CITY OF SARATOGA SPRINGS

STORM WATER MANAGEMENT PROGRAM

UPDATED JUNE 2021

Table of Contents

List of Terms

ABOP	Antifreeze, Batteries, Oil & Paint
BMP	Best Management Practices
DCIAs	Directly Connected Impervious Areas
DWQ	Division of Water Quality
EPA	Environmental Protection Agency
GIS	Geographic Information System
HHW	Household Hazardous Waste
IDDE	Illicit Discharge Detection and Elimination
MEP	Maximum Extent Practicable
MIS	Management Information System
PHF	Pesticides, Herbicides, Fertilizers
SIC	Standard Industry Classification
SLVHD	Salt Lake Valley Health Department
SWMP	Storm Water Management Program
SWPPP	Storm Water Pollution Prevention Plan
UAC	Utah Administrative Code
UPDES	Utah Pollution Discharge Elimination System
TSS	Total Suspended Solids
DEQ	Division of Environmental Quality
LOD	Limits of Disturbance

Preface

Introduction

This Storm Water Management Plan (SWMP) has been prepared to limit, to the maximum extent practicable (MEP), the discharge of pollutants from Saratoga Springs' storm drain system. The development and implementation of this SWMP will fulfill the requirements for storm water discharges from a Small Municipal Separate Storm Sewer System (MS4) (UAC R317-8) and as a co-City under the State of Utah UPDES Permit for Utah County Authorization to Discharge Municipal Storm Water, Section II, in accordance with Section 402(p)(3)(B) of the Federal Clean Water Act, and the State Storm Water Regulations (UAC R317-8-3.8). The SWMP was developed to comply with Part 4.0 of the UPDES permit.

The City of Saratoga Springs has previously been covered under the UPDES Phase 1 Storm water Discharge permit. When the permit was issued, Saratoga Springs was part of unincorporated Utah County. The City of Saratoga Springs was incorporated in 1997, and as of August 13, 2013 (The State of Utah's Notice Letter) the City is now required to issue its own storm water permit under Phase II MS4 storm water regulations (Small MS4 UPDES General Permit No. UTR090000).

Saratoga Springs is located on the west side of Utah Lake in Utah County within the Utah Valley. Utah Valley is a terminal valley which drains to Utah Lake, flows through the Jordan River, and terminates at the Great Salt Lake.

Conveyance systems in Saratoga Springs consist of natural drainages from the Lake Mountains along the western boundary of the City and storm drain facilities installed to accommodate storm water runoff in urban development. Drainage systems generally flow easterly towards to Utah Lake and the Jordan River. The Jordan River flows from Utah Lake to the Great Salt Lake. The Great Salt Lake is a terminal system.

SWMP Coordination

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Executive Summary

This SWMP has been developed to meet the requirements of the UPDES permit and consists of the six minimum control measures established by the EPA for Phase II storm water discharges. Implementation of these control measures are anticipated to result in significant reductions of pollutants discharged into receiving water bodies. The six control measures are addressed in separate chapters.

Each control measure is facilitated by Best Management Practices (BMPs) that outline specific tasks that, when implemented, will meet the objective of that control measure. This SWMP is intended to be a living document with BMP's amended, added or deleted as necessary to meet the objectives of each control measure. The following provides a summary of each minimum control measure:

Section 1: Public Education and Outreach Program (UPDES 4.2.1)

- Ensure greater public support of and compliance to the storm water program
- Emphasize education in the SWMP as a cost-effective and proactive BMP to reduce, instead of treat, storm water pollutants

Section 2: Public Involvement/Participation Program (UPDES 4.2.2)

- Provide opportunities for the public to play an active role in the development and implementation of the storm water program
- Establish BMPs that involve and educate the public on the importance of protecting storm water and the issues relating to it

Section 3: Illicit Discharges and Improper Disposal Program (UPDES 4.2.3)

- Minimize illicit discharges into the storm drain system; discharges not composed entirely of storm water
- Prevent high levels of pollutants, the storm drain system was not designed for, from entering receiving waters

Section 4: Construction Site Storm Water Runoff Control Program (UPDES 4.2.4)

- Minimize polluted storm water runoff from construction activities
- Implement erosion and sediment controls during construction activities

Section 5: Post-Construction Storm Water Management Program (UPDES 4.2.5)

- Minimize the impact of development and redevelopment on storm water quality following construction

- Plan and design to minimize pollutants in runoff caused by the increase in impervious areas from development

Section 6: Pollution Prevention/Good Housekeeping Program (UPDES 4.2.6)

- Ensure a reduction in the amount and type of storm water pollutants
- Establish routine activities for operation and maintenance of municipal operations related to storm water runoff
- Set particular guidelines for source controls and materials management

Section - 1 **Public Education and Outreach**

The Public Education and Outreach Control Measure is intended to increase awareness of water quality concerns and the BMPs that can be implemented to address those concerns. This includes providing information which describe the potential impacts from storm water discharges; methods for avoiding, minimizing, reducing and/or eliminating the adverse impacts of storm water discharges; and the actions individuals can take to improve water quality, including encouraging participation in local environmental stewardship activities. (UPDES 4.2.1)

This section of the SWMP also includes recommendations for the training of local professionals and City employees. These education and training programs should introduce the Utah Pollutant Discharge Elimination System (UPDES) program, and focus on known contaminant sources and how to control and reduce these sources.

Target Audience

The main objective of the public education and outreach control measure is to communicate with the target audience the steps they can take to reduce storm water pollution. The UPDES permit requires that the public education and outreach program specifically target the following groups:

- Residents
- Businesses
- Institutions
- Commercial facilities
- Developers
- Contractors (Construction)
- MS4 industrial facilities

BMPs for Public Education & Outreach (UPDES 4.2.1.8)

The following BMPs have been chosen for the Public Education and Outreach Program because of their ability to reach a large audience and were determined to be the best feasible options to educate the target audience about specific pollutants and pollutant sources determined by the City to be impacting, or have the potential to impact, the beneficial uses of receiving water.

BMP Title: City Web Page

Control Measure: Public Education and Outreach (UPDES 4.2.1)

Description: Provide information about storm water, pollutants, and methods for mitigating the negative impacts of storm water on the City's website. Also provide information on the NPDES and UPDES programs along with a copy of the City's SWMP.

Goal: Provide residents and local professionals with immediate and ongoing access to information pertaining storm water pollution, the City's Storm Water Management Plan and other related resources.

Implementation: The City will dedicate a location on the City's website that will provide a current copy of the SWMP, a link to the Utah County Storm Water Coalition website, a map showing locations that storm water discharges into Utah Lake and the Jordan river, a link to the Utah County's used oil program information sheet, and a link to the Utah County household hazardous waste disposal site and other links that the City finds beneficial to support the City's SWMP.

Assessment: Track how many people visit the storm water section of the City's web page (UPDES 4.2.1.7)

Start Date: 2014

End Date: Ongoing

BMP Title: City Newsletter

Control Measure: Public Education and Outreach (UPDES 4.2.1)

Description: Include information in the City's monthly newsletter to educate residents about specific pollutants and pollutant sources that are impacting, or have the potential to impact Utah Lake and the Jordan River. Also include methods residents can use for avoiding, minimizing, reducing and/or eliminating the adverse impacts of storm water discharges; and the actions they can take to improve water quality. Finally the newsletter can encourage participation in local environmental stewardship activities. Information will not be provided in every newsletter but on a consistent time frame.

Goal: Educate the public through educational materials and target issues that occur at a local scale.

Implementation: Gather information to distribute to the public that relates to the community needs through the City's monthly newsletter. Information will include but is not limited to storm drain systems, used oil programs, household hazardous waste disposal and information about specific local storm water issues.

Assessment: Document the information provided in the newsletters and keep track the number of households receiving the newsletters. (UPDES 4.2.1.7)

Start Date: 2015

End Date: Ongoing

BMP Title: Brochures

Control Measure: Public Education and Outreach (UPDES 4.2.1)

Description: Inform the public and businesses of the impact of storm water discharges on the Utah Lake, Jordan River, and Great Salt Lake systems. Information will be distributed through brochures.

Goal: Prepare and distribute educational brochures that address issues that occur at a local scale.

Implementation: Information pertaining to the SWMP will be distributed through brochures available at the City offices upon request, available on the front page of the City's stormwater website, distributed as needed at preconstruction meetings, and with the issue of business licenses.

Assessment: Document that the information/brochures are distributed and track how many people download the brochure from the City's website. (UPDES 4.2.1.7)

Start Date: 2019

End Date: Ongoing

BMP Title: Engineering & Development Standards

Control Measure: Public Education and Outreach (UPDES 4.2.1)

Description: Work with the planning department, engineering department, and the City Council to establish requirements and guidelines for Storm Water Pollution Prevention Plans (SWPPPs) and BMPs.

Goal: Prepare and adopt standards, specification, and standard details for the development of SWPPPs and site BMP's.

Implementation: The Current standards the City has adopted will be reviewed and areas that can be improved will be revised and implemented.

Assessment: City will review submitted SWPPP to ensure that the Standards are met. (UPDES 4.2.1.7)

Start Date: 2019

End Date: Ongoing

BMP Title: Training

Control Measure: Public Education and Outreach (UPDES 4.2.1)

Description: Regular training will provided to City employees by their respective department heads as they see fit.

Goal: Provide training to City employees focusing on providing a general background of the City's SWMP.

Implementation: Hold training that addresses and corrects current poor storm water management practices. The training covers equipment inspection to ensure timely maintenance, proper storage of industrial materials, proper management and disposal of wastes, proper management of dumpster, minimization of use of salt and other de-icing materials, and proper maintenance of parking lot surfaces.

Assessment: Document the training each employee receives and who receives it. (UPDES 4.2.1.7)

Start Date: 2019

End Date: Ongoing

BMP Title: Storm Water Coalition

Control Measure: Public Education and Outreach (UPDES 4.2.1)

Description: The Utah County Storm Water Coalition consists of a coalition of various local agencies located throughout Utah County. By joining the Utah County Storm Water Coalition the City will contribute in the Coalition's goal to utilize regional collaboration to identify existing resources and develop programs to reduce the negative impacts of storm water pollution.

Goal: Become a member of the Utah County Stormwater Coalition and participate in meetings.

Implementation: The City will join the Coalition. The coalition meets to discuss pertinent issues and reviews progress of each agency in meeting phase II requirements. Saratoga Springs will have representation at these meeting.

Assessment: Document the City's participation in the Utah County Storm Water Coalition. (UPDES 4.2.1.7)

Start Date: 2016

End Date: Ongoing

Section - 2 **Public Involvement / Participation**

The Public Involvement/Participation control measure addresses the importance of public involvement with respect to the protection of storm water. Community participation provides for broader public support, public understanding of the nature and magnitude of the problems faced with, shorter implementation schedules, a broader base of expertise, and development of important relationships with other community programs.

This section of the SWMP includes opportunities for the public to play an active role in the development and implementation of the SWMP. Such opportunities include the public notification process and efforts to reach out and engage all demographic groups, and additional community programs to foster public input and participation.

Public Notice (UPDES 4.2.2.4)

The City will comply with State and local public notice requirements when implementing a public involvement and participation program. Public involvement and participation programs will include steps to foster and include public input in developing, implementing, and reviewing storm water management programs.

BMP's for Public Involvement / Participation

The following BMP's have been chosen for the Public Involvement and Participation program because they were determined to provide the best opportunities for public involvement and participation through activities such as public hearings, volunteer opportunities, or other similar activities.

BMP Title: Public Hearing

Control Measure: Public Involvement/Participation (UPDES 4.2.2)

Description: Public Hearings will allow residents the opportunity to voice concerns and offer suggestions to more efficiently reduce our impact on our receiving waters.

Goal: Hold Public hearings that encourage the public to be involved in addressing storm water quality concerns. In public hearings elicit ideas from residents for improving the existing SWMP and activities to involve the public in preventing and cleaning up pollutants in the storm drain system.

Implementation: The SWMP document will be provided for public review and the City will make available the opportunity to provide input prior to adoption. The document will be made available within 180 days of notification of the requirement for Permit coverage received on August 15, 2013 (UPDES 4.2.2.2).

The City will comply with State and Local public notice requirements (UPDES 4.2.2.4)

Also the City will hold a public hearing at least every 5 years with renewal of the SWMP to involve the residents in SWMP updates. The revised SWMP will be made available to the public for review and input within 120 days from the date of the permit.

Assessment: Document comments received and attendance at public hearings.

Start Date: 2014

End Date: Ongoing

BMP Title: Storm Drain Marking

Control Measure: Public Involvement/Participation (UPDES 4.2.2)

Description: Labeling storm drain inlets will help discourage illegal dumping and inform the public of the impacts of storm water discharge into Utah Lake and the Jordan River. Utilize public volunteer groups to mark storm drain inlets and distribute educational flyers in the area where storm drain inlets were marked.

Goal: Identify and mark storm drains.

Implementation: The City will contact community volunteer groups that can place the markers and distribute educational flyers in the areas the markers are placed. The city may also provide seasonal employment in order to place the markers. The City will develop a map to track project locations and identify inlet box conditions.

Assessment: The City will document the location and number of markings placed.

Start Date: 2015

End Date: Ongoing

BMP Title: Stream/Roadway Cleanup

Permit Requirement: Public Involvement/Participation (UPDES 4.2.2)

Description: The city will provide opportunities for community volunteers to cleanup drainage and roadway areas that have the highest potential impact on storm water pollution.

Goal: Clean different locations throughout the City that may impact the storm drain system and/or receiving waters.

Implementation: Allow for interested community groups to clean and maintain rivers, drainages, shorelines, Lake and roadways.

Assessment: The City will document the number of participants and map what streams/roadways are cleaned in the program.

Start Date: 2016

End Date: Ongoing occurred

Section - 3 **Illicit Discharge Detection and Elimination (IDDE)**

The IDDE control measure is intended to systematically find and eliminate sources of non-storm water discharges from the MS4 and to implement defined procedures to prevent illicit connections and discharges. The program will implement BMPs to assist in identifying illicit discharges to the storm water system and eliminating these discharges from the system. This program will focus on prevention of new illicit discharges to the system by means of education, regulation, spill prevention, and improved response.

Public Awareness (UPDES 4.2.3.7 & 4.2.3.8)

This program will be integrated with the Public Education and Outreach Program to promote awareness of the importance of protecting the storm water system from illicit discharge and the resultant impact to receiving waters. The City will inform public employees, businesses, and the general public of hazards associated with illicit discharges and improper disposal of waste. The City will promote services for the collection of household hazardous waste.

Evaluation (UPDES 4.2.3.10)

The City will adopt and implement procedures for program evaluation and assessment which includes maintaining a database for mapping, tracking of the number and type of spills or illicit discharges identified and the inspections conducted.

BMP's for IDDE

The following BMPs describe implementation tasks and assessment tasks to be completed by Saratoga Springs for this program.

BMP Title: **Storm Sewer System Mapping**

Permit Requirement: IDDE (4.2.3.1)

Description: A map that identifies locations of all municipal storm sewer outfalls.

Goal: Keep an updated map of all City outfall locations with accompanying addresses of each outfall.

Implementation: GIS administrator will prepare and continually update a comprehensive and detailed map and data base of City storm sewer system including all outfalls.

Start Date: 2014

End Date: Ongoing

BMP Title: New City Ordinances for Illicit Discharge

Permit Requirement: IDDE (4.2.3.2)

Description: City Ordinances help in order to implement appropriate enforcement procedures. Ordinances will be used to prohibit any discharge to the storm drain system that is not composed entirely of storm water into the storm drain system.

Goal: Create/Revise City ordinances to prohibit illicit discharges.

Implementation: The City will review current city ordinances and develop new ordinances as necessary to prohibit illicit discharges. The City will address appropriate enforcement procedures and action in ordinances. With these ordinances or by-Laws the City will ensure that it has adequate legal authority to detect, investigate, eliminate, and enforce against non-storm water discharges, including illegal dumping into the MS4. The City will provide references or citations of the authority the City will use to implement all aspects of the IDDE program. Enforcement options that will be implemented will allow an escalating enforcement process.

Notes: Any discharge to the storm drain system that is not composed entirely of storm water is considered illicit with the following exceptions (UPDES Permit 1.2.2.2) (unless the City identifies these discharges as significant sources of pollutants):

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration
- Uncontaminated pumped ground water
- Discharges from potable water sources
- Foundation drains
- Air conditioning condensation
- Irrigation water
- Springs
- Water from crawl space pumps
- Footing drains
- Lawn watering runoff
- Individual residential car washing
- Flows from riparian habitats and wetlands
- Dechlorinated swimming pool discharges
- Residual street wash waters
- Dechlorinated water reservoir discharges
- Discharges or flows from firefighting activity

Start Date: 2015

End Date: 2019

City Ordinance 18.06.08 (See Appendix) lists the grounds for which illicit discharges are to be documented, recorded, and tracked to locate and track incidents of illicit discharge.

BMP Title: Public Reporting System

Permit Requirement: IDDE (4.2.3.9)

Description: A public phone line will allow residents the opportunity to reports spills or other illicit discharges.

Goal: Reduce impacts of illicit discharges through early notification.

Implementation: The City will create and publicly list and publicize a local telephone number that the community can call to report spills and illicit discharges. A written record will be kept of all calls received, all follow-up actions taken, and any feedback received from the public education efforts. Proper city personnel will be notified and investigate the reports.

The City will also develop a written spill/dumping response procedure, and a flow chart for internal use, that shows the procedures for responding to public referrals of illicit discharges, the various responsible agencies and their contacts, and who would be involved in illicit discharge incidence response, even if it is a different entity other than the City. The procedure and list will be incorporated as part of the IDDE program and incorporated into the City's SWMP document. The list will be maintained and updated as changes occur.

Start Date: 2016

End Date: Ongoing

BMP Title: Dry Weather Screening

Permit Requirement: IDDE (4.2.3.3)

Description: Dry weather screenings helps in identifying areas that are experiencing non-storm water discharges. These may include spills, illicit connections, sanitary sewer overflows and illegal dumping.

Goal: Develop written procedures for dry weather screenings and identify potential problem areas.

Implementation: The City will develop an outfall field screening program to initiate more detailed drainage area investigations. The areas will be prioritized by likelihood of having illicit discharge. The City will consider:

- Areas with older infrastructure that are more likely to have illicit connections
- Industrial, commercial, or mixed-use areas
- Areas with a history of past illicit discharges
- Areas with a history of illegal dumping
- Areas with onsite sewage disposal systems
- Areas with older sewer lines or with a history of sewer overflows or cross connections
- Areas upstream of sensitive water bodies

These areas will be monitored, and the Utah County Health Department will be informed if any illicit connections or illegal discharges are found. The City will, at a minimum, field assess 20% of the priority areas identified each year. Dry weather screenings are tracked on Utilisync.

Start Date: 2019

End Date: Ongoing

SOP Title: Characterizing the Nature of Illicit Discharges

Permit Requirement: IDDE (4.2.3.5)

Goal: Develop and implement standard operating procedures (SOPs) or similar type of documents for characterizing the nature of, and the potential public or environmental threat posed by, any illicit discharges found by or reported to the City by the hotline or other telephone number described in 4.2.3.9. These procedures shall include detailed instructions for evaluating how the discharge shall be immediately contained and steps to be taken for containment of the discharge. Compliance with this provision will be achieved by initiating an investigation immediately upon being alerted of a potential illicit discharge. Reports will be completed following the IDDE documentation when illicit discharge is identified and confirmed.

Start Date: 2016

End Date: Ongoing

SOP Title: Ceasing Illicit Discharge

Permit Requirement: IDDE (4.2.3.6)

Objective: Develop and implement standard operating procedures (SOPs) or similar type of documents for ceasing the illicit discharge, including notification of appropriate authorities; notification of the property owner; technical assistance for removing the source of the discharge or otherwise eliminating the discharge; follow-up inspections; and escalating enforcement and legal actions if the discharge is not eliminated. Upon detection, the City shall require immediate cessation of improper disposal practices upon confirmation of responsible parties in accordance with its enforceable legal authorities established pursuant to Part 4.2.3.2.1. of this Permit. All IDDE investigations will be thoroughly documented.

Start Date: 2016

End Date: Ongoing

BMP Title: Training

Permit Requirement: IDDE (4.2.3.11)

Description: Training will be provided to City employees relating to the IDDE Program.

Goal: Develop a training program for the IDDE program. Provide training to all applicable employees.

Implementation: Develop an annual training program that trains employees about the IDDE program including identification, investigation, termination, cleanup, and reporting of illicit discharges including spills, improper disposal and illicit connections. This training will be provided to all field staff that, as part of their normal job responsibilities, might come in contact with or otherwise observe an illicit discharge or illicit connection to the MS4. The City will also train office personnel who might receive initial reports of illicit discharges. The training developed will include how to identify a spill, an improper disposal, or an illicit connection to the MS4 and proper procedures for reporting the illicit discharge.

Assessment: Record the information of the employees who have completed the training.

Start Date: 2018

End Date: Ongoing

Section - 4 Construction Site Storm Water Runoff Control Program

This control measure addresses water quality concerns for construction sites greater than or equal to one acre including projects less than one acre that are part of a larger common plan of development or sale. Polluted storm water runoff from construction sites often flows to storm drains and into receiving waters. This runoff can contribute more sediment to receiving waters than would be deposited naturally during several decades. The resulting situation can cause physical, chemical and biological harm to receiving waters. The BMPs described in this section of the SWMP include the development of a program designed to reduce pollutants in storm water runoff from construction activities. This program should include procedures for construction site plan review, site inspections and notification of site specific requirements to all construction site owners/operators. Public and private projects, including projects proposed by the City departments will also be required to comply with these requirements. The development, implementation and enforcement of this program must be implemented within **18 months** of receiving coverage under this Permit.

Record Keeping (4.2.4.6)

The City will adopt and implement procedures to maintain records of all projects disturbing greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The City will keep records which include site plan reviews, SWPPPs, inspections and enforcement actions including verbal warning, stop work orders, warning letter, notices of violation, and other enforcement records. The City will keep these records of these projects for five years or until construction is completed, whichever is longer.

BMPs for Construction Site Storm Water Runoff

This program will also be integrated with other facets of the SWMP to provide information and up-to-date BMPs to the public, construction site operators, etc. The following BMPs describe goals and assessment tasks to be completed by Saratoga Springs for the Construction Site Storm Water Runoff Control Program:

BMP Title: City Ordinances for Construction Site Storm Water Runoff Control

Permit Requirement: Construction Site Storm Water Runoff Control (4.2.4.1)

Description: City Ordinances help in order to implement appropriate enforcement procedures. The ordinances will be used to require the use of erosion and sediment control practices at construction sites.

Goal: Create/Revise City ordinances to require the use of erosion and sediment control practices at construction sites.

Implementation: A city ordinance will be created, if not currently in place, and will include control of pollution generated by storm water runoff from construction activities. The Ordinance will be equivalent with the technical requirements set forth in the UPDES Storm Water General Permit for Construction Activities, UTR300000 at https://deq.utah.gov/water-quality/general-construction-storm-water-updes-permits. The ordinance will include sanctions to ensure compliance. This ordinance will apply to projects disturbing greater than or equal to one acre and to construction projects of less than one acre that are part of a larger common plan of development or sale. It will require that construction operators, for a consultant, prepare a Storm Water Pollution Prevention Plan (SWPPP) and apply sediment and erosion control BMPs to protect water quality, reduce the discharge of pollutants, and control waste (discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at the construction site, and so forth). The ordinance will also include a provision to allow access by qualified personnel to inspect construction storm water BMPs on private properties that discharge to the MS4.

Start Date: 2019

End Date: Ongoing

City Ordinances 18.06.02 and 18.06.03 cover the need for a construction site to have a Storm Water Permit, and appropriate structural BMP controls.

BMP Title: Training

Permit Requirement: Construction Site Storm Water Runoff Control (4.2.4.5)

Description: Training will be provided to City employees relating to Construction Storm Water Program.

Goal: Provide training for all staff whose primary job duties are related to implementing the construction storm water program.

Implementation: The City will ensure that all staff whose primary job duties are related to implementing the construction storm water program are trained to conduct these activities. The training may be conducted by the MS4 or outside training can be attended. Training will extend to third-party inspectors and plan reviewers as well. The training records to be kept include dates, activities or course descriptions, and names and positions of staff in attendance Training may include the following:

- Have a city employee become Registered Storm water Inspector for Utah
- Train city personnel regarding storm water regulations and storm water controls requirements on construction sites
- Provide city personnel with specific storm water BMP information
- Require city employees to view the Utah County Storm water Coalition training videos (https://utahcountystormwatercoalition.wordpress.com/)

Start Date: 2014

End Date: Ongoing

Standard Operating Procedures (SOPs)

SOP Title: Enforcement Strategy and Implementation of Enforcement of Construction Site Storm Water Runoff Ordinance

Permit Requirement: Construction Site Storm Water Runoff Control (4.2.4.2)

Objective: Develop a SOP or similar type of document that includes specific processes and sanctions to minimize the occurrence of, and obtain compliance from violators which will include appropriate, escalating enforcement procedures and actions. Also develop a method for documenting and tracking all enforcement actions.

Start Date: 2014

End Date: Ongoing

SOP Title: Construction Site Inspection and Enforcement of Construction Storm Water Pollution Control Measures.

Permit Requirement: Construction Site Storm Water Runoff Control (4.2.4.4)

Objective: Develop an SOP or similar type of document for construction storm water pollution control measures. The procedures will clearly define who is responsible for site inspections as well as who has authority to implement enforcement procedures. The Construction site storm water runoff control inspection program will provide the following:

1. Inspections will be required monthly by qualified personnel using the Construction Storm Water inspection Form found at https://deq.utah.gov/water-quality/general-construction-storm-water-updes-permits on all new construction sites that meet size requirements for a SWPPP.
2. The City will inspect all phases of construction: prior to land disturbance, during active construction, and following active construction. The City will include in this document a procedure for being notified by construction operators/owners of their completion of active construction so that verification of final stabilization and removal of all temporary control measures may be conducted.
3. Inspections by the MS4 of priority construction site will be conducted at least biweekly using the form list above.
4. Based on site inspection findings, the City must take all necessary follow-up actions to ensure compliance in accordance with the City's enforcement strategy. These follow-up and enforcement actions will be tracked and documented.

Start Date: 2014

End Date: Ongoing

Section - 5 **Long Term Storm Water Management in New Development and Redevelopment**

The Post-Construction Storm Water Management in new development and redevelopment program (Post-Construction Storm Water Management Program) addresses the importance of storm water runoff management with discharges into the MS4 following post construction. The City of Saratoga Springs is still in the early phases of development. Therefore, the city's post-construction program will mostly focus on new development projects. The City will implement this program within **18 months** of receiving coverage under this permit. All items in Section 5 are addressing sites disturbing greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale.

Inventory of Post-Construction Structural Storm Water Control Measures (4.2.5.4)

The City will develop a method to inventory all post-construction storm water control measures installed and implemented at new and redeveloped sites. This inventory will include both public and private sector sites located within the City's service area. Each entry will include basic information on each project (project name, owners name, contact information, location, start/end dates, etc.) and inventories will also include:

- Short description of each storm water control measures (type, number, design or performance specifications).
- Short description of maintenance requirements (frequency of required maintenance and inspections).
- Inspection information (date, findings, follow up activities, prioritization of follow up activities, compliance status).

The city will include a method to update the inventory as appropriate where changes occur in property ownership or the specific control measures implemented at the site.

BMP for Long Term Storm Water Management

Substantial impacts of post-construction runoff are caused by an increase in the type and quantity of pollutants in storm water runoff. The BMPs described in this section of the SWMP include the development of structural and non-structural storm water runoff strategies and the development of post-construction programs that consider water quality impacts of new development and redevelopment projects in the comprehensive land use master planning process.

The following BMPs describe goals and assessment tasks to be completed by Saratoga Springs for the Post-Construction Storm Water Management in new development and redevelopment program.

BMP Title: City Ordinances for Long-Term Storm Water Management

Permit Requirement: Long-Term Storm Water Management (4.2.5.1)

Description: Create/Revise City ordinances to require long term post-construction storm water controls at new development and redevelopment sites.

Goal: Reduce pollutants from construction site storm water runoff through City ordinances.

Implementation: Develop and adopt an ordinances that apply to new development and redevelopment sites that discharge to the MS4 and that disturb the required area stated at the beginning of this section. The ordinance or other regulatory mechanism will be equivalent with the technical requirements set forth in the UPDES Storm Water General Permit for Construction Activities found at https://deq.utah.gov/water-quality/general-construction-storm-water-updes-permits. Any existing City requirements pertaining to storm water controls at smaller site will remain in place. The Ordinance will also require BMP selection, design, installation, operation and maintenance standards necessary to protect water quality and reduce the discharge of pollutants to the MS4.

Start Date: 2019

End Date: Ongoing

See City Ordinances 18.06.05, 18.06.06, and 18.06.

BMP Title: City Standards

Permit Requirement: Long-Term Storm Water Management (4.2.5.3)

Description: Standards that ensure any storm water controls or management practices for new development and redevelopment will prevent or minimize impacts to water quality.

Goal: Minimize impact to water quality from new and redevelopment.

Implementation: The City will develop standards to minimize development in areas susceptible to erosion and sediment loss, minimize the disturbance of native soils and vegetation, preserve areas in the City that provide important water quality benefits, implement measures for flood control, and protect the integrity of natural resources and sensitive areas. Also the City will evaluate and encourage LID approach where it is practicable. Caution will be used because of the presence of collapsible soils throughout the City.
In addition to standards the City will create a plan to retrofit existing developed sites that are adversely impacting water quality. The plan will be developed to emphasize controls that infiltrate, evapotranspire, or harvest and use storm water discharges. The plan will include a ranking of control measures to determine those best suited for retrofitting as well as those that could later be considered for retrofitting. The City will include the following when developing the criteria for retrofit plan (UPDES 4.2.5.3.3):

1. Proximity to waterbody
2. Status of waterbody to improve impaired waterbodies and protect unimpaired waterbodies
3. Hydrologic condition of the receiving waterbody
4. Proximity to sensitive ecosystem or protected area
5. Any upcoming sites that could be further enhanced by retrofitting storm water controls

Also the City will develop and define specific hydrologic method(s) for calculating runoff volumes and flow rates to ensure consistent sizing of structural BMPs in their jurisdiction and to facilitate plan review.

Start Date: 2014

End Date: Ongoing

See City Ordinance 18.06.04. Reference Materials for Low Impact Development have been made available.

BMP Title: Training

Permit Requirement: Long-Term Storm Water Management (4.2.5.6)

Description: Training will be provided to City employees relating to the Long-Term Storm Water Management Program.

Goal: Reduce pollutants to receiving waters through training in Long-Term Storm Water Management Program.

Implementation: The City will provide adequate training for all staff involved in post-construction storm water management, planning and review, and inspections and enforcement. Training will be made available for staff in the fundamentals of long-term storm water management though the use of structural and non-structural control methods. The City will keep training records' including dates, activities or course descriptions, and names and positions of staff in attendance.

Start Date: 2014

End Date: Ongoing

Standard Operating Procedures (SOPs)

SOP Title: Procedures for Enforcement of Ordinances for Long-Term Storm Water Management.

Permit Requirement: Long-Term Storm Water Management (4.2.5.2)

Objective: Develop an enforcement strategy and implement the enforcement provisions of the Ordinance. Procedures will include specific processes and sanctions to minimize the occurrence of, and obtain compliance from, chronic and recalcitrant violators which shall include appropriate, escalating enforcement procedures and actions. Also the City will develop documentation on how the requirements of the ordinance will protect water quality and reduce the discharge of pollutants to the MS4. The documentation will include:

1. How long-term storm water BMP's were selected
2. The pollutant removal expected from the selected BMPs
3. The technical basis which supports the performance claims for the selected BMPs.

The Ordinance will also include provisions for both construction-phase and post-construction access for the City to inspect storm water control measures on private properties that discharge to the MS4 to ensure that adequate maintenance is performed.

Start Date: 2014

End Date: Ongoing

SOP Title: **Site Plan review procedures for Long-Term Storm Water Management.**

Permit Requirement: Long-Term Storm Water Management (4.2.5.4)

Objective: The City will adopt and implement procedures for site plan reviews which incorporate considerations of water quality impacts. The City will develop procedures to:

1. Review SWPPPs for all new development and redevelopment sites that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. This review is to ensure that the plans include long-term storm water management measures that meet the requirements.
2. Provide developers and contractors with preferred design specifications to more effectively treat storm water for different development types.
3. Keep a representative copy of information that is provided to design professionals.

Start Date: 2014

End Date: Ongoing

Section - 6 **Pollution Prevention and Good Housekeeping**

The Pollution Prevention and Good Housekeeping Program is put in place to reduce pollutants from City owned and/or operated facilities. It addresses routine activities in the operation and maintenance for drainage systems, roadways, parks and open spaces, and other municipal operations to help ensure a reduction in pollutants entering the storm drain system.

Inventory of City Owned and/or Operated facilities (4.2.6.1)

The City will develop and keep a current written inventory of all City owned or operated facilities and storm water controls that may include materials storage yards, pesticide storage facilities, all public buildings, salt storage facilities, street repair and maintenance sites, City owned and/or maintained structural storm water controls and so forth.

Assessment of facilities (4.2.6.2)

After the City compiled an inventory of all facilities the City will proceed to assess the inventory for their potential to discharge to storm water the following pollutants:

1. Sediments
2. Nutrients
3. Metals
4. Hydrocarbons (e.g., benzene, toluene, ethylbenzene, and xylene)
5. Pesticides
6. Chlorides
7. Trash
8. Other pollutants associated with the City's facilities that could be found in storm water discharges.

Identifying High Priority Facilities (4.2.6.3)

After each facility has been assessed the City will develop a process to identify which of these facilities are "high priority" (have high potential to generate storm water pollutants). The factors that will be considered in this ranking process include the amount of urban pollutants stored at the site, the identification of improperly stored materials, activities that must be performed outside, proximity to water bodies, poor housekeeping practices, and discharge of pollutant(s) of concern to impaired water.

Maintenance (4.2.6.5)

If the City contracts with a third-party to conduct municipal maintenance or allows private developments to conduct their own maintenance they will be held to the same standards as the City. This expectation will be defined in contracts between the City and the other respective party. The City will be responsible for ensuring, through contractually-required documentation or periodic site visits that the third party are using appropriate storm water controls and following the SOPs, storm water control measures, and good housekeeping practices of the City.

Water Quality Impacts (4.2.6.7)

The City will develop and implement a process to assess the water quality impacts in the design of all new flood management structural controls that are associated with the City or that discharge to the MS4. This process will include consideration of controls that can be used to minimize the impacts to site water quality and hydrology while still meeting project objectives. In addition existing flood management structural controls will be assessed to determine whether changes or additions should be made to improve water quality.

Construction Projects (4.2.6.7)

All Public construction projects will comply with the requirements applied to private projects. All public projects approved after the effective date of this Permit will include construction and post-construction controls selected and implemented pursuant to sections 4 and 5.

BMP for Good Housekeeping

The program will implement the following BMP’s that whose ultimate goal is preventing or reducing pollutant runoff from all City owned or operated facilities.

BMP Title: Operation and Maintenance program for "High Priority" Facilities

Permit Requirement: Pollution Prevention and Good Housekeeping for Municipal Operations (4.2.6.4)

Description: Specific procedures for City owned facilities using BMPs.

Goal: Prevent or reduce pollutant runoff from all City owned or operated facilities through O & M.

Implementation: The City will develop O&M program that will address facilities identified as "High Priority". The O&M program shall include the following inspections:

- Monthly Visual Inspection (4.2.6.5.1)
- Semi-Annual Comprehensive Inspection (4.2.6.5.2)
- Annual Visual Observation of Storm Water Discharges (4.2.6.5.3)

Facilities shown on the proceeding pages, if identified as "High Priority", will be considered when developing the O&M program.

Start Date: 2014

End Date: Ongoing

O&M Facility: **Buildings and Facilities (Within 180 Days of Receiving Coverage)**

Permit Requirement: Pollution Prevention and Good Housekeeping for Municipal Operations (4.2.6.6)

Objective: The O & M program will address City owned or operated offices, police and fire stations, pools, parking garages, and other City owned or operated buildings or utilities. SOPs will be developed for the following topics, if needed:

- Use, Storage, and Disposal of Chemicals
- Spill Prevention
- Dumpsters and Other Waste Management
- Sweeping Parking Lots

The City will also develop an inventory, including a map, of all floor drains located on the property of all City owned or operated buildings and facilities (4.2.6.6.6)

O&M Facility: **Material Storage Areas, Heavy Equipment Storage Areas, and Maintenance Areas**

Permit Requirement: Pollution Prevention and Good Housekeeping for Municipal Operations (4.2.6.6)

Objective: The O & M program will address City material storage areas, heavy equipment storage areas, and maintenance areas. SOPs will be developed, if needed, to protect water quality at each of these facilities owned or operated by the City and not covered under the General UPDES Permit for Storm Water Discharges Associated with Industrial Activities.

