Revised Operation and Maintenance Plan

**City of Mt. Juliet Public Works**
**Storm Water Quality**
**Standard Operating Procedures**
*Created 2/4/2020*

## Municipal Facilities



## Municipal Activities



## Municipal Inventory

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# Preface

The purpose of this Standard Operating Procedure Manual is to help educate and instruct employees on ways to reduce stormwater pollution and help prevent it in the future.

Topics covered range from good housekeeping to material management practices and vehicle maintenance to street sweeping and several items in between. Within each topic, sections such as a brief overall description of the SOP followed by an approved approach, application, procedures, maintenance, requirements, limitations and additional information may be covered.

# Good Housekeeping

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

Purchase only the amount of material that will be needed for use. In most cases, this will result in cost savings in both purchasing and disposal. Be aware of new products that may do the same job with less environmental risk and for less or the equivalent cost.

Good housekeeping is performing activities in a manner which keeps potential pollutants from either draining into or being transported offsite by managing pollutant sources and modifying construction activities. Dispose of waste materials in designated areas and in designated containers away from rainfall and stormwater runoff.

Keep work sites clean and orderly. Remove debris in a timely manner. Dispose of or recycle wash water, sweepings and sediments properly.

We have an MSDS binder on hand that's located between the back break rooms which displays each manufacturer's chemical composition of the materials we use, proper usage instructions and how to dispose of them properly.

Train all employees who may handle or come in contact with hazardous materials and hold them accountable to upholding the BMPs. Have access to spill cleanup materials available as much as possible.

Maintenance is on-going as improvements are continually being made.

# Hazardous Materials Storage[ii]

## Description

Prevent or reduce the discharge of pollutants to stormwater from material delivery and storage by minimizing the storage of hazardous materials on-site, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

## Approach

The following materials are commonly stored at the Public Works facility:

# Sand and salt
# Pesticides and herbicides
# Fertilizers
# Detergents
# Petroleum products
# Acids, lime, glues, paints, solvents, etc.

Storage of these materials on-site can pose various degrees of the following risks:

# Stormwater pollution
# Injury to workers or visitors
# Groundwater pollution
# Soil contamination

The following steps should be taken to minimize your risk:

# Designated areas for material delivery and storage are found throughout the complex.
# Refer to the MSDS binder to follow manufacturer's instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
# Keep your inventory to 'as needed' levels as much as possible.
# Minimize hazardous materials stored on-site and handle hazardous materials as infrequently as possible.
# Do not store chemicals, drums, or bagged materials directly on the ground unless otherwise contained.
# Keep chemicals in their original containers, and keep them well labeled. If other containers are used then be sure they are well marked and can be adequately sealed and stored in an appropriate place. Refer to MSDS binder for alternate labeling options.
# Employees trained in emergency spill cleanup procedures should be present when dangerous materials or liquid chemicals are unloaded.
# Do not over-apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions.
# Contain and clean up any spill immediately.
# Keep storage area clean and organized.
# During safety inspections, check for improper storage, labeling and corrosion of material containers.

## Maintenance

# Keep an ample supply of spill cleanup materials near the storage area.
# Inspect storage areas before and after rainfall events, and at least weekly during other times.

## Material Management Practices[iii]

### Description

Prevent or reduce the discharge of pollutants to stormwater system or natural streams using effective management of waste materials. Education and training employees & subcontractors; proper material use; source reduction; tracking waste generation and disposal; proper material storage, recycling, preventing stormwater contact and runoff from waste management areas and good waste disposal procedures.

**Solid Waste Management**

*Designate waste storage areas that are away from storm drain inlets, stormwater facilities or watercourses. Provide waste containers in areas where employees congregate for breaks and lunch.
*Watertight dumpsters are preferred for use and should be requested from trash-hauling contractors. Inspect dumpsters for leaks or open drain valves; repair any dumpster that is not watertight. Leave drain valve in the closed position. Do not hose out dumpsters on the project site. Let the trash-hauling contractor take care of dumpster cleaning.
*Arrange for regular waste collection before containers overflow. Provide adequate number of covered containers to keep rain out and prevent loss of waste during heavy winds.
*Make sure toxic liquid waste (used oils, solvents, paints, etc.) and chemicals (acids, pesticides, etc.) are not placed or poured into dumpsters. Inspect dumpsters daily for hazardous materials that need to be disposed in a different manner. These need to go to either Metro HHW or Sumner County Resource Authority (based on their requirements. We do not have authorization from the State to accept HHW).
*Salvage or recycle any useful material.

**Hazardous Waste Management**

*Use the entire product before disposing of the container. If the product is wet or moist, allow container to dry prior to disposal. Do not remove the original product label as it contains important safety and disposal information. MSDS information should be consulted for each product that is stored or handled. Employees should be made aware of the safety information.
*Use appropriate containment devices where the potential for spills exists. Keep hazardous waste in appropriate containers and under cover. Plaza hazardous waste containers in secondary containment. Do not allow hazardous materials to accumulate on the ground.
*Keep hazardous and non-hazardous waste separate. Store hazardous materials and wastes in covered containers.
*Do not mix wastes as this can cause unforeseen chemical reactions.
*Refer to MSDS book and the HCP (Hazardous Communication Plan) when handling, storing and using hazardous materials.
*Check waste management areas for spills and leaks.

### Maintenance

# Arrange for regular solid waste collection, disposal and recycling on regular basis.
# Inspect waste areas frequently to ensure runoff is not occurring. If so, clean up immediately.
# An updated inventory of hazardous materials on site is located within the MSDS binder.

# Pump Stations[iv]

## Description

It is important to keep our pumping stations operating at their best capacity as much as possible. Our goal is to prevent failures of our pumping stations that can cause spills and overflows.

## Approach and Maintenance

# Perform scheduled maintenance to maximize the reliability and life expectancy of all equipment.
# Prioritize repairs based on the nature and severity of the problem.
# CarteGraph contains a corrective work order system to address problems with equipment identified by operations and maintenance staff.
# Maintain a spare part inventory to reduce equipment repair time.
# Track and schedule routing maintenance.
# Refer to CMOM Manual for procedures.

# Spill Prevention and Response[v]

## Description

Prevent or reduce the discharge of pollutants to stormwater from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

## Approach

The following steps will help reduce the stormwater impacts of leaks and spills:

***Define "Significant Spill"***

# Different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. A significant spill should be defined after review of the Materials Safety Data Sheet or other descriptive documentation that presents the contents and proper handling procedures.

***General Measures***

# Hazardous materials and wastes should be stored correctly and in covered containers.
# Place a stockpile of spill cleanup materials where they are accessible.
# Annual employee training occurs and covers topics on spill prevention, cleanup procedures and on potential dangers to humans and the environment from spills and leaks.

***Cleanup***

# Clean up leaks and spills immediately.
# On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.
# Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly.
    # Minor spills typically involve small quantities of oil, gasoline, paint,
    # Use absorbent materials on small spills rather than hosing down or burying the spill.
    # Remove the absorbent materials promptly and dispose of properly.
    # If unable to manage the spill, contact the Fire Department and they will assist with the clean up and/or contact an appropriate company to handle the clean up.

        1. For spills of state reportable quantities or into a water body notify the TDEC general hotline – environmental assistance at 1-888-891-8332 (TDEC).
        2. For spills of federal reportable quantities or into a water body notify the National Response Center at (800) 424-8802.
        3. Notification should first be made by telephone and followed up with a written report.

# Keep ample supplies of spill control and cleanup materials on-site, near storage, unloading, and maintenance areas.

## Top Soil[vi]

### Description

Topsoil should be preserved and used to enhance the final site stabilization with vegetative cover. This is to be done in support of temporary or permanent seeding in conjunction with erosion source control practices such as silt fencing and mulching. This technique is applicable to all types of areas where earth-disturbing activities expose subsoil layers that are poorly suited to supporting vegetation growth. Topsoil is generally not placed on areas that are steeper than 3:1 or which are not adequately graded and compacted.

