City of Spokane Stormwater Management Program Plan

March 2024

City of Spokane
Wastewater Management
909 East Sprague Avenue
Spokane, Washington 99202

CONTENTS

LIST OF FIGURES

1.0 INTRODUCTION

1.1 Purpose

Stormwater in the City of Spokane is regulated by the Eastern Washington Phase II Municipal Stormwater Permit (the permit) issued by the Washington State Department of Ecology (Ecology). The permit requires the development and implementation of a Stormwater Management Program (SWMP) that addresses permit Sections S5, S7, and S8. This Stormwater Management Program Plan (the plan) has been prepared to provide information to the public on the activities and means that the City of Spokane (the city) expects to implement in order to protect local water quality and satisfy the conditions of the permit.

The permit requires that a municipal Stormwater Management Program consist of six elements that, when implemented, will ensure that local water quality is protected. Section S5 of the permit, *Stormwater Management Program for Cities, Towns, and Counties,* details the six elements as:

(1) Public Education and Outreach,
(2) Public Involvement and Participation,
(3) Illicit Discharge Detection and Elimination,
(4) Construction Site Stormwater Runoff Control,
(5) Post-Construction Stormwater Management for New and Redevelopment, and
(6) Municipal Operations and Maintenance.

Section S7 of the permit, *Compliance with TMDL Requirements*, requires implementation of the Total Maximum Daily Load (TMDL) monitoring detailed in Appendix 2 of the permit, and Section S8 of the permit, *Monitoring and Assessment*, details the requirements to implement stormwater management effectiveness studies.

The draft SWMP Plan is made available to the public annually via the city's stormwater webpage (Spokanestormwater.org) on or before April 1st of each year. The draft plan is posted for 30 days, at which time the public may submit comments on the draft plan. After the 30-day comment period, the SWMP Plan will be finalized and posted on the website on or before May 1st of each year. Comments on the final SWMP Plan will be accepted anytime throughout the year and considered for inclusion during the next plan revision.

1.2 Regulatory Background

The National Pollutant Discharge Elimination System (NPDES) framework was in large part established by the 1972 by the amendments to the 1948 Federal Water Pollution Control Act, which has come to be known as the Clean Water Act. The Clean Water Act (CWA) details federal regulation of stormwater and wastewater discharges to Waters of the United States (WOTUS). The Environmental Protection Agency (EPA) authorizes States to implement the NPDES program and perform many of its' permitting, administrative, and enforcement aspects. The regulatory authority in Washington State is the Washington State Department of Ecology (Ecology), who regulates stormwater east of the Cascade mountains with the Eastern Washington Phase II Municipal Stormwater general permit. The Eastern

Washington Phase II Municipal Stormwater Permit is a National Pollutant Discharge Elimination System (NPDES) permit and a Washington State waste discharge general permit, and it regulates discharges from small municipal separate storm sewers.

Ecology first issued the permit to municipalities in 2007, and has reissued it three times since 2007 with revisions in 2014 and 2019. The current permit became effective on August 1, 2019 with an expiration date of July 31, 2024. Reissuance of the permit is scheduled for August 1, 2024 with an effective period through 2029. The permit authorizes the city to discharge stormwater to surface waters and to groundwaters of the State from the city's Municipal Separated Stormwater Sewer System (MS4) in accordance with federal guidelines. The entire incorporated area within the city's municipal boundary where stormwater is discharged to a surface water or ground water is the area regulated by the Phase II permit, with exception of areas that manage stormwater in combined sanitary and stormwater system. There are several combined sewer overflow (CSO) basins within the regulated MS4 that collect and convey stormwater to the Riverside Park Water Reclamation Facility (RPWRF) for treatment. Surface waters that flow on hard surfaces and are collected and conveyed within infrastructure in the CSO basins are regulated under a separate NPDES waste discharge permit, and managed accordingly. Stormwater within CSO basins is, in large part managed in a combined sewer system, with exception of occasional structural treatment BMPs that manage stormwater locally and discharge to ground.

1.3 Stormwater Management in Spokane

The city's MS4 system consists of stormwater conveyances, catch basins, structural treatment BMPs, underground injection controls (UICs), and outfalls. Within the permitted MS4 boundary, but outside of the CSO Basins, stormwater is collected by the separated stormwater sewer system and conveyed to stormwater treatment facilities, or to outfalls that discharge directly to the river. The separated stormwater sewer system is roughly located in the along the Spokane river, and in the northern portion of the city.

Stormwater treatment facilities throughout the city within the municipal boundary are used to manage stormwater as near as possible to where the runoff is generated. The treatment facilities are typically bioretention facilities such as swales, bioretention cells, infiltration ponds, etc., which are structural stormwater BMPs designed to remove pollutants from runoff. The facilities are typically designed and constructed in accordance with the Spokane Regional Stormwater Manual (SRSM), and Stormwater Management Manual of Eastern Washington and consist of inlets, a vegetated retention area, subgrade bioretention soil media, and an outlet/overflow. They are generally designed to retain water to approximately six inches depth, and have drywells to serve as overflows. Treatment facilities range in size from a small roadside swale that receives drainage from a parking lot, to of a large dry pond that treats stormwater for an entire neighborhood, but the treatment processes are the same. Stormwater enters the treatment facility through an inlet, flows over vegetation slowing it down, and infiltrates into the ground through bioretention soil media. The vegetation, bioretention soil media, and microbes in the soil are providing treatment to the stormwater and removing any pollutants. Figure 1 shows a typical swale design.

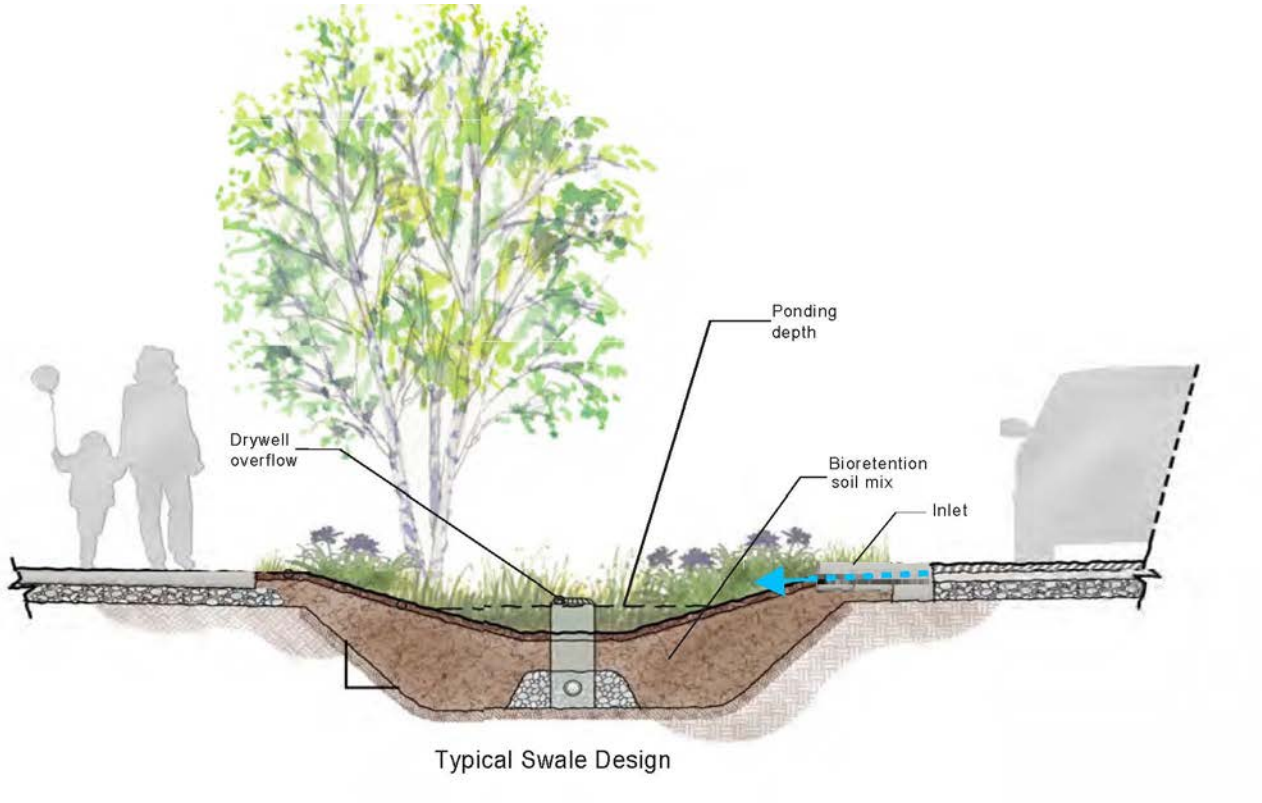


Figure 1. Typical Swale Design.

Special Drainage Districts (SDDs) have been established where typical stormwater treatment BMPs may not be effective because treatment via standard infiltration approaches is not practical. The Moran Prairie and Five Mile SDDs have been established because of the challenges that managing stormwater in those areas presents due to shallow groundwater, intermittent standing water, or steep slopes.

Figure 2 is a map of the City of Spokane that shows the generalized locations of the stormwater infrastructure. On the south side of the city, where geology does not readily allow infiltration, stormwater in CSO basins is largely managed in a combined sewer that conveys stormwater and sanitary wastewater in the same infrastructure. The CSO systems consist of catch basins, piping, and storage tanks that are used to collect and convey the stormwater to RPWRF. The CSO facilities are used to minimize or eliminate discharges of the combined sewer and stormwater, and are regulated by the waste discharge permit that the RPWRF operates under. CSO basins also contain stormwater treatment BMPs, where practical, to manage stormwater that has not been combined with sanitary

sewer locally and to minimize the amounts of stormwater that are conveyed to the wastewater treatment plant.

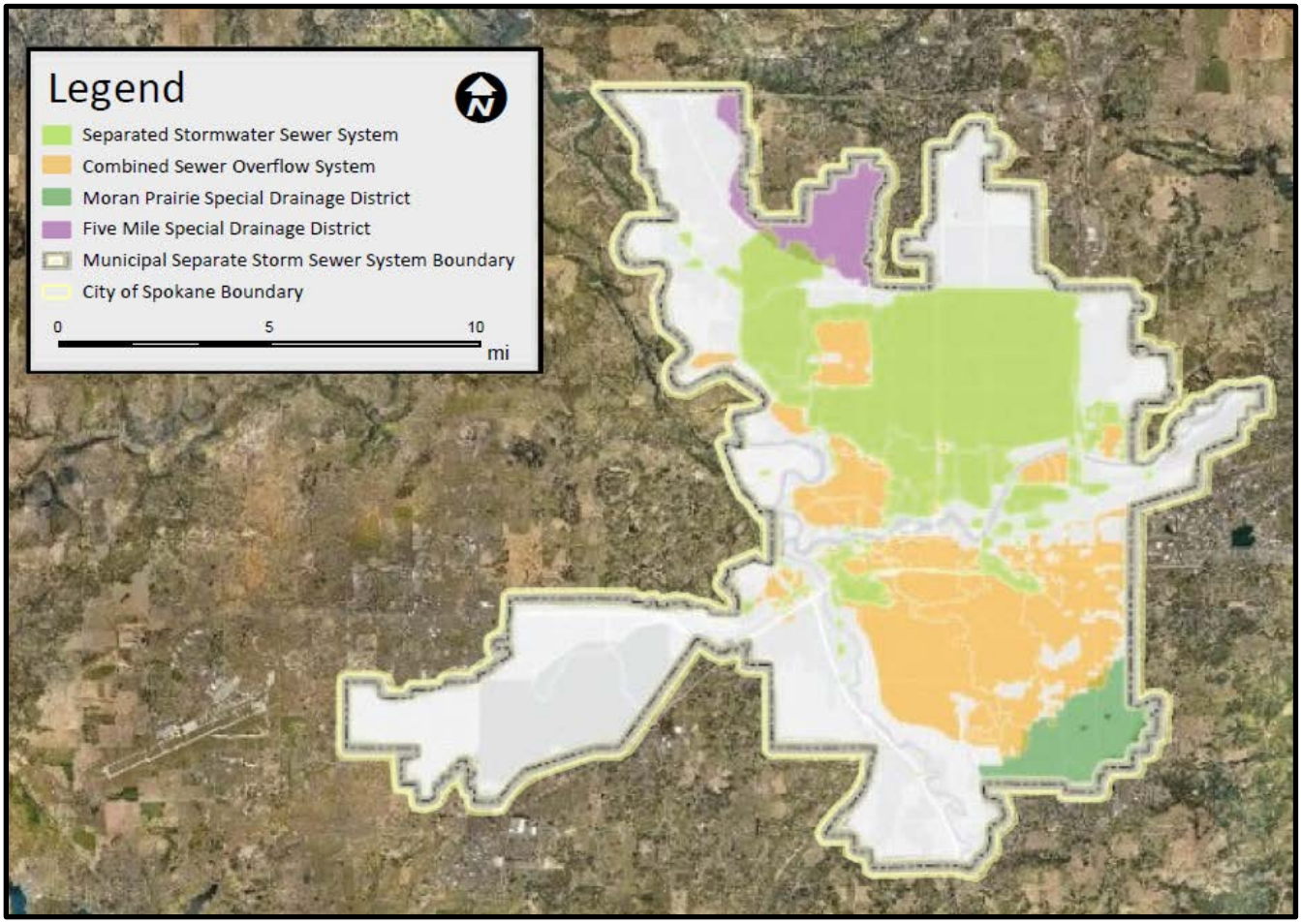


Figure 2. Map of Stormwater Management Areas.

