City of Gladstone MS4
Stormwater Management Plan
2021 – 2026

DRAFT – 2/16/21

MCMs

MCM 1. Public Education and Outreach of Stormwater Impacts

The MS4 Operator shall implement a public education program to distribute educational materials to the community and/or conduct equivalent outreach activities about impacts of stormwater discharges on water bodies and the steps that the public can take to reduce pollutants in stormwater runoff.

4.1A-F: The target audiences, target and sources of pollution, and BMP goals of MCM 1 are summarized in Table 1, Table 2, and Table 3 below.

Table 1,2: Target Audiences & BMP Goals

Target Audiences:	Explanation of why audience was chosen:	Target Pollutants:	Sources of Pollution:	Educational BMP(s)	BMP Goals
Residents	Improperly managed yards and pets can lead to the introduction of unwanted chemicals, nutrients and algae blooms in our watersheds and degradation of stream banks.	Fertilizers, chemicals/ toxics, yard waste	Poor lawn care, management of yard waste, and proper pet waste	Distribute educational materials at City events and facilities; provide an educational message on water bills.	Educate residents of Gladstone about the negative effects these activities can have on our watersheds.
Contractor	Improperly managed land disturbance sites lead to sediment runoff, chemical/toxics spills, trash/waste/floatables leaving the site.	Sediment/ Suspended Solids, chemicals/ toxics, floatables	Contractor and employees	Site management discussion during pre-construction meeting. Monthly (or when required) inspections of land disturbance site BMPs will be performed and any needed corrections made.	Educate construction workers on the importance of proper installation of site BMPS and site management to reduce target pollutants in runoff.
Elementary Schools	Gladstone has 5 elementary schools - children are eager to learn about their environment.	Sediment/ suspended solids, chemicals/ floatables	This program focuses on many different sources	Using a watershed model developed by Enviroscape, City will demonstrate how stormwater runoff carries pollutants and hot to mitigate these impacts.	Educate elementary age children.

Table 3: Outreach and Educational BMPs

BMPs:	Measurable goals (The quantity or frequency required to count as a full BMP)	Tracking & Adaptive Management
Information on the City's website	Maintain a webpage throughout the year with up to date information & working links. All links will be checked and the page will be updated as necessary at minimum twice annually.	The number of hits shall be tracked. Gladstone will use this to see which messages get reactions and if certain messages may need more education.
Maintain or mark existing storm inlets with "No Dumping – Drains to Stream" or similar message and require the installation of permanent markings on all new structures.	Placard, stencil, or paint, a minimum of 10% of existing public stormwater inlets in the City per year and permanently mark all new inlets.	Number of inlets, the location of the inlets and how they were marked will be tracked. These areas shall be noted on MCM #3 dry weather screenings and illicit discharge investigations as a method to determine if the markings are effective or if areas could benefit from the markings.
MARC Water Quality Education Committee	Actively participate in water quality education meetings	Track attendance and distribution of committee related materials.
Publish Article in "Coming Home to Gladstone" Magazine	Develop topics that are group specific and address activities and or pollutants of concern at a seasonally appropriate time. A minimum of one article will be published annually.	Track the number of magazines distributed to the public.
MARC Solid Waste Management Committee	Actively participate in the MARC Solid Waste Committee including participation in the Household Hazardous Waste Program	Track the number of meetings attended, events hosted, and the number of participants.
Brochures	Maintain brochures developed in partnership with the MARC Water Quality Education Committee at City facilities including Public Works, City Hall, and the Community Center	The number of brochures that are distributed will be tracked each year along with other activities performed by the Water Quality Education Committee.

Table 4: Involvement BMPs

BMPs	Measureable Goals (The quantity or frequency required to count as a full BMP)	Tracking & Adaptive Management
Regional Yard Waste Recycling Facility	Continue to collect yard waste at the Public Works facility from the Cities of Gladstone, Pleasant Valley, Liberty, Parkville, and Lake Waukomis.	Track the volume of material that is collected and ground for use as mulch.
Cleanup Events	Host a minimum of 2 cleanup events per year including a Spring Beautification Event and Household Hazardous Waste Disposal Event.	Track the amount of material that is collected and the number of vehicles that participate.
Engage the public to mark existing storm inlets with "No Dumping – Drains to Stream" or similar message.		Track the number of inlets, the location of the inlets and how they were marked.
School Presentations	Provide one booth or display (with school approval) at one elementary school within the City limits annually.	Record the number of interactions, the overall attendance, the topic covered, and any educational materials distributed.

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MCM 2. Public Involvement/Participation in Program Development

The permittee shall develop and implement a comprehensive public participation program that provides opportunities for public participation in the development and oversight of the permittee's Stormwater Program.

