2021 STORMWATER MANAGEMENT PROGRAM (SWMP) PLAN

City of Selah
Public Works Department
Stormwater Management

DECEMBER 2021

CONTENTS

ABBREVIATIONS

BMPs – Best Management Practices
CWSF – Central Washington State Fair
Ecology – Washington State Department of Ecology
EWSG – Eastern Washington Stormwater Group
F.O.G. – Fats, Oils, and Grease
IDDE – Illicit Discharge Detection and Elimination
MS4 – Municipal Separate Storm Sewer System
NPDES – National Pollutant Discharge Elimination System
QAPP – Quality Assurance Project Plan
RCW – Revised Code of Washington
RSWG – Regional Stormwater Working Group
SEPA – State Environmental Policy Act
SWMP – Stormwater Management Program
TAW – Technical Advisory Workgroup
TMDL – Total Maximum Daily Load

EXECUTIVE SUMMARY

The purpose of this document is to provide compliance with the Eastern Washington Phase II Municipal Stormwater Permit issued by the Washington State Department of Ecology (Ecology) that requires written documentation of Stormwater Management Programs from permittees that discharge stormwater from their Municipal Separate Storm Sewer Systems (MS4s).

The purpose of the City of Selah's SWMP Plan is to:

1. Provide current status of the Municipal Stormwater Permit (NPDES) requirements.
2. Serve as a guide to improve or add value to current processes.
3. Suggest work or needs that should be considered in upcoming budget years.
4. Meet current regulatory requirements to have a comprehensive SWMP plan.
5. Actively promote best management practices to the public to meet regulatory requirements.

City Stormwater staff updates the SWMP Plan annually, with input and adoption from the public.

The current year Plan and other related documents are available on the City's Stormwater website as required by State permit: http://www.selahwa.gov/stormwater

Future Activities and Considerations for 2022 MS4 SWMP

- Continue implementation of the SWMP to reduce discharge of pollutants from the regulated small MS4 to satisfy Water Pollution Control per RCW 90.48.
- Continue ongoing efforts of gathering, tracking, and using information to evaluate the SWMP.
- Continue internal processes to assure compliance with permit requirements.
- Coordinate with Ecology on permit implementation.
- Coordinate with other permittees through participation in the Regional Stormwater Working Group (RSWG) and Eastern Washington Stormwater Group (EWSG).
- Examine long-term plan to address stormwater infrastructure needs.
- Meet monitoring requirements expected in the wastewater treatment plant Ecology permit.
- Expand the Education and Outreach program and monitor the effectiveness.

BACKGROUND

The term "Stormwater Management Program" means the development of procedures, selection of design standards, evaluation, and selection of best management practices (BMPs), and the adoption of ordinances, all with the underlying goal of improving stormwater quality. In short, a Stormwater Management Program (SWMP) is a comprehensive effort to reduce the amount of pollution entering streams and groundwater. Materials such as petroleum products from vehicles, dust, dirt, fertilizers, animal waste products, and dead organic materials accumulate on roads, driveways, parking lots, roofs, and other impervious surfaces. Stormwater washes these materials off urban surfaces and can adversely impact the quality and beneficial uses of the receiving water. As a result, regulations were set in place to improve water quality of the runoff from urbanized areas.

Amendments to the Federal Clean Water Act in 1987 set the stage for phased implementation of a comprehensive national program to address stormwater discharges in municipalities. At the State level, Ecology issued the "Eastern Washington Phase II Municipal Stormwater Permit," which became effective on August 1, 2012. City operations are currently authorized under the third Permit term that became effective August 1, 2019, and is scheduled to expire July 31, 2024.

Selah began its Stormwater Management Program in 2001, with preparation of a Stormwater Management Plan. This initial planning effort gave the City a leg up on Ecology's requirements found in the Eastern Washington Phase II Municipal Stormwater Permit. The City of Selah has been working diligently to meet the requirements of the permit, including adoption of new ordinances, policies and procedures, contractor specifications, purchasing equipment, and training staff. Work efforts to date have been funded by Ecology grants, which provide funding for Stormwater Management and for design of improvements to specifically reduce stormwater pollutant discharges from existing development. Selah continually evaluates the effectiveness of the program, modifying procedures and BMPs when necessary to protect the receiving water quality.

WATER QUALITY

Summer weather of the Yakima River basin is hot and dry, typical of a continental climate. Winters are moderately cold and relatively dry due primarily to the maritime influence of the prevailing westerly circulation from the Pacific Ocean and a rain shadow effect by the Cascade Mountains. Approximately 75 percent of the annual precipitation occurs from October through March. Annual precipitation varies from more than 100 inches in the Cascade Range to less than 10 inches in the lower elevations. Snowfall in excess of 400 inches falls on the higher slopes of the Cascade Range, and the lower valleys receive from 15 to 20 inches. Stormwater runoff typically occurs under rapid warming events that melt accumulated snow or during localized early summer thunderstorms. Winter temperatures normally range from approximately 20°F at night to approximately 30°F during the day. Temperatures of 0°F or below can be expected in January or February. Normal summer temperatures reach 90°F during the day but cool rapidly to near 60°F at night. Temperatures exceeding 100°F are unusual; however, a few readings over 110°F have been recorded.

Stormwater runoff is generated from these rapid warming events causing runoff to flow over land or impervious surfaces, such as paved streets, parking lots, and building rooftops, and does not soak into the ground. The runoff picks up pollutants like trash, chemicals, oils, and dirt/sediment that can harm our rivers, streams, lakes, and coastal waters. To protect our resources, the City of Selah, along with the community, construction companies, industries, and others, use stormwater controls, known as best management practices (BMPs). These BMPs filter out pollutants and/or prevent pollution by controlling it at its source.

ESTABLISHMENT OF A STORM AND SURFACE WATER MANAGEMENT PROGRAM

The City of Selah has been managing drainage and stormwater runoff for a long period of time, addressing regulations, flood mitigation, and the long-term protection and preservation of public drainage infrastructure. Because of these concerns and issues, the community supported projects and activities that eventually formed into and became the City's Stormwater Management Program.

CITY ORDINANCES, CODES, AND ADOPTED STANDARDS

The City enacted ordinances and codes that address runoff pollution protection in Permit-required areas such as: illicit discharge detection and elimination (IDDE), runoff from construction sites, and post-construction stormwater management. The City adopted Stormwater Management Regulations which can be found in the Selah Municipal Code Chapter 9. Adopted Municipal Codes include:

- 9.22 Illicit Connections and Discharges to the Municipal Separate Storm Sewer System
- 9.23 Storm Water Management for Development and Redevelopment
- 9.24 Construction Site Erosion and Sediment Control

Passive enforcement of these regulations is conveyed through City issued permits, staff reviews and inspections, and through citizens reporting concerns. The online version of the Selah Municipal Code is current through Ordinance 2117, passed December 8, 2020.

GENERAL PROGRAM ADMINISTRATION (INCLUDING S5.A. AND S9)

The City of Selah has developed and continues to implement this Stormwater Management Program (SWMP). The SWMP is a set of actions and activities comprising the components listed in section S5 of the Eastern Washington Phase ll Municipal Stormwater Permit issued by Ecology. Along with completing the 2021 SWMP Plan by December 31, the City's 2022 actions and activities will include:

2022 Planned Actions and Activities

- Continue implementation of the SWMP to reduce discharge of pollutants from the regulated small MS4 to satisfy Water Pollution Control per RCW 90.48.
- Continue ongoing efforts of gathering, tracking, and using information to evaluate the SWMP.
- Continue internal processes to assure compliance with permit requirements.
- Coordinate with Ecology on permit implementation.
- Coordinate with other permittees through participation in the Regional Stormwater Working Group (RSWG) and Eastern Washington Stormwater Group (EWSG).
- Examine long-term plan to address stormwater infrastructure needs.
- Meet monitoring requirements expected in the wastewater treatment plant Ecology permit.
- Expand the Education and Outreach program and monitor the effectiveness.

PUBLIC EDUCATION AND OUTREACH (S5.B.1.)

The City of Selah believes that public education and outreach is an important element of its SWMP. Stormwater runoff is generated from the urbanized area, and residential activities have a direct impact on water quality. The City implements a public education and outreach program to provide information to the community and target audiences about the impacts of stormwater discharge to surface waters and steps the public can take to reduce pollutants to stormwater. A unique factor in improving water quality through public education and outreach is the use of best management practices. Obviously, each homeowner can't install a water treatment device, but they can make small changes in how best to manage water around their homes by keeping best management practices in mind.

In a broad sense, BMPs include activities, general good housekeeping practices, pollution prevention, maintenance procedures, and other management practices that prevent or reduce discharge of pollutants directly or indirectly to stormwater, receiving waters, or to the storm sewer system.

The City's target audience includes the general public, homeowners, renters, school age children, and overburdened communities. During community events the City distributes pamphlets (English/ Spanish), coloring books, and re-usable bags to promote education of our stormwater ways, the MS4 system, and BMPs.

The City works with local restaurants to employ stormwater BMPs. Shown in the Appendices are two brochures the City distributes to restaurants and commercial businesses. These education efforts assist in combatting adverse stormwater impacts.

The City of Selah actively participates in the Regional Stormwater Working Group (RSWG) which involves collaboration with Yakima County, City of Sunnyside, and the City of Union Gap. Selah partners with the RSWG to assist with the Public Education and Outreach element (S5.B.1) of the Eastern Washington Phase II Municipal Stormwater permit. All permittees are required to implement a public education and outreach program designed to reach target audiences to educate and encourage changed behaviors. The RSWG has contracted with the Franklin County Conservation District to achieve this goal through their Drain Rangers Program. Drain Rangers Educators visit elementary and intermediate schools within Selah's jurisdiction, typically in April, to educate students about the water cycle, erosion, stormwater runoff, stormwater pollution, riparian zones, and pervious/impervious surfaces. Educators share specific actions students can take to improve the quality of our water.

In 2020 and 2021, as part of the Effectiveness Studies requirement (S8.A.1), the City of Selah is participating with the City of Yakima to conduct studies regarding car wash practices within the community. The following table is one example of summarized data included in the final report of the Quality Assurance Project Plan (QAPP), as part of the Car Wash Wastewater Management E&O Effectiveness Study. The QAPP will be available to the public on the City of Yakima website (https://www.yakimawa.gov/services/wastewater-treatment-plant/stormwater/).

Table 13.4.1 Initial and Final Comparison of Awareness and Car Wash BMP Adoption

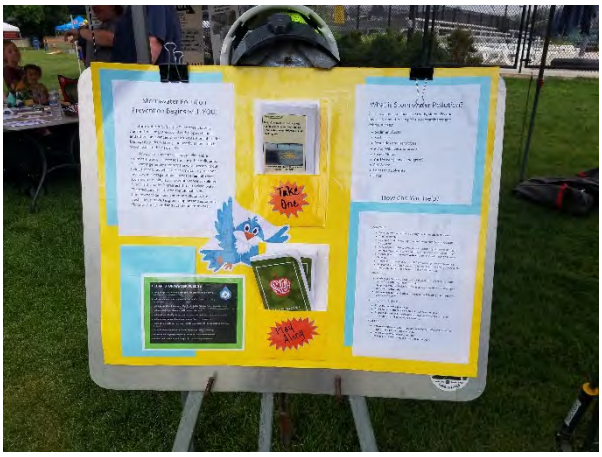
Survey Results					
	Lack of Awareness of Car Wash Wastewater Impact	Awareness of Car Wash Wastewater Impact	Lack of Adoption of Car Wash BMPs	Adoption of Car Wash BMPs	Total Surveyed
Initial	60%	40%	75%	25%	600
Final	35%	65%	35%	65%	600

2020 Actions and Activities
(Limitations applied due to mandated COVID-19 restrictions)

- Dog waste signs and bags installed at every City park
- Stormwater message sent out on utility cards
- Display board at the Central Washington State Fair (CWSF) drive-thru fair food event
- Printed slogan and spill hotline number displayed on City sweeper truck
- Drain Ranger Program at elementary and intermediate schools

2021 Actions and Activities

- Viewing message board installed near Playland Park
- Stormwater message sent out on utility cards
- National Night Out Booth at Wixon Park
- CWSF Booth
- Partnered with City of Yakima for the car wash effectiveness study
- Printed slogan and spill hotline number displayed on City sweeper truck
- Drain Ranger Program at elementary and intermediate schools



2022 Planned Activities

- Continue Drain Ranger Program at elementary and intermediate schools
- Continue Dog waste program at all City Parks
- Partner with Selah Downtown Association for quarterly F.O.G. education
- Participate in Yakima County community events such as CWSF, Earth Day celebrations, Selah Community Days and National Night Out

PUBLIC INVOLVEMENT AND PARTICIPATION (S5.B.2.)

An active and involved community is crucial to the success of a SWMP because it allows for broader public support for the program, and typically results in fewer obstacles in the form of public and legal challenges.