2.0 STORMWATER MANAGEMENT PROGRAM COMPONENTS

2.1 Public Education & Outreach

2.1.1 Public Education and Outreach Permit Requirements (S5.B.1)

Section S5.B.1.a of the permit requires the city to implement a public education and outreach program designed to reach the general public, businesses, and engineers/developers to achieve improvements in the target audiences' understanding of stormwater and how they can contribute to water quality protection. Outreach to the general public should focus on water quality impacts and tangible actions that the general public can take to protect water quality. The focus of the outreach to businesses should focus on education on preventing illicit discharges appropriate materials management. engineers/developers should receive outreach focused on technical standards, the use of BMPs and developing erosion control plans.

Section S5.B.1.b of the permit requires the city to measure the understanding and adoption of targeted behaviors for at least one target audience in at least one subject area, this is met through a multifactor approach to promotion of the Pollution Prevention Program on the Water Wise social channels.

Outreach to General Public, Homeowners, and School-age Children

Community Events

The City of Spokane plans to attend or present at 12-15 community events during the 2024 year and will provide education, interactive activities, and promotional items surrounding stormwater education. Events include but aren't limited to: Earth Day, Arbor Day, School Science Nights, Touch-a Truck events, Library events, Spokane Indians baseball games, Spokane Chiefs hockey games, school presentations, and others. The city will participate by what is requested at each event, either presenting, providing interactive activities such as pollution prevention games or permeable pavement demonstrations, or being present to pass out educational materials. Brochures will be handed out where appropriate and include the Stormwater Treatment Areas Information and Stormwater Pollution Guide brochures, among others that are planned to be developed in collaboration with internal and external groups. The city hopes to measure impressions based on number of attendees at events as well as materials given out to track impact of outreach at events. The desired goal is for attendees of all ages to understand stormwater and create behavior change to keep our waterways cleaner and safer.

Adopt-a-Drain

The storm drain adoption concept is a growing movement with active programs in approximately 170 communities across the country. At the core of this movement is community engagement and action

towards preserving local waterways. Th is project has now grown into the largest and most successfully implemented program in the nation with 86 programs and counting. Benefits include detailed sub-watershed reports that meet MS4 reporting needs and documentation that quantifies the cumulative amount and type of priority pollutants removed from the waterway. The City of Spokane plans on adopting this model across the City of Spokane as well and will coincide with a social marketing campaign to promote and spread awareness. The target population is any resident in Spokane of any age able to assist in the maintenance of storm drains. The City of Spokane will receive MS4 compliant reporting, data tracking, marketing/outreach tools, and implementation and program support. Participation with residents will lead to deeper community engagement and cleaner water. This will be accomplished through keeping debris clear on a schedule that works for them. The desired outcome is to engage residents to adopt storm drains to keep neighborhoods clean and protect waterways. Aligned with best practices in social science, this MS4-compliant program partners with cities to inspire stewardship and behavior change to prevent run-off pollution, reduce localized flooding, and ultimately improve water quality.

EnviroKids Club

Spokane EnviroKids' Club is a way for kids to team up with other kids in Spokane County to explore all parts of the environment: air, water, weather, garbage and recycling, plants and animals, and the environment. Members receive quarterly newsletters with fun facts and activities, invitations to local events, and the opportunity to earn points and win prizes. Children in grades K-6 in Spokane County are eligible. The City of Spokane participates in planning, content, and participation at local events EnviroKids puts on throughout the year, which is roughly 6 events. This aligns with stormwater education because it gives a chance to educate kids and their parents/guardians around pollution prevention, permeable pavement, swales, and more in a fun engaging environment. It also allows the City of Spokane to have a presence in the community.

Drain Rangers

The city is providing access to Drain Rangers learning materials specific to stormwater for school age children for teachers and schools to implement fully developed curriculums in their classrooms. The purpose of the Drain Rangers Elementary Stormwater Curriculum is to develop an understanding of the serious issues facing our community from stormwater runoff and to share specific actions we can take to improve the quality of our water. In this curriculum, students will be introduced to a problem-solving model where they think like an engineer and explore ways to solve the problem of polluted stormwater runoff. The lessons are specifically designed to meet classroom requirements of the Common Core and Next Generation Science Standards. Content about polluted stormwater

runoff, engineering design, and literacy skills are integrated. The city has the Drain Ranger curriculum for both primary and secondary students are posted on the stormwater website available to Spokane area teachers to implement in their classrooms. The city hopes to increase the presence of the Drain Rangers program in Spokane Area schools in 2024.

Spokane Stormwater Website

The City of Spokane stormwater website is located at Spokanestormwater.org. An overhaul of the website began in 2022 to make it more interactive and link to the social media channels performing stormwater messaging. Currently, Spokanestormwater.com webpages contain a green infrastructure page that discusses structural BMPs, Low Impact Development (LID) and Green Stormwater Infrastructure (GSI). The page provides links to the Eastern Washington LID manual and Spokane Regional Stormwater Manual (SRSM) for reference materials. Additionally, the city's stormwater webpage houses videos that provide information on Spokane Stormwater, Hazels Creek and Green Area Maintenance. A webpage dedicated to the Private Stormwater Facility Annual Certification Program was recently created as a resource to private stormwater property owners. The Spokane stormwater website continued to grow in 2023 to include a Pollution Prevention practices, stormwater educational materials, and detailed information on stormwater structural BMPs, stormwater management, private facilities certification, among other quick links to information about CSO's, the One Water approach, Integrated Clean Water Plan, and more. A visual slideshow was added to the website to enhance visibility and direct users to focused topics.

Spokane Indians Baseball Outreach

The city partners with the Spokane Indians Baseball Club to champion campaigns designed to connect citizens to the Spokane River, educate about stormwater and work begin done to clean up the river, and support local organizations devoted to River protection. Advertisements include prints, radio, television, billboards, social media, and promotion during live baseball games. The effort has been dubbed the Redband Rally Campaign, the promotion gets its name from the native Redband Trout.

The Spokane Indians Baseball partnership continued through 2023 with promotion of Ribby the Redband trout as a local mascot. Headbands with educational information on the inside that were offered to every attendee as well as an educational video that played before every game highlighting the importance of pollution prevention. The Spokane Indians Baseball team hosted home games last year, with a total attendance of 249,012 fans. This was the highest attendance at Avista Stadium since 1960. The city hosted a pre-game table at the stadium to promote stormwater and give out educational information twice during the season. Attendees from all over the region attend

66

these games and the partnership will continue in 2024. Expansion into 'kids days' include a stormwater educational activity page in the booklet provided to all 4th grade students who attend a special day game at the stadium.

Social Marketing

In order to increase the knowledge base of the general public, where the ultimate goal is stormwater stewardship, stormwater messaging was delivered online via social media channels, videos, radio, and information on the city's website in 2023. Specifically, stormwater messaging continued to evolve and grow outward through messaging by the Water Wise Spokane campaign, which has a large presence on social media and a dedicated webpage on the city's website (waterwisespokane.org). Stormwater videos focusing on stormwater facilities, maintenance, and pollution prevention tips are available for viewing on the city's stormwater webpage (Spokanestormwater.org). An overview video can be found on the stormwater webpage, and additional videos can be accessed by following the links for Green Infrastructure and Hazels Creek. These videos also have a presence on Cable Channel 5 as filler between scheduled programs. Videos and posts can be found on Waterwise Spokane Facebook and Instagram pages.

- There were over 2.1 million Facebook impressions (paid & organic) from stormwater ads January-December 2023, up from 675,045 the prior year.
- Traffic generated to website (www.spokanestormwater.org) included 8,590 unique users with an average time spent on the site of 2:32.

Detailed metrics on video and social channels outreach are included as Attachment B. but video content continues to be focused on stormwater pollution prevention (picking up pet waste, only rain down the drain, using pesticides sparingly, etc.)

Looking forward, social channel messaging will continue through 2024, and the outreach will provide source control and treatment facility educational information to the public. During 2024 educational stormwater signs will be created in conjunction with the Cochran Basin project and QR codes with videos will accompany the signs for both visual and auditory ability. An additional sign will be created with established partnerships with the city and other agencies that will be displayed at the TJ Meenach Boat Launch area.

Spokane River Forum

The City of Spokane supports the Spokane River Forum's efforts, and as such has historically partnered with the Forum with respect to stormwater outreach to ensure that messaging aligns and is consistent for the public to be able to clearly gain a better understanding of stormwater best practices. The city will continue to explore partnering opportunities with the Spokane River Forum in 2024.

Golden Stencil Stormwater Contest

The "Hunt for the Golden Stencil" contest, organized by the City of Spokane Stormwater, featured the iconic Redband trout logo spray-painted at 10 different storm drain locations across the city. In collaboration with KXLY, this contest was successfully promoted and encouraged participation through their website. Participants that found a stencil could enter to win a gift card to a local business. After entering, a stormwater educational tidbit would be displayed as a takeaway message. These messages included "Did you know anything other than stormwater is an illicit discharge?", "Help keep our waterways healthy and remember, drains are for rains!", and "Help keep our Spokane River clean and healthy, don't pollute and remember only rain down the drain!" The promotional education videos resonated with the community, inviting them to "Join the hunt to find them all!" Collaborating with KXLY and Water Wise Spokane made exciting announcements about the contest and its winners which fostered a sense of community engagement including creating and sharing.

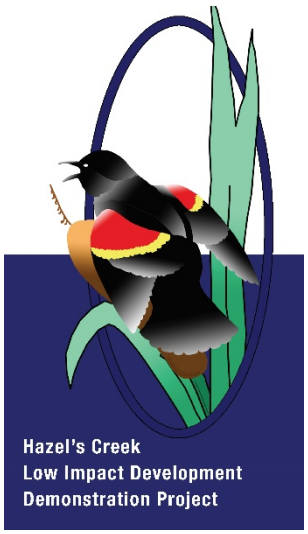
This initiative has not only significantly enhanced our community engagement but has also established a robust baseline for subsequent contests like age group for example. Majority of participants were in the 45-54 age group, giving us insight on target audience for the future. The comprehensive evaluation of the number of entries submitted, popular sites where the stencil was found, and age of entrants provides us with a quantitative as well as quantitative metric to assess the success of our promotional endeavors. The collaborative marketing efforts, particularly through our partnership with KXLY, allowed us to precisely measure the reach and effectiveness of our advertisements. Through meticulous tracking, we obtained valuable insights into the diverse channels through which participants were exposed to contest details, providing essential data for optimizing future promotional strategies. Moreover, the "Hunt for the Golden Stencil" contest has afforded us a unique opportunity to conduct a detailed analysis of the frequency and visibility of storm drains across various geographical areas. This analytical approach enables us to pinpoint key locations for targeted community outreach and strategic stormwater education initiatives. In essence, this multifaceted undertaking not only succeeded in fostering participation but also laid a solid foundation for informed decision-making in our continual efforts to promote environmental awareness and community engagement in 2024. (See attachment C)

Fix Car Leaks Don't Drip and Drive Promotion

The city is discussing with neighboring municipalities the potential to coordinate a Don't Drip and Drive workshop in 2024, dependent on support from Ecology. The city has reached out to Ecology and Spokane County to determine if there is administrative and partnering opportunities to re-implement the Don't Drip and Drive Promotion. A workshop may become available in the near future as part of the Fixcarleaks.com campaign, to be provided to the community in support source control practices with respect to car fluids. The program is being

evaluated to confirm that the rebates are valid and local automotive shop participants continue to be supportive. Discussions continued with Spokane County about the possibility of partnership for future endeavors.