### Approach

Preservation and reuse of native topsoil helps to improve the success rate of new vegetation. Importing topsoil may be necessary for some areas which do not have fertile soil layers. Typically, a minimum of 4" of stabilized topsoil is needed to support grass vegetation. Trees, shrubs and vines will require a good layer of topsoil in addition to the proper subsurface soils. If the site is excavated down to rock such as sandstone or shale, then 6" – 12" of topsoil is recommended for good plant growth.

### Maintenance

# Inspect areas of newly applied topsoil frequently until vegetation is fully established. Maintain newly-graded topsoil areas and inspect regularly. Restore areas showing wash and settlement to the specified grades with a tolerance of 1" above or below. Finish grading is ordinarily done by hand shovel operations.
# Topsoil can wash away if erosion control practices are not provided. Place stockpiles in protected areas with silt fences and other controls.
# Topsoil should not be applied to slopes steeper than 3:1 (H:V) without the use of suitable erosion control matting or geotextiles.

# Construction Site Inspection

Construction site inspections are conducted on a routine basis. The minimum requirement is once a month, however, on average, we inspect sites approximately three times a month. Also, sites are inspected immediately following a rain event. All site inspections are documented the City's standard inspection sheet.

Upon arrival to the job site, check the SWPPP to verify self-inspections are being conducted twice a week, 72 hours apart on the site and that the paperwork is current.

Inspect construction entrance to ensure its performing correctly and that sediment is not leaving the site.

Inspect outfalls on property to check for sediment leaving site. Make sure silt fence, check dams, rip-rap, etc. are installed correctly and working effectively according to the construction plans. Digital photos are taken of deficiencies found. These pictures are attached to the reporting paperwork.

Inform contractor or supervisor of any deficiencies found during inspection and communicate corrective actions needed to be in compliance.

Following inspections, a summary report is constructed summarizing each job site's deficiencies for that day. This report is distributed to internal staff via email.

# Proper Fueling Procedures[vii]

## Description

Prevent fuel spills and leaks, and reduce their impacts to stormwater by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees. This management practice is likely to create a partial reduction in toxic materials and oil and grease.

## Approach

# Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute stormwater.
# Discourage "topping-off" of fuel tanks.
# Place a stockpile of spill cleanup materials where it will be readily accessible.
# Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
# Train employees in proper fueling and cleanup procedures.
# Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts.

## Maintenance

# Keep ample supplies of spill cleanup materials on-site.
# Pumps are on a routine monthly and annual inspection and maintenance program which is regulated by the State.

# Training

New employees will be trained within 60 days of hire. Documentation of new employee training will be kept with the Stormwater Department. Existing Employees will be trained at a minimum once per permit cycle with training documentation being kept with the Stormwater Department. Acceptable training material include Spill and Skills video, MTAS Training, and passive education board in Public Works. It shall be the responsibility of the employee to work in the manner in which they have been trained and report spill or IDDE to the IDDE hotline and notify direct supervisor.

# Road Salt Application and Storage Procedures[viii]

## Description

The application and storage of deicing materials, most commonly salts such as sodium chloride, can lead to water quality problems for surrounding areas. Salts, gravel, sand and other materials are applied to highways and roads to reduce the amount of ice during winter storm events. Salts lower the melting point of ice, allowing roadways to stay free of ice buildup during cold winters. Sand and gravel increase traction on the road, therefore making travel safer.

Many of the problems associated with contamination of local waterways stem from the improper storage of deicing materials. Salts are very soluble when they come into contact with stormwater. They can migrate into ground water used for public water supplies and contaminate surface waters.

Road salt is the least expensive material for deicing operations; however, once the full social benefits are taken into account, alternative products and better management and application of salts become increasing attractive options.

## Approach

# Cover road salts as to prevent runoff.
# Minimize spillage when loading trucks during de-icing events.
# Regulate the amount of salt applied to icy roads. Adjust usage according to the road width and design, traffic concentration and proximity to surface waters.
# Calibration devices mounted in the cabs of spreader trucks help maintains the amount of salt spread on roadways.
# Sand is mixed with the salt either at a 1:1 or 2:1 ratio.

## Maintenance

# Cover road salts in order to prevent runoff.
# Product is in storage throughout most of the year and only used when icy roads occur.

# Roadway Maintenance[ix]

## Description

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent run-on and runoff pollution, properly disposing of wastes, and training of employees. This management practice is likely to create partial reductions in sediment, toxic materials, and oil and grease.

## Approach

# Avoid paving during wet weather.
# Protect water courses, particularly in areas with a grade, by employing BMPs to divert runoff or trap/filter sediment.
# Leaks and spills from paving equipment can contain toxic levels of heavy metals and oil and grease. Place drip pans or absorbent materials under paving equipment when not in use. Clean up spills with absorbent materials rather than burying.
# Cover catch basins and manholes when applying seal coat, tack coat, slurry seal, fog seal, etc.
# If paving involves asphalted concrete, follow these steps:
  - Do not allow sand or gravel placed over new asphalt to wash into storm drains, streets, or creeks by sweeping. Properly dispose of this waste.
  - Old asphalt must be disposed of properly. Collect and remove all broken asphalt from the site and recycle whenever possible.

## Maintenance

# Inspect and maintain machinery regularly to minimize leaks and drips.
# Maintain inlet protection so that water is not allowed to back up onto areas subject to traffic. Clean inlet protection measures when sediment reaches the sediment storage capacity.
# Repair inlet protection measures as needed.

# Sanitary Sewer Maintenance[x]

## Description

Prevent or reduce the discharge of pollutants to stormwater system and natural streams from sanitary and septic waste. Provide convenient and well-maintained restroom facilities. Arrange for permanent connections to the sanitary sewer system or schedule for regular service and disposal. This management practice will significantly reduce nutrients, bacteria and viruses, and oxygen demanding substances.

Refer to CMOM Manual on detailed maintenance operations and procedures.

# Storm Drain Cleaning[xi]

## Description

Storm drains are flushed with water to suspend and remove deposited materials. Flushing is particularly beneficial for storm drain pipes with grades too flat to be self-cleansing. Flushing helps ensure that pipes convey design flow and also removes pollutants from the storm drain system. This BMP is likely to create a significant reduction in sediment if flushed effluent is properly collected or treated.

## Approach

Locate reaches of storm drains with deposit problems and develop a flushing schedule to clean storm drains of deposits. Flushed effluent should be collected and pumped to a sediment trap, sediment basin or a detention basin.

Storm drain flushing usually takes place along segments of pipe with grades and are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump. The backed-up water is quickly released, resulting in the cleaning of the storm drain.

If the flushed water does not drain to a stormwater treatment device (e.g., detention basin or swale), then a second inflatable device, placed well downstream, may be used to collect the flushed water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to a stormwater treatment practice. In some cases, an interceptor structure may be more practical to collect the flushed waters.

## Requirements

TDEC regulations prohibit the discharge of soil, debris, refuse, hazardous waste, and other pollutants that may hinder the designed conveyance capacity or damage stormwater quality or habitat in the storm drain system. This includes flushing any system connected to any blue line stream on the USGS or any waterway as determined by TDEC personnel in the field. TDEC must be consulted if this practice is planned.

Equipment

1. Water source (water tank truck or fire hydrant)
2. Sediment collector (vacuum, etc.)
3. Inflatable device to block flow
4. Containment/treatment equipment for sediment and turbidity if flushing to an open channel.

## Additional Information

# It's been found cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, drainage slope, pipe length, flow rate, pipe diameter and population density.
# The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water.
# Most effective in smaller pipes (36" diameter pipe or less) depending on water supply and sediment collection capacity.
# May have difficulty finding available upstream water source.
# May have difficulty finding downstream area to collect sediments. Requires liquid and sediment collection and disposal.
# Refer to CMOM manual for additional information.