The Permit requires the City to adopt a policy directive to provide ongoing opportunities for public involvement and participation in the decision-making process for implementation of the stormwater program. The City offers opportunity through advisory panels, public hearings, watershed committees, participation in developing rate-structures, or other similar activities. The City is required to make the latest version of the Annual Report and SWMP Plan available to the public, posting both documents on the City's website by May 31 of each year (S5.B.2b)

The City of Selah actively creates opportunity for public participation by:

- Providing public involvement opportunities for stewardship activities through public events, council meetings and planning meetings
- Providing opportunities for the public to participate in stormwater management planning and implementation, including updates to the Stormwater Management Plan and adoption of all stormwater ordinances
- Posting SWMP Plan on website by May 31
- Posting Eastern Washington Phase II Municipal Stormwater Permit Annual Report by May 31
- Posting collaborated results from stormwater-related effectiveness studies to the City's website

ILLICIT DISCHARGE DETECTION AND ELIMINATION (S5.B.3.)

Illicit discharge is any discharge of pollutants or non-storm water materials into our stormwater systems from overland flows or direct dumping of materials. An example of illicit discharge would be the dumping of toxic chemicals into stormwater drains, or spills of chemicals, oil, or fuel that get picked up by rainfall and travels into our stormwater system. The City utilizes our Illicit Discharge Guidance Brochure, provided for reference in the Appendices.

Reporting Illicit Discharges (S5.B.3.c.v)
To report a suspected illicit discharge in Selah or the County, call 1-509-575-2300 or email PublicServicesIllicitDischarge@co.yakima.wa.us

In the event of a hazardous material or waste release, fire, or emergency that is a danger to personal health and safety, immediately **CALL 911 AND**

City of Selah Fire Department 1-509-698-7310

AND

City of Selah Police Department 1-509-698-7347

NON-EMERGENCY
In the event of a non-emergency spill or release to water, soil, or air call:

National Response Center: **1-800-424-8802**

AND

Washington State Emergency Management Division: **1-800-258-5990 OR 1-800-OILS-911**

AND

Washington State Department of Ecology Eastern Region: **1-509-329-3400**

2020 Activities and Accomplishments

- Clean up of nearby homeless encampments encroaching where the effluent meets the Yakima River
- Repair of crushed pipe at the City's Treatment Plant (See Appendix A Spill Response Report)
    - Smoke testing, remote video search, and visual check

2021 Activities and Accomplishments

- Detection and monitor of repairs of an aged Tree Top cross-connection

2022 Planned Activities

- Continue implementing and enforcing Selah Municipal Code 9.22 to prohibit illicit discharge
- Continue documenting through the WQwebIDDE portal all calls staff respond to in regard to illicit discharge and connection
- Continue current IDDE training to City staff

CONSTRUCTION SITE STORMWATER RUNOFF CONTROL (S5.B.4.)

SMC 9.24

Construction sites can be potential sources of stormwater contamination. Construction activity, soil type, slopes, and rainfall intensity all contribute to the nature and volume of pollution that may take place. Sediment runoff is the most common pollutant from a construction site, but other materials used in construction, such as petroleum products and paint, may also contribute to construction site pollution. In Selah, a significant source of sediment runoff is the tracking of site soils onto adjacent roadways by vehicles leaving construction sites. Erosion from construction sites can result in siltation of catch basins, infiltration systems, storm sewer pipes, and receiving waters.

Selah is unique in that it is one of the smaller communities required to comply with Phase II Municipal Stormwater Permit Requirements. As such, a more "hands on" approach can be used to implement the Construction Site Stormwater Runoff Control elements of the SWMP. Ordinance No. 1800 – Construction Site Erosion and Sediment Control, adopted in June 2010, created Chapter 9.24 of the Selah Municipal Code. This section of the code requires contractors and developers to implement the BMPs described in the *Stormwater Management Manual for Eastern Washington.*

The Ecology construction stormwater permit applies to disturbed areas of one acre of land or more. To address local conditions, a regulatory threshold was established requiring compliance for disturbed areas of more than 5,000 square feet. The full Ecology construction stormwater permit requirements do not need to be met on these smaller parcels, but runoff controls still need to be implemented. Stormwater pollution prevention plans for smaller parcels are abbreviated and submitted at the time building plans are submitted. The City then issues a permit, and the local building official inspects those sites meeting the local regulatory threshold.

These procedures were fully implemented in 2020, 2021, and will be for 2022. The following table shows permits issued and dates of completed inspections.

Structure Type	2020 Permits Issued	2020 Completed Inspections	2021 Permits Issued	2021 Completed Inspections
Single Family Residence	47	43	42	42
Multi-Family Units	1	1	24	24
Commercial Property	17	3	12	2
Totals	65	47	78	68

Included in the Appendices is a City handout describing the requirements for Construction Site Stormwater Runoff Control, which is provided to engineers, contractors, and developers. An abbreviated stormwater pollution prevention plan (SWPPP) is prepared meeting City of Selah requirements for smaller parcels. The SWPPP is reviewed as part of the building permit and inspection process. During construction, minimum BMPs typically employed by the contractors are silt fencing, filtration socks, and limiting site access to a single stabilized entrance.

Selah continues to inform developers, contractors, and design professionals of the Eastern Washington Phase ll Municipal Stormwater Permit requirements. A link has been placed on the City's building permit web page directing people to the Ecology's construction stormwater website www.ecy.wa.gov/programs/wq/stormwater/construction/. Selah also references the requirements of Ecology's *Stormwater Management Manual for Eastern Washington* in its review comments during the State Environmental Policy Act (SEPA) environmental review process. Stormwater elements for all plan reviews are examined based on the requirements of Ecology's *Stormwater Management Manual for Eastern Washington*.

Future activities related to construction site stormwater runoff control may include the following:

- Implementing inspection fees
- Updating the complaint reporting and response program

POST-CONSTRUCTION STORMWATER MANAGEMENT (S5.B.5.)
SMC9.23

This part of the SWMP forms the heart of stormwater pollution prevention, and applies to new development (typically, extension of urban development into undeveloped areas) and redevelopments (modifications or upgrades to existing developed areas). Post-construction stormwater management (controlling runoff from a completed project) is necessary because runoff from these areas has been shown to significantly affect water quality. The type and quantity of pollutants in stormwater, as well as the volume of the stormwater, greatly increases in areas where pervious surfaces (e.g., pastures, grassland, lawns) are converted to impervious area (e.g., concrete, asphalt, roofs). Studies indicate prior planning and design for the minimization of pollutants in post-construction stormwater discharges is the most cost-effective approach to stormwater quality management.

Like implementation of the construction site stormwater control elements of the SWMP, the small community "hands on" approach works well for implementing program requirements for Post-Construction Stormwater Management for New Development and Redevelopment. Ordinance No. 1799 – Stormwater Management for Development and Redevelopment, adopted in June 2010, created Chapter 9.23 of the Selah Municipal Code. This ordinance establishes Ecology's *Stormwater Management Manual for Eastern Washington* as the stormwater standard for the City of Selah. The City is responsible for stormwater quality within City limits, and stormwater quality is affected by smaller projects. Therefore, this ordinance applies the requirements to work involving 5,000 square feet or more of disturbed area, or to 5,000 square feet of new impervious area.

All storm runoff occurring on new lots and developments (private property) shall be retained and disposed of on-site. Storm runoff is not permitted to enter public property or the public storm drainage system, and therefore does not add water to the MS4. The property owner shall maintain all stormwater BMPs that are installed on private property. These General Requirements are outlined in the City of Selah's Construction Standards, Chapter 6 – Stormwater Improvements.

<u>2021 Activities</u>

- Reviewed and approved plats: Altera, Hertung, Van Alstine, Eagle Ridge, and Hillside Estates

MUNICIPAL OPERATIONS AND MAINTENANCE (S5.B.6.)

Selah's Public Works Department continues its catch basin cleaning and street sweeping programs as the basic element of the pollution prevention and good housekeeping for municipal operations.

2020 Accomplishments

- 400 catch Basins visually inspected
- Approximately 297 catch basins cleaned

Projects Completed in 2020

- West Goodlander Road Improvements
- Taylor Ditch Outfall Pollution Reduction

  The City received a Storm Water Grant from Ecology to improve storm water conditions within the City of Selah. The project reduced discharges to the Taylor Ditch drainage system outfall by providing pretreatment and disposal of the Water Quality Storm Event for several storm drains that discharge into the Taylor Ditch System. The project provided water quality treatment to existing pollutant generating surfaces connected to the Taylor Ditch conveyance pipeline.
- Storm Sewer System Map Update per S5.B.3.a

2021 Accomplishments

- Replaced 3 fleet vehicles and a dump truck with updated, more fuel-efficient units
- Maintained the City's street sweeping program, keeping debris off the street and out of gutters, decreasing costs to clean plugged drainage lines

2022 Planned Activities

- Implement electronic fleet maintenance program
- Preparing to upgrade the infrastructure on South Third Avenue between Valleyview and Southern Avenues
    - Construction slated to start Fall of 2022

COMPLIANCE WITH TOTAL MAXIMUM DAILY LOAD REQUIREMENTS – SELAH DITCH (S7)

Selah Ditch, located in the south-central portion of the City of Selah, receives water from the following sources:

- Stormwater runoff from the City of Selah;
- Stormwater runoff from a warehouse complex;
- Excess irrigation waters;
- Selah wastewater treatment plant effluent;
- Industrial non-contact cooling water from four industries; and
- Groundwater

Stormwater discharges are allowed under the Eastern Washington Phase II Municipal Stormwater Permit. The permit contains elements to improve the water quality in the Selah Ditch, including controlling stormwater discharge pollutants through BMPs.

Section S9. Compliance Schedule of Selah's NPDES Permit No. WA002103-2 required the City to perform an initial Total Maximum Daily Load (TMDL) effectiveness monitoring in August 2013 with a second in August 2015. Both events were completed, and the results were sent to Ecology. Selah's wastewater treatment plant NPDES permit was administratively extended, so the City followed the dates set in the TMDL Water Quality Improvement Plan and performed a third monitoring event in July 2021. This report, provided in the Appendices, presents the results of the most recent monitoring effort, and includes the results from the two previous events to provide a comprehensive view of the data.

The Selah Ditch Multiparameter TMDL Technical Advisory Workgroup (TAW) held its third meeting on October 20, 2021, to discuss the results of effectiveness monitoring and consider adaptive management measures to address water quality goals. The goal of Adaptive Management is to adjust implementation activities found in the Water Quality Improvement Plan to meet water quality goals. Based on the progress made to date and issues identified by the TAW, the following adaptive measures should be considered:

- Revisit the tree planting process to achieve 100% shade, including varieties and successes. Increase efforts to plant trees on the west side of Selah Ditch.
- Dissolved oxygen may no longer be a concern. Ecology will confirm permit limits, and actions will be incorporated into the next NPDES permit.
- Expand fecal coliform testing to better identify sources within the storm drain system. Examine incoming irrigation water sources and discuss with the Naches Selah Irrigation District their long-term plans for irrigation tailwater disposal.

MONITORING AND ASSESSMENT (S8)

Monitoring and assessment has been replaced with continued participation and implementation of effectiveness studies. Eight Ecology-approved studies were selected pursuant to S8.B in the Eastern Washington Phase II Municipal Stormwater Permit (2014-2019). The City of Selah participated in two effectiveness studies.

Yakima County was the lead entity for the BMP Inspection and Maintenance Responsibilities Effectiveness Study, completed in July 2021. The City of Selah participated as reviewer.

The City of Yakima was the lead entity for the Car Wash Wastewater Management E&O Effectiveness Study, completed in July 2021. The City of Selah participated as reviewer.

The City of Selah's Monitoring and Assessment efforts are based on requirements outlined in the NPDES permit. The City will continue to operate under the guidelines of the permit upon issuance in 2022.

FINANCIAL

Selah's SWMP is operated jointly with the Code Enforcement Division of Public Works. Therefore, their budgets are intertwined, and personnel costs are not always tracked separately. MS4 maintenance costs are incorporated into the street program. As a result, Selah does not have a separate stormwater fund. However, some SWMP revenues and expenditures are tracked as part of Fund 415 – Sewer.

SWMP revenue consists of funding in the form of Ecology stormwater grants. Specific SWMP expenditures are tracked under the Storm Water Program line item in the sewer budget. In 2022, the City has budgeted $55,000 in Ecology stormwater grant revenues and $55,000 in stormwater program expenditures.

CONTACTS

Questions about the City of Selah's Stormwater Management Program can be directed to:

Erin Barnett
Code Enforcement Officer
Stormwater Management
City of Selah
222 South Rushmore Road
Selah, WA 98942
(509) 698-7331
erin.barnett@selahwa.gov

Questions about the Eastern Washington Phase II Municipal Stormwater Permit can be directed to:

Andrea Jedel, PWS
Water Quality Program - CRO
Washington State Department of Ecology
1250 West Alder Street
Union Gap, WA 98902
(509) 454-4260
andrea.jedel@ecy.wa.gov

REFERENCES

Washington State Department of Ecology. *Eastern Washington Phase II MunicipalStormwater Permit*. Effective Date August 1, 2019.

Selah Municipal Code – Public Service and Utilities, Chapter 9

APPENDICES

Restaurant BMPs and FOG Commercial Brochures

Did You Know?