Hazel's Creek Regional Stormwater Facility and LID Demonstration Site



In the autumn of 2012, construction concluded, marking the commencement of stormwater reception from properties within a defined up-gradient boundary. The site, inclusive of publicly accessible walking trails, also served as a platform for Low Impact Development (LID) education. Numerous LID demonstrations were conducted along the trail system, offering visitors an educational opportunity. A brochure downloadable from the Public Works & Utilities website facilitated self-guided tours.

In 2021, the city extended its support to science education at Ferris High School by providing tools and plantings for students to establish additional vegetation at the site. Approximately 600 starts of native shrubs and bushes were planted by the students, with their progress slated for evaluation in 2022. A subsequent assessment in 2024 will gauge the survival rate of the plantings, informing decisions regarding future pursuits of similar activities.

An informational video highlighting Hazels Creek was produced in 2020 to reignite public interest, available for viewing on the Hazels Creek section of Spokanestormwater.org. In tandem, the Wastewater Department plans to evaluate the Hazels Creek area in 2024, focusing on information kiosks and site vegetation, with the aim of identifying opportunities for enhancing visitation to the site. During the 2023 year, three guided tours were provided to the public. These tours are expected to continue in the following years as messaging and outreach to neighborhood council meetings are planned.

Swale Education

Swale education and restoration are both planned for 2024. During 2023 educational updates to the City of Spokane website, Water Wise Spokane social media platforms, print materials, yard signs, and distribution of promotional items were leveraged to promote awareness and education. The goal is to increase in knowledgebase and understanding of benefits of swales. Social marketing was tailored to swale education through posts containing content surrounding importance, care/maintenance, planting suggestions, soil layers, etc. The city kicked off the Swale Yeah! Campaign, which increased awareness on the presence and function of swales, and benefits to the community. It was implemented through both an online and physical promotion within the city as well as other local partners. The Swale Yeah! campaign effort began in 2023 and is likely to run through 2025, with the goal of bringing awareness of swales to foster swale stewardship in the community. Over 100 yard signs were displayed in swales across Spokane and qualitative results indicate the signs are being recognized and leading to further education.

City of Spokane Cable 5

City of Spokane Cable Channel 5 rotates stormwater pollution prevention tips on the reader board. A different seasonally relevant is used each week. An EPA video entitled "After the Storm" is shown throughout the year, highlighting the importance of stormwater management and individual citizen responsibility to help prevent stormwater pollution. Cable 5 also broadcasts stormwater outreach and pollution prevention tip videos as filler between scheduled programming. These broadcasts will continue to occur in 2024.

Idaho Washington Aquifer Collaborative

Is a non-profit organization that is made up of Idaho and Washington water purveyors, and the city is a member of the organization. IWAC developed an educational video for the public that is an overview of the Spokane Valley Rathdrum Prairie aquifer, its importance to our region, the impact stormwater has on river and aquifer water quality, sources of pollution, and things that residents can do to protect and preserve our water for the public to understand the importance of stormwater pollution and water. The video is currently aired on Cable 5 in continuous rotation on its air and will continue to be aired in 2024.

The Wastewater Department has increased personnel to re-establish a stormwater education presence in the classrooms, and is currently determining the methods and frequencies of outreach that will provide the most benefit. The City of Spokane is still developing the best approach to educate children in the classrooms. The city participated in two education events in Spokane County at an outdoor educational facility, Bear Lake, in 2023.

Outreach to Businesses

Spokane Regional Health District's (SRHD) Pollution Prevention Program

Collaborating with the Spokane Regional Health District's (SRHD) Pollution Prevention Program allowed the city to extended stormwater messaging to businesses through voluntary site inspections. These inspections were mainly focused on restaurants/grocery stores, food rescue (becoming EnviroCertified℠), automotive facilities, schools, nail salons, as well as any sectors that have received complaints within the 2023 year. An initial site visit occurs at the actual site and results in a completed 'checklist' while a screening visit is an attempted visit to the site, but the business declined or put off the visit and unable to gather complete data, or the business does not exist anymore. A follow-up visit occurs within 90 days of the initial visit. The follow-up visit must be conducted to resolve high priority environmental issues. Last year, SRHD conducted 22 screenings, 63 initial site visits, and 30 follow-up visits.

The Pollution Prevention Program, funded by Ecology, equipped businesses with spill kits as needed. Fats, Oils, and Grease (FOG) brochures that were created in 2022 by the City of Spokane continued to be distributed at all initial site visits and as needed in the field. This brochure is available in English,

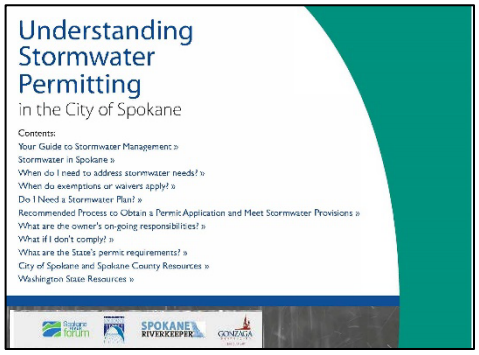
Russian, and Spanish. Continuation of this partnership is planned for 2024. Additional details of SRHD's efforts and FOG brochure examples can be found at www.spokanestormwater.org.

The SRHD summary can be found as Attachment A.

Outreach to Developers, Engineers, and Contractors

Stormwater Permitting Guidance Materials

The city partnered with the Spokane River Forum and Spokane Riverkeeper to develop the guides *Understanding Stormwater Permitting in the City of Spokane* and *City of Spokane Stormwater Compliance Guide* These guides addresses stormwater-related building permit requirements; erosion and sediment control, and also references Ecology's stormwater permit requirements. The guides are provided to development contractors during pre-construction meetings, and are also available on the Spokane River Forum stormwater website. These materials have been available for a number of years, and will continue to be available in 2024.



Developer Services Center

The City of Spokane Developer Services Center is instrumental in facilitating the progression of construction projects through the stormwater management process. Through active engagement with developers, engineers, and contractors in pre-development meetings, the center plays a pivotal role in providing crucial insights into stormwater requirements.

The Center works with developers from the design phase through permitting and issuance of Certificates of Occupancy. Throughout that process the Center provides verbal guidance and support materials for appropriate stormwater management that is necessary to receive city permits to construct. For example, project proponents are provided two stormwater permitting guidance documents *The City of Spokane Stormwater Compliance Guide*, and the informational guide document *Understanding Stormwater Permitting in the City of Spokane* guide. Each document contains helpful information on the local permitting process with respect to stormwater, as well as numerous links to additional educational stormwater materials.

Pre-development meetings are a standard practice, where during the meetings, city engineers meet with developers, and their engineers and contractors to discuss the scope of the project, to establish stormwater requirements, and identify improvement opportunities. Pre-development meeting notes are provided to the project proponents, and detail the guidance provided during the discussions. The Developer Services Center will continue to review stormwater plans, hold pre-construction meetings, and provided guidance on stormwater for development projects in 2024 and onward.

In a collaborative effort with the Wastewater Management Department, the Developer Services Center ensures the continued distribution of construction stormwater guidance materials. These materials are thoughtfully organized in an online resources folder accessible on the commercial construction permitting page of the city's website as well as at Spokanestormwater.org This strategic approach underscores the commitment to transparency and accessibility in providing developers and stakeholders with the necessary tools to effectively navigate stormwater management requirements. By fostering collaborative partnerships and streamlining access to key information, the Developer Services Center plays a crucial role in promoting compliance and best practices in stormwater management within the construction sector in Spokane. Continuation and strengthening of the partnership with Developer Services is anticipated to continue in 2024 with a specific focus on gaps in education amongst subsectors. Specifically, guidance materials similar to the construction stormwater information vehicles will be developed in 2024 for industrial stormwater and made available as the construction stormwater materials are currently.

Construction stormwater guidance materials have been cooperatively developed by the Developer Services Center and the Wastewater Department to assist development contractors and engineers navigate the requirements of the Construction Stormwater General Permit issued by Ecology, and to understand the expectations for the implementation of Best Management Practices on an active site. Also, training opportunities for development contractors and engineers have been identified on a flyer that is housed in the online toolbox for permit requestors.

The city will continue to provide outreach to the development community through the Developer Services Center, and develop guidance materials as needed in order to affect behavior change with respect to stormwater.

Eastern Washington Stormwater Education & Outreach Group

In 2023, a vital collaborative initiative took form, addressing specific stormwater pollution prevention challenges unique to Eastern Washington. Recognizing the distinct issues faced in this region, often overshadowed by content created for the west side, a dedicated group convened and initiated projects aimed at tailoring educational efforts to the local context. Eastern Washington permittees working as part of the Eastern Washington (EWA) Stormwater Education & Outreach (SW E&O) Working Group identified a need for documents with information on construction BMPs for developers, engineers, planners, review staff, contractors, and construction crews. The Washington Stormwater Center providing support to the EWA SW E&O contracted Evergreen StormH2O to assist in the development of leverageable documents to fill these underserved audiences. Two brochures and a flip book focused on construction stormwater were developed and made available for jurisdictions statewide. To aid in their adoption, the documents were produced in Publisher and are easily editable. For example, the materials are easily tailors to reflect local ordinance codes, as well as include local pictures and contact information. QR codes are provided to allow access to further information in the Department of Ecology's Stormwater Manuals. These codes are available for both EWA and WWA and can be found here: https://www.wastormwatercenter.org/permit-assistance/municipal/educationoutreach/eastern-wa-eo-documents/.

A comprehensive survey identified Developers, Engineers, & Contractors as a target audience requiring specialized assistance to meet MS4 permit requirements. Through concerted efforts involving multiple regional jurisdictions, a suite of educational materials was meticulously crafted. This included a developer brochure, Planners, Engineers, and Review Staff Brochure and a construction flipbook, with careful consideration given to layout, color, language, content, and imagery. Importantly, these materials were designed to be adaptable, allowing each jurisdiction the flexibility to modify and edit them based on the unique needs of their community. This adaptability ensures that the educational resources remain relevant and effective in diverse contexts, emphasizing a commitment to flexibility and tailored outreach. The work products of this group are being leveraged into the City of Spokane, Spokane Valley, Spokane County, Yakima, Douglas, Pasco, Richland, Pullman, Union Gap, Franklin, Walla Walla, as well as other cities and counties in eastern Washington. This collaboration regionally and beyond allows for enhanced water quality protection, meeting the permit requirement.

Going forth, the 2024 and beyond work plan consists of a focus in transcreation, researching grant opportunities, building an Eastern Washington Stormwater Education & Outreach Document Library, and producing additional adaptable outreach documents. Refer to links below, for examples illustrating the adaptability of the created materials. These materials will be leveraged into city programs as different needs arise and we be available in both print/online versions.

Planners, Engineers, and Review Staff Brochure

The goal is to ensure efforts to prevent and correct some of the most commonly observed surface water concerns on construction sites are made early on in the permitting process. It provides information to assist in meeting municipal stormwater permit requirements with topics essential to stormwater design: site control plans, low-impact development, underground injection controls, infiltration, and best management practices (BMPs). A QR code is provided to access additional information contained in the Department of Ecology stormwater management manuals.

Construction Flip Book

This was created for the contractors and construction crews. The goal was something small enough to fit in the glove box and that could be printed on a more durable paper to withstand construction site use. It contains information about temporary erosion and sediment control (TESC), low-impact development (LID), underground injection control (UIC), and best management practices (BMPs). It also provides a QR code that allows easy access to information in the Dept. of Ecology's stormwater manuals with a cell phone.

Developers Brochure

The final brochure is focused on Developers, with a slightly higher perspective. The goal is to encourage thoughtful planning for stormwater issues early on in the process.
These collaborative educational initiatives underscore the city's dedication to elevating public awareness, promoting compliance, and instilling responsible stormwater management practices within the specific challenges faced by Eastern Washington.

2.2 Public Involvement and Participation

2.2.1 Public Involvement and Participation Permit Requirements (S5.B.2)

The MS4 stormwater permit stipulates that the city provides ongoing opportunities for public involvement and participation, such as public hearings, advisory panels, and/or committees during rule-making activities. Specifically, permit section S5.B.2.a requires the city to implement a program or policy to create opportunities for the public to provide input during the decision-making processes, including development and adoption of all required ordinances and regulatory mechanisms. The permit also requires that the city provide ongoing opportunities for public involvement through various councils, committees, programs, and/or activities. In addition, develop and implement a process for consideration of public comments on the SWMP, including required ordinances and regulatory mechanisms.