# Street Sweeping

## Description

Our streets accumulate large amounts of pollutants which contribute to stormwater pollutant runoff to our surface waters. Pollutants (i.e., sediment, debris, trash, road salt, metals, etc.) can be minimized by street sweeping. Street sweeping can also improve the aesthetics of municipal roadways, control dust and decrease the accumulation of pollutants in catch basins.

## Approach

*There are three different types of street sweepers – each has their own set of pros and cons.
*Our roads are swept twice a month and Sweeping Corp.
*Street sweeping is effective in removing trash sediment buildup (salt, sand, grit, etc.) and large debris from curb gutters. These sweepers remove several tons of debris a year from city streets which minimize pollutants in our stormwater runoff.

## Requirements

Maintain logs showing the amount of waste that is collected. This data is kept in our stormwater files.

# Vehicle and Equipment Washing[xii]

## Description

Prevent or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning by using off-site facilities, washing in designated, contained areas only, eliminating discharges to the storm drain by infiltrating or recycling the wash water, and training employees and subcontractors. This management practice is likely to cause a reduction in toxic materials and oil and grease.

## Approach

# Washing vehicles and equipment outdoors or in areas where wash water flows onto paved surfaces or into drainage pathways can pollute stormwater.
# Use designated wash areas to prevent wash water from entering the creek.
# Use phosphate-free, biodegradable soaps.
# When cleaning vehicles/equipment:
  - Use as little water as possible to avoid having to install erosion and sediment controls for the wash area. High-pressure sprayers may use less water than a hose, and should be considered.
  - Use positive shutoff valve to minimize water usage.
# Don't use solvents.

# Vehicle Maintenance[xiii]

## Description

Prevent or reduce the discharge of pollutants to stormwater from vehicle maintenance.

This BMP is likely to partially reduce sediment, nutrients, toxic materials, oil and grease, and heavy metals. For other information on materials, see Spill Prevention and Control.

## Approach

Vehicle maintenance is a potentially significant source of stormwater pollution. Some activities are engine repair and service (cleaning of parts, spilled fluids, etc.) as well as storage of vehicles which leak fluids.

Perform maintenance using indoor facilities instead of outside whenever possible as to protect the stormwater runoff. If maintenance should be done outside, ensure correct procedures are followed where prevention practices for spills and leaks can be practiced if needed.

Train employees on how to handle and avoid chemical spills.

If an outdoor maintenance area is needed, it should be located on a paved concrete surface in order to facilitate cleanup. Use barriers to prevent stormwater runoff from entering the area.

Use a secondary containment such as a drain pan or drop cloth to catch spills or leaks. Keep a drip pan under the vehicle when removing hoses, filters, or other parts.

Have an ample supply of cleanup materials where they are readily accessible and properly stored. Ensure all employees know where these materials are located.

Clean leaks and other spills with as little amount of water as possible. Use rags for small spills, a damp mop for general cleanup and dry absorbent materials for larger spills.

1. Clean spills with rags or other absorbent materials.
2. Sweep floor using dry absorbent materials.
3. Mop water may be discharged to a sanitary sewer or a sink.

Provide spill containment dikes or secondary containment around stored oil and chemical drums.

Label storm drains on our property with our blue and silver metal placards.

## Limitations

# Space and time limitations may preclude all work being conducted indoors in a control automotive shop.

# Inventory BMP's

City Hall- one area drain that leads to municipal sewer – no treatment- Stoner Creek – Non Supporting

BMP – Street Sweeping
BMP- Catch Basin Cleaning

Public Works – two area drains that lead to municipal sewer- no treatment – Stoners Creek- Non Supporting

BMP – Street Sweeping
BMP- Catch Basin Cleaning
BMP- Used Oil / Automotive Fluids with secondary Containment
BMP – Spill Kit

73 E. Hill Street- curb cut to grass – infiltration- Stoners Creek – Non Supporting

BMP- Street Sweeping

Public Works Storage Yard- no paved surfaces (aggregate) sheet flow then flows to system at Seller Property (water quality unit, pond, pervious pavement, and underground detention) – Stoners Creek- Non Supporting – Removed, sold to developer, Curd Road Facility Added

York Road Public Works Yard- natural state with aggregate access road – Cedar Creek- Supporting

No BMP's, no development or improvements

Police Gun Range and Impound lot – water quality swale area fed by sheet flow – Cedar Creek- Supporting

BMP – Vegetation Management

Fire Department Station 1- Area drain shared with Public Works- storm drain that leads to municipal sewer- Stoners Creek – Non Supporting

BMP- Street Sweeping
BMP – Catch Basin Cleaning

Fire Department Station 2 – Two detention ponds with concrete outlet structures fed by roof drains and curb inlets Stoners Creek- Non Supporting

BMP- Street Sweeping
BMP-Catch Basin Cleaning
BMP- Vegetation Management

Mundy Park – one catch basin in parking lot – Stoners Creek- Non Supporting

BMP- Street Sweeping
BMP-Catch Basin Cleaning
BMP- Spill Kit

Bark Park- No infrastructure- sheet flow from impervious sheet flows across grass – Stoners Creek- Non Supporting

BMP- Vegetation Management

Jones Park- No impervious aggregate parking, grass swale on property – Stoners Creek- Non Supporting

BMP- Vegetation Management

Robinson Park- curb cut to walking trail, protected wetland on property

BMP- Vegetation Management

BMP- Street Sweeping

Charlie Daniels Park- no infrastructure, grass swale along parking lot, bio retention pond installed next to labor of love garden – Cedar Creek – Supporting

BMP- Street Sweeping

BMP- Vegetation Management

BMP- Spill Kit

Animal Control – grass swale to retention pond. Catch basin from parking lots drains to water quality unit before making way to pond – Stoners Creek – Non Supporting

BMP – Street Sweeping

BMP- Vegetation Management

BMP – Catch Basin Cleaning

BMP- Water Quality Unit Cleaning

Music City Star Parking Lot- catch basins leading to water quality unit – Stoners Creek- Non Supporting

BMP – Catch Basin Cleaning

BMP- Water Quality Unit Cleaning

BMP – Street Sweeping

Mt. Juliet Police Department- one water quality pond, one bio retention cell

BMP- Street Sweeping

BMP- Vegetation Management

Mt. Juliet Public Works Clemmons Road- One water quality Pond

BMP- Vegetation Management

BMP- Spill Kit

# Inventory by Practice

| Inventory | # |
|---|---|
| dry ponds | 5 |
| bio retention | 1 |
| grass swales | 3 |
| water quality units | 2 |

Dry Ponds

Mt. Juliet Police Department

Mt. Juliet Fire Department x2
Mt. Juliet Animal Control
Mt. Juliet Public Works Clemmons Road

Bio Retention
Mt. Juliet Police Department

Grass Swales
Mt. Juliet Impound Lot
Mt. Juliet Animal Control
Charlie Daniels Park

Water Quality Units
Mt. Juliet Public Works
RTA

Municipal facilities will be inspected yearly for maintenance purposes. Inspection reports of the facilities will be maintained. Any maintenance items that need to be remediated will be documented with photos and kept with the inspection. Files for each facility are kept in the black filing cabinet. Absent of reporting purposes Roads Supervisors and Sewer Supervisors should inspect municipal facilities at a minimum monthly.

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[i] *California Stormwater BMP Handbook, Municipal, pages SC60 1-3, January 2003.*

*Knoxville BMP Manual, Activities and Methods May 2003*

[ii] *California Storm Water Best Management Practice Handbooks, Construction and Industrial Handbooks*, CDM et. al. for the California SWQTF, 1993.

*Caltrans Storm Water Quality Handbooks*, CDM et. al. for the California Department of Transportation, 1997.

[iii] *Knoxville BMP Manual, Activities and Methods*, pages AM-08 1-5, May 2003.

