

# City of Spokane Stormwater Management Program Plan

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*Prepared by:*

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## 1.0 INTRODUCTION

### 1.1 Purpose

This Stormwater Management Program Plan (Plan) is a requirement of the Eastern Washington Phase II Municipal Stormwater Permit, which was issued to the City of Spokane (City) by the Washington State Department of Ecology (Ecology). Detailed regulatory information is provided in Section 1.3. The purpose of the Plan is to illustrate the programs and practices implemented by the City in order to manage the stormwater within the City's geographic boundary. This plan will serve to 1) demonstrate that stormwater is being managed in a responsible and sound manner by detailing the City's compliance approaches, and 2) act as a vehicle to solicit input from the public with respect to stormwater.

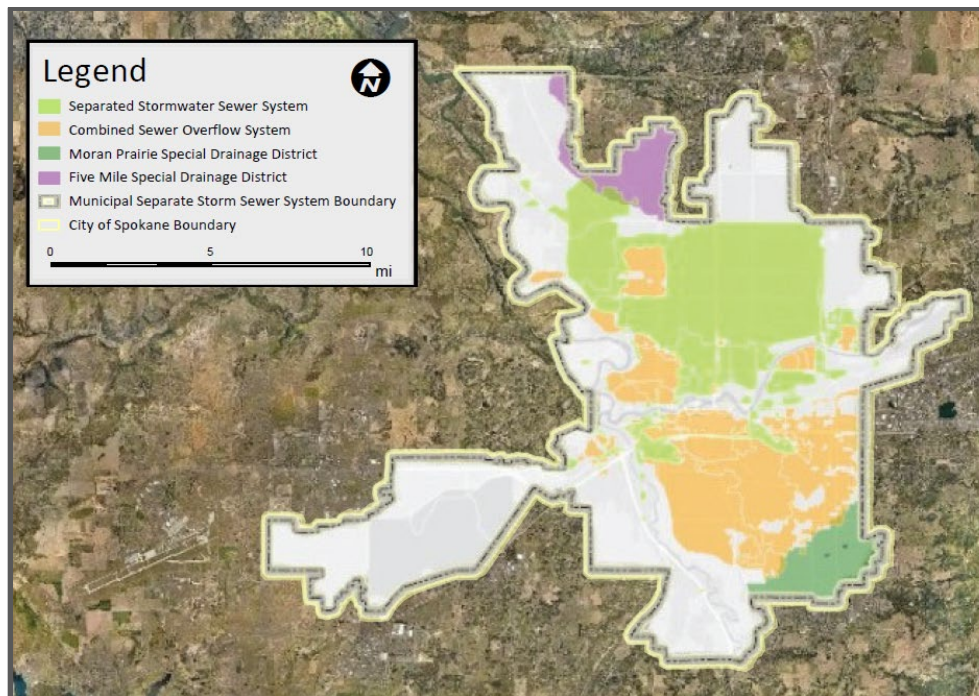
### 1.2 Background

Stormwater that flows over ground surfaces picks up pollutants generated from typical urban activities such as lawn chemicals, automotive fuels and oils, and sediment, among others. Structural Best Management Practices (BMPs) such as swales, bioretention cells, and/or ponds are treatment facilities designed to treat stormwater by flow through vegetation with subsequent infiltration through engineered soils. The treatment facility BMPs are typically designed and implemented in accordance with the Spokane Regional Stormwater Manual (SRSW), and consist of an inlet, temporary storage/treatment/infiltration area, and an outlet. There is a patchwork of green areas within the City that co-locate stormwater treatment facilities with green spaces that promote multiple uses by the public.

The incorporated area that lies within the City's geographic boundary that ultimately conveys stormwater to the river or to the ground is considered a Municipal Separate Storm Sewer System (MS4). Stormwater in the MS4 is regulated by the Eastern Washington Phase II Municipal Stormwater permit. There are several combined sewer overflow (CSO) basins in the City that collect and convey stormwater to the Riverside Park Water Reclamation Facility (RPWRF) for treatment. CSO basins are not part of the MS4, and stormwater in those basins is regulated under a separate permit from the municipal stormwater permit.

The City's stormwater management infrastructure generally consists of catch basins, piping, structural BMPs, and underground injection controls (UICs). Stormwater within the MS4 is managed in localized stormwater treatment facilities, in a separated stormwater sewer system, or in Special Drainage Districts (SDDs). Local treatment facilities are generally comprised of catch basins, BMPs (e.g. swales), and UICs (e.g. drywells). The separated stormwater sewer system consists of catch basins and piping that solely manage stormwater without the utilization of treatment BMPs. SDD's have been established to promote construction of appropriate stormwater facilities in areas that are not suited for use of the typical swale with drywell BMPs due to shallow groundwater, intermittent standing water, or steep slopes where infiltration is impractical. Figure 1 is a map of the City of Spokane that shows the generalized locations of the stormwater infrastructure systems.

**Figure 1. Map of stormwater management areas.**



Stormwater treatment facilities and/or UICs can be found throughout the MS4, with a general exception of the areas identified as CSO basins. The facilities are either public or private, dependent on the ownership of the area the facility serves. The service of a facility is based on basin hydrology and localized geology, and the size of any given treatment facility can range from of a small roadside swale that receives drainage from a parking lot, to that of a large dry pond that treats stormwater for an entire neighborhood. In general, and where possible, a drywell UIC is installed as an overflow component to a treatment BMP and serves as the facility's' outlet. In some cases, where the ground surface type allows, drywell UICs may directly receive stormwater for infiltration. Ecology's UIC program requires that 1) UIC wells are registered with Ecology, 2) new wells are constructed in accordance with the standards provided in the [UIC Guidance Manual](#) and 3) existing wells are assessed to determine if they are a high threat to groundwater, and if so, they must be retrofitted.

In areas where infiltration is impractical, stormwater is sometimes conveyed to evaporation ponds, or directly to the Spokane River. For example, in the north central portion of the City, stormwater is predominantly managed in a separated stormwater sewer system consisting of catch basins and piping that are used to collect and convey stormwater directly to outfalls that discharge to the river.

Stormwater is largely managed in CSO systems on the south side of the City, where geology does not readily allow infiltration and stormwater conveyances are shared with sewer conveyances, creating combined sewer systems. The CSO systems consist of catch basins, piping, and storage tanks that are used to collect and convey the stormwater to RPWRF, where it mixes with sanitary sewer within the infrastructure. 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.

### 1.3 Regulatory

Created in 1972 by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) is a federal requirement that regulates stormwater and wastewater discharges to “Waters of the United States”. 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 west of the Cascade mountains with the Eastern Washington Phase II Municipal Stormwater permit. The permit is specifically a NPDES and State Waste Discharge General Permit for discharges from small municipal separate storm sewers in Eastern Washington.

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 and is set to expire July 31, 2024. The City is authorized to discharge stormwater to surface waters and to groundwaters of the State from the City’s MS4 in accordance with the permit. The entire incorporated area within the City’s geographic boundary is considered the MS4, with exception of CSO basins.

The City is required by permit to develop and implement a Stormwater Management Program (SWMP), that must address the requirements from permit Sections S5, S7, and S8. Section S5 of the permit, *Stormwater Management Program for Cities, Towns, and Counties*, details six compliance components:

- (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 implementation and management approaches of the section S5 permit components, section S7 TMDL requirements, and section S8 monitoring details must be made available to the public with the opportunity to provide input, as well as documented in a written plan (i.e. this SWMP Plan). The SWMP Plan is made available to the public annually via the City’s stormwater website ([Spokanestormwater.org](http://Spokanestormwater.org)) on or before May 1<sup>st</sup> of each year.

## **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 of the permit requires the City to implement an education and outreach (PE&O) program using a multimedia approach, designed to educate the general public, businesses, and engineers/developers, respectively.

- Outreach to the general public should focus on the importance of improving water quality and protecting beneficial uses of waters of the state, potential impacts from stormwater discharges, methods for avoiding and minimizing, reducing, and/or eliminating the adverse impacts of stormwater discharges, and actions individuals can take to improve water quality, including encouraging participation in local environmental stewardship activities and programs.
- Outreach to the businesses should focus on preventing illicit discharges, including what constitutes illicit discharges, the impacts of illicit discharges, promoting the proper management and disposal of waste, management of dumpsters and washwater, and the use of automotive chemicals, hazardous cleaning supplies, carwash soaps, and other hazardous materials.
- Outreach to Engineers/Developer's should focus on technical standards, the development of stormwater site plans and erosion control plans, infiltration and underground injection control criteria, low impact development (LID) and stormwater BMPs for reducing adverse impacts from stormwater runoff from development sites, and municipal code requirements.

In addition to the requirement to implement a PE&O program for target audiences, 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, and use the results to direct ongoing education and outreach resources most effectively, as well as to evaluate changes in adoption of the targeted behaviors.

#### **2.1.2 Public Education and Outreach Program Introduction**

The central mission of the City's PE&O program is to inform the identified target audiences about the value in improving water quality by reducing stormwater pollution. The City's PE&O program has historically had a very strong focus on children in the classroom, but due to the corona virus pandemic, has had to shift focus to the general public using different outreach approaches. When the pandemic is behind us, and children are back in school, the City will reevaluate the PE&O program and potentially reinstate in-person classroom outreach.