The storm drainage system is separate from the sanitary sewer system. The sanitary sewer collects wastewater from sinks, toilets, dishwashers, and floor drains and directs it to a water treatment plant where the contaminants are removed before it is released to waterways.

The storm drainage system, however, collects stormwater runoff from parking lots, streets, and lawns and directs it to streams and rivers without treatment. That is why it is so important to implement Best Management Practices (BMPs) on a daily basis to make sure that harmful pollutants, like bacteria, and chemicals do not end up in the region's local waterways.

Restaurant BMPs Protect Local Waters

Storm drainage pipes often discharge pollutants, such as bacteria, fertilizers, and everyday household chemicals into local waterways.

- What is a Stormwater Best Management Practice?
- Are there Stormwater Best Management Practices for Restaurants?
- What activities around restaurants can harm local streams, creeks, and rivers?
- Doesn't stormwater go to a treatment plant?

See inside. . .

For more information, contact:

City of Selah Stormwater Division (509) 698-7365

City of Selah
115 W. Naches Avenue
Selah, WA 98942

Stormwater Best Management Practices for Restaurants

A Guide for City of Selah Restaurants and Eateries

What are BMPs?

Best Management Practices (BMPs) are methods or activities that may help prevent stormwater pollution. Restaurants use and produce various types of chemicals and wastes that, if allowed to enter the storm drainage system, can have a negative impact on local receiving waters and the region's drinking water supply. Typical wastes from Restaurants include:

- Fats, oils, and grease
- Floor and appliance cleaners
- Food waste

Pollutants from Restaurants enter local streams and lakes by way of the storm drainage system, which includes inlets, pipes, ditches, and roadway gutters.

The City of Yakima discharges untreated stormwater into the Yakima River, Wide Hollow Creek, Spring Creek, Randall Pond, Rotary Lake and Buchanan Lake.

By following the guidelines in this brochure, food service employees can help prevent stormwater pollution from further impacting local waterways.

What BMPs To Use?

- Connect all sink drains and floor drains to the sanitary sewer system to prevent wastes from entering the storm drainage system.
- Dispose of all wash water (and ONLY wash water) into a sink, toilet, or drain.

- Clean floor mats, range hoods, exhaust filters, garbage cans, carts, and trays in a utility/mop sink or floor area which connects to the sanitary sewer.
- Maintain and service sewer laterals and grease traps on a routine basis to prevent sewer overflows into the storm drain system.

- Recycle grease and oil and regularly request pick-up service to prevent overfilling.
- Check dumpsters for leaks and repair or replace as needed; and KEEP LIDS CLOSED!
- Regularly pick up trash in the parking lot and outdoor areas. Keep lids closed on all outdoor trashcans.

- Regularly sweep outside areas like parking lots, seating areas, and drive-thru lanes, making sure to dispose of the collected debris in a trash receptacle.

What Actions To Avoid?

- Putting ANYTHING except rainwater into a storm drain inlet.
- Pouring grease, oil, solids, or oily liquids, like sauces, into a storm drain inlet, down a sink, floor drain, on the ground, or into a dumpster.
- Pressure washing parking lots and sidewalks into the storm drain. *[To properly pressure wash outside areas, block the storm drain and vacuum up the wash water or pump it to the sanitary sewer system.]*
- Washing or cleaning floor mats, filters, and garbage cans in the parking lot.
- Hosing out your dumpsters. Dumpster "juice" has the potential for many pollutants including, oil, grease, sediment and bacteria.
- Allowing grease traps to overflow onto the parking lot.
- Allowing employees to toss cigarette butts outside or into the dumpster.

FOG

+

PIPES

= *PROBLEMS*

FOR:

The Plumber

The City's Waste Water collection system

The City's Waste Water treatment plant

and

Your wallet!

CLOGS COST YOU $$$

City of Selah Stormwater Management

115 W. Naches Ave.
Selah, WA 98942

(509)698-7365

or

(509)698-7331

For more information

KEEP

Fats

Oil and

Grease

Out of...

DO THIS:

- *Scrape or wipe down* dishes with a dry paper towel and *throw the towel in the garbage*
- Keep grease off of the floor and *use spill kits in the event of a spill*
- *Pour* used cooking oil, or grease into a sealed recycle barrel
- *Install signs* over ALL sinks that state "**NO GREASE IN THE DRAINS**"
- *Train employees* in the importance of keeping FOG out of the sewer system

SO YOU CAN:

- Save money on sewer bills
- Have lower maintenance costs
- Keep drains from getting clogged
- Avoid blockages in pipes and drains
- Prevent violation penalties

Fats, Oils and Grease are found in common food and food ingredients such as meat, fish, butter, cooking oil, mayonnaise, gravies, sauces, soups and food scraps.

Your best line of defense is to train employees on Best Management Practices.

Always clean up spills inside and outside of your business immediately!

Illicit Discharge Guidance Brochure

6) **When walking your pet use a bag or use a scooper to clean up after your pet.** Animal waste contaminates our community and our water ways. To properly dispose of your animal waste pick it up with a bag and dispose of it in a waste basket, or flush it down a toilet.

Is It Illegal To Cause An Illicit Discharge? YES

Chapter 12.10 Stormwater Authority

- **12.10.200 Prohibition of Illicit Discharge** — (1) No person shall discharge or cause to be discharged into county stormwater facilities or a public UIC any material, including but not limited to pollutants or waters containing any pollutants other than stormwater.

Reporting Illicit Discharges!

To report a suspected illicit discharge in the Cities of Selah, Sunnyside, Union Gap, or the County, call (509) 574-2300; or email PublicServicesIllicitDischarge@co.yakima.wa.us

Examples of Illicit Discharges

PLACE STAMP HERE

Yakima County Public Services
Water Resources
128 N. 2nd St.
Fourth Floor Courthouse
Yakima, WA 98901

YAKIMA COUNTY

ILLICIT DISCHARGE

2020

Guidance

What's An Illicit Discharge?

Illicit Discharge is any discharge of pollutants or non-storm water materials into our stormwater systems from overland flows or direct dumping of materials.

Give Me An Example!

- An example of an illicit discharge would be sand or dirt from a construction site washing into a street stormwater drain. We call this **Trackout**.
- Another example would be the dumping of toxic chemicals into stormwater drains, or spills of chemicals, oil, or fuel that get picked up by rainfall and travels into our stormwater system.

Additional Examples:

- **Car Wash Wastewater**
- **Gas and Motor Oils**
- **Kitchen Grease / Oils**
- **Household Cleansers**
- **Paints**
- **Pesticides**
- **Solvents**
- **Vehicle Spills**
- **Weed Killers**

Sometimes these pollutants are carried through the stormwater drainage systems by rain, wind, or improper disposal processes. All of which can result in serious health and water quality problems. In addition, wildlife and the overall appearance of the river are adversely affected by illicit discharges.

How Can I Help?

Here is a list of things you can do to help eliminate stormwater pollution from occurring and prevent illicit discharges.

1) **Clean up any oil and antifreeze spills immediately.** Kitty litter or sawdust are great absorbents and will help make the clean up processes easier. Be sure to sweep up the absorbents after they have performed their job.

2) **Wash your car on the grass, so that the water, detergent, and dirt will be filtered by the soil.** Your best option is to take it to a commercial car wash, where the dirty water is disposed of more efficiently and environmental friendly.

3) **Empty bottles of household cleaners, pesticides, and weed killers may have different requirements for disposal**; be sure to read the directions on the label for proper disposal procedures.

Everyone and Everything Depends on Clean Water

Did you know that discharging your Pool Water into a stormwater drain is an Illicit Discharge and is Illegal?

4) **Keep your grass clippings out of the street. When you are done mowing your law, ensure to sweep up any residual clippings left in the street.** This will prevent them from being washed down the stormwater drains during rainstorms. Grass clippings increase the amount of algae within our waterways; which can severely harm our wildlife.

5) **Many household products, including paints, paint thinners, and solvents can be taken to the County Household and Small Business Waste Collection Facility located at 7151 Roza Hill Dr, Yakima, WA 98901.** Lower Valley residents can utilize the drop-off stations located at Landfill Transfer Stations or the Cheyne Landfill. For more information contact this division at (509) 574-2472.

Contact Us

Yakima County Public Services
Attention: Water Resources
128 N. 2nd St.
Fourth Floor Courthouse
Yakima, WA 98901

Phone: (509) 574-2300
Fax: (509) 574-2301

Web: http://www.yakimacounty.us/

Spill Response Report

Spill Reporting Form

Use this form to document the spill, should the Fire Department not complete a report. In the event of a spill or release to water, soil, or air collect the following information:

Section 1: Reporting Party	Section 2: Responsible Party
Name: Ben Arnold, Selah Eric Neumeyer / wastewater	Name: City of Selah
Phone Number:	Phone Number: 509-698-7365
Organization: City of Selah - Wastewater	Organization: City of Selah

Section 3: Incident Information			
Incident Description: An aged sewer line crushed & leached into Stormwater			
Incident Date: 10/14/2020	Time of Discovery: Approx 11:30 AM	Cause: Broken Sewer Line	
Address:	City:	State:	County:
Material Involved: Sewage		Amount Released: Unknown	
Water Body Affected: Selah effluent ditch		Sheen Length:	
Sheen Width:		Sheen Color: Grey (rainbow, silver, grey, etc.)	
Odor Description:		Weather Conditions: Clear / over cast	

Section 4: Other
Actions Taken: During morning readings Wastewater employee, Ben Arnold noted a dark film in the effluent ditch. He notified Eric Neumeyer who notified Public Works. The Department traced the line to an aged, broken sewer pipe that leached into the

stormline. The Department then routed the sewage line w/ a temporary pump until the sewer line could be repaired. Work for the repair completed October 27th and the ditch readings were "normal."

Barnett, Erin

From: Ben Arnold <ben.arnold.electric@gmail.com>
Sent: Wednesday, October 14, 2020 11:50 AM
To: Barnett, Erin
Subject: Storm water pics


11:49

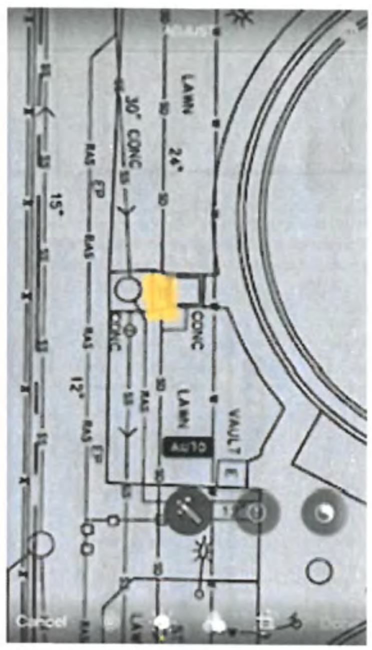

11:48

Barnett, Erin

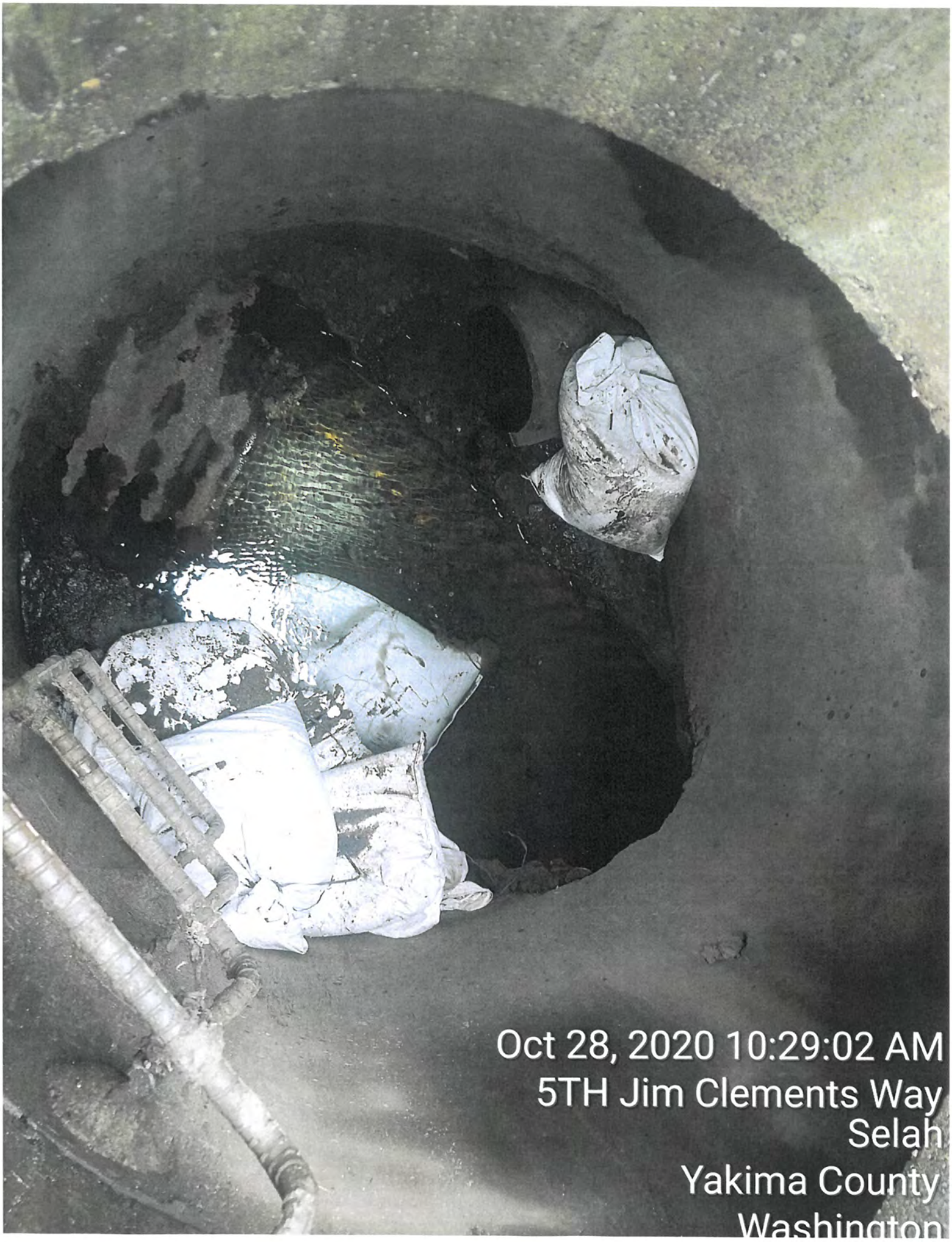
From: Neumeyer, Eric
Sent: Tuesday, October 27, 2020 3:26 PM
To: Barnett, Erin
Subject: storm repair pics
Attachments: REPAIR SITE 2020.jpg; ML LINE 2020.jpg; ML LINE BREAK 2020.jpg

We resealed the grout line area that was missing original grout on cement line causing the infiltration in the Storm. Tomorrow we will be injecting a foam sealer to seal all of it. We are flowing clean now.