[iv] *California Storm Water Quality Handbooks, Drainage System Maintenance*, CDM et. Al. for the California SWQTF, 1993. www.cabmphandbooks.com p. 2, January 2003.

www.SanDiego.gov/stormwater/pdf, Metropolitan Wastewater Operations, p. 2.1.7-5. 2001.

[v] *California Storm Water Best Management Practice Handbooks, Construction and Industrial Handbooks*, CDM et. al. for the California SWQTF, 1993.

*Caltrans Storm Water Quality Handbooks*, CDM et. al. for the California Department of Transportation, 1997.

*Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention*; Santa Clara Valley No point Source Pollution Control Program, 1992.

*Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices*, EPA 832-R-92005; USEPA, April 1992.

[vi] *Knoxville BMP Manual, Activities and Methods*, pages ES-06 1-2, January 2001.

[vii] *California Storm Water Best Management Practice Handbooks, Construction and Industrial Handbooks*, CDM et. al. for the California SWQTF, 1993.

*Caltrans Storm Water Quality Handbooks*, CDM et. al. for the California Department of Transportation, 1997.

[viii] Koppel man, L.E., E. Tananbaum, and C. Swick. 1984. *Nonpoint Source Management Handbook.* Long Island Regional Planning Board, Hauppauge, NY.
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[ix] *California Storm Water Best Management Practice Handbooks, Construction and Industrial Handbooks*, CDM et. al. for the California SWQTF, 1993.

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*Hot-mix Asphalt Paving Handbook*, U.S. Army Corps of Engineers, AC 150/5370-14, Appendix I, July 1991.

[x] *Knoxville BMP Manual, Activities and Methods*, page AM-09 1-2, May 2003.

[xi] *Knoxville BMP Manual, Activities and Methods*, page AM-05 1-2, May 2003.

[xii] *California Storm Water Best Management Practice Handbooks, Construction and Industrial Handbooks*, CDM et. al. for the California SWQTF, 1993.

*Caltrans Storm Water Quality Handbooks*, CDM et. al. for the California Department of Transportation, 1997.

Swisher, R.D., 1987, *Surfactant Biodegradation*, Marcel Decker Corporation.

[xiii] *Knoxville BMP Manual, Activities and Methods*. Page AM-16 1-4, May 2003.

*Best Management Practices and Erosion Control Manual for Construction Sites*; Flood Control District of Maricopa County, AZ, September 1992.

*Blueprint for a Clean Bay-Construction-Related Industries: Best Management Practices for Storm Water Pollution Prevention*; Santa Clara Valley Nonpoint Source Pollution Control Program, 1992.

*Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, Working Group Working Paper; USEPA, April 1992.

Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Stormwater Plans Review Checklist

# Stormwater Checklist

1. Existing conditions sheet with existing contours, streams, existing infrastructure (stormwater and utilities) ☐ Done ☐ N/A

   Comment _____

2. Grading sheet showing proposed improvements. Stormwater infrastructure, inlets, post construction BMP's, stormwater outfalls ☐ Done ☐ N/A

   Comment _____

3. Erosion control plan sheets: ☐ Done ☐ N/A

   Comment _____

   a. Under 5 acres 2 phases/sheets (initial, intermediate/final)
   b. Over 5 acres 3 phases/sheets (initial, intermediate, final).
   c. What is the receiving waters?
   d. Are there streams on or near the site? Buffers?
   e. Are they impaired?
   f. Are there areas on the site that need wetland or stream determination? Buffers?
   g. Floodplain or floodway areas? Buffers?
   h. Karst areas? Buffers?

4. Initial erosion control: ☐ Done ☐ N/A

   Comment _____

   a. Limit of disturbance
   b. Any areas to not be disturbed marked
   c. Silt fence
   d. Construction entrance/exit
   e. Concrete washout
   f. Inlet protection (existing inlet/headwalls)
   g. Stream buffers
   h. Sediment basin or trap if required (5/10 acre rule)
   i. Tree protection

5. Intermediate erosion control: ☐ Done ☐ N/A

   Comment _____

   a. Limit of disturbance
   b. Silt fence
   c. Construction entrance/exit
   d. Concrete washout
   e. Inlet protection (existing inlet/headwalls)
   f. Stream buffers
   g. Sediment basin or trap if required (5/10-acre rule)

6. Final erosion control: ☐ Done ☐ N/A

   Comment _____

   a. Final stabilization shown
   b. Matting or sod on slopes 3:1 or greater
   c. Note about 90% vegetation requirement

7. Erosion control notes: ☐ Done ☐ N/A

   Comment _____

   a. Disturbed area
   b. 2 day a week inspection, 72 hours apart.
   c. Matting or sod on slopes 3:1 or greater
   d. Note about 90% vegetation requirement
   e. Debris and trash removal
   f. Equipment filling and maintenance areas

8. Erosion control Details: ☐ Done ☐ N/A

   Comment _____

9. Detail sheets: ☐ Done ☐ N/A

   Comment _____

   a. Pond outlet structure (skimmer if applicable)
   b. Pipe table (minimum 15" pipes)
   c. Catch basin detail
   d. Outlet protection/RipRap sizing

10. Landscape plan sheets: ☐ Done ☐ N/A

Comment _____

11. Drainage report: ☐ Done ☐ N/A

Comment _____

a. Narrative stating existing and proposed conditions, how water quality and quantity is being achieved.
b. Are the 2-25 year storms met for pre and post development?
c. 1' of freeboard over the 25 year WSEL in the pond.
d. Does the pond hold the 100 year storm?
e. Is 1" infiltration being provided or are there site specific limitations.
f. If not is 80% TSS removal being provided?
g. Soil map
h. Storm pipe calculations based on 25 year storm
i. Gutter/inlet spread calculations
j. HGL calculations
k. Existing and proposed drainage maps
l. Existing and proposed hydrographs (curve numbers)
m. Pond report
n. Metro LID spreadsheets (if applicable)
o. Water quality calculations for low flow orifice
p. Sediment basin/trap calculations
q. Skimmer calculations
r. Proprietary box calculations

Stormwater SWMP

City of Mt. Juliet Stormwater Management Plan

I. Purpose

City of Mt. Juliet has been assigned the designation of a small ms4 jurisdiction and has been assigned a Small Municipal Separate Storm Sewer System Tracking Number TNS075451 that expires on September 30, 2021. Mt Juliet was granted the designation of MS4 under the authority of the Tennessee Water Quality Control Act of 1977 (T.C.A.69-3-101) and from the approval from the United States Environmental Protection Agency under the Federal Pollution Control Act, as amended by the Clean Water Act of 1977 (33 U.S.C. 1251) and the Water Quality Act of 1987,P.L. 100-4. Mt. Juliet is authorized to discharge Stormwater runoff into the waters of the State of Tennessee in accordance with the various eligibility criteria, administrative procedures, program requirements, reporting requirements, etc. set forth in parts 1 through 7 of Tennessee small municipal separate storm sewer system NPDES general permit, issued April 3,2017.

(Tab 1 of SWMP binder contains Notice of Intent, MS4 Permit, and MS4 Permit Rationale)

Regulatory Authority

- Foundation for surface water quality regulation is 1948 Federal Water Pollution Control Act (FWPCA).
- 1972, FCPCA was reorganized and expanded, and subsequently amended (principally 1977, 1987); referred to as the clean water act (CWA).
- 1977 Tennessee Water Quality Control Act.

## II. Regulatory Requirements

Federal and State requirements at a minimum require the City of Mt. Juliet to develop, implement, and enforce a Stormwater management program that is designed to reduce the discharge of pollutants into waters of the State. Mt. Juliet will do so by crafting a management strategy around the 6 minimum control measures as follows.

- Public Education and Outreach
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination
- Construction Site Stomrwater Runoff Pollution Control
- Permanent Stomrwater Management
- Pollution Prevention and Good Housekeeping for municipal operations

## III. Area of MS4 authorized

Where a city or town is covered under this permit, this permit covers all portions and areas of the MS4 operated by the city or town. Newly urbanized areas and areas annexed to the MS4 should be added to the MS4 authorized area. Annexation records are held by the City of Mt. Juliet City Recorder and are given to Stormwater Division Regularly.