Three target audiences are the focus of the education and outreach program, which are the General Public, Local Businesses, and Development contractors. The PE&O program often works in concert with the Public Involvement and Participation (PI&P) permit component, as there are many overlaps of the two components. The PI&P component is discussed in Section 2.1.2.

### ***General Public***

Households of the General Public are the focus of current PE&O efforts given that everyday activities in the urban and residential environment have the potential to impact stormwater, from daily commutes to upkeep of a residence. Census data from 2019 indicate that there are approximately 522,798 residents and 223,079 housing units in the City of Spokane, where. 202,811 of the housing units are households with 2.41 persons per household on average. So, approximately 488,775 residents live in households, where approximately 87% of households in Spokane have internet access. This means that the City could potentially reach 93% of the population by targeting the general population that reside in households, who largely have the ability to follow up online with information delivered in a utility bill.

Two objectives of the PE&O permit component for the General Public include:

- *Inform* the general public about the importance of improving water quality by minimizing eliminating adverse storm water discharges to the river and aquifer.
- *Measure* an increase in the knowledge of stormwater management following outreach.

Outreach media for the General Public include neighborhood council meetings, utility bill inserts, and online resources such as the City's website and social media. Structural Best Management Practices was identified as an area with potential for measured improvement in the public's understanding, specifically the purpose, function, and maintenance responsibilities with respect to swales.

### ***Local Businesses***

Food waste, grease, cleaning fluids, mop water and trash from restaurant operations often make their way into Spokane water bodies. The City has established a working partnership with the SRHD, who receives Ecology funding for the Pollution Prevention program, where the SRHD provides stormwater messaging regarding illicit discharges during their voluntary site inspections. The SRHD focused on the restaurant sector as the target audience in 2020 with a focus on Fats, Oils, and Grease. The SRHD conducted 12 screening visits, 73 initial visits, and 20 follow-up visits, for a total of 105 visits in all.

Additionally, the City's wastewater pretreatment program educates businesses and prevent illicit discharges. The pretreatment program surveys businesses that prior to issuing a permit to discharge to sanitary sewer to determine whether they have the potential to discharge anything other than domestic wastewater. The information gathered by the survey is used to determine what the business responsibilities are, and the interaction is used to by encourage recycling oil and grease, cleaning dumpster areas, improving maintenance operations, managing spills, and handling toxic chemicals

### ***Development Contractors***

Each year, hundreds of building permits may be granted in Spokane. This presents several opportunities for cement wash, sediment, vehicle fluids, dust and hazardous debris found from construction sites to worsen stormwater discharges. The City provides stormwater guidance documents during pre-development meetings prior to construction contractors and engineers to provide education on managing stormwater. The City encourages construction BMPs such as preventing soil erosion, sweeping sidewalks, having places for vehicle mud removal, and developing vegetative cover on sites, and City inspectors provide guidance on how to best store materials, recycle waste, prevent erosion during construction, and clean up the work site during site inspections of the activity.

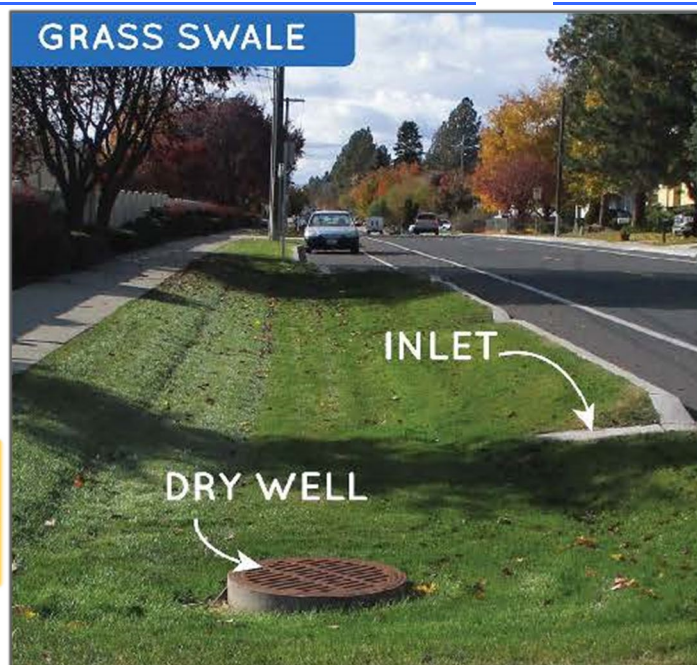


### 2.1.2.1 Elements of the PE&O Program

**Integrated Clean Water Plan:** The City of Spokane developed the [Integrated Clean Water Plan](#) to prioritize stormwater and wastewater projects based on positive environmental impact to the Spokane River. During development of the plan, the City endeavored to open and maintain communication channels with the public, stakeholders, and regulatory agencies. A communications action plan was developed and implemented, employing various approaches such as in-person presentations, meetings, local media, utility bill inserts, use of internet resources and social media to reach a wide audience. Details of the public outreach effort can be found in the public involvement chapter of the Integrated Clean Water Plan. The Integrated Clean Water Plan can be found within the City's Public Works and Utilities webpages in the Wastewater section at the URL <https://my.spokanecity.org/publicworks/wastewater/integrated-plan/>.



**Neighborhood Council Meetings:** The Wastewater Management Department attended neighborhood council meetings throughout the city in 2020 to provide information on pollution prevention and BMP maintenance. Two brochures titled [Managing Stormwater - A Residential Guide](#) and [Stormwater Pollution Guide](#) were created as outreach materials and were provided at the neighborhood council meetings. Several in person meetings were attended, and due to the pandemic, virtual meetings were attended. Nine neighborhood meetings were attended in total in 2020. The goal into 2021 is to continue is to attend virtual neighborhood council meetings as they become available and give a brief presentation on select topics, hand out



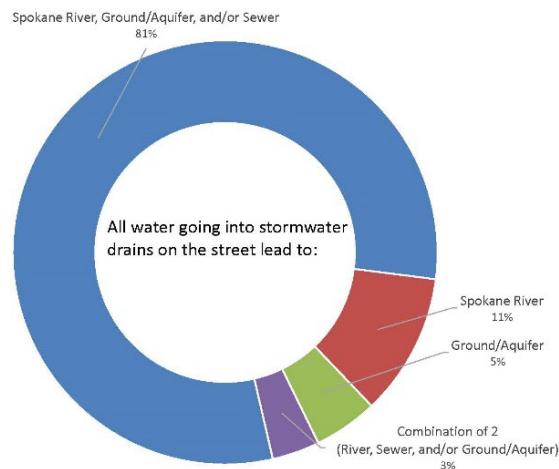
**TRIMMING, THINNING & MOWING**  
Keeps vegetation healthy & provides space for stormwater

**REMOVING SEDIMENT & DEBRIS**  
Promotes infiltration while keeping vegetation healthy

**CLEARING BLOCKED INLETS**  
allows stormwater to enter swale

brochures that provide the message in greater detail, answer any questions the community might have, and reiterate our availability to address any concerns they may have.

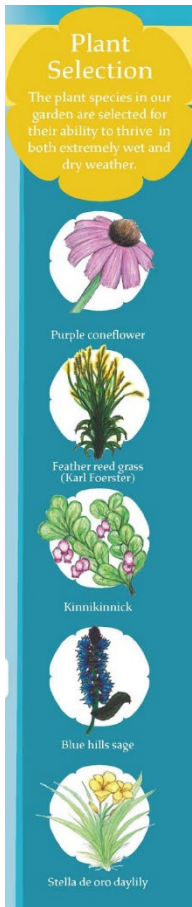
**Stormwater Survey:** Homeowners and renters within the general public were identified as being conducive for the measurement of the level of understanding of stormwater impacts and management approaches.



A stormwater survey was developed and provided to all ratepayers in the City of Spokane geographic boundary in order to obtain some knowledge on the baseline level of understanding of stormwater that the community retains. Mailers were put into each of the utility bills that went out in May 2020 offering a \$5.00 rate rebate for the first 2000 households that complete the survey. The survey had nearly 1400 respondents, and the information received from the survey is being used to tailor outreach for the year 2020 and into the year 2021.

**Storm Garden Outreach:** Storm garden locations were planned in the Shadle Park area to reduce stormwater flows to the Spokane River. The City partnered with the Lands Council, who performed public outreach and education throughout the basin. In 2014, the Lands Council went door-to-door, visiting nearly 1600 houses to find homeowners who would be interested in having a storm garden on or in front of their property. Nearly 95% of respondents liked the idea, indicating that storm gardens would be generally well-accepted in the community. While this outreach was performed in a combined sewer basin, the subject matter is applicable city-wide. Construction of three adjacent storm gardens on Garland Avenue began in fall 2014 and were completed with plantings in spring 2015. The storm gardens are currently monitored for water quality, serve as a public education tool, and satisfy a permit requirement to perform an effectiveness study. The storm gardens will be monitored until 2022, and a final report of the study that summarizes the results will be written. Additional storm gardens may be constructed in this area in the future dependent on the water quality analytical results obtained, and as funding allows.