The program must provide opportunities for public participation of the permittee's permit renewal and shall, at a minimum, comply with state and local public notice requirements. Additionally, the program must provide opportunities for public participation in activities related to developing and implementing the Stormwater Management Program.

4.2A, B, C: Gladstone will hold a public notice period for thirty (30) days to allow the public to review the draft permit and MS4 Stormwater Management Program prior to submission of the renewal application. As part of the public notice, Gladstone will develop a method to accept and respond to comments. A public meeting will be hosted by the City upon completion of the thirty (30) day notice. The date, time, attendance log, and all related correspondence will be documented and retained.

4.2.D: Gladstone will accept public inquires and concerns regarding stormwater utilizing the following methods:

- Telephone – Normal Business Hours — Public Works at 816-436-5442
  After Hours — Public Safety at 816-436-3550
- Email – stormwater@gladstone.mo.us
- E-Services via City Website (www.gladstone.mo.us)

All inquiries and responses are logged and recorded via the City's in-house Excalibur work order system.

4.2.E: The City of Gladstone has an Environmental Management Advisory Committee (EMAC) that meets quarterly. City staff will update the committee at a minimum, annually with the state of, or updates on, the Stormwater Management Program.

4.2.F: City staff will update the Gladstone Council at a minimum, annually with state of, or updates on, the Stormwater Management Program.

4.2.G, H, I: Gladstone shall utilize mechanisms, where appropriate, to track attendance, inquires or concerns, and other information that may be deemed useful to improve the Public Participation Program.

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MCM 3. Illicit Discharge Detection and Elimination

The permittee shall implement and enforce a program to detect and eliminate illicit discharges (as defined in 10 CSR 20-6.200 at 40 CFR 122.26(b)(2)) into the permittee's regulated MS4.

4.3.A, B: The City maintains GIS mapping of the storm sewer system that identifies the system boundaries and the location of outfalls. This data is accessible to all City staff via Integrity, a web-based software solution to access, edit, and analyze GIS data maintained by Midland GIS Solutions. Furthermore, the City retains an extensive file of as-built data.

4.3.C: The City has adopted an Illicit Discharge Detection and Elimination ordinance to effectively prohibit unauthorized non-storm water discharges into the storm sewer system and implement appropriate enforcement procedures and actions. The ordinance can be viewed at the following link:

https://library.municode.com/mo/gladstone/codes/code_of_ordinances?nodeId=COOR_TITVIUTTA_CH120ILDIDEEL

4.3.D-N: The City will conduct outfall field assessments in accordance with the "Illicit Detection and Elimination – A Guidance Manual for Program Development and Technical Assessments." All data will be recorded in the City's in-house Excalibur work order system. Laboratory sampling will be performed by an outside laboratory when necessary. Possible parameters that may be sampled for include but are not limited to: pH, oil and grease, E-coli and fecal coliform, surfactants and fluorescence concentration, specific conductivity, ammonia, chlorine, dissolved oxygen, and fluoride/hardness.

The City has an SOP in place for detecting and addressing unauthorized non-stormwater discharges, including illegal dumping, into the City's MS4.

4.3.O, P: Gladstone will evaluate the current program within this permit and any necessary revisions will be implemented within the first year of the permit cycle. Futhermore, facilities not contained on the stormwater map will be added within the first 2 years of the permit cycle.

4.3.Q,R: The City will develop an in-house plan that will focus on educating City staff who may come in contact with or observe an illicit discharge or illicit connect to the storm system. The target audience will include engineering, code enforcement, streets, stormwater, water, sanitary sewer, fleet maintenance, and parks and recreation. The City will use educational material available from a variety of sources including the Mid-America Regional Council. Each staff member will be required to obtain a minimum of 30-minutes of training annually on MCM 3. The training dates, topics, and attendance will be recorded and the plan will be reviewed annually.

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MCM 4. Construction Site Stormwater Runoff Control

The MS4 Operator shall develop, implement and enforce a program to reduce pollutants in any stormwater runoff to their MS from construction activities that result in land disturbance of greater than or equal to one acre. Reduction of stormwater discharges from construction activities less than one acre shall be included in the program if that construction is part of a larger common plan of development or sale that would disturb one acre or more.