Water bodies and use classification can be located at SWMP tab 10

## IV. TMDL

At this time no TMDL has been established for individual water courses in the City Limits of Mt. Juliet. TMDL's have been established for Old Hickory Watershed and Stones River Watershed as a hole. TDEC has placed North Creek, Silver Spring, Scotts Creek ,North Fork Suggs Creek And Stoners Creek on a categories L (TMDL needed) on the 2018 303.d list. Currently TMDL's are in place for the Stones River Watershed and the Old Hickory Watershed. TMDL's are stored under tab 18.

## V. Testing

<u>Overview</u>

Mt. Juliet will address testing components for the MS4 water bodies with unavailable parameters utilizing prescribed analytical and non-analytical methods laid out in the MS4 permit. Testing will be done via third party consultant Civil and Environmental Consultants (CEC). Results will be sent to local EFO and retained in SWMP. City of Mt. Juliet has chosen option one under section 5.1 of the permit.

Analytical SWMP Tab 19 – when conducted

Non Analytical SWMP Tab 20 – when conducted

Water's with unavailable parameters

Stoners Creek – 12.6 miles – Escherichia coli

Scotts Creek – 4.7 miles- Sedimentation / siltation, Phosphorus

North Creek – 2.1 miles – Sedimentation / siltation

North Fork Suggs Creek – 5.66 miles – Sedimentation / siltation, nutrient/Eutrophication Biological Indicators, Alteration in stream side or littoral vegetative covers

Silver Springs Branch – 2.54 miles – sedimentation / siltation, Alteration in stream side or littoral vegetative covers

Testing

Stoners Creek

Non Analytical Monitoring - Visual assessment – to be conducted by CEC

Analytical Monitoring - Conducted by CEC 2018-2019

Scotts Creek

Non Analytical Monitoring - Visual assessment – Conducted by CEC 2018-2019

Analytical Monitoring – To be conducted by CEC

North Creek

Non Analytical Monitoring - Visual assessment – Conducted by CEC 2018-2019

Analytical Monitoring – To be conducted by CEC

North Fork Suggs Creek

Non Analytical Monitoring - Visual assessment – to be conducted by CEC

Analytical Monitoring – To be conducted by CEC

Silver Springs Branch

Non Analytical Monitoring - Visual assessment – Conducted by CEC 2018-2019

Analytical Monitoring – To be conducted by CEC

****** City of Mt Juliet has reached out to CEC to schedule Non Analytical Monitoring of Stoners Creek and Analytical Monitoring of Scotts Creek, North Creek, and Silver Springs Branch for budget year 2019-

2020. Non Analytical Monitoring and Analytical Monitoring of North Forks Suggs Creek will be scheduled for the 2020-2021 budget years. **********

*Option 1 Analytical Monitoring*

The City of Mt. Juliet shall perform analytical monitoring as part of its stormwater management program within the MS4 program area. At a minimum the monitoring shall be conducted in streams with unavailable parameters for nutrients, pathogens, and siltation. Monitoring will be performed utilizing Semi-Quantitive Single Habitat (SQSH) Method as identified in the division's most current version of the Quality System Standard Operating Procedure for Macroinvertebrate System Survey. At least one sample per stream segment will be collected within a 5 year period. Waters with unavailable parameters for pathogens, bacteriological stream sampling must be performed utilizing methods identified in the division's most current version of the Quality System Standard Operating Procedures for Chemical and Bacteriological Sampling of Surface Water. Monitoring will include the collection of five samples within a thirty day period, performed during the summer, one series of five samples within a segment within 5 year period.

*Non Analytical Monitoring*

Visual Stream Survey will be performed on each stream segment with unavailable parameters for siltation, habitat alteration, pathogens, and nutrients. Protocols will be Natural Resource Conservation Service, State of Maryland Department of Natural Resources, and / or State of Tennessee Habitat Assessment Protocol and related stream survey sheets. All stream segments with unavailable parameters will be surveyed in a once in a five year period.

*Record Keeping*

When the City of Mt. Juliet conducts monitoring of stormwater discharges, or of receiving waters, it must comply with the following:
a. Representative monitoring. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity; and
b. Test Procedures. Monitoring results must be conducted according to test procedures approved under 40 CFR § 136.
Records of monitoring information shall include:
a. The date, exact place indicated by latitude and longitude, and time of sampling or measurements;
b. The names(s) of the individual(s) who performed the sampling or measurements;
c. The date(s) analyses were performed;
d. The names of the individuals who performed the analyses;
e. The analytical techniques or methods used; and
f. The results of such analyses.
The monitoring plan must be included in the SWMP. The records and results of analytical monitoring must be submitted to the division in the subsequent annual report. A summary of non-analytical activities and results must also be submitted in the subsequent annual report.

*Reporting*

Monitoring data is to be submitted to TDEC with the annual report via water.permits@tn.gov.

Monitoring data must be presented to the public for suggestions or comment before submitted with the annual report.

Non Analytical SWMP Tab 20 – when conducted

Analytical SWMP Tab 19 – when conducted

VI. Public Education and Outreach / Public Involvement

City of Mt. Juliet has designed PIE for the municipality that will more accurately detail public target audiences and establish the plan effectiveness. Currently the following educational initiatives have been started. BMP's as outlined in 2017 NOI.

a. Think Green think clean- trash pickup and education for students and parents in Wilson County Schools.
b. Wilson Bank and Trust Builder Fair- print material distributed at builder fair.
c. I Climbed Mt. Juliet Girl Scout Badge- award given after completion of work in a rain garden in Mt. Juliet, print material given at end of education talk.
d. Nashville Urban Water 5K- Print material distributed to runners, walkers, and observers of the 5k.
e. Adoption of new stormwater ordinance with 18 months (waiting on TDEC Rule Making) of permit coverage. ( when adopted ordinance will replace ordinance 2013-81 located at tab 2 in SWMP) (TDEC has reached an agreement with litigation parties and are pushing for rule making).
f. Automotive Fluid education material mail out ( SWMP tab 13)
g. Pesticide, herbicide, insecticide material mail out. (SWMP tab 14)
h. TNSA ~~TAB~~ ( Social Media) program- PSA's aired on radio and TV (SWMP tab 17)
i. Local working groups , Wilson County Water, and Middle Tennessee Stromwater Group, along with quarterly TNSA Middle Tennessee Region meetings ( SWMP tab 10)
j. City of Mt. Juliet Planning Commission meetings are open to the public
k. City of Mt. Juliet Commission Meetings are open to the public

PIE Plan can be located in SWMP tab 6

Publicizing Plan is located in SWMP tab 4

VII. Illicit Discharge and Elimination

a. Regulations
    i. Mt. Juliet City Code Prohibits Illicit Discharge – City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 8
    ii. Mt. Juliet City Code Prohibits Illicit Connections - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 8
    iii. Mt. Juliet City Code Reduction of Stormwater pollutants by the use of best management practices - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 8
    iv. Notification of Spills- City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 8
b. Maps – City GIS personnel have identified streams and outfalls within the City limits. Maps are on file at the City Stormwater and GIS Offices. Updates are made yearly, but the map is not complete. In 2014 City of Mt. Juliet contracted with Geo Jobe to walk and collect outfall points on all streams in Mt. Juliet. This information has been added in a map layer on the GIS data base. Currently the GIS Manager is taking older project As Built drawings and importing the information on the GIS data base. This project is complete.
c. Spring of 2017 Civil and Environmental Services have been contracted to take GIS shots of municipal owned assets for input into the GIS database.
d. Hotline
    i. Action line is a phone and email system used by the city including stormwater that allows the public to call or write about problems or concerns and is sent to the appropriate city staff to be handled.
    ii. Spill response and cleanup
        1. City of Mt. Juliet has on file a copy of Wilson County Emergency Management Agency Spill Response. WEMA has jurisdiction for HAZMAT and other spills in Wilson County.
e. All IDDE complaints will be investigated within 7 days of notification.
f. Dry Weather Screening- City of Mt. Juliet will conduct dry weather screening by an outside vendor when the analytical and non-analytical monitoring is conducted. Results will be kept in the SWMP binders.