**Stormwater Education Partnerships:** The City has partnered with The Lands Council and Spokane County Stormwater Utility to provide collaborative stormwater outreach education to two area schools: St. George’s Preparatory School and Spokane Public Montessori School. This stormwater outreach education partnership effort includes classroom lessons, field trips, and storm garden design and construction. In 2019, the yearlong curriculum was provided to students through twelve days of which culminates with a student designed, constructed, and maintained stormgarden on each respective campus. The curriculum included STEM-based (science, technology, engineering, and mathematics) practical, hands-on curriculum on stormwater management through green infrastructure and low impact development (LID) with particular emphasis on the Spokane River, watershed, and aquifer.



Also included in the curriculum was a field trip to Upriver Dam, the Spokane County Water Reclamation Facility/Water Resources Center, and W. Broadway SURGE Project. The partnership with the Lands Council and Spokane County Stormwater Utility will be reevaluated when the pandemic ends.

**Rain Barrel Workshops:** In recent years, the City partnered with the Spokane County Conservation District and Spokane County Utility District to host “do it yourself” rain barrel workshops. The goal was to educate the community regarding how rain barrels could reduce stormwater pollution. Furthermore, these workshops educated the community regarding how to construct and utilize rain barrels. Also, retrofit kits that are recycled, food-grade barrels were provided to participants. This effort will be reevaluated for upcoming years when the pandemic ends.

**Cable 5:** Cable 5 rotated stormwater pollution prevention tips on the reader board. A different seasonally relevant tip was used each week. An EPA video entitled “After the Storm” was 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 videos as filler between scheduled programming.

**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. The video is currently aired on Cable 5 in continuous rotation on its air.

**Website:** The internet domain [Spokanestormwater.org](http://Spokanestormwater.org) was created to direct people to the City’s stormwater website in the Public Works and Utilities webpages section, where stormwater information has been elevated one level to its own page on the new website. Web users seeking stormwater information are now able to find it more quickly. Upon the reissuance of the 2014-2019 stormwater permit, the City published an article titled ‘Managing stormwater protecting the Spokane River’, which is still available online. The article described the Permit and the City’s efforts to improve water quality in the river. The website is updated as necessary as additional articles are written and activities occur.



In the year 2020 the City updated the Green Infrastructure webpage within the stormwater webpages, to discuss structural BMPs, Low Impact Development (LID) and Green Stormwater Infrastructure (GSI). The webpage provides links to the Eastern Washington LID manual and



Spokane Regional Stormwater Manual (SRSW) for reference. Also, a webpage was added that provides information to the public on the Cochran/Downriver Stormwater Management Facilities project which is currently being designed and scheduled to begin construction in 2021.

The City created three videos specific to stormwater in 2020 that were tailored to provide information on [Spokane Stormwater](#), [Hazels Creek](#) and [Green Area Maintenance](#). Links to the videos can be found at [Spokanestormwater.org](#).

**Public Events:** The City participates in community events when applicable to educate the public on the importance of proper stormwater management. In recent years the City would participate in approximately nine community events including elementary science nights, fairs, and farmer's markets to distribute educational materials about stormwater pollution prevention and facilitating activities on water wise practices. Educational materials provided would include a Don't Drip & Drive Leak Guide, a Visual Oil Leak Coupon/Flyer, and Storm Drain Dan Activity Books. Education activities would include a Stormwater Bean-Bag Toss and a Storm Drain to Stream Maze activity. In 2020 due to the pandemic, no public events were attended. This element will be reevaluated after the pandemic, and may be reestablished in upcoming years

**Presentations:** Various professional and educational groups are interested in learning about the City's stormwater management system and its efforts to prevent and reduce stormwater pollution. Presentations were given to the following groups or conferences in 2020: Presentations are open to the public to attend, and are anticipated to continue to be provided, as relevant, in the current and upcoming years.

- Stormcon: Sharp Avenue Permeable Pavement
- PNWCA: Green Area Maintenance Panel

**Publications:** Integrated Capital Management and Wastewater Management Department personnel co-authored an article in the January 2021 edition of Stormwater Magazine titled [Infiltration Avenue](#). The article showcases The Sharp Avenue permeable pavement study by discussing the integrated approach to design, collaborative efforts with the Gonzaga University, and goes into the data and information collected as part of the study. The Infiltration Avenue article can be found on the [Stormwater Magazine webpage](#).



**Hazels Creek Regional Stormwater Facility and LID Demonstration Site:** In Fall of 2012, construction was completed and the facility began receiving stormwater from properties within a specified up-gradient boundary. The site also contains publicly used walking trails. This system was utilized as an LID educational opportunity, hosting various LID demonstrations throughout the trail system. Visitors can download a brochure from the Public Works & Utilities website and take a self-guided tour. An informational video showcasing Hazels Creek was created in 2020 to reinvigorate curiosity and interest from the public and is provided on the [Hazels Creek](#) link at [Spokanestormwater.org](#).

**Low Impact Development/Green Infrastructure Educational Materials:** A brochure was developed that describes the benefits of LID, recent projects completed by the City, and how to find more information.



Also it includes additional detail about different LID practices and illustrates an example LID design. Brochures are provided in each building permit application package obtained at the City Hall Development Services Center. The brochure can be found on the [Green Infrastructure webpage](http://GreenInfrastructurewebpage), linked at [Spokanestormwater.org](http://Spokanestormwater.org).

**Stormwater Permitting Educational 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 address 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](http://SpokaneRiverForumstormwaterwebsite).

**Fix Car Leaks Don' Drip and Drive Promotion:** The City has partnered with the local community college, and other organizations, for a free auto leaks workshop to help the public learn about their car and make sound choices for our region. Utility billing inserts have been used as a method of advertisement to over 70,000 customers. The free inspection and monetary savings coupon are still valid at participating shops. More detailed information and a list of participating vendors is available at [Fixcarleaks.org](http://Fixcarleaks.org).

**GET A FREE VISUAL OIL LEAK INSPECTION**  
and discount for repairs

**PARTICIPATING SHOPS**

Bob's Service Center	618 W Francis	509-467-5493
Divine's Auto Repair	203 W Third Ave	509-455-8622
Divine's Auto Repair	125 E Westley	509-463-3753
Divine's Auto Repair	3725 S. Grand	509-747-4457
Five-Mile Auto Center	6606 N. Ash	509-326-4401
Hopkins Automotive	3018 N Nevada	509-463-3943
Indian Trail Service Center	3333 W Indian Trail Rd.	509-326-0342
Jay's Automotive	3014 E. 55th Ave. #5	509-463-2200
Martin's on Monroe	2520 N Monroe St.	509-325-4568
Mechanics Place	1126 W 2nd	509-747-5371
Mechanics Place Valley	523 N Pines Rd.	509-321-7243
Mechanics Place Vernon	2925 S. Mt. Vernon St.	509-534-0360
Perfection Tire Co.	404 E 2nd Ave	509-749-1164
Perfection Tire Co.	9402 N. Division St	509-465-0110
Auto Craft	16911 E Sprague	509-924-6738
Divine's Auto Repair	1520 N. Pines	509-922-3911
Jay's Service Center	15202 E Sprague	509-926-5393
Jay's Automotive	8517 E Sprague Ave.	509-927-9034
Walker's Automotive	19029 E Appleway Ave.	509-922-0468

**FixCarLeaks.org**

Dr. Drip says: Don't get stranded on your commute or road trip. Fix leaks to keep your car healthy!

**Is that leak harming more than your car?**

Prevent stormwater pollution by getting a **FREE VISUAL OIL LEAK INSPECTION** and discount for repairs.

To find a shop near you, go to: **FixCarLeaks.org**

DEPARTMENT OF ECOLOGY  
ASA  
ASB  
ASD  
ASD

**\$50 off leak repairs**

**Check Your Car For Leaks At Home**

*Please Note: This is not a replacement for a professional inspection and may not detect all leaks.*

- Find a piece of cardboard that is about 3 feet by 6 feet long.
- Place the cardboard on the ground after your car has been driven for at least 15 minutes.
- Leave the cardboard under your car for approximately 20 minutes.
- Pull the cardboard out and look for drips.

Check your car for leaks once a month.

If you find a leak, fix it right away.

Soak up oil in your driveway with kitty litter, sweep it up and put it in the trash.

**Where is your leak?**

ENGINE OIL  
TRANSMISSION FLUID  
POWER STEERING FLUID  
BRAKE FLUID  
COOLANT  
WATER

FRONT ENGINE  
NEAR WHEELS  
BACK/EXHAUST

Receive a **FREE** visual leak inspection and save up to **\$50 off leak repairs** at a participating shop at [FixCarLeaks.org](http://FixCarLeaks.org).

**Is that leak harming more than your car?**

Don't Drip & Drive

When your car leaks oil and other fluids, it is often a sign of a larger problem. If you ignore leaks they can lead to major engine damage and a more expensive repair bill.

Oil and other vehicle fluids are toxic. Fix your leak so that vehicle fluids don't end up in puddles where kids and pets like to play!

Find out more at **FixCarLeaks.org**

DEPARTMENT OF ECOLOGY  
ASA  
ASB  
ASD  
ASD

**Educational Interactive Display:** The City designed and fabricated an educational display that is hosted at the Downtown Spokane Library. One side of the display wall is an interactive side that uses magnets to allow for the public to construct their own stormwater system. The goal is to connect the stormwater to a treatment facility. The other side of the wall promotes stormwater pollution prevention information.



**Promotional Campaign:** The City partnered with the Spokane Indians Baseball Club to champion a campaign 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 included prints, radio, television, billboards, social media, and promotion during live baseball games, and the effort has been dubbed the [Redband Rally Campaign](#), the promotion gets its name from the native Redband Trout. Due to the pandemic the campaign was temporarily suspended during 2020, but is anticipated to resume in the near future.