O&M Facility: **Parks and Open Space**

Permit Requirement: Pollution Prevention and Good Housekeeping for Municipal Operations (4.2.6.6)

Objective: The O&M program will address, if needed, SOPs for the following topics:

- Application, Storage, and Disposal of Fertilizer, Pesticides, and Herbicides
- Sediment and Erosion Control
- Evaluation of Lawn Maintenance and Landscaping Activities
- Trash Containers at Parks other Open Spaces
- Cleaning of maintenance equipment, building exteriors, trash containers, and the disposal of the associated waste and wastewater.

The SOPs will be developed and put into the O & M program on an as needed basis.

O&M Facility: **Vehicles and Equipment**

Permit Requirement: Pollution Prevention and Good Housekeeping for Municipal Operations (4.2.6.6)

Objective: The O&M program will address, if needed, SOPs for:

- Vehicle maintenance and Repairing Activities
- Vehicle Wash Waters (To prohibit them from discharging to MS4 waters)

The SOPs will be developed and put into the O and M program on an as needed basis.

O&M Facility: **Roads, Highways, and Parking Lots**

Permit Requirement: Pollution Prevention and Good Housekeeping for Municipal Operations (4.2.6.4.5)

Objective: The O&M program will address, if needed, SOPs for the following topics:

- Sweeping Streets and City Owned or Operated Parking Lots
- Road and Parking Lot Maintenance
- Cold Weather Operations
- Right-of-Way Maintenance
- Municipally-Sponsored Events

The SOPs will be developed and put into the O & M program on an as needed basis. A schedule for sweeping streets will also be included in the program.

O&M Facility: **Storm Water Collection and Conveyance System**

Permit Requirement: Pollution Prevention and Good Housekeeping for Municipal Operations (4.2.6.4.6)

Objective: The O & M program will address, if needed, SOPs for the following topics:

- Inspection, Cleaning and Repair of Catch Basins, Storm Water Conveyance Pipes, Ditches and Irrigation Canals, Culverts, Structural Storm Water Controls, and Structural Runoff Treatment and/or Flow Control Facilities
- Annual Inspections of Swales, Detention Basins, other structures.
- Proper Disposal of all Waste and Wastewater Removed from Storm Water Conveyance System.

The SOPs will be developed and put into the O & M program on an as needed basis.

O&M Facility: **Other Facilities and Operations**

Permit Requirement: Pollution Prevention and Good Housekeeping for Municipal Operations (4.2.6.4.7)

Objective: The City will identify any facilities and operations not listed above that would reasonably be expected to discharge contaminated runoff. BMPs will be developed, if needed, within the O&M program if facilities are found to be “High Priority”.

BMP Title: Training for Municipal Operations

Permit Requirement: Pollution Prevention and Good Housekeeping for Municipal Operations (4.2.6.9)

Description: Training for City Employees.

Objective: Prevent or reduce pollutant runoff from all City owned or operated facilities through training of employees.

Implementation: The City will develop a training program for all employees who have primary construction, operation, or maintenance job functions that are likely to impact storm water quality. The City will identify target employees to participate in the training sessions. Training will address:

- Importance of Protecting Water Quality
- Requirements of this Permit
- Operation and Maintenance Requirements
- Inspection Procedures
- Ways to Perform their Job Activities to Prevent or Minimize Impacts to Water Quality
- SOPs for the Various City Owned or Operated Facilities
- Procedures for Reporting Water Quality Concerns

Follow-up training will be provided as needed to address changes in procedures, methods, or staffing.

Start Date: 2014

End Date: Ongoing

SIGNATURES – APPROVAL OF THE PLAN

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations

Jeremy D. Lapin, PE
Engineering and Public Works Director

The City of Saratoga Springs – Principle Executive Officer or Elected Official or Duly Authorized Representative
(PRINTED NAME AND POSITION)

6/21/2021

The City of Saratoga Springs – Principle Executive Officer or Elected Official or Duly Authorized Representative
(SIGNATURE)

Date

Appendix A: Storm Water Pollution Prevention Checklists

Storm Water Pollution Prevention Checklist
for MS4 City Facilities (11-17)

Prepared by:
Frances Bernards, Environmental Scientist
DEQ's Pollution Prevention Grant Program
fbernards@utah.gov
(801) 536-4330

This checklist has been developed to assist MS4 facilities in Utah identify and implement Best Management Practices (BMPs) designed to reduce the discharge of pollutants from the MS4 to protect water quality.

Prepared for:

1. Name: _____ 2. Phone: _____

3. Facility: _____

4. City: _____

Potential Pollutant Source: City Facility	**Y**	**N**	**N/A**	**Notes:**
Chemicals Label all containers of hazardous substances with the name of the chemical, expiration date, health or environmental hazards, and dispose of properly.				
Store chemicals in drums, barrels, and similar containers that are tightly sealed, non-leaking, and in good condition. "Sealed" means banded or otherwise secured and without operational taps or valves.				
Preferably store chemicals in covered structures/buildings. If it is not feasible to store chemicals indoors, then use a temporary cover (e.g., tarps) outside of storm water drainage pathways and away from storm drains and surface waters. If chemicals are not covered with a permanent or temporary cover, provide secondary containment around chemical storage areas and store chemicals outside of storm water drainage pathways and away from storm drains and surface waters.				
Train employees and contractors on proper use, storage, and disposal of chemicals. Make sure employees and contractors use pesticides, herbicides, fertilizers, and other chemicals only when needed, follow instructions on the label, and dispose of properly.				
Ensure that employees and contractors who use or demonstrate the use of any restricted use pesticide (including herbicides, insecticides, fungicides, and rodenticides) have a current Utah Pesticide Applicator License. Make sure that employees and contractors understand the impacts that chemicals have on water quality.				
Spills				

Store and maintain spill cleanup materials in a location that is accessible.				
Clean up spills immediately using absorbent.				
Store used absorbent in closed, labeled, and non-leaking containers and dispose of properly.				
Train employees and contractors on proper dry cleanup procedures, disposal of cleanup materials, and reporting requirements if the spill may reach water bodies.				
Waste Management Dispose of lawn clippings and vegetation properly. Use leaf blowers to clean grass mower tractors on-site at the park(s) to avoid transporting grass and leaf debris to storage yard.				
Cover all waste material in dumpsters with a durable, non-leaking cover and anchor in a way to keep water from entering the dumpster. Ensure that dumpsters are properly sealed, plug is closed, and no liquids from the dumpster infiltrate into ground water or storm water drains.				
Clean Paved Surfaces Sweep and clean storage areas monthly or regularly as needed. Use dry cleanup methods.				
Floor Drains Develop an inventory of all floor drains inside buildings. Ensure that all floor drains discharge to the sanitary sewer with approval by local sanitary sewer district.				
Ensure that only storm water is allowed into storm water drains.				
Vehicle/Equipment Maintenance Provide a designated area to perform vehicle/equipment maintenance that is inside a covered structure or building.				
Use drip pans underneath leaky vehicles and promptly transfer fluids to a closed, labeled, and non-leaking container and dispose of properly.				
Vehicle/Equipment Storage Preferably store equipment and vehicles inside a covered structure or building.				
Use drip pans underneath leaky vehicles and promptly transfer fluids to a closed, labeled, and non-leaking container and dispose of properly.				
Vehicle/Equipment Washing				

Provide a designated area to wash vehicles and equipment that allows for the containment, collection, and proper disposal of wash water. Ensure that wash water is not discharged into storm water drains.				
Fueling Cover fueling area with an overhanging roof structure or canopy. If a covering is not feasible and the fuel island is surrounded by pavement, apply a suitable sealant that protects the asphalt from spilled fuels.				
Secondary Containment Use secondary containment to capture and control leaking materials, including potential leaks from pipes, tanks, and storage containers.				
The secondary container walls, floors, and joints should be made of durable materials, e.g. concrete, concrete block, plastic, or steel.				
Capacity of the secondary container shall be at least 110% of the total volume capacity of the primary container. The total capacity of all primary and secondary containers should be clearly marked.				
Miscellaneous Potential Pollutant Source:				**Notes:**
Additional Notes:				

Municipal Service Yards and Facilities

1. Are 55-gal drums, bulk storage tanks, or other containers stored outside specifically designed for outside storage? -OR-
Do they have adequate secondary containment and cover? **YES/NO**
Are all dumpsters or outdoor trash containers covered? **YES/NO**

2. Is vehicle/equipment maintenance or repair work performed inside? **YES/NO**

3. Are vehicles washed in a designated washing area plumbed to sanitary sewer? **YES/NO**
Are mowers/tractors washed in a designated washing area? **YES/NO**

4. At the fueling island:
Is there a spill kit w/ absorbents? **YES/NO**
Are spills/absorbents cleaned up daily? **YES/NO**
Are there signs prohibiting “topping off” and describing spill response procedures? **YES/NO**
5. Is sand/salt mix stored undercover and bermed? **YES/NO**

6. Are the Spill Plan and Spill Kits available in shop? **YES/NO**
Do all employees know where the spill kits are? **YES/NO**
Are the phone number(s) and contact person for spill reporting readily available? **YES/NO**

7. Site walk around:
Are storm drains identified and marked? **YES/NO**
Are storm drains cleaned periodically? **YES/NO**
Are parking lots inspected for excess dirt, debris and oil drips? **YES/NO**

Are there any visible spills or leaks (from vehicles, above ground storage tanks or drums)? **YES/NO**
Is there water or liquid in secondary containment structures? **YES/NO**
Is there any visible sheen on that water? **YES/NO**

Building Maintenance
8. If conducting surface or pressure washing, is wastewater collected or sent to landscaping? **YES/NO**

9. Are sprinkler systems, HVAC, cooling tower, sprinkler system, and/or boiler blow down discharges drained to sanitary sewer or to landscaping? **YES/NO**

Parks and Landscape Maintenance
10. Are irrigation systems properly maintained as to not over water? **YES/NO**
11. Are grass clippings left on the grass after mowing? **YES/NO**
Are clippings and debris swept off of sidewalks/pavement? **YES/NO**
12. Do you avoid spraying pesticides within 50 feet of any surface water, creek, ditch or storm drain or designate “no spray zones” or buffer areas around water features? **YES/NO**
13. Is spot spraying preferred for weed and insect control? **YES/NO**
Is broadcast spraying avoided? **YES/NO**

General Practices
14. Have all employees been trained in Stormwater pollution detection and prevention? **YES/NO**
15. Are contractors trained in Stormwater pollution prevention and are they following all BMPs? **YES/NO**
16. Are Stormwater discharges reported to your municipality’s Stormwater Inspector? **YES/NO**
17. Other Stormwater or water quality concerns? **YES/NO**

I certify that the above information is correct and accurate.

Signature_____

Printed Name_____

Date_____

Supervisor's Signature_____

Printed Name_____

Please file in your facility's Stormwater Pollution Prevention Plan

Storm Water Pollution Prevention Checklist
for MS4 Storm Water Conveyance Systems (11-17)

Prepared by:
Kevin Sonico, EIT MPA
City of Saratoga Springs Public Works
ksonico@saratogaspringscity.gov
(831) 595-3236

This checklist has been developed to assist MS4 facilities in Utah identify and implement Best Management Practices (BMPs) designed to reduce the discharge of pollutants from the MS4 to protect water quality.

Prepared for:

1. Name: _____ 2. Phone: _____

3. Facility: _____

4. City: _____

Potential Pollutant Source: Storm Water Conveyance	**Y**	**N**	**N/A**	**Notes:**
Yearly Inspection **Catch Basins/Inlet Structures** Conveyance structures are properly working and are not in need of any immediate repair (cracks, damaged structures, clogs, debris, etc.)				
Sump is cleaned before 40% full.				
Catch basin or inlet is stenciled with “Drains to lake” stencil.				
Catch basin or inlet has been logged into the GIS database.				
Proper records of when the structure has been cleaned, how much debris was gathered, any abnormalities, and other information have been gathered.				
Wells Sensitive areas have been located in the immediate proximity for awareness.				
Access roadways have been located and prepared to minimize the potential for erosion.				
Water and sediment accumulation has been contained and is not draining into any storm drains.				
Concentrated flows have been diverted on site. Exposed soils have been stabilized with mulch or other erosion control.				
Chemicals have been properly contained and are located away from streets, gutters, or storm drain inlets.				
Lift Stations and Sewer Maintenance No pipes are cracked or deteriorating.				
No joints or seals are leaking.				
Frequent line plugs are in good condition.				
Line is generally flowing at or near capacity				

Storm Drain Conveyance System Storm drain is properly draining and has been flushed if necessary (Flushing every three (3) years).				
Pump Stations Pump station is free of trash and silt.				
Open Channels Open channel is free of debris.				
No modifications are needed to improve channel hydraulics.				
Swales and Detention Basins Swale or detention basin is free of debris or sediment that may inhibit flow, and there is no erosion in the bed.				
Vegetation is naturally growing around the swale and basin.				

Storm Water Pollution Prevention Checklist
for MS4 Roads and Highways (11-17)

Prepared by:
Kevin Sonico, EIT MPA
City of Saratoga Springs Public Works
ksonico@saratogaspringscity.gov
(831) 595-3236

This checklist has been developed to assist MS4 facilities in Utah to identify and implement Best Management Practices (BMPs) designed to reduce the discharge of pollutants from the MS4 to protect water quality.

Prepared for:

1. Name: _____ 2. Phone: _____

3. Facility: _____

4. City: _____

Potential Pollutant Source: Roads and Highways	**Y**	**N**	**N/A**	**Notes:**
Yearly Inspections Road and highway maintenance sweeping schedule is in place and sweeping is scheduled before the wet season.				
Areas of high priority have been identified and are scheduled to be maintained regularly.				
Logs of street miles swept and debris amount have been kept.				
Debris is disposed of properly at a landfill.				
Street sweeper is working properly and effectively.				
Visual Inspection Roads immediately around storm drain inlets are free of sediment, silt, and debris.				
Right of ways have been surveyed and cleaned of any debris or silt.				
Stockpiled materials are stored away from streets, gutter areas, and storm drain inlets.				
De-icing materials are stored under cover, and excess material has not been spilled around covered area.				
Unpaved roads have sufficient erosion control in place.				
Repair Work or Projects Sealing, patching, and resurfacing has been scheduled during dry weather, done by a third-party, or by the City.				
Concrete washout areas for repair work are located at least 50 feet from storm drains, ditches, and water bodies. Wash water is properly disposed of or treated for reuse.				
Soiled repair trucks are washed in a covered bay that drains to the sanitary sewer.				
Repair vehicles have been maintained without leaks and have sufficient absorbent material or drip pans for spills.				

If construction is being performed, storm drains have been properly covered to prevent debris runoff prior to repair work.				
Repair sites are thoroughly cleaned after repair work is finished. Trash and recycling bins are available on site.				
Miscellaneous Potential Pollutant Source:				**Notes:**

Storm Water Pollution Prevention Checklist
for MS4 Water and Sewer Utilities (11-17)

Prepared by:
Kevin Sonico, EIT MPA
City of Saratoga Springs Public Works
ksonico@saratogaspringscity.gov
(831) 595-3236

This checklist has been developed to assist MS4 facilities in Utah identify and implement Best Management Practices (BMPs) designed to reduce the discharge of pollutants from the MS4 to protect water quality.

Prepared for:

1. Name: _____ 2. Phone: _____

3. Facility: _____

4. City: _____

Potential Pollutant Source: Water/Sewer Utility	**Y**	**N**	**N/A**	**Notes:**
Water Discharge Water is being reused for dust suppression, irrigation, or construction compaction.				
Water is being discharged to sanitary sewer with approval.				
Water is being discharge to the storm water drainage system with proper pollution controls in place.				
Water Discharge to Storm Drain A silt fence is being used in a relatively flat area.				
A gravel and wire mesh filter are being used in areas where a concentrated flow is expected.				
A wooden weir and fabric are installed at a curb where compact installation is desired.				
Inlet protection device (if used for discharge activities) is installed in such a way that sediment is easy to clean and does not interfere with water discharge activities.				
Sanitary Sewer Maintenance A routine maintenance program is in place to remove grease, grit, and other debris.				
Obstructions of sewer utilities (such as tree roots) have been removed.				
Lift/Pump, and Other Stations Pipes are in good condition (no cracks or deterioration).				
Joints/seals are in good condition (no leaking).				
Frequent line plugs are in good condition.				
Line generally flows at or near line capacity.				
There is no suspected infiltration or exfiltration.				

Source (For Storm Water Pollution Prevention BMPs):

Adapted from: 2016 *Municipal SOP Handbook.* California Storm Water Quality Association. Retrieved from: https://www.casqa.org/resources/SOP-handbooks/municipal-SOP-handbook

Adapted from: January, 2009 *King County Stormwater Pollution Prevention Manual.* King County Department of Natural Resources and Parks Water and Land Resources Division. Retrieved from: http://your.kingcounty.gov/dnrp/library/water-and-land/stormwater/stormwater-pollution-prevention-manual/A38_Jan09.pdf

Adapted from: *How to Care for Your Septic System.* Environmental Protection Agency. Retrieved from: https://www.epa.gov/septic/how-care-your-septic-system

Adapted from: *Proper Spa & Pool Chemical Disposal.* Sunplay. Retrieved from: https://www.sunplay.com/blog/proper-spa-pool-chemical-disposal

Appendix B: City Code

Chapter 18.06. Storm Water Regulations.

Sections:

18.06.01. Definitions.

For the purpose of this Chapter, the following definitions shall apply. The rules of statutory construction in § 1.02.11 shall apply.

1. "**As built plans**" or "**Record drawings**" or "**Just as-built**" means a set of drawings submitted by a contractor or engineer upon completion of a project or a particular job. This set of drawings reflects all specification and work drawing changes made during the construction process, and show the exact dimensions, geometry, and location of all elements of the work completed under the contract.

2. "**Best management practices**" or "**BMPs**" are physical, structural, and/or managerial practices that, when used singly or in combination, prevent or reduce pollution of water, have been approved by the City, and have been incorporated by reference into this ordinance as if fully set out herein.

3. "**Channel**" means a natural or artificial watercourse that conducts flowing water continuously or periodically.

4. "**City**" means the City of Saratoga Springs, its employees and assignees.

5. **"Community Water"** means any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wetlands, wells and other bodies of surface or subsurface water, natural or artificial, lying within or forming a part of the boundaries of the City.

6. "**Contaminant**" means any physical, chemical, biological, foreign, or radiological substance or matter in water.

7. "**Design storm event**" means a storm event of a given frequency interval and duration.

8. **"Detention Basin"** means a temporary storage facility for excess storm runoff designed in accordance with the Engineering Standards and containing at a minimum an inlet and outlet and designed for the purpose of (1) attenuating and detaining excess storm runoff, and (2) regulating the flow of such excess storm runoff so as to reduce stormwater-related damage downstream, and (3) enhancing the water quality of such excess storm runoff by providing filtration, sedimentation, and oil-removing apparatus.

9. "**Discharge**" means any solid or liquid matter that is disposed, deposited, spilled, poured, injected, seeped, dumped, leaked, or placed by any means into the municipal separate storm sewer system. This includes all entries of matter that are direct or indirect.

10. **"Engineering Standards"** means the latest adopted version of the Standard Technical Specifications and Drawings manual.

11. "**Erosion**" means the removal of soil particles by the action of water, wind, ice or other geological agents, whether naturally occurring or acting in conjunction with or promoted by anthropogenic activities or effects.

12. "**Erosion and sediment control plan**" means a plan that is designed to minimize erosion and sediment runoff at a site during construction activities.

13. "**Hot spot**" means an area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

14. "**Illicit connections**" means any of the following:
    a. Any drain or conveyance whether on the surface or subsurface, which allows contaminated or illicit discharge to enter the storm drain system.
    b. Any drain or conveyance connected to or discharging into the storm drain system which has not been approved in writing by the City.

15. "**Illicit discharge**" means any discharge to the municipal separate storm sewer system (MS4) that is not composed entirely of storm water or that is being discharged without a City-approved treatment methodology.

16. "**Irrigation Ditches**" means ditches used by irrigation shareowners having a right of water passageway by right-of-way, easement, or prescription. Irrigation ditches can also include those facilities which function as a combined storm water and irrigation conveyance intended at times as a storm water routing and disposal system.

17. "**Land-disturbing activity**" means any activity on property that results in a change in the existing soil cover (both vegetative and non-vegetative) or the existing soil topography. Land-disturbing activities may include development, re-development, demolition, construction, reconstruction, clearing, grading, filling, excavation, grubbing, and paving.

18. "**Maintenance**" means any activity that is necessary to keep a stormwater facility in good working order so as to function as designed including but not limited to complete reconstruction of a stormwater facility if reconstruction is needed in order to restore the facility to its original operational design parameters and the correction of any problem on the site property that may directly impair the functions of the stormwater facility.

19. "**Maintenance Agreement**" means a Long-Term Storm Water Management Agreement "LTSWMA" document recorded in the land records that acts as a property deed restriction and provides for long-term maintenance of stormwater management practices.

20. "**Municipal separate storm sewer/stormwater system**" or "**MS4**" means the conveyances owned or operated by the City of Saratoga Springs for the collection and transportation of stormwater, including the roads and streets and their drainage systems, catch basins, curbs, gutters, ditches, man-made channels, and storm drains.

21. "**National Pollutant Discharge Elimination System Permit**" or "**NPDES permit**" means a permit issued pursuant to 33 U.S.C. §1342.

22. "**Notice of Violation"** or "**(N.O.V.)"** occurs whenever the City finds that a person is in non-compliance with this ordinance; the City will order compliance by written notice of violation to the responsible person. Requirements in this Notice are at the discretion of the Engineer, and may include monitoring, payment to cover costs relating to the non-compliance, and the implementation of BMP.

23. "**Off-site facility**" means a structural BMP located outside the subject property boundary described in the permit application for land development activity which is intended to form an integral part of the storm drain system for a given parcel.

24. "**On-site facility**" means a structural BMP located within the subject property boundary described in the permit application for land development activity.

25. **"On-site storm water management facility"** means any feature or facility located within the subject property boundary that collects, conveys, discharges, cleans, detains, retains, and/or infiltrates storm water prior to its discharge into either the MS4, community water, or infiltration into the ground.

26. "**Peak flow**" means the maximum instantaneous rate of flow of water at a particular point resulting from a storm event.

27. "**Runoff**" means the portion of the precipitation on a drainage area that is discharged from the area. This can include water produced by storms, surface drainage, snow and ice melt, and other water handled by the storm sewer drainage system.

28. "**Saratoga Springs City Storm Water Management Program**" means those certain manuals, ordinances, practices, and policies set in place by the City of Saratoga Springs to regulate, permit, manage, and otherwise oversee the discharge of storm water within the

corporate boundaries and influence area of the City. This includes both those manuals and practices which are in place at the time of the passage of this ordinance and those which will yet be put in place or adopted in this or future actions.

29. "**Sediment**" means solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

30. "**Sedimentation**" means the process of depositing sediment in any stormwater.

31. "**Soils Report**" means a study of soils on a subject property with the primary purpose of characterizing and describing the soils. The soils report shall be prepared by a qualified soils engineer, who shall be directly involved in the soil characterization either by performing the investigation or by directly supervising employees.

32. "**Stabilization**" means providing adequate measures, vegetative and/or structural, that will prevent erosion from occurring.

33. "**Storm Water Design Standards and Regulations**" means the current City of Saratoga Springs storm water standards and regulations as adopted by the City.

34. "**Storm Water General Permit for Construction Activities"** means a permit required by the Utah Department of Environmental Quality, Division of Water Quality.

35. "**Storm Water Master Plan**" means the current City of Saratoga Springs Storm Water Master Plan, Capital Facilities Plan, and Impact Fee Facilities Plan as adopted by the City.

36. "**Storm Water Permit**" means the City Storm Water Permit as adopted by the City.

37. "**Stormwater**" means discharges, precipitation, rain, hail, stormwater runoff, snow melt runoff, surface runoff, street wash waters related to street cleaning or maintenance, infiltration, and drainage.

38. "**Stormwater Management**" means all programs designed to maintain quality and quantity of stormwater runoff to pre-development levels.

39. "**Stormwater Management Facilities System**" means the drainage structures, conduits, ditches, combined sewers, sewers, and all device appurtenances by means of which stormwater is collected, transported, pumped, treated or disposed of.

40. **"Stormwater Management Plan"** means a long term storm water management plan that evaluates the environmental characteristics of the project site, the potential impacts of all proposed development of the site, both present and future, on the water resources, and the measures and BMP's proposed for managing storm water, discharges, contaminants, and sediment generated at the project site.

41. "**Stormwater Pollution Prevention Plan**" or "**SWPPP**" means Storm Water Pollution Prevention Plan. This is the set of drawings and other documents that comprise all the information and specifications for the programs, drainage systems, structures, BMPs, concepts, and techniques intended to maintain or restore quality and quantity of stormwater runoff to pre-development levels during and after construction.

42. "**Stormwater runoff**" means flow on the surface of the ground, resulting from precipitation.

43. "**Structural BMPs**" means devices that are constructed to provide control of stormwater runoff.

44. "**Surface water**" includes all waters upon the surface of the earth, whether bounded naturally or artificially. This includes rivers, creeks, streams, canals, lakes, ponds, wetlands, reservoirs, and other water courses.

45. "**SWMP**" is an acronym for Storm Water Management Program. A Technical Report including a copy of the Land Disturbance Permit, Notice of Intent (NOI) (if applicable), Storm Water Pollution Prevention Plan (for during construction and post construction), storm water pollution prevention BMPs, spill prevention and countermeasure information, inspection records, and signed and dated Certification Statement from the Site Operator and the responsible person preparing the report.

46. "**SWPPP Manager**" means the individual who will be the contractor's and owner's representative in the field who supervises the implementation of the SWPPP and compliance with the Storm Water Permit.

47. "**Watercourse**" means a permanent or intermittent stream or other body of water, either natural or man-made, which gathers or carries surface water and may include lakes, rivers, creeks, streams, canals, ponds, and wetlands.

48. "**Watershed**" means all the land area that contributes runoff to a particular point along a waterway.

49. "**UPDES**" is an acronym for the Utah Pollution Discharge Elimination System.

(Ord. 20-14, Ord. 15-1)

18.06.02. General Provisions.

1. **Purpose.** It is the purpose of this chapter to:
    a. Protect, maintain, and enhance the environment of the City of Saratoga Springs ("the City").
    b. Establish responsibilities for controlling and managing storm water runoff.
    c. Protect the public health, safety, and general welfare of the citizens of the City by controlling discharges of pollutants to the City's stormwater system and to maintain and improve the quality of the receiving waters into which the stormwater outfalls

flow, including, without limitation, lakes, rivers, creeks, streams, canals, ponds, wetlands, and groundwater of the city.

d. Enable the City to comply with state and federal laws and regulations.
e. Allow the City to exercise the powers granted by the Utah Code and Constitution to:
    i. Exercise general regulation over the planning, location, construction, and operation and maintenance of stormwater facilities in the City, whether or not owned and operated by the City;
    ii. Adopt any rules and regulations deemed necessary to accomplish the purposes of this Chapter, including the adoption of a system of fees for services and permits;
    iii. Establish standards to regulate the quantity of stormwater discharged and to regulate stormwater contaminants as may be necessary to protect water quality;
    iv. Review and approve plans, plats, and permits for stormwater management in proposed developments;
    v. Issue permits for stormwater discharges, or for the construction of, alteration of, extension of, encroachment on, or repair of stormwater facilities;
    vi. Suspend or revoke permits when it is determined that the permittee has violated any applicable ordinance, resolution, or condition of the permit;
    vii. Regulate and prohibit discharges into stormwater facilities of sanitary, industrial, or commercial sewage or waters that have otherwise been contaminated; and
    viii. Expend funds to remediate or mitigate the detrimental effects of contaminated land or other sources of stormwater contamination, whether public or private.

2. The City Engineer shall administer the provisions of this Chapter. Nothing in this Chapter shall relieve any person from responsibility for damage to other persons or property or impose upon the City and its officers, agents or employees any liability for damage to other persons or property.

(Ord. 15-1)

18.06.03. Storm Water Permits.

1. When required:
    a. Every person will be required to obtain a Storm Water Permit from the City in the following cases:
        i. Land disturbing activity that disturbs one or more acres of land;
        ii. Land disturbing activity of less than one acre of land if such activity is part of a larger common plan of development that affects one or more acres of land;

iii. Land disturbing activity of less than one acre of land if the City Engineer determines such activity poses a unique threat to water or public health or safety;
iv. The creation and use of borrow pits or those excavation sites used to generate fill or decorative material for an off-site location;
v. Development of a single family home;
vi. Modifications of sensitive areas or areas designated as sensitive lands;
vii. Processing of earthen materials such as top soil and gravel screening;
viii. Construction of parking lots;
ix. Creation of an impervious area 0.1 acres/4,356 square feet or greater constructed with compacted gravel, asphalt, concrete, or equivalent;
x. Creation or alteration of storm drains works or systems;
xi. Excavation or disturbance of more than 1,000 cubic yards of material in any nonagricultural earth moving activity; and
xii. Any other condition that poses a unique threat to water or public health or safety and meeting the purposes in Section 18.06.01 or the intent of the regulations in this Chapter.

2. **Exemptions.**
   a. The following activities are exempt from the permit requirement;
      i. Any emergency activity that is immediately necessary for the protection of life, property, or natural resources including activities required to promote public safety, repairs to water lines and/or other city infrastructure repairs.
      ii. Existing nursery and agricultural operations conducted as a predominant land use.
      iii. Any agricultural activity that is consistent with an approved farm conservation plan or a management plan prepared or approved by the appropriate federal, state, or city agency.
      iv. Additions or modifications to existing single family structures.
      v. Landscape modifications resulting in disturbances below the limits identified in Title 19.
      vi. Excavation activities necessary for public infrastructure approved through the city approval process.

3. **Building permit.** No building permit shall be issued until the applicant has obtained a Storm Water Permit where the same is required by this ordinance.

4. **Application for a Storm Water Permit.**
   a. Each application shall include the following:
      i. Name of applicant;
      ii. Address of applicant;
      iii. Name, address, and phone number of the owner of the property of record in the office of the county assessor;
      iv. Address and legal description of subject property including the tax identification number and parcel number;

v. Name, address, and telephone number of the contractor and any subcontractor who will perform the land disturbing activity and who shall implement the erosion and sediment control plan;
vi. Designation of a SWPPP manager who will be the contractor's and owner's representative in the field who supervises the implementation of the SWPPP and compliance with the Storm Water Permit; and
vii. A statement indicating the nature, extent, and purpose of the land disturbing activity, including:
    1. the size of the area for which the permit shall be applicable,
    2. a schedule for the starting and completion dates of the land disturbing activity, and
    3. other pertinent information.

b. The applicant shall obtain from any other state or federal agency any other appropriate environmental permits that pertain to the property and submit such permits with the application for a Storm Water Permit. However, the inclusion of those permits in the application shall not foreclose the City Engineer from imposing additional development requirements and conditions consistent with this ordinance on the development of property covered by those permits. Failure of the applicant to obtain the necessary permits may be the basis for denial of issuance of a Storm Water Permit.

c. Each application shall be accompanied by:
    i. A SWPPP meeting the requirements of Stormwater General Permit for Construction Activities Permit No. UTRC00000. A model has been prepared for use by those preparing a SWPPP. A SWPPP must use this model template to ensure that a plan has been prepared in compliance with the State permit.
        1. The SWPPP template and the template guidelines can be found at the following link: http://www.waterquality.utah.gov
    ii. A Notice Of Intent (NOI) from the State of Utah, Department of Environmental Quality, Division of Water Quality ("DWQ"), for Storm Water Discharges Associated with Construction Activity Under the UPDES General Permit No. UTRC00000. An NOI can be submitted on-line at the web site for the Utah DWQ storm water data base. The NOI must be signed by the owner and contractor.
        1. This template can be found at the following link: http://www.waterquality.utah.gov
    iii. A Storm Water Management Plan meeting the Requirements of Section 18.06.04(6).
    iv. A Sediment and Erosion Control Plan meeting the Requirements of Section 18.06.04(7).
    v. An engineer's estimate for performance guarantee purposes inclusive of all costs associated with plan implementation, management, site stabilization, and clean up.
    vi. Payment for the Storm Water Permit and other applicable fees and bonds as found in the City's Consolidated Fee Schedule.

5. **Review and approval of application.**
    a. The City Engineer will review each application for a Storm Water Permit to determine its conformance with the provisions of this Chapter. Within 15 days after receiving an application, the City Engineer shall provide one of the following responses in writing:
        i. Approval of the permit application;
        ii. Approval of the permit application, subject to conditions as may be necessary to substantially meet the objectives and requirements of this Chapter; or
        iii. Denial of the permit application, including the reason for the denial.
    b. If the City Engineer has granted conditional approval of the permit, the applicant shall submit a revised plan that conforms to the conditions established by the City Engineer. However, the applicant may be allowed to proceed with his land disturbing activity so long as it conforms to conditions established by the City Engineer.
    c. No construction may begin until the Storm Water Permit has been approved and all outstanding fees paid in full.

6. **Permit duration.**
    a. Every Storm Water Permit shall expire and become null and void if :
        i. Substantial work authorized by such permit has not commenced within 180 calendar days of issuance, is not complete within 18 months from the date of the commencement of construction, or work is suspended or abandoned for a period of 180 days or longer;
        ii. The applicant is not authorized to discharge storm water under the UPDES program; or
        iii. It is determined that the applicant is not an authorized representative of the owner and/or contractor.
    b. The Storm Water Permit shall remain in effect until all of the following items have been completed:
        i. Submission of as built plans;
        ii. Written certification by a registered professional engineer licensed to practice in the State of Utah that the structural BMP's have been installed in accordance with the approved plan and other applicable provisions of this ordinance;
        iii. Submission of a signed Notice of Termination of the UPDES Permit;
        iv. Installation and acceptance by City of all permanent or long term BMP's;
        v. Completion of final inspection punch list items; and
        vi. Removal of all temporary control measures.

7. **Notice of construction.**
    a. The applicant must notify the Public Works Department within ten working days in advance of the commencement of construction with a land disturbance permit.

8. **Requirements during construction.**

a. **Noticing.**
    i. The applicant must install and maintain a notice board at a publicly accessible location near the active part of the project. The notice board must be protected from the weather, and located where the City Inspector can read it easily without obstructing construction activities. The notice board shall include, at a minimum, the following information:
        1. Project name;
        2. Copy of any NOIs in effect;
        3. Name and phone number of the SWPPP Manager;
        4. SWPPP plan and report;
        5. Saratoga Springs Storm Water Permit.

b. **SWPPP Manager.** The SWPPP Manager shall:
    i. Implement and maintain the SWPPP, Storm Water Management Plan, and Sediment and Erosion control plan;
    ii. Ensure that subcontractors and utility companies understand and comply with the SWPPP, Storm Water Management Plan, and Sediment and Erosion Control Plan, and avoid disturbing installed BMP's;
    iii. Update the SWPPP and maintain the official updated SWPPP at the construction site; and
        iv. Shall take immediate suitable action to preclude erosion and pollution if storm water discharges threaten water quality.

c. **Inspections.**
    i. Regular inspections of the stormwater management system construction shall be conducted by the party responsible for the work and reviewed by the City Inspector.
    ii. The property owner shall allow access to the City Engineer or a representative to inspect storm water control measures that discharge to the MS4. The inspection shall review the control measures in place, the maintenance plan, and the need for additional measures to completely address the erosion and sediment control for the project.
    iii. All inspections shall be documented and written reports prepared that contain the following information:
        1. The date and location of the inspection;
        2. Whether construction is in compliance with the approved stormwater management plan;
        3. Variations from the approved construction specifications;
        4. Any violations that exist.

d. **BMPs Maintenance.**
    i. BMP's that have been damaged or undercut shall be repaired or replaced.
    ii. If maintenance or modifications to existing BMP's are necessary following a storm or inspection, complete required maintenance or modifications as soon as possible and before the next storm event whenever practicable.
        1. Applicant shall maintain BMP's so they properly perform their function.
        2. Applicant shall also remove accumulated sediment and debris before the BMP loses fifty percent (50%) of its storage capacity.

3. Additionally, the applicant must clean the silt fence before it loses thirty percent (30%) of its storage capacity.
4. Applicant shall maintain temporary and permanent erosion and sediment control measures in effective operating condition and coordinate BMPs with subcontractors and utility companies doing Work in the Project area.