Stormwater division took extensive time last permit section conducting inspection at business and has decided that the best way to manage IDDE is to divide business into 3 categories.

- Confirmed Hot Spots- Business that due to nature of business or size of business contribute to pollution. These business are inspected yearly and given education material about reducing water pollution. (SWMP tab 8)
- Business of Concern / Potential IDDE- business such as food preparation that have a potential to create water pollution, but are not confirmed hotspots. These businesses are conducted from a pre-determined list and are documented by inspection results. ( SWMP tab 8)

- New Business License Inspections. New businesses that open in Mt. Juliet are required to obtain a license from the Finance Department of Mt. Juliet City government. Upon request for a new license the Finance division sends information to Stormwater including but not limited too
    - Name of Business
    - Location of business
    - Type of use or occupancy
    - Previous use or occupancy
    - If the location is a home based business or commercial store front
    - Square footage of business and storage

This information allows for Stormwater to determine if the issuance of the license would negatively inspect Stormwater or existing facilities. If a question or concern is noted a practice is made to call the owner for clarification, more information, or education. Site visits to view conditions on the ground are also made. If in the opinion of Stormwater staff the business is clear and conditions or problems have been addressed then the application is stamped and filed.

-

Enforcement Response Plan can be located in SWMP tab 5

VIII. Construction Site Stormwater Runoff Control

a. Regulations

i. Stormwater design or BMP Manual - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 4 (A{1})
    1. Mt. Juliet Subdivision Regulations
    2. TDEC Erosion and Sediment Control Handbook
    3. Tennessee Construction General Permit
    4. Metro LID Manual ( Volume 5)

ii. General performance criteria for Stormwater - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 4 (A{2})

iii. Minimum control requirements - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 4 (A{3})

iv. Stormwater management plan requirements - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 4 (A{4})

a. Inspection logs of construction activity are kept on computer files on the City Z drive, as well as original paper copies are kept at the Public Works office.

v. Storm Water Pollution Prevention Plan - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 4 (A{5})

vi. Land Disturbance Permit Required – City of Mt. Juliet Land Development Code, Part C- Stormwater Ordinance , Section 3

vii. Stormwter Design Guidelines- City of Mt. Juliet Land Development Code, Appendix C

********** infiltration requirement will be updated within 18 months as allowed by permit**********Pending legal remedy of permit challenge ********

b. Process

i. New constructions projects must have approval from a municipal level from staff technical review, passed by the Planning Commission and Board of Commissioners. Citizens have the opportunity for input at all of the above mentioned public meetings. After public meeting have been held and passed the City Engineer receives official plans for review of infrastructure and Stormwater. Specifically Erosion Control Plans, Grading and Excavating Plans, and Vegetation Plans are reviewed by the City Engineer before being stamped. After stamped plans are received from the City Engineer a pre-construction meeting is held with the owner, developer, EPSC individual, and Stormwater staff to identify milestones, potential problems, and methods for compliance. Items typically covered in pre-construction meetings include. All State and Federal Permits must be on file with the city at time of Pre Construction Meeting.

1. SWPPP placement
2. Inspection Documentation
3. Special Concerns (Priority sites near impaired streams)
4. Tracking
5. Rain gauge and records
6. Hours of Construction
7. Penalties for violations of State and Municipal Code ( Enforcement Response Plan)

8. BMP placement and practices
9. Concrete wash out, material storage, and maintenance
10. Fueling activities
11. Temporary and Final Stabilization
12. Waste Collection
13. Time and frequency of second or third party inspections
14. Documentation
15. Other issues that may arise on a case by case basis
16. BMP Maintenance
17. Verification of Maintenance Responsibility

After the pre-construction meeting the land disturbance permit is given to the contractor so that approved erosion controls on the stamped plan and per SWPPP can be installed. At this time no work other than instillation of BMP's per plan are allowed. When BMP's have been erected an inspection must be requested by phone, email or in writing to the City of Mt. Juliet Storm Water Department. When the request for inspection is received at the earliest available opportunity the BMP's will be checked for compliance. If the site is found to be noncompliant a list of deficiencies will be given to the contractor and the inspection must be requested again. If the inspection is compliant a Stormwater permit is given to the contractor and earth work is allowed to continue within the scope of the approved plans, SWPPP, and issued permits.

C .Inspections

Mt. Juliet will check all priority sites at a minimum of once per month as mandated by the NPDES Permit. Additionally Mt. Juliet has a computer data base and paper data base off inspections performed by City staff. Priority sites are identified as (P), or in red on monthly inspection logs. Contractors will also be reminded if the site is considered priority at the time of the pre-construction meeting. Mt Juliet will also attempt to check all other construction sites that are not noted as priority at least once per month. Mt. Juliet will place resources as much as possible on sites where active grading and earthwork is being done to combat erosion and illicit discharge. Mt. Juliet will also encourage the contractor to keep the SWPPP up to date with any field changes or alterations. Items inspected by the City include, but are not limited too.

1. SWPPP on site and up to date
2. Approved plan on Site
3. Twice weekly inspections are being performed and up to date
4. Deficiency noted on twice weekly inspections
5. Rain gauge on site and recorded
6. Outfall and/ or receiving stream for signs of discharge
7. BMP condition

a. Silt fence
b. Tubes
c. Sediment traps
d. Construction exit
e. Inlet protection
f. Others on plans

8. Signs of BMP effectiveness
9. Tracking Out
10. Concrete wash out facility
11. Material and trash storage areas
12. Maintenance and fueling areas
13. When final grading ceased and stabilization needs to begin
14. Inspection of permanent Storm Water Facilities

d. Priority Sites

Priority sites are those that are located on or drain too streams listed as having unavailable parameters. Streams with unavailable parameters within the boundaries of Mt. Juliet include

1. North Creek/ Snarl Creek for Sedimentation
2. Silver Springs Branch MS4 discharge
3. Scotts Creek MS4 Discharge.
4. Stoners Creek , E Coli
5. North Fork Suggs Creek

Mt. Juliet combats the Priority sites by minimum monthly inspections, increased stream buffers, as well as testing and observing the areas.

e. BMP Board

City of Mt. Juliet utilizes visual representation of acceptable and not acceptable BMP on a board outside of the conference room that pre construction meetings are held in. This helps support efforts discussed in pre-construction meetings and provides a visual representation.

f Staff training- staff will receive certification at a minimum of TDEC level I and II for plan reviewers.

Level One – Adam Meadors, Matt Glenn, Neil Hall, Matt White

Level Two – Neil Hall, Matt White

IX. Permanent stormwater Management

a. Regulations

I. As built plans - City of Mt. Juliet Land Development Code, Part C- Stormwater Ordinance, Section 5 (1)

II. Landscape & stabilization requirements - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 5 (2)

III. Inspection of Stormwater management facilities - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 5 (3)

IV. Records of installation and maintenance activities - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 5 (4)

V. Failure to meet or maintain design or maintenance standards - City of Mt. Juliet Land Development Code , Part C – Stormwater Ordinance, Section 5(5)

VI. Existing Locations and development-City of Mt. Juliet Land Development Code, Part C- Stormwater Ordinance, Section 7

b. Overview

Mt. Juliet uses mechanisms such pre development plans review, inspections, ordinances, as built certifications, and maintenance agreements to accomplish the Post Construction Runoff Control minimum control measurements. Mt. Juliet also encourages the use of "Green" technology for the use of Stormwater with practices such as, but not limited to rain gardens, pervious pavers, bio-retention ponds, rain barrels, pervious pavements, and stormwater recycling systems. Implementation date for Green Infrastructure infiltration requirement will be mandatory on or before 18 months of coverage under 2017 NOC Pending legal permit challenge outcome. City staff has prepared a map showing streams, outfalls, retention/detention areas. Currently we are adding inlets and water quality units to the comprehensive map. We hope to have this map finalized by the end of the reporting year with the ability to put the map online. Mt. Juliet has adopted Metro Nashville LID manual for water quality units.

