Vehicle Fluids			X							X
Event Facilitation and Response	Dumpster and Trash Receptacle Management	X				X	X	X		X	X
	Grounds Garbage Pickup	X									
Ground Maintenance	Dumpster and Trash Receptacle Management	X				X	X	X		X	X
	Equipment Fueling			X							
	Erosion and Sediment Control		X								
	Storage/Application of Fertilizers and Herbicides				X		X				
	Leaf Removal					X	X				
	Leaks and Spills			X							X
	Mowing			X		X	X				
	Planting and Mulching	X				X	X				
Hydrant Flushing	Erosion and Sediment Control		X								
	Hydrant Flushing								X		
Snow Storage	Snow Storage	X	X			X	X			X	
Storage of Hazardous Chemicals	Storage of Hazardous Chemicals										X
Storage of Salt/Sand	Storage of Salt/Sand		X							X	
Street and Parking Lot Maintenance	Catch Basin and Dry Well Cleaning	X	X	X		X	X			X	
	Dumpster and Trash Receptacle Management	X				X	X	X		X	X
	Striping/Painting										
	Sweeping	X	X	X		X	X			X	

SOP Category	Associated Activities with the Potential to Generate and/or Release Contaminants to the MS4	Potential Contaminants									
		Trash	Sediment	Vehicle Fluids	Herbicides/Pesticides	Organics	Nutrients	Bacteria	Chlorine	Metals	Hazardous Waste
Supply Well Development	Erosion and Sediment Control		X								
	Supply Well Development	X	X				X				
Utility Maintenance	Response to Water Main & Sanitary Main Breaks	X	X	X			X		X	X	
Vehicle and Equipment Storage	Leaks and Spills			X							X
	Vehicle and Equipment Storage			X							X
Vehicle Maintenance	Leaks and Spills			X							X
	Storage and Disposal of Vehicle Fluids			X							X
	Vehicle Fueling			X							X
	Vehicle Washing		X	X							
	Vehicle Maintenance			X						X	X
Waste Handling and Disposal	Waste Handling and Disposal	X	X							X	X
Winter Street and Parking Lot Maintenance	De-icing			X							
	Snow Removal and Storage	X	X			X	X			X	
	Sanding		X							X	

3.5.3 Development of SOPs and Training Program

Table 7 provides a timeline of SOP development and training for this permit term. All SOPs will be developed in coordination with relevant department personnel for each facility and activity. Each SOP will address the installation, implementation, and/or maintenance of storm water pollution prevention controls for that facility or activity category. Trainings will take place the year following SOP development, as indicated in **Table 7**. Records of completed trainings and attendance will be kept in the shared SWMT Box folder. Draft SOPs that have been developed are provided in **Appendix F**.

Table 7: SOP Development and Training Schedule

SOP Type	SOP	Development Year	Training Year
Facility-SOPs	Facilities Services Compound	☐ 2021	☐ 2021
	Motor Vehicle Shop	☐ 2021	☐ 2021
	Grounds and Labor Shop	☐ 2021	☐ 2021
	Parks and Open Spaces	☐ 2021	☐ 2021
	Streets and Parking Lots	☐ 2021	☐ 2021
	Snow Storage Areas	☐ 2021	☐ 2021
Activity-SOPs	Building Maintenance	☐ 2021	☐ 2021
	Equipment Storage and Maintenance	☐ 2021	☐ 2021
	Event Facilitation and Response	☐ 2021	☐ 2021
	Ground Maintenance	☐ 2021	☐ 2021
	Hydrant Flushing	☐ 2021	☐ 2021
	Snow Storage	☐ 2021	☐ 2021
	Storage of Hazardous Chemicals	☐ 2021	☐ 2021
	Storage of Salt/Sand	☐ 2021	☐ 2021
	Street and Parking Lot Maintenance	☐ 2021	☐ 2021
	Supply Well Development	☐ 2021	☐ 2021
	Utility Maintenance	☐ 2021	☐ 2021
	Vehicle and Equipment Storage	☐ 2021	☐ 2021
	Vehicle Maintenance	☐ 2021	☐ 2021
	Waste Handling and Disposal	☐ 2021	☐ 2021
	Winter Street and Parking Lot Maintenance	☐ 2021	☐ 2021

4 SWMP TRAINING

Training is conducted by UM for SWMT members and Facilities Services staff in accordance with Part II.B of the General Permit. Thorough and on-going training keeps staff informed and aware of SWMP protocols, introduces new BMPs, and facilitates proper reporting of illicit discharges. Training materials and documentation are saved in the shared University SWMP Box folder described in *Section 2.2*. Specific training programs are described in the following sections.

4.1 Comprehensive Training

Comprehensive training about the MS4 General Permit was conducted on June 3, 2020 for members of the SWMT and Facilities Services staff. This training was led by a consultant and provided an overview of the goals and objectives of the MS4 program as well as a summary of the General Permit requirements. The PowerPoint slides used for the training are included as **Appendix G**. Equivalent training for new SWMT members will be conducted within 90 days of hire date.

Additional SWMT training will be conducted in March 2021 to educate SWMT members on UM's updated SWMP and SWMT implementation responsibilities for the remaining year of the permit term.

4.2 Storm Water Awareness Training

Part II.B.2 of the General Permit requires storm water awareness training be conducted, at a minimum, during the 1st and 4th years of the permit term. UM conducted storm water awareness trainings in 2017, 2019, and 2020 to meet this requirement. Trainings in 2017 were completed on June 21 and July 5. These trainings addressed storm water impacts, requirements of the General Permit, detection and elimination of illicit discharges, implementation of the ERP, and BMPs to minimize pollutant discharges. Additional training was conducted on December 4 and 5, 2019 for Trades and Custodial staff. The UM also conducted training on December 28 and 29, 2020 (4th year of the permit term) after updating the SWMT organizational chart. New hires will be given equivalent training within 90 days of hire date.

4.3 Construction Site Storm Water Management Training

Construction occurring within UM's MS4-regulated area is under the jurisdiction of the City. City staff are responsible for reviewing construction storm water management plans and conducting construction site inspections. The SWMT is currently coordinating with the City to define roles and responsibilities for each entity. UM will update the training program after reaching an agreement with the City.

4.4 Post-Construction Site Storm Water Management Training

As discussed in *Sections 3.4* and *4.3,* construction occurring within UM's MS4-regulated area is under the jurisdiction of the City. City staff are responsible for reviewing plans involving post-construction storm water management controls. The UM SWMT is responsible for inspecting and maintaining post-construction storm water management controls on the Campus. Therefore, UM trains inspectors on the post-construction storm water management control inspection protocol and implementation of the ERP. The SWMT is currently coordinating with the City to define roles and responsibilities for each entity. UM will update the training program after reaching an agreement with the City.

Training was conducted in 2017 (1st year of the permit term). Additional trainings were conducted on December 28 and 29, 2020 (4th year of the permit term) regarding the inspection protocol and implementation of the ERP; both of which were developed in 2020. New hires will be given equivalent training within 90 days of hire date.

4.5 Storm Water Pollution Prevention SOP Training

UM conducts annual storm water pollution prevention training for staff directly involved in implementing SOPs for storm water pollution prevention. The training schedule is provided in **Table 7**.

5 STORM WATER MANAGEMENT FOR DISCHARGES TO IMPAIRED WATERBODIES

5.1 Impaired Waterbody Inventory

UM's two MS4-regulated outfalls both discharge to the Clark Fork River (Blackfoot River to Rattlesnake Creek). This section of the Clark Fork River is impaired for seven pollutants, presented in **Table 8**.

Table 8: Impairment Information for Clark Fork River (Blackfoot River to Rattlesnake Creek)

Probable Cause	Probable Sources	Associated Uses	TMDL Completed[1]
Arsenic	Mill Tailings	Drinking Water	Yes
Cadmium	Mill Tailings	Aquatic Life	Yes
Copper	Mill Tailings	Aquatic Life	Yes
Eutrophication	Industrial Point Source Discharge, Dam or Impoundment	Aquatic Life	Yes
Iron	Mill Tailings	Aquatic Life	Yes
Lead	Mill Tailings	Aquatic Life, Drinking Water	Yes
Zinc	Mill Tailings	Aquatic Life	Yes

[1] TMDL = Total Maximum Daily Load

The City's MS4 has been given a waste load allocation (WLA) for arsenic, cadmium, copper, iron, lead, and zinc (all metals, hereafter referred to as pollutants of concern). These pollutants are attributed to historical mining activities in the Butte and Deer Lodge Valley; however, the Missoula MS4 was given a WLA because DEQ estimates that the Missoula MS4 may contribute annual loads of each of these pollutants to this section of the Clark Fork River (Montana Department of Environmental Quality, 2014)[4]. The WLA is a 55 percent reduction in loads for the pollutants of concern. The WLA is not intended to add concentration load limits to MS4 permittees discharging to this section of the river (i.e., City, UM, Missoula County); rather, DEQ assumes the WLA will be met by MS4 permittees adhering to General Permit requirements and either reducing the metals concentrations or the discharge volumes, or both (Montana Department of Environmental Quality, 2014).

The UM Campus is located within the boundary of the Missoula MS4; therefore, this WLA is applicable to UM's SWMP. Further discussion of the UM MS4-related total maximum daily loads (TMDLs) is provided in UM's *Sampling Plan for TMDL-Related Monitoring*, provided in **Appendix H**.

5.2 Impaired Waterbody TMDL Implementation Strategy

This section describes UM's current efforts and future plans to address the Missoula MS4 WLA for the Clark Fork River (Blackfoot River to Rattlesnake Creek). As stated in the previous section, the WLA will be met by adhering to General Permit requirements and either reducing the metals concentrations or the discharge volumes, or both. In accordance with Part III.B of the General Permit, the following subsections describe UM's current BMPs, impairment priorities, strategies, and planned action items for controlling the discharge of pollutants of concern.

5.2.1 Assessment of Pollutants of Concern

In accordance with the UM *Sampling Plan for TMDL-Related Monitoring,* the SWMT collects and analyzes storm water samples from both outfalls for each pollutant of concern twice per year. The monitoring

[4] The Missoula MS4 encompasses the census designated Missoula urbanized area, which includes the City, portions of Missoula County, and UM Campus. The TMDL document does not specify how much of the WLA is applicable to UM; however, because the WLA is not intended to add concentration load limits to permittees it is assumed that UM will meet their portion of the WLA by adhering to the General Permit requirements.

results generally show a correlation between total suspended solids (TSS) and metals concentrations; where higher TSS values correspond with higher concentrations of all metals and lower TSS values correspond with lower concentrations of all metals. This indicates that most of the metals in storm water discharging to the Clark Fork River are likely in particulate form. A summary of monitoring results is provided in **Appendix I**.

One major source of particulates to UM's streets and parking areas is sand deposited during winter sanding operations. The SWMT has obtained samples of metals concentrations within the gravel used for sanding in 2018, 2019, and 2020. The sample results show iron levels above 2,000 mg/kg for each of the last 3 years, long-term average concentrations of copper, lead, and zinc of less than 10 mg/kg, and reported non-detects for arsenic and cadmium (with the exception that cadmium was detected at 0.3 mg/kg in 2020). Comparison with the storm water monitoring results (**Appendix I**) indicate a correlation between metals concentrations in the gravel used for street sanding and the metals concentrations in storm water discharges. Prior to purchasing winter gravel supplies in 2021, the SWMT will have samples evaluated by an analytical laboratory and select a gravel with lower metals concentrations.

The SWMT would like to prioritize street sweeping operations in 2021. Street sweeping is typically conducted once annually; however, in 2021 the SWMT has recommended that street sweeping be conducted three times, with focus on the spring season to collect sand deposited during the winter. The SWMT is evaluating whether there is budget available for this and whether the City could support street sweeping on the Campus. These evaluations will be completed by April 30, 2021. Effectiveness will be assessed based on 2021 storm water monitoring results.

The SWMT has implemented several BMPs that could lead to a reduction of metals within storm water runoff from Campus (**Table 9**). Each of the BMPs identified in **Table 9** will continue to be implemented in 2021; however, as discussed above, street sweeping and TMDL related monitoring will be prioritized.

Table 9. Current BMPs Targeting Metals

BMP	Description	Potential Contributor	Rationale
Prohibit Residential Car Washing	Vehicle washing is not permitted on Campus.	Individual residential car washing	Eliminating car washing on Campus prevents discharge of pollutants from vehicles.
Street Sweeping	Street sweeping is conducted to remove sediment and other pollutants on roadways. Wash water is vacuumed up during street sweeping operations.	Street pollutants, debris from winter sanding operations, vehicle fluids, street wash water	This is especially important following the winter season when sanding is used to enhance vehicle traction.
Storm Water Pollution Prevention SOPs	SOPs are being developed for potential pollutant generating facilities and activities on Campus. See *Section 3.5* for additional information.	Varies See **Table 6**	When implemented, SOPs will reduce the potential for pollution associated with UM facilities and activities.
TMDL Related Monitoring	Semi-annual monitoring in accordance with the *Sampling Plan for TMDL-Related Monitoring*	N/A	Analysis of monitoring results will inform the SWMT of which pollutants of concern should be prioritized and will be used to assess BMP performance.

BMP	Description	Potential Contributor	Rationale
Testing Gravel for Winter Sanding Operations	UM will analyze samples of gravel to determine which gravel type has the lowest metals concentrations prior to purchasing winter gravel supplies.	Metals in gravel applied to streets	Analysis of gravel samples will allow UM to select a gravel with low metals concentrations in order to reduce potential contaminants from winter sanding operations.

5.2.2 Long-Term Strategy and Action Item Schedule

The SWMT is considering two separate approaches to make progress towards the Missoula MS4 WLA for the Clark Fork River (Blackfoot River to Rattlesnake Creek). The first approach involves removing UM's two outfalls to the Clark Fork River and replacing the outfalls with infiltration galleries. The second approach involves continued TMDL-related monitoring and implementation of specific BMPs to reduce concentrations of priority pollutants. Each of these strategies is described below.

- **Outfall Removal.**
  - **Description.** The SWMT is currently investigating the possibility to eliminate its two outfalls to the Clark Fork River. This would be the most effective long-term BMP because it would eliminate the potential for release of pollutants of concern to the Clark Fork River from UM's storm drain system.
  - **Action Items.** UM has hired a consultant to conduct a subsurface investigation to evaluate feasibility, develop preliminary designs, and estimate capital costs for outfall removal and construction of infiltration galleries. An initial feasibility report by WGM Group established conservative options and costs but raised additional questions about assumptions and design criteria. The SWMT will further explore the options presented in the feasibility report and collect additional data for an engineering analysis. The next steps in the evaluation are to gather additional survey data and/or dig test pits to more accurately estimate infiltration rates. Data from these steps will support preliminary engineering and design. By the end of 2021, the SWMT plans to select a preferred alternative for outfall removal, obtain an engineering cost estimate, and decide whether to proceed. If this approach will be pursued, a design and implementation schedule will be developed based on funding availability. UM is also planning a development project near the West Outfall, which may present a separate opportunity to eliminate the West Outfall.
- **TMDL-Related Monitoring and BMP Implementation.**
  - **Description.** The SWMT has implemented TMDL-related monitoring to prioritize pollutants of concern. As additional BMPs are implemented, the monitoring will be used to evaluate the effectiveness of BMPs selected to reduce loading of pollutants of concern to the Clark Fork River and re-prioritize pollutants.
  - **Action Items.** The SWMT will continue monitoring in accordance with the *Sampling Plan for TMDL-Related Monitoring*. Results will be analyzed in fall 2021 to reprioritize pollutants and develop additional plans for BMP implementation (pending the results of the outfall removal investigation).

The SWMT will implement both strategies identified above in 2021. If UM decides to remove both outfalls, the SWMT believes that TMDL-related monitoring will no longer be applicable and will coordinate with DEQ

to re-assess the applicability of TMDL-related General Permit requirements. If UM does not remove the outfalls, the SWMT will continue *TMDL-Related Monitoring and BMP Implementation* and will develop a more robust long-term strategy with scheduled action items.

6 STORM WATER MONITORING

6.1 Self-Monitoring

Self-monitoring, required by Part IV.A of the General Permit, includes semi-annual sampling and analysis of storm water discharges for the list of pollutants identified in Table 1 of the General Permit. The UM has selected Monitoring Option 1 in Part IV.A.3 of the General Permit, which requires sampling at four discharge points that represent both commercial/industrial areas and residential areas; however, the UM will only sample two locations given there are only two storm water outfalls on the Campus (East Outfall and West Outfall). The sample locations, frequency, and parameters are shown in **Table 10**. Sampling procedures and quality assurance/quality control measured are detailed in the *Sampling Plan for TMDL-Related Monitoring* (**Appendix H**).

Table 10: Self-Monitoring Locations and Parameters

Name	Location	Receiving Waterbody	Sample Collection Method	Frequency	Sample Parameters
East Outfall	46.864888 -113.980524	Clark Fork River, Blackfoot River to Rattlesnake Creek	Grab	Once between January 1st and June 30th and once between July 1st and December 31st	Total suspended solids, Chemical oxygen demand, Total phosphorus, Total nitrogen, pH, Copper, Lead, Zinc, Estimated flow, Oil and grease
West Outfall	46.866459 -113.984491				

A summary and analyses of previous years' monitoring results is provided in **Appendix I**. pH levels were generally within the range of 6.0 to 9.0 standard units. The limited sampling that has been conducted (semi-annual sampling for 3 years) provides limited ability to identify statistically significant trends; however, the SWMT did identify elevated concentrations of most constituents during the first sample of the year during both 2019 and 2020. This could be related to winter street sanding operations (discussed in *Section 5.2*). As discussed in *Section 5.2*, the SWMT is exploring options to implement additional spring street sweeping in 2021 and is also exploring the possibility of replacing UM's two outfalls with infiltration galleries.

6.2 TMDL-Related Monitoring

The General Permit also requires TMDL-related monitoring in Part III.B. UM has selected and implemented TMDL-Related Monitoring Option 2 which requires the use of monitoring results to evaluate the effectiveness of BMPs selected for reducing pollutant loading to impaired receiving waterbodies. UM will sample the locations and parameters listed in **Table 11**. UM's sampling plan (**Appendix H**) details the sampling methods, strategies, and quality assurance/quality control measures for TMDL-related monitoring.

Table 11: TMDL-Related Monitoring Locations and Parameters

Name	Location	Receiving Waterbody	Sample Collection Method	Frequency	Sample Parameters
East Outfall	46.864888 -113.980524	Clark Fork River, Blackfoot River to Rattlesnake Creek	Grab	Once between January 1st and June 30th and once between July 1st and December 31st	Arsenic, Cadmium, Copper, Iron, Lead, Zinc, Temperature
West Outfall	46.866459 -113.984491				

7 REPORTING AND PERFORMANCE SUMMARY

7.1 Annual Report

Per Part IV.F of the General Permit, UM will prepare and submit an annual report to the DEQ for each calendar year of the permit term. The annual report will include monitoring results and evaluations, as discussed in *Section 6*, as well as any updates to the SWMP that were made during the year and other relevant documents and attachments.

8 SWMP INSPECTION RESPONSE PROGRESS

As previously mentioned, the SWMT has been working to address General Permit violations and recommendations identified in the inspection report issued by DEQ on February 6, 2020. In June 2020, UM submitted an inspection response containing a Proposed Compliance Schedule to Address MS4 Inspection Violations and Proposed Schedule to Address MS4 Inspection Recommendations. Each schedule outlined tasks and activities to be conducted along with expected completion dates. Since then, the SWMT has made significant progress on developing the SWMP. The SWMT spent considerable time, effort, and money investigating the possibility of permanently removing the University's two outfalls. The WGM Group was retained to produce a feasibility study which then raised additional questions about the assumptions and design criteria. An array of infiltration options was presented as well as an option for using hydrodynamic separators, which, while affordable and effective in cleaning-up storm water, does not meet the University's goal of ultimately removing the outfalls. The SWMT will continue to investigate this option fully and hopes to choose an option in 2021. A summary of completed activities is as follows and a detailed progress update is provided in **Table J-1** and **Table J-2** of **Appendix J**.

- Initiated weekly SWMT meetings
- Developed a comprehensive update to the UM SWMP document
- Redeveloped the Public Education and Outreach Program
- Initiated conversations with the City and WQD to discuss sharing of responsibilities for MCM 3, MCM 4, and MCM 5
- Developed and implemented the *Sampling Plan for TMDL-Related Monitoring* (**Appendix H**)
- Investigated and mitigated a potential illicit discharge identified at the East Outfall during routine dry weather screenings
- Developed an inspection frequency protocol and inspection forms for UM's post-construction storm water management controls

- Redeveloped the Pollution Prevention/Good Housekeeping Program
- Commissioned an investigation to assess the feasibility of removing UM's two MS4 outfalls

The SWMT will continue to address permit violations and to further develop the SWMP throughout the remainder of 2021. A detailed listing of planned activities for 2021 is provided in **Table J-3** of **Appendix J**.

9 REFERENCES

Montana Department of Environmental Quality. (2014). *Final - Silver Bow Creek and Clark Fork River Metals TMDLs.* Helena, MT: Water Quality Planning Bureau (Watershed Management Section).

Montana Department of Environmental Quality. (2018). *CLARK FORK RIVER, Blackfoot River to Rattlesnake Creek*. Retrieved from Water Quality Assessment Summary Report: http://svc.mt.gov/deq/dst/#/app/cwaic/report/cycle/2018/auid/MT76M001_030

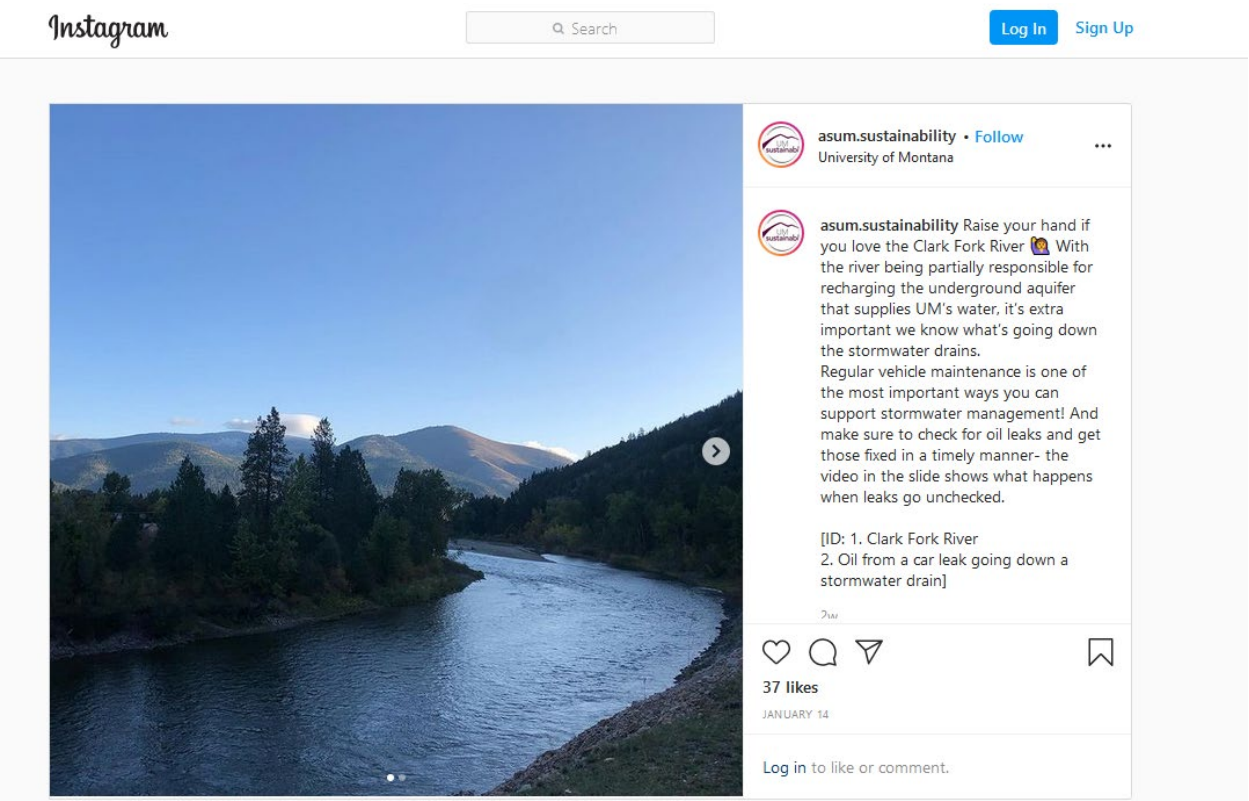
Montana Department of Environmental Quality. (February 6, 2020). *Univeristy of Montana General Permit for Storm Water Discharges Associated with Municipal Separate Storm Sewer System (MS4): Inspection Report.*

UNIVERSITY OF MONTANA
Storm Water Management Program

APPENDIX A

PUBLIC EDUCATION AND OUTREACH PROGRAM SUPPLEMENTARY INFORMATION

February 2021


Instagram
Search
Log In
Sign Up
asum.sustainability • Follow
University of Montana
asum.sustainability Raise your hand if you love the Clark Fork River 🙋 With the river being partially responsible for recharging the underground aquifer that supplies UM's water, it's extra important we know what's going down the stormwater drains.
Regular vehicle maintenance is one of the most important ways you can support stormwater management! And make sure to check for oil leaks and get those fixed in a timely manner- the video in the slide shows what happens when leaks go unchecked.
[ID: 1. Clark Fork River
2. Oil from a car leak going down a stormwater drain]
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APPENDIX B

NON-STORM WATER DISCHARGE EVALUATIONS

February 2021

Table B-1. Non-Storm Water Discharge Evaluation

Category	Suspected Significant Contributor of Pollutants (yes/no)	Potential Associated Pollutants	Discussion	Local Controls or Conditions
Water line flushing	No	Chlorine, sediment, heavy metals	This is an infrequent activity. The reduced frequency combined with efforts to direct water toward pervious surfaces reduces the potential for significant discharge of pollutants.	Where control is possible, water is directed onto pervious surfaces or dry sumps; otherwise it is output onto proximate surfaces.
Landscape irrigation	No	Chlorine, sediment, nutrients, heavy metals	Despite almost continual maintenance throughout the irrigation season, lines and heads often break or become misaligned and water could enter stormwater system. Such discharges may become contaminated with heavy metals that leach from the winter gravel/sand used to control icing; however, the discharges would be minimal and would not result in a significant discharge of pollutants to the MS4 or receiving waterbodies.	UM is always trying to improve its irrigation system and processes. With some exceptions, sprinkler heads are tuned to avoid spraying water on impervious surfaces.
Diverted stream flows	No	None	While the UM campus borders the Clark Fork river and an irrigation canal, these are beyond our purview.	Not applicable.
Rising ground waters	No	None	UM does not have issues with rising ground water.	Not applicable.
Uncontaminated ground water infiltration	No	None	Due to nearby spring activity, UM suspects some occasional infiltration into its storm system although there would not be any pollutants.	There are currently no local controls on this inconsequential discharge.
Uncontaminated pumped ground water	No	Sediment	Ground water is used for some building cooling systems and is returned to the aquifer via injection wells per UM's water rights requirements.	Pumped ground water is metered both on the supply well side and also on the re-injection to the aquifer. These systems are contained within campus buildings and would not enter the storm water system.
Discharges from potable water sources	No	Chlorine	The largest potential discharge of potable water occurs in landscape irrigation operations (addressed above).	There are no exterior drinking water fountains on UM's campus and garden hose bibs require special keys in order to activate.

Category	Suspected Significant Contributor of Pollutants (yes/no)	Potential Associated Pollutants	Discussion	Local Controls or Conditions
Foundation drains	No	None	The SWMT is not aware of any foundation drains in use on UM campus.	Not applicable.
Air conditioning condensation	No	None	This is a very minor source since most of UM campus is cooled by ground water systems.	Condensation is minute and non-polluting.
Irrigation water	No	Chlorine, nutrients, sediment	Irrigation water on UM campus is potable water.	See response above for "Landscape irrigation."
Springs	No	None	UM does not have any issues with springs on campus.	Not applicable.
Water from crawl space pumps	No	None	Campus buildings extend below grade and have sump pumps that discharge into the sanitary sewer.	Not applicable.
Footing drains	No	None	See response above for "Foundation drains".	Not applicable.
Lawn watering	No	Chlorine, nutrients, sediments, metals	See response above for "Landscape irrigation."	See response above for "Landscape irrigation."
Individual residential car washing	No	Sediment, organics, metals, oil and grease	Vehicle washing is not permitted on campus.	Not applicable.
Flows from riparian habitats and wetlands	No	Sediment	While the UM campus is proximate to a river, such habitats do not exist within its MS4.	Not applicable.
Dechlorinated swimming pool discharges	No	Chlorine	UM's swimming pool drains to the sanitary sewer.	Not applicable.
Street wash water	No	Organics, metals, trash, sediment, nutrients	Due to high levels of metals in the gravel/sand used in winter icing operations, discharges of wash water could become contaminated with metals. The minimal use of wash water combined with the fact that the water is vacuumed up reduces the potential for discharge of pollutants.	The street washing process uses minimal water which is immediately vacuumed-up by washing equipment. This activity is conducted once annually.

Table B-2. Occasional Incidental Non-Storm Water Discharge Evaluation

Category	Suspected Significant Contributor of Pollutants (yes/no)	Potential Associated Pollutants	Discussion	Local Controls or Conditions
Ground water well testing	No	Sediment	UM utilizes ground water for building cooling.	UM will develop an SOP for testing new ground water wells.
Hydrant flushing	Yes	Chlorine, sediment, metals	Only a few hydrants cannot be channeled	None currently. The SWMT is developing an SOP to flush hydrant water into a grassed area or dry sumps to avoid direct discharge to a piped storm drain. Implementation of the SOP will greatly reduce the potential for discharge of pollutants.
Emergency water main breaks	No	Hydrocarbons, metals, trash, sediment, nutrients, chlorine	There is potential for potable water to convey pollutants on impervious surfaces into the MS4 system.	The SWMT is developing an SOP for responding to emergency water main breaks.
Sculpture studio washing	No	Chlorine, sediment	Given the location of the studio, any potable wash water is received by nearby permeable surfaces.	Additional controls are not needed due to the location of the studio.
Large campus events	No	Trash	There is a potential for trash to accumulate on the ground and be conveyed into the storm sewer system or receiving waterbodies during rainfall events.	UM staff are onsite throughout events to manage trash during the event. Staff are brought in the day after event to sweep the area for any remaining trash. The SWMT is developing an SOP for event facilitation and response.

UNIVERSITY OF MONTANA
Storm Water Management Program

APPENDIX C

ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM SUPPLEMENTARY INFORMATION

February 2021

UNIVERSITY OF MONTANA
Storm Water Management Program

STORM SEWER INVENTORY MAP

February 2021

University of Montana- Storm Water Management Program
Storm Sewer Inventory Map
Figure C-1

WEST OUTFALL

EAST OUTFALL

PRIORITY AREAS

LOT P PRIORITY AREA

FACILITIES COMPOUND PRIORITY AREA

LOT U PRIORITY AREA

CLARK FORK RIVER

TUNNEL MAP

STORM DRAIN MAP

NORTH

UNIVERSITY OF MONTANA
Storm Water Management Program

DRY WEATHER SCREENING DOCUMENTATION

February 2021

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: Clark Fork		Outfall ID: West Outfall	
Today's date: 05/11/2020		Time (Military): 14:15	
Investigators: Brian P. Kerns		Form completed by: Brian P. Kerns	
Temperature (°F): 51.5F	Rainfall (in.): Last 24 hours: 0.0	Last 48 hours: 0.0	
Latitude: 46.866459	Longitude: -113.984491	GPS Unit: mobile app	GPS LMK #:
Camera: Casio EX-S770		Photo #s:	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☒ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known): University of Montana street drainage.

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☒ **Closed Pipe**	☒ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: ____	☐ Single ☐ Double ☐ Triple ☐ Other: ____	Diameter/Dimensions: 21 in. ID	In Water: ☒ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: ____	☐ Trapezoid ☐ Parabolic ☐ Other: ____		Depth: ____ Top Width: ____ Bottom Width: ____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☐ Yes ☒ No	***If No, Skip to Section 5*** Water present due to damming effect, but not flowing.			
Flow Description (If present)	☐ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☐Flow #1	Volume		Liter	Bottle
	Time to fill		Sec	
☐Flow #2	Flow depth		In	Tape measure
	Flow width	____' ____"	Ft, In	Tape measure
	Measured length	____' ____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature			°F	Thermometer
pH			pH Units	Test strip/Probe
Ammonia			mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☐ No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☐ Yes ☐ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☒	☒ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Overall Outfall Characterization

☐ Unlikely ☒ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☒ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☒ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?


5/11/2020 2:22pm

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: Clark Fork		Outfall ID: West Outfall	
Today's date: 03/12/2020		Time (Military): 15:50	
Investigators: Brian P. Kerns		Form completed by: Brian P. Kerns	
Temperature (°F):	Rainfall (in.): Last 24 hours: 0.04	Last 48 hours: 0.04	
Latitude: 46.866459	Longitude: -113.984491	GPS Unit: mobile app	GPS LMK #:
Camera: Casio EX-S770		Photo #s:	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☒ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known): University of Montana street drainage.

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☒ **Closed Pipe**	☒ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: _____	☐ Single ☐ Double ☐ Triple ☐ Other: _____	Diameter/Dimensions: 21 in. ID	In Water: ☒ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: _____	☐ Trapezoid ☐ Parabolic ☐ Other: _____		Depth: _____ Top Width: _____ Bottom Width: _____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☐ Yes ☒ No	***If No, Skip to Section 5*** Pool present, but no visible flow.			
Flow Description (If present)	☐ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☐Flow #1	Volume		Liter	Bottle
	Time to fill		Sec	
☐Flow #2	Flow depth		In	Tape measure
	Flow width	____' ____"	Ft, In	Tape measure
	Measured length	____' ____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature			°F	Thermometer
pH			pH Units	Test strip/Probe
Ammonia			mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☐ No *(If No, Skip to Section 5)* not flowing

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☒ Yes ☐ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☒	☒ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	Top of pipe eroded; see photos.
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Overall Outfall Characterization

☐ Unlikely ☒ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☒ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☒ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)? None.


MUDDY
Buddies

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: Clark Fork		Outfall ID: West Outfall	
Today's date: 11/22/2019		Time (Military): 10:19	
Investigators: Brian P. Kerns		Form completed by: Brian P. Kerns	
Temperature (°F):	Rainfall (in.): Last 24 hours:	Last 48 hours:	
Latitude: 46.866459	Longitude: -113.984491	GPS Unit: mobile app	GPS LMK #:
Camera: Casio EX-S770		Photo #s:	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☒ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known): University of Montana street drainage.

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☒ **Closed Pipe**	☒ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: ____	☐ Single ☐ Double ☐ Triple ☐ Other: ____	Diameter/Dimensions: 21 in. ID	In Water: ☒ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: ____	☐ Trapezoid ☐ Parabolic ☐ Other: ____		Depth: ____ Top Width: ____ Bottom Width: ____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☐ Yes ☒ No *If No, Skip to Section 5*				
Flow Description (If present)	☐ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☐Flow #1	Volume		Liter	Bottle
	Time to fill		Sec	
☐Flow #2	Flow depth		In	Tape measure
	Flow width	____' ____"	Ft, In	Tape measure
	Measured length	____' ____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature			°F	Thermometer
pH			pH Units	Test strip/Probe
Ammonia			mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☐ No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☒ Yes ☐ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☒	☒ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Overall Outfall Characterization

☐ Unlikely ☒ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☒ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☒ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: Clark Fork		Outfall ID: West Outfall	
Today's date: 3/13/2018		Time (Military): 18:05	
Investigators: Brian P. Kerns		Form completed by: Brian P. Kerns	
Temperature (°F):	Rainfall (in.): Last 24 hours:	Last 48 hours:	
Latitude: 46.866459	Longitude: -113.984491	GPS Unit: mobile app	GPS LMK #:
Camera: Casio EX-S770		Photo #s:	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☒ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known): University of Montana street drainage.