Eric Neumeyer
Selah Waste Water Supervisor
Eric.Neumeyer@selahwa.gov
509-698-7321


LAWN
24"
30" CONC
15"
12"
CONC
LAWN
VAULT
AUTO
Cancel


Oct 28, 2020 10:22:14 AM
503 South 1st Street
Selah
Yakima County
Washington


Oct 28, 2020 10:29:02 AM
5TH Jim Clements Way
Selah
Yakima County
Washington


Oct 28, 2020 10:29:09 AM
5TH Jim Clements Way
Selah
Yakima County
Washington

Construction Site Stormwater Runoff Control Handout

An excellent example of a properly installed construction entrance.
(Source: Asotin County)

Good installation of a construction entrance, but sediment is still being tracked off-site. Add more rock or make entrance longer.
(Source: Douglas County)

Photo: Effective and Ineffective Track Out Pads

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Water Resources
128 N. 2nd St.
Fourth Floor Courthouse
Yakima, WA 98901

YAKIMA COUNTY

CONSTRUCTION TRACK OUT

2018
Guidance

What Is Trackout?

Trackout is dirt, mud, or other debris tracked onto a paved public roadway by a vehicle leaving a construction site. Dirt and mud is adhered to the exterior or undercarriage of the vehicle leaving the construction site, which then deposits the dirt, mud, and other debris onto the roadway. Trackout is also a source for particulate matter (PM_{10}) and is a regulated air pollutant.

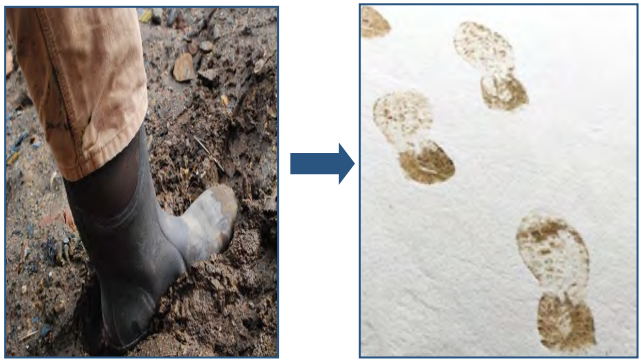
Why Is It Important To Control?

Soil sediment that leaves the construction site contributes directly to the degradation of air and water quality. As rainfall and other vehicles pass over the sediment, it is either washed into the storm drains or lifted into the atmosphere.

Is it the Law? YES

Yakima County Code, 12.10—Stormwater Authority

- http://www.codepublishing.com/WA/YakimaCounty/



Ever Track Mud Onto Your Carpet?

SAME CONCEPT

Trackout BMP Controls

There are several different types of Best Management Practice (BMP) controls to choose from that will assist in the reduction or complete elimination of Trackout. Examples below:

Trackout Pad

A stabilized constructed entrance, designed to remove debris from the tires as vehicles leave a construction site. Requirements for the construction of an effective trackout pad are:

- 15 Feet Wide (Minimum)
- 100 Feet Long (Recommended)
- 4-8 Inch Quarry Spalls
- 12 Inch Thickness

*See back of brochure for example.

Trackout Plate / Grizzly's®

A device using rails, pipes, or grates that dislodge debris from the tires and undercarriage prior to leaving a construction site. This device is usually reusable and can easily be assembled and transported.

Paving

While it might not be as cost effective, paving is an effective method of sediment control. A paved surface must extend at least 100 feet back from the point of the intersection with a paved public roadway and be a minimum width of at least 20 feet.

Photo: Grizzly incorporated into the Trackout Pad BMP.

Wash Pit or Wheel Washing System

The wash pit integrates the Trackout plates with an effective and efficient wheel washing system that helps remove debris from tires and the undercarriages of vehicles. While it may take a little longer to assemble, it is the best system for long term or high debris traction projects.

Why BMPs Are Important?

They are effective management practices for reducing pollution within our stormwater systems. Below are two websites where you can learn more about BMPs and how they can be constructed.

- https://www.yakimacounty.us/1748/Best-Management-Practices-BMPs
- https://www.wastormwatercenter.org/construction-stormwater-general-permit

Photo: Rain for Rent on-site Wheel Washing System.

Contact Us

Yakima County Public Services
Water Resources Division
128 N. 2nd St.
Fourth Floor Courthouse
Yakima, WA 98901
Phone: (509) 574-2300
Fax: (509) 574-2301

Web: http://www.yakimacounty.us/

Instalaciones de aguas pluviales en el Condado de Yakima.

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Yakima County Public Services
Water Resources
128 N. 2nd St.
Fourth Floor Courthouse
Yakima, WA 98901

*Spanish Translation by Microsoft Translator Software

PROYECTOS DE CONSTRUCTION DE AGUAS PLUVIALES

2020

Dirección

Español

Permiso de Construcción Pluvial General

Departamento de Ecología del estado de Washington (ecología) implementa la Ley Federal de agua limpia. Debido a esta ley federal construcción aguas pluviales de Ecología **permiso General es necesaria para ciertas actividades de construcción**. Los proponentes del proyecto deben obtener permiso de cobertura directamente de la ecología cuando un proyecto se cumple con los siguientes umbrales de regulación:

1) Molesta a uno o más acres de terreno.
   O
2) Es "parte de un más grade desarrollo previsto o venta" que en ultima instanica a uno más acres de tierra.
   Y
3) De aguas pluviales en el sitio de descargo en las aguas superficiales del estado o en sistemas de drenaje de la tomenta, que vierten a las aguas superficiales del estado.

Si el proyecto **no cumple** con los umbrales anteriormente un permiso de construcción General de aguas de lluvia, una lluvia contaminación prevención Plan **(SWPPP)** no será necesario; sin embargo las descargas de sedimentos o contaminantes desde el sitio de construcción para las aguas superficiales o aguas pluviales locales sistemas son responsabilidad del implementador del proyecto y pueden violar la ley y ordenanza local.

Una guía para los sitios de construcción de aguas pluviales por ecología se puede encontrar en el siguiente enlace:
https://fortress.wa.gov/ecy/publications/documents/9937.pdf

Renuncia de Erosividad

Algunos sitios en menos de hectáreas pueden ser elegibles para obtener una exención de la erosividad en lugar de obtener permiso de cobertura bajo lluvia de construcción de la ecología general permiso si el proyecto cumple con ciertas condiciones. Esta renuncia de erosividad puede encontrarse en el siguiente enlace:

https://fortress.wa.gov/ecy/publications/SummaryPages/ecy070202.html

Nuevos Desarrollos de Proyecto

Novedad es la conversión de superficie previamente subdesarrolladas o permeables en superficies impermeables y áreas administradas. Nuevo desarrollo ocurre en terrenos baldíos o a través de la expansión de sitios parcialmente desarrollados. Los nuevos proyectos de desarrollo, independientemente de si los proyectos cumple con el umbral de regulación deberán cumplir con los siguientes **elementos básicos**:

- Elemento de la base #1 - Plan del sitio de aguas pluviales
- Elemento de la base #2 - Construcción prevención de la contaminación de aguas pluviales
- Elemento de la base #3 - Control de origen de los contaminates
- Elemento de la base #4 - Preservación de los sistemas de drenaje Natural de la base
- Elemento de la base #5 - Tratamiento de la escorrentía
- Elemento de la base #6 - Control de flujo
- Elemento de la base #7 - Operación y mantenimiento (O&M)
- Elemento de la base #8 - Sistemas de transporte

Si su establecimiento no se descarga a las aguas inyección subterráneo, o si el nuevo desarrollo no cumple con los límites regulatorios, luego base elementos #5 y #7 no se requieren.

Proyectos de Remodelación

Reconstrucción de proyectos de reconstrucción es la sustitución o mejora de la contaminación que generan las superficies impermeables en un sitio desarrollado. Remodelación se produce cuando las instalaciones existentes son demolidas y reconstruidas o cambiadas substancialmente a través de la reconstrucción. Las instalaciones reconstruidas o reconstruidas son consideradas de la misma manera como novedad.

Yakima County Regional Aguas Pluviales Manual

El Manual de aguas pluviales Regional del Condado de Yakima fue desarrollado para proporcionar directrices, procedimientos, diseños y mantenimiento de instalaciones de aguas pluviales. Se recomienda que una entidad revisar completamente el manual completo antes de solicitar un permiso. El manual completo se puede encontrar en el siguiente enlace:
https://www.yakimacounty.us/1732/Stormwater-Management

Contacto

Yakima County Public Services
Atención: Water Resources
128 N. 2nd St.
Fourth Floor Courthouse
Yakima, WA 98901

Teléfono: (509) 574-2300
Fax: (509) 574-2301

Web: http://www.yakimacounty.us/

Selah Ditch Monitoring Report

CITY OF SELAH
Yakima County, Washington

SELAH DITCH MONITORING REPORT

for

ENVIRONMENTAL MONITORING AND TMDL EFFECTIVENESS (THIRD EVENT)

Prepared by

HLA Engineering and Land Surveying, Inc.
2803 River Road
Yakima, WA 98902
509.966.7000
Fax 509.965.3800
www.hlacivil.com

HLA Project No. 21006WW

AUGUST 2021

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APPENDICES

CITY OF SELAH

SELAH DITCH MONITORING REPORT

for

ENVIRONMENTAL MONITORING AND TMDL EFFECTIVENESS (THIRD EVENT)

BACKGROUND

Selah Ditch, a man-made, straight-channel body of water, approximately 4,380 feet (0.83 mile) long, is located in the south-central portion of the City of Selah, parallel to and just west of the Burlington Northern Santa Fe (BNSF) railroad tracks. At its southern end, Selah Ditch combines with Golf Club Creek (Taylor Ditch), and the combined flow of both water bodies continues downstream for approximately 0.2 miles, where it empties into the Yakima River at River Mile 117.1. The location of Selah Ditch within the City of Selah is shown on Figure 1 in the Appendix.

Selah Ditch receives water from the following sources:

- Stormwater runoff from the City of Selah;
- Stormwater runoff from a warehouse complex;
- Excess irrigation waters;
- Selah wastewater treatment plant effluent;
- Industrial non-contact cooling water from four industries; and
- Groundwater.

Discharges to the Selah Ditch are covered under two separate permits issued by the Washington State Department of Ecology (Ecology). Wastewater discharges from the Publicly Owned Treatment Works (POTW) are allowed under NPDES Permit No. WA002103-2 and stormwater discharges are allowed under the Eastern Washington Phase II Municipal Stormwater Permit. Both permits contain elements to improve the water quality in the Selah Ditch. Wastewater discharges are controlled by establishing limits on the pollutants in the effluent, and pollutants found in stormwater discharges are controlled through best management practices.

Section S9. Compliance Schedule of Selah's NPDES Permit No. WA002103-2 required the City to perform an initial TMDL effectiveness monitoring in August 2013 with a second in August 2015. Both events were completed, and the results were sent to Ecology. Selah's NPDES permit was administratively extended, so the City followed the dates set in the TMDL Water Quality Improvement Plan and performed a third monitoring event in July 2021. This report presents the results of the most recent monitoring effort and includes the results from the two previous events to provide a comprehensive view of the data.