2.2.2 Public Hearings and Rulemaking

The city provides many opportunities for public involvement and participation in its rule-making processes. Public involvement is a required component of the ordinance process, and involvement of any interested member of the public is encouraged through workshops, open houses, dedicated testimonial times, and a formal public comment period. Information on how to participate at City Council meetings and meeting agendas are provided on the city's City Council website prior to the occurrence of the meeting. Additionally, the public may attend City Council briefings, City Council hearings; Planning Commission workshops, Planning Commission hearings, and any of the several Council Committee meetings (e.g. Finance and Administration Committee; Public Infrastructure, Environment, & Sustainability; and Public Safety & Community Health Committee). The city publishes the City Council Official Gazettes - City of Spokane, Washington (spokanecity.org), which contains the meeting minutes from the City Council hearings, and includes calls for bids for stormwater management, infrastructure, and funding projects that the public can participate with. Typical examples of opportunities for public involvement include rate structure discussions, stormwater mitigation grants and projects; stormwater infrastructure improvements; joint planning of the stormwater management plans; and, ordinance creation or revision, among others.

2.2.3 Stormwater Management Program Plan Public Participation

The city posts the SWMP Plan at Spokanestormwater.org annually. The public may provide comment on this plan at any time during the year by emailing the Wastewater Department Environmental Analyst at jgeorge@spokanecity.org. The city solicits online comments on the draft plan from the public for a 30-day period when the SWMP Plan is posted. After the 30-day period, the city will review the comments and update the plan as applicable, and post the final version of the plan at Stormwater Management webpage at Spokanestormwater.org.

2.2.4 Spokane Municipal Code Revisions

The City of Spokane Wastewater and Planning Departments began a thorough assessment of the Spokane Municipal Code in 2023, specifically, Chapter 17D.060 – *Stormwater Facilities* and Chapter 17D.090 – *Erosion and Sediment Control*. The goal of the assessment is to identify sections that would benefit from a reorganization in order to streamline the code to ultimately make it more user friendly.

A preliminary draft of proposed code revisions is anticipated by fall of 2024. The final draft of the proposed changes will be announced to the public in order to solicit comments in preparation of a final draft that will be presented to the Spokane City Council for consent and adoption. Draft stormwater ordinances will be proposed to the City Council by late 2024 to early 2025.

2.3 Illicit Discharge Detection & Elimination (IDDE)

2.3.1 IDDE Permit Requirements (S5.B.3)

The permit requires the city to implement and enforce a program designed to prevent, detect, characterize, trace, and eliminate illicit connections and illicit discharges into the MS4. Specifically, Section S5.B.3.a of the permit requires the city to maintain and periodically update a map of the MS4 to include:

- Known outfalls and known discharge points,
- Size and material of construction for known outfalls,
- Receiving waters other than ground,
- Areas served by the MS4 that discharge to ground,
- Permanent stormwater facilities owned or operated by the city,
- All connections to the MS4 authorized or approved by the city after August 1, 2019,
- All known connections from the MS4 to a privately owned stormwater system, and
- Connections between the MS4 owned and operated by the city and other municipalities or public entities.

Additionally, Section S5.B.3.b of the permit requires the city to effectively prohibit, through ordinance or other regulatory mechanism, non-stormwater discharges into the MS4 to include:

- An ordinance or other regulatory mechanism that prohibits illicit discharges and authorizes enforcement actions, including on private property, and
- A compliance strategy that includes informal compliance actions such as public education and technical assistance, as well as the enforcement provisions of the ordinance or other regulatory mechanism.

Section S5.B.3.c of the permit requires the city to implement an ongoing program designed to detect and identify illicit discharges and illicit connections into the Permittee's MS4 to include:

- Procedures for conducting investigations of the Permittee's MS4, including field screening to identify potential sources, and
- Procedures for locating priority areas likely to have illicit discharges.

2.3.2 Map of the MS4

The city maintains an accurate and up-to-date map of the stormwater drainage system, which enables response to illicit discharge notifications to be efficient and timely. The permit outlines the information that should be included in the city's MS4 map to include:

- Location of all known municipal storm sewer outfalls, receiving waters, and structural BMPs owned, operated, or maintained by the city,
- Location of all known outfalls and known discharge points,
- Receiving waters,
- Areas served by the MS4 that discharge to ground,
- Permanent stormwater facilities owned or operated by the city,
- All connections to the MS4 authorized or approved by the city,
- All known connections from the MS4 to a privately owned stormwater system, and
- Connections between the MS4 owned and operated by the city and other municipalities or public entities.

In order to comply with Section S5.B.3.a, the Wastewater Management Department maintains an up-to-date Global Information System (GIS) map of the MS4 utilizing a Esri computer software program. GIS layers are updated frequently to reflect changes to the system.

2.3.3 Adoption of IDDE Ordinance

Section 17D.060.190 of the Spokane Municipal Code defines prohibited, allowable, and conditionally allowable discharges to the MS4. as well as identifying the enforcement track. The IDDE ordinances are included in the scope to evaluate and improve the stormwater sections of the Spokane Municipal Code in 2024/2025 as described in Section 2.2.4 - Spokane Municipal Code Revisions.

2.3.4 Ongoing IDDE Program

The Wastewater Management department manages an ongoing program to detect and eliminate illicit discharges and connections. The IDDE program utilizes the Wastewater Management storm sewer field crews to identify potential illicit discharges by incorporating illicit discharge field inspections into the operation and maintenance routines performed on the stormwater infrastructure. Additionally, City of Spokane stormwater inspectors are made aware of potential illicit discharges by the public from the Illicit Discharge Hotline (625-7999), MySpokane 311, Ecology's Environmental Reports Tracking System (ERTS), and/or the Spokane Regional Health District Pollution Prevention Program referrals. The city's stormwater inspectors respond to notifications provided by field observations from city field crews, and notifications from the public, and mitigate when necessary. The inspectors log their findings and observations into a database that tracks and retains response activities. See Section 2.3.6 for further discussion of field inspections, characterization, and tracing of illicit discharges.

2.3.5 IDDE Priority Areas

In order to identify priority illicit discharge areas, illicit discharge reports from 2023 were mapped to identify any geographic illicit discharge trends. Figure 3 illustrates the locations of 2023 illicit discharges, and it demonstrates that illicit discharge notifications occur throughout the city somewhat equally with mild grouping near the downtown area. Industrial zoning areas adjacent to the river are assumed to have higher potential for significant illicit discharges, where the Union Basin has the highest potential for illicit discharges associated with industrial activities.

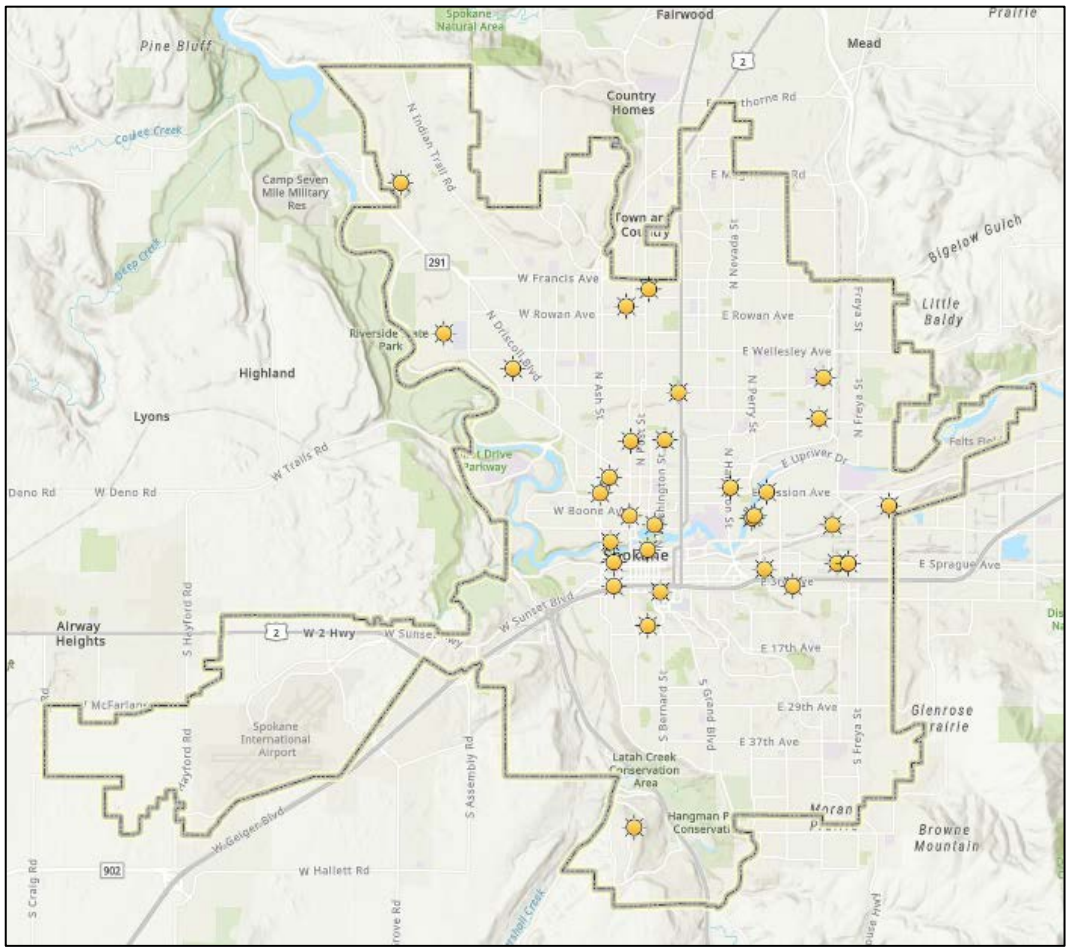


Figure 3. Location of Illicit Discharge Responses 2023.

2.3.6 Field Inspections, Characterization and Tracing of Illicit Discharge

Illicit discharge investigations are generally initiated from notifications received on the Illicit Discharge Hotline (625-7999), the MySpokane 311 hotline, or from Ecology relaying an ERTS report. The Illicit Discharge Hotline is publicized on storm drain markers throughout the city, in brochures handed out to the public, and at Spokanestormwater.org. Notifications are conveyed to the city Stormwater Inspectors, who investigate, mitigate where necessary, and generate a report. In addition to the stormwater hotline, Wastewater Management storm sewer staff continually checks for illicit discharges as a part of normal day-to-day operations and maintenance of stormwater assets, and often inform the public about illicit discharges as they observe behaviors conducive to illicit discharges in the field. Figure 4 is a decision tree procedural aid for determining if a released material is a reportable illicit discharge. Records of inspections and enforcement actions by the stormwater inspectors are maintained with the Illicit Discharge program, which retains records of inspection reports and notices of violations. The illicit discharge program is ongoing and will continue in 2024.

2.3.7 Elimination of Illicit Discharges

Several approaches have been implemented and are continually underway to minimize or eliminate illicit discharges to the MS4 including, but not limited to, curb markers, participation with the Spokane River Toxics Advisory Committee (SRTAC) [formerly known as the Spokane River Toxic Task Force], and partnering with the Spokane River Forum to promote the EnviroCertified Program.

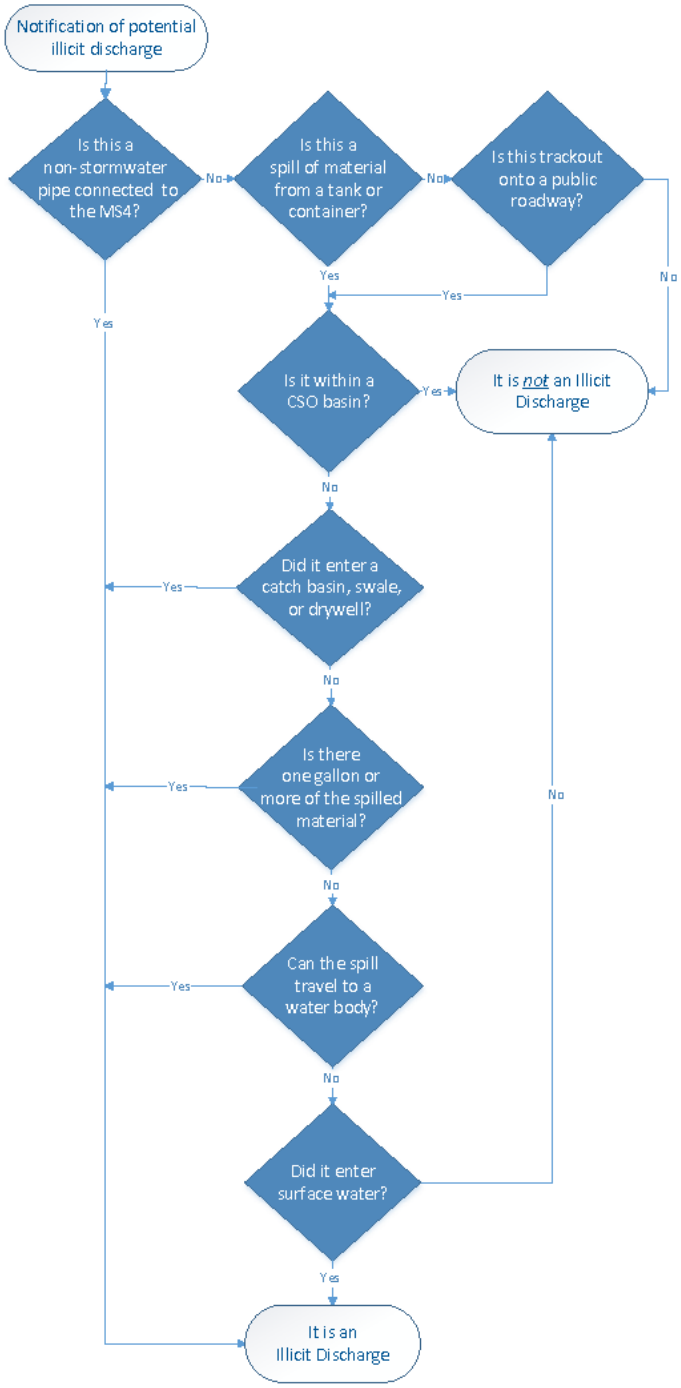


Figure 4. Illicit Discharge Decision Tree

2.4 Construction Site Stormwater Runoff Control

2.4.1 Construction Site Stormwater Runoff Control Permit Requirements

Permit Section S5.B.4 requires several conditions to implement ordinances and procedures regarding construction stormwater:

- Section S5.B.4 of the permit requires the city to implement and enforce a program to reduce pollutants in any stormwater runoff to the MS4 from construction activities.
- Section S5.B.4.a requires the city to implement an ordinance that applies to construction sites disturbing one acre or more, and to construction projects of less than one acre that are part of a larger common plan of development or sale.