9. **Performance bonds.**
    a. The City Engineer shall:
        i. Require the submittal of a performance security or performance guarantee bond prior to issuance of a permit in order to ensure that the SWPPP are implemented by the permit holder as required by the approved stormwater pollution prevention plan.
            1. The amount of the performance security or performance bond shall be the total estimated construction cost of the structural BMPs approved under the permit plus any reasonably foreseeable additional related costs.
            2. The performance security shall contain forfeiture provisions for failure to complete work specified in the SWPPP.
            3. The applicant shall provide an itemized engineer's construction cost estimate complete with unit prices which shall be subject to acceptance, amendment, or rejection by the City Engineer.
            4. Alternatively, the City Engineer shall have the right to calculate the cost of construction estimates and revise the opinion of probable cost accordingly.
    b. The performance security or performance guarantee bond shall be released in full only upon submission of:
        i. as built plans;
        ii. a written certification by a registered professional engineer licensed to practice in the State of Utah that all BMPs have been followed in accordance with the approved plan and other applicable provisions of this ordinance;
        iii. a signed Notice of Termination of the Construction General Permit;
        iv. completion of final inspection punch list items; and
        v. removal of all temporary control measures.
    c. The City Engineer or a representative will make a final inspection of the structural BMPs to ensure that they are in compliance with the approved plan and the provisions of this ordinance. Provisions for a partial pro-rata release of the performance security or performance guarantee bond based on the completion of various development stages can be made at the discretion of the City Engineer or representative.

(Ord. 20-14, Ord. 15-1)

18.06.04. Stormwater System Design and Management Standards.

1. **Irrigation ditches.**

a. Property owners are responsible for the protection of irrigation canals per the relevant sections of this ordinance.
b. Discharges into private canals require written approval from the ditch owners. The design shall comply with the terms of approvals and the City's Storm Water Design Standards and Regulations.
c. Piping of irrigation ditches and modification to diversion structures require documented approval from canal owners or representative. Design and coordination requirements shall comply with the City's Storm Water Design Standards and Regulations.

2. **Drainage channels, waterways, and sensitive areas.**
    a. Property owners shall not alter or restrict natural channels and waterways without proper Federal, State and City permits.
    b. Modifications of sensitive areas are subject to and governed by the Land Development Code (Title 19). These actions will require a Storm Water Permit and approval from all other governing agencies.
    c. Property owners proposing to redirect runoff, surface, and/or pipe flow to properties or facilities outside Saratoga Springs boundaries must provide written approval from the state, county or municipality, or their agents.
    d. Property owners are responsible for the protection of natural and artificial channels located within their property per the relevant sections of this ordinance.
    e. Discharges or modifications to the channels require written approval from the canal owners and applicable governing agencies.

3. **Stormwater design and BMP manuals.**
    a. **Adoption.** The City adopts as its stormwater design and BMP manuals the following publications, which are incorporated by reference in this ordinance as is fully set out herein:
        i. The City of Saratoga Springs Standard Technical Specifications and Drawings.
        ii. The City of Saratoga Springs Storm Water Master Plan.
        iii. The City of Saratoga Springs Storm Water Capital Facilities Plan.
        iv. The City of Saratoga Springs Storm Drainage Systems Design and Management Manual.
        v. Guidance Document for Stormwater Management (Salt Lake County Public Works Department).
            1. The document can be found at the following link: http://slco.org/pweng/stormwater/html/guide.html.
        vi. Other guidance documents required by or included in the Saratoga Springs Storm Water Management Program.
    b. These manuals include a list of acceptable BMPs and include specific design performance criteria and operation and maintenance requirements for each stormwater practice. The manuals may be updated and expanded from time to time, at the discretion of the City Council, upon the recommendation of the City Engineer, based on improvements in engineering, science, monitory and local maintenance experience.

4. **General performance criteria for stormwater management.** Unless granted a waiver or an exemption from the City Engineer, the following post construction performance criteria shall be addressed for stormwater management at all sites:
    a. A Utah registered professional engineer must design the storm drain systems (Public and Private) within City boundaries and directly supervise all discharges into a City storm drain system. The design shall carry the seal of the supervising professional engineer.
    b. All site designs shall control the peak flow rates of stormwater discharge associated with design storms specified in this ordinance or in the BMP manual and reduce the generation of post construction stormwater runoff to pre-construction levels or 100-yr historical flow rates. These practices should seek to utilize pervious areas for stormwater treatment and to infiltrate stormwater runoff from driveways, sidewalks, rooftops, parking lots, and landscaped areas to the maximum extent practical to provide treatment for both water quality and quantity.
    c. To protect stream channels from degradation, specific channel protection criteria shall be provided as prescribed in the BMP manual.
    d. Stormwater discharges to critical areas with sensitive resources (e.g., cold water fisheries, swimming beaches, recharge areas, water supply reservoirs, etc.) may be subject to additional performance criteria, or may need to utilize or restrict certain stormwater management practices.
    e. Stormwater discharges from "hot spots" may require the application of specific structural BMPs and pollution prevention practices.
    f. Prior to or during the site design process, applicants for Storm Water Permits shall consult with the City Engineer to determine if they are subject to additional stormwater design requirements.
    g. Calculations for determining allowable peak flows and runoff volumes as found in the BMP manual shall be used for sizing all stormwater facilities.

5. **Minimum control requirements.**
    a. Storm water discharge during all construction activities shall comply with the terms of the Storm Water Permit, Saratoga Springs Standard Technical Specifications and Drawings, or requirements set forth by the most recent edition of the International Building Code, and the State of Utah UPDES requirements.
    b. Stormwater designs, installations, operations, and maintenance shall meet the multi-stage storm frequency storage and runoff volume requirements as identified in the BMP manual, along with the operation, installation, and maintenance standards in the BMP manual unless the City Engineer has granted the applicant a full or partial waiver for a particular BMP pursuant to section 6 of this ordinance.
    c. Runoff rates from one lot/parcel to another may not exceed pre-existing conditions and may not increase in such a manner that may unreasonably or unnecessarily cause more harm or damage than formerly existed in the predevelopment condition.
    d. If hydrologic or topographic conditions warrant greater control than that provided by the minimum control requirements, the City Engineer may impose any and all additional requirements deemed necessary to control the volume, timing, and rate of runoff.

e. Soil, sediment, and debris brought onto streets and public ways must be removed by the end of the work day by machine, broom, or shovel to the satisfaction of the City Engineer or representative. Failure to remove the sediment, soil, or debris shall be deemed a violation of this ordinance.

6. **Stormwater Management Plan requirements**. Property owners are responsible to manage or ensure management of storm water runoff and sediment, whether in conduit systems or on the surface, that traverse through or originate on their property. This responsibility may extend to the defining of agreements, easements, and other appropriate measures to address storm water management. In order to manage storm water, the property owner must develop a stormwater management plan and implement the plan. The stormwater management plan shall include sufficient information to allow the City Engineer to evaluate: the environmental and historical characteristics of the project site; the potential impacts of all proposed development of the site, both present and future, on the water resources; and the effectiveness and acceptability of the measures proposed for managing stormwater generated at the project site. To accomplish this goal the stormwater management plan shall include the following:
    a. **Site Description.** Brief description of the subject property and a description and map of its on-site storm water management facilities.
    b. **Topographic Base Map.** A 1" = 500" topographic base map of the site that extends a minimum of 1000 feet beyond the limits of the proposed development and indicates:
        i. Existing surface water drainage including streams, ponds, culverts, ditches, sink holes, and wetlands. It must also include the type, size, elevation, etc., of the nearest upstream and downstream drainage structures, slopes, and drainage arrows;
        ii. Current land use including all existing structures, locations of utilities, and locations of roads, and easements;
        iii. All other existing significant natural and artificial features.
        iv. When deemed necessary by the City Engineer, the Topographic Base Map and Survey shall conform to the minimum levels established by the American Land and Title Association (ALTA Survey).
    c. Proposed land use with tabulation of the percentage of surface area to be adapted to various uses, drainage patterns, locations of utilities, roads and easements, and the limits of clearing and grading.
    d. Proposed structural BMPs.
    e. A written description of the site plan and justification of proposed changes. Natural conditions may also be required.
    f. **Calculations.** Hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storm events specified in the BMP manual. These calculations must show that the proposed stormwater management measures are capable of controlling runoff from the site in compliance with this ordinance and the guidelines of the BMP manual. Such calculations shall include:
        i. A description of the design storm event frequency, duration, and intensity where applicable;

ii. Time of concentration;
iii. Soil curve numbers or runoff coefficients including assumed soil moisture conditions;
iv. Peak runoff rates and total runoff volumes for each watershed area;
v. Infiltration rates, where applicable, verified by percolation test or by geological test;
vi. Culvert, stormwater sewer, ditch and/or other stormwater conveyance capacities;
vii. Flow velocities;
viii. Data on the increase in rate and volume of runoff for the design storm events referenced in the BMP manual; and
ix. Documentation of sources for all computation methods and field test results.

g. **Soils Information.** If a stormwater management control measure depends on the hydrologic properties of soils (e.g., infiltration basins), then a soils report shall be submitted. The soils report shall be based on on-site boring logs or soil pit profiles and soil survey reports. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soil types present at the location of the control measure. In all cases where subsurface infiltration is a component of the storm water management plan a site specific percolation test shall be submitted based upon field observations and testing at the location of the infiltration facility.

h. **Maintenance, and Repair Plan**: The design and planning of all stormwater management facilities shall include detailed maintenance and repair procedures to ensure their continued performance. These plans will identify the parts or components of a stormwater management facility that need to be maintained and the equipment, skills, and training necessary for such maintenance. Provisions for the periodic review and evaluation of the effectiveness of the maintenance program and the need for revisions or additional maintenance procedures shall be included in the plan. A permanent elevation benchmark shall be identified in the plans to assist in the periodic inspection of the facility.

i. **Landscaping Plan**. The applicant must present a detailed plan for management of vegetation at the site after construction is finished. This will include who will be responsible for the maintenance of vegetation at the site and what practices will be employed to ensure that adequate vegetative cover is preserved (If required by the BMP). Where it is required by the BMP, this plan must be prepared by a registered landscape architect licensed in the State of Utah.

7. **Sediment and Erosion Control Plan requirements**. The applicant must prepare a sediment and erosion control plan for all construction activities that accurately illustrates the measures that are to be taken to control storm water pollution problems. The length and complexity of the plan is to be commensurate with the size of the project, severity of the site condition, and potential for off-site damage. This plan shall be signed and sealed by a registered professional engineer licensed in the state of Utah. The plan shall also conform to the requirements found in the BMP manual, and shall include, at a minimum, the following:

a. A topographic map with contour intervals of two (2) feet or less showing present conditions and proposed contours resulting from land disturbing activity.
b. All existing drainage ways, including intermittent and wet-weather. This must also include any designated floodways or flood plains.
c. Stands of existing trees as they are to be preserved upon project completion, specifying their general location on the property. Differentiation shall be made between existing trees to be preserved, trees to be removed, and proposed planted trees. Tree protection measures must be identified, and the diameter of the area involved must also be identified on the plan and shown to scale. Information shall be supplied concerning the proposed destruction of exceptional and historic trees in setbacks and buffer strips, where they exist. Complete landscape plans may be submitted separately. The plan must include the sequence of implementation for tree protection measures.
d. Approximate limits of proposed clearing, grading, and filling.
e. Approximate flows of existing storm water leaving any portion of the site.
f. A general description of existing soil types and characteristics and any anticipated soil erosion and sedimentation problems resulting from existing characteristics.
g. Location, size, and layout of proposed stormwater and sedimentation control improvements.
h. Proposed drainage network.
i. Proposed sizing for storm sewer piping, dewatering facilities, or other waterways.
j. Approximate flows leaving site after construction and incorporating water run-off mitigation measures. The evaluation must include projected effects on property adjoining the site and on existing drainage facilities and systems. The plan must address the adequacy of outfalls from the development. This includes: when water is concentrated, what is the capacity of waterways, if any, accepting storm water offsite; and what measures, including infiltration, sheeting into buffers, etc., are going to be used to prevent the scouring and/or sedimentation of waterways and drainage areas off-site, etc.
k. The projected sequence of work represented by the grading, drainage, and sedimentation and erosion control plans as related to other major items of construction, beginning with the initiation of excavation and including the construction of any sediment basins or retention facilities or any other structural BMPs.
l. Specific remediation measures to prevent erosion and sedimentation run-off. Plans shall include detailed drawings of all control measures used. Stabilization measures including vegetation and non-vegetation measures, both temporary and permanent, will be detailed. Detailed construction notes and a maintenance schedule shall be included for all control measures in the plan.
m. Specific details for the construction of rock pads, wash down pads, and settling basins for controlling erosion; road access points; and eliminating or keeping soil, sediment, and debris on streets and public ways at a level acceptable to the City Engineer.
n. Proposed structures. Location (to the extent possible) and identification of any proposed additional buildings, structures or development on the site.

o. A description of on-site measures to be taken to recharge surface water into the ground water system through infiltration.
p. Future phasing plans and impervious areas if applicable.

8. **Maintenance Easements**. The applicant must ensure access to the site for the purpose of inspection and repair by securing all the maintenance easements needed. These easements must be binding on the current property owner and all subsequent owners of the property and must be properly recorded in the Office of the Utah County Recorder.

9. **Maintenance Agreement**. The owner of property to be served by an on-site stormwater management facility must execute an inspection and maintenance agreement that shall operate as a deed restriction binding on the current property owner and all subsequent property owners. The maintenance agreement shall:
    a. Assign responsibility for the maintenance and repair of the stormwater facility to the owner of the property upon which the facility is located and be recorded as such on the plat for the property by appropriate notation.
    b. Provide for annual inspection by the property owner or qualified designee for the purpose of documenting maintenance and repair needs and ensure compliance with the purpose and requirements of this ordinance. This inspection shall be conducted by a qualified person as defined by the Utah Division of Water Quality, and such qualified person will submit a sealed report of the inspection to the City Engineer or representative.
    c. It shall grant permission to the City to enter the property at reasonable times and to inspect the stormwater facility to ensure that it is being properly maintained.
    d. Provide that the minimum maintenance and repair needs include, but are not limited to: the removal of silt, litter, and other debris; the cutting of grass; grass cuttings and vegetation removal; and the replacement of landscape vegetation. This applies to all detention and retention basins, as well as inlets and drainage pipes and any other stormwater facilities as required by the property owner by the City. It shall also provide that the property owner shall be responsible for additional maintenance and repair needs consistent with the needs and standards outlined in the BMP manual.
    e. Provide that maintenance needs must be addressed in a timely manner, on a schedule to be determined by the City Engineer.
    f. Provide that if the property is not maintained or repaired within the prescribed schedule, the Public Works Department shall perform the maintenance and repair at the property owner's expense. The maintenance agreement shall also provide that the Public Works Department's cost of performing the maintenance shall be a lien against the property.

10. **Dedication**. The municipality shall have the discretion to accept the dedication of any existing or future stormwater management facility, provided such facility meets the requirements of this ordinance, and includes adequate and perpetual access and sufficient areas, by easement or otherwise, for inspection and regular maintenance. Any stormwater facility accepted by the municipality must also meet the municipality's construction

standards and any other standards and specifications that apply to the particular stormwater facility in question.

(Ord. 20-14, Ord. 15-1)

18.06.05. Post Construction.

1. **As-built plans**. All applicants are required to submit as built plans for any structures located on-site after final construction is completed. The plan must show the final design specifications for all stormwater management facilities and must be sealed by a registered professional engineer licensed to practice in Utah. A final inspection by the City Inspector is required before any performance security or performance bond will be released. The City Inspector shall have the discretion to adopt provisions for a partial pro-rata release of the performance security or performance guarantee bond on the completion of various stages of development. Certificates of occupancy ("occupation permits") shall not be granted until corrections to all BMP's have been made and accepted by the City Inspector.

2. **Landscaping and stabilization requirements**. Any area of land from which the natural vegetative cover has been either partially or wholly cleared shall be revegetated according to a schedule approved by the City Engineer. The following criteria shall apply to revegetation efforts:
    a. Reseeding must be done with an annual or perennial cover crop accompanied by placement of straw mulch or its equivalent of sufficient coverage to control erosion until such time as the cover crop is established over seventy (70%) of the seeded area.
        i. Any area of revegetation must exhibit a minimum of seventy percent (70%) density of the cover crop throughout the year immediately following revegetation. Revegetation must be repeated in successive years until the minimum seventy percent (70%) density for one (1) year is achieved.
    b. Replanting with native woody and herbaceous vegetation must be accompanied by placement of straw mulch or its equivalent of sufficient coverage to control erosion until the plantings are established and are capable of controlling erosion.
    c. In addition to the above requirements, a landscaping plan must be submitted with the final design describing the vegetative stabilization and management techniques to be used at a site after construction is completed. This plan will explain not only how the site will be stabilized after construction, but who will be responsible for the maintenance of vegetation at the site and what practices will be employed to ensure that adequate vegetative cover is preserved.

3. **Inspection of stormwater management facilities.** Periodic inspections of facilities shall be performed by the property owner or qualified designee for the purpose of documenting maintenance and repair needs and ensure compliance with the purpose and requirements of this ordinance. This inspection shall be conducted by a qualified person as defined by the Utah Division of Water Quality, and such qualified person will submit a sealed report of the inspection to the Public Works Department.

4. **Records of installation and maintenance activities.** Parties responsible for the operation and maintenance of a stormwater management facility shall make records of the installation of the stormwater facility, and of all maintenance and repairs to the facility, and shall retain the records for at least 5 years. These records shall be made available to the City Engineer during inspection of the facility and at other reasonable times upon request.

5. **Failure to meet or maintain design or maintenance standards.** If a responsible party fails or refuses to meet the design or maintenance standards required for stormwater facilities under this ordinance, the Public Works Department, after reasonable notice to the responsible party, may correct a violation of the design standards or maintenance needs by performing all necessary work to place the facility in proper working condition. In the event that the stormwater management facility becomes a danger to public safety or public health, the Public Works Department shall notify in writing the responsible party for maintenance of the stormwater management facility. Upon receipt of that notice, the responsible person shall have 15 days to effect maintenance and repair of the facility in an approved manner.
    a. In the event that corrective action is not undertaken within that time, the Public Works Department may take necessary corrective action. The cost of any action under this section shall be charged to the responsible party.

(Ord. 20-14, Ord. 15-1)

18.06.06. Waivers.

1. **General.** Every applicant shall provide for post construction stormwater management as required by this ordinance, unless a written request is filed to waive this requirement. Requests to waive the stormwater management plan requirements shall be submitted to the City Engineer for review, processing, and approval or forwarding to City Council where deemed appropriate by City Engineer

2. **Conditions for waiver.** The minimum requirements for stormwater management may be waived in whole or in part upon written request of the applicant, provided that at least one of the following conditions applies:
    a. It can be demonstrated that the proposed development is not likely to impair attainment of the objectives of this ordinance.
    b. Alternative minimum requirements for on-site management of stormwater discharges have been established in a stormwater management plan that has been approved by the City Engineer.
    c. Provisions are made to manage stormwater by an off-site facility. The off-site facility must be in place and designed to provide the level of stormwater control that is equal to or greater than that which would be afforded by on-site practices. Further, the facility must be operated and maintained by an entity that is legally obligated to continue the operation and maintenance of the facility.

3. **Downstream damage prohibited.** In order to receive a waiver, the applicant must demonstrate to the satisfaction of the City Engineer that the waiver will not lead to any of the following conditions downstream:
    a. Deterioration of existing culverts, bridges, dams, and other structures;
    b. Degradation of biological functions or habitat;
    c. Accelerated stream bank or streambed erosion or siltation;
    d. Increased threat of flood damage to public health, life or property.

4. **Storm Water Permit not to be issued where waiver requested.** No Storm Water Permit shall be issued where a waiver has been requested until the waiver is granted. If no waiver is granted, the application for a Storm Water Permit must be resubmitted.

(Ord. 15-1)

18.06.07. Existing Locations and Developments.

1. **Requirements for all existing locations and developments.** The following requirements shall apply to all locations and development at which land disturbing activities have occurred previous to the enactment of this ordinance:
    a. Denuded areas must be vegetated or covered under the standards and guidelines specified in the BMP manual and on a schedule acceptable to the City Engineer.
    b. Cut and Fill slopes must be properly covered with appropriate vegetation and/or retaining walls constructed.
    c. Drainage ways shall be properly covered in vegetation or secured with rip-rap, channel lining, etc., to prevent erosion.
    d. Trash, junk, rubbish, etc. shall be cleared from drainage ways.
    e. Stormwater runoff shall be controlled to the extent reasonable to prevent pollution of local waters.

2. **Requirements for existing problem locations.** The Public Works Department shall notify the owners of existing locations and developments of the specific drainage, erosion, or sediment problem affecting such locations and developments, and the specific actions required to correct those problems. The notice may be in writing and will also specify a reasonable time for compliance. If not already existing, corrective actions may include a requirement to prepare and implement a LTSWMP and LTSWMA per the provisions of this chapter.

3. **Inspection of existing facilities.** The Public Works Department may, to the extent authorized by state and federal law, establish inspection programs to verify that all stormwater management facilities, including those built before as well as after the adoption of this ordinance, are functioning within design limits. These inspection programs may be established on any reasonable basis, including but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of contaminants or pollutants or with

discharges of a type which are more likely than the typical discharge to cause violations of the municipality's NPDES/UPDES stormwater permit; and joint inspections with other agencies inspecting under environmental or safety laws.

a. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other BMPs.

4. **Business License**. Upon application for a business license, and upon annual business license renewal, the owners of property served by an on-site Storm Water Management Facility shall ensure the property is covered by a Long Term Storm Water Management Plan and a Long Term Storm Water Management Agreement compliant with the Provisions of this chapter. Upon annual business license renewal the on-site Storm Water Management Facility shall be inspected by a registered storm water inspector in the State of Utah for compliance with the LTSWP and LTSWMA who will submit a sealed report of the inspection to the City Public Works Department.
    a. A property owner may elect to have the City's Public Works Department perform the annual inspection. Each application for an inspection shall be accompanied by payment of the inspection and other storm water management fees, as adopted by resolution and found in the City Fee Schedule.
    b. Any maintenance needs identified in the inspection report must be addressed in a timely manner, on a schedule to be determined by the Public Works Department. If the property is not maintained or repaired within the prescribed schedule, the Public Works Department shall perform the maintenance and repair at its expense, and bill the same to the property owner. If not paid within 30 days, the cost of performing the maintenance may be filed as a lien against the property.

(Ord. 20-14, Ord. 15-1)

18.06.08. Illicit Discharges.

1. **Scope.** This section shall apply to all water generated on developed or undeveloped land entering the municipality's separate storm sewer system.

2. **Prohibition of illicit discharges.** No person shall introduce or cause to be introduced into the municipal separate storm sewer system any discharge that is not composed entirely of stormwater. The commencement, conduct or continuance of any non-stormwater discharge to the municipal separate storm sewer system is prohibited except as described as follows:
    a. Uncontaminated discharges from the following sources:
        i. Water line flushing or other potable water sources;
        ii. Landscape irrigation or lawn watering with potable water or pressurized irrigation;
        iii. Diverted stream flows;
        iv. Rising ground water;
        v. Groundwater infiltration to storm drains;

vi. Uncontaminated pumped groundwater;
vii. Discharges from potable water sources;
viii. Foundation or footing drains;
ix. Crawl space pumps;
x. Lawn watering runoff;
xi. Individual residential car washing;
xii. Air conditioning condensation;
xiii. Irrigation water;
xiv. Springs;
xv. Natural riparian habitat or wet-land flows;
xvi. Swimming pools (if dechlorinated to less than one PPM chlorine);
xvii. Water reservoir discharges (if dechlorinated to less than one PPM chlorine);
xviii. Residual street wash water;
xix. Firefighting activities; and
xx. Any other uncontaminated water source.

b. Discharges specified in writing by the City Engineer as being necessary to protect public health and safety.
c. Dye testing is an allowable discharge if the City Engineer has so specified in writing.
d. The prohibition shall not apply to any non-storm water discharge permitted under an UPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the State of Utah Division of Water Quality, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

3. Prohibition of illicit connections.

a. The construction, use, maintenance or continued existence of illicit connections to the separate municipal storm sewer system is prohibited.
b. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

4. **Reduction of stormwater pollutants by the use of best management practices.** Any person responsible for a property or premises, which is, or may be, the source of an illicit discharge, may be required to implement, at the person's expense, the BMP's necessary to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of stormwater associated with industrial activity, to the extent practicable, shall be deemed in compliance with the provisions of this section.

5. **Notification of spills.** Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting in, or may result in, illicit discharges or pollutants discharging into stormwater,

the municipal separate storm sewer system, the person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release.

a. **Hazardous Materials.** In the event of such a release of hazardous materials the person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services.
b. **Non-hazardous Materials.** In the event of a release of non-hazardous materials, the person shall notify the Public Works Department in person or by telephone or facsimile no later than the next business day. Notifications in person or by telephone shall be confirmed by written notice addressed and mailed to the Public Works Department within three (3) business days of the telephone notice.
c. **Written Records of Illicit Discharges.** If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least 5 years.

(Ord. 20-14, Ord. 15-1)

18.06.09. Inspection.

1. **Purpose.** To be in accordance with the General Permit for Discharges for Small Municipal Separate Storm Sewer Systems (MS4), Permit No. UTR090000, the City will conduct inspections to monitor all storm water controls and BMPs as well as all discharges to the City's Storm Sewer System and to natural water bodies including lakes, rivers, stream and canals.

2. **Scope.** Inspections relating to the MS4 Permit include but are not limited to illicit discharges, construction activities and post construction operation and maintenance of stormwater controls, reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other BMPs either publicly or privately owned.

3. **Access.**
   a. **Visual Inspections.** Visual inspections of discharges to natural water bodies, spills, stormwater related controls on private property within the City limits of Saratoga Springs are permitted by the Public Works Department at any time.
   b. **Other Inspections.** When a visual inspection is not adequate to determine the extent of discharges to natural water bodies, spills, or determine the status of stormwater related controls on private property, the City will give 24 hours' notice of the inspection to take place and the extent of the inspection. Equipment and manpower necessary to perform the inspection will be allowed to access and work as necessary to determine the state of the situation.
   c. **Emergency Inspections.** During times of emergency including discharges to natural water bodies, spills or potential damage to life or property, the City may access the location of concern as necessary and with the equipment required to

determine the status of the situation. Reasonable attempts to contact the property owner prior to the inspection will be made prior to accessing private property.

4. **Follow-up Inspections.** During initial or routine inspections if problems are identified which require corrective actions then a follow-up inspection will be scheduled.

(Ord. 20-14, Ord. 15-1)

18.06.10. Enforcement.

1. **Enforcement authority.** The City Engineer or his representatives shall have the authority to issue notices of violation, stop work orders, and citations, and to impose the civil penalties provided in this section.
    a. With the issuance of a Storm water permit, the City shall be permitted to enter and inspect, including testing and investigation, facilities subject to this ordinance at all reasonable times and as often as necessary to determine compliance. Failure to comply with the terms of this ordinance may result in punitive actions by the City, by the Utah County Health Department, or by other means identified in permits or terms set forth in development applications.

2. **Violation Procedure.**
    a. **Written Notice**. Whenever the City finds that any permittee or any other person discharging stormwater has violated or is violating this ordinance or a permit or order issued hereunder, the City may serve upon such person written notice of the violation. Within ten (10) days of this notice, the permittee or other person in violation will submit to the City Engineer an explanation of the violation and a plan for the satisfactory correction and prevention of such violations. This plan will include specific actions that will be taken in order to come into compliance with this ordinance. Submission of this plan in no way relieves the discharger of liability for any violations occurring before or after receipt of the notice of violation.
    b. **Consent Orders**. The City Engineer is empowered to enter into consent orders, assurances of voluntary compliance, or other similar documents establishing an agreement with the person responsible for the noncompliance. Such orders will include specific action to be taken by the person to correct the noncompliance within the time period specified by the order. Consent orders shall have the same force and effect as the compliance orders issued pursuant to §18.06.10(2)(d).
    c. **Show Cause Hearing**. The City Engineer may order any person who violates this ordinance or permit or order issued hereunder, to show cause for why a proposed enforcement action should not be taken. Notice shall be served on the violator specifying the time and place for the meeting, the proposed enforcement action, the reasons for such action, and a request that the violator show cause why this proposed enforcement action should not be taken. The notice of the meeting shall be served personally or by registered or certified mail (return receipt requested) at least ten (10) days prior to the hearing.
    d. **Compliance Order**. When the City Engineer finds that any person has violated or continues to violate this ordinance or a permit or order issued thereunder, the City

Engineer may issue a compliance order to the violator. This order will direct that, following a specific time period, adequate structures, or devices be installed or procedures implemented and properly operated. Orders may also contain such other requirements as might be reasonably necessary and appropriate to address the noncompliance, including the construction of appropriate structures, installation of devices, self-monitoring, and management practices.

i. **Cease and Desist Orders**. When the City Engineer finds that any person has violated or continues to violate this ordinance or any permit or order issued hereunder, the City Engineer may issue an order to cease and desist all such violations and direct those persons in noncompliance to:

1. Comply forthwith; or
2. Take such appropriate remedial or preventive action as may be needed to properly address a continuing or threatened violation, including halting operations and terminating the discharge.

3. **Conflicting standards.** Whenever there is a conflict between any standard contained in this ordinance and in the BMP manual adopted by the municipality under this ordinance, the strictest standard shall prevail.

4. **Violations.** Any person who shall commit any act declared unlawful under this ordinance, who violates any provision of this ordinance, who violates the provisions of any permit issued pursuant to this ordinance, or who fails or refuses to comply with any lawful communication or notice to abate or take corrective action by the City SD Representative, shall be guilty of a Class C Misdemeanor.

(Ord. 15-1)

18.06.11. Penalties.

1. Any person found violating the provisions of this ordinance may be assessed a fine of not less than fifty dollars ($50.00) and not more than five thousand dollars ($5,000.00) per day for each day of violation. Each day of violation shall constitute a separate violation. The City may also issue a criminal citation pursuant to Utah law or City ordinances.

2. **Measuring Civil Penalties.** In assessing a civil penalty, the City Engineer may consider:
   a. The harm done to the public health or the environment;
   b. Whether the civil penalty imposed will be a substantial economic deterrent to the illegal activity;
   c. The economic benefit gained by the violator;
   d. The amount of effort put forth by the violator to remedy this violation;
   e. Any unusual or extraordinary enforcement costs incurred by the municipality;
   f. The amount of penalty established by ordinance or resolution for specific categories of violations; and
   g. Any equities of the situation which outweigh the benefit of imposing any penalty or damage assessment.

3. **Recovery of Damages and Costs**. In addition to the civil penalty in subsection (2) above, the municipality may recover:
    a. all damages proximately caused by the violator to the municipality, including any reasonable expenses incurred in investigating violations of, and enforcing compliance with, this ordinance, or any other actual damages caused by the violation; and
    b. the costs of the municipality's maintenance of stormwater facilities when the user of such facilities fails to maintain them as required by this ordinance.

4. **Other remedies.** The municipality may bring legal action to enjoin the continuing violation of this ordinance, and the existence of any other remedy, at law or equity, shall be no defense to any such actions. In addition to the penalties established in this ordinance, the City may refuse to renew business licenses or other permits while such a violation continues.

5. **Remedies cumulative.** The remedies set forth in this section shall be cumulative, not exclusive, and it shall not be a defense to any action, civil or criminal, that one (1) or more of the remedies set forth herein has been sought or granted.

(Ord. 15-1)

Appendix C: Storm Water Management Program Documentation

Section 1

1.1 - Public Works Storm Water Web Page
(found at: http://www.saratogaspringscity.com/352/Storm-Water)

In accordance with UPDES measures 4.2.1.1. and 4.2.1.2., the Public Works storm water web page contains a link to specific information about what citizens in the community are doing to help prevent pollutant discharge into storm drains in the City of Saratoga Springs. The topics covered under this link include: Septic System Maintenance, Cleaning Your Home Carpets, Home Improvement, Maintaining and Washing Your Car, Painting, properly disposing of Pet Waste, Recycling Autumn Leaves, Yard Care, and proper disposal of swimming pool water. In addition, links are provided that access a copy of the City's present Storm Water Management Plan, the Utah County Storm Water Coalition website, a map of the locations that storm water discharges into Utah Lake and the Jordan River, Utah County's used oil program information sheet, Utah County's household hazardous waste disposal site, and additional information pertaining storm water pollution prevention. Currently, the stormwater page has an average of 841 view per year.

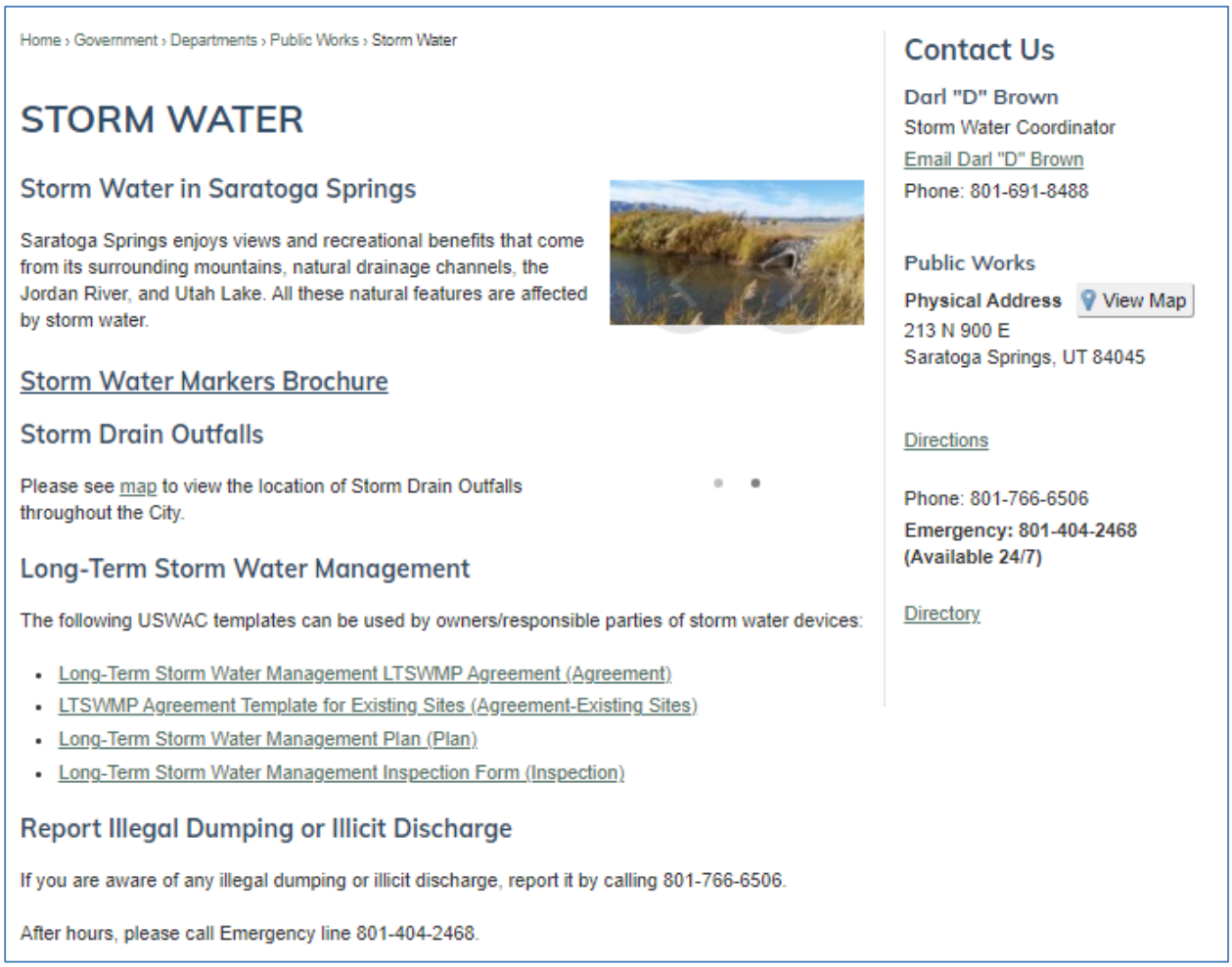
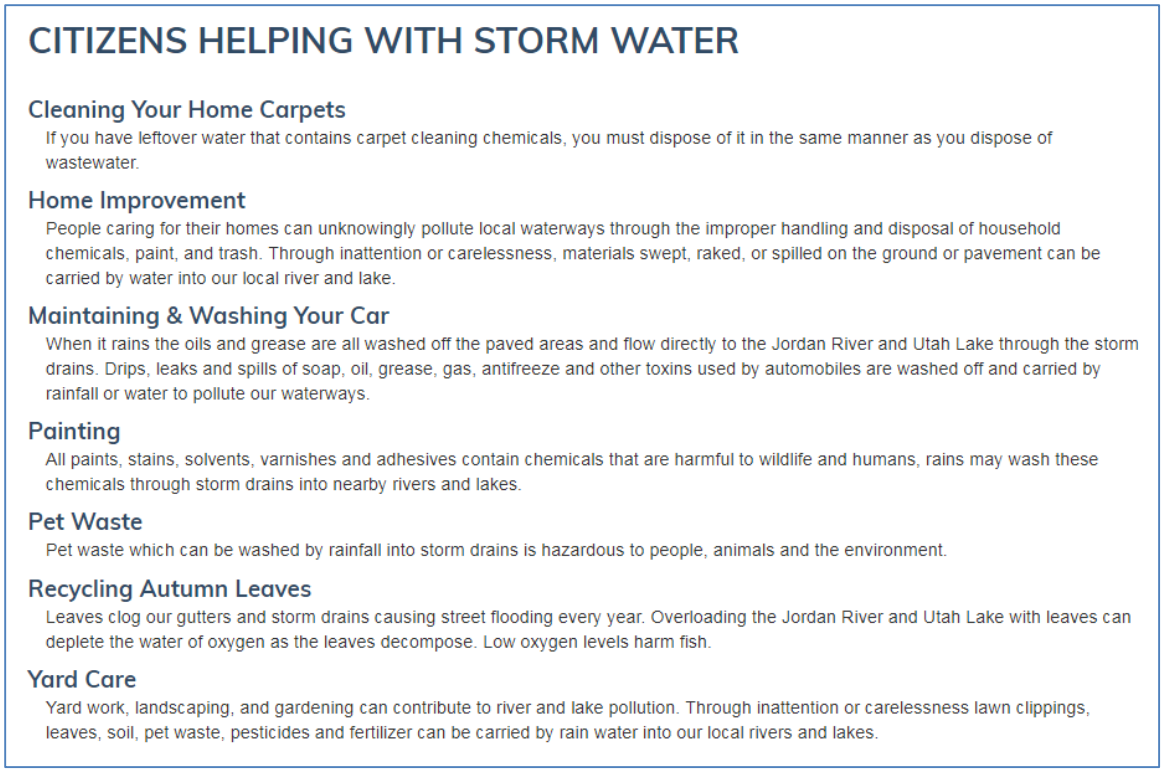


Figure 1: The storm water web page contains information about what the City is doing to prevent storm water pollution in the City of Saratoga Springs, the Storm Water Coordinator's contact information, the number to call to report illegal dumping, the Public Works office's physical address, etc.