4.4.A: The City of Gladstone has adopted an Erosion and Sediment Control ordinance that requires a permit for all construction activities that disturb greater than or equal to 200 square feet. Furthermore, a Missouri Department of Natural Resources permit is required for construction activities that disturb one-acre or more. Enforcement actions including fines and stop work orders are outlined in the ordinance. The ordinance is linked below:

https://library.municode.com/mo/gladstone/codes/code_of_ordinances?nodeId=COOR_TITIXBUCOORBA_CH2200ERSECO_S9.2200.050ERSECOPL

4.4.B: The City of Gladstone will continue to perform a pre-construction plan review of all new development, redevelopment, and capital construction projects and:

1. The site plan review will be consider the following factors:
    a) Soil erosion potential;
    b) Site slope;
    c) Project size and type;
    d) Sensitivity of receiving waterbodies;
    e) Proximity to receiving waterbodies; and
    f) Other factors relevant to the MS4 service area.
2. Use a checklist, or other listed criteria, to ensure consistency and completeness.
3. Include requirements for construction site operators to select, install, implement, and maintain appropriate stormwater control measures.
    a) This includes temporary BMPs throughout the life of the land disturbance, and permanent BMPs, which remain on site as required by local codes and ordinances.
4. Consider ways to minimize disturbed areas through actions such as, phased construction requirements, temporary seeding or sodding, or erosion mats to exposed areas.
5. Include requirements for construction site operators to control construction-site waste that may cause adverse impacts to water quality including:
    a) Discarded building materials;
    b) Concrete truck and mortar mix washout;
    c) Chemicals (such as fertilizer, paint, oils, herbicides, pesticides);
    d) Litter; and
    e) Sanitary waste.

4.4.C: The construction site stormwater program will implement at a minimum:

1. Identify priority sites for inspection based on nature of the construction activity, topography, disturbed area, and the characteristics of soils and sensitivity of, or proximity to, receiving water;
2. Construction site inspections shall be performed weekly and shall include an assessment of compliance with SWPP developed for the project and applicable ordinances;
3. The inspections shall evaluate any structure that functions to prevent pollution of stormwater or to remove pollutants from stormwater and use enforcement polices to require BMPs are implemented and effective;
4. Upon completion of the land disturbance and prior to final approval of the project, ensure all disturbed areas have been stabilized and that all temporary erosion and sediment control measures are removed.
5. The inspections conducted by Gladstone will be documented with a checklist and include a review of self-inspections performed by the site operator.
6. Enforcements actions available to Gladstone include:
    a) Bonding and/or escrow
    b) Education
    c) Written warnings or notice of violation
    d) Fines
    e) Stop Work Order

4.4.E: Gladstone will require all construction operators to inspect all BMPs on weekly basis and within 24 hours of rainfall event of 0.5 inches or more.

4.4F: Gladstone will maintain an inventory of public and private land disturbance sites at all times. This inventory shall include the project details including size, location, local contact, and land disturbance priority. Private land disturbance activities will be tracked by the Community Development Department. Public projects will be tracked by the Public Works Department

4.4G: Gladstone will track all oversite inspections including inspector name, date and time, inspection findings, and follow-up actions, if necessary.

4.4H, I: Gladstone will review its stormwater management program including ordinances, permitting procedures, review procedures, inspection procedures and enforcement procedures to ensure compliance with these requirements. Any changes, including development of a project inventory, will be completed within one (1) year of this permit issuance.

4.4J: Gladstone will receive and consider public input regarding land disturbance sites as described in Section 4.2D.

4.4K: The City will develop an in-house plan that will focus on educating City staff who deal with construction site runoff. The target audience will include engineering, code enforcement, streets, stormwater, water, sanitary sewer, fleet maintenance, and parks and recreation. The City will use educational material available from a variety of sources including the Mid-America Regional

Council. Each staff member will be required to obtain a minimum of 30-minutes of training annually on MCM 4. The training dates, topics, and attendance will be recorded and the plan will be reviewed annually.

4.4L: Gladstone will develop written procedures for inspectors to ensure consistency among inspections.

4.4M: Gladstone will review annually the Construction Site Runoff Control Program and make adjustments as necessary.

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MCM 5. Post-Construction Stormwater Management in New Development and Redevelopment

The MS4 Operator shall continue or develop, implement, an enforce a program to address the quality of long-term stormwater runoff from new development and redevelopment projects that disturb equal to and greater than one acre or more including projects less than one acre that are part of a larger common plan of development or sale that would disturb one acre or more and that discharge into the regulated MS4.