## 2.2 Public Involvement and Participation

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

- Provide ongoing opportunities for public involvement through advisory councils, watershed committees, participation in developing rate-structures, stewardship programs, environmental activities or other similar activities. Develop and implement a process for consideration of public comments on the SWMP, including required ordinances and regulatory mechanisms.
- Make the SWMP document and the Annual Report available to the public by posting it on the City website.

### 2.2.2 Public Involvement and Participation Opportunities

The City posts this plan on its website at [Spokanestormwater.org](http://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@spokane.org](mailto:jgeorge@spokane.org). The City will solicit comments from the public online for a 30-day period when this plan is posted in this, and upcoming years.

The City provides opportunities for the public to participate in educational activities designed to support positive impacts to managing stormwater. The City also provides opportunities for the public to participate in the decision-making processes inherent with City business. Decision-making processes for which the public may be involved are discussed below in Section 2.2.2.1 and Educational Public Participation activities are discussed in Section 2.2.2.2 of this plan.

The City's stormwater Public Involvement and Participation efforts have the following objectives:



- Involve the Public in decision making processes
- Encourage and support behavioral changes in reducing individual's stormwater pollution contributions
- Actively seek new ways to get the public involved and participating in improving Spokane waterways

#### **2.2.2.1 Public Participation in Decision-Making Processes**

Opportunities public involvement and participation in the City's decision making processes exist via open meetings of the City Council; Public Infrastructure, Environment, and Sustainability Committee; and Planning Commission, which occur on a weekly basis. Information on how to participate at City Council meetings is provided on the City's [City Council website](#). City Council meeting agendas are posted on the website prior to the occurrence of the meeting. [The Gazette](#) is a City publication that publishes the meeting minutes from the City Council, as well as all call for bids, which include stormwater management, infrastructure, and funding issues and projects. Examples of opportunities for public involvement include discussions at Council on rate structures, stormwater mitigation grants and projects; stormwater infrastructure improvements; joint planning of stormwater management plans; and, the creation or revisions of ordinances, among others. Public involvement is a necessary component of the ordinance process, and involvement of any interested member of the public is encouraged through workshops, open houses and a formal public comment period. Examples of ordinances relevant to stormwater passed prior to 2020 include Spokane Municipal Code (SMC) Sections [17D.060](#) Stormwater Facilities, [17D.090](#) Erosion and Sediment Control, and [Section 07.06.172](#) Preference for Products and Products in Packaging That Does Not Contain Polychlorinated Biphenyls.

In 2020, the following stormwater discussion items and ordinances were presented at Council for discussion and consent:

##### January 29, 2020

Consent Items: Ecology Stormwater Grants Applications

Stormwater management plans for the West Plains that is currently in the data collection and regional investigation phase for the West Plains, and respective funding were presented to Council for discussion.

##### February 5, 2020

Notice for Bids: Post Street Bridge Replacement Engineering Services File No. 2017105, Stormwater lift station and storm sewer main.

##### February 26, 2020

Notice for Bids: Sprague Avenue Rebuild 2B Engineering Services File No. 2019113, 1302 linear feet of 24" Stormwater pipe.

##### March 11, 2020

Priority strategy: West Plains PDA Update on Repurposing Public Property to Stimulate Private Investment was presented to Council for discussion.

April 22, 2020

Consultant Agreement: GHD, Inc. (Lynwood, WA) for development of a 20-year Capital Facilities Plan Multi Objective Decision Analysis for Water, Sewer, and Stormwater from April 1, 2020, through December 31, 2020—\$74,000. (OPR 2020-0373 / ENG 2017091)

Priority strategy: West Plains PDA Update on Repurposing Public Property to Stimulate Private Investment was presented to Council for discussion.

Priority Strategy: Parks water conservation project update on the Esmeralda golf course automated sprinkler system and underground piping for future stormwater was presented to Council for discussion.

July 15, 2020

Six-Year Wastewater Program: Integrated Clean Water Plan; Wastewater and Stormwater Collection System SCADA Master Plan—\$298,893.35. (OPR 2020-0548 / ENG 2017125) was provided to Council for discussion.

July 29, 2020

Consent item: S. Gorge Trail Phase 2 & CSO 22b Stormwater Separation Project (Engineering Services)

October 7, 2020

Consent item: Wastewater Collections SCADA (Integrated Capital Management) 6. Northwest Spokane Stormwater Study RFP (Integrated Capital Management)

October 14, 2020

Contract Renewal: ALS Canada LTD. (Burlington, Ontario, CA) to provide services for specialized testing of wastewater and stormwater, which fulfills the Department of Ecology issued discharge permit—\$55,930 (plus tax). (OPR 2017-0770 / RFP 4372-17)

NOTICE OF PUBLIC HEARING: ON PROPOSED FINANCING OF PUBLIC IMPROVEMENTS WITH COMMUNITY REVITALIZATION FINANCING Pursuant to Ordinance No. C34032. The City proposes to extend the apportionment period and revise the description of the public improvements for an increment area located on the north bank of the Spokane River Gorge directly north of and adjacent to the Central Business District and south of the West Central neighborhood in accordance with the provisions of Chapter 39.89 RCW

November 4, 2020

Notice for Bids: STORMWATER MONITORING WITH EQUIPMENT OPERATING AND MAINTENANCE SERVICES City of Spokane Integrated Capital Management RFP #5351-20

Hearing for the Amendment to Section 2 of Ordinance No. C34032

November 18, 2020

Consulting Contract with Osborn Consulting Engineers to perform the stormwater study—\$187,565. (OPR 2020-0799)



ORDINANCE NO. C35961 amending SMC sections 13.03A.0101 through 13.03A.1204, of the Spokane Municipal Code; adopting new sections 13.03A.0200, 13.03A.0412, and 13.03A.1106 to Chapter 13.03A SMC; repealing sections SMC 13.03A.1105, 13.03A.1501, and 13.03A.1502; and setting an effective date relating to the pretreatment requirements

November 25, 2020

Consent item: Contract renewal for specialized testing of wastewater and stormwater, which fulfills the Department of Ecology issued discharge permit requirements (RPWRF) in accordance with ordinance 13.03A.0303 Discharge Permit – Extra jurisdictional Users

December 9, 2020

Contract Renewal: Rogue Heart Media, Inc. (Spokane, WA) for Water Stewardship and Stormwater Media Services—not to exceed \$100,000 (incl. tax). (OPR 2019-0238 / BID 4100-354-2019)

Consulting Contract: Jacobs Engineering Group (Spokane, WA) to perform a risk assessment study of the City's Wastewater and Stormwater Systems—\$73,458 (excl. tax if applicable). (OPR 2020-0865 / ENG 2017090)

ORDINANCE NO. C35962 repealing SMC Sections 13.03.1014, 13.03.1016 relating to the rates of Wastewater and Sewer public utilities and services, amending SMC sections 13.03.1004, 13.03.1006, 13.03.1008, 13.03.1010, 13.03.1012, 13.03.1018, 13.03.1020, and 13.03.1022; to chapter 13.03 of the Spokane Municipal Code; and setting an effective date.

ORDINANCE NO. C35983 AN ORDINANCE amending SMC sections 17A.020.010, 17A.020.020, 17A.020.030, 17A.020.130, 17A.020.160, 17A.020.190 and 17A.020.200 of the Spokane Municipal Code relating to Design Standards.

December 30, 2020

Consulting Contract with Osborn Consulting Engineers for NW Spokane Stormwater Study as identified in the City's six year plan presented to Council for discussion.

The City anticipates several stormwater related discussions at council similar to the aforementioned in the year 2021.

### 2.2.2.2 Public Participation Activities in Educational Activities

**St. Georges Stormwater Gardens:** St. George's Preparatory School and the Spokane Public Montessori School participated in an outreach education partnership effort with the Lands Council and Spokane County Stormwater Utility, which included classroom lessons, field trips, and storm garden design and construction. This effort is discussed in detail in Section 2.1.2.1 of the Public Education and Outreach section of this plan. The partnership with the Lands Council and Spokane County Stormwater Utility will be reevaluated when the pandemic ends.

**Manhole Cover Art Contest:** The Spokane Arts Commission partnered with the WWM Department to congratulate a winner of the student-designed manhole cover contest. Soryanna Taylor, a 13-year-old student from Sacajawea Middle School, is the winner of the 2020 Student Designed Wastewater Access Cover Art Contest. Soryanna's design features references to the Spokane River, fish, and the sun. The City installs or replaces 100 to 200 wastewater access covers a year. There is no extra cost to the City to have the covers sport a different design. Wastewater access covers can last 50 years or more so the winning artist will help beautify our community for many years.



In 2015, Seth Tibbs, a student at Chase Middle School, was selected from over 600 entries by members of the staff of Wastewater Management, Spokane Arts Commission, and community representatives. Fifty newly designed manhole covers were strategically installed throughout Spokane in 2016, and are currently in place.

In 2010, the Spokane Arts Commission and the WWM Department congratulated Clair Mattes, a seventh grader at Shaw Middle School who was a winner of the student designed manhole cover content. Claire's manhole cover design was selected from over 600 entries by members of the staff of WWM, Spokane Arts Commission, and community representatives.