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☒ **Closed Pipe**	☒ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: ____	☐ Single ☐ Double ☐ Triple ☐ Other: ____	Diameter/Dimensions: 21 in. ID	In Water: ☒ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: ____	☐ Trapezoid ☐ Parabolic ☐ Other: ____		Depth: ____ Top Width: ____ Bottom Width: ____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☒ Yes ☐ No	***If No, Skip to Section 5***			
Flow Description (If present)	☒ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☒ Flow #1	Volume	>0.25 GPM estimated	Liter	Bottle
	Time to fill		Sec	
☐ Flow #2	Flow depth		In	Tape measure
	Flow width	____' ____"	Ft, In	Tape measure
	Measured length	____' ____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature			°F	Thermometer
pH			pH Units	Test strip/Probe
Ammonia			mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☒ No (*If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☐ Yes ☐ No (*If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☒	☒ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Overall Outfall Characterization

☐ Unlikely ☒ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☒ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☒ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: Clark Fork		Outfall ID: West Outfall	
Today's date: 11/16/2017		Time (Military): 13:22	
Investigators: Brian P. Kerns		Form completed by: Brian P. Kerns	
Temperature (°F):	Rainfall (in.): Last 24 hours:	Last 48 hours:	
Latitude: 46.866459	Longitude: -113.984491	GPS Unit: mobile app	GPS LMK #:
Camera: Casio EX-S770		Photo #s:	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☒ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known): University of Montana street drainage.

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☒ **Closed Pipe**	☒ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: ____	☐ Single ☐ Double ☐ Triple ☐ Other: ____	Diameter/Dimensions: 21 in. ID	In Water: ☒ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: ____	☐ Trapezoid ☐ Parabolic ☐ Other: ____		Depth: ____ Top Width: ____ Bottom Width: ____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☒ Yes ☐ No	***If No, Skip to Section 5***			
Flow Description (If present)	☒ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☒ Flow #1	Volume	0.5 GPM estimated	Liter	Bottle
	Time to fill		Sec	
☐ Flow #2	Flow depth		In	Tape measure
	Flow width	____' ____"	Ft, In	Tape measure
	Measured length	____' ____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature			°F	Thermometer
pH			pH Units	Test strip/Probe
Ammonia			mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☒ No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☒ Yes ☐ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☒	☒ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	Top 1/2 of pipe chipped
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Overall Outfall Characterization

☐ Unlikely ☒ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☒ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☒ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)? Pipe exit should be cleared of debris to prevent damming effect.

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: Clark Fork		Outfall ID: East Outfall	
Today's date: 05/11/2020		Time (Military): 14:08	
Investigators: Brian P. Kerns		Form completed by: Brian P. Kerns	
Temperature (°F): 51.5F	Rainfall (in.): Last 24 hours: 0.0	Last 48 hours: 0.0	
Latitude: 46.864888	Longitude: -113.980524	GPS Unit: mobile app	GPS LMK #:
Camera: Casio EX-S770		Photo #s:	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☒ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known): University of Montana street drainage.

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☒ **Closed Pipe**	☒ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: _____	☐ Single ☐ Double ☐ Triple ☐ Other: _____	Diameter/Dimensions: _____	In Water: ☐ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: _____	☐ Trapezoid ☐ Parabolic ☐ Other: _____		Depth: _____ Top Width: _____ Bottom Width: _____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☒ Yes ☐ No	***If No, Skip to Section 5***			
Flow Description (If present)	☒ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☒ Flow #1	Volume	5gal 1.22gpm	Liter	Bottle
	Time to fill	4m 5s	Sec	
☐ Flow #2	Flow depth		In	Tape measure
	Flow width	____' ____"	Ft, In	Tape measure
	Measured length	____' ____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature		41.5F cond 388.9microsiemen	°F	Thermometer
pH		8.0 TDS 266.8 ppm	pH Units	Test strip/Probe
Ammonia		0.0 ORP 296mV Cl 0.0	mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☒ Yes ☐ No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☒	☒ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☒ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☐ Yes ☒ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Overall Outfall Characterization

☐ Unlikely ☐ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☒ Obvious

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☒ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☒ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?


5/11/2020 2:17pm


5/11/2020 2:34pm

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: Clark Fork		Outfall ID: East Outfall	
Today's date: 03/12/2020		Time (Military): 15:15	
Investigators: Brian P. Kerns		Form completed by: Brian P. Kerns	
Temperature (°F): 42 F	Rainfall (in.): Last 24 hours: 0.04	Last 48 hours: 0.04	
Latitude: 46.864888	Longitude: -113.980524	GPS Unit: mobile app	GPS LMK #:
Camera: Casio EX-S770		Photo #s: E Outfall-2019-11-22.jpg	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☒ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known): University of Montana street drainage.

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☒ **Closed Pipe**	☒ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: ____	☐ Single ☐ Double ☐ Triple ☐ Other: ____	Diameter/Dimensions: _____	In Water: ☐ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: ____	☐ Trapezoid ☐ Parabolic ☐ Other: ____		Depth: ____ Top Width: ____ Bottom Width: ____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☒ Yes ☐ No	***If No, Skip to Section 5***			
Flow Description (If present)	☒ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☒Flow #1	Volume	5 gal	Liter	Bottle
	Time to fill	18'25'' 0.28 GPM	Sec	
☐Flow #2	Flow depth		In	Tape measure
	Flow width	____' ____"	Ft, In	Tape measure
	Measured length	____' ____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature		37.5F Cond: 162; TDS: 107.4	°F	Thermometer
pH		7.35 Rest: O/R ORP: 182 mV	pH Units	Test strip/Probe
Ammonia		0.0	mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☐ No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☒	☒ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☒ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☐ Yes ☒ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Overall Outfall Characterization

☐ Unlikely ☐ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☒ Obvious

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☒ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☒ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)? Investigation by UM plumbing foreman indicates HVAC cooling equipment.


Montana
ACE

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: Clark Fork		Outfall ID: East Outfall	
Today's date: 11/22/2019		Time (Military): 10:29	
Investigators: Brian P. Kerns		Form completed by: Brian P. Kerns	
Temperature (°F):	Rainfall (in.): Last 24 hours: 0.0	Last 48 hours: 0.0	
Latitude: 46.864888	Longitude: -113.980524	GPS Unit: mobile app	GPS LMK #:
Camera: Casio EX-S770		Photo #s: E Outfall-2019-11-22.jpg	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☒ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known): University of Montana street drainage.

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☒ **Closed Pipe**	☒ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: ____	☐ Single ☐ Double ☐ Triple ☐ Other: ____	Diameter/Dimensions: _____	In Water: ☐ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: ____	☐ Trapezoid ☐ Parabolic ☐ Other: ____		Depth: ____ Top Width: ____ Bottom Width: ____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☒ Yes ☐ No	***If No, Skip to Section 5***			
Flow Description (If present)	☒ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☒ Flow #1	Volume	5 gal	Liter	Bottle
	Time to fill	10'33'' 0.47 GPM	Sec	
☐ Flow #2	Flow depth		In	Tape measure
	Flow width	____' ____"	Ft, In	Tape measure
	Measured length	____' ____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature			°F	Thermometer
pH			pH Units	Test strip/Probe
Ammonia			mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☐ No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☒	☒ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☒ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☐ Yes ☒ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Overall Outfall Characterization

☐ Unlikely ☒ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☒ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☒ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)? Some trash further down culvert.

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: Clark Fork		Outfall ID: East Outfall	
Today's date: 3/13/2018		Time (Military): 18:00	
Investigators: Brian P. Kerns		Form completed by: Brian P. Kerns	
Temperature (°F):	Rainfall (in.): Last 24 hours:	Last 48 hours:	
Latitude: 46.864888	Longitude: -113.980524	GPS Unit: mobile app	GPS LMK #:
Camera: Casio EX-S770		Photo #s:	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☒ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known): University of Montana street drainage.

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☒ **Closed Pipe**	☒ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: _____	☐ Single ☐ Double ☐ Triple ☐ Other: _____	Diameter/Dimensions: _____	In Water: ☐ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: _____	☐ Trapezoid ☐ Parabolic ☐ Other: _____		Depth: _____ Top Width: _____ Bottom Width: _____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☒ Yes ☐ No	***If No, Skip to Section 5***			
Flow Description (If present)	☒ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☒ Flow #1	Volume	1.0 GPM estimated	Liter	Bottle
	Time to fill		Sec	
☐ Flow #2	Flow depth		In	Tape measure
	Flow width	____' ____"	Ft, In	Tape measure
	Measured length	____' ____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature			°F	Thermometer
pH			pH Units	Test strip/Probe
Ammonia			mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☒ No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☒ Yes ☐ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☒	☐ Oily ☐ Flow Line ☐ Paint ☒ Other:	Ice.
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☐	☐ Brown ☐ Orange ☐ Green ☐ Other:	

Section 6: Overall Outfall Characterization

☐ Unlikely ☒ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☒ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☒ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

OUTFALL RECONNAISSANCE INVENTORY/ SAMPLE COLLECTION FIELD SHEET

Section 1: Background Data

Subwatershed: Clark Fork		Outfall ID: East Outfall	
Today's date: 11/16/2017		Time (Military): 13:16	
Investigators: Brian P. Kerns		Form completed by: Brian P. Kerns	
Temperature (°F):	Rainfall (in.): Last 24 hours:	Last 48 hours:	
Latitude: 46.864888	Longitude: -113.980524	GPS Unit: mobile app	GPS LMK #:
Camera: Casio EX-S770		Photo #s:	

Land Use in Drainage Area (Check all that apply):

- ☐ Industrial
- ☐ Ultra-Urban Residential
- ☐ Suburban Residential
- ☐ Commercial
- ☐ Open Space
- ☒ Institutional
- Other: _____
- Known Industries: _____

Notes (e.g., origin of outfall, if known): University of Montana street drainage.

Section 2: Outfall Description

LOCATION	MATERIAL	SHAPE		DIMENSIONS (IN.)	SUBMERGED
☒ **Closed Pipe**	☒ RCP ☐ CMP ☐ PVC ☐ HDPE ☐ Steel ☐ Other: _____	☐ Circular ☐ Eliptical ☐ Box ☐ Other: _____	☐ Single ☐ Double ☐ Triple ☐ Other: _____	Diameter/Dimensions: _____	In Water: ☐ No ☐ Partially ☐ Fully With Sediment: ☐ No ☐ Partially ☐ Fully
☐ **Open drainage**	☐ Concrete ☐ Earthen ☐ rip-rap ☐ Other: _____	☐ Trapezoid ☐ Parabolic ☐ Other: _____		Depth: _____ Top Width: _____ Bottom Width: _____	
☐ **In-Stream**	**(applicable when collecting samples)**				
Flow Present?	☒ Yes ☐ No	***If No, Skip to Section 5***			
Flow Description (If present)	☒ Trickle ☐ Moderate ☐ Substantial				

Section 3: Quantitative Characterization

FIELD DATA FOR FLOWING OUTFALLS				
PARAMETER		**RESULT**	**UNIT**	**EQUIPMENT**
☒ Flow #1	Volume	1.5 GPM estimated	Liter	Bottle
	Time to fill		Sec	
☐ Flow #2	Flow depth		In	Tape measure
	Flow width	____' ____"	Ft, In	Tape measure
	Measured length	____' ____"	Ft, In	Tape measure
	Time of travel		S	Stop watch
Temperature			°F	Thermometer
pH			pH Units	Test strip/Probe
Ammonia			mg/L	Test strip

Outfall Reconnaissance Inventory Field Sheet

Section 4: Physical Indicators for Flowing Outfalls Only

Are Any Physical Indicators Present in the flow? ☐ Yes ☒ No *(If No, Skip to Section 5)*

INDICATOR	CHECK if Present	DESCRIPTION	RELATIVE SEVERITY INDEX (1-3)		
Odor	☐	☐ Sewage ☐ Rancid/sour ☐ Petroleum/gas ☐ Sulfide ☐ Other:	☐ 1 – Faint	☐ 2 – Easily detected	☐ 3 – Noticeable from a distance
Color	☐	☐ Clear ☐ Brown ☐ Gray ☐ Yellow ☐ Green ☐ Orange ☐ Red ☐ Other:	☐ 1 – Faint colors in sample bottle	☐ 2 – Clearly visible in sample bottle	☐ 3 – Clearly visible in outfall flow
Turbidity	☐	See severity	☐ 1 – Slight cloudiness	☐ 2 – Cloudy	☐ 3 – Opaque
Floatables -Does Not Include Trash!!	☐	☐ Sewage (Toilet Paper, etc.) ☐ Suds ☐ Petroleum (oil sheen) ☐ Other:	☐ 1 – Few/slight; origin not obvious	☐ 2 – Some; indications of origin (e.g., possible suds or oil sheen)	☐ 3 - Some; origin clear (e.g., obvious oil sheen, suds, or floating sanitary materials)

Section 5: Physical Indicators for Both Flowing and Non-Flowing Outfalls

Are physical indicators that are not related to flow present? ☒ Yes ☐ No *(If No, Skip to Section 6)*

INDICATOR	CHECK if Present	DESCRIPTION	COMMENTS
Outfall Damage	☐	☐ Spalling, Cracking or Chipping ☐ Peeling Paint ☐ Corrosion	
Deposits/Stains	☐	☐ Oily ☐ Flow Line ☐ Paint ☐ Other:	
Abnormal Vegetation	☐	☐ Excessive ☐ Inhibited	
Poor pool quality	☐	☐ Odors ☐ Colors ☐ Floatables ☐ Oil Sheen ☐ Suds ☐ Excessive Algae ☐ Other:	
Pipe benthic growth	☒	☐ Brown ☐ Orange ☒ Green ☐ Other:	Slight.

Section 6: Overall Outfall Characterization

☐ Unlikely ☒ Potential (presence of two or more indicators) ☐ Suspect (one or more indicators with a severity of 3) ☐ Obvious

Section 7: Data Collection

1. Sample for the lab?	☐ Yes	☒ No	
2. If yes, collected from:	☐ Flow	☐ Pool	
3. Intermittent flow trap set?	☐ Yes	☒ No	If Yes, type: ☐ OBM ☐ Caulk dam

Section 8: Any Non-Illicit Discharge Concerns (e.g., trash or needed infrastructure repairs)?

UNIVERSITY OF MONTANA
Storm Water Management Program

APPENDIX D

POST-CONSTRUCTION STORM WATER MANAGEMENT IN NEW AND REDEVELOPMENT AREAS SUPPLEMENTARY INFORMATION

February 2021

UNIVERSITY OF MONTANA
Storm Water Management Program

INVENTORY OF POST-CONSTRUCTION STORM WATER MANAGEMENT CONTROLS

February 2021

University of Montana
Storm Water Management Program
Post-Construction Facility Inventory

Facility #	Grid Location	Type	Notes
DW3A-1	3A	Dry Well	
DW3A-2	3A	Dry Well	
DW3A-3	3A	Dry Well	
DW4A-1	4A	Dry Well	
DW4A-2	4A	Dry Well	
DW4A-3	4A	Dry Well	
DW4A-4	4A	Dry Well	
DW5A-1	5A	Dry Well	
DW5A-2	5A	Dry Well	
DW5A-3	5A	Dry Well	
DW5A-4	5A	Dry Well	
DW5A-5	5A	Dry Well	
DW5A-6	5A	Dry Well	
DW7A-1	7A	Dry Well	
DW7A-2	7A	Dry Well	
DW7A-3	7A	Dry Well	
DW7A-4	7A	Dry Well	
DW7A-5	7A	Dry Well	
DW7A-6	7A	Dry Well	
DW7A-7	7A	Dry Well	
DW7A-8	7A	Dry Well	
DW7A-9	7A	Dry Well	
DW7A-10	7A	Dry Well	
DW7A-11	7A	Dry Well	
DW7A-12	7A	Dry Well	
DW8A-1	8A	Dry Well	
DW8A-2	8A	Dry Well	
DW8A-3	8A	Dry Well	
DW8A-4	8A	Dry Well	
DW2B-1	2B	Dry Well	
DW2B-2	2B	Dry Well	
DW2B-3	2B	Dry Well	
DW2B-4	2B	Dry Well	
DW2B-5	2B	Dry Well	
DW2B-6	2B	Dry Well	
DW2B-7	2B	Dry Well	
DW2B-8	2B	Dry Well	
DW3B-1	3B	Dry Well	
DW3B-2	3B	Dry Well	

DW3B-3	3B	Dry Well	
DW3B-4	3B	Dry Well	
DW3B-5	3B	Dry Well	
DW4B-1	4B	Dry Well	
DW4B-2	4B	Dry Well	
DW4B-3	4B	Dry Well	
DW4B-4	4B	Dry Well	
DW4B-5	4B	Dry Well	
DW4B-6	4B	Dry Well	
DW4B-7	4B	Dry Well	
DW4B-8	4B	Dry Well	
DW4B-9	4B	Dry Well	
DW4B-10	4B	Dry Well	
DW4B-11	4B	Dry Well	
DW4B-12	4B	Dry Well	
DW4B-13	4B	Dry Well	
DW4B-14	4B	Dry Well	
DW5B-1	5B	Dry Well	
DW5B-2	5B	Dry Well	
DW5B-3	5B	Dry Well	
DW5B-4	5B	Dry Well	
DW6B-1	6B	Dry Well	
DW7B-1	7B	Dry Well	
DW7B-2	7B	Dry Well	
DW7B-3	7B	Dry Well	
DW7B-4	7B	Dry Well	
DW7B-5	7B	Dry Well	
DW7B-6	7B	Dry Well	
DW7B-7	7B	Dry Well	
DW7B-8	7B	Dry Well	
DW7B-9	7B	Dry Well	
DW7B-10	7B	Dry Well	
DW7B-11	7B	Dry Well	
DW7B-12	7B	Dry Well	
DW8B-1	8B	Dry Well	
DW8B-2	8B	Dry Well	
DW8B-3	8B	Dry Well	
DW8B-4	8B	Dry Well	
DW8B-5	8B	Dry Well	
DW8B-6	8B	Dry Well	
DW8B-7	8B	Dry Well	
DW8B-8	8B	Dry Well	
DW8B-9	8B	Dry Well	
DW8B-10	8B	Dry Well	
DW8B-11	8B	Dry Well	
DW8B-12	8B	Dry Well	
DW8B-13	8B	Dry Well	

DW8B-14	8B	Dry Well	
DW8B-15	8B	Dry Well	
DW8B-16	8B	Dry Well	
DW8B-17	8B	Dry Well	
DW8B-18	8B	Dry Well	
DW4C-1	4C	Dry Well	
DW4C-2	4C	Dry Well	
DW4C-3	4C	Dry Well	
DW4C-4	4C	Dry Well	
DW4C-5	4C	Dry Well	
DW4C-6	4C	Dry Well	
DW4C-7	4C	Dry Well	
DW4C-8	4C	Dry Well	
DW4C-9	4C	Dry Well	
DW4C-10	4C	Dry Well	
DW4C-11	4C	Dry Well	
DW4C-12	4C	Dry Well	
DW4C-13	4C	Dry Well	
DW5C-1	5C	Dry Well	
DW5C-2	5C	Dry Well	
DW5C-3	5C	Dry Well	
DW5C-4	5C	Dry Well	
DW5C-5	5C	Dry Well	
DW7C-1	7C	Dry Well	
DW7C-2	7C	Dry Well	
DW7C-3	7C	Dry Well	
DW7C-4	7C	Dry Well	
DW7C-5	7C	Dry Well	
DW7C-6	7C	Dry Well	
DW7C-7	7C	Dry Well	
DW7C-8	7C	Dry Well	
DW7C-9	7C	Dry Well	
DW8C-1	8C	Dry Well	
DW8C-2	8C	Dry Well	
DW3D-1	3D	Dry Well	
DW3D-2	3D	Dry Well	
DW3D-3	3D	Dry Well	
DW3D-4	3D	Dry Well	
DW3D-5	3D	Dry Well	
DW3D-6	3D	Dry Well	
DW3D-7	3D	Dry Well	
DW3D-8	3D	Dry Well	
DW3D-9	3D	Dry Well	
DW4D-1	4D	Dry Well	
DW4D-2	4D	Dry Well	
DW4D-3	4D	Dry Well	
DW4D-4	4D	Dry Well	

DW4D-5	4D	Dry Well	

UNIVERSITY OF MONTANA
Storm Water Management Program

INSPECTION & MAINTENANCE FORMS FOR POST-CONSTRUCTION STORM WATER MANAGEMENT CONTROLS

February 2021

UNIVERSITY OF MONTANA
Storm Water Management Program

Inspection Form – Dry Well and Deep Sump Catch Basin

General Information

Facility Name/Number:	Type of Best Management Practice (BMP): ☐ Dry Well ☐ Deep Sump Catch Basin
High Priority Stormwater Control? ☐ Yes ☐ No	
Depth of Basin (distance from top of grate to floor of structure)	
Design Depth:	Current Depth:
Latitude:	Longitude:
Date of Inspection:	Inspector's Name:

Type of Inspection:

☐ Routine, dry weather ☐ Routine, Wet Weather

☐ Complaint ☐ Other

Weather Information

Weather at time of this inspection:

☐ Clear ☐ Cloudy ☐ Rain ☐ Sleet ☐ Fog

☐ Snow ☐ High Winds ☐ Other: _____

Temperature: _____

Do you suspect that any physical changes or damages to the BMP may have occurred since the last inspection?

☐ Yes ☐ No

If yes, provide description of physical changes or damages:

Are there any storm water discharges at the time of inspection (i.e., discharge from an outlet)?

☐ Yes ☐ No

If yes, provide location(s) and a description of storm water discharged from the site (presence of suspended sediment, turbid water, discoloration and/or oil sheen, odor, etc.)

Prohibited Discharges

Are there any prohibited discharges at the time of inspection and/or any signs of prohibited discharges since the last inspection (i.e., chemicals, oils, or other illicit discharges flowing into the BMP)?

☐ Yes ☐ No

If yes, please provide location(s) and a description:

Inspector's Signature: _____ Date: _____

Primary Components	Inspection Item	Desired Conditions	Maintenance Needed?	Required Corrective Action/Notes
General	Accessibility	Maintenance access is not obstructed.	☐ Yes ☐ No ☐ N/A	☐ Fix, repair, or replace. ☐ Other:
	Contaminants & Pollution	Trash and debris are not accumulated within or around the facility and there is no evidence of oil, gasoline, contaminants, or other pollutants.	☐ Yes ☐ No ☐ N/A	☐ Clear and remove sediment and debris. ☐ Other:
	Erosion Control	Upstream channels show no signs of erosion.	☐ Yes ☐ No ☐ N/A	☐ Reseed and/or stabilize upstream channels. ☐ Other:
	Sedimentation	The contributing drainage area is stabilized and not contributing excessive amounts of sediment.	☐ Yes ☐ No ☐ N/A	☐ Reseed and/or stabilize drainage area. ☐ Other:
Inlet	Structural Damage	The inlet or grate is not missing, damaged, clogged, or defective.	☐ Yes ☐ No ☐ N/A	☐ Fix, repair, or replace. ☐ Other:
	Flow	There is evidence of flow into the well/basin.	☐ Yes ☐ No ☐ N/A	☐ Check whether the gutter, inlet pipe, downspout, or flow diverter is clogged. ☐ Clear and remove debris. ☐ Other:
Basin/Sump	Structural Damage	The basin/sump is not damaged or defective.	☐ Yes ☐ No ☐ N/A	☐ Fix, repair, or replace. ☐ Other:
	Drainage	Standing water is not present after the design drain time. The observed drain time is approximately ____ hours.	☐ Yes ☐ No ☐ N/A	☐ Recheck to determine if there is standing water after 72 hours. ☐ Remove any sediment buildup and replace the stone fill if necessary. ☐ Other:
	Sediment / Debris	Excessive sediment or debris are not present in the inspection port.	☐ Yes ☐ No ☐ N/A	☐ Clear and remove sediment and debris. ☐ Other:
	Odor	There is no odor present.	☐ Yes ☐ No ☐ N/A	☐ Clear and remove sediment and debris. ☐ Other:
	Overflow	There is no overflow from the top of the well/basin.	☐ Yes ☐ No ☐ N/A	☐ Clear and remove sediment and debris. ☐ Remove any sediment buildup. ☐ Other:
Outlet (Deep Sumps Only)	Structural Damage	The outlet pipe is not clogged or damaged.	☐ Yes ☐ No ☐ N/A	☐ Clear and remove debris. ☐ Fix, repair, or replace. ☐ Other:

Photo Log

[photo here]	[photo here]
Photo 1. [Description]	**Photo 2. [Description]**
[photo here]	[photo here]
Photo 3. [Description]	**Photo 4. [Description]**

UNIVERSITY OF MONTANA
Storm Water Management Program

University of Montana Storm Water Control
Inspection Frequency Determination

Facility Name/Number	Type of Facility	Date of Analysis

Grid Location	Latitude	Longitude

Address (if Applicable)	Construction/Installation Date (if known)

Criteria	Rating System	Rating Value	Applied Rating
Operation and Maintenance Needs	Low (dry well)	1	
	High (deep sump catch basin)	3	
Proximity to Clark Fork River	Greater than 500 feet	1	
	200-500 feet	2	
	Less than 200 feet	3	
Drainage Area	Less than 0.25 acre	1	
	0.25-1 acre	2	
	Greater than 1 acre	3	
Drainage Area Land Use Type	Residential (dormitories, parks, lawns)	1	
	Commercial (campus buildings, parks, lawns, streets)	2	
	Industrial (campus buildings, maintenance areas, streets)	3	
Outfall Location	No outfall (100% infiltration)	0	
	Clark Fork River	2	
		Total Rating Value	

Total Rating Value	Priority	Inspection Frequency
4 to 6	Low	Once every three years
7 to 9	Medium	Once every two years
10 to 14	High	Annually

Inspection Frequency for Post-Construction Stormwater Management Control

Priority: _____

Inspection Frequency: _____

UNIVERSITY OF MONTANA
Storm Water Management Program

LOW IMPACT DEVELOPMENT DISCUSSION

MEETING MINUTES

February 2021

UNIVERSITY OF MONTANA
Storm Water Management Program

Meeting Minutes

Date:	December 11, 2020	**Time:**	8:30 AM –9:10 AM
Attendees:	University of Montana	Others	
	Paul Trumbley John Grasso Brad Evanger Brian Kerns Kim Nielson Jameel Chaudhry Scott Holgate		

AGENDA

1. Explain UM's MS4 permit and its requirements
    a. Display excerpt of permit pertinent to Low Impact Development (LID) (page 33)
2. Display Low Impact Development PowerPoint presentation
    a. Goals
    b. Examples
3. Discussion of policy barriers to implementing LID
4. Discuss opportunities for LID

MEETING SUMMARY

Trumbley Evanger, Kerns & Chaudhry met in-person in the large conference room. The other attendees joined via Zoom. The assembled staff included planning, development and construction, campus architect, engineering, information technology, and grounds operations.

1. Kerns discussed UM's MS4 permit, UM's outfalls and stormwater system and MCM 5.d requiring MS4's to convene a meeting with appropriate staff to discuss barriers to implementing LID.
2. Kerns ran through the attached PowerPoint presentation and facilitated discussion among the attendees. The group debated which of the suggested examples are appropriate for campus. Focus was mostly on rain gardens and green/blue roofs. The other examples (filter strips; porous pavers, porous concrete and porous asphalt; narrow streets; rain barrels/cisterns) were not deemed relevant for campus. The porous materials, while interesting to the group, were not useful in Montana's climate due to ice/thaw thermal expansion/contraction.
3. The group pondered what, if any, institutional or policy barriers might exist to thwart LID. No one could identify anything in the way UM does its development and construction projects that inhibits LID. In fact, Chaudhry pointed to the institutional requirement that UM constructs any new buildings according to LEED specifications, which encourage LID. As a matter of course, UM's new development uses dry wells to catch and infiltrate stormwater runoff.
4. Kerns mentioned that the City of Missoula has suggested a collaboration in which the 2 parties construct some type(s) of green infrastructure/LID. The group identified several areas around campus that may be good for LID:
    a. The "wetlands" area at the southeast corner of campus.

b. The “mounds” area in the vicinity of Main Hall, the Library and the UC.
c. The areas along the east & west sides of Rankin Hall.
d. Parking Lot P, if/when it gets redeveloped or re-sloped due to the museum project.

Prepared by B.P. Kerns 12/22/2020

LOW IMPACT DEVELOPMENT

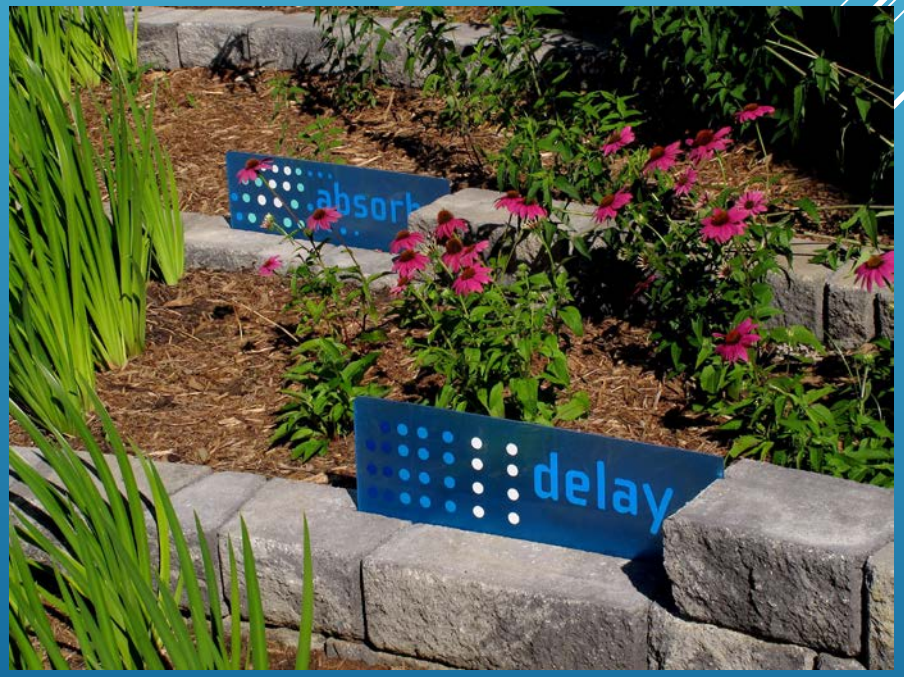
Stormwater Management Techniques

5 GOALS FOR LID

- Conserve natural areas
- Minimize development impact on hydrology
- Prevent water leaving site
- Incorporate variety of practices
  - Decentralized, microscale controls to:
    - Infiltrate
    - Store
    - Evaporate
    - Retain
- Prevention, maintenance, public education programs

EXAMPLES OF LID

- Vegetated filter strips at edges of paved surfaces
- Rain gardens to capture & infiltrate stormwater
- Porous pavers, porous concrete & porous asphalt
- Narrower streets
- Rain barrels & cisterns
- Green & blue roofs



RAIN GARDEN EXAMPLES

POROUS CONCRETE & ASPHALT

BLUE ROOFS

UNIVERSITY OF MONTANA
Storm Water Management Program

APPENDIX E

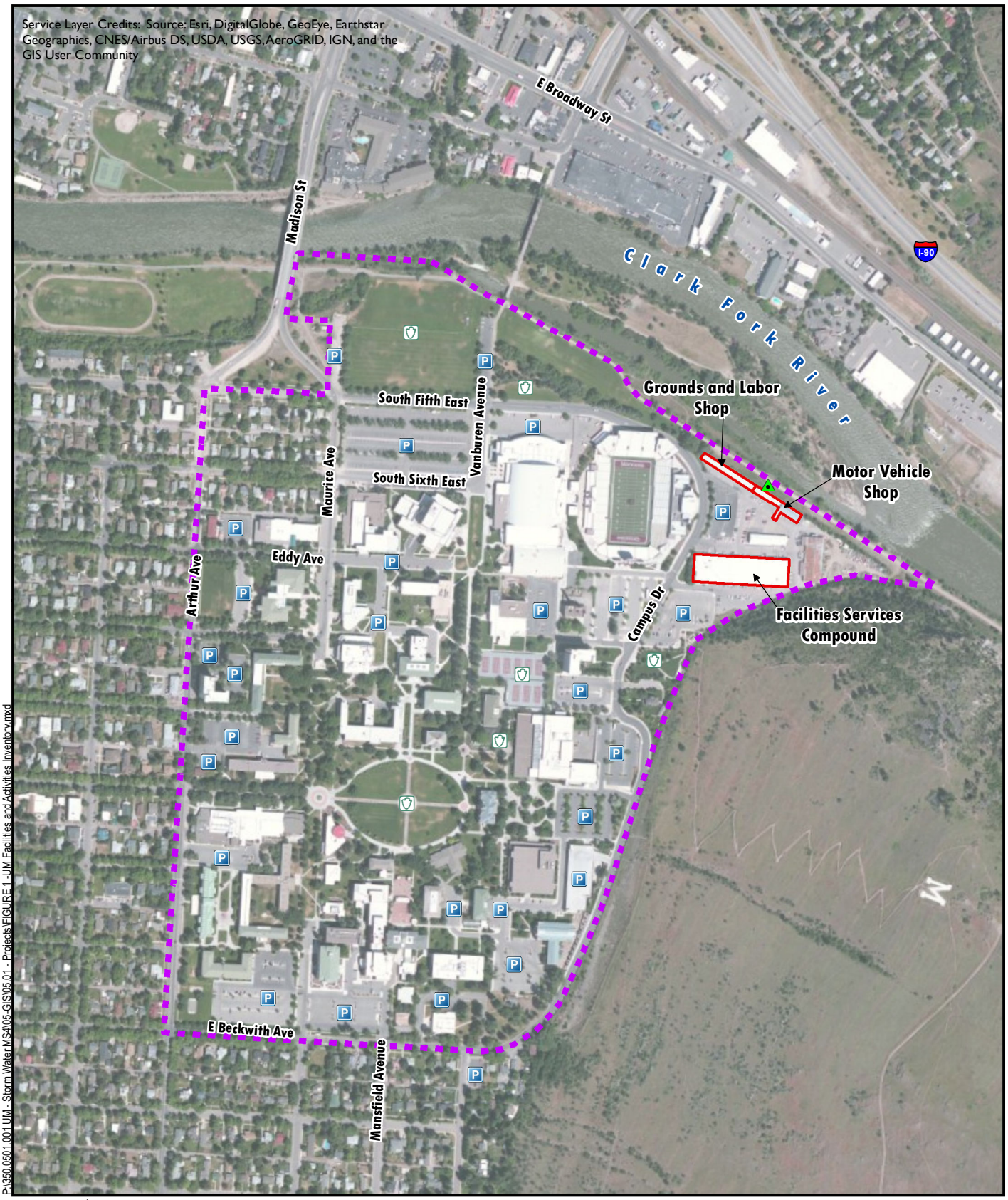
FACILITIES AND ACTIVITIES INVENTORY SUPPLEMENTARY INFORMATION

February 2021

Table E-1. Inventory of Dispersed Facilities

Facility Category	Facility Name
Parking Lots	Bus Barn Building
	Forest Service Parking
	Lommasson Center Parking Lot
	Parking Lot A
	Parking Lot B
	Parking Lot C
	Parking Lot D
	Parking Lot E
	Parking Lot F
	Parking Lot G
	Parking Lot H
	Parking Lot J
	Parking Lot J-1
	Parking Lot K
	Parking Lot K-1
	Parking Lot L
	Parking Lot M
	Parking Lot M-1
	Parking Lot N
	Parking Lot N-1
	Parking Lot P
	Parking Lot R-1
	Parking Lot R-2
	Parking Lot R-3
	Parking Lot S
	Parking Lot T
	Parking Lot U
	Parking Lot V
	Parking Lot W
	Parking Lot Y
	Parking Lot Z
Streets	Campus Drive
	Connell Avenue
	East Beckwith Avenue
	Eddy Avenue
	Mansfield Avenue
	Maurice Avenue
	South Fifth East
	South Sixth East
	Van Buren Avenue

Facility Category	Facility Name
Parks and Open Spaces	Lindsay Tennis Complex
	Phyllis Washington Park
	Practice Fields
	River Bowl
	The Oval
Snow Storage Areas	North of Motor Vehicle Shop



0 Feet 600

UNIVERSITY OF MONTANA
Storm Water Management Program

Legend

- Snow Storage Area
- Parking Lot
- Park
- Primary Facility
- UM MS4 Regulated Area Approximate Boundary

Facilities and Activities Inventory
University of Montana
FIGURE E-1

Note: Table 6 of Section 3.5 provides a list of the activities associated with each facility.