4.5.A: Gladstone has adopted the most current version of Section 5600 "Storm Drainage Systems & Facilities" of the Kansas City Metro Chapter of the American Public Works Association (APWA) Standard Specifications, which requires the installation of stormwater BMPs for comprehensive stormwater control. A link to this specification can be found below.

http://kcmetro.apwa.net/Content/Chapters/kcmetro.apwa.net/File/Specifications%2FAPWA%205600_16FEB2011%20minor%20correction%20pg%2067.pdf

4.5B: Gladstone has developed flexible program that allows operators to develop site-specific plans that minimize impacts to water quality and fit the site. The Mid-America Regional Council/APWA BMP Manual is the document utilized by the majority of developers within the community. Structural controls considered by the City include extended detention, bio-swales, rain gardens, stormwater planters, and propriety BMP items. Non-structural BMPs may include stream buffers, minimal/no-mow zones, tree preservation, buffer zones, and protection of sensitive areas. Furthermore, the City has adopted a regional approach to stormwater management including the construction of five (5) regional detention/BMP basins and the development of a linear trail park/trail system to preserve natural areas.

4.5.C: A pre-construction plan review is conducted by the City on all public and private projects.

4.5.D: Gladstone will utilize existing public nuisance ordinances to address long-term maintenance of post-construction BMP features.

https://library.municode.com/mo/gladstone/codes/code_of_ordinances?nodeId=COOR_TITIXBUCOORBA_CH1000ABNU_S9.1000.000PUNUPUDE

4.5.E: Gladstone will inspect, or require inspection of, each water quality structural and non-structural post-construction BMP according to the following schedule:

1. A minimum of one (1) inspection will be conducted during construction, and one (1) inspection before the site is finalized, to verify water quality facilities are built as designed and any applicable boundaries or practices for non-structural BMPs are being observed.
    a) The MS4 inspector shall have access to the approved plans to ensure proper installation.
2. A minimum of once in the first three (3) years after the installation.
3. Annually by the owner or operator of the post-construction BMP and a report submitted to the City of Gladstone.

4. The MS4 Operator shall inspect a minimum of 60% of all water quality post-construction BMPs within the five (5) year permit cycle. This must include installations with ongoing or open enforcement issues.

4.5.F: Gladstone will utilize existing public nuisance ordinances to address long-term maintenance of post-construction BMP features. The enforcement response will consider the following:

1. Degree and duration of the violation;
2. Effect the violation has on the receiving water;
3. Compliance history of the post-construction BMP owner or operator; and
4. Cooperation of the owner or operator with compliance efforts.

4.5.G: Gladstone will begin enforcement action within the timeframe allowed by Missouri statute. Enforcement action may include:

1. Education regarding the BMP and verbal warnings;
2. Written warnings or notice of violation;
3. Fines;
4. Property lien

4.5.H: Gladstone will maintain an inventory tracking the water quality post-construction BMPs. This inventory will include:

1. Relevant contact information for the responsible person(s) or entity (e.g., tracking number, name, address, phone, etc.);
2. The type of post-construction BMP;
3. Applicable operations and maintenance documents;
4. Date that Gladstone approved the construction site plan; and,
5. Record of all maintenance on City-owned facilities.

4.5.I: Gladstone will track post-construction BMP inspections. This may be done by retaining copies of records such as inspection checklists and email correspondence. The MS4 Operator must make these inventories available to the Department upon request. Gladstone will tract at a minimum:

1. Inspection dates/ times;
2. Inspector name(s);
3. Inspection findings; and,
4. Follow up actions including all enforcement actions

4.5.J/K: Gladstone will evaluate its existing ordinance and procedures and changes necessary to comply with this permit will be completed within the first two (2) years of permit issuance.

4.5.L: The City will develop an in-house plan that will focus on educating City staff who deal with post-construction stormwater management. The target audience will include engineering, code enforcement, streets, stormwater, water, sanitary sewer, fleet maintenance, and parks and recreation. The City will use educational material available from a variety of sources including the Mid-America Regional Council. Each staff member will be required to obtain a minimum of 30-minutes of training annually on MCM 5. The training dates, topics, and attendance will be recorded and the plan will be reviewed annually.

4.5.M: Gladstone will review the post-construction stormwater management program annually to evaluate the effectiveness of the program.

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MCM 6. Pollution Prevention/Good Housekeeping for Municipal Operations

The permittee shall develop and implement an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

4.6.A-C: The City has an in-house plan that focuses on educating City staff who deal with municipal operations. The target audience will include engineering, code enforcement, streets, stormwater, water, sanitary sewer, fleet maintenance, and parks and recreation. The City will use educational material available from a variety of sources including the Mid-America Regional Council. Each staff member will be required to obtain a minimum of 30-minutes of training annually on MCM 6. The training dates, topics, and attendance will be recorded and the plan will
be reviewed annually.

4.6.D-I: The City has developed an SOP to address MCM 6.

4.6.J: The City of Gladstone will ensure new flood management projects are assessed for impacts on water quality and existing projects are assessed for incorporation of additional water quality protection devices or practices. New flood management projects completed by private developers must contain BMPs to address the treatment of the water quality storm. The City of Gladstone rarely completes new flood management projects. However, in the event that one is scheduled on the capital projects list, the City Engineer will review the plans to determine if the water quality storm has been effectively treated. Any information related to new or retrofitted flood management projects will be included in the biennial report.