**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. The purpose of IWAC is to work together to maintain and/or enhance water quality and quantity for present and future generations by developing management strategies, which benefit the Spokane Valley Rathdrum Prairie Aquifer and the Spokane River region. IWAC will facilitate regional dialogues and studies that result in recommendations for policy directions and shared stewardship of the Aquifer and Spokane River in a collaborative manner.

## 2.3 Illicit Discharge Detection & Elimination (IDDE)

### 2.3.1 IDDE Permit Requirements (S5.B.3)

- Maintain and periodically update a map of the MS4 to include known outfalls and known discharge points, receiving waters, other than ground, areas served by the MS4 that discharge to ground., permanent stormwater facilities owned or operated by the Permittee, all connections to the MS4 authorized or approved by the Permittee 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 Permittee and other municipalities or public entities.
- Implement an ordinance or other regulatory mechanism that prohibits illicit discharges and authorizes enforcement actions, including on private property.
- Implement 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.
- Implement an ongoing program designed to detect and identify illicit discharges and illicit connections into the Permittee's MS4. The program shall include the following components:
  - Procedures for conducting investigations of the Permittee's MS4, including field screening to identify potential sources.
  - Procedures for locating priority areas likely to have illicit discharges, including, at a minimum: evaluating land uses and associated business/industrial activities present; areas where complaints have been registered in the past; and areas with storage of large quantities of materials that could result in illicit discharges, including spills.
  - Field assessments of at least 12% of the MS4 per year to include outfalls, discharge points, or facilities serving priority areas during dry weather in order to verify locations and detect illicit discharges.
- Publicize a hotline for reporting of spills or other illicit discharges. Track illicit discharge reports and actions taken in response to calls.
- Implement an ongoing program to detect and remove illicit connections, discharges, and improper disposal, including any spills not under the purview of another responding authority, into municipal separate storm sewers (MS4s) owned or operated by the Permittee.
- Implement procedures for IDDE program evaluation and assessment, including tracking the number and type of spills or illicit discharges identified, inspections made and any feedback received from public education efforts.
- Provide appropriate training to staff on identification and reporting of illicit discharges.

### 2.3.2 IDDE Introduction

The City of Spokane's IDDE program is administered by the Wastewater Management Department. In addition to meeting the requirements established by Ecology, this describes how the City uses local knowledge and available resources in systematically identifying, responding, and removing illicit discharges. The City also works to inform the public and municipal employees to take proactive measures in reducing, if not avoiding, illicit discharges. The City aims to develop and continually improve our IDDE program in order to benefit and contribute to other community-wide water resources-based programs, such as public education, stormwater management, stream restoration, and pollution prevention. To do this the City has partnered with the Spokane Regional Health District and Washington Department of Ecology to respond, mitigate, and educate on illicit discharges as they are reported.

### 2.3.3 The Basics of Illicit Discharge

Federal regulations (40 CFR 122.26(b) (2)) define *illicit discharge* as "... any discharge to an MS4 that is not composed entirely of stormwater..." with some exceptions. These exceptions include discharges from NPDES-permitted industrial sources and discharges from fire-fighting activities. Illicit discharges are considered "illicit" because MS4s are not designed to accept, process, or discharge such non-stormwater wastewaters. Municipalities can deal successfully with illicit non-stormwater discharges by having adequate information and knowledge of the public drainage system in the form of maps, legal prohibition of such discharges, and having clear defined roles and expectations.

In many communities, the municipal separate storm drain systems discharge to receiving waters without treatment. Therefore, it is particularly important that only stormwater is discharged and to ensure that illicit discharges are eliminated from the system. The permit requires an IDDE program be developed by



the permittees. Several excellent IDDE guidance manuals were reviewed and referenced in developing our own program. See the references list located at the end of this document.

**IF YOU SEE AN  
ILLICIT DISCHARGE,  
PLEASE CALL  
625-7900**

**FOR MORE INFORMATION, VISIT:  
SpokaneStormwater.org**

**Table 1. Common Stormwater Pollutants, Sources, and Impacts**

<b>Pollutant</b>	<b>Sources</b>	<b>Impacts</b>
<b>Sediment</b>	Construction Sites Winter sand and salt applications Vehicle/boat washing	Destruction of plant and fish habitat Transportation of attached oils, nutrients and other pollutants Increased maintenance costs
<b>Nutrients (phosphorus, nitrogen)</b>	Fertilizers Livestock, bird and pet waste Vehicle/boat washing Decaying grass and leaves Leaking trash containers	Nuisance or toxic algal blooms Hypoxia/anoxia (low levels of dissolved oxygen which can kill aquatic organisms)
<b>Hydrocarbons</b>	Vehicle and equipment leaks Vehicle and equipment emissions Pesticides Fuel spills Equipment cleaning Improper fuel storage and disposal	Toxic at low levels
<b>Pathogens</b>	Livestock, bird and pet waste	Risk to human health leading to closure of swimming areas
<b>Toxic Chemicals (heavy metals, PAHs, pesticides, dioxins, PCBs)</b>	Vehicle wear Spills and leaks Illegal discharges Sediments Pesticide application Deicing and dust control	Toxic at low levels
<b>Debris/Litter</b>	Improper waste disposal and storage Fishing gear Leaking trash containers	Potential risk to human and aquatic life

Source: modified from (CBEP)

### 2.3.4 Mapping the System (S5.B.3.a)

The first major component of the City's illicit discharge program is mapping the municipal stormwater drainage system. Maintaining an accurate and up-to-date map of the stormwater drainage system enables the City to track and locate the source(s) of suspected illicit discharges. The Permit outlines minimum information that should be included in the City's municipal storm sewer system map:

- 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 Permittee,
- All connections to the MS4 authorized or approved by the Permittee
- All known connections from the MS4 to a privately owned stormwater system, and
- Connections between the MS4 owned and operated by the Permittee and other municipalities or public entities.

The Wastewater Management Department completed a map of the stormwater MS4 utilizing the Global Information System (GIS) by Esri computer software program. GIS layers are updated periodically to reflect changes to the system and additional information.

### **2.3.5 IDDE Ordinance (S5.B.3.b)**

The City adopted Ordinance ORD C34564 Section 17. Section 17D.060.190 addresses illicit discharges in accordance with requirements in the Permit. The ordinance defines allowable discharges to the MS4, unlawful discharges, and enforcement actions. The ordinance is available on the Spokane Municipal Code website.

### **2.3.6 IDDE Program (S5.B.3.c)**

The Wastewater Management department incorporates field inspections with routine maintenance activities, where stormwater assets are inspected on a recurring frequency to ensure compliance with the permit. Also, the City responds to Environmental Report Tracking System (ERTS) complaints submitted to Ecology, and opportunities that Regional Health identifies while encouraging pollution prevention. The Wastewater Management department maintains a database of the City's stormwater assets that is continually updated as needed to present the current status of public stormwater assets.

#### **2.3.6.1 Priority Areas**

IDDE priority investigation areas have been defined according to the receiving water body, past illicit discharge complaints, land use and known sources of contamination. The Spokane River flows through the City, and is the main priority water body. Review of past illicit discharge complaints do not indicate that any one sub-basin within the MS4 had substantially more complaints than another. Figure 2 illustrates a map of zoning and MS4 sub-basins. Industrial zoning areas are assumed to have the greatest potential for storage of large quantities of materials which may potentially produce illicit discharges. Only one stormwater basin within the City, the Union Basin, is located in a heavy industrial area. The Union Basin is located between I-90 and the Spokane River, east of the Hamilton Street Bridge as shown in Figure 2, and is located in heavy industrial and light industrial zoned areas.

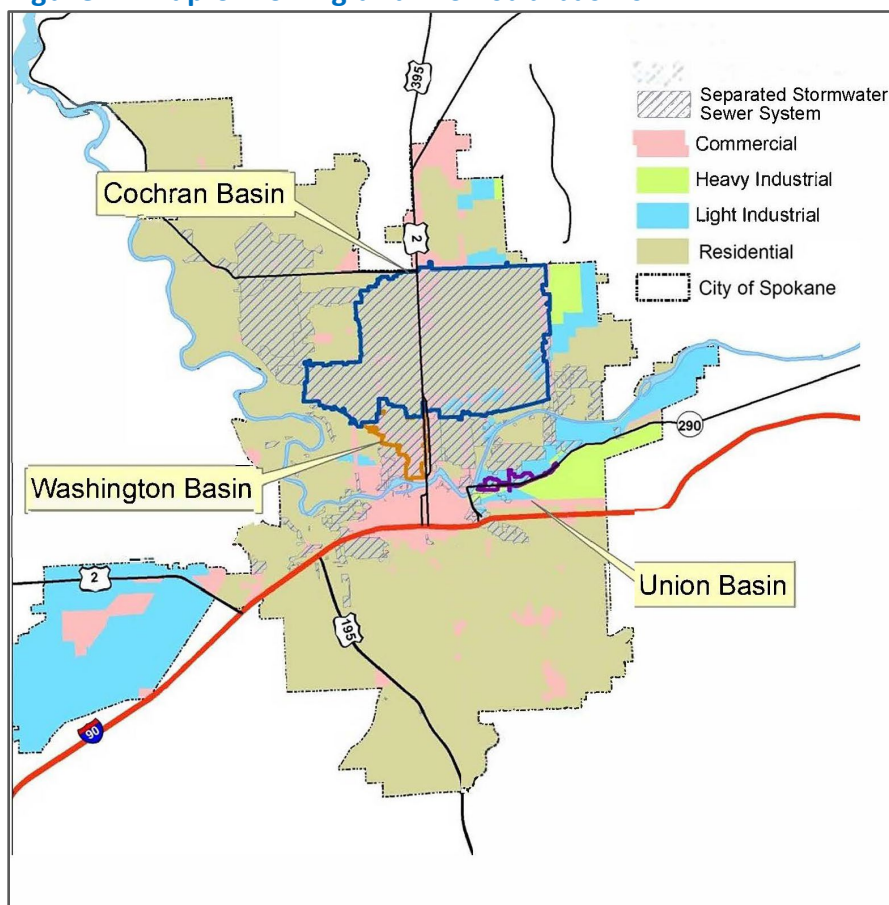
PCBs are a contaminant of concern in the Spokane River; therefore, a specific illicit discharge constituent of concern in the Union Basin was PCBs. PCBs can be found within other classifications of illicit discharges, such as motor oil, paint, and suspended solids, and detecting and eliminating sources of PCBs may in turn eliminate other illicit discharge sources. Stormwater and catch basin sediments throughout in the Union Basin were sampled for PCBs in 2009, and remedial maintenance was performed on each catch basin after sampling. This effort was part of a larger study that also sampled catch basins in other