MONITORING CONSIDERATIONS

The Compliance Schedule found in Selah's WWTP NPDES Permit (Section S9.) includes considerations to address possible low dissolved oxygen concentrations in Selah Ditch. The goal of the Compliance Schedule tasks is to complete implementation of mitigation engineering and construction of improvements, if needed, to meet water quality criterion for dissolved oxygen at the edge of the chronic mixing zone. Therefore, monitoring was needed to establish if the Selah

Ditch water quality is impaired for dissolved oxygen, and to establish the degree of that impairment and extent/effect of improvements needed to raise the dissolved oxygen concentration. A technical memorandum, submitted to Ecology in 2016, proposed improvements to improve dissolved oxygen and possible compliance issues. This report supplements previous monitoring efforts.

The three main water quality constituents of concern, as identified in the TMDL study, are dissolved oxygen, fecal coliform bacteria, and high water temperatures. Fecal coliform concentrations can be caused by human activities, as well as by other natural activities (wildlife, etc.). Other constituents to be considered, as recommended in the sampling and analysis plan, include biochemical oxygen demand (BOD_5) and *E. coli* bacteria. BOD_5 will be examined to evaluate the effect of oxygen demand on the dissolved oxygen concentrations. *E. coli* will be quantified to refine the source of bacterial contamination in Selah Ditch.

Monitoring Schedule

The collection and analysis of water samples began in January 2013. Data collection continued at the sample frequencies listed in Table 1 through August 2015. However, more frequent sampling and analysis were proposed to establish seasonal variations and to provide data for modeling and subsequent design of the WWTP improvements, if needed, to address dissolved oxygen concerns. In 2021, data were collected during the warmest months of the summer, July and August.

TABLE 1 – SURFACE WATER MONITORING

Parameter	Time of Sample	Sample Frequency[1]	Sample Type
Dissolved Oxygen	Daylight[2] and Mid-afternoon[3]	1 every 2 weeks	Grab
Biochemical Oxygen Demand (BOD_5)	Mid-afternoon	1 every 2 weeks	Grab
Temperature, °C	Continuous	30 minute intervals	data logger[5]
Fecal Coliform	Mid-afternoon	1 every 2 weeks	Grab
E. coli Bacteria	Mid-afternoon	1 per month during the critical season[4]	Grab

Notes:

1 Sampling was completed at the frequencies listed through August 31, 2015, and was thereafter adjusted based on the results and variability in the data to be completed during the hottest months of the critical season, July and August 2021.

2 Daylight dissolved oxygen samples shall be taken before sunlight can influence photosynthesis in the surface water.

3 Mid-afternoon samples shall be taken between 2 p.m. and 4 p.m.

4 The critical season is defined as the period from April 1 through October 31.

5 Continuous monitoring instruments must achieve an accuracy of 0.2 °C and must be verified annually.

6 The following additional samples shall be taken immediately after a rainfall event of one-half inch or more as measured at the wastewater treatment plant: dissolved oxygen, BOD_5, fecal coliform, and *E. coli*. If taken during the critical season, the *E. coli* sample will count as one of the required samples.

Surface Water Monitoring

Surface water samples were collected from the four locations described below and shown on Figure 2 in the Appendix:

- Station No. 1 – Just downstream of the wastewater treatment plant effluent outfall;
- Station No. 2 – At the location of the second culvert downstream from the treatment plant;
- Station No. 3 – Behind Jake's Place after the 10th street storm drain confluence; and
- Station No. 4 – At the upstream end of the culvert where the ditch passes under the BNSF railroad tracks. This station is located at the downstream end of the chronic mixing zone established for the POTW effluent.

Dissolved oxygen was tested at daylight and mid-afternoon since those times were expected to result in the lowest and highest concentrations throughout the day, respectively. BOD, fecal coliform and *E. coli* will be sampled in the mid-afternoon with the DO sample. Temperature is being monitored at the four locations with HOBO® Water Temp Pro v2 (U22-001) loggers.

MONITORING RESULTS

Dissolved Oxygen

Dissolved oxygen (DO) monitoring results are shown in Table A-1 in the Appendix. The average increased downstream from 4.5 mg/l at Station 1 to 6.2 mg/ at Station 4. Afternoon averages showed a greater downstream swing from 4.5 mg/l to 7.9 mg/l. Water temperatures were consistently lower downstream in July, indicating that DO concentrations increase with lower temperatures. Minimum, maximum, and 10th percentile concentrations also increased downstream.

Biochemical Oxygen Demand (BOD_5)

Biochemical oxygen demand (BOD_5) results are shown in Table A-2 in the Appendix. From Station 1 to Station 4, Average BOD_5 concentrations increased less than 1 mg/l. The highest recorded value was 10.0 mg/l at Station 1.

Temperature

Of the data collected, temperature was the most extensive, with values recorded at 30-minute intervals throughout the duration of the monitoring period. Temperature was only recorded at two points, the wastewater treatment plant outfall (Station No. 1) and the culvert crossing (Station No. 4). A monthly graph of the temperature data for July 2021 through August 2021 is presented in Figure A-1 of the Appendix for the two monitoring locations. Maximum daily temperatures are summarized in Table A-3 in the Appendix. These temperatures were selected peak temperature events on the dates noted. The consecutive 7-day average of the maximum daily temperatures (7-DAD Max) are listed in Table A-4. The 7-DAD Max values were calculated from the logged data by finding the maximum temperature on any given day, and consecutively averaging temperatures. The maximum of those 7-day averages within a month was then listed in the table.

Average temperatures during the testing period at Station 1 and Station 4 were nearly identical at 20.4 °C and 20.5 °C. However, maximum daily temperatures during July were consistently lower at Station 4 by more than 1 °C. Station 1 had a greater fluctuation in temperature over the

monitoring period, ranging from a minimum of 18.4 °C to a maximum of 21.8 °C, a difference of 3.4 °C. Temperature variation at Station 4 was narrower at a difference of 1.7 °C. According to 7-DAD Max temperature data, temperatures decreased downstream in July from 21.4 °C to 20.5 °C, but remained consistent in both locations at 21.0 °C during August.

Fecal Coliform Bacteria

Fecal coliform bacteria concentrations are listed in Table A-5 in the Appendix. A wide variation in concentrations is evident from the two testing days. In the past, testing methods improved as the monitoring period progressed when dilution ratios were better established, especially as a greater number of samples were taken. The data from the labs intermixed the reporting units between most probable number (MPN) and colony forming units (CFU's). It is our understanding that the MPN procedure is more variable than the membrane filtration CFU procedure, and that multiple tube fermentation (MTF)-derived MPN estimates are somewhat higher on average than CFU estimates on split samples from the same water bodies. However, a definitive relationship between the two values has not been determined. Therefore, the values were compared as if they were interchangeable. Station No. 1 consistently had the highest concentrations. The culvert had the lowest values, and concentrations decreased downstream. The values used to calculate the 90th percentile did not include the "<" or ">" values.

One "storm grab" sample was taken as required by the Eastern Washington Phase II Municipal Stormwater Permit. The results were reported as TNTC because expected concentrations were unknown and appropriate dilution factors could not be determined.

E. Coli Bacteria

Concentrations of *E. coli* bacteria are listed in Table A-6 in the Appendix. A definite decrease in downstream concentrations is evident during the testing period. Station No. 1 consistently had the highest concentrations while the flow measured at the culvert had the lowest values. The values used to calculate the 90th percentile did not include the "<" or ">" values.

The ratio of fecal coliform to E. coli bacteria is presented in Table A-7. Only valid concentrations without the "<" or ">" values were used to calculate the ratio. The ratio is lowest at the outfall of the WWTP, and highest at the Station No.4. As noted above, different test methods can skew the results. E. coli concentration should not be greater than fecal coliform concentrations.

Event Trends

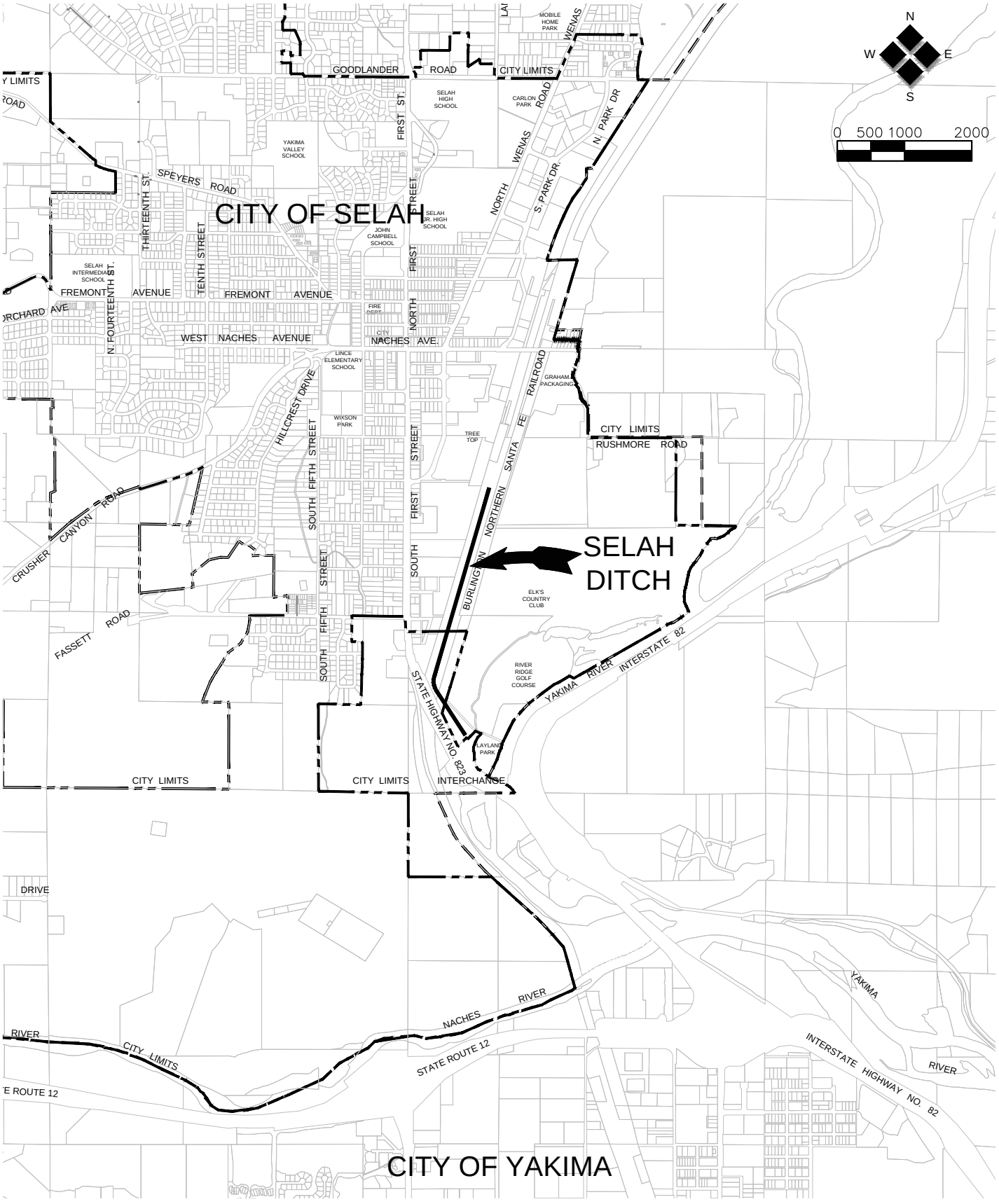
Data from the three monitoring events can provide insight into general trends at the monitored locations. Only data from the months of July and August were recorded for the most recent event, and these can be compared with data from the two previous events during the same period. The below paragraphs summarize general trends in the DO, BOD, Temperature, and Fecal Coliform/E. Coli data from the three monitoring events.

DO: During the months of July and August, DO monitoring events showed a general increase in dissolved oxygen concentrations from 2013 to 2015, but a decrease from 2015 to 2021. From the limited data, diurnal swings appear to decrease from 2013 to 2021.

BOD: There are no significant differences in BOD concentrations among the three monitoring events.

Temperature: July and August temperatures appear to generally decrease throughout the three monitoring periods. Year 2013 had greater peaks than 2015 and 2021 and 7-DAD Max temperatures were nearly 3 °C higher in July 2015 than July 2021.

Fecal Coliform/E. Coli: Limited data were collected during the third monitoring event. Nonetheless, fecal coliform generally decreased from 2013 to 2015. However, E. Coli tended to increase from 2013 to 2015, but decrease from July 2015 to July 2021.



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Huibregtse, Louman Associates, Inc.
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www.hlacivil.com

P:\Projects\2012\12006\Selah Ditch TMDL.dwg

LOCATION MAP
SELAH DITCH TMDL

FIGURE 1

HLA
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www.hlacivil.com

REVISION	DATE

JOB NUMBER: 13006WW
DATE: 09–30–13
FILE NAMES:
DRAWING: selahditch.dwg
PLAN:
PROFILE:
DESIGNED BY: TWP
ENTERED BY: TJR

SELAH DITCH
MONITORING REPORT

FIGURE 2 – SAMPLE STATIONS

APPENDIX A

THIRD SAMPLING EVENT
July to August 2021

Selah Ditch Monitoring Report
Environmental Monitoring and TMDL Effectiveness

TABLE A - 1: DISSOLVED OXYGEN MONITORING RESULTS
(All values in mg/l)

Date	Time	Eff.	Sampling Station			
			No. 1	No. 2	No. 3	No. 4
July 14, 2021	8:00 AM	5.4	4.1	4.2	2.4	4.5
	14:00 PM	-	4.0	5.4	6.3	9.0
July 28, 2021	8:00 AM	6.3	4.9	4.5	2.5	4.3
	14:00 PM	-	5.0	5.6	3.7	6.8
Statistics						
Average			4.5	4.9	3.7	6.2
Average AM			4.5	4.4	2.5	4.4
Average PM			4.5	5.5	5.0	7.9
Minimum			4.0	4.2	2.4	4.3
Maximum			5.0	5.6	6.3	9.0
10th Percentile			4.0	4.3	2.4	4.4

Selah Ditch Monitoring Report
Environmental Monitoring and TMDL Effectiveness

TABLE A - 2: BOD MONITORING RESULTS

(All values in mg/l)

Date	Time	Eff.	Sampling Station			
			No. 1	No. 2	No. 3	No. 4
July 14, 2021	2:30 PM	5.00	10	7	7	8
July 28, 2021	2:40 PM	3.00	5	4	7	8
Statistics						
Average			7.5	5.5	7.0	8.0
Minimum			5.0	4.0	7.0	8.0
Maximum			10.0	7.0	7.0	8.0
90th Percentile			9.5	6.7	7.0	8.0

TABLE A - 3: MAXIMUM DAY TEMPERATURES
(All values in degrees C at selected peak events)

Date	Sampling Station	
	No. 1	No. 4
July 19, 2021	21.8	20.4
July 26, 2021	21.8	20.5
July 29, 2021	21.5	20.6
August 3, 2021	21.1	21.3
August 11, 2021	19.2	20.8
Statistics (All Data)		
Average	20.5	20.4
Minimum	18.4	19.6
Maximum	21.8	21.3
90th Percentile	21.6	21.1

TABLE A - 4: 7 DAD MAXIMUM TEMPERATURES
(All values in degrees C)

Month	Sampling Station	
	No. 1	No. 4
July 2021	21.4	20.5
August 2021	21.0	21.0

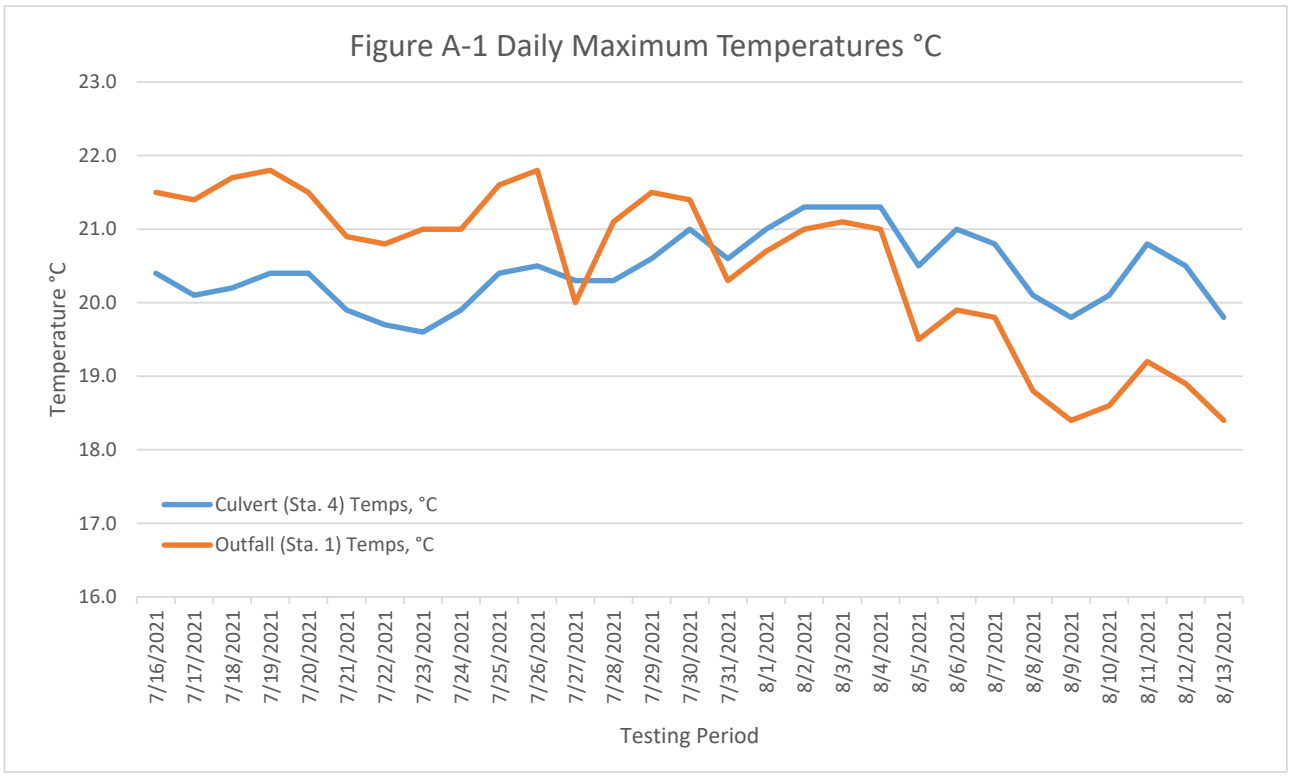
Figure A-1 Daily Maximum Temperatures °C
Temperature °C
23.0
22.0
21.0
20.0
19.0
18.0
17.0
16.0
Culvert (Sta. 4) Temps, °C
Outfall (Sta. 1) Temps, °C
7/16/2021
7/17/2021
7/18/2021
7/19/2021
7/20/2021
7/21/2021
7/22/2021
7/23/2021
7/24/2021
7/25/2021
7/26/2021
7/27/2021
7/28/2021
7/29/2021
7/30/2021
7/31/2021
8/1/2021
8/2/2021
8/3/2021
8/4/2021
8/5/2021
8/6/2021
8/7/2021
8/8/2021
8/9/2021
8/10/2021
8/11/2021
8/12/2021
8/13/2021
Testing Period

Selah Ditch Monitoring Report
Environmental Monitoring and TMDL Effectiveness

TABLE A - 5: FECAL COLIFORM MONITORING RESULTS
(All values in #/l)

Date	Time	Eff.	Sampling Station			
			No. 1	No. 2	No. 3	No. 4
July 13, 2021	11:00 AM	3.0	1,850.0	1,144.0	1,500.0	289.0
July 27, 2021	14:00 pm	13.0	500.0	275.0	250.0	222.0
Storm grab	11:43 AM	-	tntc	tntc	tntc	tntc
Statistics						
Average		8.0	1,175.0	709.5	875.0	255.5
Minimum		3.0	500.0	275.0	250.0	222.0
Maximum		13.0	1,850.0	1,144.0	1,500.0	289.0
90th Percentile		12.0	1,715.0	1,057.1	1,375.0	282.3

Selah Ditch Monitoring Report
Environmental Monitoring and TMDL Effectiveness

TABLE A - 6: *E. COLI* MONITORING RESULTS
(All values in MPN/100ml)

Date	Time	Sampling Station			
		No. 1	No. 2	No. 3	No. 4
July 28, 2021	11:00 AM	866.4	325.5	228.2	161.6

TABLE A - 7: FECAL COLIFORM TO *E. COLI* RATIO
(Fecal Coliform/*E. Coli*)

Date	Time	Sampling Station			
		No. 1	No. 2	No. 3	No. 4
July 27 : July 28, 2021	7:01 AM	0.6	0.8	1.1	1.4

*July 27 Fecal Coliform compared to July 28 Ecoli due to difference in sampling day.

APPENDIX B

FIRST SAMPLING EVENT
January to August 2013

TABLE B - 1: DISSOLVED OXYGEN MONITORING RESULTS
(All values in mg/l)

Date	Time	Sampling Station			
		No. 1	No. 2	No. 3	No. 4
January 3, 2013	8:10 AM	7.4	7.5	7.5	7.4
	3:45 PM	7.6	7.6	7.6	7.6
January 11, 2013	8:20 AM	7.3	7.5	7.4	7.5
	4:30 PM	7.4	7.4	7.5	7.6
January 17, 2013	8:15 AM	7.5	7.5	7.6	7.6
	4:15 PM	7.5	7.6	7.6	7.7
February 14, 2013	7:05 AM	7.7	7.3	7.5	7.4
	4:25 PM	7.6	7.4	7.5	7.6
February 22, 2013	7:40 AM	7.0	7.1	7.1	6.9
	4:40 PM	7.0	7.9	8.5	9.5
February 25, 2013	8:25 AM	7.2	7.6	8.3	8.5
	4:00 PM	7.3	8.1	9.1	9.8
March 5, 2013	7:40 AM	7.4	7.6	8.0	8.1
	4:15 PM	7.5	7.9	8.7	9.6
March 28, 2013	7:10 AM	6.5	6.9	6.6	6.3
	4:20 PM	6.5	7.4	8.0	8.7
April 8, 2013	7:00 AM	7.5	7.7	7.7	7.3
	3:30 PM	7.2	11.6	13.1	13.4
April 23, 2013	7:22 AM	6.8	7.5	7.8	8.0
	4:05 PM	7.0	8.1	9.3	11.6
May 14, 2013	7:18 AM	6.5	6.4	6.7	7.1
	3:45 PM	6.6	7.5	10.1	10.4
May 29, 2013	6:35 AM	5.5	6.1	5.6	5.4
	3:45 PM	6.3	7.4	9.2	10.3
June 7, 2013	6:50 AM	5.6	3.8	3.3	3.7
	3:40 PM	5.5	5.3	7.6	10.0
June 25, 2013	6:30 AM	5.5	3.4	2.4	2.8
	4:30 PM	6.0	6.5	11.6	12.9
July 5, 2013	7:20 AM	5.0	2.3	1.7	2.4
	3:45 PM	5.7	8.2	14.1	14.0
July 23, 2013	7:00 AM	5.8	2.1	2.2	2.8
	3:45 PM	5.9	6.2	9.8	11.7
August 2, 2013	7:15 AM	5.5	2.9	2.6	3.2
	3:20 PM	5.7	5.2	7.2	9.5
August 19, 2013	7:15 AM	5.6	3.5	3.3	3.7
	4:45 PM	5.7	4.9	8.8	10.1
Statistics					
Average		6.6	6.6	7.5	8.0
Average AM		6.5	5.8	5.7	5.9
Average PM		6.7	7.3	9.2	10.1
Minimum		5.0	2.1	1.7	2.4
Maximum		7.7	11.6	14.1	14.0
10th Percentile		5.5	3.5	3.0	3.5

TABLE B - 2: BOD MONITORING RESULTS
(All values in mg/l)

Date	Time	Sampling Station			
		No. 1	No. 2	No. 3	No. 4
January 3, 2013	2:10 PM	5	6	6	5
January 24, 2013	2:20 PM	6	5	9	4
February 6, 2013	2:20 PM	7	9	6	7
February 25, 2013	3:15 PM	6	7	7	6
March 7, 2013	2:25 PM	4	6	5	4
March 26, 2013	2:40 PM	4	8	6	6
April 8, 2013	2:10 PM	5	6	8	5
April 25, 2013	3:00 PM	4	7	8	5
May 7, 2013	3:05 PM	7	8	7	7
May 23, 2013	2:40 PM	11	10	9	6
June 3, 2013	3:30 PM	10	10	8	7
June 24, 2013	3:30 PM	8	7	8	6
July 2, 2013	2:25 PM	6	5	4	4
July 29, 2013	3:15 PM	4	4	3	4
August 4, 2013	3:20 PM	4	5	3	4
August 28, 2013	3:50 PM	4	3	4	3
Statistics					
Average		5.9	6.6	6.3	5.2
Minimum		4.0	3.0	3.0	3.0
Maximum		11.0	10.0	9.0	7.0
90th Percentile		9.0	9.5	8.5	7.0

TABLE B - 3: MAXIMUM DAY TEMPERATURES
(All values in degrees C at selected peak events)

Date	Sampling Station			
	No. 1	No. 2	No. 3	No. 4
January 9, 2013	12.1	12.7	12.6	12.4
February 1, 2013	12.1	13.1	13.8	14.2
February 15, 2013	12.0	13.2	14.1	14.5
March 1, 2013	13.1	14.4	13.7	14.5
March 15, 2013	14.0	14.7	15.1	15.8
April 2, 2013	15.8	16.0	17.7	18.5
May 6, 2013	17.3	17.7	19.2	20.5
May 10, 2013	18.8	20.4	21.9	20.5
June 6, 2013	19.8	19.6	20.9	21.5
July 2, 2013	22.2	21.3	23.0	23.4
July 10, 2013	20.9	22.7	22.0	21.0
July 25, 2013	21.4	23.0	22.2	21.3
August 6, 2013	21.3	22.3	21.5	21.0
August 10, 2013	22.0	21.4	22.5	23.1
Statistics				
Average	17.3	18.0	18.6	18.7
Minimum	12.0	12.7	12.6	12.4
Maximum	22.2	23.0	23.0	23.4
90th Percentile	21.8	22.6	22.4	22.6

TABLE B - 4: 7 DAD MAXIMUM TEMPERATURES

(All values in degrees C)

Date	Sampling Station			
	No. 1	No. 2	No. 3	No. 4
April	16.2	16.7	18.1	18.1
May	18.6	19.4	21.1	20.2
June	21.4	20.7	22.1	22.6
July	21.1	22.8	21.9	21.1
August	21.5	21.1	22.1	22.6
Statistics				
Minimum	16.2	16.7	18.1	18.1
Maximum	21.5	22.8	22.1	22.6

TABLE B - 5: FECAL COLIFORM MONITORING RESULTS
(All values in CFU/100ml)

Date	Sampling Station			
	No. 1	No. 2	No. 3	No. 4
January 17, 2013	<1	45	22	7
January 28, 2013	<1	2,000	1,274	1,260
February 14, 2013	<1	836	1,017	1,211
February 25, 2013	1	543	267	180
March 14, 2013	<1	>2,419.2	>2,419.2	>2,419.2
March 28, 2013	2	686	736	507
April 18, 2013	<1	>200.5	>200.5	>200.5
April 29, 2013	1	1,617	252	190
May 9, 2013	1	1,171	1,486	1,957
May 23, 2013	<1	>2,419.2	>2,419.2	921
June 4, 2013	1	33	39	94
June 19, 2013	<1	369	341	862
July 2, 2013	10	419	754	650
July 23, 2013	52	4,106	598	1,408
August 1, 2013	31	586	515	2,247
August 19, 2013	3	988	2,613	763
Statistics				
Average	11	1,031	763	876
Minimum	<1	33	22	7
Maximum	52	4,106	2,613	>2,419.2
90th Percentile	35	1,923	1,444	1,792

TABLE B - 6: *E. COLI* MONITORING RESULTS
(All values in MPN/100ml)

Date	Sampling Station			
	No. 1	No. 2	No. 3	No. 4
January 17, 2013	<1	25	23	22
January 28, 2013	<1	1,660	1,010	830
February 14, 2013	<1	560	384	531
February 25, 2013	<1			
March 14, 2013	1	>2,419.2	>2,419.2	>2,419.2
March 28, 2013				
April 18, 2013	<1	25	10	<1
April 29, 2013	<1			
May 9, 2013				
May 23, 2013	<1	223	1,607	382
June 4, 2013				
June 19, 2013	<1	87	87	223
July 2, 2013	41	173	512	109
July 23, 2013	<1	40	31	31
August 1, 2013	<1	63	52	122
August 19, 2013	<1	63	160	132
Statistics				
Average	21	292	388	265
Minimum	<1	25	10	22
Maximum	41	>2,419.2	>2,419.2	>2,419.2
90th Percentile	37	670	1,070	591

TABLE B - 7: FECAL COLIFORM TO *E. COLI* RATIO
(Fecal Coliform/*E. Coli*)

Date	Sampling Station			
	No. 1	No. 2	No. 3	No. 4
January 17, 2013		1.8	1.0	0.3
January 28, 2013		1.2	1.3	1.5
February 14, 2013		1.5	2.6	2.3
February 25, 2013				
March 14, 2013				
March 28, 2013				
April 18, 2013				
April 29, 2013				
May 9, 2013				
May 23, 2013				2.4
June 4, 2013				
June 19, 2013		4.2	3.9	3.9
July 2, 2013	0.2	2.4	1.5	6.0
July 23, 2013		102.9	19.3	45.4
August 1, 2013		9.3	9.9	18.4
August 19, 2013		15.7	16.3	5.8
Statistics				
Average	0.2	17.4	7.0	9.6
Minimum	0.2	1.2	1.0	0.3
Maximum	0.2	102.9	19.3	45.4

APPENDIX C

SECOND SAMPLING EVENT
November 2013 to September 2015

TABLE C - 1: DISSOLVED OXYGEN MONITORING RESULTS
(All values in mg/l)

Date	Time	Sampling Station			
		No. 1	No. 2	No. 3	No. 4
November 14, 2013	7:25 AM	6.2	5.6	5.8	6.3
	3:00 PM	6.5	5.9	6.1	6.7
December 10, 2013	7:52 AM	7.8	6.6	6.5	6.7
	2:45 PM	7.8	7.2	7.9	8.6
December 19, 2013	7:30 AM	7.3	-	-	-
	3:15 PM	7.5	-	-	-
January 9, 2014	7:45 AM	7.2	-	-	-
	2:50 PM	7.3	-	-	-
February 27, 2014	7:30 PM	6.2	6.4	6.3	6.5
	2:30 PM	7.2	8.3	9.2	10.1
March 25, 2014	7:35 AM	6.8	7.7	7.5	7.7
	3:30 PM	7.2	8.7	9.6	10.7
April 17, 2014	7:30 AM	6.2	6.0	5.5	6.9
	2:40 PM	6.7	7.4	7.3	7.4
May 14, 2014	7:45 AM	5.5	6.0	6.2	6.2
	3:30 PM	5.6	7.6	10.9	12.2
May 30, 2014	8:00 AM	5.5	5.9	6.3	6.4
	2:30 PM	5.1	8.4	10.2	10.8
June 20, 2014	7:30 AM	5.2	4.0	3.6	3.5
	12:30 PM	5.2	6.5	8.9	10.2
June 30, 2014	7:50 AM	5.5	4.4	3.4	3.9
	3:00 PM	5.6	6.5	9.9	11.1
July 11, 2014	8:00 AM	5.2	3.9	3.1	4.0
	3:00 PM	5.5	5.0	7.5	9.3
July 18, 2014	7:25 AM	5.4	4.1	3.0	4.1
	2:45 PM	5.7	4.9	6.0	8.9
July 28, 2014	7:30 AM	5.3	4.2	3.2	4.3
	2:30 AM	5.5	5.2	6.6	9.8
July 30, 2014	7:30 AM	5.3	4.3	3.5	4.2
	3:40 PM	5.9	4.5	6.3	9.2
August 10, 2014	7:45 AM	6.3	5.2	4.8	5.0
	2:30 PM	6.5	5.9	6.3	8.4
August 26, 2014	8:00 AM	6.2	5.4	5.3	5.5
	3:20 AM	5.5	5.5	5.5	7.1
September 8, 2014	7:35 AM	6.3	5.3	5.4	5.6
	3:25 PM	6.1	5.5	5.5	7.0
September 30, 2014	7:30 AM	6.2	5.9	5.5	6.2
	2:30 PM	6.7	6.7	7.3	8.3
October 22, 2014	7:30 AM	6.6	6.2	6.2	6.5
	3:10 PM	6.8	6.0	6.3	6.5
October 30, 2014	8:00 AM	6.2	6.3	6.2	6.2
	2:00 PM	6.6	6.3	6.1	6.3
November 7, 2014	8:00 AM	6.9	6.5	6.6	6.7
	2:30 PM	6.8	6.7	6.7	6.7
November 19, 2014	8:15 AM	7.6	7.0	7.1	7.3
	2:50 PM	6.9	7.1	7.1	7.1

Date	Time	Sampling Station			
		No. 1	No. 2	No. 3	No. 4
December 10, 2014	8:00 AM	7.2	6.6	6.6	6.8
	2:30 PM	6.8	6.5	6.6	6.6
December 17, 2014	8:00 AM	7.3	6.8	6.9	7.2
	2:30 PM	6.4	6.8	7.2	7.2
January 8, 2015	7:45 AM	7.4	7.5	7.4	7.4
	2:25 PM	7.5	7.5	7.4	7.6
January 27, 2015	7:30 AM	7.6	7.2	7.2	7.5
	2:00 PM	7.3	7.2	7.6	7.9
February 12, 2015	8:00 AM	7.0	7.4	7.6	7.8
	2:45 PM	7.2	8.2	8.8	9.6
February 26, 2015	7:25 AM	7.4	7.3	7.5	7.7
	2:45 PM	7.0	8.3	9.1	9.8
March 12, 2015	8:00 AM	7.0	7.0	6.9	7.2
	2:00 PM	7.1	9.3	10.1	10.7
March 25, 2015	7:30 AM	7.1	6.5	6.7	7.0
	2:30 AM	7.1	8.6	9.1	10.3
April 14, 2015	7:30 AM	7.2	7.2	7.1	7.4
	2:50 PM	7.0	10.4	11.3	11.8
April 29, 2015	7:30 AM	6.4	6.6	6.5	6.6
	2:15 PM	6.8	9.3	11.3	12.4
May 6, 2015	7:30 AM	6.3	6.1	6.2	6.6
	2:30 PM	6.5	9.4	11.0	11.8
May 27, 2015	7:20 AM	6.1	6.2	5.9	5.8
	3:20 PM	6.3	8.7	12.5	12.1
June 9, 2015	7:20 AM	5.7	5.9	5.1	5.0
	2:30 PM	6.2	9.5	12.4	12.9
June 23, 2015	6:28 AM	6.0	5.7	4.0	4.5
	2:30 PM	6.3	9.2	12.4	13.6
July 14, 2015	7:30 AM	6.2	5.2	3.7	4.1
	2:45 PM	6.4	8.7	9.6	11.5
July 31, 2015	6:28 AM	5.9	4.1	3.3	4.1
	2:30 PM	5.6	6.5	9.3	10.6
August 20/2015	7:40 AM	6.4	4.8	4.4	4.7
	2:10 PM	6.3	7.4	8.3	8.5
August 28, 2015	7:24 AM	6.0	4.7	4.0	4.3
	2:45 PM	6.2	6.3	6.8	7.2
September 3, 2015	7:48 AM	6.4	5.3	4.7	5.0
	2:10 PM	6.5	7.0	8.1	8.8
September 16, 2015	7:15 AM	6.7	6.0	5.0	5.2
	2:40 PM	6.6	6.9	7.2	8.3
Statistics					
Average		6.4	6.7	7.2	7.8
Average AM		6.4	5.9	5.6	5.9
Average PM		6.3	7.1	8.2	9.1
Minimum		5.1	3.9	3.0	3.5
Maximum		7.8	10.4	12.5	13.6
10th Percentile		5.5	4.9	4.3	4.6

TABLE C - 2: BOD MONITORING RESULTS

(All values in mg/l)

Date	Time	Sampling Station			
		No. 1	No. 2	No. 3	No. 4
September 12, 2013		4	2	2	2
October 10, 2013		3	2	2	2
November 14, 2013		3	2	2	2
February 27, 2014		4	3	3	2
March 25, 2014		2	2	2	2
April 17, 2014		2	2	3	2
May 30, 2014		3	2	2	2
June 20, 2014		4	2	2	2
June 30, 2014		2	2	2	2
July 18, 2014		2	2	5	3
July 29, 2014		4	2	4	2
August 13, 2014		4	2	2	2
August 26, 2014		2	1	2	1
September 18, 2014		3	2	3	3
September 30, 2014		2	2	2	2
October 13, 2014		6	4	6	6
November 7, 2014		4	3	1	5
November 20, 2014		10	7	2	7
December 10, 2014		5	5	4	4
December 24, 2014		4	2	1	3
January 8, 2015		4	4	5	4
January 27, 2015		5	4	3	3
February 12, 2015		2	1	2	2
February 27, 2015		3	3	3	3
March 12, 2015		2	2	2	2
March 27, 2015		4	5	3	3
April 14, 2015		5	3	2	2
April 29, 2015		3	3	2	2
May 7, 2015		4	2	2	2
May 27, 2015		3	2	2	2
June 9, 2015		11	2	2	2
June 24, 2015		4	2	2	2
July 14, 2015		3	2	2	2
July 31, 2015		5	3	2	4
August 10, 2015		2	3	5	2
August 28, 2015		5	4	5	3
September 3, 2015		3	4	4	3
September 16, 2015		4	4	3	3
Statistics					
Average		3.8	2.7	2.7	2.7
Minimum		2.0	1.0	1.0	1.0
Maximum		11.0	7.0	6.0	7.0
90th Percentile		5.0	4.0	5.0	4.0

TABLE C - 3: MAXIMUM DAY TEMPERATURES
(All values in degrees C at selected peak events)