CITIZENS HELPING WITH STORM WATER

Cleaning Your Home Carpets

If you have leftover water that contains carpet cleaning chemicals, you must dispose of it in the same manner as you dispose of wastewater.

Home Improvement

People caring for their homes can unknowingly pollute local waterways through the improper handling and disposal of household chemicals, paint, and trash. Through inattention or carelessness, materials swept, raked, or spilled on the ground or pavement can be carried by water into our local river and lake.

Maintaining & Washing Your Car

When it rains the oils and grease are all washed off the paved areas and flow directly to the Jordan River and Utah Lake through the storm drains. Drips, leaks and spills of soap, oil, grease, gas, antifreeze and other toxins used by automobiles are washed off and carried by rainfall or water to pollute our waterways.

Painting

All paints, stains, solvents, varnishes and adhesives contain chemicals that are harmful to wildlife and humans, rains may wash these chemicals through storm drains into nearby rivers and lakes.

Pet Waste

Pet waste which can be washed by rainfall into storm drains is hazardous to people, animals and the environment.

Recycling Autumn Leaves

Leaves clog our gutters and storm drains causing street flooding every year. Overloading the Jordan River and Utah Lake with leaves can deplete the water of oxygen as the leaves decompose. Low oxygen levels harm fish.

Yard Care

Yard work, landscaping, and gardening can contribute to river and lake pollution. Through inattention or carelessness lawn clippings, leaves, soil, pet waste, pesticides and fertilizer can be carried by rain water into our local rivers and lakes.

Figure 2: “Citizens helping with storm water” is a link showing what citizens in the community are doing to help prevent storm water pollution.

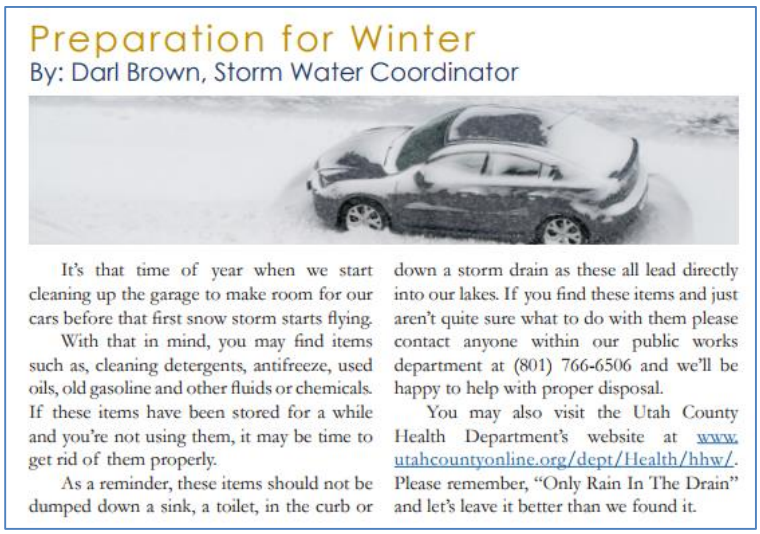
▼ Public Works - Storm Water

- Storm Water Management Program
- Utah County Used Oil Program Information
- Household Hazardous Waste Disposal
- Utah County Storm Water Coalition
- Top Ten BMPs for Construction Sites
- Volunteer Opportunities
- Utah Division of Water Quality
- Common Plan SWPPP Template
- Environmental Protection Agency - Stormwater
- Center for Watershed Protection
- International Erosion Control Association (IECA)

Figure 3: These quick links help residents, construction services, and other users quickly find access to information to help prevent storm water pollution.

1.2 - City Newsletter

The Storm Water Coordinator posts an article each month in the City's newsletter, the "Saratoga View" about how to prevent storm water pollution. Some topics include: disposing of oil properly, cleaning up leaves, and washing your car. Information about county and local organizations, including the Utah County Stormwater Coalition, and the Utah County Health Department are also included in the newsletters to help residents become more familiar with their local government. As of February 2021, 9,610 residents have received or are subscribed to the Saratoga View, the City's monthly newsletter.



Preparation for Winter

By: Darl Brown, Storm Water Coordinator

It's that time of year when we start cleaning up the garage to make room for our cars before that first snow storm starts flying.

With that in mind, you may find items such as, cleaning detergents, antifreeze, used oils, old gasoline and other fluids or chemicals. If these items have been stored for a while and you're not using them, it may be time to get rid of them properly.

As a reminder, these items should not be dumped down a sink, a toilet, in the curb or down a storm drain as these all lead directly into our lakes. If you find these items and just aren't quite sure what to do with them please contact anyone within our public works department at (801) 766-6506 and we'll be happy to help with proper disposal.

You may also visit the Utah County Health Department's website at www.utahcountyonline.org/dept/Health/hhw/. Please remember, "Only Rain In The Drain" and let's leave it better than we found it.

1.3 - Brochures

The storm water department has printed several brochures to distribute to the community and businesses to create awareness for storm water pollution. The brochures are available at City Offices, are distributed at pre-construction meetings, and are distributed with the issue of business licenses. Following the pandemic and new health safety guidelines, brochures are distributed during preconstruction meetings and are available on the City's Stormwater Webpage

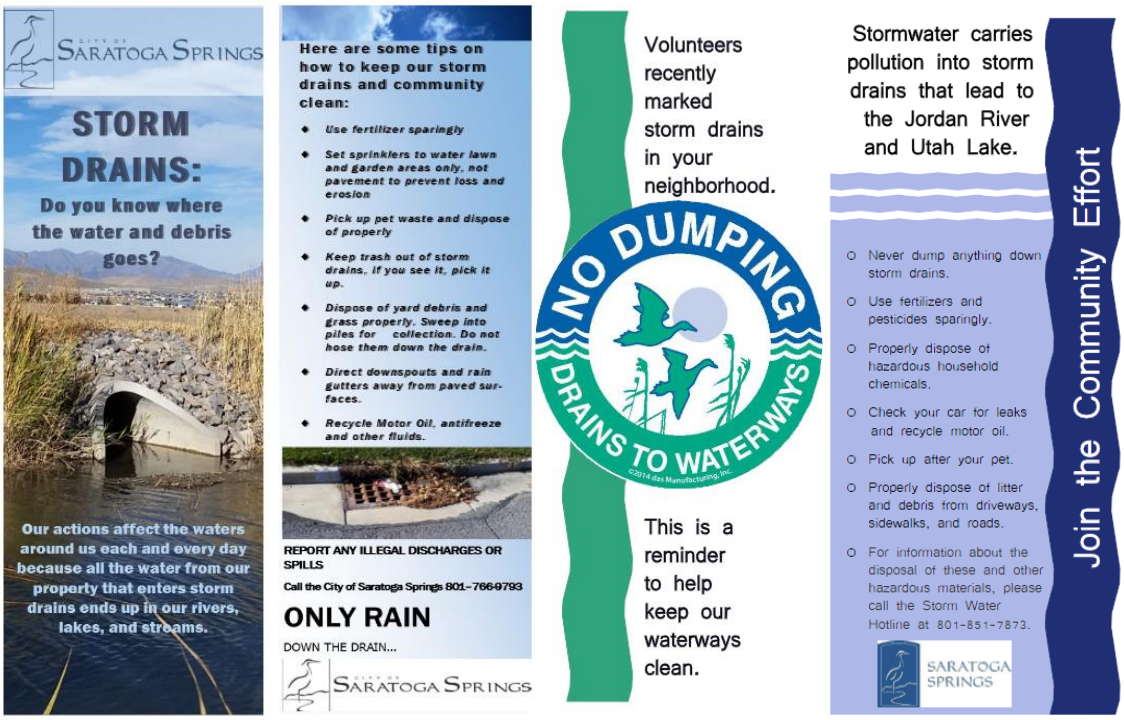


Figure 4: Storm water brochures can be printed and distributed throughout the community and during storm drain markings.

1.4 - Engineering and Development Standards

In 2015, the City of Saratoga Springs adopted several ordinances pertaining to stormwater that incorporate the need for a Storm Water Pollution Prevention Plan (SWPPP). City Ordinance 18.06.03 (see Appendix) covers the requirements and guidelines for construction operators to provide a SWPPP at their project site. This ordinance is the basis for enforcing SWPPPs on construction sites in the City, and outlines the procedure for obtaining a SWPPP and the standards and provisions needed to have a working SWPPP on site. The following is an SOP relating to developing a SWPPP that contractors and site owners can use as part of City and UPDES standards. The SOP will be posted on the storm water web page for contractors, operators, and residents to view.

SOP: DEVELOPING A STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

PURPOSE: A Storm Water Pollution Prevention Plan (SWPPP) is necessary to enforce sedimentation containment and prevent construction site storm water runoff from entering storm drains and eventually reaching sensitive water bodies. This SOP will help to provide guidance on the development of a SWPPP, the codes and laws associated with storm water pollution prevention, and what to expect once you have a fully completed SWPPP.

PRIORITY: Construction sites greater than or equal to one (1) are required to obtain a Storm Water Permit from the Division of Water Quality. In addition, construction sites that disturb less than one (1) acre are required to obtain a permit if the site is part of a "common plan of development or sale" that is over one acre. A Common Plan of Development or Sale is a plan to subdivide a parcel of land into separate parts for separate sale. If a project is less than five (5) acres, it may also qualify for an erosivity waiver, which is based on low rainfall. This SOP will address this criteria and walk through the items needed, inspection procedures, and the enforcement of a SWPPP to help contractors understand the importance of a SWPPP.

PLAN: Contractors are required to provide their own SWPPP, however, this SOP will present the items required in a SWPPP, and the procedures the City of Saratoga Springs takes to approve, and enforce a SWPPP.

ACTION:

A SWPPP Construction General Permit (CGP) template can be found at the following link: https://documents.deq.utah.gov/water-quality/permits/updes/DWQ-2017-001761.docx. Before applying for a permit, you must have a SWPPP already prepared for the project for which you are applying. The permit usually lasts for a year. Within the City of Saratoga Springs SWPPPs must be drafted in compliance with the Utah General Construction Permit, as found at the previous link.

ITEMS REQUIRED IN A SWPPP (BASED ON UTAH DEQ STANDARDS)

1. Identify people responsible for the SWPPP
2. Describe the nature of the construction activity
3. Provide a sequence of construction activities
4. Provide a site map that shows features of the site relevant to storm water management, the placement of storm water control measures deployed for the protect storm water, and areas of the site used for storage or support of construction activity that may affect storm water in a negative way.
5. Provide a list and description of pollutants
6. Identify and address non-storm water discharges
7. Describe how you are dealing with buffer zone requirements (if required)
8. Provide a description of control measures & pollution prevention procedures (this involves details showing how they will be installed properly)
9. Provide procedures for inspections, maintenance, and corrective action
10. Other items.

SWPPP APPROVAL PROCEDURE FOR THE CITY OF SARATOGA SPRINGS

1. PRE-DESIGN MEETING—during a pre-design meeting, a development proposal can be assessed with compliance to International Building Code, Land Development Code, City Ordinances, Development Requirements and Standards, and State and Federal requirements. City Ordinance 18.06.03 outlines the necessity for Storm Water Permits and a SWPPP Manager on a construction site. Inspectors and Capital Improvement Projects committee members can provide information regarding City requirements and standard and review procedures.

2. APPLICATION SUBMITTAL—an application is to be submitted to the Planning Department within the City, along with all the supporting documents, including plans, a SWPPP, Notice of Intent (NOI), a post construction storm water inventory and maintenance plan with maintenance agreement, and any supporting calculations.

3. PRELIMINARY REVIEW—a preliminary review of the plans and all supporting documents (including an eventual Notice of Termination, NOT form) is completed including:

    - Plans, calculations, and other information associated with Development Standards and Requirements for Water, Sewer, Storm Water, Street Lights, etc.
    - Confirmation that the SWPPP has been prepared using the State template for projects that warrant compliance with the Utah General Construction Permit (UGCP) regulation.
    - Review the SWPPP using Page 1 of the State UPDES Storm Water Inspection Evaluation Form for SWPPP Compliance.
    - Review the Post-Construction storm Water Maintenance Plan.

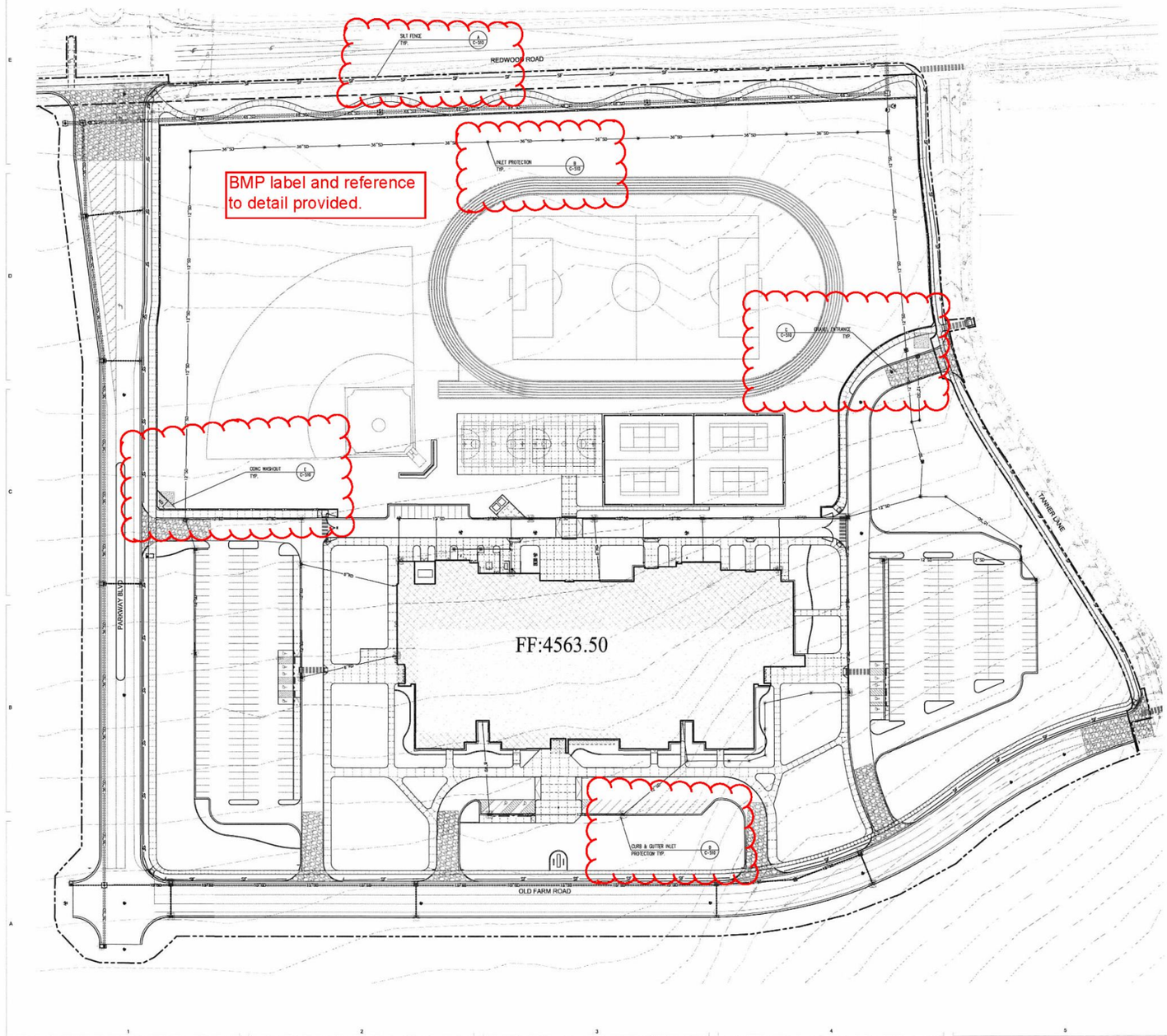
4. FOLLOW UP—review comments should be returned to the Planning Department, and a development meeting with the developer should be set-up to discuss any further questions the developer may have.

5. FINALIZATION—any further review procedures should be conducted, final plans should be submitted to the Planning Department and the Developer, and final approval should be conducted. Records of the SWPPP will be kept on file for five (5) years.

POST CONSTRUCTION BMP MAINTENANCE AGREEMENT

A post construction BMP Maintenance Agreement will be reviewed and signed to ensure future maintenance of long-term BMPs and any inspections that will take place. A record of the agreement will be kept on file.

SWPPP EXAMPLE



NOTES:

AREA AFFECTED:

1) THERE ARE ABOUT 33 ACRES WITHIN THE PROJECT BOUNDARY ALL OF WHICH WILL BE DISTURBED WITH NEW CONSTRUCTION OR CONTRACTOR STORAGE ACTIVITIES.

SEQUENCE OF CONSTRUCTION ACTIVITIES:

1) FIELD MARK LIMIT OF DISTURBANCE FOR APPROVAL BY EAGLE MOUNTAIN CITY AND OBTAIN A STORM WATER MANAGEMENT PERMIT AS NEEDED BY SARATOGA SPRINGS CITY.

2) INSTALL SILT FENCE AND/OR ENVIRONMENTAL FENCE AROUND PERIMETER OF PROJECT AS INDICATED ON THIS PLAN SHEET.

3) INSTALL SEDIMENT CONTROL MEASURES INDICATED IN ALL EXISTING STORM DRAIN INLETS ADJACENT TO THE CONSTRUCTION SITE.

4) CONTRACTOR WILL BEGIN DEMOLITION, GRADING, EXCAVATION, AND CONSTRUCTING UTILITY SITE IMPROVEMENTS. AS NEW DRAINAGE ELEMENTS ARE COMPLETED, CONSTRUCT SEDIMENT PROTECTION AT ALL NEW INLETS.

5) AREAS DISTURBED BY CONSTRUCTION ACTIVITIES WILL BE STABILIZED WITH SOD IN LANDSCAPED AREAS AND PAVEMENT IN PARKING AND DRIVEWAY AREAS. SITE STABILIZATION OF AREAS DISTURBED BY CONSTRUCTION ACTIVITIES TO BE COMPLETED WITHIN 21 DAYS OF FINISHING AN AREA TO THE FINAL LINES AND GRADES INDICATED ON THE GRADING PLAN.

6) UPON LANDSCAPE ESTABLISHMENT, REMOVE TEMPORARY MEASURE & CLEAN STORM DRAIN SYSTEM PRIOR TO RELEASE OF SYSTEM TO THE OWNER.

RUNOFF COEFFICIENTS AND DISCHARGE:

1) THE EXISTING RUNOFF COEFFICIENT FOR THE PROJECT AREA IS ESTIMATED TO BE 0.44. THE NEW RUNOFF COEFFICIENT WILL BE APPROXIMATELY 0.67 FOR THE NEW IMPROVEMENTS.

2) RUNOFF FOR THE MIDDLE SCHOOL WILL BE COLLECTED ON SITE AND DETAINED ON SITE IN ABOVE GROUND PONDS. RUNOFF IN THE NEW ROADWAYS WITHIN THE CITY ROW WILL BE NOT BE RETAINED AND DIRECTLY RELEASED INTO THE CITY STORM DRAIN.

POST CONSTRUCTION STORM WATER MANAGEMENT PRACTICES:

1) THE OWNER WILL SUBMIT POST CONSTRUCTION BEST MANAGEMENT PRACTICES TO SARATOGA SPRINGS CITY.

GENERAL STORM WATER POLLUTION CONTROL NOTES:

1) SEE C510 FOR STORM WATER POLLUTION CONTROL NOTES AND GENERAL PRACTICES.

2) ALL CONSTRUCTION PERIOD BEST MANAGEMENT PRACTICES ARE TO BE INSPECTED AND MAINTAINED AT LEAST WEEKLY, ALSO BEFORE AND AFTER EACH STORM EVENT.

3) CONTRACTOR SHALL BE REQUIRED TO KEEP RECORD OF ALL INSPECTIONS AND MAINTENANCE ON SITE WITH THE STORM WATER POLLUTION PREVENTION PLAN.

Site layout of construction period BMPs provided.

HERIDIAN ENGINEERING, INC.

0 50 100 150

SCALE 1"=60'

Instructions for silt fence BMP are properly labeled.

Technical detail of construction period BMPs.

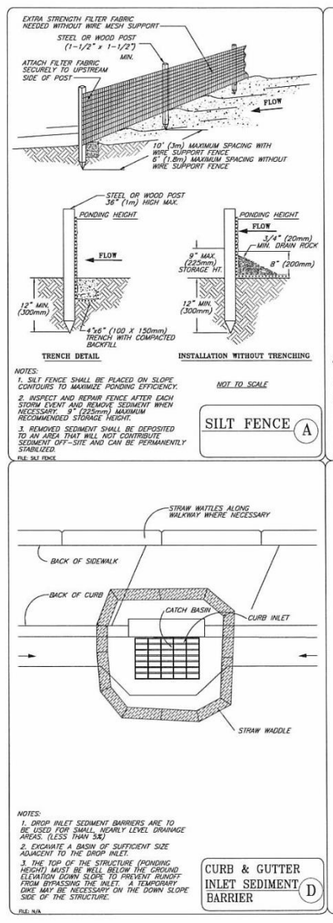
Contingency on limits of disturbance provided.

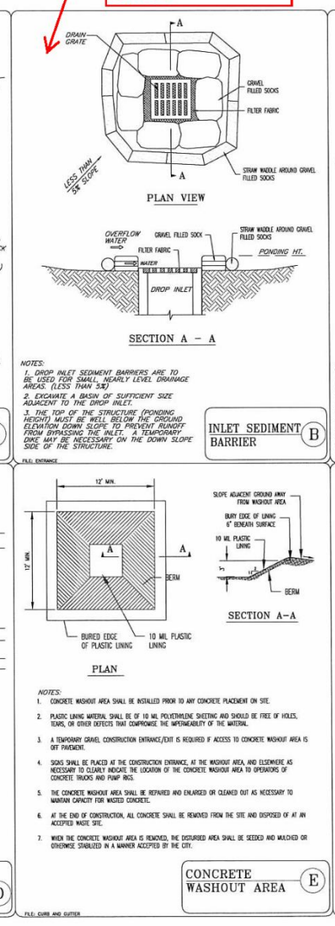
SILT FENCES, INSTALLATION OF SILT FENCES NOTE:

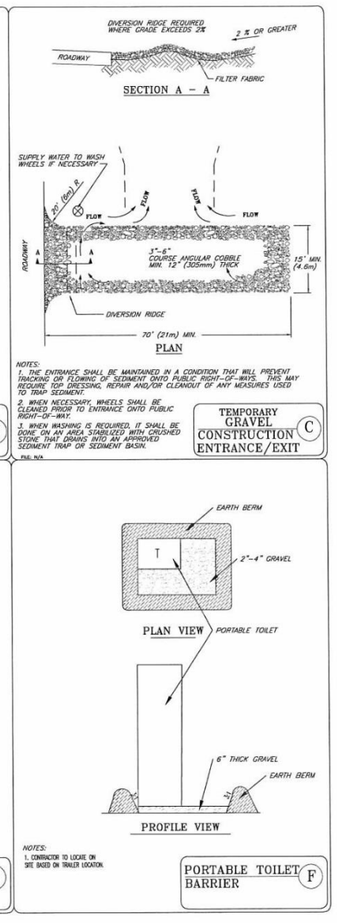
1. DIG OR TRENCH A FOUR INCH WIDE BY SIX INCH DEEP TRENCH. THE LENGTH OF THE SILT FENCE.
2. ROLL OUT SILT FENCE MATERIAL ALONG THE FRONT OF THE TRENCH SUCH THAT THE STAKES WILL BE ON THE DOWNSTREAM SIDE AND THE BOTTOM FLAP LAY IN THE TRENCH.
3. STARTING AT ONE END, DRIVE THE FIRST STAKE AT LEAST 10 INCHES INTO THE GROUND. NOTE THAT THE STAKE MUST BE DRIVEN FAR ENOUGH INTO THE GROUND SO THAT 8 – 12 INCHES OF MATERIAL REMAINS IN THE GROUND.
4. AT THE NEXT STAKE, PULL THE MATERIAL TAUT BEFORE DRIVING THE SECOND STAKE INTO THE GROUND. NOTE THAT THE STAKE MUST BE DRIVEN FAR ENOUGH INTO THE GROUND SO THAT 8 – 12 INCHES OF MATERIAL REMAINS IN THE GROUND.
5. REPEAT STEP 4 UNTIL THE STAKES ARE DRIVEN INTO THE GROUND.
6. WHEN ATTACHING TWO LENGTHS OF FENCE TOGETHER, DO THE FOLLOWING:
   - 6.1 PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE.
   - 6.2 ROTATE BOTH POSTS AT LEAST 180 DEGREES IN A CLOCKWISE DIRECTION, TO CREATE A TIGHT SEAL WITH THE FENCE MATERIAL.
   - 6.3 DRIVE BOTH POST INTO THE GROUND SO THAT 8 – 12 INCHES OF MATERIAL REMAINS IN THE GROUND.

EROSION CONTROL GENERAL NOTES:

1. AT ALL TIMES DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING AND CONTROLLING EROSION DUE TO WIND AND RUNOFF. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING THE EROSION CONTROL FACILITIES SHOWN.
2. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED DUE TO UNFORESEEN PROBLEMS OR IF THE PLAN DOES NOT FUNCTION AS INTENDED. A REPRESENTATIVE OF THE CITY PUBLIC WORKS DEPARTMENT MAY REQUIRE ADDITIONAL CONTROL DEVICES UPON INSPECTION OF PROPOSED FACILITIES.
3. ALL BEST MANAGEMENT PRACTICES AND EROSION CONTROL MEASURES ARE TO CONFORM TO THE CITY LAND DISTURBANCE DESIGN AND CONSTRUCTION STANDARDS.
4. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING THE STREETS CLEAN AND FREE FROM DEBRIS DEPOSITED BY TRAFFIC FROM THE SITE.
5. ALL STORM DRAIN FACILITIES ON SITE AND ADJACENT TO THE SITE NEED TO BE PROTECTED FROM SITE RUNOFF. INLET PROTECTION DEVICES SHALL BE INSTALLED IMMEDIATELY AS INDIVIDUAL INLETS ARE INSTALLED.
6. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE PAVED, SEEDED WITH NATIVE VEGETATION OR LANDSCAPED. REFER TO LANDSCAPE PLANS FOR SEED MIX AND PLANTING SPECIFICATIONS.
7. EROSION CONTROL STRUCTURES BELOW SODDED AREAS MAY BE REMOVED ONCE SOD AND FINAL LANDSCAPING ARE IN PLACE. EROSION CONTROL STRUCTURES BELOW SEEDED AREAS MUST REMAIN IN PLACE UNTIL THE ENTIRE AREA HAS ESTABLISHED A MATURE COVERING OF HEALTHY VEGETATION. EROSION CONTROL IN PROPOSED PAVEMENT AREAS SHALL REMAIN IN PLACE UNTIL PAVEMENT IS COMPLETE.
8. CONTRACTOR SHALL USE VEHICLE TRACKING CONTROL AT ALL LOCATIONS WHERE VEHICLES WILL ENTER OR EXIT THE SITE. CONTROL FACILITIES SHALL BE MAINTAINED WHILE CONSTRUCTION IS IN PROGRESS, MOVED WHEN NECESSARY AND REMOVED WHEN THE SITE IS PAVED.
9. ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, ETC.) SHALL BE DISPOSED OF IN A MANNER THAT PREVENTS CONTACT WITH STORM WATER DISCHARGES FROM THE SITE.
10. BLOWING DUST MUST BE CONTROLLED AT ALL TIMES. SITE WATERING SHALL BE USED TO CONTROL DUST. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION IS ABSOLUTELY PROHIBITED.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING THE EROSION CONTROL MEASURES (SILT FENCES, GRAVEL BAGS, ETC.) DUE TO GRADE CHANGES DURING THE DEVELOPMENT OF THE PROJECT.
12. ALL OFF-SITE CONSTRUCTION SHALL BE STABILIZED AT THE END OF EACH WORKING DAY. THIS INCLUDES BACKFILLING OF TRENCHES FOR UTILITY CONSTRUCTION AND PLACEMENT OF BITUMINOUS PAVING FOR ROAD CONSTRUCTION.
13. ALL MEASURES CONTAINED IN THIS PLAN SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL FINAL STABILIZATION OF THE SITE. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A RAINFALL EVENT. ANY NEEDED CLEANING AND REPAIRS SHALL BE DONE IMMEDIATELY UPON DISCOVERY.
14. ALL UTILITY LINES SHALL BE CLEANED OF DIRT AND DEBRIS PRIOR TO BEING PUT INTO SERVICE. DOWN-GRADE LINES MUST BE PROTECTED FROM WASH-WATER DURING THE CLEANING TO AVOID CONTAMINATION AND COMPROMISING OUTFALL CLEANLINESS.







UNIT OF DISTURBANCE NOTES:

1. THE LIMITS OF DISTURBANCE (L.O.D.) TO BE FIELD MARKED.
2. FIELD VERIFICATION OF AN L.O.D. BY CITY ENGINEERING.
3. PRECONSTRUCTION EROSION AND SEDIMENT CONTROL MEETING REQUIRED PRIOR TO ANY DISTURBANCE. THE REQUIRED ATTENDEES WILL BE DEVELOPER'S PROJECT MANAGER, CONSTRUCTION COMPANY'S ON SITE MANAGER.
4. MODIFICATION OF L.O.D. AS REQUIRED BY RESULTS OF PRECONSTRUCTION MEETING.
5. THE CONTRACTOR TO OBTAIN WRITTEN APPROVAL FROM THE CITY CERTIFYING THE L.O.D., DUST CONTROL, AND TREE PROTECTION HAS BEEN REVIEWED AND APPROVED PRIOR TO WORK BEGINNING

CONSTRUCTION PERIOD BEST MANAGEMENT PRACTICES NOTES:

1. CONTRACTOR WILL PERFORM EARTHWORK IN ACCORDANCE WITH THE CITY STANDARD SPECIFICATIONS, CITY EROSION, SEDIMENT, REVEGETATION REQUIREMENTS AND THE DUST CONTROL PLAN AS REQUIRED BY THE STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL DIVISION OF AIR QUALITY.
2. THE CONTRACTOR WILL PERFORM EARTHWORK IN ACCORDANCE WITH THE PROJECT EARTHWORK SPECIFICATIONS AND THE EARTHWORK RECOMMENDATIONS FOUND IN THE GEOTECHNICAL INVESTIGATION REPORT PREPARED FOR THIS PROJECT. IN THE EVENT THAT THERE IS A CONFLICT BETWEEN THE DOCUMENTS MENTIONED (NOTE 2) AND THE CITY'S EROSION AND SEDIMENT CONTROL REQUIREMENTS OR THE DUST CONTROL PLAN AS REQUIRED BY THE STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL DIVISION OF AIR QUALITY, THE CITY'S REQUIREMENTS AND THE STATE REQUIREMENTS WILL CONTROL.
3. L.O.D. BARRIERS WILL BE PROPERLY INSTALLED PRIOR TO ANY DISTURBANCE. L.O.D. BARRIERS ARE DEFINED AS SILT FENCE AND ENVIRONMENTAL FENCE.
4. INSTALL SILT FENCE ON ALL DOWNHILL SIDE OF L.O.D. SEE DETAIL AND SILT FENCE NOTES FOR CORRECT INSTALLATION PROCEDURE.
5. ENVIRONMENTAL FENCES ARE TO BE INSTALLED ON ALL UPHILL SIDE OF L.O.D.
6. THE L.O.D. SILT FENCE BARRIERS DO NOT REPLACE OR FUNCTION AS SEDIMENTATION B.M.P.S. ADDITIONAL SEDIMENT (BEST MANAGEMENT PRACTICES) BMPS WILL BE REQUIRED AS SHOWN ON THE PLANS OR AS REQUIRED BY THE CITY THROUGHOUT THE PROJECT AS UNFORESEEN SITUATIONS OCCUR.
7. WITHIN THE SAME WORKING DAY SOIL IS DISTURBED ALL SEDIMENT CONTROL B.M.P.S. WILL BE INSTALLED. AN EXAMPLE OF SEDIMENT CONTROL BMP IS A SILT FENCE OR A TEMPORARY SEDIMENTATION BASIN. EXISTING VEGETATION WILL NOT BE BURIED. THE METHOD OF DISPOSAL WILL BE SUBMITTED AND APPROVED BY THE CITY.
8. INSTALL ALL SEDIMENTATION BMPS AS SHOWN ON PLANS AND AS DIRECTED BY THE CITY
9. DUST CONTROL MEASURES WILL BE ON SITE AND IN WORKING ORDER WHEN SOIL IS DISTURBED. DUST CONTROL WILL BE USED 24 HOURS SEVEN DAYS PER WEEK UNTIL SOIL IS RESEEDED AND PROTECTED. WATER USED TO CONTROL DUST WILL CONTAIN CALCIUM CHLORIDE OR SIMILAR ADDITIVE. THE DUST CONTROL PLAN AS REQUIRED BY THE STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL DIVISION OF AIR QUALITY DOES NOT REPLACE THE CALCIUM CHLORIDE REQUIREMENT.
10. INSTALL IMPROVEMENTS AS SHOWN ON THE APPROVED CONSTRUCTION PLANS.
11. ALL DISTURBED SOIL WILL BE MADE STABLE AS WITHIN 21 DAYS OF DISTURBANCE.
12. TEMPORARY AND PERMANENT SEDIMENT BEST MANAGEMENT PRACTICES WILL REMAIN FUNCTIONAL AT ALL TIMES THROUGH THE ENTIRE PROJECT AND UNTIL ALL DISTURBED SOIL HAS BEEN STABILIZED TO PREVENT EROSION. WRITTEN APPROVAL MUST BE OBTAINED FROM THE CITY CERTIFYING ALL DISTURBED SOIL IS STABLE IS REQUIRED BEFORE ABANDONING SEDIMENTATION BEST MANAGEMENT PRACTICES.
13. IF THE EXISTING GRADES ARE DIFFERENT THAN WHAT IS SHOWN ON THE GRADING PLAN, STOP WORK AND NOTIFY THE CITY.
14. IF THE PROJECT REQUIRES EXPORT OR IMPORT MATERIAL TO ACHIEVE A BALANCED SITE. THE CONTRACTOR IS TO KEEP OFFSITE ROADS CLEAN AT ALL TIMES. FAILURE TO KEEP STREETS CLEAN WILL RESULT IN A MANDATORY WORK STOP ORDER BEING ISSUED ON THE IMPORT/EXPORT OPERATION.
15. THE PROJECT CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL PAVED STREETS ADJACENT TO OR ABUTTING THE GRADING PROJECT CLEAN AND FREE OF DIRT, MUD, AND DEBRIS AT ALL TIMES. WHEREAS THIS IS PUBLIC HEALTH AND SAFETY ISSUE, FAILURE TO COMPLY WILL RESULT IN A MANDATORY WORK STOP ORDER BEING ISSUED OVER THE ENTIRE PROJECT, INCLUDING COMMERCIAL AND RESIDENTIAL CONSTRUCTION PROJECTS.
16. THE CONTRACTOR WILL PROVIDE ADDITIONAL TEMPORARY EROSION CONTROL PLANS, AND PERMITS AS REQUIRED BY THE CITY, THE COUNTY AND THE STATE OF UTAH AS REQUIRED THROUGHOUT THE DURATION OF THE PROJECT.
17. FAILURE TO FOLLOW THE SEQUENCE OF CONSTRUCTION SHALL RESULT IN THE ISSUANCE OF WORK STOP ORDER BEING ISSUED.
18. CONCRETE TRUCKS TO USE PRE-ASSIGNED WASH OUT AREA. CONCRETE TRUCKS ARE NOT TO BE CLEANED OUT OR WASHED DOWN IN THE PUBLIC RIGHT-OF-WAY.
19. PORTABLE TOILETS TO BE LOCATED ADJACENT TO CONTRACTOR TRAILER. TOILETS SHALL BE MAINTAINED BY CONTRACTOR.
20. CONSTRUCTION WASTE BIN TO BE LOCATED NEAR CONTRACTOR TRAILER. ALL CONSTRUCTION WASTE TO BE PLACED IN WASTE BIN.
21. ALL CONSTRUCTION PERIOD BEST MANAGEMENT PRACTICES (BMPS) ARE TO BE INSPECTED AND MAINTAINED AT LEAST WEEKLY, ALSO BEFORE AND AFTER EACH STORM EVENT.
22. CONTRACTOR SHALL BE REQUIRED TO KEEP A RECORD OF ALL INSPECTIONS AND MAINTENANCE ON SITE WITH THE STORM WATER POLLUTION PREVENTION PLAN.