MS4 sub-basins throughout the City, and detailed sampling and analysis report information is available on the City's website.

The City's investigation efforts expanded to additional areas to include the Cochran and Washington stormwater basins. The Cochran stormwater basin is the largest basin in the City, encompassing nearly 5,300 acres of primarily residential area with relatively smaller areas of commercial and light industrial land use. The Washington stormwater basin, whose outfall is on the north end of the Washington Street Bridge, is a much smaller stormwater basin (about 450 acres). However, land use is predominantly commercial. PCB samples were collected near the outfall of both basins to compare concentrations of PCBs in various areas and land uses.

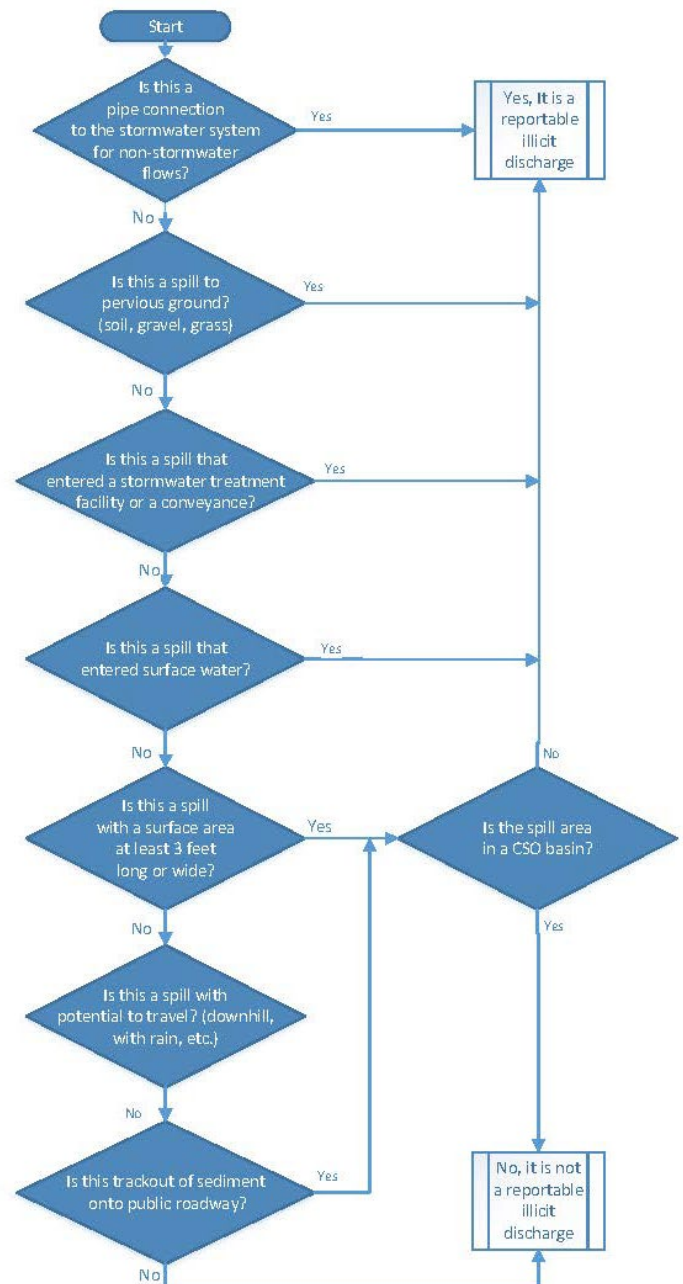
**Figure 2. Map of zoning and MS4 sub-basins.**



### 2.3.6.2 Field Inspections, Characterizing and Tracing Illicit Discharge

Most illicit discharges are detected when the City receives a call on the Illicit Discharge Hotline (625-7999), however calls may also be received on Wastewater Management primary phone number (625-7900), or on the MySpokane 311 Hotline. The Illicit Discharge Hotline is publicized on storm drain markers throughout the City, on the wastewater management website, in brochures, and in Storm Drain Dan booklets handed out at public events. A call to the hotline is routed to one of the Wastewater Management Stormwater Inspectors, who inspects and reports the complaint. Wastewater Management maintains a protocol for investigating stormwater complaints and keeping records. In addition to the stormwater hotline, Wastewater Management staff continually checks for illicit discharges as a part of normal day-to-day operations. Staff and maintenance crews frequently en route to job sites throughout the City report any noticed illicit discharges to the Stormwater Inspectors. In many cases, the staff and maintenance crews inform the public about proper disposal and appropriate BMPs at the time of seeing the illicit discharge. Figure 3 is a decision tree procedural aid for determining if a released material is a reportable illicit discharge

Figure 3. IDDE Decision Tree



### 2.6.6.3 Eliminating Illicit Discharges

#### Windshield Investigations and Curb Markers

Windshield investigations were performed throughout the priority investigation areas. Wastewater Management staff performed visual inspections of each parcel within the Union Basin groups. Potential for stormwater to run from the property to City right of way was assessed, and any preliminary potential sources of sediment and PCBs were noted. This information was collected to determine potential illicit discharge contributions to catch basins within the priority areas and therefore aid in illicit discharge elimination.

Curb markers were installed on all catch basin inlets throughout the basin groups and the locations recorded during the sediment sampling process. Markers were not placed on sumps located in the middle of the street. After markers were installed, a larger effort was undertaken throughout the City.



Areas with high pedestrian traffic, downtown, and around schools were targeted first. Installation of curb markers are now incorporated into regular maintenance activities throughout the City.

### **Spokane River Regional Toxics Task Force**

The City is actively engaged in a regional effort to address PCBs and dioxins in the Spokane River watershed, referred to as the Spokane River Regional Toxics Task Force (SRRTTF). The Toxics Task Force is currently working to identify the unknown sources of PCBs in the Spokane River and develop a cleanup plan aimed at meeting applicable water quality standards. Background information and current activities are available on the SRRTTF's website. The SRRTTF contracted with an independent community technical advisor to assist in tracking sources of PCBs and developing control methods.



The SRRTTF performed a low-flow synoptic sampling survey to assess contributions to the river from groundwater and dry weather wastewater discharges, and to identify unknown sources reaching the river through groundwater. Wet weather sampling was tentatively planned to assess contributions from stormwater, snowmelt, and other wet weather contributions. Future studies include filling the data gaps from other sources such as air and dust particles and understanding the potential complications from fish stocking activities. The knowledge gained from these studies will aid in identification of sources of PCBs; and, therefore the most effective control methods. Future implementation of the SRRTTF Comprehensive Plan will also aim to focus efforts of identifying and cleaning up sources of PCBs.

### **Local Source Control**

Local source control (also known as pollution prevention) efforts are an effective means of pollution prevention by reaching out to businesses and the general public to make them aware of their environmental impacts and how to mitigate them. In Spokane much of the work is performed by the Urban Waters Initiative, a cooperation between the Department of Ecology and the Spokane Regional Health District. The City worked with the Urban Waters initiative to define a target area for business inspections. Initially, the Union stormwater basin was targeted for a voluntary business inspection and technical assistance visit. After the Union stormwater basin was complete, the team moved onto the Cochran stormwater basin. Since the Cochran basin is so large, the most concentrated commercial areas were given first priority, such as the area along Division Street.

### **EnviroStars Waste Directory**

The Spokane River Forum administers the EnviroStars program in Spokane, a small business certification program to provide assistance and incentives for reducing hazardous materials and waste. The Spokane EnviroStars Waste Directory website was developed and is available on their website. Businesses and households can use this resource to understand their waste and learn how to properly dispose of it.



### **Union Basin Disconnection Grant**

The City of Spokane was awarded a grant from the Department of Ecology to reduce or eliminate PCB discharges from the Union basin to the Spokane River. Detailed engineering design of the stormwater

system began, as the concept was to collect, treat, and infiltrate stormwater runoff in the basin using LID techniques such as tree filter boxes and vegetated infiltration swales.

### **PCB Product Sampling Grant**

The City was awarded an additional PCB-related grant from the Department of Ecology. This Grant of Regional or Statewide Significance was aimed at defining the true sources of PCBs to stormwater from products purchased and used by municipalities. Products that may come into contact with stormwater, such as road paint, deicer, and dust suppressants, were sampled and analyzed for PCBs.

Approximately 40 different products were sampled and nearly each product contained significant amounts of PCB in comparison to water quality standards. A PCB page is continually being developed to house this and other PCB reports, and will include public information such as why PCBs are an issue and tips on how to reduce exposure to PCBs.

Products with the highest overall PCB loading, such as hydroseed, motor oil, and magnesium chloride deicer and dust suppressant, are the initial target focus pollution prevention efforts. The City is working with the SRRTTF, Washington State Department of Transportation (WSDOT), Ecology, and other interested parties around the state to further understand PCB sources in these products and identify management practices to reduce the

## **2.4 Construction Site Stormwater Runoff Control**

### **2.4.1 Construction Site Stormwater Runoff Control Permit Requirements**

- Implement an ordinance or other regulatory mechanism to require ESCs, and other construction-phase stormwater pollution controls at new development and redevelopment projects. The ordinance shall require construction operators to prepare and adhere to a *Construction Stormwater Pollution Prevention Plan* (Construction SWPPP) and application of BMPs to protect water quality.
- Include a permitting process with *Stormwater Site Plan* review, site inspection and enforcement capability to meet the required standards.
- Implement a procedure for keeping records of inspections and enforcement actions by staff, including inspection reports, warning letters, notices of violations and other enforcement records.
- Provide training for all staff involved in plan review, field inspection, and enforcement to carry out the provisions of this SWMP. Keep training records including dates, course or activity descriptions, names and positions of attended staff.
- Provide information to construction site operators about training available on how to install and maintain effective erosion and sediment controls.
- 

### **2.4.2 Construction Site Stormwater Runoff Control Introduction**

Development projects in urban areas generally result in the replacement of open land with impervious surfaces that prevent infiltration. This creates changes in the patterns of stormwater runoff, which can lead to flooding problems at the project site and on properties downstream. Further, this can affect water quality as sediment and pollutants are transported into streams, wetlands, lakes, and groundwater.

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 Manual meets or exceeds applicable criteria from the Washington State Department of Ecology's *Stormwater Management Manual for Eastern Washington (SWMMEW)*. Portions of the manual relevant to meeting Permit requirements are highlighted in this document.

#### **2.4.3 Construction Site Stormwater Runoff Control Activities**

The SRSM outlines Erosion and Sediment Control (ESC) requirements, which are equivalent to Core Element #2, Construction Stormwater Pollution Prevention, in Appendix 1 of the Permit. An 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;
- Protect water quality.

An ESC Plan is required for land disturbing activities 5,000 square feet or greater and projects identified as special sites of any size. 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.

##### **2.4.3.1 Construction Site Stormwater Runoff Control Ordinance (S5.B.4.a.)**

The ESC Ordinance, available on the Spokane Municipal Code 17D.909 website, was adopted and is relevant documents such as the SRSM and SWMMEW; require drainage plans and submittals, maintenance and performance standards in compliance with the Permit.

##### **2.4.3.2 Procedures for Site Plan Review (S5.B.4.b.)**

Erosion and sediment control (ESC) plans are reviewed by the Development Services Center to ensure the proposed controls prevent erosion and keep pollutants from leaving the project site during construction. Commercial application submittal requirements are available on the City's website. An ESC Plan is required as one of the minimum site plan elements.

##### **2.4.3.3 Site Inspection and Enforcement (S5.B.4.c.)**

Inspectors and field engineers from the Development Services Center inspect privately constructed infrastructure. The City of Spokane also has two stormwater inspectors located at the Wastewater Management Department who inspect development sites during construction and when illicit discharge calls are received by the general public. Engineering Services 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.

Records of inspections and enforcement actions by Wastewater Management staff are maintained concurrently with the Illicit Discharge program. Many of the erosion and sediment control violations, such as track-off of sediments from the construction site to the street, are considered illicit discharges. These are logged in a database (Complaint Tracker) and on employee time sheets. WWM also maintains records of inspection reports and notices of violations.

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.

#### **2.4.3.4 Training and Informational Materials (S5.B.4.d.)**

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. In addition to highlighting erosion and sediment control requirements, brochures direct the target audience to the SRSM. 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 Stormwater Management Permit Requirements (S5.B.5)**

- Implement an ordinance that requires post-construction stormwater controls at new development and redevelopment projects.
- Implement procedures for site plan review.
- Implement procedures for site inspection and enforcement of post-construction stormwater control measures.
- Provide training for staff involved in post-construction stormwater management.
- Provide information to design professionals about available training and compliance with BMPs described in the Spokane Regional Stormwater Manual.
- Establish record-keeping methods.

### **2.5.2 Post Construction Stormwater Management Permit Introduction**

This section identifies post-construction stormwater requirements, including adoption of the Stormwater Facilities Ordinance, site plan review, site inspection and enforcement of control measures, training, and record keeping. The SRSM, introduced in section 2.4, is used to implement the post-construction stormwater runoff program. The Manual meets or exceeds applicable criteria from the Washington State Department of Ecology's SWMMEW.

### **2.5.3 Post-Construction Stormwater Management Activities**

The SRSM outlines the post-construction 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.

#### **2.5.3.1 Post-Construction Stormwater Facilities Ordinance (S5.B.5.a.)**

The Stormwater Facilities Ordinance, [SMC Chapter 17D.060](#), was adopted and effective in March of 2010. The ordinance references relevant design documents such as the SRSM and the City of Spokane design standards and specifications, enforcement authority, runoff and infiltration controls, and natural location of drainage requirements.

#### **2.5.3.2 Procedures for Site Plan Review (S5.B.5.c.)**

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 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 required.

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.

#### **2.5.3.3 Site Inspection and Enforcement (S5.B.5.d.)**

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.

#### **2.5.3.4 Training for Staff and Professionals (S5.B.5.d., S5.B.5.e.)**

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.

#### **2.5.3.5 Eastern Washington LID Guidance Manual**

The Eastern Washington Low Impact Development (LID) Guidance Manual was adopted as a supplemental guidance for the design, construction, and maintenance of LID stormwater best management practices. The manual was a regional effort led by Spokane County in conjunction with many Eastern Washington municipalities, including the City of Spokane, the Washington Stormwater Center, Department of Ecology, and regional LID experts. It builds on the practices of stormwater pollution prevention, flow control, and treatment, promoting the use of natural features and managing stormwater as close to where it falls as possible. The guidance manual is available on the City's website. The City of Spokane adopted this manual in the Spokane Municipal Code ([SMC 17D.060.300](#)). LID remains optional in Eastern Washington, but is encouraged in the City in part by the adoption of this manual. It provides an understanding of LID practices applicable in Eastern Washington and design guidance that both developers and City review engineers can follow.

## **2.6 Pollution Prevention & Good Housekeeping for Municipal Operations**

### **2.6.1 Municipal Operations and Maintenance (S5.B.6)**

- Implement Operations and Maintenance (O&M) Plans for municipally-owned facilities. The O&M Plan shall 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
  - Material storage areas, heavy equipment storage areas and maintenance areas
  - Flood management projects
  - Other facilities that would reasonably be expected to discharge contaminated runoff
- Provide training for employees who have primary construction, operations or maintenance job functions that are likely to impact stormwater quality

## **2.6.2 Municipal Operations and Maintenance Introduction**

An operation and maintenance (O&M) program has been developed and implemented that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

## **2.6.3 Municipal Operations and Maintenance Activities**

In coordination with each pertinent City department, Wastewater Management developed a Stormwater Pollution Prevention Operations and Maintenance (O&M) Plan. The O&M Plan was updated to include City activities in one comprehensive document. The Wenatchee O&M Plan template, provided by Ecology, was used.

The O&M Plan highlights pollution control, good housekeeping, BMPs and source control measures that are implemented at public facilities. Basic principles of the O&M Plan are shown below. Recordkeeping and inspection requirements as well as responsible departments are listed within the O&M Plan. It's available on the City's website.

### **2.6.3.1 Stormwater Collection and Conveyance System**

Stormwater treatment and flow control facilities owned by the City were inspected by Wastewater Management at least once during the first Permit cycle. After major storm events, at a minimum for the 10-year recurrence interval, spot checks of these facilities are conducted. The second permit cycle requires that each facility be inspected at least once every two years. Maintenance concerns are reported after each inspection and addressed as necessary.

The MS4, including streets, catch basins, curbs, gutters, ditches, and storm drains, are also inspected by Wastewater Management. Wastewater Management utilizes a database to assist with documenting inspections. The City is divided into four quadrants. Maintenance crews inspect the sewer and stormwater systems in each quadrant until inspection of the system is complete before restarting the process. Catch basins are inspected for proper function, structural stability, and debris buildup. A work order is processed for any required maintenance work. Catch basins on steep hills and in problem flooding areas are inspected twice a year (spring and fall).