Date	Sampling Station No. 1	No. 2	No. 3	No. 4
September 4, 2013	21.3	20.5	20.3	22.1
September 15, 2013	21.5	20.7	20.7	20.8
October 10, 2013	16.6	17.1	17.5	16.8
November 1, 2013	14.7	15.9	15.5	15.4
November 12, 2013	14.9	15.6	15.4	15.2
December 2, 2013	11.9	13.7	12.7	12.3
January 14, 2014	12.2	13.5	13.0	12.6
February 21, 2014	12.1	14.2	14.1	13.4
March 16, 2014	14.1	14.9	14.6	14.7
March 24, 2014	13.6	15.7	14.6	16.7
March 29, 2014	13.8	15.3	15.3	15.7
April 2, 2014	14.6	17.0	18.1	17.6
April 30, 2014	16.9	16.7	19.3	19.1
May 16, 2014	19.1	18.7	20.5	19.8
May 22, 2014	19.3	18.5	20.4	19.5
June 12, 2014	20.5	20.0	20.5	20.7
June 24, 2014	20.5	19.7	20.3	19.1
July 16, 2014	22.8	21.0	22.1	22.1
July 30, 2014	22.8	20.5	22.4	21.2
August 4, 2014	22.7	20.1	21.8	21.1
August 12, 2014	22.4	20.1	21.6	22.0
August 21, 2014	21.4	21.4	20.5	21.4
September 9, 2014	20.2	20.1	19.8	19.9
October 7, 2014	19.4	19.7	20.4	19.9
November 6, 2014	16.0	17.0	16.9	16.5
December 11, 2014	13.2	14.0	13.8	13.9
December 21, 2014	12.9	14.0	13.9	14.0
January 12, 2015	11.6	13.5	13.5	13.5
January 19, 2015	11.4	13.4	13.1	13.7
January 26, 2015	11.7	13.3	12.6	12.5
February 12, 2015	13.8	14.9	14.9	15.2
March 27, 2015	16.5	17.1	16.5	18.2
April 20, 2015	16.6	17.6	18.7	19.4
April 28, 2015	17.1	18.0	18.4	19.7
May 4, 2015	17.3	18.4	17.7	20.1
May 9, 2015	17.4	18.5	18.9	18.5
May 30, 2015	21.3	16.6	20.0	18.7
June 8, 2015	21.5	21.0	22.7	22.8
June 30, 2015	23.2	22.2	23.4	24.3
July 2, 2015	23.5	22.3	23.4	24.5
July 10, 2015	22.8	22.3	23.4	23.7
August 2, 2015	21.7	21.4	22.4	22.8
August 13, 2015	22.1	21.8	22.5	22.7
Statistics				
Average	17.7	17.9	18.3	18.5
Minimum	11.4	13.3	12.6	12.3
Maximum	23.5	22.3	23.4	24.5
90th Percentile	22.8	21.4	22.5	22.8

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TABLE C - 4: 7 DAD MAXIMUM TEMPERATURES
(All values in degrees C)

Date	Sampling Station No. 1	No. 2	No. 3	No. 4
September-13	21.2	20.6	21.0	21.9
October-13	16.8	17.1	17.3	16.4
November-13	14.4	15.4	15.0	14.7
December-13	11.4	13.6	12.4	12.1
January-14	11.9	13.4	12.7	12.3
February-14	11.6	13.5	13.4	12.7
March-14	14.0	15.4	15.4	15.9
April-14	16.6	16.5	18.5	18.1
May-14	18.9	18.5	20.0	19.0
June-14	20.4	19.3	20.6	20.4
July-14	22.4	20.6	21.4	21.4
August-14	22.4	20.7	21.5	21.7
September-14	20.3	19.7	19.9	20.2
October-14	18.8	18.6	18.7	18.6
November-14	16.1	16.6	16.2	15.8
December-14	12.9	13.9	13.6	13.7
January-15	11.7	13.2	12.7	12.7
February-15	13.5	14.4	14.5	14.8
March-15	15.7	16.6	16.2	17.7
April-15	17.1	17.8	17.9	19.5
May-15	20.5	18.3	19.5	19.6
June-15	23.1	22.0	23.0	24.0
July-15	23.1	22.1	23.2	24.2
August-15	21.6	21.3	22.0	22.4
Statistics				
Minimum	11.4	13.2	12.4	12.1
Maximum	23.1	22.1	23.2	24.2

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TABLE C - 5: FECAL COLIFORM MONITORING RESULTS

Date	Sampling Station											
	No. 1 (Effluent)		S.W.		Eff./S.W.		No. 2		No. 3		No. 4	
February 6, 2014	<1	CFU/100mL					4,352	CFU/100mL	14,136	CFU/100mL	17,329	CFU/100mL
February 27, 2014	<1	CFU/100mL					1,500	CFU/100mL	1,935	CFU/100mL	1,500	CFU/100mL
April 17, 2014	41	CFU/100mL					5,012	CFU/100mL	1,824	CFU/100mL	546	CFU/100mL
June 25, 2014	-						130	MPN/100mL	94	MPN/100mL	79	MPN/100mL
June 30, 2014	16.7	CFU/100mL					45	CFU/100mL	107	CFU/100mL	106	CFU/100mL
September 30, 2014	23	MPN/100mL	790	MPN/100mL	2,400	MPN/100mL	2,200	MPN/100mL	5,400	MPN/100mL	9,200	MPN/100mL
October 22, 2014	2	MPN/100mL	9,200	MPN/100mL	2,200	MPN/100mL	1,300	MPN/100mL	490	MPN/100mL	490	MPN/100mL
October 30, 2014	<1	MPN/100mL	>24,196	MPN/100mL	>24,196	MPN/100mL	5,475	MPN/100mL	9,804	MPN/100mL	2,164	MPN/100mL
November 19, 2014	20	CFU/100mL	3,100	CFU/100mL	TNTC	CFU/100mL	1,250	CFU/100mL	1,030	CFU/100mL	1,550	CFU/100mL
December 10, 2014	11	CFU/100mL	TNTC	CFU/100mL	TNTC	CFU/100mL	TNTC	CFU/100mL	TNTC	CFU/100mL	TNTC	CFU/100mL
December 17, 2014	0	CFU/100mL	TNTC	CFU/100mL	TNTC	CFU/100mL	1,180	CFU/100mL	400	CFU/100mL	410	CFU/100mL
January 13, 2015	20	CFU/100mL	33	MPN/100mL	220	MPN/100mL	490	MPN/100mL	330	MPN/100mL	490	MPN/100mL
	#1 Eff		#2 SW		#3 SW/Eff		#4		#5		#6	
January 27, 2015	TNTC	CFU/100mL	1,300	MPN/100mL	2,400	MPN/100mL	170	MPN/100mL	1,100	MPN/100mL	1,300	MPN/100mL
February 12, 2015	0	CFU/100mL	2,200	CFU/100mL	2,400	CFU/100mL	1,200	CFU/100mL	745	CFU/100mL	570	CFU/100mL
February 26, 2015	0	CFU/100mL	1,300	MPN/100mL	3,500	MPN/100mL	490	MPN/100mL	230	MPN/100mL	490	MPN/100mL
March 12, 2015	1	CFU/100mL	5,400	MPN/100mL	1,700	MPN/100mL	330	MPN/100mL	330	MPN/100mL	110	MPN/100mL
March 25, 2015	0	CFU/100mL	9,200	MPN/100mL	9,200	MPN/100mL	5,400	MPN/100mL	330	MPN/100mL	330	MPN/100mL
April 15, 2015	0	CFU/100mL	5,400	MPN/100mL	2,200	MPN/100mL	280	MPN/100mL	230	MPN/100mL	490	MPN/100mL
April 29, 2015	10	CFU/100mL	2,400	MPN/100mL	1,300	MPN/100mL	490	MPN/100mL	330	MPN/100mL	280	MPN/100mL
May 6, 2015	TNTC	CFU/100mL	3,500	MPN/100mL	3,500	MPN/100mL	1,100	MPN/100mL	700	MPN/100mL	940	MPN/100mL
May 27, 2015	15	CFU/100mL	3,500	MPN/100mL	5,400	MPN/100mL	790	MPN/100mL	120	MPN/100mL	490	MPN/100mL
June 9, 2015	9	CFU/100mL	2,200	MPN/100mL	790	MPN/100mL	1,100	MPN/100mL	700	MPN/100mL	490	MPN/100mL
June 24, 2015	2	CFU/100mL	1,700	MPN/100mL	1,100	MPN/100mL	350	MPN/100mL	700	MPN/100mL	230	MPN/100mL
July 14, 2015	52	CFU/100mL	1,700	MPN/100mL	79	MPN/100mL	230	MPN/100mL	280	MPN/100mL	230	MPN/100mL
July 29, 2015	28	CFU/100mL	1,700	MPN/100mL	700	MPN/100mL	330	MPN/100mL	490	MPN/100mL	490	MPN/100mL
August 18, 2015	21	CFU/100mL	1,700	MPN/100mL	490	MPN/100mL	790	MPN/100mL	2,400	MPN/100mL	330	MPN/100mL
August 26, 2015	7	CFU/100mL	1,700	MPN/100mL	230	MPN/100mL	1,100	MPN/100mL	230	MPN/100mL	330	MPN/100mL
September 15, 2015	7	CFU/100mL	3,500	MPN/100mL	700	MPN/100mL	1,100	MPN/100mL	330	MPN/100mL	460	MPN/100mL
Statistics												
Average	13		3,076		2,132		1,414		1,659		1,534	
Minimum	<1		33		79		45		22		7	
Maximum	52		9,200		9,200		5,475		14,136		17,329	
90th Percentile	28		5,780		3,880		4,616		3,600		1,796	

TABLE C - 6: *E. COLI* MONITORING RESULTS
(All values in MPN/100ml)

Date	Sampling Station					
	No. 1	SW	Eff/SW	No. 2	No. 3	No. 4
February 6, 2014	<1			2,909	10,462	10,462
February 27, 2014	<1			717	1,314	1,162
April 17, 2014	20			2,142	1,106	185
May 15, 2014	-			-	-	-
June 25, 2014	17			170	70	79
June 30, 2014	45			35.4	94.5	109.1
September 30, 2014	6.8	330	1,300	1,300	1,700	430
October 22, 2014	2	2,400	5,400	1,300	490	490
October 30, 2014	<1	>24,196	12,997	4,106	908	1,050
November 19, 2014	17	5,400	5,400	790	2,400	1,300
December 10, 2014	4.5	3,500	1,700	3,500	1,100	790
December 17, 2014	-	-	-	-	-	-
January 13, 2015	9.2	33	220	490	330	490
	#1	#2 SW	#3 SW/Eff	#4	#5	#6
January 27, 2015	330	790	1,300	170	700	170
February 12, 2015	-	-	-	-	-	-
February 26, 2015	<1.8	1,300	3,500	490	230	490
March 12, 2015	-	-	-	-	-	-
March 25, 2015	2	9,200	9,200	1,400	330	330
April 15, 2015	-	-	-	-	-	-
April 29, 2015	2	2,400	1,300	490	330	700
May 6, 2015	-	-	-	-	-	-
May 27, 2015	13	9,200	1,400	790	1,400	490
June 9, 2015	-	-	-	-	-	-
June 24, 2015	4.5	1,700	1,100	210	700	130
July 14, 2015	22.0	1,700	79	230	280	230
July 29, 2015	34.0	1,700	940	330	490	490
August 18, 2015	-	-	-	-	-	-
August 26, 2015	23.0	1,700	230	1,100	230	330
September 15, 2015	2.0	3,500	460	1,100	330	460
Statistics						
Average	33	2,990	2,908	1,132	1,190	970
Minimum	<1	33	79	35	70	79
Maximum	330	9,200	12,997	4,106	10,462	10,462
90th Percentile	38	9,200	8,820	3,145	1,980	1,217

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TABLE C - 7: FECAL COLIFORM TO *E. COLI* RATIO
(Fecal Coliform/*E. Coli*)

Date	Sampling Station					
	No. 1	SW	Eff/SW	No. 2	No. 3	No. 4
February 6, 2014	1.0			1.5	1.4	1.7
February 27, 2014	1.0			2.1	1.5	1.3
April 17, 2014	2.1			2.3	1.6	3.0
June 25, 2014	-			0.3	1.3	1.3
June 30, 2014	0.4			62.1	1.1	84.3
September 30, 2014	3.4	2.4	1.8	1.0	3.2	1.1
October 22, 2014	1.0	3.8	0.4	4.2	1.0	4.4
October 30, 2014	1.0	1.0	2.0	0.3	10.8	1.5
November 19, 2014	1.2	0.6	NA		0.4	
December 10, 2014	2.4	NA	NA	0.3		0.5
December 17, 2014						
January 13, 2015	2.2	1.0	1.0	1.0	1.0	1.0
January 27, 2015	NA	1.6	1.8	1.0	1.6	7.6
February 12, 2015						
February 26, 2015	NA	1.0	1.0	1.0	1.0	1.0
March 12, 2015						
March 25, 2015	0.0	1.0	1.0	3.9	1.0	1.0
April 15, 2015						
April 29, 2015	5.0	1.0	1.0	1.0	1.0	0.4
May 6, 2015						
May 27, 2015	1.2	0.4	3.9	1.0	0.1	1.0
June 9, 2015						
June 24, 2015	0.4	1.0	1.0	1.7	1.0	1.8
July 14, 2015	2.4	1.0	1.0	1.0	1.0	1.0
July 29, 2015	0.8	1.0	0.7	1.0	1.0	1.0
August 18, 2015						
August 26, 2015	0.3	1.0	1.0	1.0	1.0	1.0
September 15, 2015	3.5	1.0	1.5	1.0	1.0	1.0
Statistics						
Average	1.6	1.3	1.4	4.4	1.7	5.8
Minimum	0.0	0.4	0.4	0.3	0.1	0.4
Maximum	5.0	3.8	3.9	62.1	>20	>200.5