Erosion Control notes are provided.

CONSTRUCTION PERIOD BEST MANAGEMENT PRACTICES

Notes on construction period BMPs provided.

STORM WATER SYSTEM COVENANT FOR POST CONSTRUCTION LONG-TERM BMP'S

WHEN RECORDED RETURN TO
CITY OF SARATOGA SPRINGS CITY RECORDER
1307 N COMMERCE DR, SUITE 200
SARATOGA SPRINGS, UTAH 84045 Tax Id. No._____

STORM WATER SYSTEM COVENANT

The undersigned _____ herein after referred to as Owner(s) of Lot ___ of _____ Subdivision, and the storm water system within said subdivision (the "Subject Property") located in Saratoga Springs, State of Utah.

In consideration for approval by the City of Saratoga Springs (the City) of a land development project on the Subject Property, the Owner(s), do hereby agree to be responsible for the storm water system on said Subject Property, described herein.

This storm water system location situated in the County of Utah, State of Utah, and more particularly described as follows:

As Described by Exhibit A

Furthermore, and in consideration for approval by the City, Owner(s), hereby agree(s) to construct the storm water system attached hereto as Exhibit "B"

Furthermore, the undersigned Owner(s) of the Subject Property, covenant and agree to the following:

1. To maintain, preserve and protect said storm water system, particularly storm water conveyance and detention areas, as it was intended for the purpose of flood control.
2. To ensure that said system shall not be modified from the design originally approved by the City without the City's approval.
3. That the City may enforce the terms of this covenant by requiring any Owner(s) of said Lot ___ of Subject Property to specifically perform the conditions of this covenant.
4. To reimburse all legal and attorney costs the City incurs in the event that the City pursues legal action to enforce this covenant.

5. To indemnify, defend, and hold the City harmless from any liability associated with said system.

Finally, the undersigned Owner(s), of the Subject Property, hereby agree that the City, its officers, employees, agents, representatives, contractors and assigns shall have the right of ingress to and egress on the above described property to inspect, measure, and sample said storm water system for such purpose to verify maintenance, preservation and the protection of said storm water system.

This covenant and agreement shall run with the land and shall be binding upon ourselves, any future owners, encumbrancers, their successors, heirs, or assignees, and shall continue in effect so long as the Subject Property is found to contain buildings and roads in support of the intended use, regardless of whether the property is occupied.

SO AGREED this _____day of _____20_____.

PROPERTY OWNER(S)

By:_____ Title: _____

By:_____ Title: _____

STATE OF)

) ss.

COUNTY OF UTAH)

The above instrument was acknowledged before me by _____, this _____ day of _____, 20_____.

_____

Notary Public

Residing in: _____

My commission expires: _____

1.5 - Training

Following the completion of the 2019 version of the Storm Water Management Plan, the plan will be distributed to different City departments to review, and to become familiar with so that if there are any questions, they can be addressed. Training will be tracked internally.

1.6 - Storm Water Coalition

The City has formed a coalition with two environmental agencies in the community. These agencies are the Utah County Storm Water Coalition, and the Utah Lake Commission.

List of Environmental Stewardships with City of Saratoga Springs

Stewardship	Website	Address	Contact Information
Utah County Stormwater Coalition (partner)	https://www.utahcounty.gov/Dept/PubWrks/StormWaterCoalition.asp	2855 South State Street Provo, Utah 84606	801-851-8600 801-851-8612 (fax
Jordan River Commission	https://jordanrivercommission.com/	PO Box 526081	801-536-4158
Utah Lake Commission (partner)	http://utahlakecommission.org/	51 S University Ave # 109, Provo, UT 84601	801-851-2900
Utah Clean Water Partners	https://www.utahcleanwater.org/		
Department of Environmental Quality (UDEQ)	https://deq.utah.gov/	195 North 1950 West, Salt Lake City, UT 84114	801-536-4400
Division of Water Quality (DWQ)	https://deq.utah.gov/	Multi Agency State Office Building 195 North 1950 West, DEQ Third Floor	801-536-4400
Utah Valley Earth Forum	http://uvef.org/UVEF.html	2608 E Canyon Crest DR Spanish Fork UT 84660	801-798-2888
Action Utah	http://actionutah.org/	PO Box 521855	801-613-2439
Utah Storm Water Advisory Committee (USWAC)	https://uswac.org/		

General Public (UPDES 4.2.1.2)	*City Web Page*	*City News Letter*	*Brochures*	*Engineering & Development Standards*	*Training*	*Storm Water Coalition*
• **Proper Maintenance of Septic Systems**	x		x			
• **Effects of Outdoor Activities such as Lawn Care (use of pesticides, herbicides, fertilizer)**	x	x	x			x
• **Effects of Automotive Work and Car Washing on Water Quality**	x	x	x			x
• **Proper Disposal of Swimming Pool Water**	x	x	x			x
• **Proper Management of Pet Waste**	x	x	X			x
• **Benefits of Onsite Infiltration**	X					

Businesses, Institutions, and Commercial Facilities (UPDES 4.2.1.3)	*City Web Page*	*City News Letter*	*Brochures*	*Engineering & Development Standards*	*Training*	*Storm Water Coalition*
• **Proper lawn maintenance (use of pesticides, herbicides and fertilizers)**	x	x	x			x
• **Building and equipment maintenance (proper management of waste water)**			x			
• **Use of salt or other deicing materials (cover/prevent runoff to storm system and contamination to ground water)**		x	x			
• **Proper storage of materials (emphasizing pollution prevention)**	x	x	x			
• **Proper Management of waste materials and dumpsters (cover and pollution prevention)**		x	x			

• **Proper management of parking lot surfaces (sweeping)**				x			
• **Benefits of Onsite Infiltration**		X			X		x

Engineers, Developers, Contractors, Land Planners (UPDES 4.2.1.4)	***City Web Page***	***City News Letter***	***Brochures***	***Engineering & Development Standards***	***Training***	***Storm Water Coalition***
• **Instructions for Development of Storm Water Pollution Prevention Plan (SWPPP)**				x	x	
• **Best Management Practices (BMP) for Reducing Adverse Impacts of Storm Water Runoff. Information will be given with site plan and preliminary plan.**	x			x		
• **Post-Construction Controls – permit at business**				x		

City Staff (UPDES 4.2.1.5)	***City Web Page***	***City News Letter***	***Brochures***	***Engineering & Development Standards***	***Training***	***Storm Water Coalition***
• **Equipment Inspection to Ensure Timely Maintenance**					x	
• **Proper Storage of industrial materials (emphasizing pollution prevention)**					x	
• **Proper management and disposal of wastes**			x		x	
• **Proper management of dumpsters**		x	x		x	

• **Minimization of use of salt and other de-icing materials (cover/prevent runoff to MS4 and ground water contamination)**			x	x		x
• **Proper maintenance of parking lot surfaces (sweeping)**				x		x

MS4 Engineers, Development and Plan Review Staff, and Land Use Planners (UPDES 4.2.1.6)	***City Web Page***	***City News Letter***	***Brochures***	***Engineering & Development Standards***	***Training***	***Storm Water Coalition***
• **Low Impact Development (LID) practices**	x			x	x	
• **Green Infrastructure practices**	x			x	x	
• **Communicate specific requirements for post-construction control and the associated Best Management Practices (BMPs) chosen with the SWMP**	x			x	x	

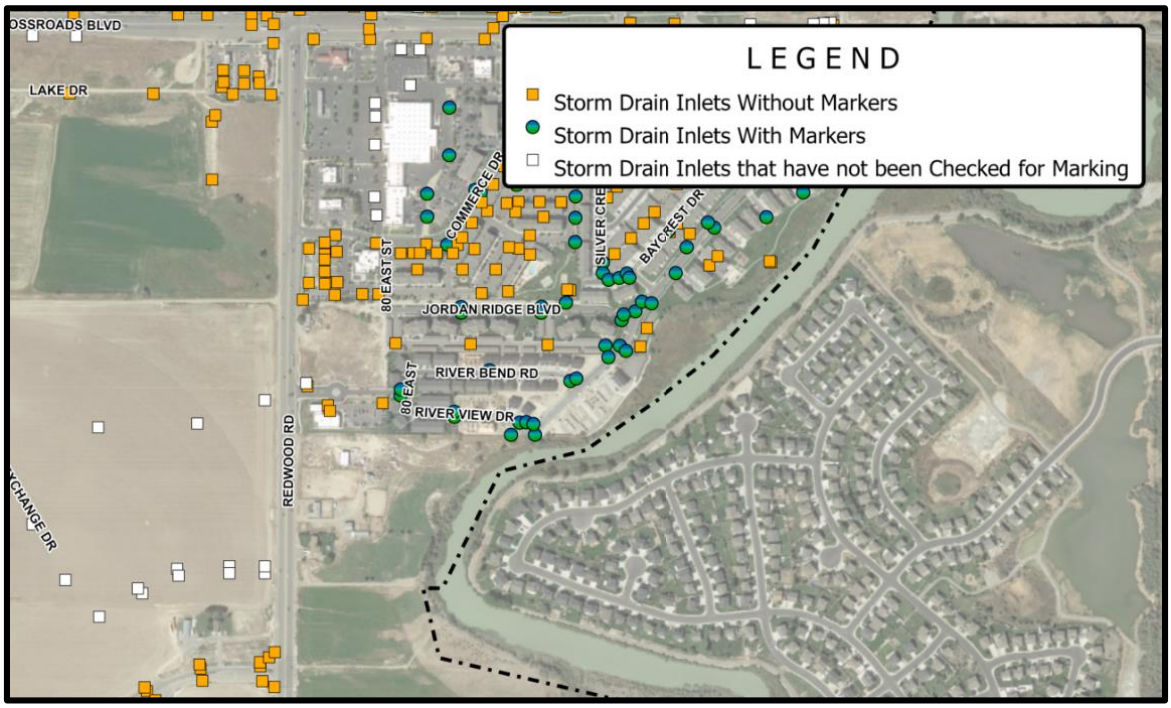
Section 2

2.1 – Public Notice, Hearing, and Ordinance

The City completed all required state and local public notice requirements. The public had time to review and comment on the SWMP. City Code can be found at https://www.saratogaspringscity.com/491/City-Code and adoption documentation is available upon request.

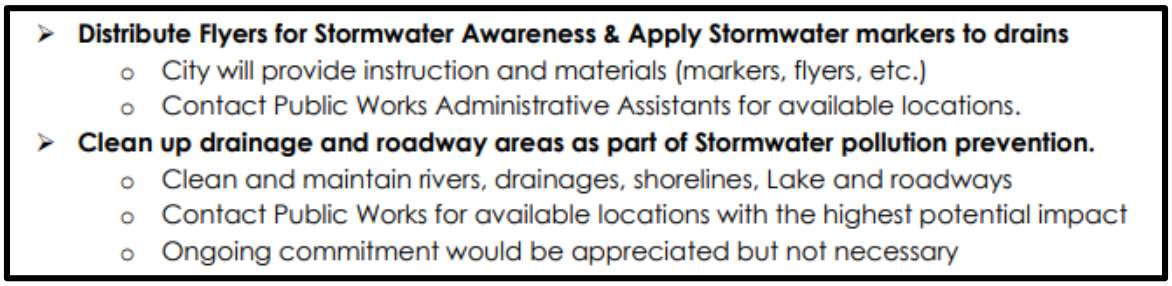
2.2 - Storm Drain Marking

The City uses a GIS mapping system to track the number of storm drains that have been marked by volunteers in the community. The map is updated on a regular basis, and scout groups and other volunteers give of their time regularly to help with storm drain marking. Below is a screenshot of the GIS mapping that is tracked. Tracking maps of the entire City are available upon request. Tracking history, including documentation from all storm drain marking projects, is available upon request.



2.3 – Stream/Roadway Cleanup

The City provides opportunities for volunteer groups to participate in stream and/or roadway cleanup. The opportunity (as well as the storm drain marking volunteer opportunity) has been posted on the City's website. A screenshot of the flyer is posted below.

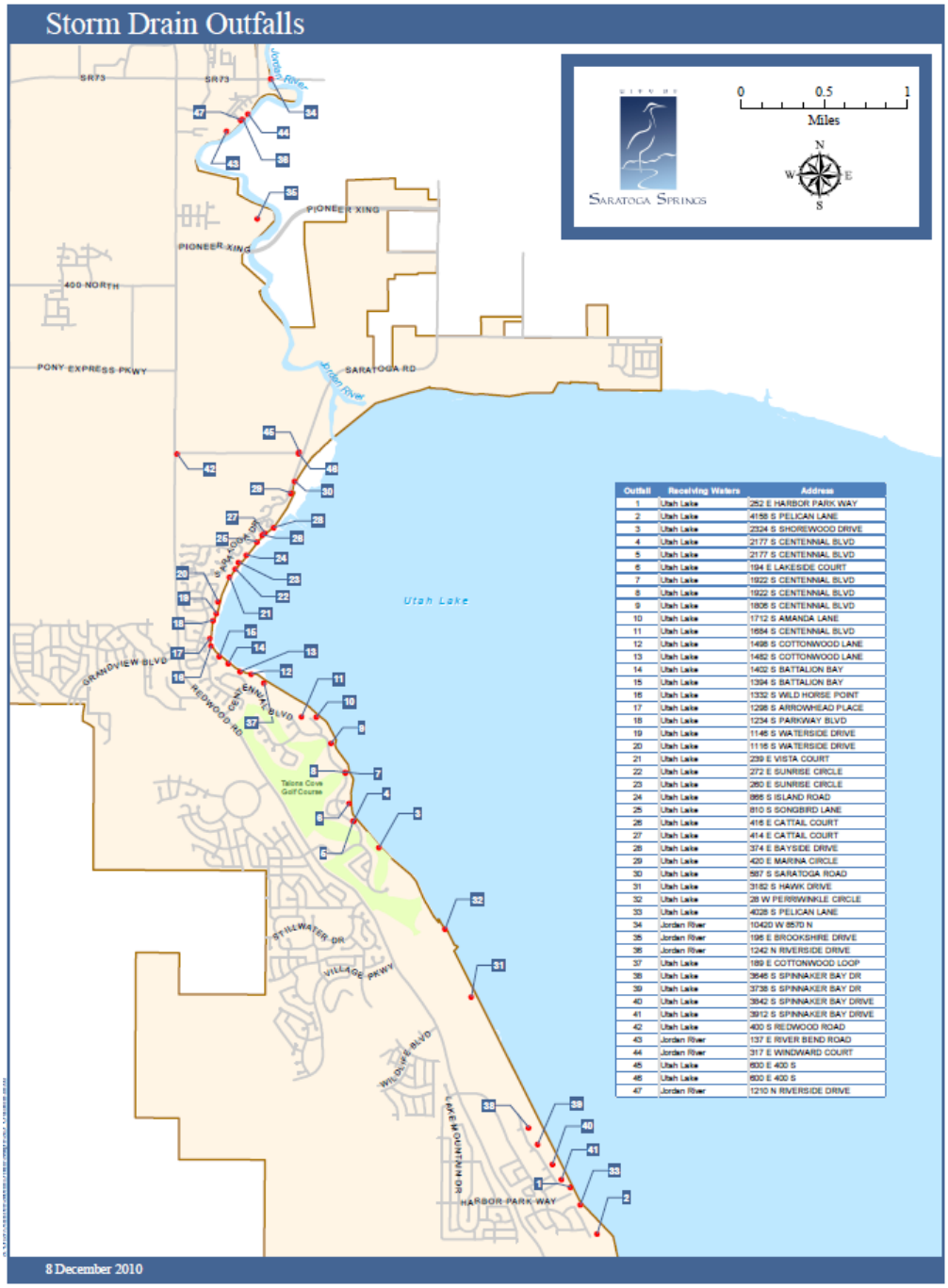


- **Distribute Flyers for Stormwater Awareness & Apply Stormwater markers to drains**
  - City will provide instruction and materials (markers, flyers, etc.)
  - Contact Public Works Administrative Assistants for available locations.
- **Clean up drainage and roadway areas as part of Stormwater pollution prevention.**
  - Clean and maintain rivers, drainages, shorelines, Lake and roadways
  - Contact Public Works for available locations with the highest potential impact
  - Ongoing commitment would be appreciated but not necessary

Section 3

3.1 – Storm Drain Outfall Map

The Storm Drain Outfall Map PDF was last updated in 2019. The PDF is updated following the completion of each Capital Facilities Plan. A live version of the storm drain system, including outfall locations, is always available on the City's GIS page which can be found at https://ssgis.maps.arcgis.com/home/index.html



Outfall	Receiving Waters	Address
1	Utah Lake	252 E HARBOR PARK WAY
2	Utah Lake	4158 S PELICAN LANE
3	Utah Lake	2324 S SHOREWOOD DRIVE
4	Utah Lake	2177 S CENTENNIAL BLVD
5	Utah Lake	2177 S CENTENNIAL BLVD
6	Utah Lake	194 E LAKESIDE COURT
7	Utah Lake	1922 S CENTENNIAL BLVD
8	Utah Lake	1922 S CENTENNIAL BLVD
9	Utah Lake	1806 S CENTENNIAL BLVD
10	Utah Lake	1712 S AMANDA LANE
11	Utah Lake	1684 S CENTENNIAL BLVD
12	Utah Lake	1498 S COTTONWOOD LANE
13	Utah Lake	1482 S COTTONWOOD LANE
14	Utah Lake	1402 S BATTALION BAY
15	Utah Lake	1394 S BATTALION BAY
16	Utah Lake	1332 S WILD HORSE POINT
17	Utah Lake	1298 S ARROWHEAD PLACE
18	Utah Lake	1234 S PARKWAY BLVD
19	Utah Lake	1146 S WATERSIDE DRIVE
20	Utah Lake	1116 S WATERSIDE DRIVE
21	Utah Lake	239 E VISTA COURT
22	Utah Lake	272 E SUNRISE CIRCLE
23	Utah Lake	260 E SUNRISE CIRCLE
24	Utah Lake	868 S ISLAND ROAD
25	Utah Lake	810 S SONGBIRD LANE
26	Utah Lake	416 E CATTAIL COURT
27	Utah Lake	414 E CATTAIL COURT
28	Utah Lake	374 E BAYSIDE DRIVE
29	Utah Lake	420 E MARINA CIRCLE
30	Utah Lake	587 S SARATOGA ROAD
31	Utah Lake	3182 S HAWK DRIVE
32	Utah Lake	28 W PERRIWINKLE CIRCLE
33	Utah Lake	4028 S PELICAN LANE
34	Jordan River	10420 W 8570 N
35	Jordan River	196 E BROOKSHIRE DRIVE
36	Jordan River	1242 N RIVERSIDE DRIVE
37	Utah Lake	189 E COTTONWOOD LOOP
38	Utah Lake	3546 S SPINNAKER BAY DR
39	Utah Lake	3736 S SPINNAKER BAY DR
40	Utah Lake	3842 S SPINNAKER BAY DRIVE
41	Utah Lake	3912 S SPINNAKER BAY DRIVE
42	Utah Lake	400 S REDWOOD ROAD
43	Jordan River	137 E RIVER BEND ROAD
44	Jordan River	317 E WINDWARD COURT
45	Utah Lake	600 E 400 S
46	Utah Lake	600 E 400 S
47	Jordan River	1210 N RIVERSIDE DRIVE

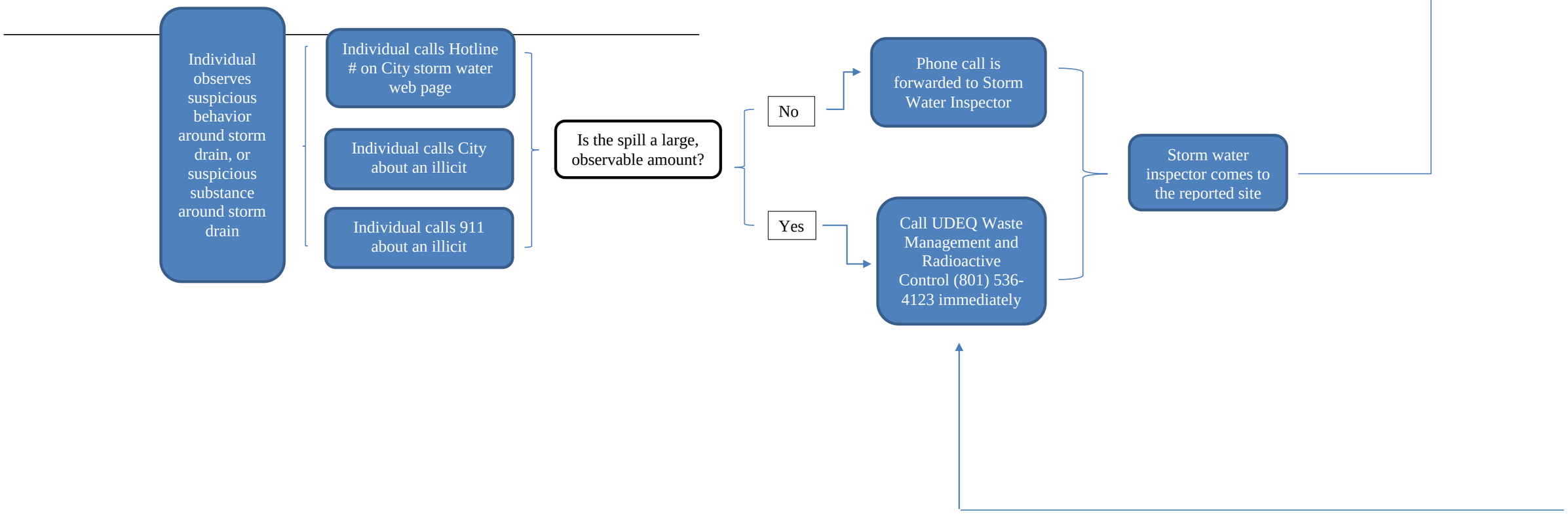
3.2 – City Ordinance

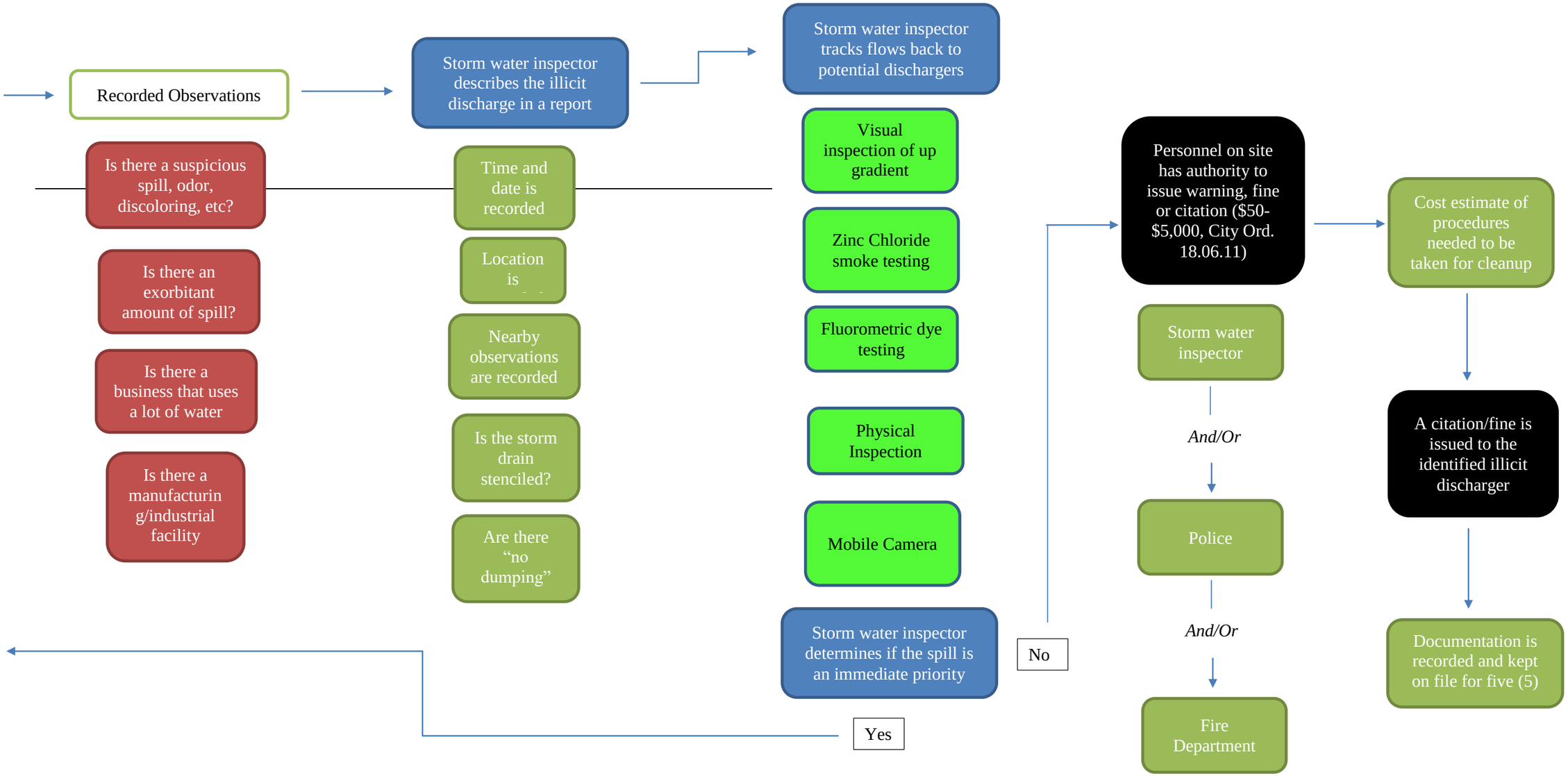
City Ordinance 18.06.08 (See Appendix) lists the grounds for which illicit discharges are to be documented, recorded, and tracked to locate and track incidents of illicit discharge.

3.3 - Illicit Dumping / Spill Response Procedure

The City's internal flowchart for responding to public referrals of illicit discharges. It includes the various responsible agencies. This flowchart is shown on the following pages. Additional contact information can be found on the City's website.

Illicit Dumping/Spill Response Procedure




Recorded Observations
Storm water inspector describes the illicit discharge in a report
Storm water inspector tracks flows back to potential dischargers
Is there a suspicious spill, odor, discoloring, etc?
Is there an exorbitant amount of spill?
Is there a business that uses a lot of water
Is there a manufacturing/industrial facility
Time and date is recorded
Location is
Nearby observations are recorded
Is the storm drain stenciled?
Are there "no dumping"
Visual inspection of up gradient
Zinc Chloride smoke testing
Fluorometric dye testing
Physical Inspection
Mobile Camera
Storm water inspector determines if the spill is an immediate priority
No
Yes
Personnel on site has authority to issue warning, fine or citation ($50-$5,000, City Ord. 18.06.11)
Storm water inspector
And/Or
Police
And/Or
Fire Department
Cost estimate of procedures needed to be taken for cleanup
A citation/fine is issued to the identified illicit discharger
Documentation is recorded and kept on file for five (5)

3.4 – SOP: Tracing the Source of an Illicit Discharge

SOP: TRACING THE SOURCE OF AN ILLICIT DISCHARGE

PURPOSE: Illicit discharges pose a threat to the storm water conveyance system and to the receiving water bodies of storm water discharge. Though storm water filtration systems may separate oil from water before discharging to receiving waters, some separation devices may not be equipped to handle chemical or fuel discharges. Tracing the source of an illicit discharge is the first line of defense in preventing a pollution hazard to sensitive water bodies and surrounding areas.

PRIORITY: Some areas within the City may be more susceptible to illicit discharge than others, e.g. businesses that use a lot of water, manufacturing plants with high amounts of effluent, or residential areas where residents are not informed about the hazards of illicit discharge. As illicit discharges occur, record will be kept of where these discharges occur, by whom, and the circumstances wherein they occur.

PLAN: By having a map of the storm water conveyance system and outfall locations, the storm water coordinator, or any other personnel that appear on site to respond to an illicit discharge call, will be able to confront the discharger and/or trace the illicit discharge to its source. Training will be provided to City employees to properly trace the source of an illicit discharge.

ACTION:

1. IDENTIFY THE ILLICIT DISCHARGE

When called to the reported site of an illicit discharge, the first step is to make your way to the source of the discharge, and start making judgments of the contaminated area. Some discharges are obvious, while others may be subtle, but following a standard process helps to quickly identify what environmental threat is, and what action should be taken to contain it.

Upon arriving to the site, have an idea of the drainage network of the area. If observing contamination in a particular outfall, check the upstream outfall to observe if an illicit discharger is there. If the discharge seems more complex, more effective methods will be needed to trace the source discharge. Nevertheless, note the contaminated outfall for any obvious discharge, such as dumping (concrete washout, vacuumed debris, etc.), oil, solvent, or chemicals, wash water or suds, or sewage. Additionally note any abnormal characteristics at the outfall, including:

- An unnatural odor, such as sulfide (rotten eggs), natural gas, sewage, a rancid or sour smell, or petroleum or other smell.
- Abnormal appearance, such as an oil sheen, cloudiness (turbidity), suds, or a "normal" appearance.
- Floatables, such as sewage (toilet paper, etc.), algae, dead fish, or other floatables.

Any combination of these could lead you to a conclusion about how the outfall has been contaminated. Remember only storm water should be entering the storm drain.

2. TRACE THE STORM WATER NETWORK TO THE SOURCE

If the discharge is more complex than anticipated, alternative methods may be used to determine the drain pattern of the system, and any possibly openings in the storm drain system contributing to contamination.

Several methods of identifying possible discharge include:

- Zinc Chloride Smoke Testing—a smoke discharge is placed in the storm drain system, and any openings within the system are identified by ventilating smoke throughout the network.
- Fluorometric dye testing—a dye is added to the storm drain flow, and the reaction of the dye to the water predicts possible types of contaminant.
- Mobile cameras—inspecting the contaminants of the system more closely using a camera.
- Analyzing water samples—performing tests on the water to determine what it is contaminated with.

Once the source has been identified, it is easier to make judgments about who or what the possible discharger is, and how the discharge or discharger can be detained.

3. PREVENT FURTHER CONTAMINATION

When a contaminant source has been identified, the discharge should be halted immediately. If the discharge is significant, it may be necessary to plug flows by inserting sand bags or other plugging devices. Removal of the entered contaminate should commence immediately, using a vacuum truck or other removal device. If needed, a third-party environmental cleanup crew should be dispatched.

3.5 – Characterizing the Nature of an Illicit Discharge

- SOP: CHARACTERIZING THE NATURE OF AN ILLICIT DISCHARGE

PURPOSE: When an illicit discharge has been identified, it is necessary to take the proper steps to document the discharge, including the location of the discharge, the suspected or actual violator, and a description of the discharge. Characterizing the nature of an illicit discharge will help to prevent future occurrences and incidents.

PRIORITY: Illicit discharge may be an intentional action, such as when a business or manufacturer intentionally discharges waste water to avoid fees associated with proper disposal, or it may be unintentional, such as when a resident does not know City Ordinances surrounding the implications of an illicit discharge. In either case, it is necessary to document the nature of the discharge, and educate the resident or business on the seriousness of illicit discharge, and the proper wastewater disposal procedures.

PLAN: An Illicit Discharge Detection and Elimination (IDDE) Inspection Report has been provided to correctly document the observations of an illicit discharge, and procedures for containment have been provided in this SOP. Training on the characterization of an illicit discharge will be given to City employees and these procedures will be available in the event of a discharge.

ACTION:

1. NOTIFY THE PROPER CORRESPONDENTS OF AN ILLICIT DISCHARGE

When a call comes through to the City, or to the storm water coordinator, one of the questions asked of the caller is whether the discharge is of an exorbitant amount (greater than or equal to at least 10 gallons of discharge), or if it is a minor discharge that needs to be inspected. Depending on the severity of the illicit discharge, authorities may need to cite the discharger, and a third-party clean up may need to come to remove the pollutant material. If a large amount of pollutant has been discharged into the storm drain, the Utah Division of Waste Management and Radiation Control hotline should be called at (801) 536-4123.

2. CONTAIN THE DISCHARGE

Once the discharge source has been identified, it is necessary to disconnect the source from the storm drain, and perform any corrective actions that may be needed. The type of correction may be specific to the discharge that has occurred to the storm drain network, but may be of any of these variety:

1. Service lateral disconnection, reconnection—Lateral is connected to the wrong line; *needs to be disconnected and reconnected to correct line*.
2. Cleaning—Line needs to be cleaned; *use flushing (high pressure water stream through the line) or pigging (pulling a large rubber pig through the line)*.
3. Excavation and replacement—Line is collapsed, severely blocked, misaligned, or undersized; *existing pipe needs to be removed, new pipe needs to be placed with correct alignment*.

4. Manhole repair—flow needs to be prevented from infiltrating groundwater; *grout, mortar, or shotcrete needs to be applied inside walls, or new precast manhole installed*.
5. Corrosion control coating—pipe is corroded or corroding; *spray or brush on coating needs to be applied to interior of pipe*.
6. Grouting—Seal on joints are leaking, or small cracks are occurring; *joints and small cracks sealed with grout*.
7. Pipe bursting—Line is collapsed, severely blocked, or undersized; *new pipe is hydraulically inserted, guided by existing pipe and existing pipe is pushed out radially by pipe burst device*.
8. Slip lining—Pipe has numerous cracks and/or leaking joints but is continuous and not misaligned; *slip lining pulls new pipe through the old one*.
9. Fold and formed pipe—Pipe has numerous cracks and leaking joints; *a folded thermoplastic pipe is inserted into existing pipe and rounded to conform to the existing pipe*.
10. Inversion lining—Pipe has numerous cracks or leaking joints or misalignments; *a soft resin impregnated felt tube is inserted into the pipe, inverted by filling it with air or water at one end, and cured in place*.

3. FILE AN INVESTIGATION REPORT

Accurate and consistent documentation helps to prevent illicit discharges into the storm drain by identifying repeat dischargers, problem areas, or areas with a high hazard of discharge (such as near an industrial or manufacturing facility, or construction site). An IDDE inspection report should be filled out, and information entered into a spreadsheet to look for local trends in pollutant discharge so that further action can be taken to discontinue the illicit discharges.

Illicit Discharge Detection
Elimination (IDDE) Inspection Report

Responder Information	
Call taken by:	Call date:
Call time:	Precipitation (inches) in past 24-48 hrs:
Reporter Information	
Incident time:	Incident date:
Caller contact information *(optional*):	

Incident Location			
Nearest address to illicit discharge:			
Location description:			
Outfall description:			
Description of surrounding area: ☐ Residential ☐ Industrial ☐ Rural ☐ Other:			
Primary Location Description	**Secondary Location Description:**		
☐ Stream corridor *(In or adjacent to stream)*	☐ Outfall	☐ In-stream flow	☐ Along banks
☐ Upland area *(Land not adjacent to stream)*	☐ Near storm drain	☐ Near other water source (storm water pond, wetland, lake, river, etc.)	
Narrative description of location:			

Upland Problem Indicator Description		
☐ Dumping	☐ Oil/solvents/chemicals	☐ Sewage
☐ Wash water, suds, etc.	☐ Other: _____	

Stream Corridor Problem Indicator Description				
Odor	☐ None	☐ Sewage	☐ Rancid/Sour	☐ Petroleum (gas)
	☐ Sulfide (rotten eggs); natural gas	☐ Other: Describe in "Narrative" section		
Appearance	☐ "Normal"	☐ Oil Sheen	☐ Cloudy	☐ Suds
	☐ Other: Describe in "Narrative" section			
Floatables	☐ None:	☐ Sewage (toilet paper, etc.)	☐ Algae	☐ Dead fish
	☐ Other: Describe in "Narrative" section			
Narrative description of problem indicators:				
Suspected Violator (name, personal or vehicle description, license plate #, etc.)				

Origin of Flow

Flow Tracing Method	☐ Zinc Chloride testing	☐ Fluorometric dye testing
	☐ Physical inspection	☐ Mobile Camera
	☐ Other: _____	

Removal Method/Enforcement Action

Date of Removal:	
Prescribed Removal Method for Discharge and/or repairs to storm water structure:	
Responsible party: ☐ Municipality ☐ Private Property Owner	Action taken: ☐ Warning ☐ Fine (Include amount) ☐ Issued Violation

Investigation Notes

Initial investigation date:	**Investigators:**
☐ No investigation made	Reason:
☐ Referred to different department/agency:	Department/Agency:
☐ Investigated: No action necessary:	
☐ Investigated: Requires action	Description of actions:
Hours between call and investigation:	Hours to close incident:
Date case closed:	
Notes:	

I certify that the above IDDE inspection report findings are true *(Signatures required)*

- **IDDE inspection Conducted by:** (UT-LTAP Registered Storm Water Inspector)

_____	_____	**/ /** _____	_____
UTLTAP Cert. RSI Name (Print)	*UT RSI Cert. ID#*	*Expiration Date*	*Signature*

3.6 – Ceasing Illicit Discharge and Prevention

SOP: CEASING ILLICIT DISCHARGE AND PREVENTION

PURPOSE: When an illicit discharge has been identified and characterized, actions to prevent future occurrences will be necessary. Assessing the extent of the damage will help to determine what steps are necessary to clean up the spill, and compensation to repair and reverse the discharge.

PRIORITY: The respondent on site will assess the damage of an illicit discharge and file a report for the illicit discharge, in addition to a fine or citation to prevent further occurrences.

PLAN: City Ordinance 18.06.11 has been created to characterize the enforcement procedures associated with an illicit discharge. A respondent has the authority to issue a citation or fine.

ACTION:

1. ASSESS THE DAMAGE

When an illicit discharge is discovered it is necessary to make a quick assessment of the damage that has occurred to the storm drain system. This may include contamination that has already infiltrated the storm drain network, ecological effects of the pollution, infrastructure that needs to be repaired or replaced, and any tests or public notification that may immediately follow the pollutant discovery. Follow up inspections may be required to ensure compliance with remediation procedures.

2. IDENTIFY THE RESPONSIBLE PARTY

When an illicit discharger has been identified, they are immediately responsible for the damage that has been done to the storm water network. City Ordinances 18.06.08 to 18.06.11 specifically outline the provisions and authority for identifying illicit discharges, inspecting, enforcing provisions, and penalties involved with illicit discharge. If the discharge is from a city owned and/or operated facility or vehicle, the City is directly responsible for the illicit discharge.

3. IDENTIFY WHO WILL PAY FOR THE ILLICIT DISCHARGE AND OBTAIN ANY INSURANCE INFORMATION

If the City is responsible for the illicit discharge, it is responsible for all environmental impacts of the pollution, and any accompanying repair or reconstruction work that needs to take place. This may range anywhere from fifty dollars to thousands of dollars (as outlined in City Ordinance 18.06.11). By the same token, any identified violator will be responsible for the repair or reconstruction work that needs to be performed. This person will be charged a reasonable amount to compensate for the damage.

4. PREVENT FUTURE DISCHARGES

The best way to manage illicit discharges is to prevent them from occurring. This can be best accomplished by educating residents in the community about illicit discharges, the storm water pollution hotline, and the importance of preserving the storm water network to provide clean water to the community and the environment. Additionally, training among City employees will help to create awareness of storm water pollution, especially the procedures followed when observing an illicit discharger or contaminated storm drain, and also training will help the storm water coordinator to effectively manage pollutant discharges whenever they occur. Several public outreach methods can be used to accomplish these goals:

- Public education and outreach (distributing brochures, flyers, setting up booths, holding storm water coalition meetings, etc.)
- Public participation/involvement (stenciling storm drains with markers, participating in community events or school field trips, etc.)
- City pollution prevention/good housekeeping (training City employees on illicit discharge prevention and enforcement; training City employees on good housekeeping practices that divert any discharges away from the storm drain).

Though the best practices would be to have zero pollution to the storm drain, unfortunately illicit discharges do occur, and the appropriate measures need to be taken to stop storm water pollution from occurring. By repeating these practices of quickly identifying, characterizing, and ceasing illicit discharge from the storm drain, hopefully the City will eventually create enough awareness to achieve "zero discharge" into the storm drain network, effectively preserving and sanctioning the surrounding rivers, streams, and bodies of water.

3.7 – IDDE Training

IDDE training is tracked internally. Training tracking is available upon request.

Section 4

4.1 – City Ordinances

City Ordinances 18.06.02 and 18.06.03 cover the need for a construction site to have a Storm Water Permit, and appropriate structural BMP controls.

4.2 – Training

The City has provided training for any employees who's job duties are related to implementing the construction storm water program. – see links in the screenshot below. Additionally, the City has a number of Registered Stormwater Inspectors. One of the certifications is pictured below for reference. A complete list of Registered Stormwater Inspectors and copies of their certificates is available upon request.

The training videos can be found at:
http://www.utahcounty.gov/Dept/PubWrks/StormWaterVideos.asp

There are three videos to watch. They are on the right under "Training

They also can be found using these YouTube links:
https://www.youtube.com/watch?v=6_rXxM07qBs
https://www.youtube.com/watch?v=CutnOgzckos
https://www.youtube.com/watch?v=t5Eta9bhKGA

4.3 – Enforcement Strategy and Implementation of City Ordinance 18.06.10

SOP: ENFORCEMENT STRATEGY AND IMPLEMENTATION OF CITY ORDINANCE 18.06.10

PURPOSE: The purpose of this SOP is to list the procedures followed to enforce City Ordinance 18.06.10

PRIORITY: City Ordinance 18.06.10 outlines the legal procedures followed whenever a construction site falls out of compliance with its accompanying Storm Water Pollution Prevention Plan (SWPPP). Enforcement of this City Ordinance is necessary to continue to hold a high standard for storm water pollution prevention within the City.

PLAN: A SWPPP inspector will carry out the following procedures in the event of non-compliance of a construction site with its accompanying SWPPP.

ACTION:

During SWPPP inspections on construction sites, the storm water manager will follow a State-issued SWPPP compliance inspection form to check for any non-compliance from a construction site. The manager follows protocol for issuing a "warning" with the construction site if not in compliance with storm water regulations. If measures are not corrected upon the next visit, these procedures are followed:

1. A WRITTEN NOTICE OF VIOLATION—a written notice of violation is sent to the permittee informing them that their site is not in compliance with SWPPP inspection. The permittee then submits an explanation to the City Engineer for non-compliance with the SWPPP inspection.

2. CONSENT ORDERS—the City Engineer will enter into an agreement for non-compliance on the site, including actions taken, or to be taken by the person to correct non-compliance.

3. SHOW CAUSE HEARING—The City Engineer may order any person who violates this ordinance to show cause for why a proposed action should not be taken. The notice of the meeting shall be served personally or by registered or certified mail at least ten (10) days prior to the hearing.

4. COMPLIANCE ORDER—if the permittee continues to violate this ordinance or a permit or order issued thereunder, the City Engineer may issue a compliance order to the violation. This order will direct that a specified time period, adequate structures, or devices will be installed or procedures implemented and properly operated. A "cease and desist" will be issued if the permittee continues to be in non-compliance.

5. VIOLATIONS—any person who commits any act declared unlawful under City Ordinance 18.06.10 will be guilty of a Class C Misdemeanor.

4.4 – Pre-Construction Storm Water Pollution Prevention Plan (SWPPP) Review

SOP: PRE-CONSTRUCTION STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REVIEW

PURPOSE: To establish the procedures followed to prevent storm water pollution prior to the construction performed on a site.

PRIORITY: Specific guidelines will be established for a construction site, based on a Storm Water Pollution Prevention Plan (SWPPP), and based on sensitive lands or areas surrounding a construction site.

PLAN: A Public Works Capital Projects committee will meet with developers and/or contractors to discuss the requirements of a SWPPP, and review the Salt Lake County Top Ten BMPs for Construction Sites to ensure that a project will be in compliance with City and State standards for storm water pollution prevention.

ACTION:

Prior to construction on a site, a preconstruction meeting is held, in which the storm water coordinator, capital projects committee, and any other inspectors discuss and review storm water pollution prevention (as contained in a SWPPP) to ensure that the site will sufficiently contain potential pollutants and thus prevent storm water pollution. :

6. PRECONSTRUCTION PACKAGE—the capital improvements committee submits a preconstruction package (found at S:\Public Works\Forms and Templates\PRE CON Package) to the developers of a project that contains a Building Permit Approval Checklist covering these requirements:
    - Provide the City with a copy of the Notice of Intent (N.O.I.) permit
    - Provide the City with a copy of the Notice of Termination (N.O.T.) permit
    - Provide a copy of weekly inspection reports that of proof of compliance with the SWPPP, and any implementations that will be adjusted until the N.O.T. is provided.
    - Compliance with items selected from the Top Ten BMPs for Salt Lake County.
    - A copy of the State SWPPP Compliance Inspection form for reference.
7. DEVELOPER MEETING—a meeting is held in which the storm water pollution measures are discussed, including BMPs and other storm water pollution prevention methods.
8. SIGNATURE SHEET—all parties involved in the Developer Meeting are required to sign a sheet showing that they are in agreement with the storm water pollution prevention measures.

• S

WPPP CHECKLIST DATE: _____/_____/_____

Project Name: _____

Project/Site Address: _____

SWPPP reviewed by: _____

Estimated Start Date: ____/____/____
Estimated Completion Date: ____/____/____

SWPPP contains:

☐	***A cover/title page***
☐	***Project and SWPPP contact information***
☐	***Site and activity description, including a site map***
☐	***Identification of potential pollutant sources***
☐	***Description of controls to reduce pollutants***
☐	***Maintenance/inspection procedures***
☐	***Records of inspections and follow-up maintenance of BMPs***
☐	***SWPPP amendments***
☐	***SWPPP certification***

Who is on the stormwater pollution prevention team? _____
Who will install structural stormwater controls? _____
Who will supervise and implement good housekeeping programs, such as site cleanup and disposal of trash and debris, hazardous material management and disposal, vehicle and equipment maintenance, and so on? _____
Who will conduct routine inspections of the site to ensure all BMPs are being implemented and maintained? _____
Who will maintain the BMPs? _____
Who is responsible for documenting changes to the SWPPP? _____

Who is responsible for communicating changes in the SWPPP to people working on the site? _____

4.5 – Construction Site Inspection and Enforcement of Construction Storm Water Pollution Control Measures

SOP: CONSTRUCTION SITE INSPECTION AND ENFORCEMENT OF CONSTRUCTION STORM WATER POLLUTION CONTROL MEASURES

PURPOSE: To establish procedures followed for the frequency schedule and priority of inspections on construction sites.

PRIORITY: A SWPPP inspector should establish a regular schedule to inspect construction sites based on its priority.

PLAN: A SWPPP inspector will be designated to inspect construction sites, and identify any issues if necessary.

ACTION:

During construction, sites will be inspected and monitored for compliance with storm water pollution control measures, including:

9. A SWPPP INSPECTION—conducted at least every thirty (30) days or more frequently as needed on higher priority sites (as outlined in the Defining Priority Sites SOP).

10. ENFORCING COMPLIANCE—contacting, by phone, email, or other means, the operators of a specific site to notify them of adjustments that need to be made to the site to bring it in compliance with SWPPP standards.

11. ENFORCEMENT STRATEGY—enforcing compliance with City Ordinance 18.06.10 as outlined in SOP: Enforcement Strategy and Implementation of Enforcement of Ordinance 18.06.10.

4.6 – Defining Construction Priority Sites

SOP: DEFINING CONSTRUCTION PRIORITY SITES

PURPOSE: The purpose of this SOP is to identify construction sites that are susceptible to storm water runoff and prioritize them from greatest to normal priority.

PRIORITY: Construction sites that are in close proximity to Utah Lake or the Jordan River, or are in the direct line of runoff from the Utah Lake/Jordan River watershed will most readily contribute to storm water runoff to Utah Lake and the Jordan River, and need to be monitored closely and frequently.

PLAN: Construction sites in close proximity to the Jordan River and Utah Lake will be identified as priority construction sites, and will be inspected at least bi-weekly or more often if necessary.

ACTION:

During preconstruction meetings for construction sites, personnel responsible for reviewing a construction site's SWPPP will prioritize a construction site's potential for storm water pollution based on the following items (in hierarchical order):

1. PROXIMITY TO RECEIVING WATER BODIES—two susceptible water bodies exist in Saratoga Springs; the Jordan River, and Utah Lake.
2. PROJECT SIZE AND TYPE—the size of a construction site (1-acre or greater) pose a greater threat for storm water pollution.
3. SOIL EROSION POTENTIAL—the nature of the soil at the construction site (e.g. sandy soil, silty, or heavier grade gravel). Finer soils will increase erosion potential.
4. SITE SLOPE—Some areas in Saratoga Springs have more inclined site slopes towards the existing water bodies that receive storm water runoff.
5. SENSITIVITY OF RECEIVING WATER BODIES—The Jordan River and Utah Lake are both bodies that are in dire need of cleaner storm water runoff in order to improve the quality of these sensitive water bodies.
6. NON-STORM WATER DISCHARGES AND PAST RECORD OF NON-COMPLIANCE BY THE OPERATORS OF THE CONSTRUCTION SITE—any construction site operators found discharging non-storm water discharges will categorized as "priority" and kept on file.

4.7 – LTSWMP Inspection Report

Long-Term Storm Water Management Inspection Report (Print Clearly)

Inspection Date:			
Project Location:			
Current Ownership Information			
Current Owner:			
Address:	Phone Number: (____)____-_____	Fax: (____)____-_____	Email Address:
Best Management Practices (BMP) Information			

Non-Structural BMP Type:

1. Condition of BMP: ☐ Poor ☐ Acceptable ☐ Good
2. Condition of Surrounding Vegetation: ☐ Poor ☐ Acceptable ☐ Good
3. Sediment and Debris Accumulation: ☐ Low ☐ Moderate ☐ High
4. Condition of Inlet and Outlet Structures: ☐ Poor ☐ Acceptable ☐ Good

Additional Notes:
Maintenance Required (If any):

Structural BMP Type:

5. Condition of BMP: ☐ Poor ☐ Acceptable ☐ Good
6. Condition of Surrounding Vegetation: ☐ Poor ☐ Acceptable ☐ Good
7. Sediment and Debris Accumulation: ☐ Low ☐ Moderate ☐ High
8. Condition of Inlet and Outlet Structures: ☐ Poor ☐ Acceptable ☐ Good

Additional Notes:
Maintenance Required:

***Re-inspection Date (If Applicable)*:**

I certify that the above Long-Term Storm Water Management survey findings are true *(Signatures required)*

- **Survey Conducted by:** (UT-LTAP Registered Storm Water Inspector)

		/ /	
UTLTAP Cert. RSI Name (Print)	*UT LTAP Cert. ID#*	*Expiration Date*	*Signature*

Section 5

5.1 – City Code

See City Ordinances 18.06.05, 18.06.06, and 18.06 for more information about Long-Term Storm Water Management in New Development and Redevelopment

5.2 - Low Impact Development Program Report

Purpose of the Program

The purpose of the Low Impact Development (LID) Engineering and Development Standards program is to create awareness about the environmental impacts of storm water infrastructure, improve drainage in commercial and residential areas in subtle ways, improve water quality, and to introduce new ways to reduce the impact and cost of storm water infrastructure.

Roles and Responsibilities

Each department within the City has a role to play in the implementation of LID. Those most directly concerned with implementation are the Engineering Department, the Public Works Department, and the Storm Water division.

Department	Role	Responsibility
Engineering	Design Review	Ensure LID is feasibly possible and meets that standard requirements as outlined in the Technical Specifications and Drawings Manual
Public Works	Design Implementation	Ensure the constructability of LID Designs
Storm Water	Implementation Review	Ensure that LID is performing correctly; mitigating storm water to designated areas

Proposed Program Plan

The proposed program plan for LID consists of two steps:

1. Distribute information about LID
2. Measure the implementation of LID practices throughout the year

Budget and Resources

The Engineering and Public Works department will be responsible for the printing and distribution of handouts containing cost and benefit information about LID practices.

Limitations

The limitations of this program pertain to the fact that there is no defined method of measuring the results of LID practices, or prediction of how well they will mitigate storm water. There are also no clear guidelines or standards for the practices.

Program Questions

Several questions will help to address the importance of this program:

1. Why is LID important?
2. Where would LID be implemented?
3. What long-term impact will it have to incorporate LID?
4. Is it in the long-term interest of the City to invest in LID?
5. What kind of maintenance does it require?

Stakeholders

Stakeholder	**Decisions to be made/Actions to be taken**
City Manager, permitting, etc.	Will this be good for our City?—Decide to disseminate information to businesses/developers
Developers	Will this increase the cost of development? What are the long-term/short-term impacts of LID on the development? How will we implement LID?
Public Works/Engineering	Who will be responsible? What kind of maintenance will be required? How do we incorporate LID into discussions about development?

Program Description

The Low Impact Development (LID) Engineering and Development Standards program is designed to increase the conversation and incorporate LID ideas into discussions about development. The program is targeted towards developments in close proximity to water bodies, including Utah Lake, and the Jordan River, and nearby watersheds where development may have an impact on the natural environment. Incorporating LID ideas will allow developers to design communities that integrate natural elements of the environment, increasing aesthetic appeal, raising property values, improving water quality, and the quality of life.

In addition the program will allow the incorporation of LID ideas into discussions with commercial developers. The City will make available information about LID to commercial developers and will suggest ideas to implement storm water drainage without resorting to traditional storm water infrastructure, where feasible.

Program Theory

Rainwater runoff, rather than being directed to storm drains, can be filtered on site where natural processes of infiltration and evapotranspiration can occur. Traditional infrastructure is necessary and convenient in many circumstances, however, with increased regulations from state water departments, LID is being incorporated to greater improve water quality in cities. Traditional infrastructure requires the excavation, placement of infrastructure, maintenance, and repair of infrastructure to ensure effective storm water drainage, whereas LID requires less materials for installation, very little excavation, and can often be maintained conveniently on an annual basis. For this reason it is beneficial to incorporate LID into discussions with developers about considering LID over traditional storm water drainage practices.

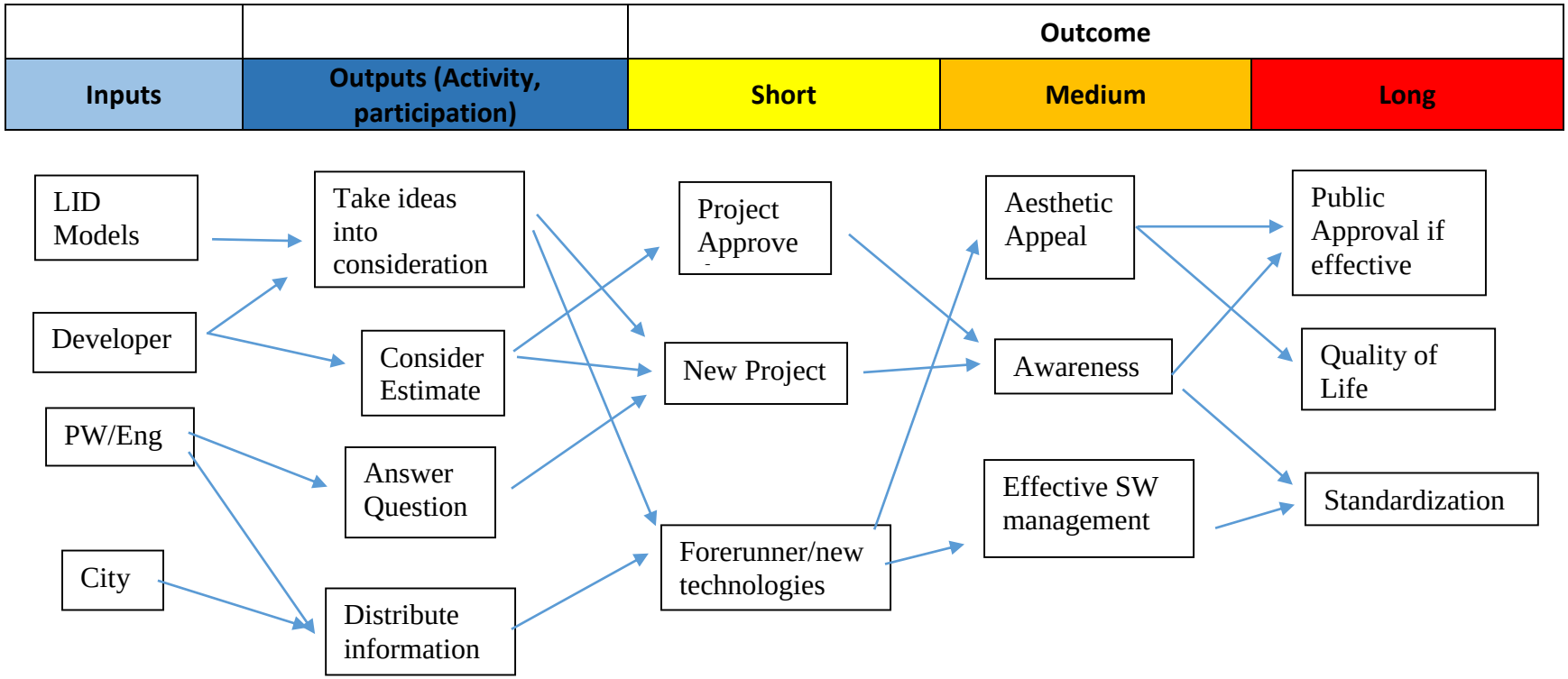
The program will measure the effectiveness of LID Best Management Practices (BMPs) quantitatively by measuring the number of LID implementations at developments, the decrease in costs for storm water infrastructure, and the amount of water infiltrated on site at the development.

Outcome goals and objectives

The outcomes and goals of this program are not limited to quantitative measurement. They may additionally be measured by the amount of education that occurs to developers, residents, and even schools. Some outcome goals and objectives may be:

- Implement 10 LID installations in 2019
- Reduce cost by 10% of storm water infrastructure
- Increase the amount of water infiltrated through pervious surfaces on site
- Improve water quality draining to Utah Lake and the Jordan River

Logic Model


Outcome
Inputs
Outputs (Activity, participation)
Short
Medium
Long
LID Models
Developer
PW/Eng
City
Take ideas into consideration
Consider Estimate
Answer Question
Distribute information
Project Approve
New Project
Forerunner/new technologies
Aesthetic Appeal
Awareness
Effective SW management
Public Approval if effective
Quality of Life
Standardization

Evidence in support of program

In a report filed by the Environmental Protection Agency, 17 case studies were conducted in which cost estimates were performed on developments with traditional infrastructure, and estimates were conducted on developments using LID as part of their storm water system. In an urban area, all but one of the developments incorporating LID into their design resulted in cost savings, ranging from 15 to 80 percent. These practices also resulted in increased property values, increased marketing potential, and faster sales. Improved water quality was assumed for the use of LID, but more research was needed to draw a clear conclusion.

Proposed Program Structure

The program can seek increase the number of LID implementations by distributing material, and incorporating ideas into discussions with the following engineering firms and developers:

Engineering Firms and Developers	**Specialties**
Project Engineering Consultants (PEC)	Multiple
CRS Engineers	Multiple
LEI	Multiple
Hansen, Allen, and Luce	Water
McNeil Engineering	Multiple
Ensign Engineering	Multiple
Bowen Collins	Multiple
Twin Peaks	Planning, Residential
J Thomas Homes	Single Family, Townhomes, Communities
EDGEhomes	Single Family, Townhomes, Communities
Candlelight Homes	Communities, Home Design
Woodside Homes	Communities, Home Design
D.R. Horton	Communities, Home Design
Flagship Homes	Communities, Home Design
Ivory Homes	Home Design

Proposed Measurement Tools

A few clearly defined measurement tools will help to assist in measuring the effectiveness of LID implementation throughout the community:

Key Construct	Definition	Operational Definitions
Survey-Public Approval	Measurement of device's approval	Approval of LID implementation throughout City
Rating Scale	Measurement of device's effectiveness	Actual effectiveness to retain SW throughout City

Program Procedures

The program will incorporate using five steps to implement LID techniques and practices, and then to evaluate the program for effectiveness:

1. Document information
2. Distribute information
3. Refer specialist to project, implementation practices
4. Measure Effectiveness
5. Evaluate program

Program Checklists

The types of LID practices, descriptions, and application will be listed in a separate document, giving the technical application of LID practices. This document will help to educate city employees about practices that can be implemented throughout the City.

Program Instructions

A few instructions assist in executing the program according to the program's purpose, and the outcomes intended to achieve, which include:

- Integration of LID into discussions
- Spreading the word about Low Impact Development practices
- Distributing public information/Involving the public

Program Responsibilities

Department	Role	Task	Timeline
City	Admin responses	Obtain so much City approval	April '18

PW/Eng	Implementation	Integrate onto discussion, suggest if feasible	Jan ‘18
SW	Review	Determine effectiveness of structure	May/June ‘19

Conclusion

Implementation of LID in Saratoga Springs will preserve and improve natural areas, preserve rainwater, improve aesthetics, save costs, and hopefully increase property values by implementing LID in commercial, and residential areas.

LOW IMPACT DEVELOPMENT REPORT

WHAT IS LOW IMPACT DEVELOPMENT AND GREEN INFRASTRUCTURE?

Low Impact Development (LID) is a "comprehensive storm water management and site-design technique" used to "infiltrate, filter, evaporate, and store [storm water] runoff close to its source."[1] This design technique is a versatile approach to storm water management that relies on point source infiltration, rather than on costly storm water conveyance structures and excavation for burial and maintenance. In addition, Green Infrastructure (GI) is "an array of products, technologies, and practices that use natural systems—or engineered systems that mimic natural process…"[2] Green infrastructure generally uses soils and vegetation to achieve infiltration, evapotranspiration, and/or recycling of storm water runoff, whereas LID techniques may be structural, utilizing small, cost-effective landscape features located on-site.

WHY LOW IMPACT DEVELOPMENT AND/OR GREEN INFRASTRUCTURE?

The goal is to improve water quality. Low Impact Development and Green Infrastructure have several benefits when thoughtfully and carefully prepared for. Immediate benefits include: 1. Compliance with storm water regulations and reduction of pollutant runoff into storm drain conveyance systems, 2. Increased water infiltration into permeable soils for groundwater recharge and evapotranspiration, 3. Decreased use of storm water infrastructure by providing natural drainage in soils on site, and 4. A decrease in cost for storm water utility maintenance and infrastructure.

LOW IMPACT DEVELOPMENT AND GREEN INFRASTRUCTURE VS. STANDARD INFRASTRUCTURE

Though the use of LID/GI really depends on the site that it is implemented at, and how it is implemented, it is a cost/benefit and quality of life issue when considering whether LID/GI or traditional storm water infrastructure would be beneficial. For most cities, traditional infrastructure is the norm, and because a network has already been established it is convenient to tap into. However, considering future growth, expansion, and population, some areas may be more conducive to LID/GI, than to traditional infrastructure because they improve aesthetics, raise property values, and increase the amount of space used for development. Such areas may be areas with existing natural vegetation, forestry, wetlands, lakesides, rivers, etc. In these communities, traditional infrastructure may be more of a "burden than a blessing" because traditional infrastructure might require removal of natural vegetation and tree cover rather than incorporating a drainage design that meshes with the natural landscape of the area.

In commercial areas, LID/GI serve more as a "function" to mitigate storm water rather than to increase quality of life. However, even serving as a function, the appeal of LID/GI will increase the value of the property, and collectively, the city as a whole. Increased implementation and experience with LID/GI can create standards and receive public approval to allow more incorporation of LID/GI into commercial areas, increasing the quality of life for residents who frequently visit commercial areas. As cities grow, and commercial areas start to bump into

[1] Office of Water/Wastewater Management. *Green Infrastructure: Glossary of Commonly Used Terms.* 2009. Retrieved from: https://www.epa.gov/green-infrastructure
[2] Ibid.

each other, it is more aesthetically appealing to incorporate some natural elements of the environment into the commercial areas to increase "curb appeal" and, cumulatively, increase the city's value.

In some cities, governments have made requirements that the preconstruction site pervious conditions meet the post construction pervious conditions. This means that they have made it a requirement that as much water infiltrates the site before construction, should be the same amount that infiltrates after construction. This reduces the amount of storm water that, following construction, is drained off of impervious surfaces, such as roads, sidewalks, courtyards, etc. into gutters or storm drains, instead incorporating on-site infiltration that allows water to permeate into the soil, recharging the site's water table, and only using additional infrastructure to preempt heavier rainfalls.

PUBLIC AWARENESS

Without full-on implementation into existing facilities and planned developments, small measures can be taken to increase public awareness of low impact development and green infrastructure. These measures can include:

Documenting the use of high-permeability soils at development sites, parks, or new facilities and providing this information to the public via information available on site (brochures, information signs, markers, etc.)
Public web posts documenting the implementation of low impact development and/or green infrastructure on City projects and other sites.
Distributing information explaining the benefits of LID and Green Infrastructure, including lower costs in utility rates, protection of the environment, improved water quality, and overall increased quality of life in adopting new and innovative practices.

COST ANALYSIS

Low Impact Development and Green Infrastructure can result in cost savings if implementation and planning are treated with the right respect. In general, LID/GI practices seek to enhance the existing condition of the available area, and eliminate the usage of underground installation, maintenance, and replacement of traditional storm water infrastructure. Flexibility in implementation and project planning are key components of LID/GI practices. Savings have been incurred by reducing the materials needed for paving roads and driveways and for installing curbs and gutters. Additionally, LID/GI techniques can lower costs by reducing the size and cost of flood-control structures. One consideration, however, is that, according to the EPA Factsheet: Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, a few projects have resulted in higher costs due to "more expensive plant material, site preparation, soil amendments, underdrains, and connections to municipal stormwater systems, as well as increased project management

Table 1. Cost Comparisons Between Conventional and LID Approaches

Project[a]	Conventional Development Cost	LID Cost	Cost Difference[b]	Percent Difference[b]
2nd Avenue SEA Street	$868,803	$651,548	$217,255	25%
Auburn Hills	$2,360,385	$1,598,989	$761,396	32%
Bellingham City Hall	$27,600	$5,600	$22,000	80%
Bellingham Bloedel Donovan Park	$52,800	$12,800	$40,000	76%
Gap Creek	$4,620,600	$3,942,100	$678,500	15%
Garden Valley	$324,400	$260,700	$63,700	20%
Kensington Estates	$765,700	$1,502,900	–$737,200	-96%
Laurel Springs	$1,654,021	$1,149,552	$504,469	30%
Mill Creek[c]	$12,510	$9,099	$3,411	27%
Prairie Glen	$1,004,848	$599,536	$405,312	40%
Somerset	$2,456,843	$1,671,461	$785,382	32%
Tellabs Corporate Campus	$3,162,160	$2,700,650	$461,510	15%

[a] Some of the case study results do not lend themselves to display in the format of this table (Central Park Commercial Redesigns, Crown Street, Poplar Street Apartments, Prairie Crossing, Portland Downspout Disconnection, and Toronto Green Roofs). [b] Negative values denote increased cost for the LID design over conventional development costs. [c] Mill Creek costs are reported on a per-lot basis.

costs."[3] Other considerations included the land required for LID/GI implementation, and regulatory requirements for the given location. Overall, however, out of an analysis of 17 case studies, LID/GI provided benefits that were not monetized and factored into the project bottom line, including, "improved aesthetics, expanded recreational opportunities, increased property values due to the desirability of the lots and their proximity to open space, increased total number of units developed, increased marketing potential, and faster sales."[4] The studies also showed a decrease in the incidences of combined sewer overflows. Savings for these case studies ranged from 15 to 80 percent when LID/GI methods were used. Since LID/GI is a relatively new field, more research is needed to quantify all the environmental benefits.

Low Impact Development and Green Infrastructure Practices

Constructed Wetlands

Constructed wetlands are a viable alternative to wastewater treatment. Generally, their construction costs are much less (50 to 90%) than conventional systems and operating costs are low. They are usually below ground level with wetland plants such as cattails and bulrushes. Subsurface systems, or systems where the water level is kept one inch below a gravel cover improve water quality and control mosquitoes. The filtration occurs through the roots of the plants, and natural biological processes that occur through native organisms and microorganisms. Because of a lack of standard information, engineers are currently limited on the design of wetlands, and wetlands may not be able to treat all complex pollutants. However, areas in close proximity to native wetlands and vegetated areas can be a benefit to communities by designing systems to treat wastewater with wetlands. Wetlands also provide opportunities to educate the public about water quality.

Infiltration Basins

Infiltration basins are used to improve water quality by allowing rainwater to infiltrate through permeable soils and recharge the groundwater aquifer. They are different from a retention or detention basin in that they are not designed to hold water. Some design considerations for infiltration basins include choosing a site where the water can infiltrate the soil at a rate that will not cause flooding. In addition, they are not effective in areas with high groundwater tables, compacted soils, high levels of sediment in the storm water, or areas with a high clay soil content.

Bioretention

Bioretention is a process of excavating an area, filling it in with permeable soils or medium (such as sand or permeable soil), and planting native vegetation to help with the filtration of water retained in the basin. Bioretention ponds generally consist of a depressed area with native vegetation, and with layers of sand, permeable soil, and other filtration mediums underneath. The water level contained within a bioretention will not usually exceed about 5.9 inches, and the water is treated by the infiltration process, and by evapotranspiration. Because of the filtration process and accumulated hydrocarbons, heavy metals, and

[3] National Service Center for Environmental Publications (NSCEP). *Fact Sheet - Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*. 2007. Retrieved from: https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100SHX0.txt
[4] Ibid.

nutrients from storm drain runoff, bioretentions may require maintenance to aerate the soil, or otherwise replace the soil and filtration mediums as particles accumulate.

Surface Sand Filters

Surface sand filters work at storm water hot spots (areas that are anticipated to receive a lot of storm water) and are designed to retain pollutants in the event of a heavy rainfall. They are designed to trap sediment, filter water through a sand filter, and then retain the water with a layer of impermeable fabric at the bottom. They are great for removing organic nutrients, but may leave a residue of nitrate and sometimes phosphorus. They can also be an eyesore if not maintained well and often.

Rain Barrel

A rain barrel does exactly what it says, it collects rain during a storm that can be stored for later uses, such as to water plants, and for other purposes. It is often very effective as an aesthetic component when used in surrounding gardens, or around buildings, and may be a very effective LID practice on ground areas.

Cistern

A cistern is similar to a rain barrel but has larger storage capacity. Cisterns can sometimes be installed underground to retain rain water, and are used for similar purposes as rain barrels, such as watering plants, waterworks, or for other uses.

Wet (Retention) Pond

Retention ponds are graded structural ponds that are used to retain storm water runoff. They use natural processes of infiltration and evapotranspiration to improve water quality. They can have high or low upkeep, depending on the area.

Dry (Detention) Pond

Detention ponds are similar to retention ponds in that they are designed to retain storm water. However, detention ponds are a structural device designed to collect excess storm water in the event of a heavy storm. Detention ponds generally stay dry during the non-rainy season, and for this purpose they often serve a dual purpose as recreational fields and for parks. Because of the amount of storm water they are designed to detain, they often require large areas to detain water, and can be expensive. In heavy commercial areas, it is generally not feasible to use detention ponds, and point BMPs may be a better option.

Grassed Swale (Bioswale)

Bioswales are swales lined with high permeability soils, native vegetation, and some aesthetic landscaping to mitigate storm water and allow natural percolation and evaporation without retaining the water completely. Using native vegetation allows for the appeal of the natural environment, and the invitation of natural wildlife to increase the appeal of the area. Using bioswales may reduce the need to build detention/retention ponds and accommodate a larger area of storm water runoff.

Infiltration Trench

An infiltration trench is a trench filled with permeable material (such as large aggregates or rocks) that is designed to infiltrate storm water through permeable soils into the groundwater aquifer. They often serve to collect water runoff from pervious surfaces such as parking lots or sidewalks, and can be used for collecting water over an area perpendicular to the drainage as well. Some design considerations include using soil that has sufficient porosity for storm water. Infiltration trenches may not be appropriate for sites where there is a possibility of groundwater contamination, or where there is soil with a high clay content that could clog the trench.

Vegetated Filter Strip

Vegetated filter strips are used as an elongated structure to capture and filter storm water runoff from impervious surfaces, such as parking lots, sidewalks, roads, or other large surfaces. They are usually planted with native vegetation and assist with removing sedimentation and water infiltration. Biological uptake, and microbial activity processes are also allowed to occur as well. They are not usually designed as a primary water treatment practice, but can serve as pretreatment for other infiltration devices, such as infiltration trenches, or bioretention areas.

Non-surface Sand filter

Non-surface sand filters act much in the same way as surface sand filters, except that they are covered with a layer of top soil, and the primary drainage from the treatment zone (the sand filter) is discharged through an outlet pipe into the storm drainage system. Non-surface sand filters generally are not suited for high levels of sediment infiltration, but are better used for the filtration of heavy metals and hydrocarbon loadings from parking lots and roads.

Green Roof

Green roofs are generally popular in urban areas. A green roof consists of a layer of permeable soils that can be vegetated and have a layer of impermeable fabric underneath, shielding the structure from water and the roots of vegetation. Green roofs contribute to the air quality, aesthetic appeal, and innovation of green infrastructure that mix both the natural and urban environment into one setting. However, costs for green roofs may be very high, they often may invite unwanted wildlife and pests, and require a significant amount of maintenance.

Permeable Pavement

Permeable pavement is pavement that has a higher permeability rate than typical impervious surfaces. This increase in permeability allows for natural infiltration of rain water into the soil beneath. Maintenance for permeable pavement is generally low—it may require surface cleaning or industrial vacuuming, and in the most extreme case, replacement. In many cases it has proven successful in increasing drainage on street and auxiliary surfaces. Permeable pavement may be combined with other LID techniques, such as providing a permeable surface with keyed-in curb and gutters to allow water to flow into a permeable area.

Low Impact Development and Green Infrastructure Design

Designing for LID/GI requires subtle improvements in the design of high volumes of impervious surfaces, such as parking lots, courtyards, or other large areas that may otherwise be modified with improved drainage. Some existing areas with low permeability and drainage may also be retrofitted to accommodate LID/GI practices.

An engineer or landscape architect may be the one to consult about LID/GI practices, but a basic knowledge is required to incorporate ideas into conversations with developers. One consideration is that LID/GI practices may not only reduce costs and increase aesthetics for developments, but also increase the amount of area that can be used to develop a structure. An example is using infiltration trenches, bioretention, and grassed swales surrounding an area rather than using a detention pond in one location. Other examples can be obtained from www.lid-stormwater.net.

The Georgetown Climate Center provides a valuable toolkit for incorporating Green Infrastructure practices into municipal operations. The toolkit can be found at http://www.georgetownclimate.org/adaptation/toolkits/green-infrastructure-toolkit/introduction.html.

LID/GI TECHNIQUES AS BEST MANAGEMENT PRACTICES

	Design Technique	Application	Description	Estimated Cost
Point BMP	Constructed Wetland	Design and construct a wetland that receives storm water discharges and is, overall, self-sustaining.	A natural drainage area where native vegetation and wildlife can thrive and populate.	$30,000-$65,000 per acre (2004)[5]
	Infiltration Basin	Used to design an infiltration site that contributes directly to the underground aquifer.	A basin lined with completely pervious material/soil that absorbs water.	$30,000 per acre (2009)[6]
	Bioretention	Used to spread storm water cover over a distributed area and evapotranspire into the atmosphere.	A small, indented, area lined with native plants and vegetation to assist drainage.	$5,000-$10,000 per acre (2005)[7]
	Sand Filter (surface)	Used on an immediate source to create water distribution and improve water quality	An area with sand cover that receives rain water and naturally filters it, and dissipates through evapotranspiration.	$18,500 per acre (1999)[8]
	Rain Barrel	Collects rain water runoff and is stored as a secondary source for plant watering and other uses.	A barrel install as part of or connected to a building to collect rainwater from drains for future use.	$120/barrel (2017)[9]

[5] www.bfenvironmental.com/pdfs/ConstrWetlands.pdf
[6] www.dnrec.delaware.gov/swc/wa/Documents/AppoPCSdocs/Appendix%20E%20-%20Cost%20Calculations.pdf
[7] www.lakesuperiorstreams.org/stormwater/toolkit/bioretention.html
[8] https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=200044AG.txt
[9] www.lid-stormwater.net/raincist_cost.htm

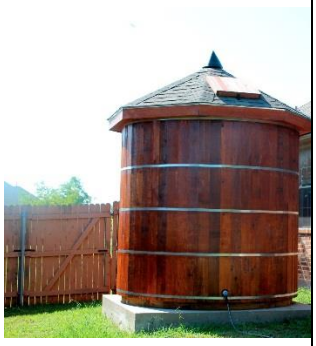
	Cistern	Similar to a rain barrel, but larger in size and application.	A large storage tank or barrel incorporated into a building to collect rain water from drains for future use.	$1,500 (above ground), $5,000 (below ground) (2017)[10]
	Wet (Retention) Pond	Retains storm water runoff, but holds it for natural biological and evaporative processes (for groundwater recharge).	A large, depressed area with natural vegetation used to retain rain water and storm water runoff.	$30,000 per acre (1991)[11]
	Dry (Detention) Pond	Serves as a storm water overflow in the event of heavy rains and floods.	A large, depressed area lined with grass or other vegetation to accommodate heavy rain flows.	$85,000 per acre (2007)[12]
Linear BMP	Grassed Swale	Retains and absorbs water during rainfalls in a natively vegetated swale.	A depressed, longitudinal structure lined with native vegetation and permeable soil.	$5-$20 per linear foot (2011)[13]
	Infiltration Trench	Allows water infiltration over a trenched area to increase storm water management in a large perimeter.	A slightly trenched area lined with permeable material or soil to increase drainage.	$4-$9 per cubic foot (2003)[14]
	Vegetated Filter Strip	Absorbs water and removes pollutants over a linear area.	A long, indented strip lined with native vegetation and permeable material or soil.	$50,000 per acre (2006)[15]

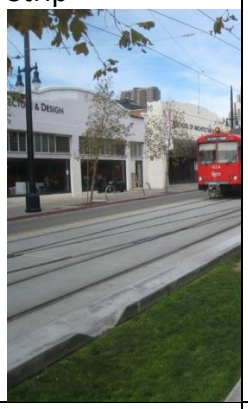
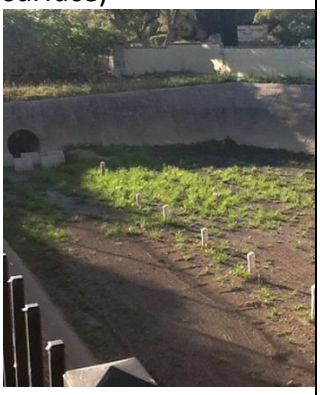
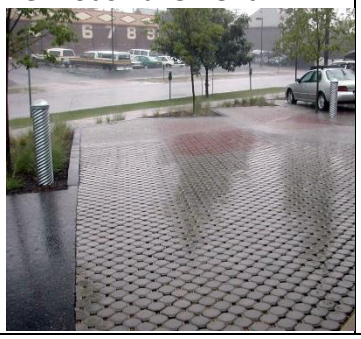
[10] home.costhelper.com/cistern.html
[11] www.cmhc-schl.gc.ca/en/inpr/su/waho/waho_010.cfm
[12] Jacob's Ranch Detention Basin Cost
[13] http://www.saveitlancaster.com/wp-content/uploads/2011/10/09_VegSwale_V3.pdf
[14] www.elibrary.dep.state.pa.us/dsweb/Get/.../6.4.4%20BMP%20Infiltration%20Trench.pdf
[15] www.elibrary.dep.state.pa.us/dsweb/Get/Document-67997/6.4.9%20BMP%20Vegetated%20Filter%20Strip.pdf

	Sand Filter (non-surface)	Absorbs water under a ground layer and discharges water into storm water outlet.	Ground cover over a layer of sand to improve filtration of water into the underground aquifer.	$10,000-$14,000 per acre (1994)[16]
Area BMP	Green Roof	Replaces impervious rooftops to increase the amount of permeable area on a building.	A vegetated roof over a waterproof membrane used to absorb water and improve water quality.	$15-$20 per sq. ft. (2017)[17]
	Porous Pavement	Allows quick drainage of rainwater into the soil beneath the pavement.	Pavement with larger aggregates and less oil additives to absorb water from the surface into the ground.	$2-$6.50 per sq. ft. (2002)[18]

[16] https://www.environment.fhwa.dot.gov/ecosystems/ultraurb/3fs7.asp
[17] www.lid-stormwater.net/greenroofs_cost.htm
[18] www.lid-stormwater.net/permpaver_costs.htm

EXAMPLES

Wetland 	Infiltration Basin 	Bioretention 	Sand Filter (Surface) 
Rain Barrel 	Cistern 	Wet (Retention) Pond 	Dry (Detention) Pond 

Grassed Swale 	Infiltration Trench 	Vegetated Filter Strip 	Sand Filter (non-surface) 
Green Roof 	Pervious Pavement 		

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https://engineering.purdue.edu/~frankenb/NU-prowd/cwetfact.htm

INFILTRATION BASIN

https://en.wikipedia.org/wiki/Infiltration_basin
https://upload.wikimedia.org/wikipedia/commons/c/cf/Infilt_basin.jpg

BIORETENTION

https://upload.wikimedia.org/wikipedia/commons/e/ed/Bioretention_cell_rain_garden_US_winter.jpg
https://en.wikipedia.org/wiki/Bioretention

SURFACE SAND FILTER

http://chesapeakestormwater.net/training-library/stormwater-bmps/sand-filters/
https://www.montgomerycountymd.gov/DEP/Resources/Images/water/stormwater-facilities/Oak-Manor-Sand-Filter.jpg

PERVIOUS PAVEMENT

https://nacto.org/wp-content/themes/sink_nacto/views/design-guides/retrofit/urban-street-design-guide/images/pervious-pavement/carousel//pervious-pavement-9.jpg

GREEN ROOF

https://en.wikipedia.org/wiki/Green_roof
https://upload.wikimedia.org/wikipedia/commons/thumb/4/41/British_Horse_Society_Head_Quarters_and_Green_Roof.jpg/300px-British_Horse_Society_Head_Quarters_and_Green_Roof.jpg'

NON-SURFACE SAND FILTER

http://www.state.nj.us/dep/stormwater/bmp_manual/NJ_SWBMP_9.9.pdf
http://www.storm-tex.com/wp-content/uploads/2014/09/sand-filter-2.jpg

VEGETATED FILTER STRIP

http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-67997/6.4.9%20BMP%20Vegetated%20Filter%20Strip.pdf
http://www.3riverswetweather.org/sites/default/files/GI/BMPs/VegetatedFilterStrip_1.jpg

INFILTRATION TRENCH

https://en.wikipedia.org/wiki/Percolation_trench
http://www.es-enterprise.com/publishImages/Infiltration-trench-percolation-trench~~element30.jpg

GRASSED SWALE

http://www.lakesuperiorstreams.org/stormwater/toolkit/images/swale_big.jpg

DETENTION POND

http://www.stormwaterpartners.com/facilities/images/DetentionPond1.jpg

RETENTION BASIN

https://upload.wikimedia.org/wikipedia/commons/thumb/5/52/Trounce_Pond.jpg/1200px-Trounce_Pond.jpg

CISTERN

http://4.bp.blogspot.com/-dxOTEOFb0dM/UfCCZh6hV8I/AAAAAAAABUY/4of6h3IQJYo/s1600/IMG_1629.JPG

RAIN BARREL

https://www.epa.gov/soakuptherain/soak-rain-rain-barrels
https://s7d1.scene7.com/is/image/BedBathandBeyond/52154843067886p?hei=2000&wid=2000&qlt=50,1

5.3 – Training

Training is completed by various department heads as they see fit for their respective departments. They are each given a copy of the updated plan and are expected to inform the employees of their department of the relevant sections.

5.4 – Long-Term BMP Selection

Task 5.4: Document how long-term storm water BMPs were selected, the pollutant removal expected from the selected BMPs, and the technical basis which supports the performance claims for the selected BMPs

Long-Term Storm Water BMPs were selected based on many factors including feasibility and active BMPs in surrounding cities. The influence of our neighbors in Salt Lake and Lehi influenced the BMPs selected. It was estimated that there would be a steady increase of pollutant removal as time continued. This is due to public knowledge increasing as well as proper time designated to implementing the new BMPs. Post construction site storm water awareness is significant because with the increased precautions taken by business owners and residents, their combined efforts will help decrease the level of pollutants entering city storm drains.

5.5 – Preconstruction Storm Water Protection Information

SARATOGA SPRINGS
PUBLIC WORKS

Storm Water Protection Information

This document contains information regarding the policies and procedures set in place by the City of Saratoga Springs in order to protect downstream water resources. It is the responsibility of the recipient of this information to understand their responsibilities and implement these procedures.

City Storm Water Coordinator
Darl "D" Brown
Email: DBrown@saratogaspringscity.com
Office: 801-766-9793 Ext. 172
Mobile: 801-691-8488

Reporting Illegal Dumping or Illicit Discharge
Phone: 801-766-6506
After Hours: 801-404-2468

Best Management Practices and Procedures

- Never dispose of anything down storm drains
- Properly dispose of waste and chemicals
- Monitor all vehicles on site for leaks, place drip pans under any older vehicles
- Avoid track-out, make sure there is a declared track-out pad
- Close dumpster lids when not in use, have frequent and regular trash disposal pick up
- Have an easily accessible spill kit, with all employees knowing its location
- Make sure portable toilets are staked down at least 10 ft away from any curb
- Don't wash equipment over dirt areas
- Have a concrete washout accessible for cement and pump trucks
- Label all drums and chemicals
- Keep all personnel aware of potential pollutants
- Have street sweepers on site for roads needing cleaning
- Water trucks needed on site for hot weather conditions & dust
- Inform the Storm Water Manager who will be doing monthly SWPPP inspections; giving him their contact information
- Any and all information regarding the SWMP must be given to the Storm Water Manager

Storm Water Management Program (SWMP)
https://www.saratogaspringscity.com/DocumentCenter/View/5111

FAQs Regarding UPDES Permits
https://deq.utah.gov/water-quality/general-construction-frequently-asked-questions-storm-permits-updes-permits

Construction Site BMPs
https://slco.org/uploadedFiles/depot/publicWorks/engineering/final_bmp_constructi.pdf

5.6 – LTSWMP Agreement Template

Submit to:

City Recorder
1307 N. Commerce Drive, Suite 200
Saratoga Springs, UT 84045

When recorded, mail copy to:

_____
_____
_____
Email: _____

LONG-TERM STORMWATER MANAGEMENT AGREEMENT

This Long-Term Stormwater Management Agreement ("Agreement") is made and entered into this _____ day of _____, 20_____,
by and between the City of Saratoga Springs, a Utah municipal corporation ("City"), and
_____,
a _____ ("Owner").

RECITALS

WHEREAS, the City is authorized and required to regulate and control the disposition of storm and surface waters within the MS4, as set forth in the City Stormwater Ordinance contained in Title 18 of the City Code and the Standard Technical Specifications and Drawings Manual, as amended ("Ordinance"), adopted pursuant to the Utah Water Quality Act, as set forth in *Utah Code Ann*. §§ 19-5-101, *et seq*., as amended ("Act"); and

WHEREAS, the Owner hereby represents and acknowledges that it is the owner in fee simple of certain real property more particularly described in Exhibit "A," attached hereto and incorporated herein by this reference ("Property"); and

WHEREAS, the Owner desires to build or develop the Property and/or to conduct certain regulated construction activities on the Property which will alter existing storm and surface water conditions on the Property and/or adjacent lands; and

WHEREAS, in order to accommodate and regulate these anticipated changes in existing storm and surface water flow conditions, the Owner is required to build and maintain at Owner's expense a storm and surface water management facility or improvements ("Stormwater Facilities"); and

WHEREAS, the Stormwater Facilities are more particularly described and shown in the final site plan or subdivision approved in writing for the Property and related

engineering drawings, and any amendments thereto, which plans and drawings are on file with the City and are hereby incorporated herein by this reference ("Development Plan"); and

WHEREAS, summary description of all Stormwater Facilities, details and all appurtenances draining to and affecting the Stormwater Facilities and establishing the standard operation and routine maintenance procedures for the Stormwater Facilities, and control measures installed on the Property are more particularly shown in Exhibit "B" on file with the City Recorder ("Long Term Stormwater Management Plan"); and

WHEREAS, a condition of Development Plan approval, and as required as part of the City's Small MS4 UPDES General Permit from the State of Utah, Owner is required to enter into this Agreement establishing a means of documenting the execution of the Long Term Stormwater Management Plan.

NOW, THEREFORE, in consideration of the benefits received and to be received by the Owner, its successors and assigns, as a result of the City's approval of the Long Term Stormwater Management Plan, and the mutual covenants contained herein, the parties agree as follows:

Section 1

Construction of Stormwater Facilities. The Owner shall, at its sole cost and expense, construct the Stormwater Facilities in accordance with the Development Plans and specifications, and any amendments thereto which have been approved in writing by the City.

Section 2

Maintenance of Stormwater Facilities. The Owner shall, at its sole cost and expense, adequately maintain the Stormwater Facilities. Owner's maintenance obligations shall include but are not limited to all system and appurtenances built to convey stormwater, as well as all structures, berms, channels, outlet structures, pond areas, access roads, improvements, oil/water separators, pipes, culverts, ditches, vegetation, etc. provided to control the quantity and quality of the stormwater. Adequate maintenance, for purposes of this Agreement, is defined as good working condition so that the Stormwater Facilities are performing their design functions. The Owner shall, at its sole cost and expense, perform all work necessary to keep the Stormwater Facilities in good working condition.

Section 3

Annual Maintenance Report of Stormwater Facilities. The Owner shall, at its sole cost and expense, cause the Stormwater Facilities to be inspected by a Utah licensed and registered engineer, and shall cause that an inspection report and certification from the engineer be submitted to the City annually. The purpose of the inspection and certification is to ensure safe and proper functioning of the Stormwater Facilities. The annual inspection shall cover all aspects of the Stormwater Facilities, including, but not limited to, the parking lots, structural improvements, berms, channels, outlet structure,

pond areas, access roads, oil/water separator, pipes, culverts, ditches, vegetation, landscaping, etc. Deficiencies shall be noted in the inspection report. The report shall also contain a certification as to whether adequate maintenance has been performed and whether the structural controls are operating as designed to protect water quality. The annual inspection report and certification shall be due by June 30th of each year and shall be on forms acceptable to the City, which acceptance shall be in writing from the City.

Section 4

City Oversight Inspection Authority. The Owner hereby grants permission to the City, its authorized agents and employees, to enter upon the Property and to inspect the Stormwater Facilities upon reasonable notice not less than two (2) business days to the Owner, except in the case of an emergency, in which case an inspection may be performed with or without notice. Such inspections shall be conducted in a reasonable manner and at reasonable times, as determined appropriate by the City. The purpose of the inspection shall be to determine and ensure that the Stormwater Facilities are being adequately maintained, are continuing to perform in an adequate manner, and are in compliance with the Act, the Ordinance, and the Stormwater Facilities Maintenance Plan.

Section 5

Notice of Deficiencies. If the City finds that the Stormwater Facilities contain any defects or are not being maintained adequately, the City shall send Owner written notice of the defects or deficiencies and provide Owner with a reasonable time, but not less than thirty (30) days, to cure such defects or deficiencies. Such notice shall be confirmed delivery to the Owner or sent certified mail to the Owner at the address listed on the County Tax Assessor.

Section 6

Owner to Maintain, Repair, and Replace. The Owner shall, at its sole cost and expense, maintain, repair, replace, change or modify the Stormwater Facilities as may be determined as reasonably necessary by the City in writing within the required cure period to ensure that the Stormwater Facilities are adequately maintained, repaired, and replaced, and continue to operate as designed and approved in writing.

Section 7

City's Corrective Action Authority. In the event the Owner fails to adequately maintain, repair, or replace the Stormwater Facilities so that the facilities continue in good working condition acceptable to the City after the notice period in Section 5 expires, then the City may issue a Citation punishable as a Misdemeanor or administrative violation per City ordinances, in addition to any State or EPA fine. The City may also give written notice that the facility storm drain connection will be disconnected. The City may also enter upon the property to maintain, replace, or repair the Stormwater Facilities and assess the costs to Owner pursuant to this Agreement. It is expressly understood and agreed that the City is under no obligation to maintain or repair the Stormwater Facilities, and in no event shall this Agreement be construed to impose any such

obligation on the City. The actions described in this Section are in addition to and not in lieu of any and all equitable remedies available to the City as provided by law for Owner's failure to remedy deficiencies or any other failure to perform under the terms and conditions of this Agreement.

Section 8

Reimbursement of Costs. In the event the City, pursuant to this Agreement, incurs any costs or expenses relating to enforcement of this Agreement, the Owner shall reimburse the City upon demand, within thirty (30) days of receipt thereof for all costs incurred by the City. After said thirty (30) days, such amount shall be deemed delinquent and shall be subject to interest at the rate of ten percent (10%) per annum. Owner shall also be liable for any collection costs, including attorneys' fees and court costs, incurred by the City in collection of delinquent payments. Any and all costs and expenses may be attached as a lien on the Owner's Property pursuant to state law, and the Owner hereby gives the City the express authority to record such a lien on the Property.

Section 9

Successor and Assigns. This Agreement shall be recorded in the County Recorder's Office and the covenants and agreements contained herein shall run with the land and whenever the Property shall be held, sold, conveyed or otherwise transferred, it shall be subject to the covenants, stipulations, agreements and provisions of this Agreement which shall apply to, bind and be obligatory upon the Owner hereto, its successors and assigns, and shall bind all present and subsequent owners of the Property described herein. The Owner or any subsequent owners may be continue to be held liable for the obligations in this Agreement unless the Owner/grantor and the purchaser/grantee sign a written assignment agreement in which the purchaser/grantee agrees to assume all obligations and requirements of this Agreement regardless of when the obligation incurred.

Section 10

Severability Clause. The provisions of this Agreement shall be severable and if any phrase, clause, sentence or provision is declared unconstitutional, or the applicability thereof to the Owner, its successors and assigns, is held invalid, the remainder of this Covenant shall not be affected thereby.

Section 11

Utah Law and Venue. This Agreement shall be interpreted under the laws of the State of Utah. Any and all suits for any claims or for any and every breach or dispute arising out of this Agreement shall be maintained in the appropriate court of competent jurisdiction in Utah County, Utah.

Section 12

Indemnification. This Agreement imposes no liability of any kind whatsoever on the City, and the Owner agrees to hold the City harmless from any liability in the event the Stormwater Facilities fail to operate properly or any violation of this Agreement takes place. The Owner shall indemnify and hold the City harmless for any and all damages,

accidents, casualties, occurrences, claims, actions, or suits which might arise or be asserted against the City from failure of Owner to comply with its obligations under this agreement relating to the Stormwater Facilities or Owner's operation of the Stormwater Facilities.

Section 13

Amendments. This Agreement shall not be modified except by written instrument executed by the City and the Owner of the Property at the time of modification, and no modification shall be effective until recorded in the Utah County Recorder's Office.

Section 14

Subordination Requirement. If there is a lien, trust deed or other property interest recorded against the Property, the trustee, lien holder, etc., shall be required to execute a subordination agreement or other acceptable recorded document agreeing to subordinate their interest to the Agreement.

Section 15

Exhibit B. The Long-Term Stormwater Management Plan (LTSWMP) must adapt to change in good judgment when site conditions and operations change and when existing programs are ineffective. Exhibit B will not be filed with the agreement at County Recorder but is included by reference and kept on file with the City Recorder. Revision applications must be filed with the City of Saratoga Springs and amended into the LTSWMP on file with the Saratoga Springs City recorder.

Section 16

Incorporation of Recitals. The Recitals set forth in the introductory paragraphs are hereby incorporated by this reference and are made a part of this Agreement.

LONG-TERM STORMWATER MANAGEMENT PLAN AGREEMENT

SO AGREED this _____day of _____20_____.

PROPERTY OWNER

By:_____ Title: _____

By:_____ Title: _____

STATE OF UTAH)
:ss.
COUNTY OF)

The above instrument was acknowledged before me by _____, this _____ day of _____, 20_____.

_____
Notary Public
Residing in: _____
My commission expires: _____

_____ CITY

By: _____ Date: _____
City Manager _____

Attest: _____
City Recorder

STATE OF UTAH)
:ss.
COUNTY OF)

The above instrument was acknowledged before me by _____, this _____ day of _____, 20_____.

_____
Notary Public
Residing in: _____
My commission expires: _____

LTSWMP

_____

Section 6

6.1 – Priority Facilities in the City of Saratoga Springs

Priority facilities in the City of Saratoga Springs are based on the facility's potential for storm water pollution based on the chemicals and materials stored on site, potential pollutants (such as vehicles, tractors, loaders, and other industrial equipment), and misuse of materials, chemicals, or equipment at a given facility. Booster Stations, Filter Stations, and Wells are also listed under City Facilities, however, harmful chemicals are not used or stored at those sights, so they are not considered potential storm water pollutant facilities. Proximity to sensitive water bodies is also taken into consideration.
All city inspections are tracked on Utilisync. The following list is a summary of the inspections required for medium and high priority facilities:

- High Priority Facilities
    - Monthly Visual Inspections
    - Semi-Annual Comprehensive Inspections
    - Annual Visual Observation of Storm Water Discharges
- Medium Priority Facilities
    - Annual Comprehensive Inspection (as needed)
    - Visual Inspections (as needed)
- Low Priority Facilities
    - Annual Inspection (as needed)

The following is a list of all facilities that are required to be inventoried. Any of the facilities which fall in the following list have been included in the summary table below:

- Composting facilities, Equipment storage and maintenance facilities, Fuel farms, Hazardous waste disposal facilities, Hazardous waste handling and transfer facilities, Incinerators, Landfills, Landscape maintenance facilities on municipal property, Materials storage yards, Pesticide storage facilities, Public buildings, including libraries, police stations, fire stations, municipal buildings, restrooms, and similar permittee-owned or operated buildings, Public parking lots, Public golf course maintenance facilities, Public swimming pool maintenance facilities, Public works yards, Public marinas and boat launches, Recycling facilities, Salt storage facilities and deicing storage facilities, Solid waste handling and transfer facilities, Street repair and maintenance facilities and or shed sites, Vehicle storage and maintenance yards, Airports, Animal control facilities, Vehicle salvage yards, Chemical storage facilities, Transportation hubs, including bus stations

Once each facility was identified, the Public Works Department filled out a worksheet to assist them in determining the prioritization of each facility. The completed worksheets are available by request. Please contact the Public Works Office for more information.

Saratoga Springs Priority Facilities List

Facility	Inspection Frequency	Potential Pollutants	Priority (Low, Medium, High)	Inspection Form	Department
Marina Park	Monthly Visual Inspection, Semi-Annual Comprehensive Inspection, Annual Observation of Storm Water Discharges	Nutrients, Hydrocarbons, Trash	High	Utilisync (Facility Inspection) for monthly visual and annual visual inspections, City Facilities & Storm Water Conveyance Systems inspection forms for Comprehensive inspections	Public Works Department, Parks Department
Public Works Facility	Monthly Visual Inspection, Semi-Annual Comprehensive Inspection, Annual Observation of Storm Water Discharges	Sediments, Nutrients, Hydrocarbons, Pesticides, Trash	High	Utilisync (Facility Inspection) for monthly visual and annual visual inspections, City Facilities & Storm Water Conveyance Systems inspection forms for Comprehensive inspections	Public Works Department
Inlet Park	Annual inspection, Visual Inspection and follow up with the Parks Department as needed	Nutrients, Hydrocarbons, Pesticides, Trash	Medium	Utilisync (Facility Inspections) for annual inspection and visual inspection	Parks Department
Patriot Park	Annual inspection, Visual Inspection and follow up with the Parks Department as needed	Nutrients, Hydrocarbons, Pesticides, Trash	Medium	Utilisync (Facility Inspections) for annual inspection and visual inspection	Parks Department
RC Airplane Park	Annual inspection, Visual Inspection and follow up with the Parks Department as needed	Nutrients, Hydrocarbons, Pesticides, Trash	Medium	Utilisync (Facility Inspections) for annual inspection and visual inspection	Parks Department
City Hall	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Public Works Department, Streets Department, Buildings Department
Fire Station 261	Annual inspection.	Nutrients, Hydrocarbons, Trash, Protein-based foam (other)	Low	Utilisync (Facility Inspection)	Fire Department
Fire Station 262	Annual inspection.	Nutrients, Hydrocarbons, Trash, Protein-based foam (other)	Low	Utilisync (Facility Inspection)	Fire Department

Facility	Inspection Frequency	Potential Pollutants	Priority (Low, Medium, High)	Inspection Form	Department
Police Station / Courthouse	Annual inspection.	Nutrients, Hydrocarbons, Trash	Low	Utilisync (Facility Inspection)	Police Department
Loch Lomond Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Shoreline Park	Annual inspection.	Nutrients, Pesticides	Low	Utilisync (Facility Inspection)	Parks Department
Devonshire Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Nature Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Harvest Hills Park	Annual inspection.	Nutrients, Hydrocarbons, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Shay Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Sunrise Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Talus Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Meridian Park (Talus Ridge Park A)	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Pinnacle Park (Talus Ridge Park B)	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Neptune Park	Annual inspection.	Nutrients, Hydrocarbons, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Triton Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Valley View Park (Bowl Park)	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Island Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Regal Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Fitness Trail Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Israel Canyon Trailhead	Annual inspection.	Nutrients, Hydrocarbons, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department

Facility	Inspection Frequency	Potential Pollutants	Priority (Low, Medium, High)	Inspection Form	Department
Remington Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Palomino Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Honeysuckle Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Lakewood Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Reid & Ursula Wayman Park	Annual inspection.	Nutrients, Hydrocarbons, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Panorama Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Mountain Moon Park	Annual inspection.	Nutrients, Pesticides, Trash	Low	Utilisync (Facility Inspection)	Parks Department
Lift Station 1	Annual inspection.	Nutrients, Bacteria, Sewage (other)	Low	Utilisync (Facility Inspection)	Sewer Department
Lift Station 2	Annual inspection.	Nutrients, Bacteria, Sewage (other)	Low	Utilisync (Facility Inspection)	Sewer Department
Lift Station 3	Annual inspection.	Nutrients, Bacteria, Sewage (other)	Low	Utilisync (Facility Inspection)	Sewer Department
Lift Station 4	Annual inspection.	Nutrients, Bacteria, Sewage (other)	Low	Utilisync (Facility Inspection)	Sewer Department
Lift Station 5	Annual inspection.	Nutrients, Bacteria, Sewage (other)	Low	Utilisync (Facility Inspection)	Sewer Department
Lift Station 6	Annual inspection.	Nutrients, Bacteria, Sewage (other)	Low	Utilisync (Facility Inspection)	Sewer Department
Lift Station 7	Annual inspection.	Nutrients, Bacteria, Sewage (other)	Low	Utilisync (Facility Inspection)	Sewer Department
Lift Station 8	Annual inspection.	Nutrients, Bacteria, Sewage (other)	Low	Utilisync (Facility Inspection)	Sewer Department
Booster 1	Not required.	None.	N/A	N/A	Water Department
Booster 2	Not required.	None.	N/A	N/A	Water Department
Booster 3	Not required.	None.	N/A	N/A	Water Department
Booster 4	Not required.	None.	N/A	N/A	Water Department
Booster 5	Not required.	None.	N/A	N/A	Water Department

Facility	Inspection Frequency	Potential Pollutants	Priority (Low, Medium, High)	Inspection Form	Department
Sunrise Booster	Not required.	None.	N/A	N/A	Water Department
Filter Station 1	Not required.	None.	N/A	N/A	Water Department
Filter Station 2	Not required.	None.	N/A	N/A	Water Department
Filter Station 3	Not required.	None.	N/A	N/A	Water Department
Filter Station 4	Not required.	None.	N/A	N/A	Water Department
Well 1	Not required.	None.	N/A	N/A	Water Department
Well 2	Not required.	None.	N/A	N/A	Water Department
Well 3	Not required.	None.	N/A	N/A	Water Department
Well 4	Not required.	None.	N/A	N/A	Water Department
Well 5	Not required.	None.	N/A	N/A	Water Department
Well 6	Not required.	None.	N/A	N/A	Water Department

6.2 – Good Housekeeping Best Management Practices

Buildings and Facilities

Spill Prevention, Storage, and Disposal of Chemicals

Potential Pollutants
☒ Sediments
☒ Nutrients
☒ Metals
☒ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)
☐ Bacteria
☒ Pesticides
☐ Chlorides
☐ Trash
☒ Other Pollutants that could be found in storm water discharges.

Spills and leaks, if not properly controlled, can adversely impact the storm drain system and receiving waters. Due to the type of work or the materials involved, many activities that occur either at a municipal facility or as a part of municipal field programs have the potential for accidental spills and leaks. Proper spill response planning and preparation can enable municipal employees to effectively respond to problems when they occur and minimize the discharge of pollutants to the environment.

Spill/leak Prevention Measures

Understand the site layout of your facility. Knowing where chemicals or oil are stored will help you to respond quickly in the event of a spill or accident. Should a hazardous spill occur, know who to contact to contain, and control the spill that has occurred. Also know the structural BMPs that are located at the facility. Finally, train personnel in material handling procedures to ensure that oil or chemicals are properly handled in a safe manner.

Spill Response Procedure

In the event of a spill:

- Assess the site and potential impacts
- Contain the material (if possible)
- Notify the proper personnel and perform evacuation procedures if necessary
- Clean up the site, or call a third-party to clean up if necessary
- Dispose of the waste material properly, and
- Keep records (including a spill report) properly

Best Practices

To quickly and effectively handle a chemical or oil spill, have the following protocols in place at your facility:

- Store liquid materials properly so that if ruptured, they will not discharge.
- Have drip pans and/or absorbent material on site for oil/chemical maintenance.
- Only transport the minimum amount of material needed for the daily activities.
- Follow the spill prevention plan located in the Public Works facility SWPPP.
- Have spill kit and spill absorbent material on site to anticipate and clean up a chemical or oil spill event.

Dumpsters and Other Waste Management

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids, and other pollutants to enter storm water runoff. The discharge of pollutants to storm water from waste handling and disposal can be prevented and reduced by tracking waste generation, storage, and disposal; reducing waste generation and disposal through source reduction, re-use, and recycling; and preventing runon and runoff.

Waste Generation/Pollution Prevention

Understanding how waste is generated, where it can contaminate storm water drainage, and how to contain it will greatly reduce storm water pollution in the City. Use measures to contain waste in bins (such as covered trash receptacles and dumpsters), understand where waste is generated and transported, dispose of waste properly at site disposal areas, and additionally, use recycling when possible at all sites where waste is generated.

City and Community Events

Plan for litter enforcement at all community and city events. During and after all city events, enforce litter control and plan events around weather conducive to the activity. Also, organize cleanup crews to provide trash cleanup after city events.

Standard Waste Control Procedures

Some standard procedures can be used to control litter and waste generation at popular areas:

- Post “No Littering” signs and enforce anti-litter laws.
- Provide a sufficient number of litter receptacles at the facility.
- Clean out and cover litter receptacles frequently to prevent contamination.
- Maintain waste containers and apply the above procedure to all trash receptacles.
- Train employees in proper waste management practices and enforce practices at the facility.

Potential Pollutants

- ☒ Sediments
- ☒ Nutrients
- ☐ Metals
- ☐ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)
- ☒ Bacteria
- ☐ Pesticides
- ☐ Chlorides
- ☐ Trash
- ☒ Other Pollutants that could be found in storm water discharges.

Sweeping Parking Lots

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through storm water runoff or non-storm water discharges. The following protocols are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Pollution Prevention

Various new practices have been implemented to control storm drain pollution in parking lots, including designing parking lots to drain towards biofilters or retentions, and installing pervious pavement to improve drainage of storm water. However, on impervious surfaces, which are most common, it is the most practical to follow some standard surface cleaning and surface repair procedures.

Potential Pollutants

- ☒ Sediments
- ☐ Nutrients
- ☒ Metals
- ☒ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)
- ☐ Bacteria
- ☐ Pesticides
- ☒ Chlorides
- ☐ Trash
- ☒ Other Pollutants that could be found in storm water discharges.