UNIVERSITY OF MONTANA
Storm Water Management Program

APPENDIX F

STORM WATER POLLUTION PREVENTION SOPS

February 2021

Storm Water Pollution Prevention

Facilities Standard Operating Procedures

SOP #1

University of Montana
Facilities Services Compound

SOP Preparation Date: 01/ 20 / 2021

Facility Description and Contact Information

1.1 Facility Information

Facility Information

Name of Facility: Facilities Services Compound

Street: 32 Campus Drive

City: Missoula State: MT ZIP Code: 59812

Discharge Information

Drainage Basin: Columbia River

Drainage Basin Receiving Waterbody: Clark Fork River

Does this facility discharge storm water *directly* into any segment of a receiving waterbody?[1]

☒Yes ☐No

Permit Information

Is this facility permitted by an MPDES Permit (in addition to MS4)? ☐Yes ☒No

If Yes, identify other discharge permits:

1.2 Contact Information/Responsible Parties

Facility Director:

Name: Bob Smith

Telephone number: 406-243-2095

Email address: bob.smith@mso.umt.edu

University of Montana Storm Water Management Program Coordinator:

Storm Water Management Contact Name (Primary): Paul Trumbley

Telephone number: 406-243-2127

Email address: paul.trumbley@mso.umt.edu

1.3 Storm Water Pollution Prevention Team

The storm water pollution prevention team is responsible for implementing and maintaining storm water control measures/BMPs, and taking corrective actions when required.

Name	Position/Title	Individual Responsibilities
John Grasso	Associate Director	Grounds Operations
Paul Trumbley	Associate Director	SWMP Coordinator
Brad Evanger	Planning, Construction Design Tech	Technical Assistance
Eva Rocke	Sustainability Coordinator	Public Outreach
Brian Kerns	Utility Engineer	SWMP Activity Coordination
Vacant	Industrial Hygienist	Spill Prevention/Clean-up

[1] For purposes of this document, direct discharge refers to site runoff discharging directly into a stream or other receiving waterbody immediately upon leaving the bounds of the site or facility.

1.4 Site Description

The Facilities Services Compound houses most university facility staff, including trade shops (carpentry, custodial, electrical, plumbing, painting, HVAC, locksmith, machine shop), vehicle maintenance & rentals, storage of equipment and materials, including chemicals (pesticides, herbicides, fertilizers, lubricants, sand/gravel, deicer, etc.), used in performing maintenance operations throughout campus. Campus police department is also housed in this facility. Compound is fenced and has dry wells although the east storm water sewer system is in close proximity as it runs along Campus Drive to an outfall that is located about 150 feet behind the northwest corner of the compound. The compound is approximately 6.5 acres.

1.5 Purpose and Limitations

This standard operating procedures (SOP) document identifies potential storm water pollutants that could be discharged from the site and storm water pollution best management practices (BMPs) to be implemented to minimize the discharge of pollutants from storm water runoff. The potential pollutants and BMPs identified in the document only address management of storm water associated with University of Montana activities. The nearby City of Missoula has its own storm water permit and management plan.

This document is not expected to cover all possible circumstances. Operations staff is allowed to adapt SOPs to site conditions in good judgment when it is necessary for safety and the effective containment of pollutants.

Figure 1. Facility Services Compound Site Plan

SECTION 2.0 Potential Storm Water Pollutant Sources

This section describes potential storm water pollutant sources associated with the University of Montana Facilities Services Compound.

2.1 Potential Storm Water Pollutants Associated with Facility Activities

The Facilities Services Compound is the operational nerve center of the University of Montana main campus. Activities include on-site fabrication, vehicle maintenance and storage, trade shops and maintenance vehicles, bus dispatch and charging, recycling, police dispatch activities, shipping and receiving, inventory warehouse, chemical and other bulk material storage. A list of activities with the potential to discharge pollutants to the storm drainage system is provided in Table 1. Measures to be taken to reduce the potential for discharge of pollutants associated with these activities are identified in Section 3.2.2.

Table 1. Facilities Services Compound Activities and Potential Storm Water Pollutants

Activity	Potential Pollutants								
	Sediment	Nutrients	Trash	Metals	Bacteria	Oil, Grease, Fuel	Organics	Pesticides/Herbicides	Hazardous Waste
Vehicle Maintenance				X		X			X
Snow Storage	X		X			X			X
Storage of Hazardous Chemicals				X		X	X	X	X
Vehicle & Equipment Storage	X	X	X			X	X		X
Storage of Bulk Materials	X	X		X			X		
Street & Parking Lot Maintenance	X	X	X	X		X	X	X	X
Winter Street & Parking Lot Maintenance	X	X	X	X		X	X	X	X
Waste Handling & Disposal	X	X	X	X	X	X	X	X	X
Recycling	X	X	X	X					
Building Maintenance	X		X	X		X			X
Supply Well Development	X								

2.2 Spills and Leaks

Activities across the Facilities Services Compound all have spill potential. Fortunately, the area is graded so as flows are directed into dry sumps and not into the storm water sewer system. Table 2 provides additional detail. Spill response protocol is described in Section 3.2.3.

Table 2. Areas Where Potential Spills/Leaks Could Occur

Location	Discharge Point
Main Office/Trade Shops	Trade shops all have interior bays where spillages could occur. There is also storage of some materials such as lubricants in shop areas.
Bus Barn - storage	Interior bays, perimeter parking.
Grounds shop - storage	Storage bays, equipment & vehicles
Motor Vehicle shop	Interior maintenance bays
Equipment Garage - storage	Interior bays

SECTION 3.0 Storm Water Control Measures

This section describes the storm water BMPs to minimize the discharge of pollutants from storm water runoff at the facility.

3.1 Structural BMPs

3.1.1 Storm Water Drainage System

Storm water drainage is graded to flow towards the 15 dry wells installed across the Facilities Services Compound. The University of Montana's east outfall storm water system generally follows the adjacent Campus Drive but flows inside the compound shouldn't enter this system.

3.1.2 Permanent Storm Water Management BMPs

BMP Locations

With reference to Figure 1 above, 15 dry wells have been installed to capture and infiltrate storm water into the Missoula Valley Aquifer.

BMP Inspection and Maintenance

As the Compound's dry wells become clogged, Associate Director Grasso schedules a contract vacuum truck to clear & clean the dry well.

3.1.3 Chemical and Bulk Fuel Storage

Chemicals and bulk materials such as gasoline, diesel, pesticide, herbicide, fertilizer, deicer, lubricants, waste oil, etc. are stored in various locations throughout the Compound. Interior bays are designed to pool and contain spillages inside. Floor drains in bays are connected to the sanitary sewer. The bulk fueling station has a concrete containment perimeter. The vehicle maintenance shop has floor drains connected to the sanitary sewer and has an oil-water separator.

3.2 Non-Structural BMPs

3.2.1 Employee Training

Training Procedures

Employees are given storm water awareness training and are schooled in effective execution of their work activities. In addition, staff is given specific storm water pollution prevention training.

Training Schedule

Newly hired staff is given storm water training on applicable activities within 90 days of hiring.

3.2.2 Good Housekeeping

Good housekeeping procedures to be implemented by facility staff are listed in Table 3.

Table 3. Facility Services Compound Storm Water Management Good Housekeeping Procedures

Activity	Responsible Person/Position	BMP to Reduce Potential for Pollution
Vehicle Maintenance	Bob Peterson	Vehicle Maintenance SOP
Snow Storage	Mick Alva	Snow Storage SOP
Storage of Hazardous Chemicals	Ben Carson	Storage of Hazardous Chemicals SOP
Vehicle & Equipment Storage	Mick Alva	Vehicle & Equipment SOP
Storage of Bulk Materials	Ben Carson	Storage of Bulk Materials SOP
Street & Parking Lot Maintenance	Mick Alva	Street 7 Parking Lot Maintenance SOP
Winter Street & Parking Lot Maintenance	Mick Alva	Winter Street & Parking Lot Maintenance SOP
Waste Handling & Disposal	Mick Alva	Waste Handling & Disposal SOP
Recycling	Eva Rocke	Recycling SOP
Building Maintenance	Shawn Monson	Building Maintenance SOP
Supply Well Development	Brad Evanger	Supply Well Development SOP

3.2.3 Spill Response

Spill response and cleanup is addressed by employee training, discussed in Section 3.2.1. Spill response procedures are provided below.

Facility Spill Kit

Spill kits are populated throughout the Facility Services Compound. Each shop has a kit within the shop and each technician's service vehicle also has a kit. Additionally, kits are available in the office of the Associate Director of Engineering/Utilities. The spill kit contains the following items:

- Absorbent Pads (white pads for vehicle fluids; grey pads for most everything, including oils & vehicle fluids)
- Bags of Floor Dry
- Disposal Bags
- Safety Goggles
- Rubber Gloves

Minor Spill Response Procedure

A minor spill is defined as one that poses no significant threat to human health or the environment. These spills generally involve less than 5 gallons and can usually be cleaned up by staff with supplied spill kits. Other characteristics of a minor spill include:

- The spilled material is easily stopped or controlled at the time of the spill
- The spill is localized
- The spilled material is not likely to reach surface water or groundwater

- There is little danger to human health
- There is little danger of explosion

Use the following procedures in response to a minor spill:

1. Immediately notify management of the spill.
2. If necessary, physically contain the spill to prevent further migration from the site.
    a. Stop or reduce continued release by ceasing activity, closing valves or flipping switches.
    b. Block or slow the migration of spilled material.
    c. Close or plug drains when possible.
2. Using proper personal protective equipment, obtain and use supplies from the spill kit for containment and absorption.
3. In consultation with the management, clean up small spills that can be effectively cleaned up by staff or hire a spill cleanup contractor.
4. Dispose of all contaminated products in accordance with applicable federal, state and local regulations.
5. Document the spill material, location, size, and date.

Major Spill Response Procedure

A major spill is defined as one involving a spill that cannot be safely and or adequately controlled or cleaned up by on-site staff. Characteristics of a major spill include:

- The spill is large enough to spread beyond the immediate area
- The spill material entered surface water or ground water (regardless of the size)
- The spill requires special training and equipment to cleanup
- The spill material is a threat to human health
- There is a danger of fire or explosion

Use the following procedures in response to a major spill:

1. All workers shall immediately evacuate the spill site to a safe distance away from the spill.
2. Notify management of the spill and details regarding the spill.
3. If there is not an immediate health or safety danger and if actions can be implemented safely, a trained employee shall conduct obvious and immediately implementable containment measures in the following sequence:
    a. Stop or reduce continued release by ceasing activity, closing valves or flipping switches.
    b. Block or slow the migration of spilled material.
    c. Close or plug drains when possible.
4. Management will contact the Fire Department to notify the Hazardous Response Team.
5. Management will coordinate cleanup with the Hazardous Response Team.
6. Document the spill material, location, size, and date.

Attachments: Activity SOPs

Building Maintenance
Equipment Storage and Maintenance
Event Facilitation and Response
Ground Maintenance
Hydrant Flushing
Recycling
Snow Storage
Storage of Hazardous Chemicals
Storage of Salt/Sand
Street and Parking Lot Maintenance
Supply Well Development
Vehicle and Equipment Storage
Vehicle Maintenance
Waste Handling and Disposal
Winter Street and Parking Lot Maintenance

Storm Water Pollution Prevention

Facilities Standard Operating Procedures

University of Montana
Grounds and Labor Shop

SOP Preparation Date: 01/ 20 / 2021

Facility Description and Contact Information

1.1 Facility Information

Facility Information

Name of Facility: Grounds and Labor Shop

Street: 32 Campus Drive

City: Missoula State: MT ZIP Code: 59812

Discharge Information

Drainage Basin: Columbia River

Drainage Basin Receiving Waterbody: Clark Fork River

Does this facility discharge storm water *directly* into any segment of a receiving waterbody?[1]
☐Yes ☒No

Permit Information

Is this facility permitted by an MPDES Permit (in addition to MS4)? ☐Yes ☒No

If Yes, identify other discharge permits:

1.2 Contact Information/Responsible Parties

Facility Director:

Name: Bob Smith

Telephone number: 406-243-2095

Email address: bob.smith@mso.umt.edu

University of Montana Storm Water Management Program Coordinator:

Storm Water Management Contact Name (Primary): Paul Trumbley

Telephone number: 406-243-2127

Email address: paul.trumbley@mso.umt.edu

1.3 Storm Water Pollution Prevention Team

The storm water pollution prevention team is responsible for implementing and maintaining storm water control measures/BMPs, and taking corrective actions when required.

Name	Position/Title	Individual Responsibilities
John Grasso	Associate Director	Grounds Operations
Brad Evanger	Planning, Construction Design Tech	Technical Assistance
Eva Rocke	Sustainability Coordinator	Public Outreach

[1] For purposes of this document, direct discharge refers to site runoff discharging directly into a stream or other receiving waterbody immediately upon leaving the bounds of the site or facility.

Name	Position/Title	Individual Responsibilities
Brian Kerns	Utility Engineer	SWMP Activity Coordination
Vacant	Industrial Hygienist	Spill Prevention/Clean-up

1.4 Site Description

The Facilities Services Grounds and Labor shop houses grounds staff and equipment such as sand/gravel, deicer vehicles as well as lawn mowers and miscellaneous fertilizers and chemicals. The facility consists of two offices, a break room with personal lockers and heated equipment storage area, all within the main facility at NW end of the Facilities Services compound. To the East of this is a series of 29 garage bays that serve as storage for vehicles and supplies. The compound is fenced and has dry wells although the east storm water sewer system is in close proximity as it runs along Campus Drive to an outfall that is located about 150 feet behind the northwest corner of the compound. The compound is approximately 6.5 acres.

1.5 Purpose and Limitations

This standard operating procedures (SOP) document identifies potential storm water pollutants that could be discharged from the site and storm water pollution best management practices (BMPs) to be implemented to minimize the discharge of pollutants from storm water runoff. The potential pollutants and BMPs identified in the document only address management of storm water associated with University of Montana activities. The nearby City of Missoula has its own storm water permit and management plan.

This document is not expected to cover all possible circumstances. Operations staff is allowed to adapt SOPs to site conditions in good judgment when it is necessary for safety and the effective containment of pollutants.

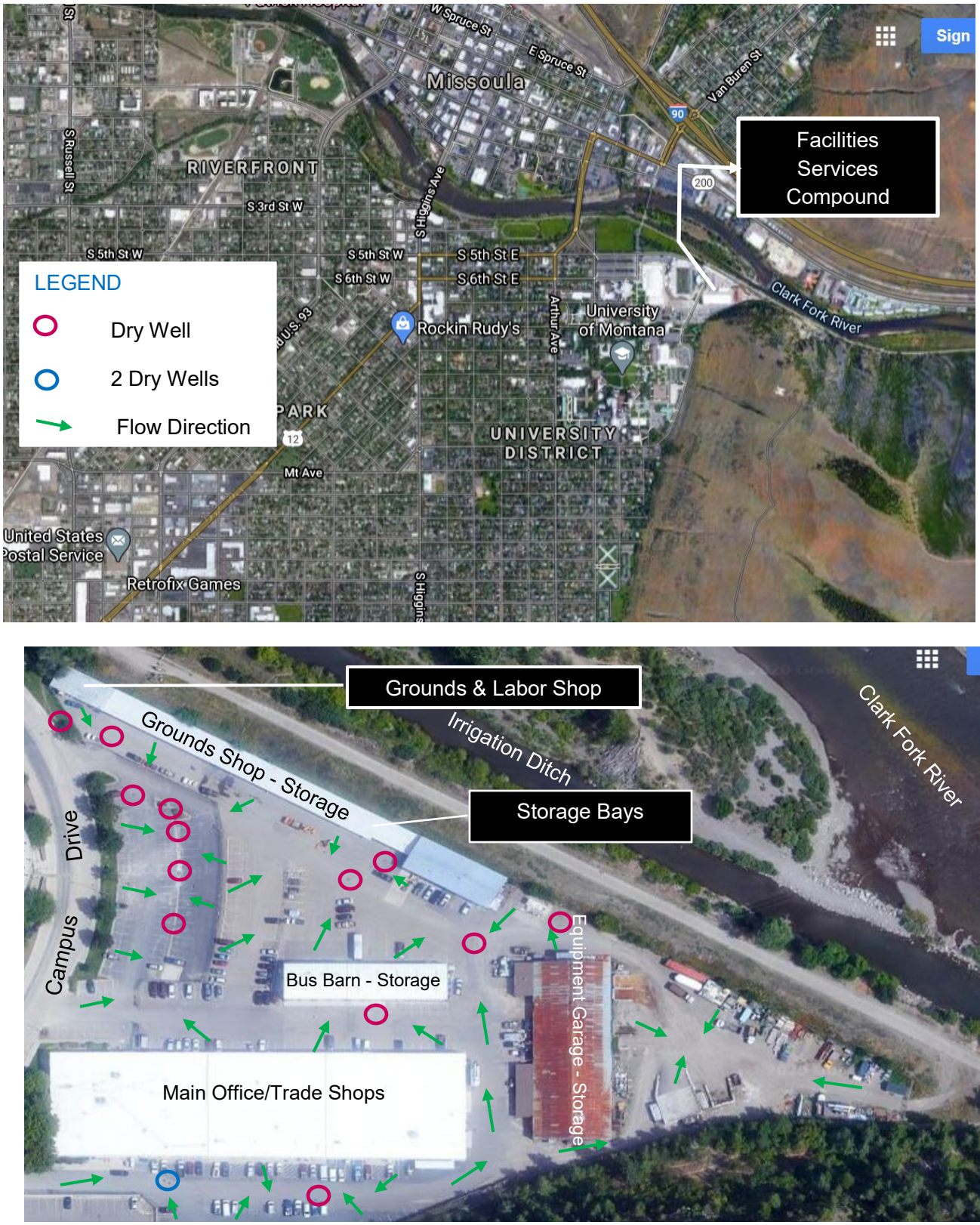


Figure 1. Facility Services Compound Site Plan

SECTION 2.0 Potential Storm Water Pollutant Sources

This section describes potential storm water pollutant sources associated with the University of Montana Facilities Services Compound.

2.1 Potential Storm Water Pollutants Associated with Facility Activities

The Grounds and Labor shop is within the Facilities Compound which is the operational nerve center of the University of Montana main campus. Shop activities include fertilizer and pesticide preparation, grounds equipment and heavy machinery storage and maintenance. A list of activities with the potential to discharge pollutants to the storm drainage system is provided in Table 1. Measures to be taken to reduce the potential for discharge of pollutants associated with these activities are identified in Section 3.2.2.

Table 1. Facilities Services Compound Activities and Potential Storm Water Pollutants

Activity	Potential Pollutants								
	Sediment	Nutrients	Trash	Metals	Bacteria	Oil, Grease, Fuel	Organics	Pesticides/Herbicides	Hazardous Waste
Snow Storage	X		X			X			X
Storage of Hazardous Chemicals				X		X	X	X	X
Vehicle & Equipment Storage	X	X	X			X	X		X
Storage of Bulk Materials	X	X		X			X	X	X
Street & Parking Lot Maintenance	X	X	X	X		X	X	X	X
Winter Street & Parking Lot Maintenance	X	X	X	X		X	X	X	X
Waste Handling & Disposal	X	X	X	X	X	X	X	X	X
Recycling	X	X	X	X					
Building Maintenance	X		X	X		X			X

2.2 Spills and Leaks

Activities across the Facilities Services Compound all have spill potential. Fortunately, the area is graded so flows are directed into dry sumps and not into the storm water sewer system. Table 2 provides additional detail. Spill response protocol is described in Section 3.2.3.

Table 2. Areas Where Potential Spills/Leaks Could Occur

Location	Discharge Point
Grounds and labor Shop	Some fertilizers and pesticides are stored and prepared for dispersal within the shop and storage bays.

Location	Discharge Point
Grounds shop - storage	Storage bays, equipment & vehicles
Equipment Garage - storage	Interior bays

SECTION 3.0 Storm Water Control Measures

This section describes the storm water BMPs to minimize the discharge of pollutants from storm water runoff at the facility.

3.1 Structural BMPs

3.1.1 Storm Water Drainage System

Storm water drainage is graded to flow towards the 15 dry wells installed across the Facilities Services Compound. The University of Montana's east outfall storm water system generally follows the adjacent Campus Drive but flows inside the compound shouldn't enter this system.

3.1.2 Permanent Storm Water Management BMPs

BMP Locations
With reference to Figure 1 above, 15 dry wells have been installed to capture and infiltrate storm water into the Missoula Valley Aquifer.

BMP Inspection and Maintenance
As the Compound's dry wells become clogged, Associate Director Grasso schedules a contract vacuum truck to clear & clean the dry well.

3.1.3 Chemical and Bulk Fuel Storage

Chemicals and bulk materials such as gasoline, diesel, pesticide, herbicide, fertilizer, deicer, lubricants, waste oil, etc. are stored in various locations throughout the Compound. Interior bays are designed to pool and contain spillages inside. Floor drains in bays are connected to the sanitary sewer. Non-Structural BMPs

3.1.4 Employee Training

Training Procedures
Employees are given storm water awareness training and are schooled in effective execution of their work activities. In addition, staff is given specific storm water pollution prevention training.

Training Schedule
Newly hired staff is given storm water training on applicable activities within 90 days of hiring.

3.1.5 Good Housekeeping

Good housekeeping procedures to be implemented by facility staff are listed in Table 3.

Table 3. Facility Services Compound Storm Water Management Good Housekeeping Procedures

Activity	Responsible Person/Position	BMP to Reduce Potential for Pollution
Vehicle Maintenance	Bob Peterson	Vehicle Maintenance SOP
Snow Storage	Mick Alva	Snow Storage SOP
Storage of Hazardous Chemicals	Ben Carson	Storage of Hazardous Chemicals SOP
Vehicle & Equipment Storage	Mick Alva	Vehicle & Equipment SOP
Storage of Bulk Materials	Ben Carson	Storage of Bulk Materials SOP
Street & Parking Lot Maintenance	Mick Alva	Street 7 Parking Lot Maintenance SOP
Winter Street & Parking Lot Maintenance	Mick Alva	Winter Street & Parking Lot Maintenance SOP
Waste Handling & Disposal	Mick Alva	Waste Handling & Disposal SOP
Recycling	Eva Rocke	Recycling SOP
Building Maintenance	Shawn Monson	Building Maintenance SOP
Supply Well Development	Brad Evanger	Supply Well Development SOP

3.1.6 Spill Response

Spill response and cleanup is addressed by employee training, discussed in Section 3.2.1. Spill response procedures are provided below.

Facility Spill Kit

Spill kits are populated throughout the Facility Services Compound. Each shop has a kit within the shop and each technician's service vehicle also has a kit. Additionally, kits are available in the office of the Associate Director of Engineering/Utilities. The spill kit contains the following items:

- Absorbent Pads (white pads for vehicle fluids; grey pads for most everything, including oils & vehicle fluids)
- Bags of Floor Dry
- Disposal Bags
- Safety Goggles
- Rubber Gloves

Minor Spill Response Procedure

A minor spill is defined as one that poses no significant threat to human health or the environment. These spills generally involve less than 5 gallons and can usually be cleaned up by staff with supplied spill kits. Other characteristics of a minor spill include:

- The spilled material is easily stopped or controlled at the time of the spill
- The spill is localized
- The spilled material is not likely to reach surface water or groundwater
- There is little danger to human health
- There is little danger of explosion

Use the following procedures in response to a minor spill:

1. Immediately notify management of the spill.
2. If necessary, physically contain the spill to prevent further migration from the site.

   a. Stop or reduce continued release by ceasing activity, closing valves or flipping switches.
   b. Block or slow the migration of spilled material.
   c. Close or plug drains when possible.
2. Using proper personal protective equipment, obtain and use supplies from the spill kit for containment and absorption.
3. In consultation with the management, clean up small spills that can be effectively cleaned up by staff or hire a spill cleanup contractor.
4. Dispose of all contaminated products in accordance with applicable federal, state and local regulations.
5. Document the spill material, location, size, and date.

Major Spill Response Procedure

A major spill is defined as one involving a spill that cannot be safely and or adequately controlled or cleaned up by on-site staff. Characteristics of a major spill include:

- The spill is large enough to spread beyond the immediate area
- The spill material entered surface water or ground water (regardless of the size)
- The spill requires special training and equipment to cleanup
- The spill material is a threat to human health
- There is a danger of fire or explosion

Use the following procedures in response to a major spill:

1. All workers shall immediately evacuate the spill site to a safe distance away from the spill.
2. Notify management of the spill and details regarding the spill.
3. If there is not an immediate health or safety danger and if actions can be implemented safely, a trained employee shall conduct obvious and immediately implementable containment measures in the following sequence:
   a. Stop or reduce continued release by ceasing activity, closing valves or flipping switches.
   b. Block or slow the migration of spilled material.
   c. Close or plug drains when possible.
4. Management will contact the Fire Department to notify the Hazardous Response Team.
5. Management will coordinate cleanup with the Hazardous Response Team.
6. Document the spill material, location, size, and date.

Attachments: Activity SOPs

Building Maintenance
Equipment Storage and Maintenance
Event Facilitation and Response
Ground Maintenance
Hydrant Flushing
Snow Storage
Storage of Hazardous Chemicals
Storage of Salt/Sand
Street and Parking Lot Maintenance
Supply Well Development
Vehicle and Equipment Storage
Vehicle Maintenance
Waste Handling and Disposal
Winter Street and Parking Lot Maintenance
Recycling

Storm Water Pollution Prevention

Facilities Standard Operating Procedures

SOP #4

University of Montana
Parks and Open Spaces

SOP Preparation Date: 02/18/2021

Facility Description and Contact Information

1.1 Facility Information

Facility Information

Name of Facility: Parks and Open Spaces

Street: 32 Campus Drive

City: Missoula State: MT ZIP Code: 59812

Discharge Information

Drainage Basin: Columbia River

Drainage Basin Receiving Waterbody: Clark Fork River

Does this facility discharge storm water *directly* into any segment of a receiving waterbody?[1]

☒Yes ☐No

Permit Information

Is this facility permitted by an MPDES Permit (in addition to MS4)? ☐Yes ☒No

If Yes, identify other discharge permits:

1.2 Contact Information/Responsible Parties

Facility Director:

Name: Bob Smith

Telephone number: 406-243-2095

Email address: bob.smith@mso.umt.edu

University of Montana Storm Water Management Program Coordinator:

Storm Water Management Contact Name (Primary): Paul Trumbley

Telephone number: 406-243-2127

Email address: paul.trumbley@mso.umt.edu

[1] For purposes of this document, direct discharge refers to site runoff discharging directly into a stream or other receiving waterbody immediately upon leaving the bounds of the site or facility.

1.3 Storm Water Pollution Prevention Team

The storm water pollution prevention team is responsible for implementing and maintaining storm water control measures/BMPs, and taking corrective actions when required.

Name	Position/Title	Individual Responsibilities
John Grasso	Associate Director	Grounds Operations
Paul Trumbley	Associate Director	SWMP Coordinator
Brad Evanger	Planning, Construction Design Tech	Technical Assistance
Eva Rocke	Sustainability Coordinator	Public Outreach
Brian Kerns	Utility Engineer	SWMP Activity Coordination
Vacant	Industrial Hygienist	Spill Prevention/Clean-up

1.4 Site Description

The University of Montana main campus contains over 150 acres that encompass multiple streets and parking lots, only some of which are connected to the storm water sewer system (see map below). UM has 30 parking lots in total, 10 of which are tied into the storm water system. UM has about 2.5 miles of asphalt roadway, 0.5 miles which contribute to the storm water system. Obviously, the asphalt roadways conduct vehicular traffic through campus. Streets and parking lots experience a lot of improperly discarded garbage plus plenty of vehicle fluid leaks. An average of about 8,500[2] vehicles travel through campus on any given day. About 3,500[3] parking permits are issued annually. 2 full time traffic officers patrol campus looking for parking or moving violations.

1.5 Purpose and Limitations

This standard operating procedures (SOP) document identifies potential storm water pollutants that could be discharged from these dispersed facilities. The best management practices (BMPs) contained herein will minimize the discharge of pollutants from these facilities. The potential pollutants and BMPs identified in the document only address management of storm water associated with University of Montana activities. The nearby City of Missoula has its own storm water permit and management plan.

This document is not expected to cover all possible circumstances. Operations staff is allowed to adapt SOPs to site conditions in good judgment when it is necessary for safety and the effective containment of pollutants.

[2] Nelson|Nygaard, “Parking and Transportation Demand Management Plan,” 2016, p. xiv.
[3] Rocke, Eva, Fiscal Year 2021 parking statistics, 2/16/2021 email.

Figure 1. Parks and Open Spaces at the University of Montana.

SECTION 2.0 Potential Storm Water Pollutant Sources

This section describes potential storm water pollutant sources associated with the University of Montana streets and parking lots.

2.1 Potential Storm Water Pollutants Associated with Street and Parking Lot Activities

UM streets and parking lots are the conduit for the many daily commuters that come onto campus. Activities are mainly campus vehicular ingress and egress as well as daily parking. Trash receptacles are placed along streets and lots and sections are used for snow storage in the winter. Occasionally, a ground water well will be located in parking lots as with the Champions Center well in Lot T. Fire hydrants are testing and flushed annually by Plumbing staff. Effluent from hydrant activities is kept off impervious surfaces as much as possible per the hydrant flushing SOP. These activities are provided in Table 1. Measures to be taken to reduce the potential for discharge of pollutants associated with these activities are identified in Section 3.2.2.

Table 1. Streets and Parking Lot Activities and Potential Storm Water Pollutants

Activity	Potential Pollutants								
	Sediment	Nutrients	Trash	Metals	Bacteria	Oil, Grease, Fuel	Organics	Pesticides/Herbicides	Hazardous Waste
Hydrant Flushing	X	X	X			X		X	
Snow Storage	X		X			X			X
Street & Parking Lot Maintenance	X	X	X	X		X	X	X	X
Supply Well Development	X								
Vehicle & Equipment Storage	X	X	X			X	X		X
Winter Street & Parking Lot Maintenance	X	X	X	X		X	X	X	X
Waste Handling & Disposal	X	X	X	X	X	X	X	X	X

2.2 Spills and Leaks

Potential pollutants from activities along streets and parking lots mostly lend themselves to leaking vehicular fluids. The majority of storm water incidents reported involve oil and gasoline leaks in parking lots. Table 2 provides additional detail. Spill response protocol is described in Section 3.2.3.

Table 2. Areas Where Potential Spills/Leaks Could Occur

Location	Discharge Point
Campus Drive	Trash expelled from vehicles; automotive fluid leaks.
Parking Lots	All parking spaces. It's worth noting that a single vehicle that is leaking fluids can pollute multiple locations over a long period of time as the owner accesses multiple spaces around campus.

SECTION 3.0 Storm Water Control Measures

This section describes the storm water BMPs to minimize the discharge of pollutants from storm water runoff along streets and lots.

3.1 Structural BMPs

3.1.1 Storm Water Drainage System

Storm water drainage along roads and parking lots is graded to flow towards either dry wells or into storm sewer grates which then conduct the storm water to one of UM's 2 outfalls.

3.1.2 Permanent Storm Water Management BMPs

BMP Locations

With reference to Figure 1 above, of the parking lots called-out on the image, Lots F, M & Z are served by dry wells while the other lots enter the storm water system directly and are discharged into the Clark Fork River. Some of the devices are catchment basins that offer some storm water storage and infiltration before overflowing into an invert into the storm sewer. Campus Drive, between the 2 green stars shown on Figure 1, drains storm water directly into the storm sewer. Other portions of Campus Drive and other campus streets are served by dry sumps.

BMP Inspection and Maintenance

Dry sumps and catchment basins are cleaned-out by a contract vacuum truck as they show signs of becoming clogged, Associate Director Grasso schedules the vacuum truck.

3.1.3 Infiltration

With reference to Figure 1 above, the orange arrow shows approximate location where the street curb is breached in order to allow storm water to drain off the asphalt and into turf grass where it can then percolate into the ground.

3.2 Non-Structural BMPs

3.2.1 Employee Training

Training Procedures

Employees are given storm water awareness training and are schooled in effective execution of their work activities. In addition, staff is given specific storm water pollution prevention training.

Training Schedule

Newly hired staff is given storm water training on applicable activities within 90 days of hiring.

3.2.2 Good Housekeeping

Good housekeeping procedures to be implemented by facility staff are listed in Table 3.

Table 3. Facility Services Compound Storm Water Management Good Housekeeping Procedures

Activity	Responsible Person/Position	BMP to Reduce Potential for Pollution
Hydrant Flushing	Luke Woodward	Hydrant Flushing SOP
Snow Storage	Mick Alva	Snow Storage SOP
Vehicle & Equipment Storage	Mick Alva	Vehicle & Equipment SOP
Street & Parking Lot Maintenance	Mick Alva	Street 7 Parking Lot Maintenance SOP
Winter Street & Parking Lot Maintenance	Mick Alva	Winter Street & Parking Lot Maintenance SOP
Waste Handling & Disposal	Mick Alva	Waste Handling & Disposal SOP
Supply Well Development	Brad Evanger	Supply Well Development SOP

3.2.3 Spill Response

Spill response and cleanup is addressed by employee training, discussed in Section 3.2.1. Spill response procedures are provided below.

Facility Spill Kit

Spill kits are available in the trades' shops and are also carried in fleet service vehicles. Additionally, kits are available in the office of the Associate Director of Engineering/Utilities. The spill kit contains the following items:

- Absorbent Pads (white pads for vehicle fluids; grey pads for most everything, including oils & vehicle fluids)
- Bags of Floor Dry
- Disposal Bags
- Safety Goggles
- Rubber Gloves

Minor Spill Response Procedure

A minor spill is defined as one that poses no significant threat to human health or the environment. These spills generally involve less than 5 gallons and can usually be cleaned up by staff with supplied spill kits. Other characteristics of a minor spill include:

- The spilled material is easily stopped or controlled at the time of the spill
- The spill is localized
- The spilled material is not likely to reach surface water or groundwater
- There is little danger to human health
- There is little danger of explosion

Use the following procedures in response to a minor spill:

1. Immediately notify management of the spill.
2. If necessary, physically contain the spill to prevent further migration from the site.
    a. Stop or reduce continued release by ceasing activity, closing valves or flipping switches.
    b. Block or slow the migration of spilled material.
    c. Close or plug drains when possible.
2. Using proper personal protective equipment, obtain and use supplies from the spill kit for containment and absorption.

3. In consultation with the management, clean up small spills that can be effectively cleaned up by staff or hire a spill cleanup contractor.
4. Dispose of all contaminated products in accordance with applicable federal, state and local regulations.
5. Document the spill material, location, size, and date.

Major Spill Response Procedure

A major spill is defined as one involving a spill that cannot be safely and or adequately controlled or cleaned up by on-site staff. Characteristics of a major spill include:

- The spill is large enough to spread beyond the immediate area
- The spill material entered surface water or ground water (regardless of the size)
- The spill requires special training and equipment to cleanup
- The spill material is a threat to human health
- There is a danger of fire or explosion

Use the following procedures in response to a major spill:

1. All workers shall immediately evacuate the spill site to a safe distance away from the spill.
2. Notify management of the spill and details regarding the spill.
3. If there is not an immediate health or safety danger and if actions can be implemented safely, a trained employee shall conduct obvious and immediately implementable containment measures in the following sequence:
    a. Stop or reduce continued release by ceasing activity, closing valves or flipping switches.
    b. Block or slow the migration of spilled material.
    c. Close or plug drains when possible.
4. Management will contact the Fire Department to notify the Hazardous Response Team.
5. Management will coordinate cleanup with the Hazardous Response Team.
6. Document the spill material, location, size, and date.