  The ordinance shall include:

  - Provisions to review site plans,
  - Provisions to inspect sites with high potential for sediment transport prior to clearing or grading,
  - Provision for access by qualified personnel to inspect construction-phase stormwater BMPs on private properties that discharge to the MS4, and
  - Sanctions to ensure compliance with escalating enforcement procedures and actions.

  The ordinance shall require:

  - Erosion and Sediment Controls, among others, at new development and redevelopment projects,
  - Construction operators to:
    - Adhere to the Core Elements, which include preparation of Construction Stormwater Pollution Prevention Plans,
    - Implement appropriate erosion and sediment control BMPs, and
    - Control waste materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site.

- Section S5.B.4.b of the permit requires the city to implement procedures for site plan review which incorporates consideration of potential water quality impacts.
- Section S5.B.4.c requires the city to implement procedures for site inspection and enforcement of construction stormwater pollution control measures prior to clearing and grading for high potential sites, and during construction to verify proper installation and maintenance of required erosion and sediment controls.
- Section S5.B.4.d requires the city to ensure that all staff who are implementing construction stormwater program are trained accordingly.
- Section S5.B.4.e requires the city to provide information to construction site operators about available training opportunities.

- Section S5.B.4.f requires the city to keep records of all projects disturbing one acre or more, and all projects of any size that are part of a common plan of development or sale that is one acre or more.

2.4.2 Guidance Manuals for Development and Re-development

The *Spokane Regional Stormwater Manual (SRSM)* was developed in joint cooperation by the Cities of Spokane and Spokane Valley and Spokane County. The manual establishes standards for stormwater design and management to protect water quality, natural drainage systems and down-gradient properties as urban development (and redevelopment) occurs. The permit requires that the city use the BMPs from the Washington State Department of Ecology's *Stormwater Management Manual for Eastern Washington (SWMMEW)*, or another technically equivalent manual approved by Ecology. The SRSM was updated to reflect the 2019 revisions of the SWMMEW and provided to Ecology for approval in 2021. The SRSM is currently under review by Ecology and will continue to be required for development until Ecology's review is finalized.

The SRSM outlines the development and re-development requirements of the stormwater program. Chapter 2, Basic Requirements, defines the eight basic requirements for stormwater management for new development and redevelopment projects. Within the city, the threshold for requiring compliance with the Basic Requirements is the "addition or replacement of any impervious surfaces." Basic Requirements include:

No. 1 – Drainage Submittal,

No. 2 – Geotechnical Site Characterization,

No. 3 – Water Quality Treatment,

No. 4 – Flow Control,

No. 5 – Natural and Constructed Conveyance Systems,

No. 6 – Erosion and Sediment Control,

No. 7 – Source Control; and

No. 8 – Operation and Maintenance.

The Stormwater Site Plan referenced in the municipal stormwater permit (S5.B.5.b) is analogous to the drainage submittal in the SRSM (2.2.1 Basic Requirement No. 1). A concept drainage report, a requirement of a drainage submittal, is generally required for large projects or those located in environmentally sensitive areas to preliminarily assess drainage requirements and potential impacts. A drainage report, another requirement of a drainage submittal, is required for most projects and is used to identify drainage impacts from the project as well as determine necessary stormwater runoff treatment and controls. The drainage report also assesses operation and maintenance requirements, inspection requirements, and erosion and sediment control.

2.4.3 Erosion and Sediment Control Plan

The SRSM outlines erosion and sediment control requirements, which are equivalent to Core Element #2, Construction Stormwater Pollution Prevention, in Appendix 1 of the Permit. An Erosion and Sediment Control (ESC) plan is a requirement of the construction permit process and is equivalent to the Permit's Construction Stormwater Pollution Prevention Plan (Construction SWPPP). Controlling erosion and preventing sediment and other pollutants from leaving the project site during the construction phase is achievable through implementation and selection of BMPs that are appropriate both to the site and to the season during which construction occurs.

The SRSM highlights four objectives of the ESC Plan:

- Protect existing or proposed stormwater management infrastructure,
- Minimize the impacts of erosion, sedimentation and increased runoff caused by land-disturbing activities on private property, public roads and rights-of-way, and water bodies,
- Protect the health, safety, and welfare of the general public, and
- Protect water quality.

Section 17D.090.070 of the Spokane Municipal Code, requires the generation of an ESC for projects that disturb 5000 square feet, or are a special site. Special sites are defined in SMC 17D.090.080 and may include sites with greater than 10 percent slope, highly erosive soils, slope lengths greater than 300 feet, or disturbance of natural vegetative buffer within 50 feet of a wetland or water body. If an ESC Plan is not required, the proponent would still be responsible to control erosion and sediment during construction. Section 17D.090.070 was updated in 2021 to include the requirement of a Stormwater Pollution Prevention Plan, where applicable per the Construction Stormwater General Permit issued by Ecology.

In accordance with city permitting processes and review procedures, Erosion and Sediment Control (ESC) plans are reviewed by the Development Services Center to ensure the proposed project will control erosion and keep pollutants from leaving the project site during construction. An ESC Plan is prescribed as one of the minimum application elements for the commercial development application. Application submittal requirements are provided on the city's Business & Development Commercial Services website.

2.4.4 Construction Site Inspection and Enforcement

The City of Spokane Field Engineering Department provides construction oversight for public capital improvement projects on City-owned land. The Engineering Services inspectors verify proper installation and maintenance of required erosion and sediment controls for NPDES Construction Stormwater General permitted development sites and capital improvement projects prior to clearing and grading for construction if a high potential for sediment transport is determined, and during construction. Inspectors and field engineers from the City of Spokane Developer Services Center, and Field Engineering, and Wastewater Management Departments inspect privately constructed infrastructure prior to the Planning Department issuing a Certificate of Occupancy. Records of inspections and enforcement actions completed by Engineering Services and the Development Services Center are maintained in daily inspection logs as well as digitally in the Accela computer software program.

2.4.5 Construction Stormwater Training and Informational Materials

Informational materials regarding erosion and sediment control are available to construction site operators, design professionals, and other members of the public in the Development Services Center lobby at City Hall and online at the Business and Development Resources web page in the construction stormwater folder[†]. In addition to highlighting erosion and sediment control requirements, brochures direct the target audience to the SRSM, and the SRSM details erosion and sediment control requirements equivalent to Appendix 1 of the Permit and BMPs in Department of Ecology's SWMMEW.

2.5 Post-Construction Stormwater Management

2.5.1 Post-Construction Site Stormwater Runoff Control Permit Requirements

Permit Section S5.B.5 requires several conditions to implement ordinances and procedures regarding construction stormwater:

- Section S5.B.5 of the permit requires the city to implement a program to address post-construction stormwater runoff for development and redevelopment projects to ensure that controls are in place to prevent or minimize water quality impacts.
- Section S5.B.5.a requires the city to implement an ordinance that requires post-construction stormwater controls for development and redevelopment projects that disturb one acre or more or, are less than one acre and are part of a larger common plan of development or sale. The ordinance must include mechanisms to ensure compliance, and require projects to adhere to the Core Elements. The ordinance must also include requirements to ensure adequate ongoing long-term operation and maintenance of the constructed BMPs.
- Section S5.B.5.b.ii of the permit details that the ordinance should require development and redevelopment projects to adhere to the Core Elements and encourage Low Impact Development of green stormwater infrastructure.
- Section S5.B.5.b.ii(c) of the permit requires the ordinance to include requirements to ensure adequate long-term operation and maintenance of the BMPs occurs.
- Section S5.B.5.b.iii of the permit requires that the ordinance include provisions for both construction-phase and post-construction access for the city to inspect stormwater BMPs on private properties that discharge to the MS4. In lieu of requiring post-construction access to private properties for city inspectors in perpetuity, Section S5.B.5.b.iii allows for the city to require annual certifications of stormwater facilities by a qualified third party to meet the conditions of S5.B.5.b.ii(c) of the permit.
- Section S5.B.5.b.iv of the permit requires that the ordinance include enforcement procedures with the ability to escalate.

Note:

[†]Business Development Resources > Guidance/Handouts > Construction Stormwater.

- Section S5.B.5.b.v of the permit requires the ordinance to include enforcement provisions, and for the city to implement an enforcement strategy for the conditions of Section S5.B.5 of the permit.

2.5.2 Post-Construction Stormwater Ordinances

Post-construction stormwater management is addressed in Chapter 17D.060 of the Spokane Municipal Code. Chapter 17D.060 identifies the post-construction stormwater requirements such as duties of property owners, prohibition of illicit discharges, inspection requirements, and enforcement measures, among others. Chapter 17D.060 of the code became effective in March of 2010, and the ordinance references relevant standards that are protective of stormwater, such as the SRSM, SWMMEW, City of Spokane design standards and specifications, among others.

2.5.3 Encouragement of Low Impact Development

Low Impact Development (LID) is encouraged but optional in the City of Spokane. The city encourages use of the Eastern Washington LID Guidance Manual through adoption of Chapter 17D.060.300 of the Spokane Municipal Code. The LID Manual was adopted as supplemental guidance for the design, construction, and maintenance of LID stormwater best management practices, and it provides background on LID practices applicable in Eastern Washington. The regional LID manual focuses on the practices of stormwater pollution prevention, flow control, and treatment by promoting the use of natural features and managing stormwater as close to where it falls as possible. The LID guidance manual is available from the Spokane Stormwater Green Infrastructure website.

2.5.4 Procedures for Development Site Plan Review

The city requires developers to submit a maintenance plan for all facilities during the plan review. A draft copy of the Conditions, Covenants and Restrictions (CC&Rs) for the homeowners' association in charge of operating and maintaining the drainage facilities is also required.

Drainage submittals are reviewed by the Planning department for code requirements such as critical areas of management, buffers, impervious area creation, building and landscape design and building setbacks. Then, Development Services Center reviews Drainage Submittals for civil plan requirements as described in City Engineering Design Standards and the SRSM.

Engineering Services reviews plans for city Capital Improvement Projects and stormwater plans for the public right-of-way to ensure consistency with Design Standards.

The Development Services Center reviews and approves drainage submittals for private commercial and residential developments. A Stormwater Intake Checklist was added to the city's Engineering Services website to ease the review process. The drainage submittal requires a Drainage Report, Drainage Plan, Grading Plan, Swale Details, and Erosion and Sediment Control Plans and Details.

The developer must address any comments resulting from city staff review and submit revised plans to the city. After confirming that staff comments have been adequately addressed, the Development Services Center will send the developer a letter accepting the design and permitting construction.

2.5.5 Construction Site Inspection and Enforcement

There are three inspectors and a field engineer from the Development Services Center who inspect privately constructed infrastructure. Two stormwater inspectors from the Wastewater Management Department inspect privately constructed stormwater controls. Engineering Services provides construction oversight for public capital improvement projects on city-owned land.

Private development sites are inspected during installation and upon completion of construction. If there are deficiencies, a punch list is created by the Engineering Services inspectors to be completed by the developer. Final acceptance does not occur until all deficiencies have been remedied.

2.5.6 Training for Staff and Stormwater Professionals

The Development Services Center is responsible for providing information to construction site operators and design professionals about training available regarding how to (1) install and maintain effective erosion and sediment controls, (2) comply with the requirements of Appendix 1 of the Permit and (3) apply the BMPs described in the SRSM. Copies of information provided to construction site operators are kept. If information is distributed to a large number of design professionals at once, the dates of the mailings and lists of recipients should also be kept.

Staff and professional training is provided for employees and design professionals to aid in reaching water quality goals, ensure permit compliance, and reduce pollution to stormwater runoff. Five training modules were developed, including NPDES Overview, Operations and Maintenance, Facility Inspections, Site Plan Review, and Illicit Discharge. Training was provided for LID and records should be kept including training materials, the date of training, and attendees.

2.6 Pollution Prevention & Good Housekeeping for Municipal Operations

Pollution Prevention for Municipal Operations Permit Requirements

The permit requires several pollution prevention and good housekeeping conditions for municipal operations and maintenance activities:

- Section S5.B6 of the permit requires the city to implement an operation and maintenance program with the goal of preventing or reducing pollutant runoff from municipal operations.
- Section S5.B.6.a of the permit requires the city to develop an Operation and Maintenance (O&M) Plan that details a schedule of the city's Operation and Maintenance activities by December 31, 2022. The O&M Plan must include BMPs that will reduce the discharge of pollutants and protect water quality.
- Section S5.B6.a.i of the permit details that the O&M Plan must include appropriate pollution prevention procedures for the following types of facilities and/or activities that must be implemented by the city:
    - Inspections and cleaning of stormwater collection and conveyance system assets to include♠:
        - Catch basins
        - Stormwater sewer pipes
        - Open channels
        - Culverts
        - Structural stormwater treatment
        - Structural stormwater treatment flow control facilities
    - Maintenance of roads, highways, and parking lots owned or operated by the city that are pollutant generating impervious surface ≥ 5,000 square feet to include:
        - Street cleaning
        - Deicing
        - Snow removal
        - Managing runoff from snow storage areas
        - Managing material storage areas (e.g. salt, sand, or other chemical storage)
        - All-season BMPs to reduce road and parking lot debris and other pollutants
    - Management of fleet vehicles fleets to include♣:
        - Storage
        - Washing
        - Maintenance
        - Repair
        - Fueling

- Maintenance and pollution prevention activities for municipal buildings owned and/or operated by the city to include:
    - Cleaning
    - Washing
    - Painting
    - Other maintenance activities

- Maintenance and pollution prevention activities for parks and open spaces to include:
    - Application of fertilizer
    - Application of pesticides, and herbicides
    - Pet waste BMPs
    - Sediment and erosion control BMPs
    - BMPs for landscape maintenance and vegetation disposal
    - Trash and dumpster management
    - Building exterior cleaning and maintenance BMPs

- Implementing construction projects owned or operated by the city to include:
    - Adhering to the Construction Stormwater General Permit
    - Adhering to the construction and post-construction controls detailed in the Core Elements

- Implementing industrial activities owned or operated by the city to include:
    - Adhering to the conditions of the Industrial Stormwater General Permit

- Implementing and updating Stormwater Pollution Prevention Plans (SWPPPs) for material storage areas, heavy equipment storage areas, and maintenance owned or operated by the city to include♥:
    - Site map showing the facility's stormwater drainage, discharge points, and potential pollutant areas
    - Inventory of the materials and equipment stored on-site, and the activities conducted at the facility which may be exposed to precipitation or runoff
    - Spill prevention and mitigation plan for illicit discharges
    - Description and schedule of facility BMPs (operational and structural)♦
    - Annual inspections of the facility to evaluate the effectiveness of the BMPs, identify maintenance needs, and determine if additional or different BMPs are needed.
    - Record keeping of inspection results (report or checklist)

- Implementation of flood management projects to include:
    - Controls that minimize impacts to site hydrology

- Implementation of BMPs at other facilities in order to protect water quality

Notes:

♠ Waste materials generated must be properly managed, and adequate records kept of all cleaning inspection, and disposal activities.

♣ All vehicle and equipment washing and maintenance must be performed in a self-contained covered building, or in designated wash and/or maintenance area that separates wash water from stormwater.

♥ Unless required to have coverage under the Industrial Stormwater General Permit.

♦ BMPs shall be consistent with the Stormwater Management Manual for Eastern Washington, or other Ecology-approved technical manual.

- Section S5.B6.a.ii of the permit requires the O&M Plan to include schedule of inspections and requirements for recordkeeping pursuant to permit Section S9 – Reporting and Record Keeping. The schedule of inspections must include:
    - Requirement to inspect a minimum of 95% of all known stormwater treatment and flow control facilities (except catch basins) owned, operated, or maintained by the city shall be inspected at least once every two years. Problem facilities identified during inspections should be inspected more frequently.
    - Requirement to inspect all catch basins and inlets owned or operated by the city every two years. Catch basins should be cleaned as needed in accordance with permit section S5.B.6.a.
    - Requirement to conduct spot of stormwater treatment and flow control facilities after major storm events for damage. Maintenance and repairs should be performed as soon as practicable.
- Section S5.B6.a.iii of the permit requires the city to identify the responsible departments or roles for performing each activity in the O&M Plan.
- Section S5.B6.a.iii of the permit requires that all city employees with primary construction, operations, or maintenance job functions that are likely to impact stormwater quality to have training that addresses trained: protection of water quality, operation and maintenance requirements, relevant SWPPPs, inspection procedures, and pollution prevention methods to use during job activities.

2.6.2 Municipal Operations and Maintenance Program

An operation and maintenance (O&M) program has been developed and implemented that includes a citywide Operation and Maintenance Plan for typical municipal activities, site specific SWPPPs for applicable municipal properties, and a recurring training component, where the ultimate goal is reducing or preventing pollutant runoff from municipal operations in order to protect water quality.

2.6.3 Municipal Stormwater Operations and Maintenance Plan

The permit requires the implementation of an O&M Plan for municipal activities with the potential to impact stormwater.

The O&M Plan must include appropriate pollution prevention and good housekeeping procedures for the following facilities and/or activities:

- Stormwater collection and conveyance system,
- Roads, highways and parking lots,
- Vehicle fleets,
- Municipal buildings,
- Parks and open space,
- Construction projects,
- Industrial activities, and
- A schedule of O&M activities that includes the identification of the responsible department for the performance of the activity.

The Wastewater Management Department developed the City of Spokane Municipal Stormwater O&M Plan in 2022, and began training city operations and maintenance field staff in 2023. Training will continue in 2024 to ensure that all applicable staff receive the training. The citywide Municipal Stormwater O&M Plan replaces several O&M Plans that were written in 2010 that were specific to a department, and also included a Stormwater Pollution Prevention Plans (SWPPP) as a component of the respective plan. The current citywide O&M Plan is a comprehensive document applicable to all departments that contains pertinent Best Management Practices (BMPs) for typical municipal activities that have the potential to impact stormwater. Site Specific SWPPPs were developed as separate documents in 2019/2020 for the applicable municipal properties. The citywide Municipal Stormwater O&M Plan contains guidance on pollution prevention and good housekeeping measures, in addition to activity specific BMPs adopted directly from the SWMMEW.

Stormwater Collection and Conveyance System

The City of Spokane storm sewer system consists of catch basins, storm sewer pipes, open channels, culverts, stormwater treatment and flow control facilities, which collectively capture runoff to minimize flooding and convey to a treatment and/or infiltration feature or to an outfall that discharges to the river. The Sewer Maintenance Division of the City's Wastewater Management Department is responsible for managing the storm sewer infrastructure which includes regular inspections and cleaning of components of the system, and maintenance and/or replacement of components, as necessary. BMP documents for inspecting and maintaining the storm sewer system are provided in the citywide Municipal Stormwater O&M Plan.

The Water Department is responsible for maintaining the vegetation in city owned stormwater facilities on city properties, which includes keeping vegetation healthy and cut back, and removing the cuttings from the facility to dispose of appropriately. The green area maintenance crew shall maintain healthy vegetation with regular mowing or trimming during the late spring and summer seasons. BMP documents for landscaping and vegetation management are provided in the citywide Municipal Stormwater O&M Plan.

The citywide Municipal Stormwater O&M Plan documents the frequencies that the storm sewer components shall be inspected, cleaned, and maintenance performed, if necessary, and the department responsible for performing the inspections and maintenance activities. BMPs for managing the physical components and associated vegetation of the storm sewer system, are provided in the O&M Plan.

The city operates a vactor waste decant facility located at 2401 E. Ferry, in Spokane, Washington. Waste generated from cleaning catch basins and other stormwater management and treatment facilities are transferred to the decant facility. The liquids are separated from solids, and conveyed to an evaporation pond, and solids are dried with subsequent transport to a permitted solid waste landfill. Procedures for using the decant facility are incorporated into the citywide Municipal Stormwater O&M Plan and a site Stormwater Pollution Prevention Plan (SWPPP).

Roads, Highways and Parking Lots

The City of Spokane roadway system consists of residential streets, major and minor arterials, highways, and parking lots, all of which accumulate petroleum hydrocarbons, toxic chemicals, heavy metals, salts, and sediment and debris, among others pollutants, which become stormwater pollution during a rain event. Stormwater runoff from roadway and parking lot pavements must be managed appropriately in order to minimize the amount of pollutants that enter local waterways by collecting sediment, debris, and other pollutants before they can enter the stormwater collection and conveyance system.

All City Departments are responsible for maintaining the parking lots and parking areas owned the respective department, which includes good housekeeping, clearing the pavements, removing snow, and protecting stormwater.

The Streets Department is responsible for maintaining the city's streets, roads, and highways in order to ensure they are able to be traveled and safe to use, which includes performing maintenance activities, completing maintenance projects, clearing obstructions, managing snow removal, adding sand and/or deicer, and performing street sweeping to recover accumulated pollutants before they are transported downstream by runoff.

BMP documents on good housekeeping practices, management of bulk materials, application of pesticides, and maintenance of roadways, among others, that are applicable to all city departments are, provided in the citywide Municipal Stormwater O&M Plan.

Vehicle Fleets

Motor vehicles are located at most city department office buildings and work sites. Spills and/or leaks of motor fluids, fuels, and oil from motor vehicles, and the soap and debris inherently contained in vehicle washwaters, have the potential to enter into the stormwater collection and conveyance system during rain and/or snow melt events. The city departments that own city vehicles are responsible for operating, fueling, storing, and washing their city vehicles, as well as maintaining the vehicle parking areas go be protective of stormwater. Maintenance and repair of city vehicles is the responsibility of Fleet Services, and is performed upon request of the vehicle owning departments, as necessary.

All vehicle and equipment washing and maintenance should be performed in self-contained, covered buildings, or in designated wash and/or maintenance areas that are operated to keep washwater and stormwater separated, where washwaters are discharged to the sanitary sewer. Stormwater BMPs applicable to storing, washing, fueling, and maintaining city vehicles are provided in citywide Municipal Stormwater O&M Plan and are applicable to all city departments who own vehicles and/or parking lots or vehicle storage areas.

Maintenance and repair of city owned vehicles and equipment should be performed by Fleet Services at the Central Services Center. The Central Services Center manages stormwater under a site specific SWPPP. Stormwater BMPs pertinent to the maintenance and repair vehicle and equipment are provided in the citywide Municipal Stormwater O&M Plan.

Municipal Buildings

Municipal building maintenance includes cleaning, washing, painting, and landscape maintenance. Potential pollutants from these activities include organic compounds, oil and grease, soap, heavy metals, and particulate matter. Each department is responsible for the maintenance of its municipal buildings in a manner protective of stormwater, which includes implementing stormwater BMPs when performing cleaning and maintenance activities in order to reduce the potential for pollutants to enter the storm sewer, and ultimately the Spokane River. Stormwater BMP documents provided in the citywide Municipal Stormwater O&M Plan, which contains pollution mitigation measures for activities typically performed at municipal buildings that are applicable to all City departments.

Parks and Open Space

The maintenance of parks and open space areas inherently includes fertilization, mowing, pesticide application, and supplemental irrigation, and has significant potential to impact stormwater and ultimately the Spokane River. Potential pollutants from these activities include nutrients (ammonia and phosphorous), chemicals (pesticides), organic debris, and sediment, among others, which must be mitigated with appropriate stormwater BMPs. Stormwater treatment facilities and green stormwater infrastructure are often incorporated into parks and open spaces to provide multi-use facilities for the public. Green areas used to manage stormwater have additional maintenance requirements beyond those for parks and open spaces alone.

The Parks Department is responsible for maintaining city owned parks and many open spaces, and the Water Department is responsible for maintaining the remaining open spaces and stormwater treatment facilities. Stormwater BMPs applicable to the maintenance activities that are performed at parks and open spaces, as well as BMPs for stormwater bioinfiltration facilities, are provided in the citywide Municipal Stormwater O&M Plan as guidance resources for the department responsible for maintenance.

Construction Projects

Public and private construction projects are required to comply with Appendix 1 of the stormwater permit, which details the requirements of seven core elements for the protection of stormwater. In addition, larger construction projects are also required to obtain a project specific Construction General Stormwater Permit from the Department of Ecology.

Construction projects have significant potential to impact stormwater from soil particles derived from exposed soils, and from the materials and chemicals used for the construction project. Stormwater pollution prevention BMPs are required to be implemented for construction projects performed by the city. BMPs for both large and small construction sites are provided in the citywide Municipal Stormwater O&M Plan

Industrial Activities

Industrial activities inherently have a significant potential to impact stormwater with pollutants that are specific to industrial sector. The City of Spokane municipal operations activities that may typically qualify for an industrial stormwater permit are the Northside Landfill and the Waste to Energy Facility.

The Northside Landfill is closed to the public and no longer accepts municipal solid waste for disposal. The Waste to Energy Facility is active, and conducts all waste transfer and processing of materials indoors under a building roof. In lieu of an industrial stormwater permit, the Northside Landfill and the Waste to Energy Facility sites manage stormwater onsite in accordance with a site-specific Stormwater Pollution Prevention Plan (SWPPP), as required for municipal operations by the municipal stormwater permit.

The Northside Landfill and Waste to Energy Facility are each responsible to keep the site-specific SWPPPs for the respective facility current for the activities of its' operations, and continue to perform the responsibilities identified in the SWPPP for the site. In addition to performing the responsibilities of the SWPPP, the Northside Landfill and Waste to Energy Facility should implement the applicable stormwater BMPs that are not provided in the site specific SWPPP, specifically BMPs for good housekeeping and the BMPs for non-routine maintenance activities that are occasionally performed, provided in the citywide Municipal Stormwater O&M Plan.

The Riverside State Park Water Reclamation Facility (RPWRF) is a publicly owned wastewater treatment plant that operates under a National Pollutant Discharge Elimination System (NPDES) permit that is specific to the facility. RPWRF is responsible to operate in accordance with the conditions of its' NPDES permit, and the requirements of the municipal stormwater facility do not regulate the activities at RPWRF.

Staff Training

The city provides training for employees with primary construction, operation, or maintenance job functions likely to impact stormwater quality. Training is typically performed by each department for the applicable personnel, which addresses the importance of protecting water quality, the requirements of the Permit, operation and maintenance requirements, inspection procedures, ways to perform job activities to prevent or minimize impacts to water quality, and procedures for reporting such water quality concerns as potential illicit discharges. The city is currently implementing a training program that is part of the long-term strategy of the implementation of the citywide Municipal Stormwater O&M Plan. Every employee will receive annual training on the O&M Plan by department stormwater focal points, who will have been trained as trainers on the O&M Plan.

2.6.4 Stormwater Pollution Prevention Plans (SWPPPs)

Site specific SWPPPs have been developed for the municipal properties that have material storage areas, heavy equipment storage areas, and outdoor maintenance areas. The SWPPP documents contain a site map, inventories of equipment and materials, a description of the operations activities, spill mitigation procedures, and inspection criteria to identify site conditions water quality protection practices specific to each respective site.

The following properties have had site specific SWPPPs developed for their operations:

Sewer Maintenance Operations
909 E. Sprague Avenue
December 2022

Water Department Operations
914 E. Foothills Drive
December 2022

Vactor Waste Facility
2401 E. Ferry Road
August 2019

Northside Landfill
7202 N. Nine Mile Road
March 2021

Waste to Energy Facility
8125 W. Pilot Drive
December 2022

Central Services Center
915 N. Nelson Street
October 2019

Parks Operations Complex
2304 E. Mallon Street
December 2022

Riverfront Park
610 W. Spokane Falls Boulevard
December 2022

Manito Park
2406 S. Tekoa Street
December 2022

3.0 COMPLIANCE WITH TOTAL MAXIMUM DAILY LOAD

3.1 Total Maximum Daily Load (TMDL)

3.1.1 TMDL Permit Requirements

Section S7 of the permit requires the city to apply the conditions of the Total Maximum Daily Limit (TMDL) applied to the Spokane River and Lake Spokane (Long Lake), which are detailed in Appendix 2 of the permit. Appendix 2 states that the city must:

- Continue to monitor Cochran Basin for phosphorus, ammonia, CBOD, and flow rates in accordance with the Cochran Basin DO TMDL Stormwater Sampling Quality Assurance Project Plan (April 2016),
- Continue to implement the monitoring program throughout the duration of the Eastern Washington Phase II Permit issued on August 1, 2019, and expires on July 31, 2024,
- Enter the results of monitoring for each calendar year into Ecology's EIM database by January 31st of the following year, and
- Evaluate and report the results of the monitoring program on an annual basis with respect the city's share of the stormwater Waste Load Allocations in the TMDL.

3.1.2 Monitoring Cochran Basin Discharges

Stormwater from the Cochran Basin in the northwest portion of the City of Spokane was monitored from 2016 – 2019. Continuous flow rates were recorded, and analyses was performed on stormwater samples for temperature, pH, total suspended solids (TSS), carbonaceous biological oxygen demand (CBOD), phosphorus, ammonia, and polychlorinated biphenyls (PCBs). The city submitted the Cochran Basin Dissolved Oxygen (DO) TMDL Stormwater Monitoring Report to Ecology in June 2020, which presented the monitoring results for the basin for the years 2016 – 2019 in accordance with Appendix 2 of the permit.

The monitoring data indicated that the city exceeded the assumptive modeled Waste Load Allocations in 2016 and 2017 for CBOD, and 2019 for ammonia. Given the WLA exceedances, the Stormwater TMDL Waste Load Reduction Action Plan was submitted to Ecology on August 6, 2020, which detailed the construction of stormwater infrastructure that will ultimately eliminate discharges from Cochran Basin into the river for storms up to the size of the 6-month design storm. In support of treatment for Cochran Basin stormwater runoff, the city evaluated treatment facility design options at properties near or within the basin. The evaluation determined that the preferred design option would be to construct three separate treatment facilities near the current Cochran Basin stormwater outfall. The three bioretention facility locations will be at TJ Meenach Drive and Northwest Boulevard, the Disc Golf Course at Downriver, and the Boat Launch facility near the TJ Meenach Bridge. Flows to each facility will be managed from a single common flow control vault in Cochran Street between Cleveland and Grace Avenues. The flow control vault will distribute prescribed flows to each of the facilities, and will bypass flows in excess of the 6-month design storm to the existing outfall which discharges to the

Spokane River. Construction of the Cochran Basin Stormwater facilities was completed in late 2023, and will be brought online in the summer of 2024.

Monitoring continued to be conducted in 2020 in accordance with the protocols established in the Cochran Basin DO TMDL Stormwater Sampling Quality Assurance Project Plan (QAPP). Six qualifying storm events were monitored and sampled for phosphorus, ammonia, CBOD, and flow rates, among other parameters, in 2020. Monitoring for phosphorus, ammonia, CBOD, and flow rates, among others, will continue to be conducted in accordance with the QAPP through the end of the permit cycle in July 2024. Monitoring results were tabulated and uploaded into Ecology's Environmental Information Management (EIM) database for the data from 2020, 2021, 2022, and 2023.

Upon receipt of comments back from Ecology on the initial Cochran Basin Dissolved Oxygen TMDL Stormwater Monitoring Report, the city will evaluate and create a report of the results of the annual monitoring performed in 2023.

4.0 MONITORING AND ASSESSMENT

4.1 Stormwater Management Program Effectiveness Studies

4.1.1 Effectiveness Study Permit Requirements

Section S8 of the permit requires the city perform and/or participate in effectiveness studies. Section S8.A.1 requires the city to continue to implement the effectiveness studies that are ongoing from 2014-2019 permit cycle in accordance with the applicable Quality Assurance Project Plan (QAPP).

- Section S8.A.1 requires the city to continue to participate in implementation of the eight Ecology-approved studies that were selected pursuant to Section S8.B in the Eastern Washington Phase II Municipal Stormwater Permit (2014-2019) in accordance with the QAPP.
- Section S8.A.2 requires the city to coordinate with other Permittees to plan and begin an additional Stormwater Management Program effectiveness study.
- Section S8.A.2.a requires the city to:
    - Participate in an effectiveness study by serving as the Lead Entity, contributing staff time or other in-kind services, and/or providing funding,
    - Submit to Ecology a brief description of the study, with a list of project participants and each participant's associated role(s) in the study, on or before June 30, 2021,
    - Submit a detailed study design proposal to Ecology on or before September 30, 2022 following the instructions in Eastern Washington Stormwater Effectiveness Studies, Detailed Study Design Proposal & QAPP template (July, 1, 2019, v.1),
    - Submit a completed QAPP on or before July 31, 2023,
    - Begin to conduct the study on or before December 1, 2023, or within three months of receiving Ecology's approval of the QAPP (whichever is later), and
    - Include effectiveness study activities (e.g. assigned duties; participation in meetings, proposal development, project reviews; and study implementation) in the Permittee's updated SWMP.

- Section S8.B.2.1 of the permit requires the city to follow the reporting requirements and timelines in the approved QAPP for the study, including:
    - Entering all applicable data collected for the study into Ecology's Environmental Information Management (EIM) database.
    - Publishing a final report within 60 days with the results of the study and recommended future actions based on the findings.
    - Producing a fact sheet summarizing the findings and recommendations with 90 days of completing the study and sharing it with other Permittees. The target audience for the fact sheet is stormwater managers and local government elected officials.

- Section S8.B.2.2 of the permit requires the city to track assigned duties and record participation in effectiveness study meetings, proposal development, project reviews, and study implementation, and include a summary in the Permittee's Annual Report.

4.1.2 Ongoing City of Spokane Effectiveness Studies

Two effectiveness studies have been initiated by the City of Spokane: 1) Sharp Avenue Sharp Avenue Permeable Pavement Pollutant Removal Efficacy Study, and 2) Garland Avenue Biochar Amended Storm Garden Pollutant Removal Efficacy Study.

Sharp Avenue Sharp Avenue Permeable Pavement

Permeable pavement in the forms of pervious concrete and porous hot mix asphalt was constructed on Sharp Avenue in order to satisfy the effectiveness studies requirements of Section 8 of the permit. The project was funded in part by Ecology grant WQC-2016-Spokan-000016, and construction was completed in 2018. The intent of permeable pavement is to allow for precipitation and stormwater runoff to infiltrate into the subsurface. Therefore, the location of this study is its own catchment area or drainage basin. This drainage basin includes a portion of a minor arterial with Average Daily Traffic (ADT) count of 7,500 that is surrounded by residential and campus land use. The approach of this study is to collect stormwater infiltrated into the permeable pavements and associated sub-base via underdrains and piping conveyance systems to separate monitoring locations.

Two different types of permeable pavements have been constructed on Sharp Avenue: porous hot mix asphalt (HMA) and pervious concrete. Pervious concrete with associated sub-base materials was constructed on Sharp Avenue between the side streets of Lidgerwood Street and Astor Street, where a liner and underdrain were installed on the south side of Sharp Avenue to collect infiltrated stormwater for sampling. Porous HMA with associate sub-base materials was constructed on Sharp Avenue between the side streets of Addison Street and Dakota Street, where a liner and underdrain were installed on the south side of Sharp Avenue between Addison Street and Standard Street to collect infiltrated stormwater for sampling. In order to collect a background stormwater sample to determine the efficacy of pollutant removal by the permeable pavements, catch basins and conveyance piping were installed to the west of the permeable pavement areas in order to collect un-infiltrated stormwater runoff.

A Quality Assurance Program Plan detailing the monitoring to be conducted was submitted to Ecology and approved in 2019. Monitoring began in 2019 and will be ongoing for 5 consecutive years to include observations of the pavements through the changes in season and in response to maintenance activities such as street sweeping and snow removal. Stormwater sampling at 3 distinct locations began in 2019 and the data continues to be evaluated. Infiltration tests at various locations is being performed before and after certain street sweeping events to monitor changes in the permeability of the pavements after sweeping and over time.

The Sharp Ave effectiveness study was ongoing in 2021. Sampling equipment has been installed in manholes on Sharp Ave. between Pearl St. and Dakota St., and sampling and analysis is performed in accordance with the Ecology approved QAPP, as storm events allow, and sampling will be ongoing

through 2024. However, 2021 was a very dry year and there was also equipment malfunctions. Only two qualifying events were sampled in 2021. The equipment has been troubleshot and returned to service and is currently functioning Data will be summarized at the end of the study in the year 2024 and published in accordance with the QAPP. The Sharp Avenue project was summarized in an article in Stormwater Magazine in January 2021 and can be found online at Infiltration Avenue | Storm Water (stormh2o.com). Monitoring continued through 2023, and will be wrapped up in 2024. A final report will be completed for Sharp Avenue Effectiveness study in late 2024 to early 2025.

Garland Avenue Biochar Amended Storm Garden

Storm gardens were installed on Garland Avenue in order to satisfy the effectiveness studies requirements of Section 8 of the permit. The City of Spokane and University of Idaho funded a laboratory research study to develop a soil/biochar design mix for application in the storm gardens. The study used bench-scale laboratory testing of two different types of biochar available in the Spokane Region: 1) wood, and 2) Kentucky bluegrass stubble. The laboratory study conducted at Gonzaga University included bench scale laboratory testing to identify a soil mixture for field application. Results from the study determined that the wood biochar with loamy sand (and no other additives) removed the most pollutants. As a result, it was selected for use in the storm garden field application phase.

The goal of this study is to measure the percent reduction of monitored pollutant concentrations between the influent and effluent at the storm garden. To achieve this, the city will sample the influent (pre-infiltration) and effluent (post-infiltration) stormwater concentrations. Influent sample concentrations will be measured prior to infiltration, and effluent sample concentrations will be measured after infiltration through the storm garden comprised of the amended soil. A Quality Assurance Program Plan detailing the monitoring to be conducted was submitted to Ecology and approved in 2019. Monitoring began in 2019 and will be ongoing for 5 consecutive years to include observations of water quality over time.

The Garland Ave effectiveness study was ongoing in 2021. Monitoring continued through 2022, and continues in 2023. Monitoring equipment has been installed at the corner of Garland Ave and Belt St., and sampling and analysis is performed in accordance with the Ecology approved QAPP, as storm events allow. The Garland Ave effectiveness study will be wrapped up in 2024, and the data will be summarized in late 2024 to early 2025 and published in accordance with the QAPP.

4.1.3 Additional Effectiveness Study (2019–2024 Permit Cycle)

The City of Spokane, the City of Spokane Valley, and Spokane County have partnered to perform a study that will evaluate the treatment performance of two non-vegetated bioretention soil media (BSM) Best Management Practices in Eastern Washington through the TAPE process. The media tested will include the high performance (HP) BSM and the 60 sand to 40 compost (60:40) BSM. A rock mulch will be used to protect the surface from erosion. The City of Spokane was awarded a water quality grant from Ecology to perform the TAPE project in 2023, which will commence in 2024 at a swale test site on Gonzaga University.

An Effectiveness Study will be performed in concert with the TAPE Project and will leverage the TAPE data into the study for comparisons outside the scope of the TAPE Project. The study will be implemented by a consultant on behalf of all municipal partners, and the City of Spokane will be the lead entity. The details for this non-vegetated swale study were provided to Ecology in June 2021. The non-vegetated bioretention soil media effectiveness study was being designed in 2022, and a detailed design study proposal was submitted to Ecology in September 2022. The effectiveness study QAPP was developed and submitted to Ecology in 2023, and the study will be kicked off with the TAPE Project in 2024. Dependent on the results, local stormwater management guidelines may be revised, and municipal management strategies modified.

5.0 REPORTING REQUIREMENTS

5.1 Annual Stormwater Report

5.1.1 Permit Requirements for Reporting

Section S9 of the permit requires the city to submit an annual report electronically using Ecology's WQWebPortal program no later than March 31st each year.

Section S9.A requires the city to keep all records related to the permit for at least five years.

Section S9.B requires the city to make all records related to the permit and this SWMP available to the public at reasonable times during business hours, and provide a copy of the most recent Annual Report to any individual or entity, upon request.

Section S9.C of the permit requires the city to include in the following:

- Stormwater Management Program Plan (SWMP Plan),
- Annual Report form describing the status of implementation of the requirements of the permit for the reporting period,
- Attachments to the Annual Report form including summaries, descriptions, reports, and other information, as required or as applicable, to meet the conditions of this Permit during the reporting period.
- Certification and signature of the report by principal executive officer or ranking elected official, and
- Notification of any annexations, incorporations or jurisdictional boundary changes resulting in an increase or decrease in permit coverage during the reporting period.

5.1.2 City of Spokane Annual Stormwater Report

The city completes the Annual Report and submits by the March 31st deadline on an annual basis. The annual report is submitted using Ecology's WQWebPortal in SecureAccess Washington. Copies of the annual report can be found on the city 's website at www.Spokanestormwater.org.

6.0 ACRONYMS

BMP:	Best Management Practice
CFR:	Code of Federal Regulation
CSO:	Combined Sewer Overflow
CWA:	Clean Water Act
ESC:	Erosion and Sedimentation Control
GIS:	Geographic Information System
LID:	Low Impact Development
MS4:	Municipal Separate Storm Sewer System
NPDES:	National Pollutant Discharge Elimination System
O&M:	Operation and Maintenance
RCW:	Revised Code of Washington
SRSM:	Spokane Regional Stormwater Manual
SMC:	Spokane Municipal Code
SMP:	Stormwater Management Plan
SWMP:	Stormwater Management Program
SWPPP:	Stormwater Pollution Prevention Plan
TMDL:	Total Maximum Daily Load
UIC:	Underground Injection Control
WAC:	Washington Administrative Code

7.0 DEFINITIONS

Best Management Practice: The utilization of methods, techniques and/or products that have been demonstrated to be the most effective and reliable in minimizing environmental impacts.

CWA: The federal Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92-500, as amended in Pub. L. 95-217, Pub. L. 95-576, pub. L. 96-483, and Pub. L 97-117, 33 U.S.C 1251 *et seq*.

Development: Any proposed land use, zoning, or rezoning, comprehensive plan amendment, annexation, subdivision, short subdivision, planned unit development, planned area development, conditional use permit, special use permit, shoreline development permit, or any other property development action permitted or regulated by the Spokane Municipal Code (SMC).

Discharge (v): Disposal, injections, dumping, spilling, pumping, emitting, emptying, leaching or placing of any material so that material enters and exits from the MS4 or from any other publicly owned or operated drainage system that convey storm water. The term includes other verb forms where applicable.

Discharge (n): Runoff, excluding offsite flows, leaving the proposed development through overland flow, built conveyance systems or infiltration facilities.

Discharger: When used in the context of stormwater management and the SMC of 17D.060 and 17D.090, means any person who discharges to the City's MS4 or any other publicly owned or operated drainage system that conveys, manages, or disposes of stormwater flows.

Drainage: (1) The process of removing surplus ground or surface water by artificial means, (2) the manner in which the waters of an area are removed, or (3) the area from which waters are drained; a drainage basin.

Erosion and Sedimentation Control: Any temporary or permanent measures taken to reduce erosion, control siltation and sedimentation, and ensure that sediment-laden water does not leave a site.

Groundwater: Water in a saturated zone or stratum beneath the surface of the land or below a surface water body.

Heavy Equipment Maintenance or Storage Yard: An uncovered area where heavy equipment (e.g. mowers, excavators, dump trucks, backhoes, or bulldozers) is washed or maintained, or where at least five pieces of heavy equipment are stored regularly or on a long term basis.

Illicit Connection(s): Any man-made conveyance connected to the municipal separate storm sewer system (MS4 system) in violation of the National Pollutant Discharge Elimination System (NPDES) permit requirements.

Illicit Discharge: The introduction or discharge of anything into the municipal separate storm sewer system (MS4 system) in violation of the National Pollutant Discharge Elimination System (NPDES) permit requirements.

Impervious Surface: A hard surface area that either prevents or retards the entry of water into the soil mantle. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios,

driveways, parking lots, storage areas, concrete, or surfaces that impede the natural infiltration of stormwater.

Industrial Activity: Manufacturing, processing or raw materials storage areas at an industrial plant. These activities may be required to have Department of Ecology's NPDES permit coverage in accordance with 40 CFR 122.26.

Low Impact Development: A stormwater management and land development strategy applied at the parcel and/or subdivision scale that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic pre-development hydrologic conditions.

Material Storage Facilities: An uncovered area where bulk materials (liquid, solid, granular, etc.) are stored in piles, barrels, tanks, bins, crates, or other means.

Municipal Separate Storm Sewer System (MS4): A conveyance or system of conveyances, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains, (1) owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of wastes, stormwater, or other wastes, including special districts under State Law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States, (2) designed or used for collecting or conveying stormwater, (3) which is not a combined sewer, and (4) which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES): The national program for issuing, modifying, revoking, and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters of the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington State Department of Ecology (Ecology).

NPDES Eastern Washington Phase II Municipal Stormwater Permit (WAR04-6505): A permit issued to the City of Spokane from the Washington State Department of Ecology, granting authority to discharge stormwater into state surface waters. Permit also addresses water quality issues.

Outfall: A point source ad defined by 40 CFR 122.2 at the point where a municipal separate storm sewer discharges to waters of the State and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels, or other conveyances which connect segments of the same stream or other waters of the State and are used to convey waters of the State.

Permittee: Any Primary Permittee, Co-Permittee, or Secondary Permittee unless specifically stated otherwise for a particular section of permit WAR40-6505.

Pollutant: (1) Any substance prohibited or limited by federal, state or local regulations, released or discharged in conjunction with development. (2) Any substance, released or discharged, that causes or contributes to violation of water quality standards.

Runoff: Water that travels across the land surface, or laterally through the ground near the land surface, and discharges to water bodies either directly or through a collection and conveyance system, includes stormwater and water that travels across the land surface from other sources.

Spokane Regional Stormwater Manual: A technical document establishing standards for stormwater design and management to protect water quality, natural drainage systems, and down-gradient properties as urban development occurs.

Stormwater: Any runoff flow occurring during or after any form of natural precipitation, and resulting from such precipitation, including snowmelt. Stormwater further includes any locally accumulating ground or surface waters, even if not directly associated with natural precipitation events, where such waters contribute or have potential to contribute to runoff onto the public right-of-way, public storm or sanitary sewers, or flooding or erosion on public or private property.

Stormwater Management Program (SWMP): A set of actions and activities designed to reduce the discharge of pollutants from the regulated small MS4 to the MEP, and to protect water quality; it comprises the components listed in S5 or S6 of permit WAR04-6505 and any additional actions necessary to meet the requirements of applicable TMDLs.

Total Maximum Daily Load (TMDL): A water cleanup plan. A TMDL is both a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. The calculation includes a margin of safety to ensure that the water body can be used for its state-designated purposes. The calculation also accounts for seasonable variation in water quality. Water quality standards are set by states, territories, and tribes. They identify the uses for each water body—such as drinking water supply, contact recreation (swimming), and aquatic life support (fishing)—and the scientific criteria to support that use. The Clean Water Act, Section 303, establishes the water quality standards and TMDL programs.

8.0 REFERENCES

Brown, E., D. Caraco, and R. Pitt. 2004. *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*. Center for Watershed Protection, Ellicott City, MD. [http://cfpub.epa.gov/npdes/stormwater/menuofbmps/illicit.cfm]

Casco Bay Estuary Partnership (CBEP). *Guidelines and Standard Operating Procedures: For Stormwater Phase II Communities in Maine.* [http://www.cascobay.usm.maine.edu/publications.html].

City of Spokane, City of Spokane Valley, and Spokane County. (2008). *Spokane Regional Stormwater Manual.* http://www.spokanewastewater.org/Docs/Stormwater/Spokane_Regional_Stormwater_Manual.pdf.

Mays, L.W. (Ed.). 2001. Stormwater collection systems design handbook. New York: McGraw-Hill.

Washington State Department of Ecology, AHBL, and HDR. (2013). *Eastern Washington Low Impact Development Guidance Manual.*

Washington State Department of Ecology. (2007). Eastern Washington Phase II Municipal Stormwater Permit.

Washington State Department of Ecology. (2006). *Guidance for UIC Wells that Manage Stormwater.* Publication No. 05-10-067.

Washington State Department of Ecology. (2008). Municipal stormwater general permit: Guidance for cities and counties.

Washington State Department of Ecology. (2004). *Stormwater Management Manual for Eastern Washington.* http://www.ecy.wa.gov/programs/wq/stormwater/tech.html.