Surface Cleaning

When cleaning a parking lot surface, follow these procedures to prevent storm water contamination in the nearby storm drain:

- Use “dry” cleaning methods to prevent discharge of pollutants into the storm water conveyance system.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Block the storm drain when performing heavy cleaning and maintenance, and direct waste water toward the sanitary sewer.
- Dispose of debris and dirt at a landfill.
- Use proper material and absorbents when cleaning oil spots.

Surface Repair

Before surface repair, cover nearby storm drains and manholes with waterproof or mesh material, and perform transfer or loading procedures of hot bituminous material away from the storm drain. Use only as much water as needed for dust control, and use catch drip pans or absorbent material to catch any leakage from paving machines. When applying slurry or seal coat, perform during dry weather to prevent contamination.

Material Storage Areas, Heavy Equipment Storage Areas, and Maintenance Areas

Material Storage Areas and Heavy Equipment Storage Areas

Accidental releases of materials from above ground liquid storage tanks, drums, equipment, and dumpsters present the potential for contaminating storm waters with many different pollutants. Tanks and equipment may store many potential storm water runoff pollutants, such as gasoline, aviation gas, diesel fuel, ammonia, solvents, syrups, etc. Materials spilled, leaked, or lost from storage tanks or equipment may accumulate in soils or on other surfaces and be carried away by rainfall runoff. These source controls apply to containers and equipment located outside of a building used to temporarily store liquid materials and include installing safeguards against accidental releases, installing secondary containment, conducting regular inspections, and training employees in standard operating procedures and spill cleanup techniques.

Pollution Prevention

At storage areas, it is important to keep an inventory of the materials and heavy equipment that are being stored, and a map, or identification page to easily identify materials and equipment. Spill prone equipment and/or hazardous materials or chemicals should never be stored in direct proximity of a storm drain. Containers with hazardous chemicals should be clearly labeled. Placing drip pans or absorbent material under and around container taps will prevent the accumulation of material on the floor around the tap and container. When installing piping to a storage container, ensure that the piping is below product level, and ideally, that a shear valve with a shut-off valve is located inside the tank.

Potential Pollutants

- ☒ Sediments
- ☒ Nutrients
- ☐ Metals
- ☒ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)
- ☐ Bacteria
- ☐ Pesticides
- ☒ Chlorides
- ☐ Trash
- ☒ Other Pollutants that could be found in storm water discharges.

Storage and Handling

Whenever items are delivered and transferred to storage, ensure that all containers/materials and equipment are properly sealed or contained to prevent any leakage into the surrounding drainage area. To prevent storm water contamination during the event of a rainfall, a few simple procedures can be used to prevent contaminated runoff from the storage area:

- Cover the storage area with a roof.
- Minimize storm water runoff by enclosing the area or building a berm around it.
- Use a “doghouse” structure for storage of liquid containers.
- Build a guard rail or retention wall to prevent accidental puncture from forklifts or other vehicles.
- Use covered dumpsters for waste product containers.
- Inspect areas regularly to ensure no leakage or contamination is occurring from the containers.
- Ensure that containers are sealed by checking lids and/or checking bags for proper containment.
- Place liquid containers on top of pallets for easy transfer and identification of leakage or spill.
- If a spill occurs, contact the spill manager as outlined in the Public Works SWPPP or an appropriate third-party to contain and clean up the spill.

Maintenance Areas

Outside or indoor process equipment operations and maintenance can contaminate storm water runoff. Activities, such as grinding, painting, coating, sanding, degreasing or parts cleaning, landfills and waste piles, solid waste treatment and disposal, are examples of process operations that can lead to contamination of storm water runoff. Source controls for outdoor/indoor process equipment operations and maintenance include reducing the amount of waste created, enclosing or covering all or some of the equipment, installing secondary containment, and training employees.

Best Practices for Maintenance Areas

In addition to the activities described above in "Material Storage Areas and Heavy Equipment Storage," a few simple procedures can be performed to prevent storm water pollution in indoor or outdoor maintenance areas:

- Perform outdoor maintenance activities during dry periods.
- Use non-toxic chemicals for maintenance and minimize or eliminate the use of solvents.
- Consider enclosing the activity in a building and connecting the floor drains to the sanitary sewer.
- Cover the work area with a permanent roof.
- Minimize contact of storm water with outside process equipment operations through berming and drainage routing. If possible, connect process equipment to sanitary sewer.
- Dry clean the work area regularly.

For more information about vehicle maintenance, refer to the "Vehicles and Equipment" BMP in the following section of this report.

Potential Pollutants

☒ Sediments

☐ Nutrients

☒ Metals

☒ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)

☐ Bacteria

☐ Pesticides

☐ Chlorides

☐ Trash

☒ Other Pollutants that could be found in storm water discharges.

Parks and Open Space

Storm water runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers, and pesticides, suspended solids, heavy metals, and abnormal pH. Utilizing the following protocols will prevent or reduce the discharge of pollutants to storm water from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the storm water collection system.

Landscaping Activities (e.g. Mowing, Trimming, and Planting)

- When performing landscaping activities, do not apply chemicals (insecticide, herbicide, or fertilizer) directly to surface waters, unless the application is approved and permitted by the State.
- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.
- Check irrigation schedules so pesticides will not be washed away and to minimize non-storm water discharge. Inspect irrigation systems periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- When bailing out muddy water, consider using an alternative approach, such as pouring it over landscaped areas rather than in the storm drain.
- Use hand or mechanical weeding where practical.

Potential Pollutants

☒ Sediments

☒ Nutrients

☐ Metals

☐ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)

☐ Bacteria

☒ Pesticides

☐ Chlorides

☐ Trash

☒ Other Pollutants that could be found in storm water discharges.

Building Repair, Remodeling, and Construction

- During any type of repair, remodeling, and/or construction, do not dump toxic substances or liquid waste on the pavement, the ground, or toward a storm drain.
- When performing paint mixing and tool cleaning, use a ground cloth or oversized tub to catch any residual runoff.
- Ensure that all washing activities are directed towards the sanitary sewer, rather than the storm drain. When possible, cover the storm drain with a filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin.
- The containment device(s) must be placed at the beginning of the day, and any accumulated waste and solids must be disposed of at the end of the work day.

- When dewatering an excavation site, you may need to filter the water before discharging to a catch basin or off-site. In which case, you should direct the water through hay bales, a sediment filter, or other sediment trap.
- Store toxic materials in their proper location.

Fertilizer and Pesticide Management

- When applying fertilizer or pesticide, follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Follow manufacturers' recommendations and label directions. Pesticides must never be applied if precipitation is occurring or predicted. Do not apply insecticides within 100 feet of surface waters such as lakes, ponds, wetlands, and streams.
- Use less toxic pesticides that will do the job, whenever possible. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected, unless indicated on the manufacturers' label.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low, as recommended according to manufacturers' label.
- Work fertilizers into the soil rather than dumping or broadcasting them onto the surface, with the exception of fertilizing turf.
- Use low precipitation irrigation and cycle and soak run times to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Properly dispose of empty pesticide containers, use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Tips

For better pollution prevention on parks and open space, consider:

- Switching to non-toxic chemicals for maintenance when possible.
- Choosing cleaning agents that can be recycled.
- Encouraging proper lawn management and landscaping, including use of native vegetation.
- Encouraging the use of Integrated Pest Management techniques for pest control.
- Proper onsite recycling of yard trimmings.
- Recycling residual paints, solvents, lumber, and other material as much as possible.

Vehicles and Equipment

Fueling

Spills and leaks that occur during vehicle and equipment fueling can contribute hydrocarbons, oil and grease, as well as heavy metals to storm water runoff. Implementing the following management practices can help prevent spills and leaks.

Pollution Prevention

When refueling, use offsite fueling stations whenever possible. Such businesses are better equipped to handle fuel and spills properly. Avoid topping off gas tanks to avoid spills. Inspecting piping systems and visually inspecting leaks from vehicles will help to know how to treat the inspected problem before it becomes a hazard. Labeling drains by whether they flow to an oil/water separator, or directly to the sewer or storm drain will help to eliminate confusion about where the drain leads. Tagging or labeling valves will also reduce human error.

Vehicle and Equipment Cleaning

Wash water from vehicle and equipment cleaning activities performed outdoors or in areas where wash water flows onto the ground can contribute toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, and suspended solids to storm water runoff. Use of the procedures outlined below can prevent or reduce the discharge of pollutants to storm water during vehicle and equipment cleaning.

Best Practices

To best retain wash water and prevent storm water pollution, designate areas, and mark them clearly as a wash area. Build a berm around wash areas to prevent wash water from contaminating runoff. Know where on-site storm drain locations are, and avoid discharges to the storm drain. Provide a trash receptacle to throw away waste during cleaning. Educate employees about the storm drain, consider providing a map of the nearby storm drains, and diverting wash water away from them. Ensure nozzles and hoses are attended while washing is occurring. Check with sanitary sewer regulations to determine whether the City requires pretreatment and monitoring of wash water into the sanitary sewer. Discharge wash water to:

1. The sanitary sewer, a holding tank, or process treatment system or
2. An enclosed recycling system.

Potential Pollutants

- ☐ Sediments
- ☐ Nutrients
- ☐ Metals
- ☒ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)
- ☐ Bacteria
- ☐ Pesticides
- ☐ Chlorides
- ☐ Trash
- ☒ Other Pollutants that could be found in storm water discharges.

Vehicle and Equipment Repair

Vehicle or equipment maintenance and repair is potentially a significant source of storm water pollution, due to the use of materials and wastes created that are harmful to humans and the environment. Engine repair and service (e.g. parts cleaning), replacement of fluids (e.g. oil change), and outdoor equipment storage and parking (dripping engines) can impact water quality if storm water runoff from areas with these activities occurring on them becomes polluted by a variety of contaminants.

Best Practices

When performing vehicle maintenance, conduct repair activities indoors whenever feasible. Store idle equipment containing fluids under cover. Ensure that maintenance activities are performed away from any storm drain inlets. Also avoid hosing down maintenance areas so as to prevent storm drain runoff from the area. Use drip pans and absorbents to catch and retain oil and other unused chemicals. Performing maintenance around a curbed area will prevent large spills from flowing outside of the area.

Potential Pollutants

- ☐ Sediments
- ☐ Nutrients
- ☒ Metals
- ☒ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)
- ☐ Bacteria
- ☐ Pesticides
- ☐ Chlorides
- ☐ Trash
- ☒ Other Pollutants that could be found in storm water discharges.

Material and Waste Handling

When performing maintenance on vehicles, and other machinery, fluids drained should be contained, and disposed of properly at designated locations, or by proper services. Some simple procedures will help reduce storm water pollution by draining fluids:

- Designate a special area to drain and replace motor oil, coolant, and other fluids. This area should not have any connections to the storm drain or the sanitary sewer and should allow for easy cleanup of drips and spills.
- Drain all fluids from wrecked vehicles immediately. Ensure that the drain pan or drip pan is large enough to contain drained fluids (e.g. larger pans are needed to contain antifreeze, which may gush from some vehicles).
- Do not pour liquid waste to floor drains, sinks, outdoor storm drain inlets, or other storm drains or sewer connections.
- Do not dispose of used or leftover cleaning solutions, solvents, and automotive fluids and oil in the sanitary sewer.
- Dispose of all waste materials according to applicable laws and regulations.
- Collect leaking or dripping fluids in drip pans or containers. Fluids are easier to recycle if kept separate.
- Promptly transfer used fluids to the proper waste or recycling drums and store in an appropriately designed area that can contain spills. Don't leave drip pans or other open containers lying around.
- Do not dispose of oil filters in trash cans or dumpsters, which may leak oil and contaminate storm water. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Most municipalities prohibit or discourage disposal of these items in solid waste facilities. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.
- Store cracked and/or dead batteries in a non-leaking covered secondary container and dispose of properly at recycling or household hazardous waste facilities.

Maintenance and Repair Activities

- Provide a designated area for vehicle maintenance.
- Keep equipment clean, don't allow excessive build-up of oil and grease.

- If temporary work is being conducted outside: Use a tarp, ground cloth, or drip pans beneath the vehicle or equipment to capture all spills and drips. The collected drips and spills must be disposed, reused, or recycled properly.
- If possible, perform all vehicle fluid removal or changing inside or under cover to prevent the runon of storm water and the runoff of spills:

    - Keep a drip pan under the vehicle while you unclip hoses, unscrew filters, or remove other parts. Use a drip pan under any vehicle that might leak while you work on it to keep splatters or drips off the shop floor.
    - Promptly transfer used fluids to the proper waste or recycling drums. Don't leave drip pans or other open containers lying around.
    - Keep drip pans or containers under vehicles or equipment that might drip during repairs.
    - Do not change motor oil or perform equipment maintenance in non-appropriate areas.

- If equipment (e.g. radiators, axles) is to be stored outdoors, oil and other fluids should be drained first. This is also applicable to vehicles being stored and not used on a regular basis.
- Monitor parked vehicles closely for leaks and place pans under leaks to collect the fluids for proper disposal or recycling.
- Discharge wastewater generated from steam cleaning and pressure washing to an appropriate treatment control that is connected to a blind sump. Non-caustic detergents should be used instead of caustic cleaning agents, detergent-based or water-based cleaning systems in place of organic solvent degreasers, and non-chlorinated solvent in place of chlorinated organic solvents for parts cleaning.

Roads, Highways, and Parking Lots

Roads and Highways

Streets, roads, and highways are significant sources of pollutants in storm water discharges, and BMPs, if not conducted properly, can contribute to the problem. Storm water pollution from roadway and bridge maintenance should be addressed on a site-specific basis. Accumulation of sediment, trash, dust, silt, or other contaminants can cause hazards in the storm drain system, and ultimately adversely affect wildlife in the receiving rivers and water bodies that drains discharge into. Use of the procedures outlined below, that address street sweeping and repair, bridge and structure maintenance, and unpaved roads will reduce pollutants in storm water.

Potential Pollutants

☒ Sediments

☐ Nutrients

☒ Metals

☒ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)

☐ Bacteria

☐ Pesticides

☒ Chlorides

☐ Trash

☒ Other Pollutants that could be found in storm water discharges.

Street Sweeping and Cleaning

Proper procedures for street sweeping and cleaning are paramount for the diversion of contaminants into the storm water treatment system:

- Maintain a consistent sweeping schedule. Provide minimum monthly sweeping of curbed streets.
- Perform street cleaning during dry weather if possible.
- Avoid wet cleaning or flushing of street, and utilize dry methods where possible.
- Consider increasing sweeping frequency based on factors such as traffic volume, land use, field observations of sediment and trash accumulation, proximity to water courses, etc.
- Increase the sweeping frequency for streets with high pollutant loadings, especially in high traffic and industrial areas.
- Increase the sweeping frequency just before the wet season to remove sediments accumulated during the summer.
- Increase the sweeping frequency for the streets in special problem areas such as special events, high litter or erosion zones.
- Maintain cleaning equipment in good working condition and purchase replacement equipment as needed. Old sweepers should be replaced with new technologically advanced sweepers (preferable regenerative air sweepers) that maximize pollutant removal.
- Operate sweepers at manufacturer requested optimal speed levels to increase effectiveness.
- To increase sweeping effectiveness consider the following:

- Institute a parking policy to restrict parking in problematic areas during periods of street sweeping.
- Post permanent street sweeping signs in problematic areas; use temporary signs if installation of permanent signs is not possible.
- Develop and distribute flyers notifying residents of street sweeping schedules.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- If available use vacuum or regenerative air sweepers in the high sediment and trash areas (typically industrial/commercial).
- Keep accurate logs of the number of curb-miles swept and the amount of waste collected.
- Dispose of street sweeping debris and dirt at a landfill.
- Do not store swept material along the side of the street or near a storm drain inlet.
- Keep debris storage to a minimum during the wet season or make sure debris piles are contained (e.g. by berming the area) or covered (e.g. with tarps or permanent covers).

- Survey right-of-way areas to ensure that excess sediment or trash will not flow into storm water during a rain event.

Street Repair and Maintenance

Pavement Marking

Paint and other marking activities can contribute to storm water pollution if not conducted with care. Follow standard procedures to help reduce problems associated with painting and marking activities.

- Schedule pavement marking activities for dry weather.
- Develop paint handling procedures for proper use, storage, and disposal of paints.
- Transfer and load paint and hot thermoplastic away from storm drain inlets.
- Provide drop cloths and drip pans in paint mixing areas.
- Properly maintain application equipment.
- Street sweep thermoplastic grindings. Yellow thermoplastic grindings may require special handling as they may contain lead.
- Paints containing lead or tributyltin are considered a hazardous waste and must be disposed of properly.
- Use water based paints whenever possible. If using water based paints, clean the application equipment in a sink that is connected to the sanitary sewer.
- Properly store leftover paints if they are to be kept for the next job, or dispose of properly.

Concrete Installation and Repair

Installing concrete can also be a contributor of storm water pollution, if proper storm drain protective measures and wash off are not followed. Consider the following procedures as concrete installation, mixing, and repair activities occur:

- Schedule asphalt and concrete activities for dry weather.
- Take measures to protect any nearby storm inlets and adjacent watercourses, prior to breaking up asphalt or concrete (e.g. place sand bags around inlets or work areas).
- Limit the amount of fresh concrete or cement mortar mixed, mix only what is needed for the job.

- Store concrete materials under cover, away from drainage areas. Secure bags of cement after they are open. Be sure to keep wind-blown cement powder away from streets, gutters, storm drains, rainfall, and runoff.
- Return leftover materials to the transit mixer. Dispose of small amounts of hardened excess concrete, grout, and mortar in the trash.
- Do not wash sweeping from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stockpile, or dispose in the trash.
- When making saw cuts in pavement, use as little water as possible and perform during dry weather. Cover each storm drain inlet completely with filter fabric or plastic during the sawing operation and contain the slurry by placing straw bales, sandbags, or gravel dams around the inlets. After the liquid drains or evaporates, shovel or vacuum the slurry residue from the pavement or gutter and remove from site. Alternatively, a small onsite vacuum may be used to pick up the slurry as this will prohibit slurry from reaching storm drain inlets.
- Wash concrete trucks, mixers, and equipment off site or at washout areas (located at least 50 feet from storm drains, ditches, and water bodies).

Patching, Resurfacing, and Surface Sealing

Similar to surface cleaning and repair operations, patching, resurfacing, and surface sealing should be performed with care to protect the storm drain system, and to preserve the condition of streets. Following these procedures will help to prevent pollution, and maintain streets in their best condition:

- Schedule patching, resurfacing, and surface sealing for dry weather.
- Stockpile materials away from streets, gutter areas, storm drain inlets or watercourses. During wet weather, cover stockpiles with plastic tarps or berm around them if necessary to prevent transport of materials in runoff.
- Pre-heat, transfer or load hot bituminous material away from drainage systems or watercourses.
- Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and maintenance holes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and until all water from emulsified oil sealants has drained or evaporated. Clean any debris from covered maintenance holes and storm drain inlets when the job is complete.
- Prevent excess material from exposed aggregate concrete or similar treatments from entering streets or storm drain inlets. Designate an area for cleanup and proper disposal of excess materials.
- Use only as much water as necessary for dust control, to avoid runoff.
- Sweep, never hose down streets to clean up tracked dirt. Use a street sweeper or vacuum truck. Do not dump vacuumed liquid in storm drains.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Equipment Cleaning Maintenance and Storage

Daily cleaning and maintenance of equipment will not only help to protect storm drain pollution, but it will also preserve equipment and ensure that it is working properly, providing safety on site, and prolonged life of the equipment in use.

- Inspect equipment daily and repair any leaks. Place drip pans or absorbent materials under heavy equipment when not in use.
- Perform major equipment repairs at the corporation yard, when practical.
- If refueling or repairing vehicles and equipment must be done onsite, use a location away from storm drain inlets and watercourses.
- Clean equipment, including sprayers, sprayer paint supply lines, patch and paving equipment, and mud jacking equipment at the end of each day. Clean in a sink or other area (e.g. vehicle wash area) that is connected to the sanitary sewer.

Bridge and Structure Maintenance

In the event of bridge and structure maintenance, it is good to keep all supplies secure and gathered to one place to ensure safety, and effective operations on bridges and other structures. Following these maintenance procedures will help to keep operations speedy and moving efficiently:

- Transport paint and materials to and from job sites in containers with secure lids and tied down to the transport vehicle.
- Do not transfer or load paint near storm drain inlets or watercourses.
- Test and inspect spray equipment prior to starting to paint. Tighten all hoses and connections and do not overfill paint containers.
- Plug nearby storm drain inlets prior to starting painting where there is significant risk of a spill reaching storm drains. Remove plugs when the job is completed.
- If sand blasting is used to remove paint, cover nearby storm drain inlets prior to starting work.
- Perform work on a maintenance traveler or platform, or use suspended netting or tarps to capture paint, rust, paint removing agents, or other materials, to prevent discharge of materials to surface waters if the bridge crosses a watercourse. If sanding, use a sander with a vacuum filter bag.
- Capture all cleanup water, and dispose of properly.
- Recycle paint when possible (e.g. paint may be used for graffiti removal activities). Dispose of unused paint at an appropriate household hazardous waste facility.

Repair Work

Repair work is routine maintenance that occurs on streets and roadways, and requires routine protective measures to prevent storm drain pollution. Follow these procedures to ensure that storm drains are protected in the effected work area:

- Prevent concrete, steel, wood, metal parts, tools, or other work materials from entering storm drains or watercourses.
- Thoroughly clean up the job site when the repair work is completed.
- When cleaning guardrails or fences follow the appropriate surface cleaning methods.
- If painting is conducted, follow the painting and paint removal procedures above.
- If graffiti removal is conducted, use non-toxic chemical cleaning methods for graffiti, direct wash water away from storm drains, and vacuum runoff water wherever possible.
- If construction is taking place, follow construction activity BMPs as outlined on the Utah DEQ's construction BMPs practices web page.
- Recycle materials whenever possible.

Cold Weather Operations

The main hazard for storm drainage during cold weather is de-icing and de-skidding chemicals that enter the storm drain runoff during freeze/thaw conditions. For cold weather operations, a few standard procedures will minimize the amount of pollution that occurs during snow melt, and intermediate rainfalls during the winter season:

- Keep contaminating materials away from paved surfaces and out of accumulated or dumped snow.
- Store de-icing and other anti-skid chemicals under covered storage and mix areas.
- Use only the needed amount of de-icing and anti-skid chemicals.
- Route snow removal and meltwater to less sensitive receiving waters or treatment facilities.
- Sweep paved surfaces immediately after snowmelt.
- Enforce litter control.

Unpaved Roads and Trails

Naturally occurring storm water runoff flows through unpaved roads and trails, eroding trails if proper maintenance is not performed during rainfall and storm events. These procedures will help to protect runoff from unpaved roads and trails, and preserve these trails for recreational use:

- Stabilize exposed soil areas to prevent soil from eroding during rain events. This is particularly important on steep slopes.
- For roadside areas with exposed soils, the cost-effective choice is to vegetate the area, preferably with a mulch or binder that will hold the soils in place while the vegetation is establishing. Native vegetation should be used if possible.
- If vegetation cannot be established immediately, apply temporary erosion control mats/blankets; a comma straw, or gravel as appropriate.
- If sediment is already eroded and mobilized in roadside areas, temporary controls should be installed. These may include: sediment control fences, fabric-covered triangular dikes, gravel-filled burlap bags, biobags, or hay bales staked in place.

Parking Lots

For a comprehensive guide on maintaining parking lots, refer to the “Sweeping Parking Lots” section in “Buildings and Facilities Operation and Maintenance” found at the beginning of this report.

Storm Water Collection and Conveyance System

Drainage System Maintenance

As a consequence of its function, the storm water conveyance system collects and transports urban runoff that may contain certain pollutants. Maintaining catch basins, storm water inlets, and other storm water conveyance structures on a regular basis will remove pollutants, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Catch Basins/Inlet Structures

When inspecting catch basins and inlet structures, City employees should regularly inspect facilities to ensure the following:

- Immediate repair of any deterioration threatening structural integrity.
- Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
- Stenciling of catch basins and inlets.

Cleaning catch basins, storm drain inlets, and other conveyance structures in high pollutant load areas just before the wet season prevents sediment and debris accumulation during the summer. Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often, then clean and repair as needed. Whenever an inspection is conducted, keep accurate logs of the number of catch basins cleaned (mark the catch basins and inlet structures to be recorded in the City GIS system). Record the amount of waste collected. Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain. Before disposing of wastes, dewater the waste with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed of. Do not dewater near a storm drain or stream. Except for small communities with relatively few catch basins that may be cleaned manually, most municipalities will require mechanical cleaners such as eductors, vacuums, or bucket loaders.

Potential Pollutants

- ☒ Sediments
- ☒ Nutrients
- ☐ Metals
- ☒ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)
- ☒ Bacteria
- ☐ Pesticides
- ☐ Chlorides
- ☒ Trash
- ☒ Other Pollutants that could be found in storm water discharges.

Storm Drain Conveyance System

When inspecting storm drains, locate reaches of the storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup (flush as priority requires). Collect flushed effluent and pump to the sanitary sewer for treatment.

Pump Stations

Pump stations can often be a source of storm water pollution if not properly, and routinely inspected and cleaned. Prior to wet season, cleaning all storm drain pump stations will prevent silt and trash from entering the storm drain. Do not allow discharge from cleaning a storm drain pump station or other facility to reach the storm drain system. Consider conducting quarterly routine maintenance at each pump station. Inspect, clean, and repair as necessary all outlet structures prior to the wet season. Sample collected sediments to determine if landfill disposal is possible, or illegal discharges in the watershed are occurring.

Open Channel

Consider modification of storm channel characteristics to improve channel hydraulics, to increase pollutant removals, and to enhance channel/creek aesthetic and habitat value. If lined with rip rap, inspect the channel slopes for trash or any other neglected debris that could pollute the open channel.

Swales and Detention Basins

Conduct inspections on swales and detention basins annually before the wet season. When inspecting swales and detention basins, make sure that there is no erosion in the basin and bed, and remove any sediment or debris that

has accumulated that may inhibit flow. Check to make sure that vegetation is naturally growing around the swale and basin, and observe any damage to the swale or basin that may have been caused by local activity, or wildlife.

Storm Drain Flushing

Pipe flushing is a common practice that is used to clean organic material out of pipe systems to increase water quality, flow, and longevity of the system. Commonly pipe flushing is performed on sewer pipe systems, but flushing of storm drain systems is recommended as well. Flushing in pipes with a 36” diameter or less is most effective. Typically the length of line for flushing should not exceed 700 feet. At this length, the percent removal efficiency ranges between 65-75 percent for organics, and 55-65 percent for dry weather grit/inorganic material. To make the best use of water, it is recommended to that storm drain flushing coincide with fire hydrant flushing.

Other Facilities and Operations

Water and Sewer Utility Maintenance

Although the operation and maintenance of public utilities are not considered chronic sources of storm water pollution, some activities and accidents can result in the discharge of pollutants that can pose a threat to both human health and the quality of receiving waters if they enter the storm drain system. Sewage incident response and investigation may involve a coordinated effort between staff from a number of different departments or agencies.

Using Good Judgment

Inspect potential non-storm water discharge flow paths and clear or cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills). Frequent flushing of water lines, fire hydrant testing, flushing water supply mains after new construction, and dewatering mains for maintenance work will all contribute to clean water that is free of pollution to flow into storm drain systems. Some practices contribute to storm water pollution prevention in water mains:

- Reusing water for dust suppression, irrigation, or construction compaction.
- Discharging to sanitary sewer system with approval.
- Discharging to the storm drain system using applicable pollution control measures.

When water is discharged to the storm drain, ensure that these controls are in place:

- Silt fence—appropriate where the inlet drains a relatively flat area.
- Gravel and wire mesh sediment filter—appropriate where concentrated flows are expected.
- Wooden weir and fabric—use at curb inlets where a compact installation is desired.

Prior to discharge, inspect the discharge flow path and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).

General design considerations for inlet protection devices include the following:

- The device should be constructed such that cleaning and disposal of trapped sediment is made easy, while minimizing interference with discharge activities.
- Devices should be constructed so that any standing water resulting from the discharge will not cause excessive inconvenience or flooding/damage to adjacent land or structures.

The effectiveness of control devices must be monitored during the discharge period and any necessary repairs or modifications made.

Unplanned Discharges

Whenever any unplanned discharges occur, take steps to immediately prevent the pollution of nearby storm drain inlets or water bodies:

- Stop the discharge as quickly as possible.
- Inspect flow path of the discharged water:
    - Identify erodible areas which may need to be repaired or protected during subsequent repairs or corrective actions.
    - Identify the potential for pollutants to be washed into the waterway.
- If repairs or corrective action will cause additional discharges of water, select the appropriate procedures for erosion control, chlorine residual, turbidity, and chemical additives. Prevent potential pollutants from entering the flow path.

Sanitary Sewer Maintenance

Though pollution of the storm drain system from the sewer utility is unlikely, it is still necessary to take precautions to prevent such a catastrophe from occurring. Lift and pump stations in particular are susceptible to storm water

and nearby water body pollution, and if not routinely and properly maintained, may result in an unexpected catastrophe. Some basic sewer maintenance care can prevent hazardous contamination from occurring:

- Clean sewer lines on a regular basis to remove grease, grit, and other debris that may lead to sewer backups.
- Establish a routine maintenance program. Cleaning should be conducted at an established minimum frequency and more frequently for problem areas such as restaurants that are identified.
- Cleaning activities may require removal of tree roots and other identified obstructions.
- During routine maintenance and inspection, note the condition of sanitary sewer structures and identify areas that need repair or maintenance. Items to note may include the following:
    - Cracked/deteriorating pipes
    - Leaking joints/seals at manhole
    - Frequent line plugs
    - Line generally flows at or near capacity
    - Suspected infiltration or exfiltration.
- Prioritize repairs based on the nature and severity of the problem. Immediate clearing of blockage or repair is required where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, sewer line blockages). These repairs may be temporary until scheduled or capital improvements can be completed.
- Review previous sewer maintenance records to help identify “hot spots” or areas with frequent maintenance problems and locations of potential system failure.

Spills and Overflows

- Identify and track sanitary sewer discharges. Identify dry weather infiltration and inflow first. Wet weather overflow connections are very difficult to locate.
- Locate wet weather overflows and leaking sanitary sewers using conventional source identification techniques such as monitoring and field screening. Techniques used to identify other illicit connection sources can also be used for sewer system evaluation surveys.
- Implement community awareness programs for monitoring sanitary sewer wet weather overflows. A citizen’s hotline for reporting observed overflow conditions should be established to supplement field screening efforts.
- Establish lead department/agency responsible for spill response and containment. Provide coordination within departments.
- When a spill, leak, and/or overflow occurs and when disinfecting a contaminated area, take every effort to ensure that the sewage, disinfectant, and/or sewage treated with the disinfectant is not discharged to the storm drain system or receiving waters. Methods may include:
    - Blocking storm drain inlets and catch basins
    - Containing and diverting sewage and disinfectant away from open channels and other storm drain fixtures (using sandbags, inflatable dams, etc.)
    - Removing the material with vacuum equipment
- Record required information at the spill site.
- Perform field tests as necessary to determine the source of the spill.
- Develop notification procedures regarding spill reporting.

Septic Systems

- Ensure that homeowners, installers, and inspectors are educated in proper maintenance of septic systems. This may require coordination with staff from other departments. Outreach to homeowners should include inspection reminders informing them that inspection and perhaps maintenance is due for their systems. Recommend that the system be inspected annually and pumped-out regularly.
    - The average household septic system should be inspected at least every three years by a septic service professional.

    - Household septic tanks are typically pumped every three to five years.
    - Four major factors influence the frequency of septic pumping:
        - Household size
        - Total wastewater generated
        - Volume of solids in wastewater
        - Septic tank size
    - Generally, if the sludge layer is within 12 inches of the outlet, your tank needs to be pumped.
- The following assist in maintaining the condition of the septic system by using water efficiently:
    - High-efficiency toilets
    - Faucet aerators and high-efficiency showerheads
    - Washing machines-selecting the proper load size will reduce waste water.
- Never dispose of trash, feminine products, or chemicals in the toilet.
- Programs which seek to address failing septic systems should consider using field screening to pinpoint areas where more detailed onsite inspection surveys are warranted.

Disposal of Pool Water

Properly disposing of pool water and chemicals will ensure that no pollutants are found in the storm drain. These procedures help to properly dispose of pool chemicals, and ensure that the storm drain remains uncontaminated:

- Never discard of pool or spa chemicals in the trash or pour them down a drain, toilet, on the ground, or in a storm drain.
- Use chemicals only in the pool.
- Ensure residents know where to properly dispose of their pool chemicals at the following locations:
    - A pool company
    - Community clean up events
    - The waste management department
    - A household hazardous waste facility

Grease Traps

- Monthly inspection of grease traps should be performed by the City.
- Grease traps should be cleaned when they have reached greater than 25% capacity.

Housekeeping

Promote efficient and safe housekeeping practices (storage, use, and cleanup) when handling potentially harmful materials such as fertilizers, pesticides, cleaning solutions, paint products, and automotive products, and swimming pool chemicals.

Pollution Prevention

To prevent soluble waste water, purchase only the amount of material that will be needed for the foreseeable use. In most cases this will result in cost savings in both purchasing and disposal. Also, be aware of new products that may do the same job with less environmental risk and for less or the equivalent cost. Total cost must be used here; this includes purchase price, transportation costs, storage costs, use related costs, cleanup costs, and disposal costs.

Potential Pollutants

- ☒ Sediments
- ☒ Nutrients
- ☒ Metals
- ☒ Hydrocarbons (e.g. benzene, toluene, ethylbenzene, and xylene)
- ☒ Bacteria
- ☒ Pesticides
- ☒ Chlorides
- ☒ Trash
- ☒ Other Pollutants that could be found in storm water discharges.

General

Some simple work practices can keep both your shop clean, and your storm drain pollution free. Following these procedures will help to keep the work site contaminant free:

- Keep work sites clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Dispose of wash water, sweepings, and sediments properly.
- Recycle or dispose of fluids properly.
- Establish a daily checklist of office, yard, and plant areas to confirm cleanliness and adherence to proper storage and security. Specific employees should be assigned specific inspection responsibilities and given the authority to remedy any problems found.

- Post waste disposal charts in appropriate locations detailing for each waste its hazardous nature (poison, corrosive, flammable), prohibitions on its disposal (dumpster, drain, sewer) and the recommended disposal method (recycle, sewer, burn, storage landfill).
- Summarize the chosen BMPs applicable to your operation and post them in appropriate conspicuous places.
- Require a signed checklist from every user of any hazardous material detailing amount taken, amount used, amount returned, and disposal of spent material.
- Do a before audit of your site to establish baseline conditions and regular subsequent audits to note any changes and whether conditions are improving or deteriorating.
- Keep records of water, air, and solid waste quantities and quality tests and their disposition.
- Maintain a mass balance of incoming, outgoing, and on hand materials so you know when there are unknown losses that need to be tracked down and accounted for.
- Use and reward employee suggestions related to these procedures: hazards, pollution reduction, work place safety, cost reduction, alternative materials and procedures, recycling, and disposal.
- Have, and review regularly, a contingency plan for spills, leaks, weather extremes, etc. Make sure all employees know about it and what their role is so that it comes into force automatically.

Best Management Practices for City Owned and/or Operated Facilities and related inspections are tracked on Utilisync. Please contact the Public Works Director or the Stormwater Program Administrator for more information.

6.3 – Training

Training is completed by various department heads as they see fit for their respective departments. They are each given a copy of the updated plan and are expected to inform the employees of their department of the relevant sections.

ERRATA SHEET

The following changes are proposed by Saratoga Springs and have been incorporated into the Saratoga Springs Storm Water Management Program document.

SUMMARY OF CHANGES – JUNE 2021

Page	Date	Summary of Change
162-166	6/18/21	Updated the list of City priority facilities to match most recent City conditions, updated preceding text
13	6/18/21	Updated brochure section to allow electronic distribution of brochures
26	6/18/21	Updated text to state dry weather screening is tracked on Utilisync and not within this document
43	6/21/21	Update required inspections to match most recent MS4 permit requirements
62-87	6/21/21	Updated City Code to most recent Saratoga Springs Code
89-93	6/21/21	Updated information regarding City Website, Brochures, and Training
105	6/21/21	Updated Coalition contact information and websites
106-108	6/21/21	Added benefits of onsite infiltration & updated tables
109-111	6/22/21	Updated section 2 in the appendices to reflect updated public involvement information
118-121	6/22/21	Added the “Characterizing the Nature of Illicit Discharges” SOP
155	6/22/21	Updated the Storm Water Protection Information page
156-161	6/22/21	Updated LTSWMP Agreement
All	6/22/21	Updated formatting & minor edits that do not affect content of the SWMP