Numerous bio-infiltration swales are located throughout the City. Adjacent property owners and Planned Unit Developments (PUDs) are responsible for maintenance of most swales. WWM is responsible for maintenance of a portion of the swales. The swales maintained by WWM are either planted in dry land grass and maintained as needed or planted in turf grass and maintained on a regular schedule. Turf grass is mowed regularly to maintain a height of two to three inches. For curb cut inlets, maintenance crews remove grass, sediment and debris to prevent buildup and clogging of the inlet. Curb cut inlets are inspected as maintenance crews work through their designated quadrants of the City, or if there is flooding problems.

Culverts are inspected on a three-year cycle by the City's Street Department. Wastewater Management staff clean out culvers as needed upon request.

#### **2.6.3.2 Decant Facility**

The City received a grant from the Department of Ecology to construct a Vactor waste decant facility at the Playfair site, located at 2400 E. Ferry, in Spokane, Washington. Waste generated from cleaning catch basins and other stormwater management and treatment facilities are transferred to the decant facility. At the facility, the liquids are decanted from solids. Liquids are conveyed to an evaporation pond, and solids are transported to a lined landfill. Procedures for using the decant facility are incorporated into the O&M Plan and a site Stormwater Pollution Prevention Plan (SWPPP).

#### **2.6.3.3 Roads, Highways and Parking Lots**

The City of Spokane Street Maintenance Division is responsible for cleaning, repairing and performing preventative maintenance on the 2017 lane miles of paved streets and 61 lane miles of gravel streets. Various divisions within the Streets Department are responsible for maintaining the following: street sweeping, leaf pick up, weed control, street markers, asphalt repair, paving and bridge maintenance, de-icing operations and snow removal. Streets equipment is located at the Central Services Center at 901 N. Nelson, and site has a site specific SWPPP.

#### **2.6.3.4 Vehicle Fleets, Heavy Equipment Storage Areas and Maintenance Areas**

The City of Spokane Fleet Services conducts routine vehicle maintenance on City vehicles including heavy equipment. Fleet Services also conducts major vehicle engine maintenance and/or repairs on vehicles. Vehicle maintenance BMPs are followed to prevent stormwater pollution from cleaning solvents, leaking vehicle parts and vehicle fluids.

The City of Spokane Fleet Services stores numerous heavy and small equipment as well as vehicles on impervious areas such as concrete or asphalt. Oils, greases, metals, vehicle fluids and suspend solids can



contribute to stormwater pollution. These facilities are considered high-use sites and have oil/water separators installed.

Fleet Services' Central Service Center facility has a covered designated area wash bay for trucks, equipment, and vehicle washing. The wash bay is connected to the sanitary sewer and is equipped with an oil/water separator for pretreatment of wash water. Sewer Maintenance cleans and removes accumulated sediment as needed. BMPs are followed for proper washing and storage of equipment. SWPPPs have been prepared for facilities with material storage areas, heavy equipment storage areas, and maintenance areas. However, there are no known municipal facilities which discharge runoff to the separated storm sewer system. At this time, we are unaware of any municipal facilities that require industrial stormwater permits.

#### **2.6.3.5 Municipal Buildings**

Facility operations have the potential to pollute stormwater without proper BMP utilization. Measures are taken to control window washing, carpet and floor cleaning, exterior building and rooftop cleaning and maintenance, painting, trash and dumpster management, remodeling and retrofitting, parking lot maintenance, and landscape maintenance.

#### **2.6.3.6 Parks and Open Space**

Pesticides, herbicides, and fertilizers contain pollutants such as nutrients and toxins. City of Spokane Parks Operations only utilizes store-bought products (i.e. Trimec, Tripleshot, Foundation, Speedzone, Roundup®, fertilizers). Small amounts of such products are applied to stormwater facilities in the field for routine maintenance. By law, when applying any Restricted Use Pesticide (RUP), the applicator must be certified. BMPs are utilized to minimize the impact of pesticides, herbicides, and fertilizers.

Landscaping waste can consist of, but is not limited to, leafy and woody debris from clipping, cutting, mowing and other maintenance activities. These materials can accumulate in the storm system and/or discharge into receiving waters. To ensure that these waste materials do not enter the storm drainage system, proper disposal is necessary.

#### **2.6.3.7 Construction Projects**

Municipal construction projects are subject to the same requirements as those projects proposed by private developers. During construction, erosion and sediment controls are used to prevent sediment-laden stormwater from flowing away from the site and into the stormwater collection and conveyance system. Construction NPDES permits are obtained from the Department of Ecology for projects disturbing more than one acre.

#### **2.6.3.8 Staff Training (S5.B.6.b.)**

The City provides training for employees with primary construction, operation, or maintenance job functions likely to impact stormwater quality. Target employees were identified to participate in the training sessions. Training 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. Follow-up training should be provided as needed to address changes in procedures, methods or staffing.

Training is generally provided in conjunction with other permit training requirements and/or on the job training activities. Records should be kept including training materials, the date of training, and attendees.

### **3.0 TOTAL MAXIMUM DAILY LOAD REQUIREMENTS**

#### **3.1 TMDL Permit Requirements (S7)**

Section S7 applies for jurisdictions with applicable Total Maximum Daily Load (TMDL) approved for stormwater discharges from MS4s as listed in Appendix 2 of the permit. Appendix 2 of the permit states the City of Spokane, within the area under its jurisdiction, shall:

- Continue to implement the Appendix 2 TMDL monitoring program that was developed during the August 1, 2014, to July 31, 2019, Eastern Washington Phase II Municipal Stormwater Permit cycle for the Cochrane Basin. Stormwater shall be monitored for phosphorus, ammonia, CBOD, and flow rates. Monitoring shall be conducted according to the Cochran Basin DO TMDL Stormwater Sampling Quality Assurance Project Plan (April 2016).
- The City of Spokane shall 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.
- The results of the monitoring for each calendar year shall be entered into Ecology's EIM database by January 31st of the following year.
- The City of Spokane shall evaluate and report the results of the monitoring program on an annual basis with respect to the City of Spokane's share of the stormwater Waste Load Allocations in the TMDL

#### **3.2 TMDL Activities**

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 were 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.

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 year 2020 data.

Upon receipt of comments back from Ecology on the 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 2020.

## **4.0 MONITORING AND ASSESSMENT**

### **4.1 Monitoring and Assessment Permit Requirements (S8)**

- Continue to participate in implementation of the Ecology-approved studies pursuant to *Eastern Washington Phase II Municipal Stormwater Permit (2014-2019)*.
- Coordinate with other Permittees in your Urban Area to plan and begin an additional Stormwater Management Program effectiveness study. Submit to Ecology a detailed study design proposal.
- Submit a completed QAPP to Ecology.
- Enter all applicable data collected as part of conducting the study into Ecology's Environmental Information Management (EIM) database.
- Within 60 days of completing the study, publish a final report with the results of the study and recommended future actions based on the findings.

### **4.2 Eastern Washington Effectiveness Studies**

Each City and County in Eastern Washington was required to participate in preparation of studies to test the effectiveness of stormwater management program components. A total of twelve to fifteen study ideas were submitted to Ecology. Eight to twelve of these studies should be implemented.

The City of Spokane Valley received a grant from Ecology and was coordinating the first phase of this effort. In 2014, permittees developed a long list of potential study ideas and began to refine the list. Potential studies may involve:

- Public education and outreach strategies that provide the most benefit
- Catch basin cleaning and street sweeping effectiveness
- Most beneficial frequency of maintenance practices
- IDDE techniques that provide the most benefit
- Planting options for vegetated swales
- Pollutant loading from various land uses specific to eastern Washington
- Checklists for reporting requirements
- Effective design of BMPs

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.

#### ***4.2.1 Sharp Avenue Sharp Avenue Permeable Pavement Pollutant Removal Efficacy Study***

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-Spokane-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 associated 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 underway in 2020. Sampling equipment had been installed in manholes on Sharp Ave. between Pearl St. and Dakota St., and sampling and analysis was performed in accordance with the Ecology approved QAPP, as storm events allow, and sampling will be ongoing

through 2022. Data will be summarized at the end of the study in the year 2022 and published in accordance with the QAPP.

#### **4.2.2 Garland Avenue Biochar Amended Storm Garden Pollutant Removal Efficacy Study**

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 underway in 2020. Sampling equipment had been installed at the corner of Garland Ave and Belt St., and sampling and analysis was performed in accordance with the Ecology approved QAPP, as storm events allow, and sampling will be ongoing through 2022.

#### **4.2.3 Additional Effectiveness Study (2019–2024 Permit Cycle)**

The City of Spokane is currently assessing the potential to cooperatively perform an effectiveness study with the City of Spokane Valley and Spokane County to determine the pollutant removal efficacies of two soils for comparison: 1) a bioretention soil mix created using soil mix standards provided in the Stormwater Management Manual for Eastern Washington, and 2) a bioretention soil mix created using soil mix standards provided in the Spokane Regional Stormwater Management manual. If it is agreed on between the jurisdictions, adjacent swales will be installed in the field with each having a different soil mixture. Pollutant removal efficacies will be determined from data collected on stormwater pre- and post- swale for each swale co-located in a university parking lot. Dependent on the results, local stormwater management guidelines may be revised and municipal management strategies modified. The study would be implemented by a consultant on behalf of all municipal partners, and the City of Spokane would be the lead entity. If deemed feasible, plans to move forward will be finalized, and the details for this soil pollutant removal field study comparison will be provided to Ecology by June 2021

## 5.0 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

## **6.0**      **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 as 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 WAR04-6505.

**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.

## 7.0 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](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>.