4.6.K, L: Gladstone will evaluate its existing procedures and procedures and changes necessary to comply with this permit will be completed within one (1) year of this permit issuance.

4.6.M: Gladstone will review its Municipal Operations Program annually to evaluate the effectiveness of the program.

APPENDICES

Standard Operating Procedure: Erosion and Sediment Control for Construction Sites

Responsible Staff: City Staff/Contractors

Facilities: Active Construction Sites

Description:

During the construction phase, it is important to inspect active sites regularly to ensure that practices are consistent with approved site plans and the site's Stormwater Pollution Prevention Plan (SWPPP) or other document. The following guidelines apply:

1. A SWPPP will be prepared that clearly identifies the type and location of Best Management Practices (BMPs) and the responsible party for maintaining these facilities.
2. Erosion and sediment control features should be constructed before initiating activities that remove vegetated cover or otherwise disturb the site. These shall be installed consistent with the approved site plans and with manufacturer's instructions. Existing vegetation should be maintained on site as long as possible.
3. Gladstone will require all construction operators to inspect all BMPs on weekly basis and within 24 hours of rainfall event of 0.5 inches or more (see attached).
4. Construction should proceed progressively on the site in order to minimize exposed soil, and disturbed areas restored as soon as possible after work has been completed.
5. Water should be diverted away from disturbed areas to prevent erosion and sedimentation.
6. Sediment basins and sediment barriers should be cleaned out regularly.
7. Vegetated buffers should be protected.
8. Dust control shall be performed which may consist of light watering.
9. Streets shall be kept free from dirt and debris. This may be accomplished through designated construction entrances and mechanical street sweeping.

Erosion and Sediment Control Inspection Guidelines:

1. Plan the inspection before visiting the site:
    a. Review all supporting documentation including site plan, previous inspection reports, and other applicable information.
2. If it's a planned visit, meet with the Contractor to:
    a. Review the SWPPP or other documentation as needed

b. Get a general overview of the project
c. Review contractor inspections
d. Status of corrective issues
e. Discuss complaints or incidents since last meeting

3. Inspect the perimeter controls including the structural integrity of BMPs.
4. Inspect the slopes and temporary stockpiles
5. Compare BMPs to the site plan approved for construction.
6. Inspect the construction entrances/exits.
7. Inspect sedimentation basins.
8. Inspect pollution prevention and good housekeeping practices.
9. Inspect discharge points and downstream areas that may be affected by the work.
10. Meet with the contractor prior to leaving to discuss the effectiveness of the controls and to address concerns.

CONSTRUCTION SITE OPERATOR
INSPECTION AND MAINTENANCE REPORT FORM
TO BE COMPLETED EVERY 7 DAYS AND WITHIN 24 HOURS OF A RAINFALL EVENT OF 0.5 INCHES OR MORE

INSPECTOR:_____ DATE:_____

INSPECTOR'S QUALIFICATIONS:

_____

_____

TIME SINCE LAST RAINFALL:_____

AMOUNT OF LAST RAINFALL:_____

OBSERVATIONS:

_____

_____

STABILIZATION REQUIRED:

_____

_____

TO BE PERFORMED BY:_____

ON OR BEFORE:_____

CITY OF GLADSTON CONSTRUCTION RUNOFF INSPECTION FORM

GENERAL INFORMATION	
PROJECT NAME/NUMBER:	LOCATION:
DATE OF INSPECTION:	TIME OF INSPECTION:
INSPECTORS NAME:	PRESENT PHASE OF WORK:
TYPE OF INSPECTION: ☐ REGULAR ☐ PRE-STORM EVENT ☐ DURING STORM EVENT ☐ POST-STORM EVENT	

HAS THERE BEEN ANY RAIN SINCE LAST INSPECTION: ☐ YES ☐ NO

IF YES, PROVIDE:

STORM DATE/TIME: APPROXIMATE AMOUNT OF RAINFALL:

WEATHER AT TIME OF INSPECTION:

☐ CLEAR ☐ CLOUDY ☐ RAINING ☐ SLEETING ☐ FOG ☐ SNOWING ☐ HIGH WINDS

☐ OTHER: TEMPERATURE:

HAVE ANY DISCHARGES OCCURRED SINCE LAST INSPECTION? ☐ YES ☐ NO

IF YES, DESCRIBE:

ARE THERE ANY DISCHARGES AT TIME OF INSPECTION? ☐ YES ☐ NO

IF YES, DESCRIBE:

SIGNATURE OF INSPECTOR *PRINTED NAME & TITLE* *DATE*

SITE BMP CHECKLIST			
BMP/ACTIVITY	IMPLEMENTED?	MAINTENANCE REQUIRED?	CORRECTIVE ACTIONS NEEDED/NOTES
ALL INACTIVE SLOPES AND DISTURBED AREAS HAVE BEEN STABILIZED	☐ YES ☐ NO	☐ YES ☐ NO	
ARE NATURAL RESOURCE AREAS PROTECTED WITH BARRIERS OR SIMILAR BMP?	☐ YES ☐ NO	☐ YES ☐ NO	
ARE ALL SANITARY WASTE RECEPTACLES PLACED IN SECONDARY CONTAINMENT AND FREE OF LEAKS?	☐ YES ☐ NO	☐ YES ☐ NO	
ARE ALL DISCHARGE POINTS AND RECEIVING WATER FREE OF SEDIMENT?	☐ YES ☐ NO	☐ YES ☐ NO	
ARE STORM DRAIN INLETS PROPERLY PROTECTED?	☐ YES ☐ NO	☐ YES ☐ NO	
IS THE CONSTRUCTION EXIT PREVENTING SEDIMENT FROM BEING TRACT OFF SITE?	☐ YES ☐ NO	☐ YES ☐ NO	
IS TRASH/LITTER FROM WORK AREA COLLECTED AND PLACES IN A COVERED DUMPSTERS?	☐ YES ☐ NO	☐ YES ☐ NO	
ARE WASHOUT FACILITIES AVAILABLE, CLEARLY MARKED AND MAINTAINED?	☐ YES ☐ NO	☐ YES ☐ NO	
ARE VEHICLE/EQUIPMENT FUELING AND MAINTENANCE	☐ ☐	☐ ☐	

Standard Operating Procedure: Municipal Operations

Responsible staff: Public Works/Parks & Recreation/Public Safety

Facilities:

1. City Hall (7010 N. Holmes)
2. Linden Square (602 NE 70th Street)
3. Gladstone Public Works (4000 NE 76th Street)
4. Gladstone Community Center (6901 N. Holmes)
5. Gladstone Municipal Pool (7011 N. Holmes)
6. Fire Station No. 1 (6118 N. Oak)
7. Fire Station No. 2 (6569 N. Prospect)
8. Water Treatment Plant
9. Parks: Happy Rock Park, Hobby Hill Park, Meadowbrook Park, Hidden Hollow Park, Central Park, Little Gully Park, Hamilton Heights Park

Equipment: All municipal equipment

Material: asphalt, rock, salt & calcium chloride, herbicides, dirt, concrete debris & asphalt milling, fill material (excavated debris), mulch/tree debris, steel refuse, fuel & oils, detergents, paints & solvents.

Procedure:

1. Standard Housekeeping – Public Works (City Crews)
    - City crews review and clean up the public works facility twice a year. This includes organizing and restocking equipment and material (i.e. pipe, hydrants, casting, barricades, concrete forms, etc.) Trash pick-up during these events includes, but is not limited to the disposal of non-usable and damaged material & equipment. General trash pick-up is part of the daily routine.
    - Two on-site trash containers (10 yd and 40 yd) are available for general trash and bulky items. Two additional 20 yd containers are on-site for metal recycling. One of the 20 yd containers is used for city generated scrap and the other is for use by Gladstone residents.
    - An on-site wash bay is used for cleaning vehicles and equipment. The bay uses a debris collection tank before it empties into the sanitary sewer system. Use of the wash bay prevents contaminates such as oils, salt and calcium chloride residue, sewer residue and soap from infiltrating into the storm sewer system. The debris tank is checked frequently and pumped out as necessary.
    - The Central Garage recycles oil via a heater located in the garage bay. Small amounts of residual oil/fluids that escape are collected in a garage bay drain,

which pass through an oil/sand separator before entering the sanitary sewer system.

- Brush and yard waste are collected at the Public Works Facility from both City property and participating communities' residential property. Collected material is then ground into chips and hauled to a processing facility to be recycled as compost/mulch. This process prevents brush and yard waste from infiltrating the storm system.
- Aggregate material is kept in storage bays constructed of large blocks to reduce the potential of material washing away in heavy rains. Topsoil is kept under cover.
- Sediment and run-off mitigation of the public works site (including fill area) is accomplished by the use of rock check dams.
- Road salt is stored in two on-site, covered storage buildings and is not exposed to the environment. Calcium chloride is stored in two on-site, enclosed tanks.
- Road salt is loaded into material spreaders, which are mounted to dump trucks, by mobile loading equipment. Spreaders are loaded on a concrete surface and any spilled material is put back in the covered storage building. Calcium chloride liquid is pumped directly from the enclosed storage tank into tanks installed on dump trucks. The transfer takes place in the wash bay previously described.

2. Standard Housekeeping – Other City Facilities
    - Trash is collected on a routine basis as necessary. On-site trash containers are located at Oak Grove Park (8 yd), City Hall (8 yd, 6 yd, and 8 yd recycle), Fire Station No. 1 (4 yd), Fire Station No. 2 (6 yd), Community Center (8 yd), and the Water Treatment Plant (4 yd).
    - Parking lots are swept as necessary. City Hall, Linden Square, and the Community Center parking lots are swept prior to all major events.
    - Detergents, paints, solvents, and other materials are stored under cover as recommended by the manufacturer.
    - Fertilizer, pesticides, and other hazardous materials will be used and stored in accordance with the manufacturer's recommendations.
    - Hazardous materials will be properly disposed of at the Regional Household Hazardous Waste Facility located at 4707 Deramus, Kansas City, MO.

3. Construction Sites (All Types)
    - Erosion and sediment control measures shall be installed in accordance with the Erosion and Sediment Control SOP.
    - City Projects - During routine operations, spoil material is generated. This material includes, but is not limited to trash, dirt, rock, concrete, deteriorated pipe and fittings, and steel. General trash is deposited in the large trash containers located at the Public Works facility and metal/steel refuse is placed in the recycle container at Public Works. Dirt and concrete debris is used as fill material on site. Select concrete debris (non-rebar reinforced) may be reused as stormwater open channel armament, along remote creek locations.

4. Spill & Leak Response

- City crews respond immediately to spills of fuel, oil, and/or chemicals using spill containment material. Report large spills to the appropriate regulatory agency.
- Any fluid leakage from city equipment is contained with absorbent material, which prevents any infiltration into the storm sewer system. Equipment maintenance incorporates keeping equipment under cover, as much as possible.
- Underground fuel tanks are constantly monitored for leaks using a combination of FuelMaster and VeederRoot systems.
- An oil/water separator is installed at the Central Garage and cleaned as necessary.

6. ROW Maintenance (Street Sweeping)
    - City streets are swept twice a year and arterial streets are swept by-monthly as weather permits. Sweeping of streets is performed to keep debris from entering the storm system. Debris collected is placed along with dirt/rock as fill material at the Public Works site.
    - Trash pickup is performed along major roadways, 3 times a year. Removal of debris in roadway is part of the daily route of this city crew.
    - Weed control is performed by City crew along right of ways and some easement areas. All materials are used and stored in accordance with manufacturer's recommendations.
    - City right of ways along public lands are mowed by both the City crew and contracted. Normal maintenance requires mowing every two – three weeks during the season. Contractor assignments and schedules are set by the administrative staff. Contract mowing includes storm basin locations and MoDOT right of way.

ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

PUBLIC WORKS DEPARTMENT

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CHAPTER 1 – INTRODUCTION

Purpose

The purpose of this document is to establish standard guidelines within the City of Gladstone for the detection and elimination of illicit discharges. This document was developed based upon information contained in the "Illicit Discharge Detection and Elimination- A Guidance Manual for Program Development and Technical Assessments" prepared by the Center for Watershed Protection and Robert Pitt in conjunction with the United States Environmental Protection Agency.

Definition

The EPA defines an illicit discharge as "…any discharge to the municipal separate storm sewer system that is not composed entirely of storm water, except for discharges allowed under a NPDES permit or waters used for firefighting operations." Illicit discharges result in contaminated/untreated storm water entering into the storm sewer system. Examples of illicit discharges include failing septic systems and improper floor drain connections to the storm sewer system. Other examples of illicit discharges include the illegal dumping of paint, oil, and debris (including grass and leaves) that eventually make it to the storm system.

In order to simplify the detection and elimination of illicit discharges, the "Illicit Discharge Detection and Elimination Guidance Manual for Program Development and Technical Assessments" uses the following four- part definition.

1. Illicit discharges are defined as a storm drain that has measurable flow during dry weather containing pollutants and/or pathogens. A storm drain with measurable flow but containing no pollutants is simply considered a discharge.
2. Each illicit discharge has a unique frequency, composition, and mode of entry in the storm drain system.
3. Illicit discharges are frequently caused when the sewage disposal system interacts with the storm drain system. A variety of monitoring techniques can be used to locate and eliminate illegal sewage connections. These techniques trace sewage flows from the stream or outfall, and go back up the pipes or conveyance

system to reach the problem connection.

4. Illicit discharges of other pollutants are produced from specific source areas and operations known as "generating sites." Knowledge about these generating sites can be helpful to locate and prevent non-sewage illicit discharges. Depending on the regulatory status of specific sites, education, enforcement, and other pollution prevention techniques can be used to manage this class of illicit discharges. *(Pitt et al 2004)*

CHAPTER 2 – BASICS OF ILLICIT DISCHAGES

Storm Sewer System
A storm sewer system is comprised of both enclosed pipes and open channels. The EPA defines a major storm drain as an enclosed pipe with a diameter of 36-inches or larger or an open channel that drains more than 50-acres. In industrial areas, a major storm drain is defined as an enclosed pipe with a diameter of 12-inches or larger or an open channel that drains more than 2-acres.

The City of Gladstone's program will initially focus on major storm drains. It should be noted that minor storm drains can also be sources of illicit discharges, and these will be investigated on a case-by-case basis. It is anticipated that the program will be expanded in the future to include minor storm drains.

Dry Weather Discharges
The primary tool that will be used to identify illicit discharges is the examination of dry weather discharges from the storm sewer system. Dry weather discharges may consist of sewage, washwater, liquid waste, landscape irrigation water, or groundwater. Laboratory testing is often required to distinguish between the different types of dry weather discharges.

The frequency of dry weather discharges can be classified as continuous, intermittent, or transitory. The "Illicit Discharge Detection and Elimination Guidance Manual for Program Development and Technical Assessments" uses the following definitions.

1. Continuous discharges occur most of the time, are usually the easiest to detect, and typically produce the greatest pollutant load.
2. Intermittent discharges occur over a short period of time, are difficult to detect, and can cause serious water quality problems.
3. Transitory do not occur often and are typically the result of an event such as an industrial spill, sanitary sewer break, or illegal dumping. These discharges are difficult to detect but can result in severe water quality problems.

Illicit discharges can be further classified as direct or indirect by the method in which the discharge enters the storm sewer system. Direct discharges are connected directly to the storm sewer system. Indirect discharges are generated outside the storm sewer system and enter through storm inlets or by infiltration through pipe joints.

Illicit Discharge Generating Sites

Several studies have concluded that land-use is a good indicator of potential illicit discharges. The EPA defines these areas as "generating sites." By examining these areas, the City can use this information to detect, identify, and eliminate illicit discharges.

CHAPTER 3 – FIELD INVESTIGATION

Field Screening
The field screening technique recommended by the EPA to detect illicit discharges is the Outfall Reconnaissance Inventory (ORI). The primary purpose of the ORI is to collect basic visual data by field investigation.

Training
Prior to conducting field investigations, City personnel shall review Chapter 11 of the EPA's "Illicit Discharge Detection and Elimination Guidance Manual for Program Development and Technical Assessments."

Procedure
The following procedure shall be used by City to collect field data:

1. During the dry season when groundwater levels are low, City field crews shall walk open channels and streams. Major receiving waters within the City of Gladstone include: East Creek, Cave Creek, Old Maids Creek, Mill Creek, Rock Creek, and Shoal Creek.
2. During the field investigation, measure and photograph all major outfalls (as identified in Chapter 2) and minor outfalls with dry weather discharges. The number of major outfalls targeted for visual inspection and screening is 20% per year.
3. The City has developed GIS maps of the storm sewer system. Clearly identify any discrepancies between the City's GIS maps and actual field conditions. If a new outfall is located, mark the location using the City's GPS handheld unit.
4. Record outfall characteristics using the ORI field data sheet included in Appendix A.
5. For flowing outfalls, determine the rate of flow from the outfall. Utilize the following sensory indicators to evaluate the discharge: odor, color, turbidity, and floatables.
6. Report the location of all flowing outfalls to the City Engineer.

Field crews will occasionally encounter an obvious illicit discharge. When obvious discharges are encountered, immediately track the down the source of the discharge, and report it to the appropriate agency for corrective action.

Safety

Safety should be the primary concern during field investigations. Potentially hazardous materials should be avoided. Never approach, contact, or sample a substance if you are unsure of the material.

CHAPTER 4 – TRACKING ILLICIT DISCHAGES

Tracking
Upon completion and review of the initial field investigation, a list of flowing outfalls will be identified for additional investigation. Sensory data collected during the initial investigation will be used to help prioritize outfalls. It is anticipated that continuous discharges will be tracked first since these are typically the easiest to detect.

The following methods will be the primary tools used by the City of Gladstone to track illicit discharges:

1. Desktop analysis of land-use to identify potential illicit discharge sources.
2. Additional field investigation at various locations within the watershed.
3. Video detection and inspection.
4. Laboratory analysis and indicator monitoring.