Legal Requirements on hold until permit challenge resolved, then ordinance change will be enacted per permit requirement.

4.2.5 Permanent Stormwater Management

- Permanent Stormwater Standards
- Site Specific Limitations
- Water Quality treatment Volume

- Off Site Mitigation
- Water Quality Riparian Buffer

c. Process

City of Mt. Juliet has posted ordinances and design specification online so that Engineers and other design professionals can meet Post Construction Runoff Goals. Once the design professionals draft proposals they bring the project to the City to be vetted via staff technical review, Planning Commission, and Board of Commissioners. After approval from those bodies a pre-construction meeting is scheduled after the City Engineer has reviewed and stamped the plans with or without exceptions. Storm Water requires that all State of Tennessee permits and Federal Permits be obtained before scheduling of pre con (Notice of Intent, Notice of Coverage, Aquatic Resource Alteration Permit, Well Injection, as well as an approved SWPPP). Once the permits and stamped plans are received the Construction meeting is held discussions are held about Post Construction as follows

i. As built plans are required of all ponds, bio retention areas, pipes, structures, etc. stating they have been installed per plan and meet or exceed design specifications as approved.
ii. Stabilization requirements - bare areas must be vegetated with seed and straw, matting, or sod. If seed and straw is used a minimum of 90% cover must be reached. If Sod is used minimum 75 % cover with matting on the remainder. Mt. Juliet has allowed in very limited cases such as extreme drought the issuance of surety bonds and checks with a signed agreement that stabilization will occur after adequate rain fall. In these instances the surety check is 150% of the vegetation cost. This has been done to allow for the Certificate of Occupancy process to work yet achieve viable vegetation at a later date. Mt. Juliet does require that all erosion control measure remain in place with twice weekly inspections until the stabilization is achieved under surety option.
iii. Inspections- Inspections are twofold. The initial final inspection that is required by the city to allow for a certificate of occupancy requires
    1. Stabilization
    2. All Stormwater infrastructure installed per plan
    3. As built PDF/DWG
    4. As built certifications
    5. Signed maintenance agreement with a maintenance plan
    6. Copy of Notice of Termination sent to TDEC
iv. Maintenance Agreement – Maintenance agreements are signed by the property owner and are recorded on the deed with the Wilson County Register of Deeds prior to a pre-construction meeting. Copies of the maintenance agreement and inspection schedule are held in the job file with the City of Mt. Juliet.
v. Inventory- Permanent Stormwater Structures are inventoried and checked by stormwater staff for maintenance requirements.

X. Pollution Prevention and Good House Keeping

a. Education – Mt. Juliet trains at minimum employees to via video presentation or other acceptable means work practice on pollution prevention. Topics covered include
    i. Use of drip pans
    ii. Use of absorbents at spills
    iii. Eliminating blow able trash
    iv. Securing lids and covers on trash receptacles
    v. Spotting and reporting Illicit Discharge
    vi. Chemical , fuel, and material storage
    vii. Benefits of street sweeping and clean working areas
    viii. Proper fueling operations
    ix. Car washing near storm drains
    x. Eliminating track out

    Training records kept in SWMP tab 12

b. Planned Maintenance- Mt. Juliet has compiled a comprehensive maintenance plan that includes Street Sweeping. Street Sweeping is done periodically on City Streets using a mechanical sweeper. Logs for sweeping are filled out from Street Department Employees and kept in the Management Plan folder in the Coordinators office for the current year. Street Employees and Park labor are tasked with mowing and maintain City infrastructure in Parks and in the public right of way. Stormwater inspectors also check catch basins and outfalls in neighborhoods and existing business for effectiveness and maintenance. Chipper service is also a service offered by the city to encourage keepings limbs, leaves, and brush out of storm systems. Chipper crews run periodically and after major storm events on a route map designed by the Public Works supervisor.

    BMP maintenance log SWMP tab 16

c. Salt is used in winter months to keep roads open for the public in winter snow and ice. Mt. Juliet uses only Sodium Chloride and no brine mixture. Salt is stored under roof in a shed with 3 walls and a shade to keep the product from reaching the storm system.
d. Operation and Maintenance Plan- Mt. Juliet maintains operation and maintenance plans and procedure. The document can be found in SWMP tab 7.

Description of BMP's to control discharges to the maximum extent Possible (MEP)

- Hotspot inspections
- Proprietary Device Inspections / LID practices Inspections

- Plan review and approval
- Technical Review
- Pre-construction meeting / Permit issuance
- Priority construction site database
- Notice of Violation (NOV) database
- Construction site database / Priority site database
- Monitoring records
- PIE Plan
- ERP Plan

3-D Storm Water Data

http://mtjuliet.maps.arcgis.com/home/webscene/viewer.html?webscene=1d5fcf40f8b54367b2f642857f9c9790

Storm Water Web Application

http://mtjuliet.maps.arcgis.com/apps/webappviewer/index.html?id=721bd62e871a4d7e83a76b33b16674a9

Mt. Juliet Elevation Indicator

http://mtjuliet.maps.arcgis.com/apps/Elevations/index.html?appid=80c43728ca144648969abe862bb435bd

Username: **amedors_mtjuliet**

Password: **ameadorsgis1**

**Based upon current GIS Map**

Outfalls- 221

Head Wall- 1058

Curb Inlet- 171

Catch Basin- 87

Detention Ponds- 137

Pipes- 7982ft or 1.51 miles

Culverts-4897ft or .93 miles

Ditches-72897ft or 13.81 miles

Streams-450789ft or 85.38 miles

Last Reviewed / updated 04/15/2019 – AM

O&M SOP updates 12/10/19 - AM

Stormwater PIE

*January 30, 2020*

# City of Mt. Juliet MS4 PIE Plan

**(Public Information and Education Plan)**

City of Mt. Juliet wishes to maintain coverage as a permitted MS4 (municipal separate storm sewer system) under authority of the Clean air and Water Act as well as the Tennessee Water Quality Control Act. Under such coverage it has become necessary for updates to the PIE Plan the primary planning and record keeping document of the MS4 regarding educational outreaches, groups targeted, materials distributed, dates, locations, and number of peoples outreached. This document may be updates during the course of the MS4 permit. Additional information will be presented in this plan as a management tool to help evaluate the effectiveness of the plan to determine if the activity will continue, be discontinued, or replaced with another outreach to achieve the desired outcome.

## Targeted Educational Campaigns

1. General Public awareness on the impacts of water quality from general housekeeping maintenance activities

- Think Green Think Clean Yearly in May
- Master Gardner Spring Festival when announced by Master Gardners

2. Homeowner association and other operators of permanent BMP's awareness of the importance of maintenance activities
    - Builder Fair Yearly in February
    - Urban water 5K Yearly in August
3. Local engineering and development communities awareness of stormwater ordinances, regulations, and guidance materials related to long term water quality impacts
    - ~~Builder-Developer meetings sponsored by Chamber of Commerce~~

    Removed after audit 1/28/2020

4. General public and professional chemical applicators awareness on the proper storage, use, and disposal of pesticides, herbicides, and fertilizers use.
    - Individual mail out education material to local pest control companies, retailers of lawn chemicals, landscapers with business licenses within the city (Pollutants of concern) Yearly in January and February
5. General Public and professional chemical applicator awareness on the proper storage, use, and disposal of oil and other automotive related fluids
    - Individual mail out educational material to local automotive repair shops (pollutants of concern) Yearly in January and February
    - Channel 3 PSA
    - TNSA PSA Facebook
6. General Public and municipal employees on the awareness of identifying and reporting procedures for illicit connection/ discharges, sanitary sewer seepage, spills, etc.
    - training by MTAS or video archive to municipal public works staff
7. Local engineering, development, and construction company awareness of stormwater ordinances, regulations and guidance materials related to construction phase water quality impacts.
    - BMP board at Public Works- passive education

8. Municipal employees/contractors awareness of water quality impacts from daily operations
    - BMP board at Public Works- passive education
    - training by MTAS or video archive to municipal public works staff

City of Mt. Juliet reserves the right to alter the PIE plan by both adding to and deleting education efforts listed above based on effectiveness of the plan, and addition of new alternatives that may present themselves throughout the life of the permit. *Educational outreaches will be recorded in the following format.*

Date:

Event:

Materials Distributed:

Number of Attendees:

Target Audience: (Check all that apply)

General Public awareness on the impacts on water quality from general housekeeping maintenance activities.