Attachments:

1. Activity SOPs

Hydrant Flushing
Snow Storage
Street and Parking Lot Maintenance
Supply Well Development
Vehicle and Equipment Storage
Waste Handling and Disposal
Winter Street and Parking Lot Maintenance

2. Inventory of Dispersed Facilities

Storm Water Pollution Prevention

Facilities Standard Operating Procedures

SOP #5

University of Montana
Streets and Parking Lots

SOP Preparation Date: 02/12/2021

Facility Description and Contact Information

1.1 Facility Information

Facility Information

Name of Facility: Streets and Parking Lots

Street: 32 Campus Drive

City: Missoula State: MT ZIP Code: 59812

Discharge Information

Drainage Basin: Columbia River

Drainage Basin Receiving Waterbody: Clark Fork River

Does this facility discharge storm water *directly* into any segment of a receiving waterbody?[1]

☒Yes ☐No

Permit Information

Is this facility permitted by an MPDES Permit (in addition to MS4)? ☐Yes ☒No

If Yes, identify other discharge permits:

1.2 Contact Information/Responsible Parties

Facility Director:

Name: Bob Smith

Telephone number: 406-243-2095

Email address: bob.smith@mso.umt.edu

University of Montana Storm Water Management Program Coordinator:

Storm Water Management Contact Name (Primary): Paul Trumbley

Telephone number: 406-243-2127

Email address: paul.trumbley@mso.umt.edu

[1] For purposes of this document, direct discharge refers to site runoff discharging directly into a stream or other receiving waterbody immediately upon leaving the bounds of the site or facility.

1.3 Storm Water Pollution Prevention Team

The storm water pollution prevention team is responsible for implementing and maintaining storm water control measures/BMPs, and taking corrective actions when required.

Name	Position/Title	Individual Responsibilities
John Grasso	Associate Director	Grounds Operations
Paul Trumbley	Associate Director	SWMP Coordinator
Brad Evanger	Planning, Construction Design Tech	Technical Assistance
Eva Rocke	Sustainability Coordinator	Public Outreach
Brian Kerns	Utility Engineer	SWMP Activity Coordination
Vacant	Industrial Hygienist	Spill Prevention/Clean-up

1.4 Site Description

The University of Montana main campus contains over 150 acres that encompass multiple streets and parking lots, only some of which are connected to the storm water sewer system (see map below). UM has 30 parking lots in total, 10 of which are tied into the storm water system. UM has about 2.5 miles of asphalt roadway, 0.5 miles which contribute to the storm water system. The asphalt roadways conduct vehicular traffic through and around campus. Streets and parking lots experience a lot of improperly discarded garbage plus plenty of vehicle fluid leaks are evident in parking lots. An average of about 8,500 vehicles[2] travel through campus on any given day. About 3,500 parking permits[3] are issued annually. 2 full time traffic officers patrol campus for parking and moving violations.

1.5 Purpose and Limitations

This standard operating procedures (SOP) document identifies potential storm water pollutants that could be discharged from these dispersed facilities. The best management practices (BMPs) contained herein will minimize the discharge of pollutants from these facilities. The potential pollutants and BMPs identified in the document only address management of storm water associated with University of Montana activities. The nearby City of Missoula has similar adjacent facilities that are subject to its own storm water permit and management plan.

This document is not expected to cover all possible circumstances. Operations staff is allowed to adapt SOPs to site conditions in good judgment when it is necessary for safety and the effective containment of pollutants.

[2] Nelson|Nygaard, “Parking and Transportation Demand Management Plan,” 2016, p. xiv.
[3] Rocke, Eva, Fiscal Year 2021 parking statistics, 2/16/2021 email.

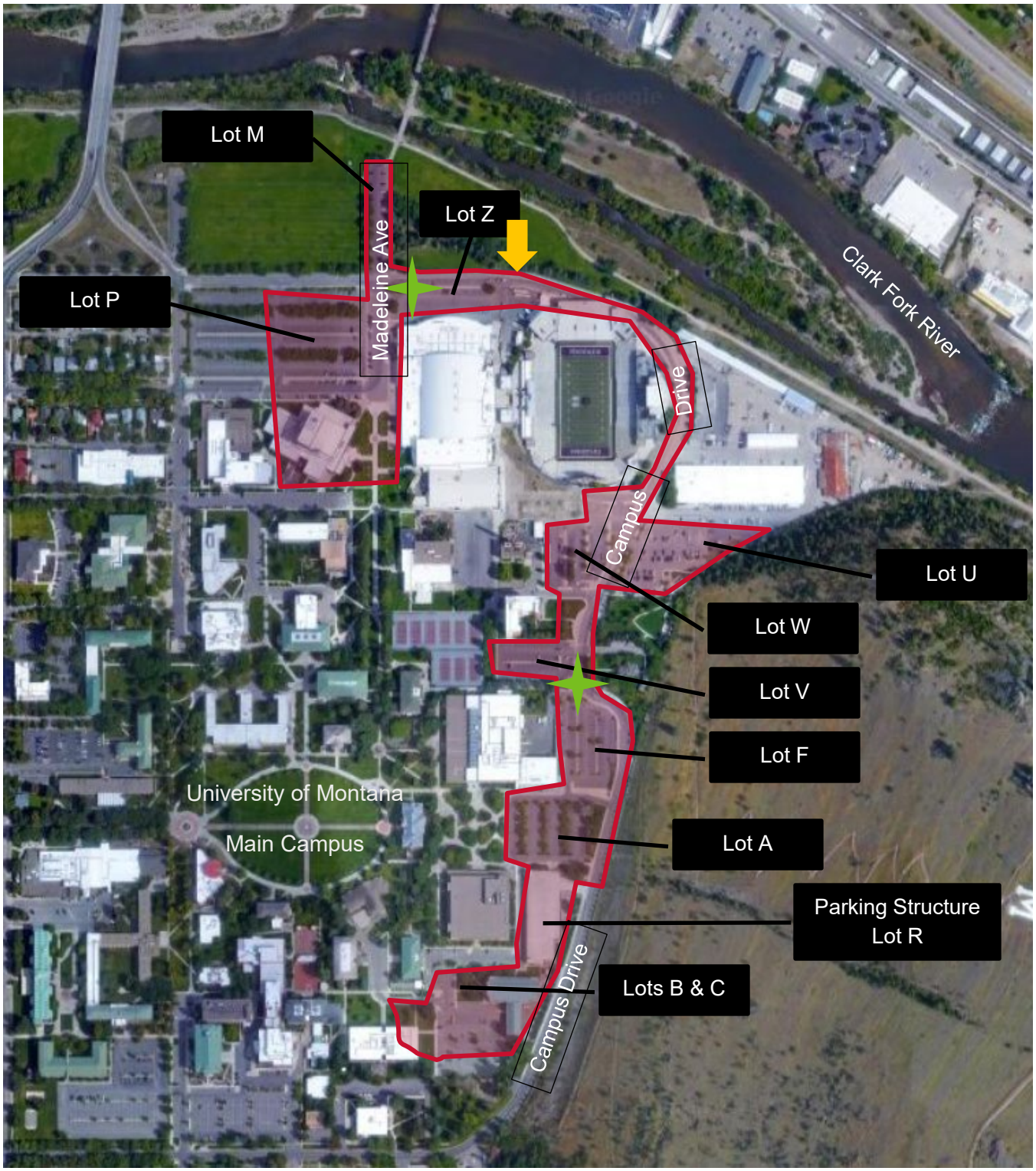


Figure 1. Area of streets & parking lots that connect to storm water system.

SECTION 2.0 Potential Storm Water Pollutant Sources

This section describes potential storm water pollutant sources associated with the University of Montana streets and parking lots.

2.1 Potential Storm Water Pollutants Associated with Street and Parking Lot Activities

UM streets and parking lots form the principal conduit for the many daily commuters that come onto campus. Activities are mainly campus vehicular ingress and egress as well as daily and long-term parking. Trash receptacles are placed along streets and lots and sections of each are used for snow storage in the winter. Occasionally, a ground water well may be located in a parking lot, an example of which is the Champions Center well in Lot T. Fire hydrants line streets and lots and are tested annually by Plumbing staff. Effluent from hydrant testing activities is kept off impervious surfaces as much as possible per the hydrant flushing SOP. Streets and lots are maintained by periodic street sweeping, pothole and crack repair and annual striping.

These activities are listed in Table 1. Measures to be taken to reduce the potential for discharge of pollutants associated with these activities are identified in Section 3.2.2.

Table 1. Streets and Parking Lot Activities and Potential Storm Water Pollutants

Activity	Potential Pollutants								
	Sediment	Nutrients	Trash	Metals	Bacteria	Oil, Grease, Fuel	Organics	Pesticides/Herbicides	Hazardous Waste
Hydrant Flushing	X	X	X			X		X	
Snow Storage	X		X			X			X
Street & Parking Lot Maintenance	X	X	X	X		X	X	X	X
Supply Well Development	X								
Vehicle & Equipment Storage	X	X	X			X	X		X
Winter Street & Parking Lot Maintenance	X	X	X	X		X	X	X	X
Waste Handling & Disposal	X	X	X	X	X	X	X	X	X

2.2 Spills and Leaks

Potential pollutants from activities along streets and parking lots mostly lend themselves to leaking vehicular fluids. The majority of storm water incidents reported involve oil and gasoline leaks in parking lots. Table 2 provides additional detail. Spill response protocol is described in Section 3.2.3.

Table 2. Areas Where Potential Spills/Leaks Could Occur

Location	Discharge Point
Campus Drive	Trash expelled from vehicles; automotive fluid leaks.
Parking Lots	All parking spaces. It's worth noting that a single vehicle that is leaking fluids can pollute multiple locations over a long period of time as the owner accesses multiple spaces around campus.

SECTION 3.0 Storm Water Control Measures

This section describes the storm water BMPs to minimize the discharge of pollutants from storm water runoff along streets and lots.

3.1 Structural BMPs

3.1.1 Storm Water Drainage System

Storm water drainage along roads and parking lots is graded to flow towards either dry wells or into storm sewer grates which then conduct the storm water to one of UM's 2 outfalls. Limited sections of Campus Drive and Madeleine Avenue are connected to the storm water sewer.

3.1.2 Permanent Storm Water Management BMPs

BMP Locations

With reference to Figure 1 above, of the parking lots called-out on the image, Lots F, M & Z are served by dry wells while the other lots enter the storm water system directly and are discharged into the Clark Fork River. Some of the devices are catchment basins that offer some storm water storage and infiltration before overflowing into an invert into the storm sewer. Campus Drive, between the 2 green stars shown on Figure 1, drains storm water directly into the storm sewer. Other portions of Campus Drive and other campus streets are served by dry sumps.

BMP Inspection and Maintenance

Dry sumps and catchment basins are cleaned-out by a contract vacuum truck as they show signs of becoming clogged. Associate Director Grasso schedules the vacuum truck.

3.1.3 Infiltration

With reference to Figure 1 above, the orange arrow shows approximate location where the street curb is breached in order to allow storm water to drain off the asphalt and into turf grass where it can then percolate into the ground.

3.2 Non-Structural BMPs

3.2.1 Employee Training

Training Procedures

Employees are given storm water awareness training and are schooled in effective execution of their work activities. In addition, staff is given specific storm water pollution prevention training.

Training Schedule

Newly hired staff is given storm water training on applicable activities within 90 days of hiring.

3.2.2 Good Housekeeping

Good housekeeping procedures to be implemented by facility staff are listed in Table 3.

Table 3. Facility Services Compound Storm Water Management Good Housekeeping Procedures

Activity	Responsible Person/Position	BMP to Reduce Potential for Pollution
Hydrant Flushing	Luke Woodward	Hydrant Flushing SOP
Snow Storage	Mick Alva/Ben Carson	Snow Storage SOP
Vehicle & Equipment Storage	Mick Alva	Vehicle & Equipment SOP
Street & Parking Lot Maintenance	Mick Alva	Street 7 Parking Lot Maintenance SOP
Winter Street & Parking Lot Maintenance	Mick Alva	Winter Street & Parking Lot Maintenance SOP
Waste Handling & Disposal	Ben Carson	Waste Handling & Disposal SOP
Supply Well Development	Brad Evanger	Supply Well Development SOP

3.2.3 Spill Response

Spill response and cleanup is addressed by employee training, discussed in Section 3.2.1. Spill response procedures are provided below.

Facility Spill Kit

Spill kits are available in the trades' shops and are also carried in fleet service vehicles. Additionally, kits are available in the office of the Associate Director of Engineering/Utilities. The spill kit contains the following items:

- Absorbent Pads (white pads for vehicle fluids; grey pads for most everything, including oils & vehicle fluids)
- Bags of Floor Dry
- Disposal Bags
- Safety Goggles
- Rubber Gloves

Minor Spill Response Procedure

A minor spill is defined as one that poses no significant threat to human health or the environment. These spills generally involve less than 5 gallons and can usually be cleaned up by staff with supplied spill kits. Other characteristics of a minor spill include:

- The spilled material is easily stopped or controlled at the time of the spill
- The spill is localized
- The spilled material is not likely to reach surface water or groundwater
- There is little danger to human health
- There is little danger of explosion

Use the following procedures in response to a minor spill:

1. Immediately notify management of the spill.
2. If necessary, physically contain the spill to prevent further migration from the site.
    a. Stop or reduce continued release by ceasing activity, closing valves or flipping switches.
    b. Block or slow the migration of spilled material.
    c. Close or plug drains when possible.
2. Using proper personal protective equipment, obtain and use supplies from the spill kit for containment and absorption.
3. In consultation with the management, clean up small spills that can be effectively cleaned up by staff or hire a spill cleanup contractor.
4. Dispose of all contaminated products in accordance with applicable federal, state and local regulations.
5. Document the spill material, location, size, and date.

Major Spill Response Procedure

A major spill is defined as one involving a spill that cannot be safely and or adequately controlled or cleaned up by on-site staff. Characteristics of a major spill include:

- The spill is large enough to spread beyond the immediate area
- The spill material entered surface water or ground water (regardless of the size)
- The spill requires special training and equipment to cleanup
- The spill material is a threat to human health
- There is a danger of fire or explosion

Use the following procedures in response to a major spill:

1. All workers shall immediately evacuate the spill site to a safe distance away from the spill.
2. Notify management of the spill and details regarding the spill.
3. If there is not an immediate health or safety danger and if actions can be implemented safely, a trained employee shall conduct obvious and immediately implementable containment measures in the following sequence:
    a. Stop or reduce continued release by ceasing activity, closing valves or flipping switches.
    b. Block or slow the migration of spilled material.
    c. Close or plug drains when possible.
4. Management will contact the Fire Department to notify the Hazardous Response Team.
5. Management will coordinate cleanup with the Hazardous Response Team.
6. Document the spill material, location, size, and date.

Attachments:

1. Activity SOPs

Hydrant Flushing
Snow Storage
Street and Parking Lot Maintenance
Supply Well Development
Vehicle and Equipment Storage
Waste Handling and Disposal
Winter Street and Parking Lot Maintenance

2. Inventory of Dispersed Facilities

Storm Water Pollution Prevention

Facilities Standard Operating Procedures

SOP #6

University of Montana
Snow Storage Areas

SOP Preparation Date: 02/ 17 / 2021

Facility Description and Contact Information

1.1 Facility Information

Facility Information

Name of Facility: Snow Storage Areas

Street: 32 Campus Drive

City: Missoula State: MT ZIP Code: 59812

Discharge Information

Drainage Basin: Columbia River

Drainage Basin Receiving Waterbody: Clark Fork River

Does this facility discharge storm water *directly* into any segment of a receiving waterbody?[1]

☒Yes ☐No

Permit Information

Is this facility permitted by an MPDES Permit (in addition to MS4)? ☐Yes ☒No

If Yes, identify other discharge permits:

1.2 Contact Information/Responsible Parties

Facility Director:

Name: Bob Smith

Telephone number: 406-243-2095

Email address: bob.smith@mso.umt.edu

University of Montana Storm Water Management Program Coordinator:

Storm Water Management Contact Name (Primary): Paul Trumbley

Telephone number: 406-243-2127

Email address: paul.trumbley@mso.umt.edu

[1] For purposes of this document, direct discharge refers to site runoff discharging directly into a stream or other receiving waterbody immediately upon leaving the bounds of the site or facility.

1.3 Storm Water Pollution Prevention Team

The storm water pollution prevention team is responsible for implementing and maintaining storm water control measures/BMPs, and taking corrective actions when required.

Name	Position/Title	Individual Responsibilities
John Grasso	Associate Director	Grounds Operations
Paul Trumbley	Associate Director	SWMP Coordinator
Brad Evanger	Planning, Construction Design Tech	Technical Assistance
Eva Rocke	Sustainability Coordinator	Public Outreach
Brian Kerns	Utility Engineer	SWMP Activity Coordination
Vacant	Industrial Hygienist	Spill Prevention/Clean-up

1.4 Site Description

The Snow Storage areas are designated throughout campus and include small islands within parking lots, neighboring landscape beds, near parking lots and sidewalks and grassy areas where the snow can melt. As a “dispersed” facility, snow is temporarily stored on many locations across campus. Long term storage during significant snow accumulation events occurs behind the motor pool area and also at the south campus golf course. The areas along streets, parking lots and sidewalks are typically convenient corners and areas where snow can be easily plowed and piled.

1.5 Purpose and Limitations

This standard operating procedure (SOP) document identifies potential storm water pollutants that could be discharged from snow storage areas and best management practices (BMPs) to be implemented to minimize the discharge of pollutants from storm water runoff. The potential pollutants and BMPs identified in the document only address management of storm water associated with University of Montana activities. The nearby City of Missoula has its own storm water permit and management plan.

This document is not expected to cover all possible circumstances. Operations staff is allowed to adapt SOPs to site conditions in good judgment when it is necessary for safety and the effective containment of pollutants.

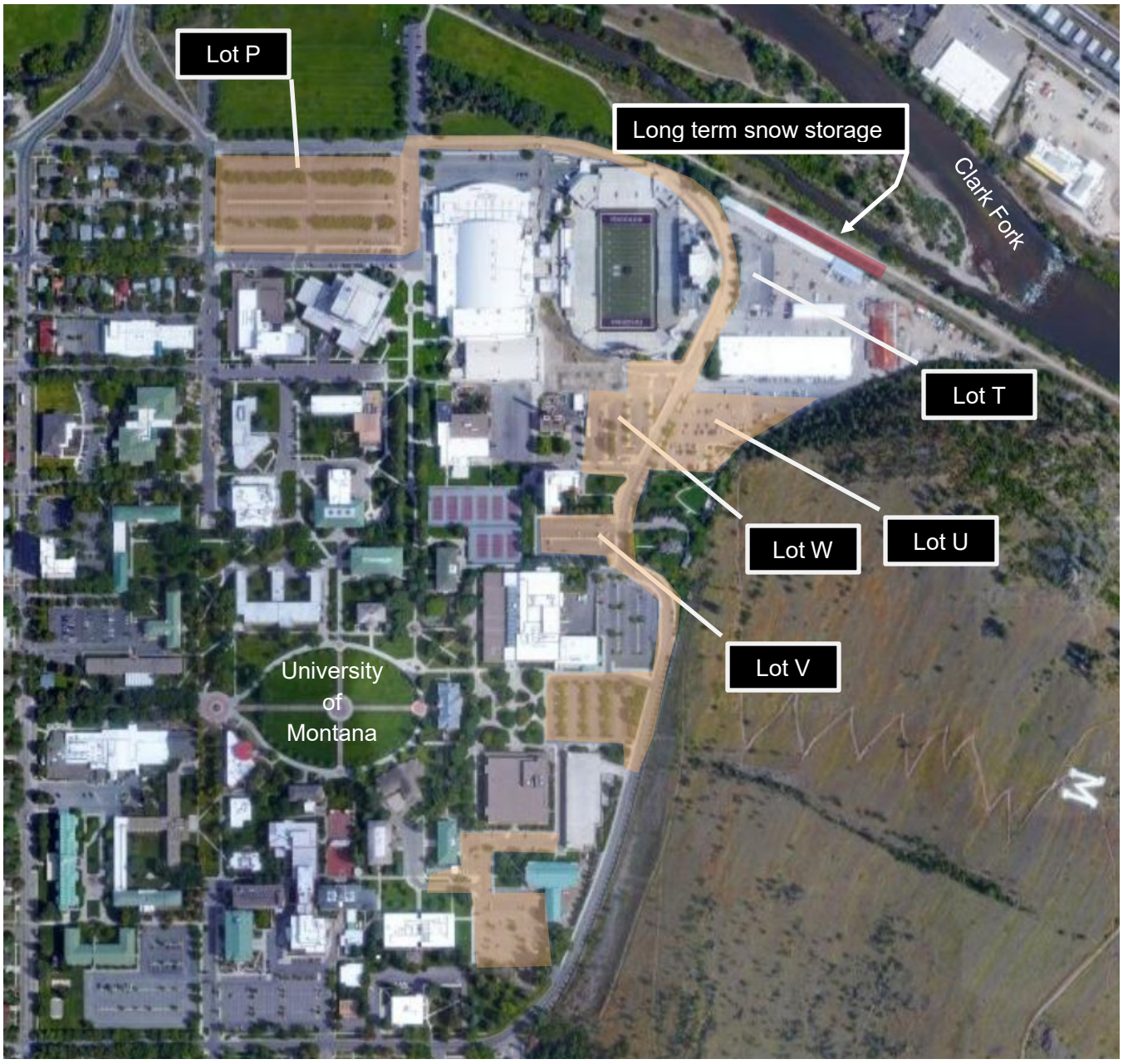


Figure 1. University of Montana main campus long term snow storage. Other short-term locations exist along streets, sidewalks and parking lots.

SECTION 2.0 Potential Storm Water Pollutant Sources

This section describes potential storm water pollutant sources associated with the University of Montana dispersed facilities for snow storage.

2.1 Potential Storm Water Pollutants Associated with Snow Storage

During the winter months snow storage is handled in stages. Public safety is the first priority in removing snow and creating a safe corridor for travel. Snow is immediately plowed into piles in convenient locations in lots, streets & sidewalks. Piles are preferably put on grassy or landscaped areas if nearby and convenient. Islands within a parking lot are commonly used. Once the storm has passed and there's been significant accumulation, crews will then try to relocate snow campus to the long-term storage area shown in Figure 1. This is a large, permeable area that is quickly and easily accessed by campus vehicles. As the piles melt away and debris is exposed, crews will collect and bag it to be taken to the dump. If, during a severe winter, the on-campus storage location reaches capacity, snow will also be stored permeable ground on South Campus near the University golf course. Storm sewer infrastructure is not present at the South Campus storage location but these piles will still be periodically inspected for debris.

2.2 Spills and Leaks

Snow storage locations across campus all have the ability to contain the same kinds of debris that plagues roadways, namely garbage, animal waste, and can be contaminated with vehicle fluids. During the spring months, as the piles melt, crews inspect for debris and possible pollutants, collect and dispose of any found. Table 2 provides some locations that are periodically inspected and of most concern because of their proximity to the Outfalls. Reference Figure 1 for lot locations.

Table 1. Areas Where Snow Melt Could Become Contaminated

Location	Snow Mound Locations
Lot P	Tree Islands Practice fields due north of center aisle across 5th
Lot U	Lot Islands Landscape row along West side of lot
Lot T	South East corner of lot
Lot W	Lot islands
Lot V	Center island
Long Term Snow Storage Area	Entire Area

SECTION 3.0 Storm Water Control Measures

This section describes the storm water BMPs to minimize the discharge of pollutants from storm water runoff at the facility.

3.1 Structural BMPs

3.1.1 Storm Water Drainage System

The University of Montana's 2 storm water drainage systems primarily serve the northeast section of campus, see orange-shaded areas in Figure 1. Other areas of campus are served by over 100 dry wells.

3.1.2 Permanent Storm Water Management BMPs

BMP Locations
With reference to Figure 1 above, a series of storm water grates and catchment basins handle the orange-shaded area in Figure 1.

BMP Inspection and Maintenance
Associate Director Grasso schedules a contract vacuum truck to clear & clean dry wells when they begin to clog.

3.2 Non-Structural BMPs

3.2.1 Employee Training

Training Procedures
Employees are given storm water awareness training and are schooled in effective execution of their work activities. In addition, staff is given specific storm water pollution prevention training.

Training Schedule
Newly hired staff is given storm water training on applicable activities within 90 days of hiring.

3.2.2 Good Housekeeping

Good housekeeping procedures to be implemented by facility staff are listed in Table 3.

Table 2. Snow Storage Areas Storm Water Management Good Housekeeping Procedures

Activity	Responsible Person/Position	BMP to Reduce Potential for Pollution
Snow Storage	Mick Alva/Ben Carson	Snow Storage SOP
Vehicle & Equipment Storage	Mick Alva	Vehicle & Equipment SOP
Street & Parking Lot Maintenance	Mick Alva	Street & Parking Lot Maintenance SOP
Winter Street & Parking Lot Maintenance	Mick Alva	Winter Street & Parking Lot Maintenance SOP

3.2.3 Spill Response

Spill response and cleanup is addressed by employee training, discussed in Section 3.2.1. Spill response procedures are provided below.

Facility Spill Kit
Spill kits are populated throughout the Facility Services Compound. Each shop has a kit within the shop and each technician's service vehicle also has a kit. Additionally, kits are available in the office of the Associate Director of Engineering/Utilities. The spill kit contains the following items:

- Absorbent Pads (white pads for vehicle fluids; grey pads for most everything, including oils & vehicle fluids)
- Bags of Floor Dry
- Disposal Bags
- Safety Goggles
- Rubber Gloves

Minor Spill Response Procedure

A minor spill is defined as one that poses no significant threat to human health or the environment. These spills generally involve less than 5 gallons and can usually be cleaned up by staff with supplied spill kits. Other characteristics of a minor spill include:

- The spilled material is easily stopped or controlled at the time of the spill
- The spill is localized
- The spilled material is not likely to reach surface water or groundwater
- There is little danger to human health
- There is little danger of explosion

Use the following procedures in response to a minor spill:

1. Immediately notify management of the spill.
2. If necessary, physically contain the spill to prevent further migration from the site.
    a. Stop or reduce continued release by ceasing activity, closing valves or flipping switches.
    b. Block or slow the migration of spilled material.
    c. Close or plug drains when possible.
2. Using proper personal protective equipment, obtain and use supplies from the spill kit for containment and absorption.
3. In consultation with the management, clean up small spills that can be effectively cleaned up by staff or hire a spill cleanup contractor.
4. Dispose of all contaminated products in accordance with applicable federal, state and local regulations.
5. Document the spill material, location, size, and date.

Major Spill Response Procedure

A major spill is defined as one involving a spill that cannot be safely and or adequately controlled or cleaned up by on-site staff. Characteristics of a major spill include:

- The spill is large enough to spread beyond the immediate area
- The spill material entered surface water or ground water (regardless of the size)
- The spill requires special training and equipment to cleanup
- The spill material is a threat to human health
- There is a danger of fire or explosion

Use the following procedures in response to a major spill:

1. All workers shall immediately evacuate the spill site to a safe distance away from the spill.
2. Notify management of the spill and details regarding the spill.
3. If there is not an immediate health or safety danger and if actions can be implemented safely, a trained employee shall conduct obvious and immediately implementable containment measures in the following sequence:
    a. Stop or reduce continued release by ceasing activity, closing valves or flipping switches.
    b. Block or slow the migration of spilled material.

   c. Close or plug drains when possible.
4. Management will contact the Fire Department to notify the Hazardous Response Team.
5. Management will coordinate cleanup with the Hazardous Response Team.
6. Document the spill material, location, size, and date.

Attachments: Activity SOPs

Snow Storage
Street and Parking Lot Maintenance
Vehicle & Equipment Storage
Winter Street and Parking Lot Maintenance

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Building Maintenance**	SOP NUMBER: **07** ISSUE DATE: **02/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Exterior painting **Roofing** **Mechanical maintenance of rooftop equipment** **Window washing** **Roof Clean-up of Bird Droppings**	**Sediment** **Chemicals** **Oil & Grease** **Debris**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstance at hand. Significant amounts of maintenance activities occur within a building's walls, but these activities should not impact stormwater as they are wholly contained. Problems such as broken water lines could overrun interior containment strategies and escape the building and potentially enter the stormwater system. Building proximate activities such as cleaning/clearing sidewalks and maintenance of adjacent grounds are covered by other SOPs.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

Building exterior maintenance activities include cleaning, painting, roof work, maintenance & repair of rooftop units all can introduce pollutants into stormwater. Pollutants are principally chemicals such as solvents, lubricants, cleaning chemicals. On some campus buildings, particularly PARTV and the stadium, have on-going problems with pigeons. Excrement can build-up and pose a pollution problem.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Survey work site to access the stormwater pollution risk.
2. Locate all storm drain collection structures and inlets prior to starting work.
3. Have a spill kit handy.
4. Check liquid containers for competency.
5. Inspect equipment for gas, oil, and other fluid leaks prior to use.
6. Promptly clean up spills with appropriate materials.
7. Collect and dispose of all trash in the work area.
8. Keep liquid wastes contained.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

EXTERIOR PAINTING

Crews should take standard precautions in preparing the work site to protect structures and landscaping and to contain potential splashes and spills. Clean-up of equipment should be conducted back at shop

where proper facilities connected to the sanitary sewer exist:

1. Use drop cloths to shield landscaping from painting & prep work (scrapping, sandblasting).
2. Perform clean-up in shop area.

ROOFING

Repairs performed on roofs require extra planning and care in execution. Different technics are required depending upon whether the roof is pitched or flat.

1. Establish if subject building fluids and debris (wash water, repair chemicals, ballast, dirt, etc.) can enter the storm sewer system.
2. If so, place filter pads over likely affected storm sewer grates.
3. If the building's roof leaders drain into the storm sewer, obstructive mats need to be placed to prevent roofing materials from being conducted into the storm sewer.
4. A spill kit must be readily accessible.
5. Removed and discarded roofing material should be managed through chutes into trash receptacles.
6. On buildings with pigeon poop (PARTV & Stadium) – implement a preventative maintenance procedure that, at least annually, inspects, cleans and removes the accumulated excrement. Poop should be gathered into bags for proper disposal and NOT washed off roofing surfaces with water.

MECHANICAL MAINTENANCE OF ROOFTOP EQUIPMENT

Rooftop mechanical equipment often requires maintenance. Equipment usually takes the form of air handlers, DX condensers, mini-splits, exhaust fans, etc. Repair activities can take many forms, from simple inspections to extensive overhauls. This SOP is concerned with activities that may involve the use of fluids (water, lubes, coolants, cleaning chemicals) that could spill and be flushed into the storm water system.

1. Ascertain whether building lies within an area of campus served by the storm water sewer systems.
2. If troubleshooting indicates that equipment coolant systems may be the problem, then:
    a. Roof leader inlets should be sealed with absorbent pads.
    b. Spill kits should be readily accessible.
    c. Collect & contain any coolant substances for proper disposal.

WINDOW WASHING

Exterior window washing activities should take similar precautions as those listed for EXTERIOR PAINTING.

Roof Clean-up of Bird Droppings

Some campus building roofs (PARTV, Clapp) and structures (Stadium) prove irresistible to roosting pigeons and they leave ample evidence of their presence. Considerable quantities of excrement can buildup over time and should be periodically cleaned.

1. Do not create dust. Wear protective gear such as rubber boots and respirator mask.
2. Seal off roof leaders.
3. Apply a spray solution of soapy water to droppings before and during clean up to prevent the formation of airborne dust. Continue wetting droppings throughout the cleaning process.
4. Place droppings in plastic bag & double bag when finished.
5. Wash water can be allowed to evaporate or gathered up with wet vacs. Dispose of waste water in sanitary sewer.
6. Stadium operations should continue to follow their established best practice of power washing droppings into the stadium where it is concentrated and then gathered into bags for landfill disposal.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Event Facilitation and Response**	SOP NUMBER: **09** ISSUE DATE: **01/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Trash Collection and Removal **Portable Toilet Service** **Food and Vendor Waste**	**Emulsified Asphalt** **Fuel & Oil** **Gravel & Sand** **Street painting**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstance at hand. This SOP is designed to address BMP's while preparing for large campus events that have the potential to impact stormwater quality. Potential contaminants may include trash, septage, organics and fossil fuel spills.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

Stormwater pollution prevention procedures for Campus Events, including game day tailgating or large venue concerts, will plan in advance to initiate BMP's tailored to each unique event. When services are contracted, these same procedures should be provided the contractor with the expectation that they are responsible for following this SOP while on campus property.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Survey work site to assess the stormwater pollution risk.
2. Locate all storm drain collection structures and inlets prior to starting work.
3. Have a spill kit handy.
4. Check liquid containers for competency.
5. Inspect equipment for gas, oil, and other fluid leaks prior to use.
6. Promptly clean up spills with appropriate materials.
7. Collect and dispose of all trash in the work area.
8. Keep liquid wastes contained.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

Trash Collection and Removal

1. Provide adequate trash receptacles for vendors and guests.
2. Monitor and respond to leaking waste containers.
3. Empty trash receptacles to prevent overflow.
4. Store waste containers under cover or on grassy areas if possible.
5. Do not wash out trash receptacles unless wash water will be discharged to the sanitary sewer.

6. Walk the outdoor event area during and after to pick up loose trash and debris.
7. Sweep roadway and parking lots after large events.
8. Have spill kits available and ensure that vendors understand their responsibility on campus property.

Portable Toilet Service

1. It is the responsibility of the particular event coordinator to contract with a portable toilet service.
2. Coordinator is to strategically place toilets based on event crowd design.
3. Toilets are not to be placed within 100 feet and down gradient of any drains to the University's two outfalls.

Food and Beverage Vendor Waste

All street maintenance/repair contractors are to be made aware of existing outfalls and expected to follow best management practices concerning surface water contamination.

1. Vendors are to be given a copy of the SWMP Outdoor Event SOP and are responsible for following it..
2. Vendor waste can be placed in University dumpsters provided that they are sacked do not contain any hazardous materials.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Grounds Maintenance**	SOP NUMBER: **10** ISSUE DATE: **01/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Tree Trimming **Mowing** **Fertilizer/Pesticide/Herbicide Application** **Planting** **Equipment Fueling**	**Pesticides** **Nutrients** **Sediment** **Oil & Grease** **Organics**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstances encountered.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

Grounds maintenance activities that have the potential to discharge pollutants to storm water runoff and surface waters include, tree trimming, mowing, fertilizing/pesticide/herbicide application, planting and equipment fueling. The activities occur on the main University of Montana campus.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Locate all storm drain collection structures and inlets prior to starting work Containers should be appropriately labeled
2. Use temporary catch basin protection when necessary.
3. Use appropriate personal protective equipment (PPE) such as gloves, eye protection, face shields, skin protection, etc.
4. Spill kits and absorbent materials appropriate to the specific chemicals must be nearby.
5. Inspect equipment for gas, oil, and other fluid leaks prior to use.
6. Promptly clean up spills in accordance with the spill response and containment SOP.
7. Conduct all equipment cleaning and maintenance at Facilities Services Compound.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

Mowing

UM Grounds staff are responsible for maintaining all grassy areas at the University of Montana main campus. Mowing includes the operation of mowers, trimmers, edgers, and blowers to maintain aesthetics of the UM managed grassy areas. A variety of pollutants can be introduced to the storm water system and nearby surface waters while mowing. Implement the following procedures to minimize the potential for storm water pollution during the mowing process:

1. Adjust mower height to match the area's intended use and minimize clippings.

2. Avoid excessive soil and vegetation damage by varying mowing patterns.
3. Mulch all grass back into the lawn
4. Sweep or blow clippings from sidewalks and streets to grassy areas when mowing is complete

Tree Trimming

UM Grounds Staff perform routine care for trees and shrubs at the University of Montana main campus Tree trimming includes the operation of chainsaws, trimmers, chippers, and blowers to maintain aesthetics of the UM managed trees and shrubs. Oil, grease, fuel, and organics can be introduced to the storm water system and nearby surface waters while trimming. Implement the following procedures to minimize potential for pollution during the trimming process:

1. Collect all trimmings and debris in the area when work is complete.
2. Sweep or blow chips from sidewalks or street into soil areas.
3. Dispose of trimmings and debris behind building 25 (Either chip and reuse or dispose)

FERTILIZER/PESTICIDE/HERBICIDE APPLICATION

Properly trained and certified persons perform routine care for grassy areas at the University of Montana main campus. Fertilizer, pesticide, and herbicide application includes the operation of sprayers and spreaders to maintain health of UM managed grassy and vegetated areas. A variety of nutrients and chemicals can be introduced to the storm water system and nearby surface waters during treatment.
Implement the following procedures to minimize potential for pollution in the fertilizer/pesticide/herbicide application process:

1. Read and review all product information prior to use. This information includes but is not limited to, safety data sheets, product instructions, and federal and state regulations governing use.
2. Avoid application within a minimum of 20 feet of storm drainage facilities and surface waters and 100 feet of any well head.
3. Calibrate application equipment to avoid excessive material application.
4. Check the weather forecast. Wind and or rain conditions (current and future) may not be acceptable for application. Do not use pesticides if rain is expected within a 24-hour period and only apply when wind speeds are less than 5 mph.
5. Mix and prepare all fertilizers, pesticides, and herbicides away from storm drains, waterbodies, and soils, preferably inside a protected area within a watertight secondary container.
6. Employ appropriate techniques to minimize off-target application spray drift and over broadcasting are possible pollutants to the storm water system.
7. Clean spills immediately and follow product specified procedures.
8. Rinse application equipment away from water bodies and storm drains. Do not dispose of chemicals to storm drain, sewer, or ground surface.
9. Dispose of excess material following manufacturer's instructions.

Planting

Planting includes digging, planting/seeding, and backfilling to maintain aesthetics of County managed land. Sediment and nutrients can be introduced to the storm water system and nearby surface waters during planting if proper procedures are not followed. Implement the following procedures to minimize potential for pollution when planting:

1. Prior to digging call Montana 811 by dialing 811 or 800-424-5555 to locate underground facilities.
2. While digging place spoils near the hole for ease of backfilling, avoid placing spoils in or near the gutter, a storm drain, or water body.
3. Do not add excessive amounts of compost or fertilizer while backfilling.
4.
5. Apply seed and cover using pre-determined application method and rate, in accordance with manufacturer's instructions.
6. Sweep dirt from surrounding pavement(s) into the planter area.
7. Remove extra spoils from the site responsibly, use a tarp if necessary to contain spoils during transport.
8. Transport spoils to the County Shops.

Equipment Fueling

Equipment fueling applies to all gas, or diesel, vehicles and equipment required for maintenance of UM facilities. Harmful chemicals can be introduced to the storm water system and nearby surface waters if spills occur while fueling equipment. Implement the following procedures to minimize pollution during fueling:

1. Use the fuel automatic shut off (where applicable) to prevent overfilling, and do not 'top off' the tank.
2. Mobile fueling should be minimized, whenever practical transport vehicles and equipment to designated fueling areas.
3. When fueling small equipment from portable containers, fuel in an area a minimum of 50 feet away from storm drains and water bodies.
4. If a large fuel spill occurs (greater than 1 gallon), contact the UM storm water coordinator and your supervisor to determine if specialized spill response procedures are necessary.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Fire Hydrant Testing**	SOP NUMBER: **11** ISSUE DATE: **01/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Testing of Fire Hydrants	**Chlorine** **Sediment** **Organics**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstances encountered.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

Grounds maintenance activities that have the potential to discharge pollutants to storm water runoff and surface waters include, tree trimming, mowing, fertilizing/pesticide/herbicide application, planting and equipment fueling. The activities occur on the main University of Montana campus.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Locate all storm drain collection structures and inlets prior to starting work.
2. Use temporary catch basin protection when necessary.
3. Know the project sites runoff patterns and the immediate area stormwater drainage system.
4. Direct hydrant flow into grassy areas whenever possible.
5. If necessary install inlet filter to protect runoff.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

Fire Hydrant Testing

UM Plumbers are responsible for testing all fire hydrants at the University of Montana main campus. A variety of pollutants can be introduced to the storm water system and nearby surface waters while testing hydrants. Implement the following procedures to minimize the potential for storm water pollution during the testing process:

1. Direct hydrant flow into pervious areas.
2. Avoid blowing hydrant into landscape beds to avoid runoff of bark and mulch beds
3. Cleanup organic material if necessary
4. If unable to direct flow away from bark and mulch beds, then install diverter plywood or similar to keep much in place when flowing hydrant

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Recycling**	SOP NUMBER: **12** ISSUE DATE: **02/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Collection and Transportation of Materials for Recycling **Offloading & Sorting of Materials to be Recycled** **Consolidation of Materials to be Recycled** **Bulk Storage of Materials to be Recycled**	**Debris** **Metals** **Oils and grease**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstances at hand. UM maintains a significant recycling program on its campuses. Recycling crews collect materials deposited in bins at campus buildings and brings them back to the Facilities Services Compound for sorting, compacting and storage. Third party contractors periodically collect the accumulated recycle material and transport it to off-site processing facilities.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

Recycling crews move through UM campuses removing the contents of recycling containers, loading the material onto truck beds, transporting material to the campus recycling center where it is consolidated & stored until certain thresholds are met. The material is then removed by outside contractors. Debris could escape confinement during the collection and transporting processes.

APPLICABILITY

The SOP shall apply to all staff (fulltime, part-time & volunteer) engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Don't allow collection bins to overflow with material.
2. Wash water from cleaning operations should be collected and put in sanitary sewer or done where infiltration can occur.
3. Material should be secured in beds of transport vehicles to prevent inadvertent loss during transportation.
4. Exterior bins must have lids which should be kept closed when not being accessed.
5. Any spillage of material should be promptly picked up.
6. Exterior collection and storage areas should be periodically inspected and cleaned.
7. Hazardous or toxic materials like batteries must be stored within Building 25.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

COLLECTION AND TRANSPORTATION OF MATERIALS FOR RECYCLING

Recycling materials must be securely contained at all times. Collection and storage areas should be kept tidy.

1. Collection should occur often enough so that the recycling bins at buildings do not overflow.
2. Recycling material needs to be securely bagged to prevent any loss during transportation to the recycling center.
3. Bins must be cleaned and sanitized annually.
4. Post contact information at building recycling areas in case an unanticipated pick up is required.

OFFLOADING AND SORTING OF MATERIALS TO BE RECYCLED

The unloading and sorting of comingled materials could provide an opportunity for pollutants to escape and come into contact with storm water. Typical precautions should mitigate any risk.

1. Unloading area should be secure enough so that material is not dispersed beyond the immediate work area.
2. Work area should be capable of being periodically cleaned and sanitized.
3. Any hazardous materials must be segregated and disposed of properly.
4. Area could be bermed with sandbags to provide additional storm water protection from contaminates.

CONSOLIDATION OF MATERIALS TO BE RECYCLED

Recycling crews use mechanical devices to compact and bale materials to be recycled into more convenient forms to facilitate storage and subsequent pick up by third party contractors. These machines and the method with which they are operated can be a source of storm water pollutants.

1. Properly maintain hydraulic systems.
2. Frequently lubricate and replace filters, if any.
3. Keep a spill kit handy in the event of a hydraulic or lubrication leak.

BULK STORAGE OF MATERIALS TO BE RECYCLED

Unfortunately, the UM recycling center is located at the mouth of Hellgate Canyon which is battered by notorious wind currents. Bulk storage of consolidated materials should be sufficiently secure so as not be subject to scattering by the wind.

1. Be sure lids of storage containers are closed at the end of the day.
2. Areas surrounding bulk storage containers should be kept free of debris.
3. Periodic clean and sanitize storage bins; discard waste water into sanitary sewer.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Snow Storage**	SOP NUMBER: **13** ISSUE DATE: **01/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Snow Storage throughout winter	**Emulsified Asphalt** **Fuel & Oil** **Gravel & Sand** **Street painting**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstance at hand. This SOP is designed to address BMP's to protect stormwater by minimizing the impact of snow piles that could contain sand, salt, trash and fossil fuels that generate concentrated releases of pollutants during spring snowmelt conditions.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

Stormwater pollution prevention procedures for Snow Storage will include the identification of sensitive ecosystems prior to disposal and snow removal crews will have established, clearly defined, safe zones for snow piles. For smaller snow events, parking lot islands are often used or parking spaces themselves. Between storms, these piles will be relocated to designated spring thaw locations that are chosen to be safe from the threat of impacting waterways, drainage ditches, ponds, creeks or wetlands.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Survey work site to assess the stormwater pollution risk.
2. Locate all storm drain collection structures and inlets prior to starting work.
3. Have a spill kit handy.
4. Inspect equipment for gas, oil, and other fluid leaks prior to use.
5. Promptly clean up spills with appropriate materials.
6. Collect and dispose of all trash from snow piles during spring thaw.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

Snow Storage

1. Minor storms throughout winter, snow will be piled within existing parking lots, either on lot islands or within parking spaces.

2. Between storms throughout winter, snow piles from streets and lots will be relocated to preapproved locations in pervious areas where melt water can infiltrate into the ground and not into the storm drain system.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Storage of Hazardous Chemicals**	SOP NUMBER: **14** ISSUE DATE: **01/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Chemical Transfers into Containers **Choosing Proper Containers** **Siting Appropriate Storage Locations** **Transporting Chemicals**	**Chemicals (see list below)**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstance encountered. Where and how potentially dangerous chemicals are stored is important as spills could enter the storm sewer system and be discharged into the Clark Fork river.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

Solvents, gasoline, diesel, used oil, antifreeze, batteries, paints, deicers, herbicides, pesticides, fertilizers, lubricants & coolants – all are important, useful chemicals employed in campus activities. The management and storage of these chemicals is important, given the proximity of the facilities compound in relation to the Clark Fork river. Storage containers must be sufficient to securely hold and dispense the materials. Storage locations should be properly sited so as to minimize the potential to enter into the storm water sewer system.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Containers must be constructed of materials sufficient to properly store the chemical of interest.
2. Storage locations should be carefully sited so as to provide containment of any spillages.
3. Storage locations should allow for easy cleanup in the event of any spills.
4. Containers should be appropriately labeled
5. Safety Data Sheets (SDS)pertaining to the stored chemicals should be posted nearby.
6. Use appropriate personal protective equipment (PPE) such as gloves, eye protection, face shields, skin protection, etc. Breathing filters or respirators may be needed for handling of some chemicals such as ammonia & herbicides/pesticides.
7. Spill kits and absorbent materials appropriate to the specific chemicals must be nearby.
8. Check liquid containers for leaks.
9. Inspect storage locations monthly.
10. Recycle materials such as batteries and vehicle fluids.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

CHEMICAL TRANSFERS INTO CONTAINERS

Many chemicals are stored in bulk in the Facilities Services compound and employees must be able to safely transfer the chemicals from the storage containers and into portable containers that are then transported for use around campus. The areas chosen for bulk storage should possess attributes such as 1) an area which does not drain into storm sewer, 2) has non-porous, chemical resistant flooring, and 3) has secondary containment structure.

1. Keep chemicals in appropriate containers (both bulk storage & portable) with correct labels.
2. Do not mix chemicals or introduce a chemical into another chemical's container. Incompatible chemicals can create explosive situations.
3. Be aware of harmful vapors that may emanate from the chemical being handled. If chemical is volatile and harmful, be sure the area has adequate ventilation.
4. If diluting chemicals, follow specific instructions for dilution procedure.
5. If storing used or waste chemicals, be sure to use container appropriate for chemical and that it is properly labeled with chemical identity and also noted as "waste" or "recycle" as applicable.
6. Store hazardous chemicals together and separate from non-hazardous chemicals. Both can be stored at same site, just not intermixed.
7. Be sure containers are tightly sealed after use.
8. Transfer devices such as funnels, pumps, measurement cylinders, etc. should be properly cleaned and stored after use.

CHOOSING PROPER CONTAINERS

Container materials include metal, plastic and glass. Note that flammable liquids such as solvents and vehicle fuels must be stored in containers approved by Occupational Safety and Health Administration (OSHA).

1. Corrosive materials should be placed in plastic preferably or in steel that is lined with plastic.
2. Glass containers should be avoided, unless specifically recommended for the particular chemical.
3. Do not fill any container to the top as temperature fluctuations can cause expansion/contraction of the fluid and the container that could lead to leaks.
4. All containers should have a "Hazardous Material" label affixed.
5. Colored containers should be avoided as some colors (red for biohazards & sharps, for instance) are federally regulated.
6. Containers should be chosen for features such as ability to resist punctures and leaks, endure fire damage, resist tumbling over and tampering.
7.

SITING APPROPRIATE STORAGE LOCATIONS

Some of the points listed below are standard safety measures not necessarily related to storm water management but are repeated here

1. Store volatile toxics and odoriferous chemicals in ventilated cabinets.
2. Store flammable liquids in approved cabinets.
3. Containers should be kept at shoulder level or lower.
4. Containers should have a date-received label and an expiry date.
5. Sites with secondary containment features are preferable.
6. Storage should be away from heating sources and should also avoid direct sunlight.
7. Inspect storage sites at least monthly.

TRANSPORTING CHEMICALS

Chemical containers being transported are easily compromised due to jostling around enroute to the service location. The special precautions below should be employed during transit:

1. Provide a secondary containment.
2. Secure container so it cannot slide, tumble or bounce about during transit.
3. Avoid transporting chemicals during busy times such as class changes.
4. Be certain to have a spill kit onboard.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Storage of Bulk Materials (Salt, Sand, Gravel, Mulch, Topsoil, Concrete, etc.)**	SOP NUMBER: **15** ISSUE DATE: **01/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Receiving deliveries of material **Loading onto maintenance vehicles** **Inspection**	**Sediments** **Leached chemicals from stored material such as iron**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstance encountered. Materials such as salt, sand, and gravel are commonly used during winter operations to provide traction on icy surfaces. These materials as well as construction and landscaping materials (concrete, mulch, topsoil, etc.) are commonly stored outside, largely in open piles or stacks. Storm water can be contaminated if it encounters such material.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

UM has determined that some pollutants such as iron can readily be leached out of gravel. Storing materials properly can help mitigate such pollutants from encountering storm water and ultimately from entering the Clark Fork river. The precautions listed here should be followed whenever employees manage storage piles. Note that this SOP does not pertain to the use or application of these materials during the course of normal operations. Obviously, salt, sand, gravel and deicer must be applied to streets and sidewalks during winter de-icing operations in order to be effective for safety reasons. Other SOPs apply to the proper deployment of such materials.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Choose covered storage whenever possible.
2. Site storage locations away from storm water drains & runoff patterns.
3. Open, outside storage piles should be tarped or otherwise covered.
4. Open, outside storage piles should be bermed to prevent contact with storm water.
5. Keep storage piles tidy by sweeping & consolidating scattered material.
6. Inspect storage locations at least monthly.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

RECEIVING DELIVERIES OF MATERIAL

Where ever possible, store these bulk items in a covered location such as Building 25. If this can be accomplished, the following guidelines may be unnecessary.

1. If bulk material is to be stored in an outside, open location, choose the site carefully so that it is away

from storm sewer drains and out of flow ways.

2. Site should also allow easy access to subsequent vehicles for loading.
3. Consider placing a tarp underneath the bulk material.
4. Deposit material is as condensed a pile as possible.
5. Cover material with a tarp or similar.

LOADING ONTO MAINTENANCE VEHICLES

If stored bulk materials are to be used in the nearby vicinity (construction site or grounds operations), care should be exercised in transporting the material from storage to point of use so as not to scatter material enroute.

1. Position vehicle as close as possible to storage pile so that material transfer is smooth and clean.
2. During inclement weather, only uncover part of the storage pile to keep the rest of it protected.
3. Inspect area after loading:
    a. Be sure to replace covering over pile.
    b. Repair/restore the berm containment if the vehicle damages it during transfer operations.

INSPECTION

Period inspection of storage of bulk materials is necessary to ensure no contamination of storm water occurs. Reviews should be conducted at least monthly and at least once during inclement weather.

1. Conduct at least monthly.
2. Track inspections with an inspection log sheet. Track date & time of inspection and also the name of the inspector and any anomalies discovered.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Street and Parking Lot Maintenance**	SOP NUMBER: **15** ISSUE DATE: **01/2021**
ACTIVITIES:	TARGET POLLUTANTS:
General Maintenance **Maintenance of Storm Drains, Culverts and Detention Areas** **Asphalt Paving, Re-surfacing and Concrete Projects** **Paint & Striping** **Salt, Sand Deicer Application** **Snow Plowing and Snow Storage**	**Emulsified Asphalt** **Fuel & Oil** **Gravel & Sand** **Street painting**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstance at hand. This SOP is designed to address BMP's while doing street and parking lot maintenance. Spill kit and equipment for dry clean up should be on hand (socks, absorbent pads etc.) Inlet protection devices should always be installed f(Wattles, draine covers, berms and /or filter fabric.)

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

General maintenance of UM's main campus streets and parking lots must include an awareness of the proximity to its two outfalls and have in place mitigation plans in the case of a possible contamination event.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above as well as outside contractors.

BEST MANAGEMENT PRACTICES

1. Survey work site to assess the stormwater pollution risk.
2. Locate all storm drain collection structures and inlets prior to starting work.
3. Have a spill kit handy.
4. Check liquid containers for competency.
5. Inspect equipment for gas, oil, and other fluid leaks prior to use.
6. Promptly clean up spills with appropriate materials.
7. Collect and dispose of all trash in the work area.
8. Keep liquid wastes contained.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

General Maintenance

1. Designate staff to conduct inspections and maintenance of parking lots and garages including stormwater conveyance systems.

2. Clean leaves, trash, sand and other debris from parking lots regularly to prevent debris from reaching any storm drain inlet.

3. Sweep parking lots with a street sweeper at end of winter season during thaw to prevent runoff from pushing deicer into storm drain system.

4. Stencil or mark any storm drain inlets in or near the parking lot with the message "Do not dispose of any materials or wastes."

5. Inspect all dumpster or waste disposal areas regularly. Clean up any trash, spills or leaks and report leaking dumpsters to the disposal company.

Maintenance of Storm Drains, Culverts and Detention Areas

1. Inspect storm structures, culverts, detention areas or structural BMPs regularly(Suggested frequency: Weekly) for debris accumulation.
2. Have dry sumps cleaned of buildup annually and dispose of waste in an approved landfill.

Asphalt Paving, Re-surfacing and Concrete Projects

All street maintenance/repair contractors are to be made aware of existing outfalls and expected to follow best management practices concerning surface water contamination.

1. Re-seal or pave on dry days when no rain is expected and stop paving activities well before rainfall is expected.
2. Protect or block nearby downstream, storm drain inlets from debris from maintenance work(Asphalt cap, chip sealing, concrete breaking, or saw cutting). Leave inlet protection in place until the job is complete. Clean up debris from around inlets and dispose of properly.
3. Designate a "Concrete Wash-Out Area" on the job site- in a grassy or graveled area where pooled water can soak into the ground. If no "Wash-out Area" is available, wash out into a container(pool, bucket, wheelbarrow) and dispose of material properly.

Painting and Striping

1. Schedule painting, marking, and striping projects during dry weather only. Cease all activities when rain threatens.
2. Use thermoplastic markings in place of paint whenever possible.
3. Block nearby storm drain inlets(within 25 feet and down gradient of project) when painting or striping.
4. Promptly clean up any spoils of paints, cleaners or other chemicals.

Deicer and Sanding

1. When conditions warrant, salt spreaders are installed on the larger trucks. Each spreader is calibrated prior to the deicing season and checked throughout the winter.
2. On traffic lanes, deicer is sprayed in 20 foot sections every 60 feet unless a major winter event is expected.
3. A 10 percent salt solution is used, which freezes at 20 degrees Fahrenheit, at which point sand/gravel mixture is utilized.

Snow Plowing and Snow Storage

1. Do not plow or store excess snow or debris near creeks, ditches or surface waterways.
2. Snow disposal areas should be located at least 50 feet from or down gradient from any storm drain inlets, drainage ditches, ponds, creeks or wetlands.
3. If possible, store excess snow in a pervious (gravel) area where melt water can infiltrate into the ground and not flow into the storm drain system.
4. If snow storage is on a paved area, sweep up the remaining debris after snow melt.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Ground Water Supply Well Development**	SOP NUMBER: **17** ISSUE DATE: **01/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Drilling the well bore **Completing the well** **Testing the well**	**Sediment** **Drilling fluids** **Cement**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstance encountered. Since UM continues to utilize ground water cooling on new buildings and during some remodels, the drilling, completion & testing of ground water wells is a frequent occurrence. Pure, untreated, uncontaminated ground water poses a threat to surface waters in that it can carry sediment from the producing zone and can also flush sediments that are on the surface into the storm water system and onto the Clark Fork river. The Montana Department of Environmental Quality maintains that it is a violation of UM's storm water discharge permit to have ANYTHING besides storm water emptying into the river.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

UM contracts for the development of ground water wells. Contractors drill with the use of drilling fluids (drill mud) which are usually contained at the drill site, but could escape containment and flow into the storm system. Once drilled, the well is tested to determine its maximum flow rate and aquifer draw-down potential. Flow tests can produce a lot of water at a high rate of flow. If not properly managed and contained, it could flow into the storm system, carrying sediment among other pollutants.

APPLICABILITY

The SOP shall apply to all contractors and UM agents engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Contain all drilling fluids at the drilling site and dispose of properly.
2. During testing, all produced water must be kept out of the storm system:
    a) Place filtration mats over nearby storm grates.
    b) Produced water can be directed to storm water sumps or tied into existing ground water injection wells.
    c) If b) above is not possible, produce the ground water into a tank of sufficient size.
    d) Produced water can be kept on-site to allow water sufficient time to infiltrate into ground.
    e) Produced water can be put into sanitary sewer, if convenient.
3. Establish a bermed perimeter around the drill site.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

DRILLING THE WELL BORE

Wells bores should be rotary drilled rather than cable tool (or percussion) drilled.

1. If drill site is within area served by the storm water sewer system or in close proximity to the Clark Fork river (such as green areas near the Kim Williams recreation trail), the drill site perimeter should have a berm or other fluid containment structure.
2. Covers or filter mats should be placed over storm drains.
3. Drilling fluids must be captured at the drilling site.

COMPLETING THE WELL

Completion of wells include cementing the well casing, perforating the casing (if applicable), backfilling and grading the well bore area. Care should be taken to manage and keep such fluid materials contained.

1. Use same precautions as with **DRILLING THE WELL BORE** above.
2. Any produced water from the well during completion activities is potentially contaminated with drilling fluids and cement and must be kept out of storm water system.

TESTING THE WELL

Due to the quantity and flow rates involved with testing, this activity has the highest potential to break containment and enter the storm water system. Extra care must be maintained.

1. During prior tests, UM has been successful in using a large Republic Services' dumpster that has been sealed-off with spray foam insulation.
2. A dry sump or several dry sumps may be able to accept the produced water during testing. A hydrologist will have to assess the viability of this option.
3. It might be possible to secure a special discharge permit to produce into the storm water system.
4. Explore the possibility of producing into a nearby injection well.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Utility Maintenance**	SOP NUMBER: **18** ISSUE DATE: **02/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Emergency response to water mains ruptures	**Trash** **Sediments** **Vehicle Fluids** **Nutrients** **Chlorine** **Metals**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstance at hand. Ruptures of water mains are not infrequent on the university campus, given the age and condition of the water infrastructure and also due to construction excavation. Such types of ruptures constitute an emergency as the loss of water on campus adversely impacts most activities and operations and needs to be restored as expeditiously as possible.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

Water main breaks can occur anywhere throughout campus. Depending upon location, there could be a significant inflow to the storm sewer and from there, into the Clark Fork River. Water main breaks almost always involve extensive excavation to locate and repair the damage. Sediment from pit spoil could be flushed into the storm sewer as well as any trash, chemicals (pesticides, herbicides, fertilizers, etc.) that could be on the surfaces that the water contacts.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. When possible and as time allows, protect storm drains with covers or sandbags if the main break is located proximate to the storm system.
2. Pile spoil from excavations out of the way of possible water flow path.
3. Refill any excavation pits as expeditiously as possible.
4. If pit spoil was stored on impervious surfaces (pavements, streets, parking lots), have the area cleaned-up with brooms or street cleaner as soon as possible.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

EMERGENCY RESPONSE TO WATER MAIN RUPTURES

Emergency operations are fast moving with the singular intent to restore normal conditions as soon as possible. Still, with a little aforethought, it's possible to protect the Clark Fork River from polluted runoff via the following steps:

1. Determine if the area under consideration is within that served by the storm water sewer system. A quick glance of the attached map can help make that determination.
2. If area under consideration is served by storm sewer, consider covering nearby storm grates.
3. Have the excavator place the spoil pile upstream of any potential water flow.
4. If the spoil pile is to be left overnight, consider providing a berm of sandbags.
5. Cover the spoil pile with tarps if it is be left overnight.
6. After pit has been refilled, take care to clear the area of left-over sediment if the spoil was piled on hardscape.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Vehicle and Equipment Storage**	SOP NUMBER: **19** ISSUE DATE: **02/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Vehicle Washing **Vehicle Fueling** **Vehicle Maintenance**	**Sediment** **Oil, Grease, Fuel** **Other Vehicle Fluids**

GENERAL

This SOP is not expected to cover all Necessary procedure Actions. Operators are allowed to adapt SOP's to unique site conditions in good judgement when it is necessary for safety and the proper and effective containment of pollutants.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

The storage of vehicles and equipment has the potential to discharge pollutants to storm water runoff and surface waters include sediment, oil, grease, fuel and other vehicle fluids.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Know the facilities runoff patterns and stormwater management system. See Facilities Site Map in Section 2.
2. Clean up spills and leaks promptly; know the spill kit locations. Spills are not cleaned up until the absorbent is picked up and disposed of properly. Report large spills to the supervisor.
3. Sweep and clean the storage area regularly. Do not hose down the spill area or absorbent material into a storm drain.
4. Report leaking vehicles to fleet maintenance.
5. If equipment is being stored outdoors for long periods of time, oil and other fluids should be drained.
6. Monitor vehicles and equipment closely for leaks and place drip pans under any leak to collect the fluids for proper disposal or recycling.
7. Keep the parking and storage areas clean and orderly.
8. Sweep all parking areas a minimum of annually.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Vehicle Maintenance**	SOP NUMBER: **20** ISSUE DATE: **02/2021**
ACTIVITIES: **Vehicle Washing** **Vehicle Fueling** **Vehicle Maintenance**	TARGET POLLUTANTS: **Parts Cleaning Solvents** **Vehicle Fluids** **Lubricants** **Battery Acid** **Sediment** **Organics**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstance encountered. Where and how potentially dangerous chemicals are stored is important as spills could enter the storm sewer system and be discharged into the Clark Fork river.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

The Vehicle Maintenance service activities that have the potential to discharge pollutants to storm water runoff and surface waters include vehicle fueling, vehicle washing, material storage, and vehicle maintenance. Pollutants associated with these activities include sediment, vehicle fluids, lubricants, organics, and hazardous waste.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Know the facilities runoff patterns and stormwater management system. See Facilities Site Map in Section 2.
2. Do not perform maintenance and repair activity directly over or next to the storm drain system.
3. Designate a location for vehicle maintenance and repair to take place. The location should not have any connection to the storm drain system. The area should allow for easy cleanup of drips and spills, and be under a cover whenever feasible.
    a. Vehicle maintenance should be performed in the Motor Vehicle Shop, located in the Facilities Services Compound.
    b. The Motor Vehicle Shop has a drain connected to the sanitary sewer. The drain has an oil and grease separator, which is cleaned regularly.
4. Do not pour materials down drains or hose work areas; use dry absorbent and sweeping.
5. Minimize the use of solvents. Clean parts without using solvents whenever possible.
6. Recycle used batteries, motor oil, diesel oil, and other vehicle fluids and parts.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

VEHICLE FUELING

Vehicle fueling applies to all gas and diesel vehicles used by UM facilities staff. Harmful chemicals can be introduced to the storm water system and nearby surface waters if spills occur while fueling. Implement the following procedures to minimize potential pollution during fueling:

1. Shut off the vehicle prior to fueling.
2. Fuel vehicles at approved locations: Facilities Services Compound Fuel Pumps
3. Inspect fueling location for corrosion, leaks, cracks, scratches, and other physical damage that may lead to spills.
4. Follow all posted warnings.
5. Use the fuel automatic shut off (where applicable) to prevent overfilling, and do not 'top off' the tank.
6. Remain by the fill nozzle while fueling.
7. Mobile fueling should be minimized, whenever practical transport vehicles to designated fueling areas.
8. If a large fuel spill occurs (greater than 1 gallon), contact the UM SWMT and your supervisor to determine if specialized spill response procedures are necessary.

VEHICLE WASHING

Vehicle washing removes snow, ice, mud, and dirt from the surface of vehicles. Washing occurs at the Motor Vehicle Shop or other approved locations. Pollutants associated with vehicle washing include sediment, oil, grease, and fuel. Implement the following procedures to minimize potential pollution during vehicle washing:

1. Wash vehicles in designated areas only, with drainage connecting to the sanitary sewer system.
2. Avoid using excess water and soap when washing vehicles.
3. Use hoses with automatic shut off nozzles to minimize water usage.

VEHICLE MAINTENANCE

Vehicle maintenance is routine for all UM owned vehicles. Preventative maintenance will occur at the Motor Vehicle Shop, while emergency repairs may require off-site work. Potential pollutants associated with vehicle maintenance include oil, antifreeze, brake fluid, solvents, batteries, fuels, and cleaners. Implement the following procedures to minimize potential pollution during vehicle maintenance:

1. Perform maintenance activities in a designated maintenance bay at the Motor Vehicle Shop whenever possible.
2. If outdoor work is required, prevent spilling through use of oil pans or similar devices.
3. Use absorbent pads and drip pans when necessary.
4. Keep equipment clean and do not allow excessive build-up of oil and grease.
5. Perform regular preventative maintenance to minimize occurrence of leaks and major repairs.
6. Dispose of used fluids, rags, and absorbent pads in respective disposal containers within the Motor Vehicle Shop.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Waste Handling and Disposal**	SOP NUMBER: **21** ISSUE DATE: **01/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Trash collection **Grounds cleaning** **Equipment cleaning**	**Trash** **Chemical contaminants** **Sediment** **Nutrients**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstance encountered. Many campus activities include upkeep and beautification of buildings and grounds. These activities can impact the storm water system and the Clark Fork river through the method by which trash and other wastes are handled and disposed.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

Trash is most noticeable across campus and Facilities crews spend significant time patrolling campus for trash and in keeping the multitude of trash containers, both within buildings and out on the grounds, empty and clean. UM crews dispose of collected trash into various dumpsters across campus that are owned and emptied by a contractor, Republic Services. Chemical contaminants include oil and other vehicle fluids, cleaning chemicals, pesticide/herbicide/fertilizers, garbage leachate, etc.

APPLICABILITY

The SOP shall apply to employees engaged in the activities noted above. Custodial, Grounds & Labor crews are the most likely to be executing the listed activities. Republic Services' employees are also responsible for managing the waste in dumpsters.

BEST MANAGEMENT PRACTICES

1. Trash and other solid wastes must be contained in dumpsters.
2. Do not place waste or debris next to dumpster.
3. Dumpster lids must be closed after use.
4. Campus trash containers are inspected daily and emptied when necessary.
5. Areas around dumpsters should be kept clean and free of debris.
6. Cleaning activities should occur away from storm drains.
7. Wash/rinse water from cleaning activities must be put into sanitary sewer.
8. Inspect trash cans and dumpsters regularly and replace any that are in poor condition.
9. Post littering prohibition signage around campus.
10. Keep pet waste dispensers adequately supplied across campus.
11. Be careful in loading or unloading trash.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

TRASH COLLECTION

Custodial crews remove trash from building interiors and deposit it into exterior receptacles such as dumpsters. Garbage removal contractors then off-load dumpsters into mobile garbage trucks or cart dumpster to landfill for emptying. Improper waste handling and disposal can allow pollutants such as oils, nutrients, sediments and trash to contaminate storm water.

1. Dumpsters are provided with lids to keep contents dry and to prevent trash from being carried off with the wind. Remember to replace lids in the closed position.
2. Refuse contractors may occasionally return dumpsters to a position that traps the lid against a wall in an open position. Alert a manager when this happens so that the contractor may be notified and can correct.
3. Refuse contractors empty campus dumpsters according to a predetermined schedule. Notify management if the schedule requires adjusting to be able to accept normal waste loads.
4. Do not stack waste outside of dumpsters.
5. Keep the area around dumpsters clean.
6. Liquid spills should be cleaned with appropriate spill kits.
7. Keep spill kits readily accessible.
8. Recycle when possible.

GROUNDS CLEANING

Waste generated from grounds crews include grass clippings, tree debris, leaves, plant trimmings, soil, rock and other landscaping materials.

1. Reuse or compost debris when possible.
2. Most landscaping waste, excluding rocks, can be composted by the City of Missoula's Garden City Compost facility.
3. If material is to be landfilled, follow the BMPs listed above for Trash Collection.

EQUIPMENT CLEANING

Fleet vehicles and other Facilities Services equipment such as lawnmowers will require periodic cleaning. Be sure debris is properly collected and disposed.

1. Solid materials from equipment and vehicles (such as clumps of grass clippings and dirt/mud on plows) should be managed in an area that will not impact the storm sewer system. Debris should be collected and composted, if applicable, or properly deposited in dumpsters.
2. Vehicle/equipment washing should be done in appropriate garage bays where waste water can be contained and flow into the sanitary sewer.

UNIVERSITY OF MONTANA Storm Water Management Program **STANDARD OPERATING PROCEDURE** CATEGORY: **Winter Street & Parking Lot Maintenance**	SOP NUMBER: **22** ISSUE DATE: **02/2021**
ACTIVITIES:	TARGET POLLUTANTS:
Sanding **Deicing**	**Sediment** **Salt Brine** **Corrosion inhibitor**

GENERAL

This SOP does not foresee all possible situations and employees are expected to use reasonable judgement to adapt this SOP to the circumstances encountered. Spill kit and equipment should be on hand for potential spills.

DESCRIPTION OF ACTIVITIES AND POLLUTANT SOURCE

Winter street and parking lot maintenance activities that have the potential to discharge pollutants to storm water runoff and surface waters include, sanding and deicing. The activities occur on the main University of Montana campus.

APPLICABILITY

The SOP shall apply to all employees engaged in the activities noted above.

BEST MANAGEMENT PRACTICES

1. Locate all storm drain collection structures and inlets prior to starting work.
2. Use temporary catch basin protection when necessary.
3. Have spill kits and absorbent materials available
4. Inspect equipment for gas, oil, and other fluid leaks prior to use.
5. Promptly clean up spills in accordance with the spill response and containment SOP.

THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED FOR EACH LISTED ACTIVITY

Sanding

UM labor crew are responsible for sanding streets and parking lots at the University of Montana main campus. Sanding includes the operation of a truck with a sanding spreader mounted in the bed of the truck. Sander should be calibrated and checked for proper functionality. Check vehicle for leaks and have repaired if necessary. Sand and or gravel are known as sediment which is the pollutants that can be introduced to the storm water system and nearby surface waters. Implement the following procedures to minimize the potential for storm water pollution during the sanding process:

1. On traffic lanes and driving lanes in parking lots apply sand evenly to areas to prevent over saturation of sand.
2. Make sure sander is working properly before each use.
3. Repair equipment as needed at Facilities Services.

Deicing

UM labor crew are responsible for deicing streets and parking lots at the University of Montana main campus. Deicing includes the operation of a truck with a large tank mounted on the back. The truck has a pump and spray arm mounted horizontally to distribute deicer compound evenly on roadways and in parking lots. Deicer should be calibrated and checked for proper functionality. Check vehicle for leaks and have repaired if necessary. Deicer contains a mixture of salt and water with a corrosion inhibitor. These are the pollutants that can be introduced to the storm water system and nearby surface waters. Implement the following procedures to minimize the potential for storm water pollution during the deicing process:

1. On traffic lanes and driving lanes in parking lots apply deicer evenly to all areas.
2. Make sure deicing truck is working properly before each use.
3. Repair equipment as needed at Facilities Services.

UNIVERSITY OF MONTANA
Storm Water Management Program

APPENDIX G

POWERPOINT SLIDES FOR COMPREHENSIVE TRAINING

February 2021

UNIVERSITY OF MONTANA

MS4 GENERAL PERMIT TRAINING

JUNE 3, 2020

NewFields

UNIVERSITY OF MONTANA

UNIVERSITY OF MONTANA - MS4 GENERAL PERMIT TRAINING

Introductions

MS4 Background

MS4 General Permit Overview

University of Montana MS4

UNIVERSITY OF MONTANA - MS4 GENERAL PERMIT TRAINING

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MS4 General Permit Overview

University of Montana MS4

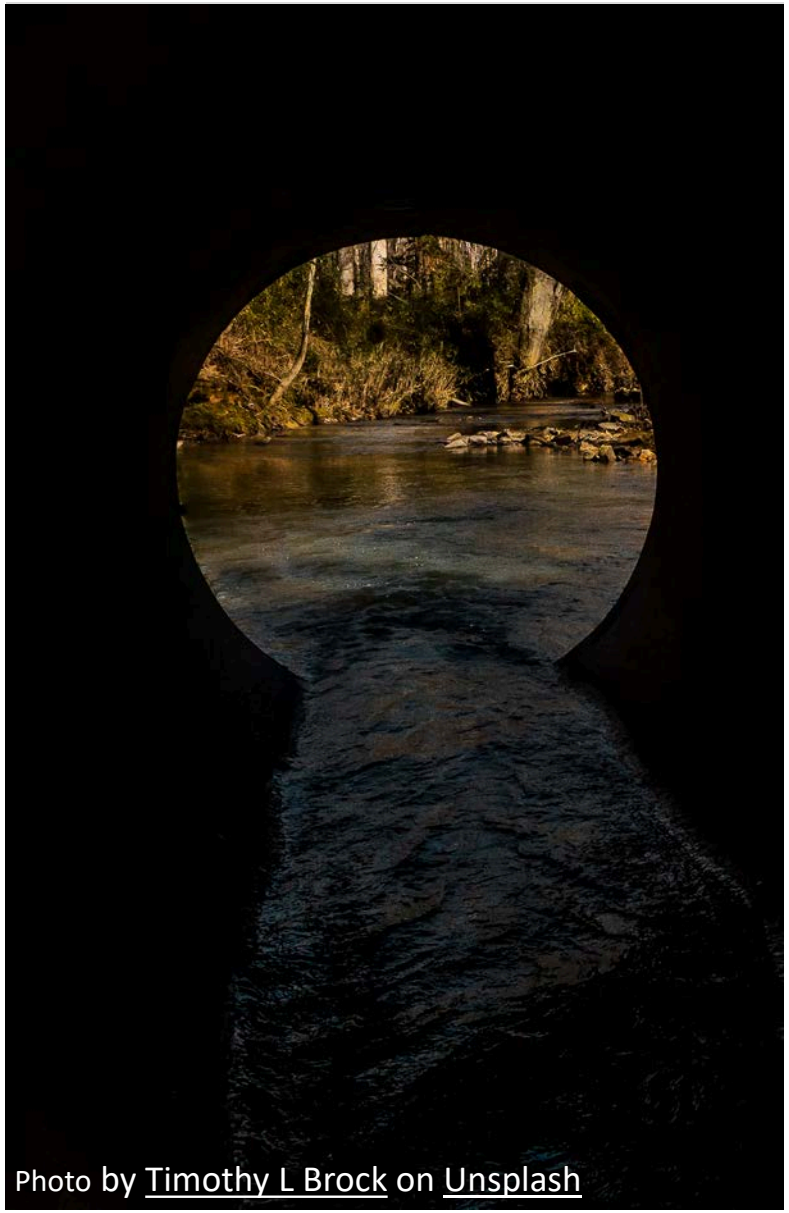
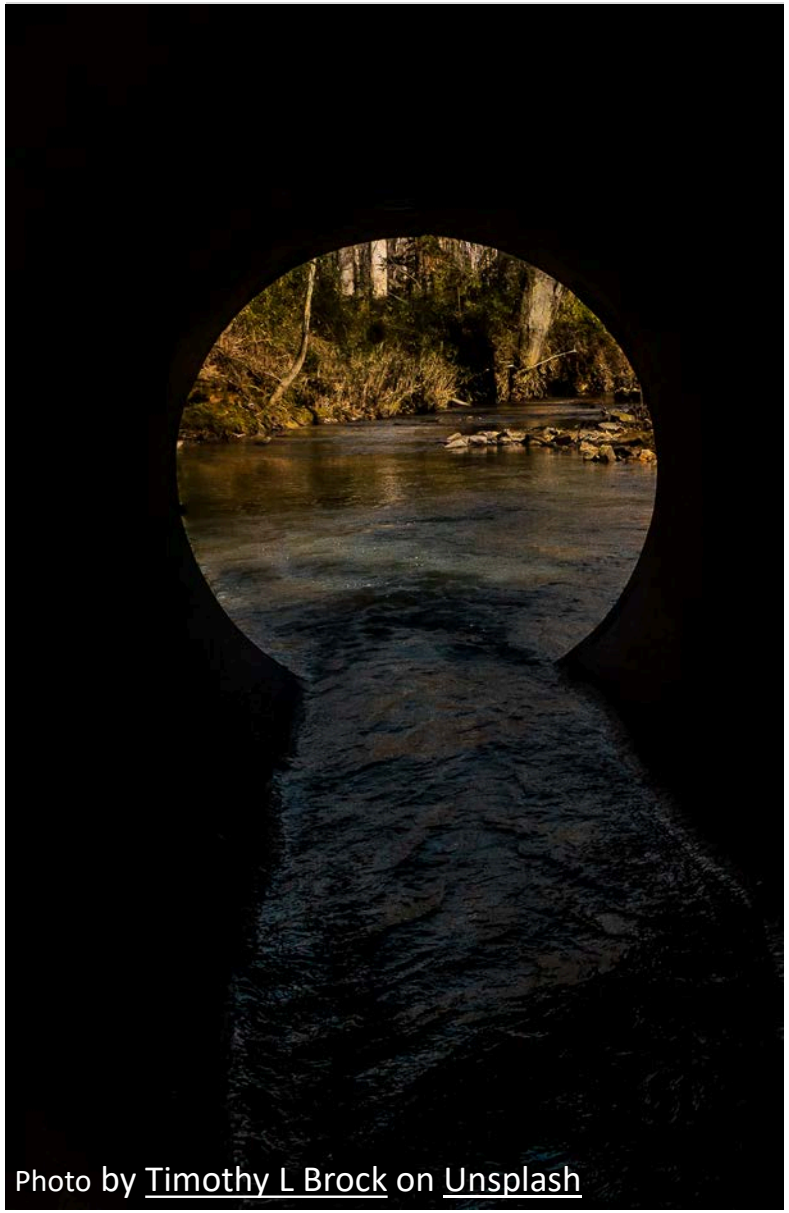


Photo by Timothy L Brock on Unsplash

Photo by Louis Hansel @shotsoflouis on Unsplash

MS4 PROGRAM BACKGROUND

- Storm Water Runoff Common Pollutants
  - Sediment
  - Nutrients
  - Chlorides
  - Pathogens
  - Metals
  - Trash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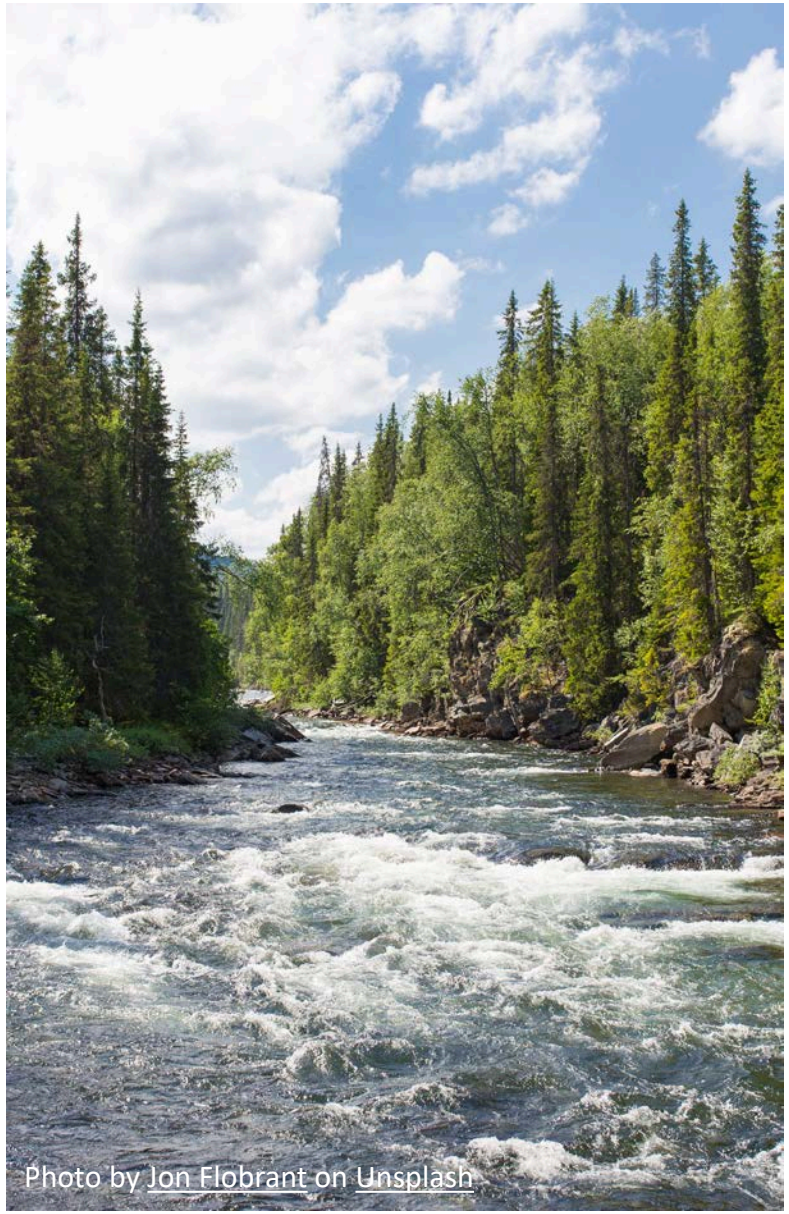
MS4 PROGRAM BACKGROUND

- Negative Effects of Impervious Surfaces and Storm Water Runoff
  - Increased volume and velocity of runoff
  - River scouring and erosion
  - Increased risk of flooding
  - Water pollution
  - Environment and human health concerns


Photo by Louis Hansel @shotsoflouis on Unsplash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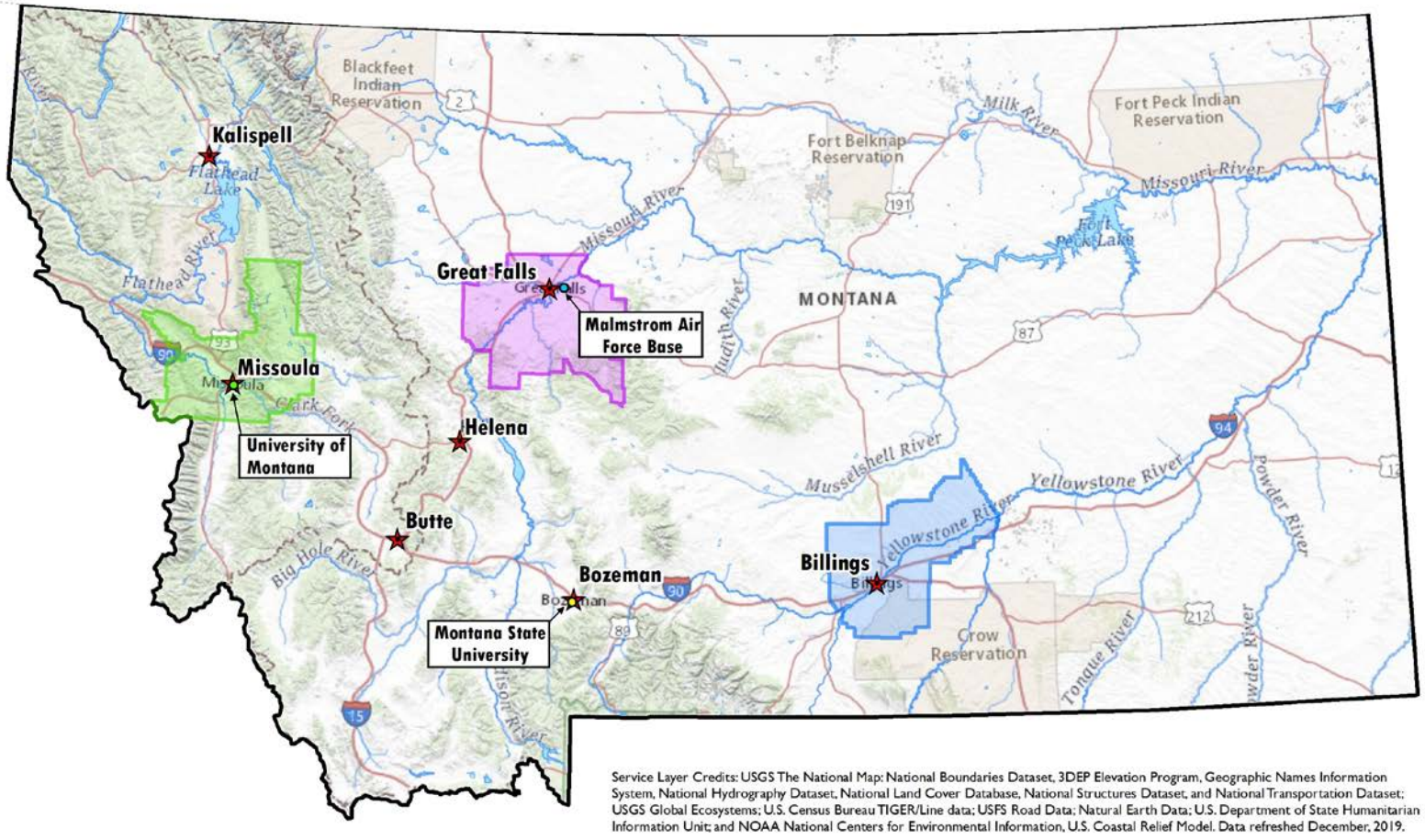
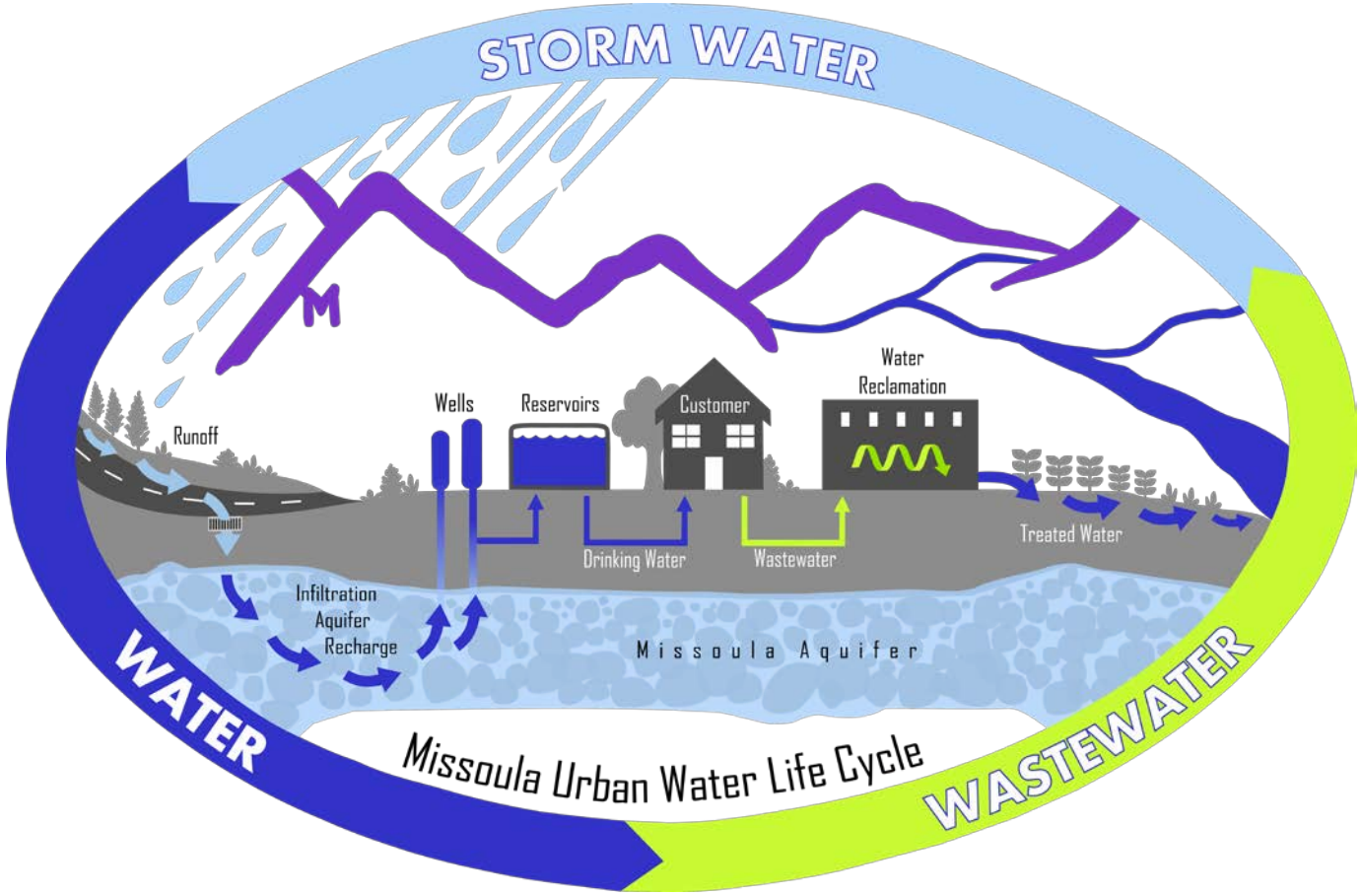
MS4 PROGRAM BACKGROUND

- MS4: Municipal Separate Storm Sewer System
- Clean Water Act (1972)
- Phase 1 MS4 (1990)
- Phase 2 MS4 (1999)
- Iterative process to attain water quality standards
- Montana MS4 General Permit
  - 2005, 2010, 2015, 2017



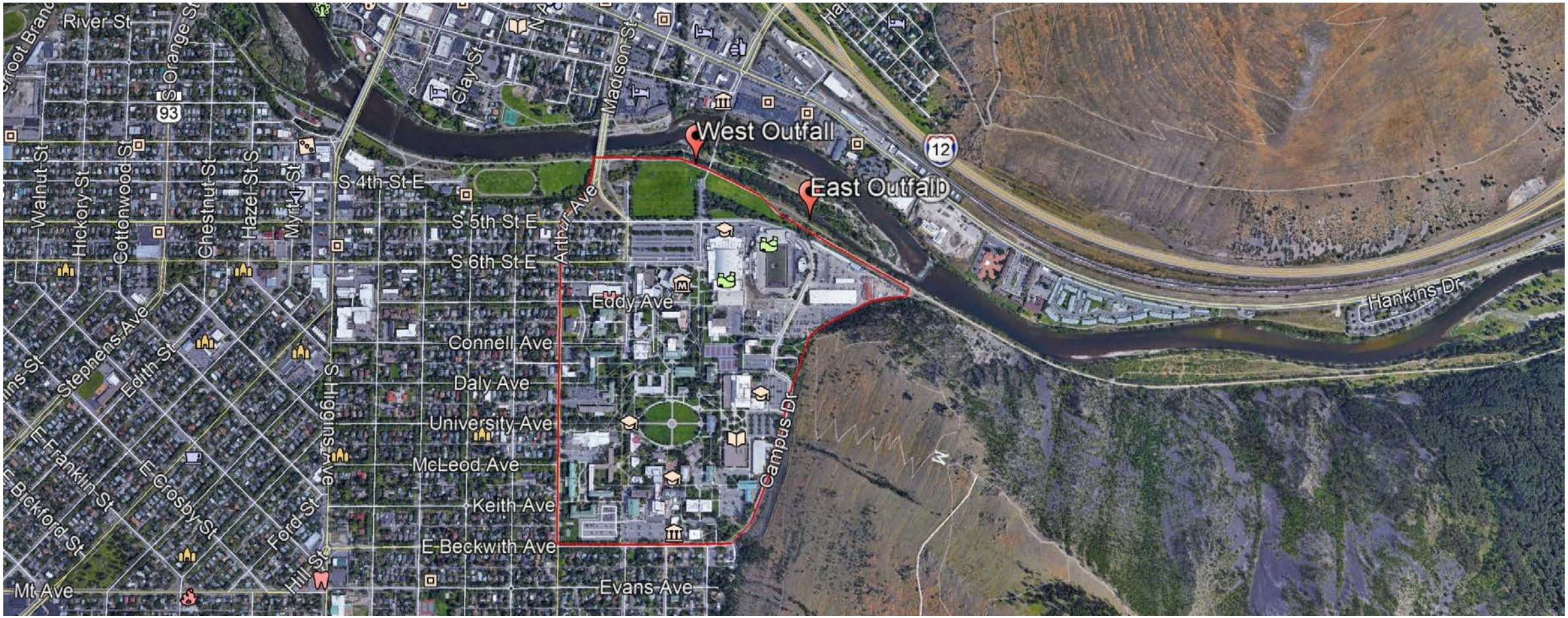
MS4'S IN MONTANA

- 7 Cities
- 3 Counties (urbanized areas)
- 2 Universities
- Malmstrom Air Force Base
- Department of Transportation
- MS4 Program Administered by Montana Department of Environmental Quality (DEQ)



MS4'S IN MISSOULA

- Missoula County
- City of Missoula
- University of Montana
- Department of Transportation



UNIVERSITY OF MONTANA MS4

UNIVERSITY OF MONTANA - MS4 GENERAL PERMIT TRAINING

Introductions

MS4 Background

MS4 General Permit Overview

University of Montana MS4

MS4 GENERAL PERMIT OVERVIEW

- MS4 Classifications
- Storm Water Management Program
- Minimum Control Measures
- Training
- Sharing Responsibility
- TMDL Considerations
- Monitoring
- Reporting

MS4 CLASSIFICATIONS

- Traditional MS4
  - Cities
  - Counties
- Non-Traditional MS4
  - University of Montana
  - Montana State University
  - Malmstrom Air Force Base
- Individual Permit
  - Montana Department of Transportation
- General vs. Individual Permit

STORM WATER MANAGEMENT PROGRAM (SWMP)

- "SWMP" Document
- Storm Water Management Program Team
  - Primary SWMP coordinator
  - Organizational chart
- Formal Mechanisms for Communication
  - Regular team meetings
  - Document agendas, attendees, discussions, etc.

MINIMUM CONTROL MEASURES (MCM)

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Storm Water Management
5. Post-Construction Site Storm Water Management in New and Redevelopment
6. Pollution Prevention / Good Housekeeping


Photo by Alex Dukhanov on Unsplash

MCM 1 & 2: PUBLIC EDUCATION, OUTREACH, INVOLVEMENT & PARTICIPATION

- Program to educate and involve public and key target audiences
- Raise awareness about impacts of storm water pollution
- Educate about the behaviors and activities that have the potential to pollute storm water discharges
- Motivate action to change behaviors to reduce pollutants in storm water runoff
- Involve key target audiences in SWMP development

MCM 1 & 2 – PERMIT REQUIREMENTS SUMMARY

- Identify key target audiences
- Involve key target audiences in SWMP implementation
- Develop and distribute outreach messages
- Develop and implement outreach strategies
- Develop and advertise storm water website


Photo by Perry Grone on Unsplash

MCM 3: ILLICIT DISCHARGE DETECTION AND ELIMINATION

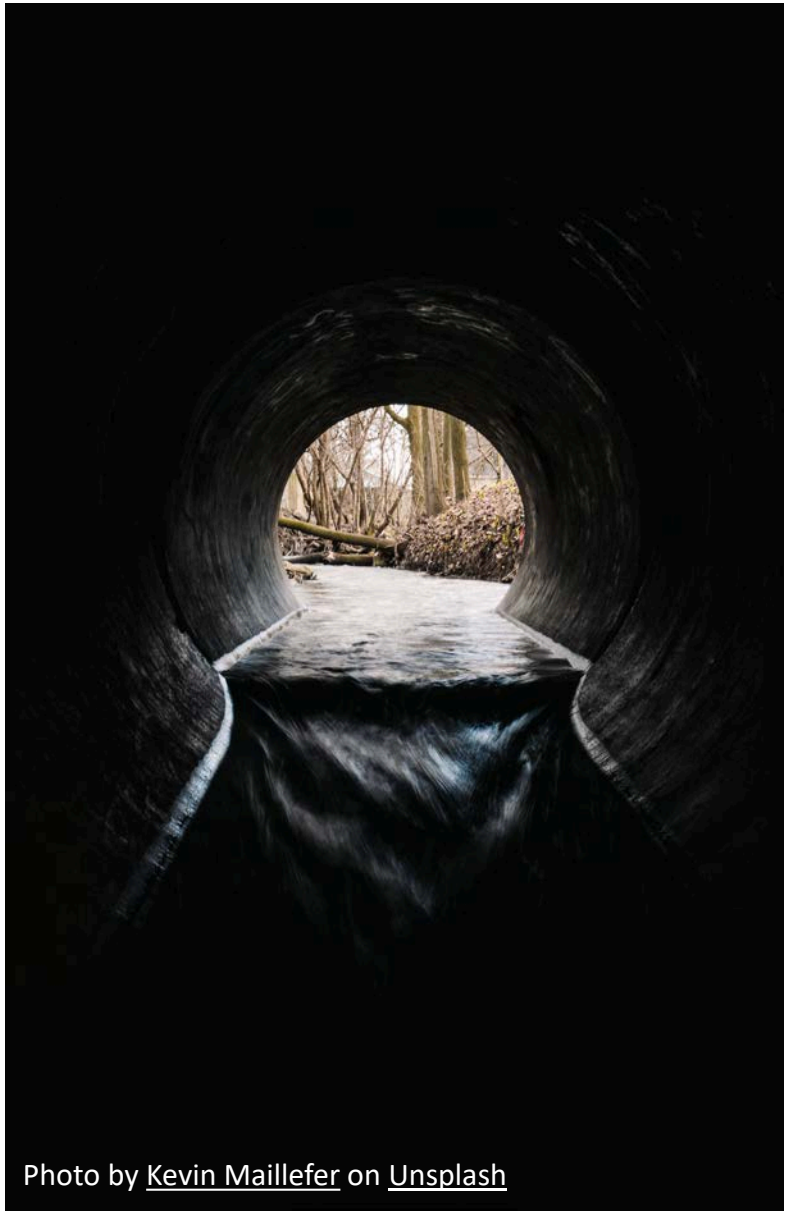
- Program to detect and eliminate illicit discharges
- Illicit Discharge:
  - Any discharge to a MS4 that is not composed entirely of storm water except discharges pursuant to an MPDES permit and discharges resulting from firefighting activities.
- Examples:
  - Vehicle leaks
  - Pesticides and fertilizers
  - Hydrant flushing
  - Supply well development discharges to storm drain
  - Dumping to storm drain


Photo by John Rourke on Unsplash

MCM 3 – PERMIT REQUIREMENTS SUMMARY

- Identify common potential illicit discharges (Non-storm water discharge evaluations)
- Storm water sewer inventory
- Prohibit illicit discharges
- Illicit discharge enforcement
- Outfall inspections and prioritization
- Illicit discharge investigations and corrective actions
- Investigation and enforcement documentation

Photo by Glenn Carstens-Peters on Unsplash



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MCM 4: CONSTRUCTION SITE STORM WATER MANAGEMENT

- Program to reduce pollutants in storm water runoff from construction activities
- Regulated sites
  - Land disturbance of greater than 1 acre
  - Land disturbance of less than 1 acre if part of larger common plan of development
- Program components
  - Require construction BMPs
  - Plan reviews and approvals
  - Inspections
  - Enforcement


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Photo US EPA


Photo City of Milwaukee

MCM 4 – SUMMARY OF PERMIT REQUIREMENTS

- Require construction storm water management controls
- Plan review checklist
- Plan reviews for permittee-owned projects
- Inspection form
- Inspection frequency determination protocol
- Inspections for permittee-owned projects
- Regulated project inventory
- Enforcement response plan


Photo by Scott Blake on Unsplash

MCM 5: POST-CONSTRUCTION STORM WATER MANAGEMENT IN NEW AND REDEVELOPMENT

- Program to reduce pollutants in storm water runoff from new and redevelopment projects
- Regulated sites
  - Land disturbance of greater than 1 acre
  - Land disturbance of less than 1 acre if part of larger common plan of development
- Program components
  - Require post-construction BMPs
  - Plan reviews and approvals
  - Inspections
  - Enforcement

- Examples
  - Bioretention
  - Infiltration basin
  - Permeable pavement systems
  - Dispersion
  - Biofiltration swale
  - Extended detention basin
  - Wet detention basin
  - Proprietary devices (hydrodynamic separator, filters)

MCM 5 – PERMIT REQUIREMENTS SUMMARY

- Require post-construction BMPs (1/2" Rule)
- Plan review checklist
- Plan reviews for permittee-owned projects
- Inspection form(s)
- Prioritize inspections
- Conduct inspections (for permittee-owned BMPs)
- BMP inventory
- Enforcement response plan
- Low impact development evaluation

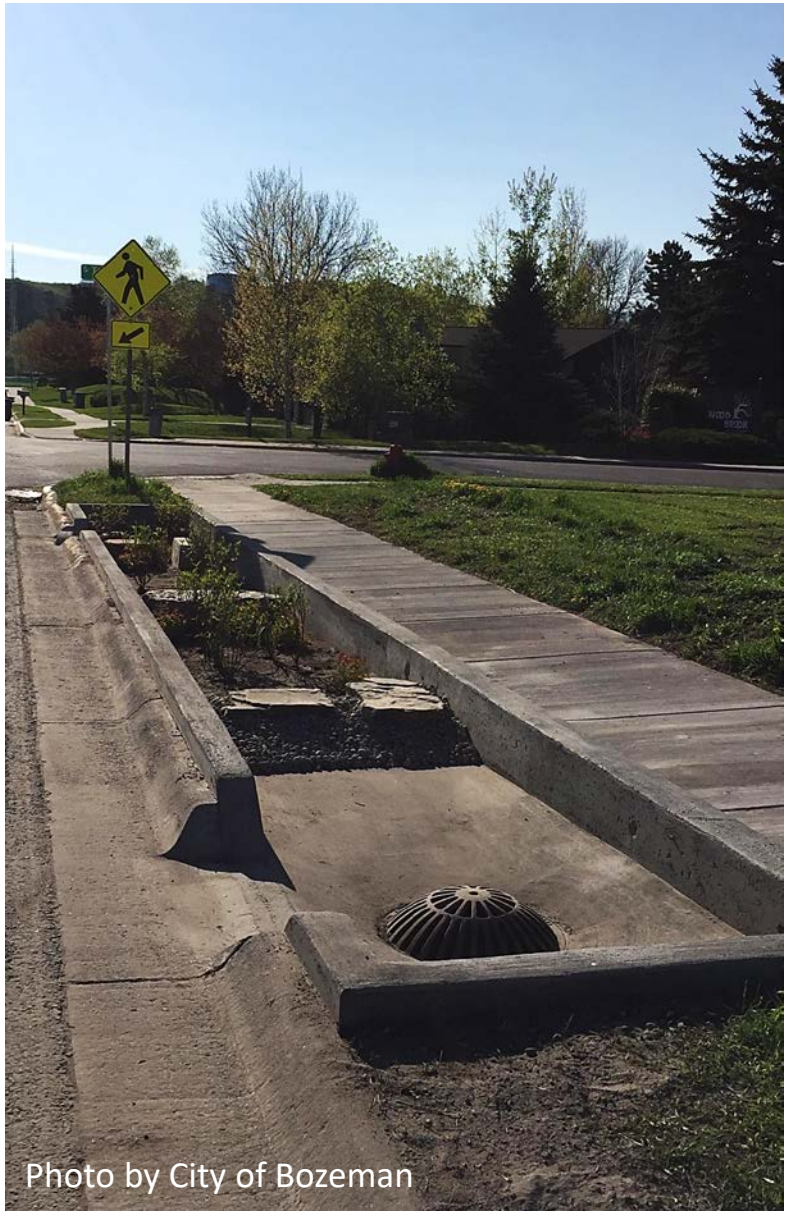
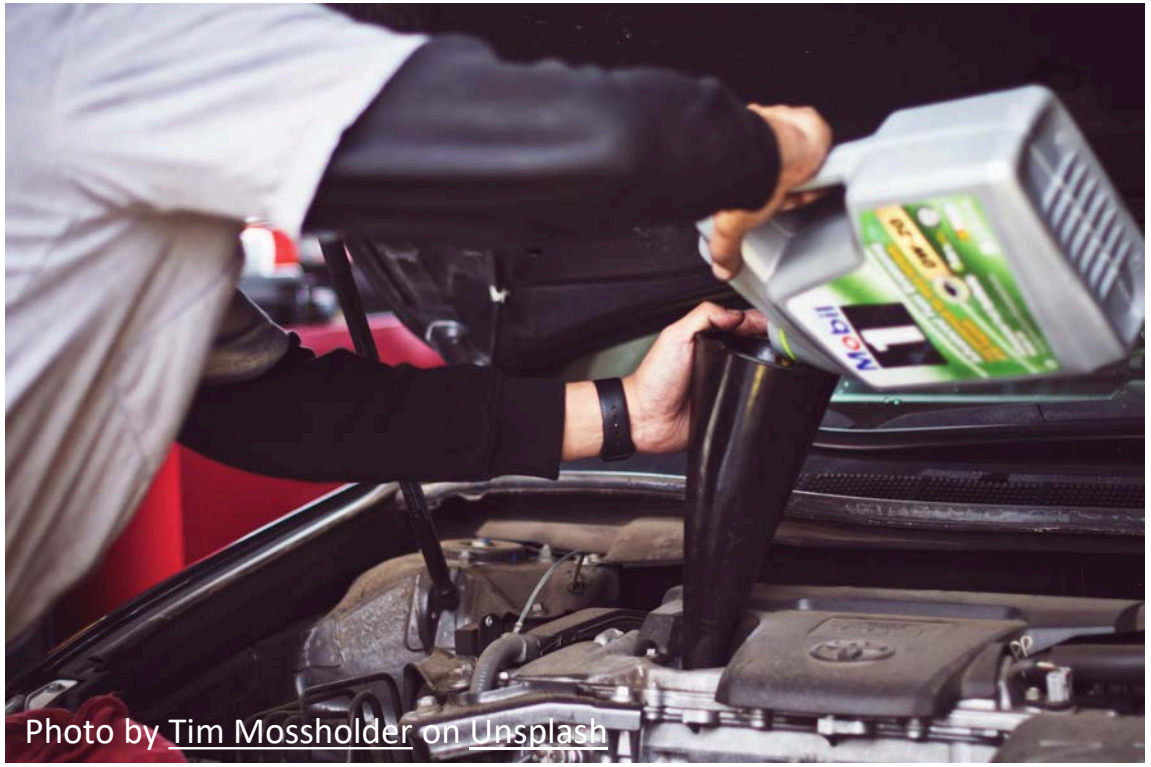


Photo by City of Bozeman


Photo by City of Bozeman

MCM 6: POLLUTION PREVENTION / GOOD HOUSEKEEPING FOR PERMITTEE OPERATIONS

- Operation and maintenance program
- Goal of preventing or reducing pollutant runoff from permittee operations
- Examples
  - Landscaping
  - Vehicle maintenance
  - Building maintenance
  - Street and parking lot maintenance
  - Snow removal and storage
  - Garbage management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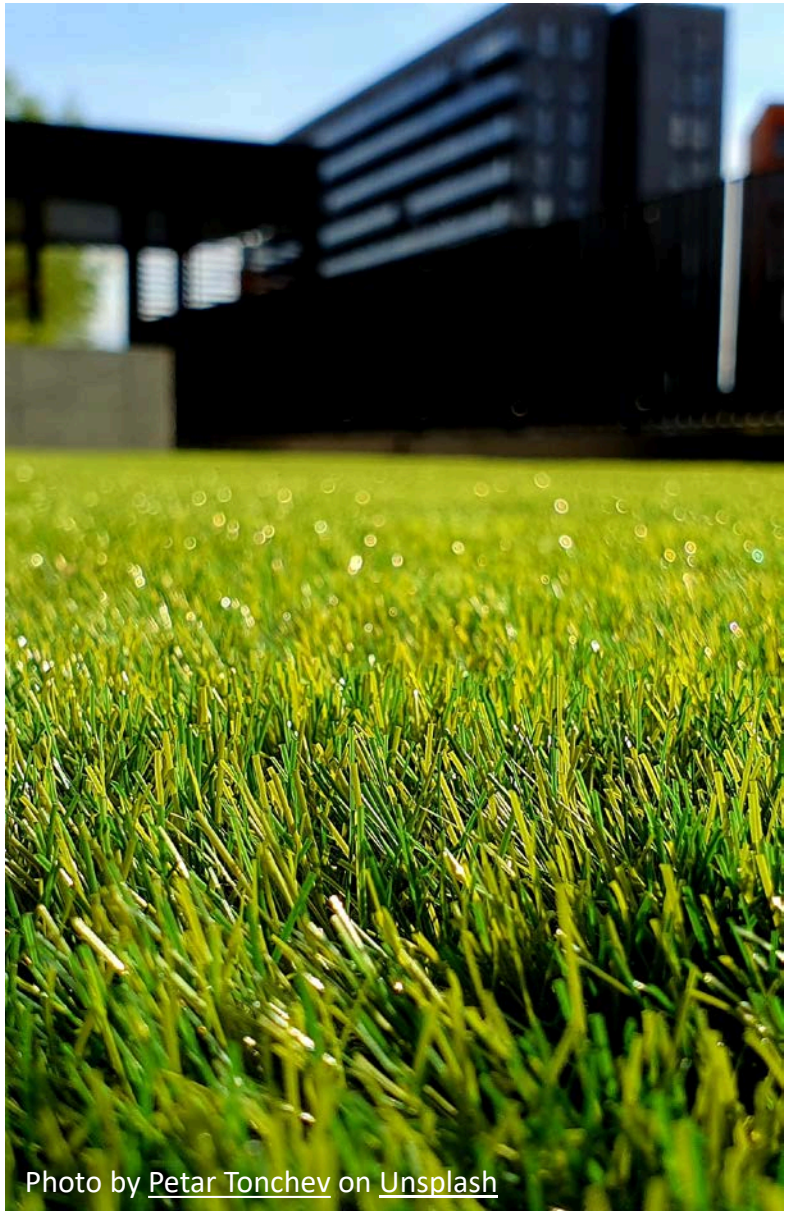
MCM 6 – SUMMARY OF PERMIT REQUIREMENTS

- Inventory of permittee facilities
  - Maintenance yards
  - Waste handling/disposal areas
  - Fleet/maintenance shops
  - Salt/sand storage locations
  - Snow disposal areas
- Inventory of permittee activities
  - Park/open space maintenance
  - Parking lot maintenance
  - Building maintenance
  - Road maintenance/deicing
  - Storm water system maintenance
- Facility/activity map
- SOPs and SOP training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TRAINING

- Comprehensive permit training
- Storm water awareness training
- Construction site storm water management
- Post-construction site storm water management
- SOP training

Photo by Etienne Girardet on Unsplash

SHARING RESPONSIBILITY

- Shared responsibility to implement MCMs
- Written agreement
- UM shared responsibilities
  - Illicit discharge detection and elimination
  - Construction site storm water management
  - Post-construction site storm water management
- UM MS4 Partners
  - City of Missoula
  - Missoula Valley Water Quality District

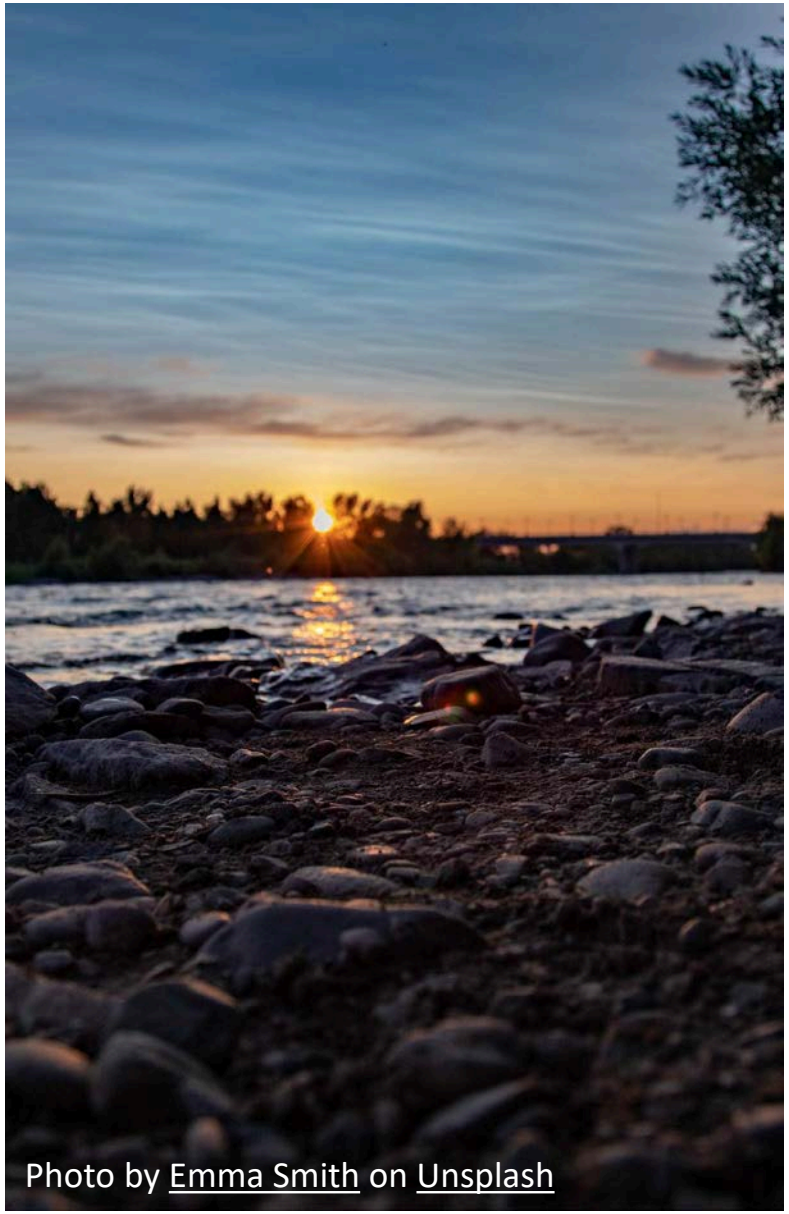
TMDL CONSIDERATIONS

- Impaired waterbody
  - Does not meet water quality standards based on Clean Water Act provisions
- Total maximum daily load
  - Plan for restoring impaired waters that identifies a pollutant reduction target and allocates load reductions necessary to the source(s) of the pollutant
- Waste load allocation (WLA)
  - The portion of a receiving water's loading capacity that is allocated to one of its existing or future point sources.


Photo by Emma Smith on Unsplash

TMDL – PERMIT REQUIREMENT SUMMARY

- SWMP Must Identify
  - Impaired waterbodies in MS4 area
  - Outfalls discharging to impaired waterbodies
  - Identify pollutants of impairment
- TMDL SWMP Section
  - BMPs to be implemented
  - Impairment priorities
  - Long term strategy
  - Interim milestones
- TMDL-Related Monitoring
  - Evaluate effectiveness of BMPs to reduce MS4 loading to impaired waterbodies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CLARK FORK RIVER TMDL

- MS4 Impairments Priorities (WLA)
  - Arsenic
  - Cadmium
  - Copper
  - Iron
  - Lead
  - Zinc

SELF-MONITORING

- Separate from TMDL-related monitoring
- 4 discharge points (2 for UM)
- Semi-annual
- Self evaluate results
- Develop BMPs to improve results


Photo by Hans Reniers on Unsplash

SELF-MONITORING

- Parameters
  - Total suspended solids
  - Chemical oxygen demand
  - Total phosphorus
  - Total nitrogen
  - pH
  - Copper
  - Lead
  - Zinc
  - Estimated flow
  - Oil and grease


Photo by Hans Reniers on Unsplash

REPORTING

- MS4 Annual Report
  - Progress update for each MCM
  - Inspection results
  - Sampling results
  - Training documentation
  - Updated SWMP document

UNIVERSITY OF MONTANA - MS4 GENERAL PERMIT TRAINING

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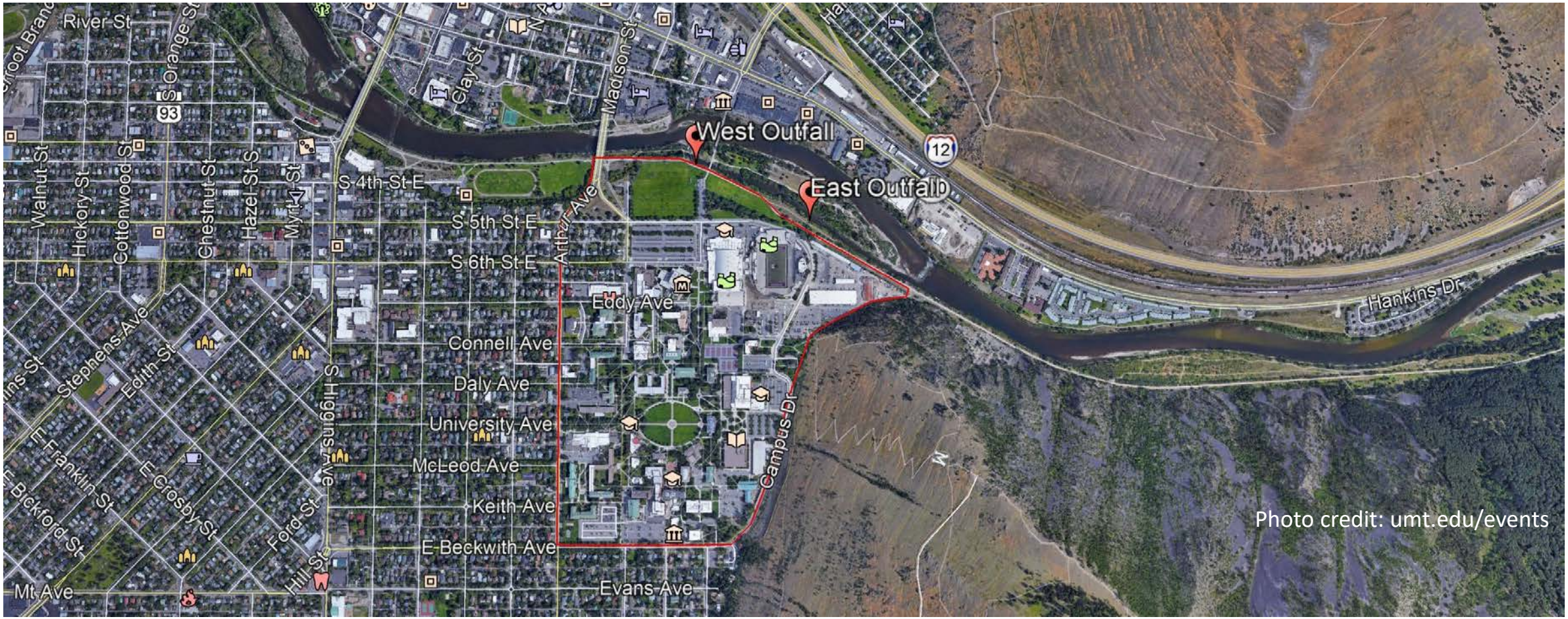
University of Montana MS4

UNIVERSITY OF MONTANA MS4



UNIVERSITY OF MONTANA MS4

- 2019
  - Program development and implementation
  - DEQ inspection
- 2020
  - DEQ inspection response
  - Sampling and dry weather screenings
  - Coordinate with City of Missoula and WQD
  - Develop/update SWMP
- 2021
  - Continued program development and implementation
- 2022
  - New MS4 Permit?


Photo credit: umt.edu/events

QUESTIONS AND DISCUSSION

UNIVERSITY OF MONTANA
Storm Water Management Program

APPENDIX H

SAMPLING PLAN FOR TMDL RELATED MONITORING

February 2021

Sampling Plan for TMDL-Related Monitoring

UNIVERSITY OF MONTANA

Storm Water Management Program

Prepared for:

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Missoula, MT 59812

Prepared by:

NewFields
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U.S.A.

May 2020

NewFields

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Tables

Appendices

1 INTRODUCTION

1.1 Background

The University of Montana-Missoula (UM) is a non-traditional Small Municipal Separate Storm Sewer System (MS4) that operates its storm water management program (SWMP) under the authorization of the Montana Pollutant Discharge Elimination System (MPDES) General Permit for Storm Water Discharges Associated with Small MS4s (General Permit) (Montana Department of Environmental Quality [DEQ], 2016).

Storm water sampling is required under Parts III.B and IV.A of the General Permit. Part III.B, Total Maximum Daily Load (TMDL)-Related Monitoring, requires monitoring targeted at evaluating either MS4 loading to impaired receiving waterbodies or the effectiveness of best management practices (BMPs) implemented to reduce MS4 pollutant loading to impaired receiving waterbodies. Part IV.A, Self-Monitoring, requires semi-annual sampling and testing of storm water discharges for specific monitoring parameters.

1.2 Purpose

This sampling plan describes UM's sampling program to satisfy the requirements of Parts III.B and IV.A of the General Permit. Specifically, this document was developed to satisfy Part III.B, which requires a sampling plan for TMDL-related monitoring. UM has selected monitoring Option 2 for TMDL-related monitoring, which requires UM to use monitoring results to evaluate the effectiveness of BMPs selected for reducing MS4 loading to impaired receiving waterbodies.

2 UM MS4-RELATED TMDLS

2.1 TMDL Overview

The UM has two storm water outfalls, each of which are located in the City of Missoula's (City) MS4 boundary and discharge to the Clark Fork River (Blackfoot River to Rattlesnake Creek section). This section of the Clark Fork River is impaired for seven pollutants, as presented in **Table 1**.

Table 1: Impairment Information: Clark Fork River, Blackfoot River to Rattlesnake Creek

Probable Cause	Probable Sources	Associated Uses	TMDL Completed
Arsenic	Mill Tailings	Drinking Water	Yes
Cadmium	Mill Tailings	Aquatic Life	Yes
Copper	Mill Tailings	Aquatic Life	Yes
Eutrophication	Industrial Point Source Discharge, Dam or Impoundment	Aquatic Life	Yes
Iron	Mill Tailings	Aquatic Life	Yes
Lead	Mill Tailings	Aquatic Life, Drinking Water	Yes
Zinc	Mill Tailings	Aquatic Life	Yes

Source: 2018 Water Quality Assessment Summary Report (Montana Department of Environmental Quality, 2018)

Although the City's MS4 is not listed as a probable source for any of the pollutants of impairment in the DEQ's 2018 Water Quality Assessment Summary Report (**Table 1**), it has been given a waste load allocation (WLA) for arsenic, cadmium, copper, iron, lead, and zinc because DEQ estimates that the Missoula MS4 may contribute annual loads of each of these pollutants to this section of the Clark Fork River. Additionally, DEQ believes that MS4 loadings for these pollutants have significantly reduced over time as a result of implementation of storm water BMPs and that further reductions are possible through the implementation of additional storm water BMPs (Montana Department of Environmental Quality, 2014).

The WLA assigned to the Missoula MS4 is a 55 percent reduction in metals loads, applicable to arsenic, cadmium, copper, iron, lead, and zinc; however, the TMDL report notes that the WLAs are not intended to add concentration load limits to the General Permit and that DEQ assumes the WLAs will be met by adhering to the General Permit requirements and by reducing either the metals concentrations or the discharge volumes, or both. The TMDL report also calls for continued collection and evaluation of storm water samples to assess BMP performance (Montana Department of Environmental Quality, 2014).

Because the UM MS4 is located in the boundary of the City's MS4, the WLAs for arsenic, cadmium, copper, iron, lead, and zinc are also applicable to the UM's SWMP. These six pollutants are referred to as the *pollutants of concern* throughout the remainder of this document.

2.2 TMDL Strategies

Part III.B of the General Permit requires UM to include a section in the SWMP describing the BMPs it plans to implement, impairment priorities, long-term strategy, and completion schedule for action items for controlling the discharge of pollutants of concern. The sampling results from TMDL-related monitoring will assist UM in selecting and implementing appropriate BMPs to target pollutants of concern. In addition, monitoring results will allow UM to evaluate the effectiveness of BMPs once implemented. More detailed discussion of impairment priorities, pollutant reduction strategies, and interim milestones will be provided in the TMDL section of the SWMP.

3 MONITORING LOCATIONS AND STRATEGIES

3.1 Monitoring Locations

Monitoring will be conducted at each of the UM's outfalls (two locations), which are shown in **Appendix A** and described below.

3.1.1 East Outfall - 001

The East Outfall is a concrete pipe that discharges to the Clark Fork River upstream of Rattlesnake Creek, northeast of Washington Grizzly Stadium (see **Appendix A**). Storm water in this outfall is expected to be representative of industrial and commercial areas. The eastern side of campus includes facilities services compound, Washington Grizzly Stadium, open space/grassed areas, the heating plant, student centers and campus buildings, parking lots and streets, and one dormitory. Anticipated potential pollutants generated in the outfall's drainage area include organic materials, herbicides/pesticides, nutrients, sediment, trash, metals, oil, grease, and hydrocarbons.

3.1.2 West Outfall - 002

The West Outfall is a concrete pipe that discharges to the Clark Fork River upstream of Rattlesnake Creek, west of Vanburen Avenue (see **Appendix A**). Storm water directed to this outfall originates mainly from

campus buildings, parking lots and streets, dormitories, and parks and lawns. Storm water in this outfall is expected to be more representative of commercial and grassed/park areas. Anticipated potential pollutants generated in the outfall's drainage area include organic materials, herbicides/pesticides, nutrients, sediment, trash, metals, oil, grease, and hydrocarbons.

3.2 Monitoring Strategies

3.2.1 TMDL-Related Monitoring

The purpose of TMDL-related monitoring is to evaluate effectiveness of BMPs selected to reduce loading of pollutants of concern to the Clark Fork River. Because the pollutants of concern are generally related to mining and milling activities, the UM believes that storm water discharges from the UM may not be contributing to loading of certain pollutants. The UM will sample for the constituents shown in **Table 2** to identify which pollutants of concern are to be prioritized for BMP implementation and identify whether certain pollutants of concern are not present within UM's storm water runoff. If certain pollutants of concern are not present for two years of sampling, the UM may propose to revise this sampling plan and remove those pollutants from the list of parameters to be analyzed.

Table 2: TMDL-Related Monitoring Locations and Parameters

Name	Location	Receiving Waterbody	Sample Collection Method	Frequency	Sample Parameters
East Outfall	46.864888 -113.980524	Clark Fork River, Blackfoot River to Rattlesnake Creek	Grab	Semi-annual[1]	Arsenic, Cadmium, Copper, Iron, Lead, Zinc, Temperature
West Outfall	46.866459 -113.984491				

[1]One sample collected between January 1st and June 30th, one collected between July 1st and December 31st.

3.2.2 Self-Monitoring

The purpose of self-monitoring is to monitor and evaluate storm water discharges from the UM MS4 for the list of pollutants identified in Table 1 of the General Permit. The same monitoring locations used for TMDL-related monitoring will be used for self-monitoring (**Table 3**). UM has selected Self-Monitoring Option 1 in Part IV.A.3 of the General Permit. UM recognizes that Self-Monitoring Option 1 requires sampling at four discharge points, representative of both commercial/industrial areas and residential areas; however, UM will sample at only two locations because they are the UM's only storm water outfalls. Sampling locations and parameters required for self-monitoring are listed in **Table 3**.

Table 3: Self-Monitoring Locations and Parameters

Name	Location[1]	Receiving Waterbody	Sample Collection Method	Frequency	Sample Parameters
East Outfall	46.864888 -113.980524	Clark Fork River, Blackfoot River to Rattlesnake Creek	Grab	Semi-annual[2]	Total suspended solids, Chemical oxygen demand, Total phosphorus, Total nitrogen, pH, Copper, Lead, Zinc, Estimated flow, Oil and grease
West Outfall	46.866459 -113.984491				

[1]Self-monitoring Option 1 presented in Part IV.A.3.a of the General Permit requires sampling at four discharge points; however, the UM only has two outfalls and will therefore only conduct sampling at these two locations.

[2]One sample collected between January 1st and June 30th, one collected between July 1st and December 31st.

4 MONITORING PROTOCOL AND REQUIRMENTS

This section describes the field sampling methods, sampling parameters and associated analytical methods, sampling frequency, and quality assurance and quality control (QA/QC) measures that will be used to evaluate usability and validity of monitoring results.

4.1 Sampling Methods and Parameters

UM will collect grab samples from the locations listed in Section 3.1 at the frequency specified in Section 4.2. A standard operating procedure (SOP) for surface water sampling (SOP SP-5) is provided in **Appendix B**. Equipment decontamination will be conducted as necessary for any equipment reused between sampling locations and events. Sampling parameters, listed in **Table 4**, were compiled from the self-monitoring parameters given in Table 1 of Part IV.A.2 of the General Permit and from parameters with TMDLs in the Clark Fork River between the Blackfoot River and Rattlesnake Creek (see **Table 2**). UM will sample for each of these parameters at each sample location in order to comply with both self-monitoring and TMDL-related sampling requirements.

Table 4: Sampling Parameters and Analytical Methods

Sample Type	Parameter	Units	Analytical Method	Sample Container	Preservative	Maximum Holding Time
S	Total Suspended Solids	mg/L	SM 2540-D	1 L plastic	Cool to ≤ 6°C	7 days
S	Chemical Oxygen Demand	mg/L	SM 5220-C	500 mL plastic	Cool to ≤ 6°C, Sulfuric acid to pH < 2	28 days
S	Total Phosphorus	mg/L	EPA 365.1	500 mL plastic	Cool to ≤ 6°C, Sulfuric acid to pH < 2	28 days
S	Total Kjeldahl Nitrogen	mg/L	SM 4500-NH3-G	500 mL plastic	Cool to ≤ 6°C, Sulfuric acid to pH < 2	28 days
T	Arsenic, Total Recoverable	mg/L	EPA 200.8	500 mL HDPE	Nitric acid to pH < 2	6 months
T	Cadmium, Total Recoverable	mg/L				
S,T	Copper, Total Recoverable	mg/L				
T	Iron, Total Recoverable	mg/L				
S,T	Lead, Total Recoverable	mg/L				
S,T	Zinc, Total Recoverable	mg/L				
S	Oil and Grease	mg/L	EPA 1664A	1 L amber glass (1)	Cool to ≤ 6°C, hydrochloric acid to pH < 2	28 days
S	Estimated Flow	gpm	On-site	--	--	--
S	pH	su	On-site *	--	--	15 minutes
T	Temperature	°C	On-site	--	--	15 minutes

Notes: S = self-monitoring; T = TMDL-related monitoring; mg/L = milligrams per liter; gpm = gallons per minute; su = standard units; °C = degrees Celsius; On-site = parameter measured on-site, no analytical method; * procedure given in SOP SP-4; -- = not applicable.

4.2 Sample Frequency

Each location will be sampled at least twice per calendar year, once between January 1st and June 30th, and once between July 1st and December 31st. Part IV of the General Permit requires sampling to be conducted during a storm event with a measurable amount of discharge. This is interpreted as any storm event that results in sufficient volume and water depth for grab samples to be collected from UM's outfalls.

Storm events and precipitation will be monitored using radar managed by the National Oceanic and Atmospheric Administration's National Weather Service. These data may also be used to determine storm characteristics, if necessary, such as storm duration, intensity, and total precipitation.

4.2.1 Substitute Sampling

If UM is unable to collect a sample within a six-month monitoring period, a substitute sample will be collected during the next six-month cycle, in addition to the required sample for that six-month period. The substitute sample and required sample will be collected from different storm events with at least 48 hours of no measurable precipitation between them. UM will also provide the reason(s) a sample could not be collected during the six-month period when reporting results in the Annual Report.

4.3 Sample Handling and Documentation

4.3.1 Sample Collection and Field Documentation

Samples will be collected using standardized procedures (SOP SP-5, **Appendix B**), and equipment decontamination will be performed as necessary for equipment that is reused for multiple samples. UM will maintain a database (spreadsheet) to document each sampling event that includes, at a minimum:

- Sampling location
- Sample collection date and time
- Total rainfall measurements/estimates of storm event
- Name of sampler

The procedure for field documentation is detailed in SOP SP-1 in **Appendix B**. Storm precipitation data will be collected from the National Oceanic and Atmospheric Administration's National Weather Service and on-site or local weather stations (e.g., Missoula Airport weather station), as available.

4.3.2 Sample Naming Scheme

Sample names will be assigned according to the sampling location and sampling date, and as required by Part IV.A.3.a of the General Permit. Sample locations will be referred to by the following standard nomenclature:

- East Outfall – 001
- West Outfall – 002

The sample name will consist of the above standard nomenclature followed by an underscore and the date in YYYYMMDD format, another underscore and the sample matrix code. For example, a surface water sample collected from the East Outfall on January 7, 2021 would have the sample name "001_20210107_SW". This will allow UM personnel to easily identify sample locations and differentiate between sampling events. Refer to SOP SP-2 (**Appendix B**) for further detail on sample naming.

4.3.3 Sample Handling

Sample containers, preservatives, and holding times will adhere to requirements shown in **Table 4**. Sample packaging and shipment procedures will follow SOP SP-3 (**Appendix B**) to maintain sample integrity. Chain-of-custody (COC) procedures (SOP SP-2, **Appendix B**) will be followed in order to demonstrate sample integrity. The handling of all samples collected will be traceable from the time of collection, through analysis, until final disposition. A COC record will be completed and accompany every sample shipment. Each person who has custody of the samples must sign the record. The completed COC record should be put in a waterproof plastic bag and placed inside the sample cooler if the samples are to be shipped or transported to a laboratory.

4.3.4 Laboratory Sample Handling and Documentation

Laboratory personnel will assess the integrity of the custody seals upon sample arrival. They will also verify and document the following information upon sample receipt:

- Condition of shipping container;
- Condition of sample container(s);
- Condition of custody seals;
- Presence/absence of sample labels;
- Agreement/non-agreement of documents;
- Cross-reference of laboratory numbers; and,
- Temperature inside shipping container.

Laboratory personnel will document any problems or discrepancies with the samples or custody documents, contact UM, and document the resolution to the problems or discrepancies.

Laboratory reports will be delivered to UM as either hardcopy or electronic digital file (e.g., .pdf) and as an electronic data deliverable (EDD). Lab reports will include the following information, at a minimum:

- Date and time of sample analysis;
- Initials or names of laboratory personnel who performed analysis;
- References or written procedures, when available, for the analytical techniques or methods used
- Results of analysis; and,
- Case narrative describing any deviations from the analytical methods or QA/QC procedures and corrective actions taken, if any.

4.4 Quality Assurance / Quality Control

QA/QC measures will evaluate whether data are of sufficient quality to assess the effectiveness of UM's BMPs. Data quality and usability are measured by precision, accuracy, representativeness, completeness, and comparability (PARCC). These indicators will be evaluated according to the following results and procedures:

- **Precision** – laboratory duplicates will be used to evaluate precision.
- **Accuracy** – the laboratory will run control samples, matrix spike samples, calibrations, internal standards, and surrogates as required by the analytical method.
- **Representativeness** – the laboratory will use method blank samples to assess the possibility of contamination. In addition, UM personnel will follow method requirements and collect samples using decontaminated equipment in order to reduce the possibility of introducing contamination

to the samples prior to analysis. Sample containers, preservation requirements, and holding times for each analytical method (refer to **Table 4**) will be adhered to in order to ensure results are representative of site conditions.

- **Completeness** – UM will collect samples as required by the sampling plan and the General Permit. UM personnel will review the COCs prior to submitting to the laboratory, and review results received by the laboratory to verify all required parameters are requested and reported.
- **Comparability** – UM will use consistent sample collection methods so results are comparable to other sampling events for storm water monitoring. The laboratory will use the analytical methods listed in **Table 4**.

Laboratory QA/QC, including QC sample frequency and control limit guidance, will be maintained through adherence to the laboratory's internal quality assurance protocol (LQAP) during analysis. Laboratory QC sample frequency and control limit guidelines are specified in the LQAP Manual.

Laboratory analysis all samples will include prescribed QC procedures and samples according to the published analytical method and internal laboratory QC procedures. The laboratory will conduct internal QC checks for analytical methods in accordance with their SOPs and the individual method requirements.

5 ANALYSIS OF RESULTS

All storm water monitoring results will be compiled into a single spreadsheet that will be maintained with current data. This spreadsheet will contain, at a minimum, sample locations, collection dates and times, total rainfall, sample parameters, numeric results, and any associated data quality notes. Analysis procedures for sampling results will be further developed as UM develops site-specific BMPs. At a minimum, the following analysis will be conducted to evaluate pollutant loading to the Clark Fork River.

The long-term median for each parameter at each location will be calculated and presented in the Annual Report. Monitoring results from the most recent monitoring year will be compared to the long-term median to evaluate how results compare to previous monitoring results.

Concentration versus time plots will also be created and maintained for all parameters at each location. These plots will help UM determine trends in water quality over time and understand effectiveness of BMPs. Decreasing water quality trends will indicate the BMPs are effective at reducing pollutant loading to the Clark Fork River. Increasing or stagnant trends will indicate that BMPs are not effective, which will assist UM in adjusting BMPs to be more effective.

6 REPORTING

Results of the monitoring events will be reported in the appropriate Annual Report for each calendar year of sampling. The calculated long-term median will also be presented in the Annual Report, as well as a discussion of monitoring results including the following:

- Comparison of results to long-term medians;
- Any indication of outliers in the dataset;
- Discussion of results for samples with pH less than 6.0 or greater than 9.0;
- Comparison between locations;
- Discussion of trends observed in the dataset; and
- Evaluation of BMP effectiveness and how results will inform improvements to planned BMPs, including schedule and rationale for action items.

7 REFERENCES

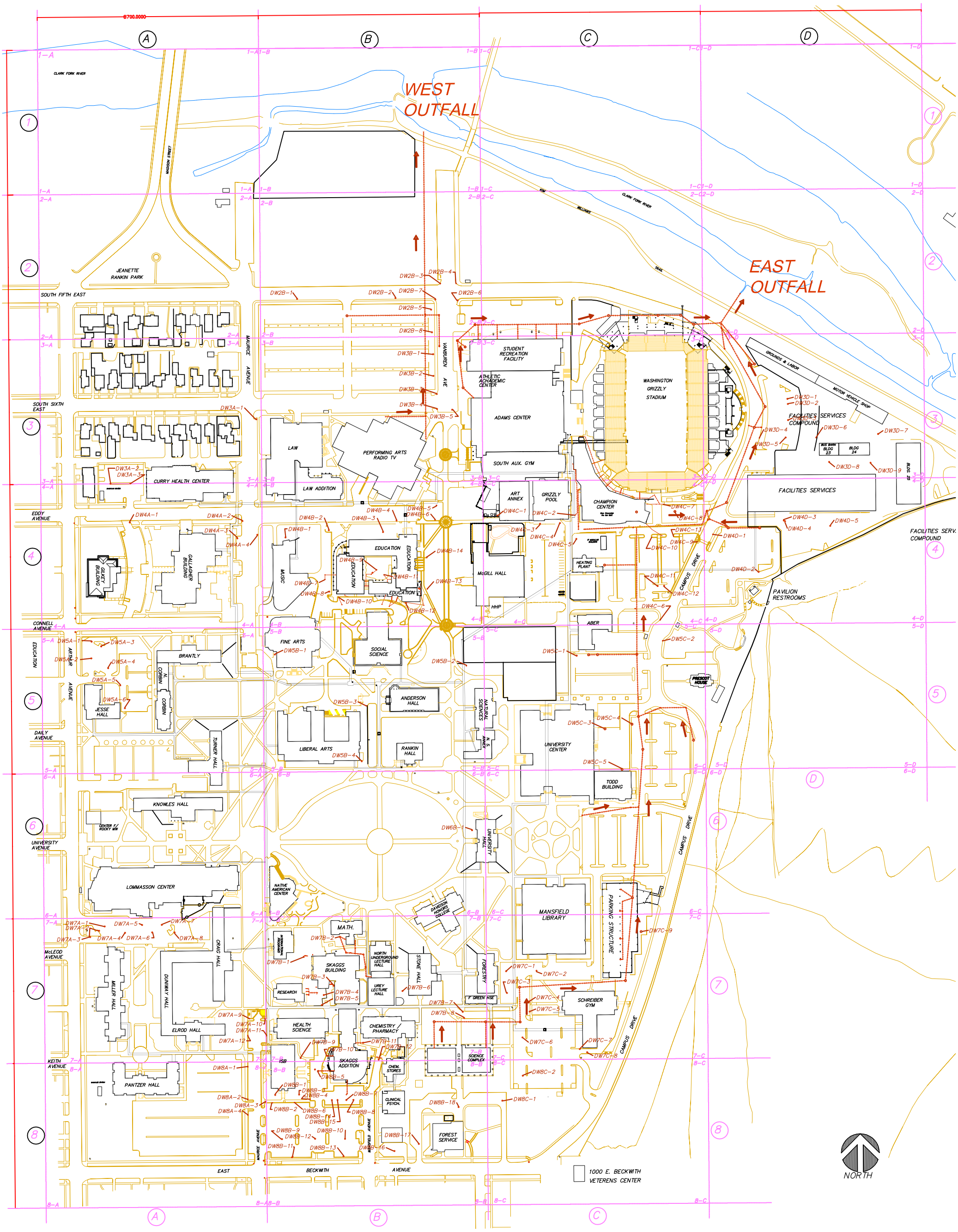
Montana Department of Environmental Quality. (2018). *CLARK FORK RIVER, Blackfoot River to Rattlesnake Creek*. Retrieved from Water Quality Assessment Summary Report: http://svc.mt.gov/deq/dst/#/app/cwaic/report/cycle/2018/auid/MT76M001_030

Montana Department of Environmental Quality (2016). General Permit for Storm Water Discharges Associated with Small Municipal Separate Storm Sewer Systems (MS4s), Permit Number MTR040000. Issued November 30, 2016.

Montana Department of Environmental Quality. (May 2014). *Final - Silver Bow Creek and Clark Fork River Metals TMDLs.* Helena, MT: Water Quality Planning Bureau (Watershed Management Section).

Appendix A
University of Montana Storm Water Map

University of Montana
Storm Water Management Program
MS4 Outfall Location Map



Appendix B
Standard Operating Procedures

STANDARD OPERATING PROCEDURES TABLE OF CONTENTS	
SOP	**TITLE**
SP-1	Field Log Book and Field Sampling Forms
SP-2	Sample Nomenclature, Documentation, and Chain-of-Custody Procedures
SP-3	Sample Packaging and Shipping
SP-4	Field Measurement of pH
SP-5	Surface Water Sampling

SOP SP-1

FIELD RECORDS AND FIELD SAMPLING FORMS

Field investigation and sampling information should be recorded on appropriate sampling forms to provide a continual record of actions taken each day on the site. Each employee is responsible for completing a record of the day's activities in field forms of sufficient detail such that someone can reconstruct the field activities without relying on the memory of the field crew. At a minimum, entries on the field log shall include:

- Project
- Purpose of the field effort
- Names of field crew leader and team members present on the site, and other site visitors
- Description of site conditions and any unusual circumstances, including weather conditions
- Details of actual work effort, particularly any deviations from the field work plan or standard operating procedures
- Location of sample site, including map reference, if relevant
- Field observations
- Field measurements made (e.g., pH, temperature)
- Date and time of initiation and cessation of work

Purpose

Provide guidance on how to document activities completed in the field

Goal and Objective

To provide a record of project work and decisions made in the field

Equipment Needs

Indelible Ink Pen
Field Sampling Forms
Field Tablet

Specific details for each sample collected should be recorded using standardized field forms or electronic field applications. These field forms contain blank queries to be filled in by field personnel. Items typically recorded on field sampling forms consist of the following:

- Sample name
- Time and date samples were collected
- Number and type (media; natural, duplicate, QA/QC) of samples collected
- Analysis requested
- Sample preservative (if applicable)
- Sampling method, particularly any deviations from standard operating procedures
- Signature of sampler

All entries on the field sampling forms must be made in indelible ink (if using paper), or entered into field tablets and backed up promptly when service is available. Upon completion of the field effort, original paper field forms shall be scanned and maintained in the project file. Electronic forms will be backed up in multiple locations and saved into project folder. Photocopies of original field forms can be used as working documents.

SOP SP-2

SAMPLE NOMENCLATURE, DOCUMENTATION, AND CHAIN-OF-CUSTODY PROCEDURES

When completing sampling, it is critical that the process used to label and transport samples to the laboratory for analysis is sufficient to demonstrate with confidence that the samples were collected from the location indicated, and that during transport to the laboratory, no actions were taken to potentially alter the integrity of samples. Without following strict sample labeling and chain-of-custody procedures, analytical data collected at a site have little to no value.

Purpose

Identify specific requirements for labeling and documenting sample collection

Goal and Objective

To increase confidence in sample locations and to submit samples to the laboratory without risk of integrity loss

Equipment Needs

Indelible Ink Pen

Chain-of-Custody Forms

Field Log Book

Field Sampling Forms

SAMPLE NOMENCLATURE

Samples should be labeled according to the sampling location and date. The sample location will be referred to by the standard nomenclature presented in the Sampling Plan. Additional samples will be given standard names as needed. The sample date will be in YYYYMMDD format. Samples should be labeled as follows:

Sample location_sample date_sample matrix code

For example, sample 001_20200107_SW, indicates the following: a surface water (SW) sample was collected at site 001 on January 7, 2020 (20200107). Prior to initiating sampling, field personnel should familiarize themselves with the Sampling Plan and the sample nomenclature to be used for the site. The character prefixes in the table below are recommended for sample types. This list should be updated as needed for additional sample types.

SAMPLE DOCUMENTATION

In addition to the chain-of-custody forms discussed below, field personnel must keep a list of samples collected at the field in the field log book and on appropriate field sampling forms (see SOP SP-1). This allows you to go back and verify sample locations and numbers should there be any confusion at a later time. Upon returning to the office, the field log book and forms should be scanned and maintained in the project file, and subsequent copies sent to the laboratory, or other designated parties, as needed.

Each person in the field is responsible for putting entries into the field log and sampling forms. Designating an individual from the sampling team for record keeping is fine, provided all field personnel come to an agreement as to who this will be, and the field crew leader is certain field personnel are familiar with the record keeping requirements. All entries on the log book and field sampling forms must be made in indelible ink.

Sample Matrix Code	Sample Matrix
SW	Surface Water
GW	Groundwater Sample
SS	Surface Soil Sample
SBSS	Subsurface Soil Sample

CHAIN-OF-CUSTODY PROCEDURES

A chain-of-custody form must be generated for all samples collected in the field for laboratory analysis. Samples from more than one project should not be included on the same chain-of-custody form; however, multiple samples from a specific project can be included on the same chain-of-custody form.

Copies of the chain-of-custody form should be maintained in the project file. The sampler may use a NewFields' chain-of-custody form or a form provided by the laboratory. Sample custody records must be maintained from the time of sample collection until the time of sample delivery to the analytical laboratory, and should accompany the sample through analysis and final disposition. Information to be included on the chain-of-custody form will include, but is not limited to:

- Project number/site name
- Sampler's name and signature
- Date and time of sample collection
- Unique sample identification number or name
- Number of containers
- Sample media (e.g., soil, water, vapor, etc.)
- Sample preservative (if applicable)
- Requested analysis
- Comments or special instructions to the laboratory

Each sample must be assigned a unique sample identification number as described above. The information on the chain-of-custody form, including the sample identification number, must correspond to the information recorded by the sampler on the field forms, log book, and label on the sample container.

A sample is considered under a person's control when it is in their possession. When custody of a sample is relinquished by the sampler, the sampler will sign and date the chain-of-custody form and note the time that custody was relinquished. The person receiving custody of the sample will also sign and date the form and note the time that the sample was accepted into custody. The goal is to provide a complete record of control of the samples. Should the chain be broken (signed by the relinquisher, but not receiver, or vice versa), the integrity of the sample is lost and the resulting analytical data are suspect. Samples must be packaged and shipped to the laboratory following the procedures described in SOP SP-3. If an overnight shipping service is used to transport the samples to the laboratory, custody of the samples must be relinquished to the shipping service. If possible, have the shipping service sign the chain-of-custody form prior to placing the chain-of-custody form in the sample cooler. If this is not possible (i.e., form placed in

sealed cooler), a note should be included on the chain-of-custody that the shipping company will receive the samples with the chain-of-custody form inside the sample container.

SOP SP-3

SAMPLE PACKAGING AND SHIPPING

SAMPLE PACKAGING

Samples must be packaged to preclude breakage or damage to sample containers, and shipped to comply with shipper, U.S. EPA, and U.S. DOT regulations. When packaging samples:

- Use sample labels from the laboratory whenever possible. Place the sample label on the sample container prior to collecting the sample, and use indelible ink when completing the label.
- Place labeled sample bottles in a high quality cooler. Place the samples in an upright position inside the cooler and wrap the samples with cushioning material for protection during transport. The cooler should be able to withstand tough handling during shipment without sample breakage.
- Make sure the cooler has an adequate amount of ice (secured inside sealed Ziploc® bags) to maintain a temperature of 4°C or less inside the cooler from the time the samples are placed in the cooler until they are received by the laboratory. Excess ice should be used when sampling in warm weather. Ensure the cooler drain plug is taped shut.
- Fill out the appropriate chain-of-custody forms and place them in a Ziploc bag and tape it to the inside lid of the shipping container. If more than one cooler is used per chain-of-custody form, put a photocopy of the form in the other coolers and mark them as a copy.
- Close and seal the cooler using strapping shipping tape.
- Place signed and dated sample custody seals on the outside of the cooler such that the seals will be broken when the cooler is opened. Secure the custody seals on the cooler with clear strapping tape.
- Secure a shipping label with address, phone number, and return address on the outside of the cooler where it is clearly visible.

Purpose

Ensure samples are properly packaged for shipment to the analytical laboratory

Goal and Objective

To have samples received by the analytical laboratory in good condition and within EPA temperature thresholds

Equipment Needs

Indelible Ink Pen
Chain-of-Custody Forms
Custody Seals
Sample Labels from Lab
Coolers and Ice
Strapping Tape
Field Sampling Forms
Ziploc Bags

SHIPPING HAZARDOUS MATERIALS/WASTE

Transportation regulations for shipping of hazardous substances and dangerous goods are defined by the U.S. DOT in 49 CFR, Subchapter C, Part 171 (October 1, 1988); IATA and ICAO. These regulations are accepted by Federal Express and other ground and air carriers.

According to U.S. DOT regulations, environmental samples are classified as Other Regulated Substances (ORS). ORS are articles, samples, or materials that are suspected or known to contain contaminants and/or are capable of posing a risk to health, safety, or property when transported by ground or air. Samples, substances, or materials from sources other than material drums, leachate streams, and sludges should be considered as ORS or environmental samples. Materials shipped under the classification of ORS must not meet any of the following definitions:

> Class 1: explosives; Class 2: gases-compressed, liquefied, dissolved under pressure, or deeply refrigerated; Class 3: flammable liquids; Class 4: substances susceptible to spontaneous combustion; Class 5: oxidizing substances; Class 6: poisonous (toxic and infectious); Class 7: radioactive materials; and/or Class 8: corrosives.

If your samples might meet any of the above definitions, contact the project manager to obtain instructions on sample shipment.

SOP SP-4

FIELD MEASUREMENT OF pH

Purpose

Provide guidelines for pH measurements in water samples

Goal and Objective

To obtain accurate pH measurements in the field

Equipment Needs

pH Meter

Calibration Standards (within expiration date)

Glass Container or Flow-through Cell

Extra Set of Batteries

Indelible Ink Pen

Field Sampling Form

Deionized/Distilled Water

INSTRUMENT CALIBRATION

The pH meter must be calibrated prior to each field event and after every 10 samples during a sampling event, or more frequently if required by the project/client. Follow the manufacturer's recommendations to calibrate the meter. This typically involves the following sequence of steps:

1. Verify sensor is clean and filled with solution, then turn on meter.
2. Place in pH 7 solution, press "cal", and wait until calibration is complete.
3. Rinse sensor in deionized or distilled water.
4. Place in pH 10 (or pH 4) buffer solution, press "cal" a second time, and wait until endpoint is reached.
5. Rinse in distilled water.

Three-point calibration is the standard procedure. If the instrument is a multi-parameter meter, follow instructions for measurement of pH from the manual.

Periodically throughout the field day, place the probe in 7.0 pH buffer solution. If the measured value differs from the expected value by more than 0.1 pH units, recalibrate the meter according to the manufacturer's instructions.

FIELD MEASUREMENT PROCEDURE

- Rinse a decontaminated glass beaker or plastic flow-through cell with sample water three times.
- Rinse the pH probe with deionized or distilled water.
- Fill the container with sample water.
- Immerse the probe in the sample and agitate it to provide thorough mixing. Continue to agitate until the reading has stabilized. Read the pH value from the meter to the nearest 0.1 standard unit (s.u.) and record on the field sampling form. If the reading is being taken in-situ or using a flow-through cell, wait until the reading stabilizes and record the final pH value.
- Note any problems such as erratic readings. If previous readings are available, compare the current measurement to previous reading to check that the current reading is within reasonable limits.
- Rinse probe with deionized or distilled water and store according to the manufacturer's instructions.

SOP SP-5

SURFACE WATER SAMPLING

Samples of surface water (e.g., streams, rivers, springs, ponds, and lakes) can be collected using a variety of methods, with the grab sampling method being the most common. This method is described below, along with a method of sampling free product floating on a surface water body.

Purpose

Provide field sampling methodologies for surface water

Goal and Objective

To ensure surface water samples are collected correctly and consistently in the field

Equipment Needs

Decontamination Supplies

Latex or Nitrile gloves

Water Quality Meter for pH, conductivity, temperature

Coolers and Ice

Sample Bottles & Preservatives

Indelible Marking Pen

Field Sampling Form

Chain-of-Custody

GRAB SAMPLING

- When collecting a grab sample of surface water, the sample bottles commonly are placed directly in the water body, and the container(s) are allowed to fill with the water source. Optionally, a single container, such as a clean bucket, can be filled with the water source and then the composited water used to fill the individual sample bottles (see additional description below).
- When collecting water samples from a stream or river, attempt to collect the sample at the interval in the stream which exhibits the largest volume of flow and/or highest velocity. If safely wadable, the samples can be collected away from the bank. If not, the samples should be collected from or near the bank where flow is evident. More than one depth interval may be sampled in the water body.
- When collecting water samples from a pond or lake, the water samples typically are collected from or near the bank where water depths are greater than a few inches.
- Latex or nitrile gloves should be worn when sampling surface water. Decontamination procedures typically are not required for collection of surface water samples, with the exception of meter probes used for measurement of field water quality parameters (see bullet below).
- Field parameters (pH, temperature, conductivity) should be measured in accordance with applicable SOPs prior to sample collection for laboratory analysis. Take care to collect measurements from the sample locations in the water body similar to the grab sample. Try to limit the disturbance of fine sediment on the bed of the water body while collecting samples. The intent is to prevent increasing the turbidity prior to and during sample collection. If, during sampling, fine sediment on the bed is disturbed, wait until the water clears before collecting a sample.
- Prior to collecting the water samples, the sample bottle labels should be adhered to the bottles and the sample information completed on each label with indelible ink.

- To collect a sample, submerge a sample bottle such that mouth of bottle is submerged below the water surface at least 2 to 3 inches, if possible. Initially, allow each bottle to fill partially, then rinse bottle by shaking and discharge this water away from sample site. Repeat this procedure three times. Do not rinse sample bottles if the laboratory has previously added a preservative to the container.
- Once the sample container is filled, add preservative (if necessary), and cap the container. If water is too shallow to fill directly to sample bottles, use a decontaminated container to collect sample water. Transfer water from compositing container into the individual sample bottles.
- If the water is too shallow to sample with a bottle, a peristaltic pump can be used to collect a sample. New tubing should be used to pump the shallow surface water directly into sample bottles. A peristaltic pump is also the preferred method of collecting a filtered surface water sample for dissolved constituents because the filter can be placed in-line for ease of sample collection.
- Place sample containers in a cooler with sufficient ice; sample packaging and shipping procedures are included in SOP SP-3. Sample documentation and chain-on-custody procedures are described in SOP SP-2.
- Fill out appropriate field form(s) documenting sample location, time, and other pertinent information prior to leaving sampling site (see SOP SP-1).

SAMPLING FREE PRODUCT ON SURFACE WATER

The procedure described below is to be used when sampling for free phase organic constituents floating on top of a surface water body (e.g., sheen):

- Latex or nitrile gloves should be worn when conducting the sampling procedure.
- Using a wide-mouth jar, submerge the container in such a manner that leaves the mouth of the container half-way out of the water; allow the container to fill.
- Transfer sample from wide-mouth jar directly into sample bottles for lab analysis.
- Refer to SOP SP-2 and SOP SP-3 for information about procedures for sample documentation, chain-of-custody, and sample packaging and shipping.

UNIVERSITY OF MONTANA
Storm Water Management Program

APPENDIX I

STORM WATER MONITORING RESULTS

February 2021

Table H-1. Comprehensive Summary of Monitoring Results

Monitoring Site ID	Receiving Waterbody	Sampling Period	Sample Date	TSS[1] (mg/l)	COD[1] (mg/l)	TP[1] (mg/l)	TN[1] (mg/l)	pH[1]	Copper[1,2] (mg/l)	Lead[1,2] (mg/l)	Zinc[1,2] (mg/l)	Iron[2] (mg/l)	Arsenic[2] (mg/l)	Cadmium[2] (mg/l)	Oil & Grease[1] (mg/l)	Estimated Flow (gpm)
East Outfall	Clark Fork River	1st Half 2018	6/18/2018	12	133	0.09	0.451	7.31	0.00648	0.00124	0.0481	0.374	ND	ND	ND	577
		2nd Half 2018	8/27/2018	102	380	0.167	1.15	6.7	0.0183	0.00856	0.169	3.16	ND	0.000193	3.29	577
		1st Half 2019	6/27/2019	362	338	0.635	11.2	6.4	0.0326	0.014	0.258	6.56	0.00257	0.00193	2.27	398
		2nd Half 2019	9/27/2019	42	224	0.187	1.96	6.8	0.0285	0.00254	0.0846	1.11	0.000405	ND	3.75	57
		1st Half 2020	4/23/2020	61	194	0.15	0.835	6.59	0.0333	0.0046	0.0752	2.07	ND	0.00382	ND	6.8
		2nd Half 2020	10/13/2020	17.2	59.4	0.21	1.0	6.847	0.0101	0.0016	0.0686	0.514	0.00071	ND	5	6.8
		1st Half 2021														
		2nd Half 2021														
Long-term Median Concentration[3]				*51.5*	*209.0*	*0.177*	*1.075*	*6.750*	*0.02340*	*0.00357*	*0.0799*	*1.590*	*0.00020*	*0.00010*	*2.78000*	*227.5*
West Outfall	Clark Fork River	1st Half 2018	6/18/2018	15	154	0.056	0.336	7.37	0.0162	0.00064	0.0427	0.239	ND	ND	ND	819.0
		2nd Half 2018	8/27/2018	46	354	0.063	0.603	6.3	0.0163	0.00543	0.0782	1.9	ND	0.000218	4.47	2135.0
		1st Half 2019	6/27/2019	99	375	0.283	6.38	5.7	0.0223	0.00463	0.165	1.62	0.00235	0.000391	1.4	6161.0
		2nd Half 2019	9/27/2019	ND	253	ND	0.752	7.2	0.00208	0.000288	0.0301	0.0987	ND	ND	ND	385.0
		1st Half 2020	4/23/2020	37	88.9	0.078	0.798	6.05	0.0112	0.00174	0.06	1.34	ND	0.000345	ND	3.3
		2nd Half 2020	10/13/2020	3.4	16.1	0.074	1.1	5.86	0.0028	0.00098	0.0489	0.116	ND	ND	ND	3.3
		1st Half 2021														
		2nd Half 2021														
Long-term Median Concentration[3]				*37.0*	*203.5*	*0.074*	*0.775*	*6.18*	*0.01370*	*0.001360*	*0.0545*	*0.7895*	*0.00000*	*0.00011*	*0.00000*	*602.0*

ND = Parameter not detected at reporting limit

[1] *Self-Monitoring Parameter*

[2] *TMDL-Related Monitoring Parameter*

[3] *Non detects are considered a "zero" value for calculation the long-term median concentration*

Table H-2. Winter Gravel Sampling Results

Year	Total Arsenic (mg/kg)	Total Cadmium (mg/kg)	Total Copper (mg/kg)	Total Iron (mg/kg)	Total Lead (mg/kg)	Todal Zinc (mg/kg)
2018	0	0	3.68	6570	1.21	0
2019	0	0	7.40	8340	2.50	15.10
2020	0.89	0	3.00	2390	0.78	6.10
Long-term Average Concentration	*0.30*	*0.00*	*4.69*	*5767*	*1.50*	*7.07*

"0" is inserted into the table for "ND" (non-detectable) results from the laboratory

UNIVERSITY OF MONTANA
Storm Water Management Program

APPENDIX J

INSPECTION RESPONSE PROGRESS SCHEDULES AND SCHEDULE OF PROJECTED 2021 ACTIVITIES

February 2021

Table J-1. Schedule to Address MS4 Inspection Violations

Inspection Report Section	Permit Part	Proposed Action	Initial Proposed Completion Date	Status
SWMP				
3.1.4 (a)	II.A	**Formalize Mechanisms for Communication** 1. Schedule a monthly re-occurring SWMT meeting. 2. Develop (and use) templates for meeting notes. 3. Establish a file sharing system that all SWMT members can access to review meeting notes and other SWMP documents.	N/A	Complete
Illicit Discharge Detection and Elimination				
3.2.4 (a)	II.A.3.a.i	**Identification of More Frequent Categories of Non-Storm Water Discharges or Flows** 1. Develop a standard template to evaluate and facilitate an annual non-storm water discharge evaluation. 2. Conduct non-storm water discharge evaluation.	N/A	Complete
3.2.4 (b)	II.A.3.b.i	**Identification of Other Similar Occasional Incidental Non-Storm Water Discharges** 1. Develop a standard template to evaluate and facilitate an annual occasional incidental non-storm water discharge evaluation. 2. Conduct occasional incidental non-storm water discharge evaluation.	N/A	Complete
3.2.4 (c)	II.A.3.b.ii	**Provision Prohibiting Any Occasional Incidental Non-Storm Water Discharge** 1. Identify occasional incidental non-storm water discharges that are determined to contribute significant amounts of pollutants to the MS4. 2. Develop SOPs to minimize pollution for activities identified in Table 2[1].	N/A 10/1/2020	Complete In progress
3.2.4 (d)	II.A.3.d.ii	**Adoption of an Ordinance or Other Regulatory Mechanism to Prohibit Illicit Discharges** 1. Conduct meeting with the WQD and City regulatory compliance manager to discuss their IDDE program. 2. Update the SWMP to describe the City's IDDE prohibitions and exemptions (and the applicability to UM's campus).	N/A 3/1/2021	Complete Complete

[1] Table 2 as presented in UM's *Response to MS4 Inspection Violations* (June 2020).

Inspection Report Section	Permit Part	Proposed Action	Initial Proposed Completion Date	Status
3.2.4 (e)	II.A.3.d.iv	**Enforcement Response Plan** 1. Coordinate with the WQD and City to identify roles and responsibilities of UM, WQD, and the City, legal authority, enforcement escalation process, schedule to eliminate discharge, abate any damages, and prevent recurrence, and informal, formal, and judicial responses. 2. Develop an MOU. 3. Update the ERP to address deficiencies. 4. Develop IDDE Policies and Procedures that will become part of the SWMP or an attachment to the SWMP.	10/1/2020 3/1/2021	In progress In progress
3.2.4 (f)	II.A.3.e.i	**Proactive Inspection of All Outfalls to Detect Illicit Discharges and Connections in to the MS4** 1. Screen the UM's outfalls during dry weather in spring 2020 and sample discharge. Evaluate levels of pollution. 2. Re-screen the outfalls during dry weather in summer 2020. 3. Conduct an investigation to identify the source of the dry-weather discharge. 4. Provide update to DEQ on IDDE investigation.	N/A 7/1/2020 On-going 7/1/2020	Complete Complete On-going Complete
Construction Site Storm Water Management				
3.3.4 (a)	II.A.4.b.iii	**Storm Water Management Plan Review Checklist** 1. Document the process for construction site storm water management under the City's jurisdiction in the updated SMWP. 2. Develop an MOU with the City for construction site storm water management on Campus.	3/1/2021	In progress (See SWMP Section 3.3)
3.3.4 (b) 3.3.4 (c)	II.A.4.c.ii II.A.4.c.v	**Inspection Form or Checklist and Inspection Frequency Determination Protocol** 1. Document the process for construction site storm water management inspections under the City's jurisdiction in the updated SWMP.	3/1/2021	In progress (See SWMP Section 3.3)

Inspection Report Section	Permit Part	Proposed Action	Initial Proposed Completion Date	Status
Post-Construction Storm Water Management in New and Redevelopment				
3.4.4 (a)	II.A.5.b.i and ii	**Plan Review Checklist** 1. Document the process for post-construction storm water management under the City's jurisdiction in the updated SWMP. 2. Develop an MOU with the City for post-construction storm water management on campus.	3/1/2021	In progress (See SWMP Section 3.4)
3.4.4 (b)	II.A.5.c.ii	**Inspection Form or Checklist** 1. Revise the Inspection Form to account for all UM post-construction storm water management controls. 2. Identify appropriate staff members to conduct inspections of post-construction storm water management controls and begin implementing the inspection form.	10/1/2020	Complete
3.4.4 (c)	II.A.5.c.vi	**Inspection Frequency Determination Protocol** 1. Develop a new inspection frequency determination protocol based on the priority of each post-construction storm water management control. 2. Identify appropriate staff members to conduct inspections of post-construction storm water management controls and begin implementing the inspection frequency protocol.	10/1/2020	Complete
Pollution Prevention / Good Housekeeping for Permittee Operations				
3.5.4 (a)	II.A.6.i	**Inventory of Permittee Owned / Operated Facilities and Activities** 1. Develop and submit updated and complete inventory in the updated SWMP. 2. Identify the department and/or position responsible for pollution prevention at each facility/activity and organize facilities/activities into categories to be used when developing storm water pollution prevention standard operating procedures. 3. Update the Facilities Inventory Map. 4. Develop a schedule for developing storm water pollution prevention SOPs.	3/1/2021	Complete

Inspection Report Section	Permit Part	Proposed Action	Initial Proposed Completion Date	Status
Training				
3.6.4 (a.i)	II.B	**Comprehensive Training** 1. Attend training by NewFields on overview of the goals and objectives of the MS4 program and summary of the MS4 General Permit Requirements. 2. Conduct comprehensive SWMT training (led by the Primary SWMP Coordinator or a consultant) after the updated SWMP has been developed and submitted to DEQ.	6/3/2020 3/31/2021	Complete Will occur in March 2021
3.6.4 (a.ii)	II.B	**Storm Water Awareness Training** 1. Conduct storm water awareness training after updating the ERP and SWMT organizational chart.	12/31/2020	Complete
3.6.4 (a.iii)	II.B	**Inspectors and Plan Reviewers Responsible for Implementation of the Construction Site Storm Water Management Minimum Control Measure** 1. Document process for inspection of the construction site storm water management minimum control measure under the City's jurisdiction in the updated SWMP.	3/1/2021	In progress (See SWMP Section 3.3)
3.6.4 (a.iv)	II.B	**Inspectors and Plan Reviewers Responsible for Implementation of the Post-Construction Storm Water Management in New and Redevelopment** 1. Document process for inspection of the post-construction site storm water management in new and redevelopment under the City's jurisdiction in the updated SWMP. 2. Conduct and/or attend training for post-construction storm water management control inspectors.	3/1/2020 12/31/2020	Complete Postponed to 2021
Special Conditions, Monitoring, Recording, and Reporting Requirements				
3.8.4 (a)	III.B.2	**Sampling Plan** 1. Develop new sampling plan to be submitted with this inspection response document.	N/A	Complete
3.8.4 (b)	IV.A.7	**Monitoring Procedures** 1. Outline updated sampling protocols in the sampling plan.	N/A	Complete
3.8.4 (c)	IV.A.2, IV.A.7, IV.B	**Reporting of Analytical Results** 1. Report copper, lead, and zinc in milligrams per liter for future samples	3/1/2021	Complete

Table J-2. Schedule to Address MS4 Inspection Recommendations

Inspection Report Section	Permit Part	Proposed Action	Initial Proposed Completion Date	Status
SWMP				
3.1.3(a)	II.A	**Review Roles and Responsibilities and Update the Organizational Chart** 1. Evaluate recommendation to add a representative from Environmental Health to the SWMT. 2. Review the roles and responsibilities of each department and section in Facilities Services to consider whether additional team members should be added. Update the SWMT organizational chart.	N/A 3/1/2021	Complete Complete
3.1.3(b)		**Work Order System** 1. Evaluate options for CMMS and incorporate into SWMP. 2. Describe use of CMMS in updated SWMP document.	3/1/2021	Complete
Illicit Discharge Detection and Elimination				
3.2.3(a)	II.A.3.c.i	**Update Storm Water Map** 1. Conduct field survey to verify locations and infrastructure for storm sewer map. 2. Identify high priority areas on the storm sewer inventory map. 3. Add the storm sewer system components as assets to the CMMS. 4. Update storm water map as needed.	11/1/2020 12/31/2020 3/1/2021 3/1/2021	In progress Complete Postponed to 2021 In progress
3.2.3(b)	II.A.3.f.ii and iv	**Document Illicit Discharge Investigation and Corrective Actions** 1. Coordinate with CMMS manager to request revisions to CMMS illicit discharge documentation template, if necessary. 2. Discuss use of CMMS template for use with IDDE investigations and corrective actions in updated SWMP. 3. Provide summary of this year's IDDE investigations and corrective actions in the 2020 MS4 annual report.	As needed 3/1/2021 3/1/2021	As needed Complete Complete

Inspection Report Section	Permit Part	Proposed Action	Initial Proposed Completion Date	Status
Construction Site Storm Water Management				
3.3.3(a)	II.A.4.a.ii	**Regulatory Mechanism** 1. Develop an MOU to clearly document roles and responsibilities related to construction storm water management on campus. 2. Document MOU and process for requiring construction storm water management controls in the updated SWMP.	3/1/2021 3/1/2021	In progress (see SWMP Section 3.3) In progress (see SWMP Section 3.3)
3.3.3(b)	II.A.4.a.iii	**Enforcement Response Plan** 1. Coordinate with the City to determine the appropriate implementation of an ERP for construction activities.	10/1/2020	In progress (see SWMP Section 3.3)
Post-Construction Storm Water Management in New and Redevelopment				
3.4.3(a)	II.A.5.a and b	**Review, Update, and Formalize Post-Construction Policy(s)** 1. Develop an MOU to clearly document roles and responsibilities related to post-construction storm water management on campus. 2. Document MOU and process for requiring post-construction storm water management controls in the updated SWMP.	3/1/2021 3/1/2021	In progress (see SWMP Section 3.4.1) In progress (see SWMP Section 3.4.1)
3.4.3(b)	II.A.5.c.v	**Update Inventory of Existing Permittee-Owned Post-Construction BMPs** 1. Conduct field investigation to identify post-construction storm water management BMPs within the UM's MS4 regulated area. 2. Update UM's post-construction BMP inventory.	11/1/2020 3/1/2021	In progress Complete
Pollution Prevention / Good Housekeeping for Permittee Operations				
3.5.3(a)	II.A.6.a.ii	**Update Map Identifying Locations of Facilities and Activities** 1. Update the Facilities Inventory (including activities) and Facilities Inventory Map for the updated SWMP.	10/1/2021	Complete

Inspection Report Section	Permit Part	Proposed Action	Initial Proposed Completion Date	Status
3.5.3(b)	II.A.6.a.iii	**Review and Update Standard Operating Procedures (SOPs)** 1. Review existing SOPs to ensure each is specific to UM. 2. Re-assess the need for revised and/or additional SOPs after the Facilities Inventory is updated. 3. Create SOP development schedule with list of SOPs to be updated and/or developed along with anticipated timeframe for their development and implementation.	3/1/2021	Complete
Training				
3.6.3(b)	II.A.6.v and II.B	**Conduct Annual Storm Water Pollution Training** 1. Conduct training for storm water pollution SOPs. 2. Include updated training schedule in SWMP to document trainings to take place in 2021 for new and updated SOPs.	12/31/2020 3/1/2021	In progress Complete
3.6.3(c)	II.A.6.v and II.B	**Training Documentation** 1. Evaluate capabilities of CMMS to track and maintain records of SWMP trainings. 2. If CMMS will not suffice, develop a separate method to track and maintain records.	3/1/2021	Complete
Sharing Responsibility				
3.7.3(a)	II.A.3.d.ii and iii and II.C	**Written Agreements** 1. Partner with the City and WQD to implement several General Permit requirements. Develop MOUs and submit with the updated SWMP.	3/1/2021	In progress

Table J-3. Schedule of Projected 2021 Activities

Permit Reference	SWMP Reference	Action Item
SWMP Requirements		
II.A	2.2	Conduct weekly SWMT meetings. Develop an agenda prior to each meeting and distribute meeting notes to document discussions, decisions, and action items.
		Conduct quarterly stakeholder meetings.
	Figure 2	Coordinate with UM Industrial Hygienist, once hired, to determine if they will join the SWMT.
MCM 1 and 2		
II.A.2.a.i and ii	3.1.2	Work with interested CFC faculty to develop storm water-related student projects, potentially including updating the CMMS with storm sewer system components as assets and training students to conduct post-construction storm water management inspections.
		Coordinate with the CFC faculty to develop a student engagement and involvement plan and schedule that could include classroom presentations, development of a SWMP engagement group, and exploring opportunities for including storm water management curriculum in CFC classes.
		Conduct a student service day during the Fall 2021 semester to re-stencil storm water grates.
		Initiate implementation of the student engagement and involvement plan.
		Conduct quarterly storm water awareness trainings for Facilities Services staff.
		Develop and implement storm water pollution prevention SOPs with input from Facilities Services staff.
		Publish an article in UM Today newsletter in February 2021.
		Post storm water content on Instagram throughout the year.
		Include storm water awareness in sustainability presentations to Faculty and Staff Senates. Solicit input during the presentation and encourage interested faculty and staff to attend quarterly stakeholder meetings.
		Maintain UM's four pet waste stations.
II.A.1.a.ii	3.1.3	Update Storm Water website with 2020 Annual Report, outreach materials, and outreach event information.
Illicit Discharge Detection and Elimination		
II.A.3.b	3.2.2	Conduct and document annual non-storm water discharge evaluations.
II.A.3.c	3.2.3	Conduct field survey to verify locations and infrastructure for storm sewer map and update the storm sewer inventory/map.
II.A.3.c	3.2.3	Add the storm sewer system components as assets to the CMMS.
II.A.3.d.iv	3.2.5	Meet with the City of Missoula and determine how UM will address regulatory-related requirements for IDDE program.
		Develop an MOU with the City and WQD to define roles and responsibilities relating to IDDE program implementation within UM's MS4-regulated area.

Permit Reference	SWMP Reference	Action Item
II.A.3.d.iv		Develop IDDE Policies and Procedures.
II.A.3.d.iv		Update and implement ERP.
II.A.3.d.v II.A.3.f.i II.A.3.f.ii	3.2.5	Develop and implement an Illicit Discharge Investigation and Corrective Action Plan.
II.A.3.e.i	3.2.4	Continue investigation into source of dry-weather discharge at the east outfall.
II.A.3.e.iii	3.2.3 and 3.2.4	Inspect and screen high priority outfalls during dry weather.
II.A.3.f.ii	3	Maintain documentation that describes IDDE investigations.
Construction Site Storm Water Management		
II.A.4.a.ii and II.A.4.b.iii	3.3.1	Meet with the City of Missoula and determine how the construction site storm water management requirements will be implemented on Campus.
		Coordinate with the City to determine the appropriate implementation of an ERP for construction activities.
		Develop an MOU with the City for Construction Site Storm Water Management, including how planned construction activities on Campus will be reviewed, approved, and monitored for compliance (if applicable).
		Document process for construction site plan reviews, approvals, and enforcement in the updated SWMP.
Post-Construction Storm Water Management in New and Redevelopment		
II.A.5.a and b	3.4.1	Meet with the City of Missoula and determine how the General Permit's post-construction site storm water management requirements will be implemented on the Campus, specifically with regard to reviewing and approving plans and development and implementation of an ERP.
		Develop an MOU with the City for post-construction site storm water management controls, including how planned construction activities on Campus will be reviewed, approved, and monitored for compliance (if applicable).
		Document MOU and process for requiring post-construction storm water management controls in the updated SWMP.
		Update the inventory of post-construction storm water management controls on Campus.
II.A.5.c	3.4.2	Inspect High Priority post-construction storm water management controls.
Pollution Prevention / Good Housekeeping for Permittee Operations		
II.A.6.a.iii	3.5.3, Table 7	Develop SOPs for all categories of facilities and activities that have the potential to release contaminants to the MS4.
II.A.6.a.iv		
II.A.6.a.v		Conduct annual storm water pollution prevention training for all permittee staff directly involved with implementing SOPs.

Permit Reference	SWMP Reference	Action Item
Training		
II.B.1	4.1	Conduct comprehensive SWMT training (led by the Primary SWMP Coordinator or a consultant) after the updated SWMP has been developed and submitted to DEQ.
II.B.2	4.2	Conduct storm water awareness training after updating the ERP.
		Conduct storm water awareness training for new hires within 90 days of the hire date (as needed).
II.B.3	4.3	Conduct training for all inspectors and plan reviewers responsible for implementation of Construction Site Storm Water Management Control Minimum Measure (if applicable).
II.B.4	4.4	Conduct training for all inspectors and plan reviewers responsible for implementation of Post-Construction Site Storm Water Management in New Development and Redevelopment Minimum Measure (if applicable).
		Conduct post-construction site storm water management training for new hires within 90 days of the hire date (as needed).
TMDL-Related Monitoring		
III.B	6.2	Conduct TMDL-related monitoring between January 1 and June 30, 2021.
		Conduct TMDL-related monitoring between July 1 and December 31, 2021.
	5.2.2	Investigate possibility to eliminate outfalls to the Clark Fork River.
	5.2.1, Table 9	Implement BMPs identified in Table 9 of the SWMP.
		Sample prospective winter gravel supplies and choose material with lowest concentrations of potential pollutants.
		Determine whether street sweeping can be conducted more frequently in 2021, with focus in the spring season to collect sand deposited during the winter.
Self-Monitoring		
IV.A	6.1	Conduct self-monitoring sampling and analysis of storm water discharges between January 1 and June 30, 2021.
		Conduct self-monitoring sampling and analysis of storm water discharges between July 1 and December 31, 2021.
Reporting		
IV.F	7.1	Prepare 2020 Annual Report in accordance with General Permit.
IV.B.1		Submit monitoring results to the Department with each annual report.
IV.B.2		Calculate long-term median concentration of each parameter in Table 1 of Part IV.A of the General Permit.
IV.B.3		Self-evaluate measures taken to improve the quality of storm water discharges.