HOA and other operators of permanent BMP awareness of the importance of maintenance activities.

Local Engineering and Development communities' awareness of the stormwater ordinances, regulations, and guidance materials related to long term water quality impacts.

General public and professional chemical applicators awareness on the proper storage, use, and disposal of oil and other automotive related fluids.

General public and professional chemical applicator awareness on the proper storage, use and disposal of pesticides, herbicides, and fertilizer use.

General public and municipal employees on the awareness of identifying and reporting procedures for illicit connection/discharges, sanitary sewer seepage, spills, etc.

Local engineering, development, and construction community awareness of the stormwater ordinances, regulations and guidance materials related to construction phase water quality impacts.

Municipal employees/contractor awareness of water quality impacts from daily operation.

Comments:

Using the standard recording method along with supporting documents such as tracking number of attendees, review of media clippings, direct evaluations and observations allow for evaluating the educational campaigns over the life of the permit cycle. Having multiple years of data will allow staff to evaluate if the outreach should be continued, modified, or discontinued. Tracking over time will also allow staff to make an educated decision about affective the outreach events are over time.

Public Involvement and Participation

Wilson County Water "WCW" holds monthly gatherings at local restaurants with Wilson County Stormwater and City of Lebanon Stormwater allowing for members of the public or other agencies to gather in an informal setting to discuss water quality issues.

- *As of 2019 this meeting rarely happen between MS4's due to staff change ( RT Baldwin, Leanna Draines, and John Dewall living MS4 Coordinator positions) meetings held on as needed basis*

Middle Tennessee Stormwater Group "MTSG" holds monthly meetings with MS4's from Davidson, Sumner, Wilson, and Montgomery Counties and other to provide educational session meetings and to allow for the public to gather in an informal setting to discuss water quality issues.

- *Since WCW rarely meets we have put our focus on attending MTSG groups to supplement WCW, sign in sheets of meetings are located in binders tab 10 meetings held monthly*

Tennessee Stormwater Association "TNSA" statewide water quality organization that host training, outreach via TAB program, yearly conference, and fosters as a link between MS4's and TDEC.

Think Green Think Clean- outreach event between City of Lebanon, City of Mt. Juliet, and Wilson County Government that promotes a yearly event to encourage students in Wilson County Schools to pick up trash in the community. Cash prizes are given to schools for most trash removed from the community or for most participation.

Other participation events may be added in the future as opportunities arise.

Hotline

City of Mt. Juliet maintains a hotline via telephone and email. The hotline is used in conjunction with the 311 and is listed under the Public Works Illicit Discharge page or complaints cans be made via City of Mt. Juliet web page under "report a municipal code violation". Complaints are investigated and action taken within timeframes specified in the SWMP.

Illegal Dumping and Illegal Connections to Storm Sewer

Illegal dumping, Illicit Connections, Illicit Discharges, and Improper disposal of waste are all violations of local laws and ordinances. Violations are either managed by municipal court system for prosecution or via ERP plan. Deterrents in the form of educating the general public are employed to discourage potential polluters. Education material at a minimum include.

- City of Mt. Juliet Stormwater website
- Signage on poles and signal boxes
- Messages from TNSA via TAB program / facebook
- Literature distributed at outreach events such as EPA after the storm

Attached

BMP's and measurable goals of NOI as submitted

# City of Mt. Juliet
# Stormwater Inspection Report

| | |
|---|---|
| Date of Inspection: 1/29/2020 | Commercial Inspector: Matt Glenn |
| Site or Project Name: Vintage Station North | Phase/Section: Only |
| Contractor: Rawso | Current Weather Conditions: Overcast/Wet |
| Has rainfall been checked/documented daily: ☐ Yes ☒ No | Developer: TDK |

**Best Management Practices (BMP's):**

| **Are the Erosion Prevention and Sediment Controls (EPSC's) functioning correctly:** If "No", describe below in Comment Section | | | | |
|---|---|---|---|---|
| 1. | Are all applicable EPSC's installed and maintained per the SWPPP? | ☐ Yes | ☒ No | |
| 2. | Are all EPSC's functioning correctly at all disturbed areas/material storage areas per section 4.1.5? | ☒ Yes | ☐ No | |
| 3. | Are EPSC's functioning correctly at outfall/discharge points such that there is no objectionable color contrast in the Receiving stream, and no other water quality impacts per section 5.3.2? | ☒ Yes | ☐ No | |
| 4. | Are EPSC's functioning correctly at ingress/egress points such that there is no evidence or track out? | ☐ Yes | ☒ No | |
| 5. | If applicable have discharges from dewatering activities been managed by appropriate controls per section 4.1.4? If "No", describe below the measures to be implemented to address deficiencies. | ☒ N/A | ☐ Yes | ☐ No |
| 6. | If construction activity at any location on-site has temporarily/permanently ceased, was the area stabilized within 14 days Per section 3.5.3.2? If "No". describe below each location and measures taken to stabilize the area(s) | ☒ N/A | ☐ Yes | ☐ No |
| 7. | Have pollution prevention measures been installed, implemented, and maintained to minimize the discharge of pollutants From equipment and vehicle washing, wheel wash water, and other wash waters per section 4.1.5? If "No", describe below the measures to be implemented to addressed deficiencies. | ☐ N/A | ☒ Yes | ☐ No |
| 8. | If a concrete washout facility is located on site, is it clearly identified on the project and maintained? If "No", Describe below the measures to be implemented to address deficiencies. | ☐ N/A | ☒ Yes | ☐ No |
| 9. | Have all previous deficiencies been addressed? If not, describe the remaining deficiencies in the comments section. ☒ Check if deficiencies/corrective measures have been reported on a previous form. | ☐ N/A | ☒ Yes | ☐ No |
| 10. | Is the site stable? | ☐ Yes | ☒ No | |

Comment Section: If the answer is "No" for any of the above, please describe the problem and corrective action to be taken. Otherwise, describe any pertinent observations:

- *2x weekly inspections are up to date. SWPPP & NOC are in box.
- New row of SF has been installed along the southwestern perimeter. Sections of SF are in need of maintenance/repair between Outfall # 1 & 2, mainly backfilling. SF needs to be removed in front of headwalls/outfalls & replaced with sock check dams to allow for positive drainage.
- SF is untrenched near N Mt Juliet Rd exit. Siltsoxx are in place at the base. Do not see a major threat at this time but sock is starting to deteriorate.
- Perimeter controls in ok to good shape along north end of site.
- Drop bag needs to be added to curb inlet on N Mt Juliet near train tracks.
- All castings & grates need to be installed so that proper I.P. can be installed. Pallets & plywood are insufficient. Felt/SF fabric is also not an approved measure.
- Fabric should be installed for roof drains surrounding Townhomes C-E.
- New headwalls installed for Outfall 1 & 2.
- Tire wash station in use.
- New stone put down down for CE.
- Vehicle parking along Fiberglass Dr is causing track out issues.

Inspector's Signature: