

BERKELEY COUNTY STORMWATER MANAGEMENT PROGRAM

POLLUTION PREVENTION/GOOD HOUSEKEEPING MANUAL

**Adopted February 23, 2011
Revised April 2023**

**212 Oakley Plantation Drive
Moncks Corner, SC 29461
Telephone: 843.719.4195**

TABLE OF CONTENTS

1.0	Introduction	3
2.0	Basics of County/Municipal Pollution Prevention/Good Housekeeping Programs	4
3.1	County/Municipal Operations and Activities Affecting Water Quality	5
3.2	Hotspot Facility Management	6
3.3	Construction Project Management	11
3.4	Post-Construction Stormwater Management	12
3.5	Street Repair and Maintenance	15
3.6	Storm Drain Maintenance	17
3.7	Park and Landscape Maintenance	19
3.8	Animal Shelters	21
3.9	Employee Training	22
4.1	References	25

TABLES

Table 3-1:	Stormwater Pollutants Associated with County/Municipal Operations and Activities	5
Table 3-2:	Pollution Generating Activities Associated with County/Municipal Hotspot Facilities	6
Table 3-3:	Stormwater Pollutants Associated with Activities Conducted at Hotspot Facilities	7
Table 3-4:	Pollution Prevention/Good Housekeeping Practices Commonly Used to Control Stormwater Pollution at County/Municipal Hotspot Facilities	10
Table 3-5:	Pollution Prevention/Good Housekeeping Practices Commonly Used to Improve County/Municipal Construction Project Management	12
Table 3-6:	Pollution Prevention/Good Housekeeping Practices Commonly Used to Improve Post-Construction Stormwater BMPs	14
Table 3-7:	Pollution Prevention/Good Housekeeping Practices Commonly Used to Improve County/Municipal Street Repair and Maintenance Activities	16
Table 3-8:	Expected Pollutant Removal Rates for Catch Basin Cleanouts (Lawet et al., 2008)	18
Table 3-9:	Equipment Used for Catch Basin and Inlet Cleaning (from Lager et al. 1979)	18
Table 3-10:	Pollution Prevention/Good Housekeeping Practices Commonly Used to Improve County/Municipal Park and Landscape Maintenance Activities	20
Table 3-11:	Pollution Prevention Practices Commonly Used for Animal Handling Facilities	21
Table 3-12:	Employee Training Programs – Presenting the Right Information to the Right Audience	23

FIGURES

Figure 2-1:	County/Municipal Activities Negatively Impacting Water Quality	4
Figure 2-2:	County/Municipal Activities Improve Water Quality	4
Figure 3-1:	Public Works Yards – Typical Severe Hotspot Facilities in a Community	8
Figure 3-2:	Typical Categories of Pollution-Generating Activities to Assess at Hotspot Facilities	9
Figure 3-3:	Pollution Prevention/Good Housekeeping Practices Commonly Used at County/Municipal Hotspot Facilities	11
Figure 3-4:	Stormwater Best Management Practices (BMPs) – Dry Detention Ponds, Wet Detention Ponds, Bioretention Area and Swales	13
Figure 3-5:	Roadway Repairs and Maintenance Generating Significant Amounts of Sediment	15
Figure 3-6:	Catch Basin Detail	17
Figure 3-7:	Catch Basin Maintenance Operation	19

APPENDICES

Appendix A –	List of Berkeley County, Cities of Goose Creek and Hanahan Owned/Operated Facilities
Appendix B –	Prioritization Matrix for Catch Basins in Public Systems
Appendix C –	Spill Prevention and Response Plan
Appendix D –	Good Housekeeping/IDDE Training Workshop Template and Sample Certificate

1.0 INTRODUCTION

Berkeley County has developed and is implementing a program for pollution prevention/good housekeeping to meet conditions of their National Pollutant Discharge Elimination System (NPDES) Phase II Small Municipal Separate Storm Sewer Systems (MS4) permit. Minimum Control Measure number six (6) of the County's MS4 permit states that Berkeley County must 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 County operations as an integral part of their Stormwater Management Program (SWMP). The Program includes employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet, and building maintenance, new construction and land disturbances, and stormwater system maintenance.

According to the NPDES Phase II regulations, the operator of a regulated MS4 community must develop a pollution prevention/good housekeeping program to:

- Prevent or reduce the amount of stormwater pollution generated by county/municipal operations and conveyed into receiving waters,
- Train employees on how to incorporate pollution prevention/good housekeeping techniques into county/municipal operations,
- Identify appropriate best management practices and measurable goals for preventing or reducing the amount of stormwater pollution generated by county/municipal operations.
- Prioritize County owned and/or operated storm water management systems/structures and implement a maintenance schedule.
- Develop a set of pollution prevention measures that, when applied during municipal O&M activities, will reduce the discharge of pollutants in stormwater Municipal operation and maintenance activities to be considered include but are not limited to pavement and rights-of-way maintenance, bridge maintenance, cold weather operations, and municipally sponsored events.
- Inspect and maintain, wherever and whenever necessary, all municipally-owned or maintained structural stormwater controls.
- Maintain all municipally owned green infrastructure practices through regularly scheduled maintenance activities.

This good housekeeping/pollution control manual is designed to assist Berkeley County staff in addressing potential stormwater runoff issues from County owned and/or operated facilities. A list of County and City owned, and/or operated facilities can be found in Appendix A. This manual includes information from the Berkeley County staff and the Urban Subwatershed Restoration Manual No. 9: Municipal Pollution Prevention/ Good Housekeeping Practices Version 1.0 produced by the Center for Watershed Protection.

Berkeley County entered into an Inter-Governmental Agreement (IGA) with the Cities of Hanahan and Goose Creek in October 2015. This IGA makes the County responsible for ensuring compliance with all six (6) minimum measures of the NPDES Phase II MS4 Permit, including development and implementation of the pollution prevention/good housekeeping program. Throughout this manual, wherever there is a reference to Berkeley County facilities, operations or projects, it also applies to the municipalities of Hanahan and Goose Creek.

2.0 BASICS OF COUNTY/MUNICIPAL POLLUTION PREVENTION/GOOD HOUSEKEEPING PROGRAMS

Every day, Berkeley County employees engage in a variety of activities that influence water quality. Some activities, such as County facility management, construction project management, and street repair and maintenance can negatively impact water quality, while others, such as storm drain maintenance and employee training, can help improve it. Whether a pollution prevention/good housekeeping program is designed to reduce the influence of activities that negatively impact water quality (Figure 2-1), or increase the influence of activities that help improve it (Figure 2-2), it should be carefully designed to address local water quality issues. A specific pollution prevention program activity that Berkeley County has recently undertaken to improve water quality is implementation of a catch basin maintenance program. Utilization of a vacuum truck and crew has allowed the County to remove debris, trash and sediment (with attached pollutants) from catch basins prior to potentially impacting downstream waterbodies.

Construction Site with No Erosion or Sediment Controls



Animal Shelter Pet Waste Washed into Ditch



Uncovered Storage Barrels at Public Works Yard



Figure 2-1: County/Municipal Activities Negatively Impacting Water Quality

Stormwater System Cleanout



Pet Waste Pick-Up Station



Covered/Contained Fuel Tanks



Figure 2-2: County/Municipal Activities Improving Water Quality

3.1 COUNTY/MUNICIPAL OPERATIONS AND ACTIVITIES AFFECTING WATER QUALITY

Pollution prevention/good housekeeping involves identifying county/municipal operations and/or activities that may affect stormwater runoff in a community and improving them to better support water quality goals. County/municipal operations and/or activities should be systematically evaluated to determine where improvements can be made in the following areas, at a minimum:

- Hotspot facility management
- Construction project management
- Post-construction stormwater management
- Street repair and maintenance
- Storm drain maintenance
- Park and landscape maintenance
- Employee training

These county/municipal operations/activities can generate or reduce a variety of stormwater pollutants, including sediment, nutrients, metals, hydrocarbons, pesticides, chlorides, bacteria and trash. Typical pollutants expected to be affected by these operations and/or activities are included in Table 3-1.

Table 3-1: Stormwater Pollutants Associated with County/Municipal Operations and Activities

County/Municipal Operations	Sediment	Nutrients	Metals	Hydro-carbons	Toxins	Others
Hotspot Facility Management	●	●	●	●	●	Trash, Organic Matter, Pesticides, Chlorine
Construction Project Management	●	■	○	■	■	Trash
Street Repair and Maintenance	●	■	■	●	■	Trash
Storm Drain Maintenance	■	○	○	○	○	Trash, Organic Matter
Park and Landscape Maintenance	■	●	○	○	■	Pesticides
Post-construction Stormwater Management	■	■	■	○	○	Bacteria
Animal Shelters	●	●	○	○	○	Bacteria
Employee Training	●	●	●	●	●	Chloride, Trash
Key ● = frequently associated with operation ■ = infrequently associated with operation ○ = rarely associated with operation						

Developing an effective pollution prevention/good housekeeping program involves determining which of these operations and/or activities are conducted in Berkeley County and designing a program that will increase or reduce their influence, depending on whether they have a positive or negative impact on water quality. One program that Berkeley County has initiated to address this issue is an aggressive stormwater system maintenance program. The County has identified and prioritized County owned/operated facilities and is systematically performing cleaning/vacuuming as necessary to meet schedules identified in a ranking matrix. A list of Berkeley County, City of Goose Creek and City of Hanahan owned/operated facilities can be found in Appendix A. The prioritization matrix used by the County to identify necessary maintenance frequencies is locate in Appendix B.

3.2 HOTSPOT FACILITY MANAGEMENT

County/municipal hotspot facilities are publicly owned and/or operated facilities that produce higher levels of stormwater pollutants and/or present a higher potential risk for spills, leaks or illicit discharges. Common county/municipal hotspot facilities include facilities that handle solid waste, wastewater, road and vehicle maintenance, and yard waste, such as:

- Equipment Storage and Maintenance Yards
- Hazardous Waste Disposal Facilities
- Hazardous Waste Handling and Transfer Facilities
- Landfills
- Materials Storage Yards
- Public Buildings (e.g. Libraries, Police and Fire Departments)
- Public Works Yards
- Solid Waste Handling and Transfer Facilities
- Vehicle Storage and Maintenance Yards
- Water and Wastewater Treatment Facilities
- Facilities such as morgue, mosquito abatement facility, fueling area, etc.
- Boat Landings
- Convenience Sites
- Animal Shelters

If not carefully managed, the activities conducted at county/municipal hotspot facilities can generate a wide variety of stormwater pollutants, including nutrients, hydrocarbons, metals, chlorides, pesticides, bacteria and trash. A summary of the pollution-generating activities typically conducted at county/municipal hotspot facilities and the pollutants associated with those activities are presented in Tables 3-2 and Table 3-3 below.

Table 3-2: Pollution Generating Activities Associated with County/Municipal Hotspot Facilities

County/Municipal Hotspot Facility	Pollution Generating Activities
Public Works Yards	Vehicle Maintenance and Repair, Vehicle Fueling, Vehicle Washing, Vehicle Storage, Outdoor Loading and Unloading, Outdoor Storage, Dumpster/Waste Management, Building Repair, Building Maintenance, Parking Lot Maintenance, Turf Management, Landscaping
Vehicle Storage and Maintenance Yards	Vehicle Maintenance and Repair, Vehicle Fueling, Vehicle Washing, Vehicle Storage, Outdoor Loading and Unloading, Outdoor Storage, Dumpster/Waste Management, Building Repair, Building Maintenance, Parking Lot Maintenance
Equipment Storage and Maintenance Yards	
Materials Storage Yards	Outdoor Loading and Unloading, Outdoor Storage, Dumpster/Waste Management, Parking Lot Maintenance
Water and Wastewater Treatment Facilities	Vehicle Storage, Outdoor Loading and Unloading, Outdoor Storage, Dumpster/Waste Management, Building Repair, Building Maintenance, Parking Lot Maintenance, Turf Management, Landscaping
Landfills	Vehicle Fueling, Vehicle Storage, Outdoor Loading and Unloading, Outdoor Storage, Dumpster/Waste Management
Solid Waste Handling and Transfer Facilities	
Hazardous Waste Disposal Facilities	
Hazardous Waste Handling and Transfer Facilities	
Composting Facilities	

County/Municipal Hotspot Facility	Pollution Generating Activities
Public Buildings	Outdoor Loading and Unloading, Outdoor Storage, Dumpster/Waste Management, Building Repair, Building Maintenance, Parking Lot Maintenance, Turf Management, Landscaping
Public Golf Course	Vehicle Maintenance and Repair, Vehicle Fueling, Vehicle Washing, Vehicle Storage, Outdoor Loading and Unloading, Outdoor Storage, Dumpster/Waste Management, Building Repair, Building Maintenance, Parking Lot Maintenance, Turf Management, Landscaping
Public Swimming Pool	Building Repair, Building Maintenance, Parking Lot Maintenance, Swimming Pool Discharges
Animal Shelters	Animal Washing/Handling, Lawn/Turf Maintenances, Waste Management

Table 3-3: Stormwater Pollutants Associated with Activities Conducted at Hotspot Facilities

Hotspot Operation or Activity	Sediment	Nutrients	Metals	Hydro-carbons	Toxins	Others
Vehicle Repair	○	○	●	●	●	
Vehicle Fueling	X	○	●	●	●	
Vehicle Washing	●	●	■	■	●	
Vehicle Storage	○	X	■	●	○	Trash
Outdoor Loading	●	■	■	○	○	Organic Matter
Outdoor Storage	●	■	■	■	■	
Waste Management	○	■	■	■	●	Trash
Building Repair	●	○	■	■	■	
Building Maintenance	●	X	●	○	■	
Parking Lot Maintenance	●	○	■	●	■	
Turf Management	■	●	X	X	●	Pesticides
Landscaping	○	●	X	X	●	Pesticides
Swimming Pool Discharges	X	X	X	X	X	Chlorine
Animal Shelters	○	●	X	X	X	Bacteria
Key X = not a pollutant source ○ = minor pollutant contribution ■ = moderate pollutant contribution ● = major pollutant contribution						

Of the hotspot facilities listed above, public works yards are often one of the most severe potential pollutant contributors (Figure 3-1). Several stormwater pollutants are often stored or handled at these facilities and they should be one of the first hotspot facilities to be investigated during the development of a pollution prevention/good housekeeping program. While animal shelters do not typically have the potential for a number of pollutants associated with other hotspot facilities, they can be a major contributor of bacteria and nutrients if proper best management practices are not used.



Figure 3-1: Public Works Yards - Typical Severe Hotspot Facilities in a Community

Inspecting Berkeley County owned, and/or operated facilities is necessary to identify potential causes of stormwater pollution. These investigations can be used to systematically evaluate the typical major categories of pollution-generating activities illustrated in Figure 3-2 that commonly contribute to stormwater quality problems at county/municipal facilities:



Figure 3-2: Typical Categories of Pollution-Generating Activities to Assess at Hotspot Facilities

Ideally, the individuals who manage or oversee each of the facilities will be present during a site inspection. They should be able to answer questions about the activities that are conducted at their facility and explain any pollution prevention/good housekeeping practices that may already be in place. Participation during site inspections is also an opportunity for facility managers/operators to learn more about the county/municipality's pollution prevention/good housekeeping efforts and how the activities conducted at their facility can influence stormwater quality.

During a county/municipal facility site inspection it is helpful to have an aerial photograph or site plan on which the locations of proposed pollution prevention/good housekeeping practices or stormwater retrofits can be marked. Digital photos should be taken during any facility inspection to document areas that need improvement and in the identification of stormwater management and pollution prevention/good housekeeping practices. The pictures can also be used to educate the facility manager and other county/municipal staff during employee training sessions.

Berkeley County's pollution prevention and good housekeeping inspection program was initiated in 2010 and has been executed in two main phases. The first phase of the program, conducted in 2010, included an initial audit of select municipal activities. These audit results were used to provide a baseline assessment of the pollutant potential at municipal sites and to guide the development of good housekeeping practices by County personnel.

The second phase of the County's program was initiated in 2015, when the County developed a comprehensive list of all County owned municipal facilities and any activities at each location which might harm the water quality of stormwater runoff. This list of identified municipal facilities with any pollution potential was selected for a thorough inspection to determine whether each constituted the designation of a "high priority" facility. A custom inspection form was developed and utilized to document all inspection findings at each listed facility and inspections were conducted in June of 2015.

A new “high priority” facility list was generated using the inspection results conducted in June 2015, as well as new facilities owned and operated by the co-permittees, City of Goose Creek and City of Hanahan. The facilities on this new comprehensive list were inspected in September 2016 and November 2017 utilizing the customized assessment forms to document all inspection findings.

A wide range of pollution prevention/good housekeeping practices can be used to address the pollution-generating activities conducted at county/municipal hotspot facilities. Some of the most commonly used practices are listed in Table 3-4.

Table 3-4: Pollution Prevention/Good Housekeeping Practices Commonly Used to Control Stormwater Pollution at County/Municipal Hotspot Facilities

Hotspot Operation or Activity	Pollution Prevention/Good Housekeeping Practices
Vehicle Maintenance and Repair	Drip pans, traps, covered outdoor storage areas, secondary containment, discharge of wash water to sanitary sewer system, proper disposal of used fluids, disconnected storm drains, automatic shutoff nozzles, signs, spill response plans, spill cleanup materials, dry cleanup methods, employee training, stormwater retrofits
Vehicle Fueling	
Vehicle Washing	
Vehicle Storage	
Outdoor Loading and Unloading	Covered loading and unloading areas, secondary containment, storm drain disconnection or treatment, inventory control, spill response plans, spill cleanup materials, dry cleanup methods, employee training, stormwater retrofits
Outdoor Storage	
Dumpster/Waste Management	Dumpster/Waste Management, secondary containment, storm drain disconnection or treatment, liquid separation/containment, employee training
Building Repair	Temporary covers/traps, employee training, contractor training, proper cleanup and disposal procedures, disconnected storm drains, dry cleaning methods, stormwater retrofits
Building Maintenance	
Parking Lot Maintenance	
Turf & Vegetation Management	Integrated pest management, reduced non-target irrigation, careful applications, proper disposal and landscaping water, avoid blowing and hosing to storm drain, employee training, stormwater retrofits
Landscaping	
Stormwater System Maintenance & Repair	Prioritization of stormwater systems with high potential for negative impacts if unmaintained, routine cleaning/vacuuming of catch basins, identification of damaged or deficient systems and repair/replacement
Spill Prevention and Response Plans	Identification of spills that require special cleanup, materials, inventory, maximum cleanup amount, facility map, spill kit inventory and associated labeling, employee training log.

In many cases, the pollution prevention/good housekeeping practices that can be used to address the pollution-generating activities associated with a county/municipal hotspot facility save time and money, reduce liability and do not greatly interfere with normal operations. For example, the pollution prevention/good housekeeping practices applied at a vehicle storage and maintenance yard might include the use of drip pans under vehicles, tarps for covering disabled vehicles, dry clean-up methods for spills, proper disposal of used fluids and covering and providing secondary containment for any outdoor storage area (Figure 3-3). In some cases, however, costlier on-site stormwater retrofit practices may be needed to control and treat stormwater runoff, especially when the facility is rated as a severe hotspot.



Figure 3-3: Pollution Prevention/Good Housekeeping Practices Commonly Used at County/Municipal Hotspot Facilities

Once the inspection is done a brief implementation plan should be developed. The plan should summarize the results of the assessment of the current County pollution prevention/good housekeeping practices and the practices that will be used to reduce the stormwater pollution generated by hotspot facilities. The plan should also include a schedule that describes when the prescribed pollution prevention/good housekeeping practices will be implemented. The contents of the implementation plan should be reviewed with the individual who manages the hotspot facility. A spill prevention and response plan should be incorporated for hotspot facilities (i.e. fleet maintenance). A sample Berkeley County plan is located in Appendix D.

3.3 CONSTRUCTION PROJECT MANAGEMENT

Berkeley County performs several capital improvement, development and redevelopment construction projects, which can generate a wide range of stormwater pollutants, including sediment, nutrients, hydrocarbons, pesticides, trash and construction debris.

Common county/municipal construction projects include:

- Public works facilities.
- Road construction and widening.
- Utility construction and repair.
- Water and wastewater treatment facilities.
- Public buildings (e.g. libraries, police and fire departments).

These County funded construction projects can have several negative impacts on water quality both during and after construction. From a water quality standpoint, the construction phase is often considered the most damaging phase of the land development cycle particularly regarding sediment impacts.

County construction project erosion/sediment control plans and procedures should include the following practices, at a minimum:

- 3.5.1.** Minimize Clearing;
- 3.5.2.** Protect Waterways;
- 3.5.3.** Phase Construction;
- 3.5.4.** Implement Rapid Soil Stabilization;
- 3.5.5.** Protect Steep Slopes;
- 3.5.6.** Install Perimeter Controls;
- 3.5.7.** Adjust Erosion and Sediment Control Plan for Site Conditions; and
- 3.5.8.** Assess Erosion and Sediment Control Plan After Storm Events.

All of these practices will be part of any County construction project and Berkeley County Ordinance 14-11-36 will ensure that necessary sediment/erosion control practices adequately apply to County projects. Some of the practices most commonly used to improve the way that county/municipal construction projects are managed are listed in Table 3-5.

Table 3-5: Pollution Prevention/Good Housekeeping Practices Commonly Used to Improve County/Municipal Construction Project Management

Existing Conditions	Recommended Improvements
<ul style="list-style-type: none"> No local erosion and sediment control and/or stormwater ordinance in place 	<ul style="list-style-type: none"> Develop a local erosion and sediment control and/or stormwater management ordinance Ensure that county/municipal construction sites are required to meet the provisions of each ordinance
<ul style="list-style-type: none"> County/municipal construction projects are not subject to the requirements of the local erosion and sediment control and/or stormwater management ordinance 	<ul style="list-style-type: none"> Revise the local erosion and sediment control and/or stormwater management ordinance to ensure that county/municipal construction sites are required to meet the provisions of each ordinance
<ul style="list-style-type: none"> County/municipal construction projects are not subject to local plan review and site inspection procedures 	<ul style="list-style-type: none"> Revise the local development review process to ensure that county/municipal construction sites are subject to local plan review and site inspection procedures
<ul style="list-style-type: none"> Existing contractor selection and procurement procedures do not consider erosion and sediment control and/or stormwater management 	<ul style="list-style-type: none"> Revise the selection and procurement procedures to ensure that erosion and sediment control and stormwater management are considered during the selection process
<ul style="list-style-type: none"> Innovative sediment/erosion control practices are not used on county/municipal construction projects 	<ul style="list-style-type: none"> Revise the local sediment/erosion control ordinance to ensure these practices are allowed Promote the use of innovative sediment/erosion control practices on all county/municipal construction projects Provide training to design engineers and contractors on the design and installation of innovative sediment/erosion control practices

3.4 POST-CONSTRUCTION STORMWATER MANAGEMENT

Stormwater Best Management Practices (BMPs) are engineered facilities designed to treat or otherwise manage post-construction stormwater runoff and mitigate the negative impacts of land development. These practices, which include dry detention ponds, wet detention ponds, stormwater wetlands, bioretention areas, swales, filtration practices and infiltration practices (Figure 3-4), provide many water quality and water quantity benefits and, if carefully designed, can provide several other benefits to the community (e.g. aesthetics, wildlife habitat, etc.).



Figure 3-4: Stormwater Best Management Practices (BMPs): (Clockwise from Top Left) Dry Detention Ponds, Wet Detention Ponds, Bioretention Area and Swales

Under the NPDES Phase II regulations, Berkeley County must ensure adequate long-term operation and maintenance of post-construction stormwater BMPs. Within many communities, the county/municipality as well as homeowners' associations and private landowners are responsible for the maintenance and upkeep of stormwater BMPs. Regulated communities can help to ensure that privately owned and - operated facilities are maintained by including enforceable provisions within the local stormwater management ordinance that require regular maintenance of these facilities.

Although not necessary, it is often helpful to create a map showing the location of each publicly owned and/or operated stormwater BMPs. A list of all Berkeley County, City of Goose Creek, and City of Hanahan owned/operated facilities, and their associated BMPs, has been created and can be found in Appendix A. It is important to conduct a site assessment of all county/municipal owned and/or operated stormwater BMPs to determine how well each practice is being maintained. An inspection checklist should be used to compile information during the assessment. Once inspected the County owned/operated facilities should be prioritized regarding the facilities which need most attention for routine maintenance activities. Berkeley County's stormwater system maintenance prioritization matrix for catch basins in public systems is contained in Appendix B.

After county/municipal owned/operated post-development stormwater BMPs are assessed, a comparison of the inspection results to determine which stormwater treatment practices are in the worst condition should be formulated. At the completion of each inspection, the local stormwater manager should make a note of any maintenance tasks that need to be performed and how urgent those tasks appear to be. If there are any urgent maintenance needs, the local stormwater manager should immediately notify the individual responsible for the upkeep and maintenance of the stormwater BMPs. These improvements, especially those that are needed to alleviate a safety hazard, should be made as soon as possible.

This process should also help to identify any common problems with maintenance, which can result in recommended changes to the county/municipality's inspection and maintenance procedures. Some of the most commonly used practices to improve post-construction stormwater BMPs are listed in Table 3-6.

Table 3-6: Pollution Prevention/Good Housekeeping Practices Commonly Used to Improve Post-Construction Stormwater BMPs

Post-Construction Stormwater BMPs	Recommended Practices
Dry Detention Ponds	<ul style="list-style-type: none"> • Mow side slopes monthly. • Repair undercut or eroded areas as necessary. • Pesticide/ nutrient management. • Remove litter/ debris as necessary. • Inspect for erosion of pond banks or bottom semi-annually. • Seed or sod to restore dead or damaged ground annually (as needed). • Inspect for damage to the embankment annually. • Monitor for sediment accumulation in the facility and forebay annually. • Inspect monthly to ensure that inlet and outlet devices are free of debris and operational. • Removal of sediment from the forebay every 5 to 7 years • Monitor sediment accumulations and remove sediment when the pond volume has been reduced by 25%.
Wet Detention Ponds	<ul style="list-style-type: none"> • Mow side slopes of the pond monthly. • Since decomposing vegetation captured in the wet pond can release pollutants, especially nutrients, it may be necessary to harvest dead vegetation annually. Otherwise the decaying vegetation can export pollutants out of the pond and also can cause nuisance conditions to occur. • Clear debris from all inlet and outlet structures monthly. • Repair all eroded or undercut areas as needed. • Place a sediment marker in the forebay to determine when sediment removal is required. • Monitor sediment accumulations in the main pond area and remove sediment when the permanent pool volume has been significantly filled and/or the pond becomes eutrophic.
Bioretention Area	<ul style="list-style-type: none"> • Pruning and weeding as needed • Remove trash and debris as needed • Inspect inflow points for clogging semi-annually (every 6-months). • Remove any sediment semi-annually (every 6-months). • Repair eroded areas. Re-seed or sod as necessary semi-annually (every 6-months). • Mulch void areas semi-annually (every 6-months). • Inspect trees and shrubs to evaluate their health semi-annually (every 6-months). • Remove and replace dead or severely diseased vegetation semi-annually (every 6-months). • Remove evasive vegetation semi-annually (every 6-months). • Nutrient and pesticide management. Annual, or as needed. • Water vegetation, shrubs and trees semi-annually (every 6-months). • Remove mulch, reapply new layer annually • Test planting mix for pH annually. • Apply lime if pH < 5.2. as needed. • Add iron sulfate + sulfur if pH > 8.0 as needed. • Place fresh mulch over entire area as needed. • Replace pea gravel diaphragm every 2 to 3 years if needed.

Swales	<ul style="list-style-type: none"> • Mow grass to maintain design height and remove clippings as needed (frequent/seasonally). • Nutrient and pesticide management annually, or as needed • Inspect side slopes for erosion and repair annually, or as needed • Inspect channel bottom for erosion and repair annually, or as needed • Remove trash and debris accumulated in forebay annually. • Annual (semi-annually first year) inspection of vegetation. Plant an alternative grass species if original cover is not established. • Annual inspection for clogging and correct the problem. • Roto-till or cultivate the surface of the bed if swale does not draw down in 48 hours as needed. • Remove sediment build-up within the bottom of the swale as needed, after 25% of the original design volume has filled.
Stormwater Wetlands	<ul style="list-style-type: none"> • Monitor wetlands after all storm events greater than 2-inches of rainfall during the first year to assess erosion, flow channelization and sediment accumulation. Inspection should be made at least once every six months during the first three years of establishment. • Place a sediment cleanout stake in the forebay area to determine when sediment removal is required. • Debris should be removed from the inlet and outlet structures monthly. • Monitor wetland vegetation and replaced as necessary once every 6-months during the first three years of establishment. • Annually inspect and maintain the depth of the zones within the wetland. • Annually remove invasive vegetation. • Repair all eroded or undercut areas as needed.
Vegetated Filter Strip	<ul style="list-style-type: none"> • Inspect vegetation for rills and gullies annually and correct. Seed or sod bare areas. • Inspect grass after installation to ensure it has established. If not replace with an alternative species. • Inspect to ensure that grass has established annually. If not, replace with an alternative species. • Mow grass to maintain a height of 3- to 4-inches. • Remove sediment build-up from the bottom when it has accumulated to 25% of the original capacity.

3.5 STREET REPAIR AND MAINTENANCE

Public streets and roadways in Berkeley County make up a significant percentage of the urban infrastructure and require regular maintenance to keep them in good condition. Regular County street repair and maintenance activities, such as pavement marking, repair, patching, resurfacing, sealing and right-of-way maintenance, can generate a range of stormwater pollutants, including metals, chlorides, hydrocarbons, nutrients, sediment and trash. If not properly managed, these activities can negatively impact water quality (Figure 3-5).



Figure 3-5: Roadway Repairs and Maintenance Generating Significant Amounts of Sediment

There are three primary county/municipal street repair and maintenance activities that can influence stormwater quality:

- Routine road and bridge maintenance: Re-chipping, grinding, pothole repair, pavement striping, asphalt re-paving, saw cutting.
 - Potential pollutants: Sediment, chloride, cyanide, and phosphorus.
- Winter operations: Sanding, application of deicing compounds.
 - Potential pollutants: Fine particles, creosote and PAH.
- Right-of-way maintenance: Herbicide and pesticide application, vegetation selection.
 - Potential pollutants: Nutrients, herbicides, pesticides.

All streets and roadways have routine maintenance needs such as mowing and sweeping, with other maintenance needs dictated by age, traffic volume or climatic conditions. Recommended pollution prevention/good housekeeping techniques for roadways are applied through county/municipal employee, utility employee and contractor training, as well as county contracting specifications.

Improving the way that county/municipal street repair and maintenance activities are conducted within the community can reduce the amount of stormwater pollution that is conveyed into receiving waters. Some of the practices most commonly used to improve the way that county/municipal street repair and maintenance activities are conducted are listed in Table 3-7.

Table 3-7: Pollution Prevention/Good Housekeeping Practices Commonly Used to Improve County/Municipal Street Repair and Maintenance Activities

Street Repair or Maintenance Activity	Recommended Improvements
Routine Roads and Bridges Maintenance	<ul style="list-style-type: none"> • Prevent paving materials and wastes from entering the storm drain system • Minimize the area of soils left exposed or graded • Collect any loose sand, gravel, asphalt, or other material as soon as possible after construction activities • When placing chip seals, limit spreading aggregate to the sealed surface and sweep up excess aggregate once cured and each day thereafter until aggregate loss is insignificant • Mix road stabilization materials during periods of calm, dry weather, and seal as soon as possible after dressing • Fill and compact soil, gravel, and asphalt in layers • Reuse road spoil in repairs if possible and sweep up and dispose of properly • Eliminate 'edge break' by fully sealing road shoulders • When striping, use water-based paints or thermoplastics rather than solvent based ones • Avoid striping operations while the pavement is wet, during humid conditions, or if rain is likely • Avoid applying thermoplastics at low temperatures, i.e. below 54°F • When possible, use portable drip trays under equipment to catch spills • Use a skirt around the blaster to minimize the spraying of material away from the work site • Coordinate street-sweeping with line removal, so that waste material is picked up before it can be transported by rain, wind, and traffic • Use dry cutting techniques when saw cutting and sweep or vacuum up residue • Construct runoff barriers to protect storm drains from wet saw-cut runoff • Place drip pans or absorbent materials under saw-cut equipment when not in use • Use as little cooling water as possible and switch the water off when the saw is not in use

Vegetative Maintenance	<ul style="list-style-type: none"> • Use mechanical methods of vegetation removal rather than herbicides • Dispose of lawn clippings at a landfill; clippings should not be disposed of in streams or storm drains • Avoid applying herbicides and pesticides if rain is expected • Calibrate equipment to avoid over application
------------------------	---

A field investigation should regularly be done to assess current County pollution prevention/good housekeeping practices for street repair and maintenance activities. Once the investigations are done a brief implementation plan should be created if practices/activities are deemed to be causative of pollution. The plan will summarize the results of the assessment as it relates to the current County pollution prevention/good housekeeping practices and the practices that will be used to reduce the stormwater pollution generated by County street repair and maintenance activities. The plan will also include a schedule that describes when the prescribed pollution prevention/good housekeeping practices will be implemented. The contents of the implementation plan will be reviewed with the individual who manages the street repair and maintenance activities.

3.5.1. Street Sweeping

The public streets and roadways in Berkeley County under Berkeley County's maintenance responsibility require regular maintenance to keep them in good condition. Regular County street maintenance activity, via street sweeping maintenance, can generate a range of stormwater pollutant removals including Total Solids, Total Phosphorous, and Total Nitrogen, sediment and trash. However, if not properly managed, these activities can negatively impact water quality.

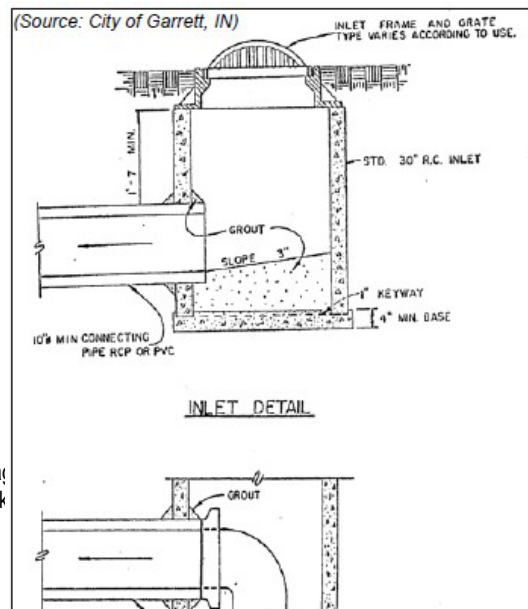
Using a conceptual model, it is expected that pollutant removal rates from street sweeping for TS, TP, and TN are: 9 %, 3% and 3%, respectively. The presented value is representative of mechanical, monthly street sweeping. All values presented are dependent upon the Street Particulate Matter (SPaM) that is available to be captured by pick-up of a street sweeper.

Berkeley County's and Municipality's solid waste programs includes a curb-side leaf litter pick-up that is able to maximize the reduction of leaf litter and prevent it from entering the storm drains. This is important for two reasons, 1) Berkeley County's street sweepers may also emulsify leafy debris and make it more easily entrained by runoff, and 2) the decomposition of leaves and other organic debris in storm drain inlets or catch basins can create an environment suitable for the release of inorganic nitrogen and transport to receiving waters.

3.6 STORM DRAIN MAINTENANCE

Storm drain maintenance is often the last opportunity to remove pollutants before they enter the storm drain system. The effectiveness of this pollution prevention/good housekeeping practice depends on the basic design of the stormwater conveyance in a subwatershed. Most systems have a catch basin (Figure 3-6) or sump pit located in the storm drain inlet to trap sediment and organic matter and prevent clogging. In some areas, however, conveyance systems were designed to be self-cleansing and thus have no storage. Each catch basin or sump pit tends to be unique in how quickly it fills up, and whether the trapped material is liquid, solid or organic. To this extent, each reflects the conditions and behaviors that occur within the few hundred feet of street it serves.

Berkeley County Stormwater Management
Pollution Prevention/Good Housekeeping



The Berkeley County Stormwater Design Standards Manual (2009) contains additional information in regard to catch basins that may be encountered during the County's maintenance process. Materials and construction of storm drainage structures (catch basins, junction boxes, control structures, etc.) are as specified in Section 719 of the SCDOT specifications (2013). Roadway catch basins are typically SCDOT Type 9, Type 16, Type 17 or Type 18 Catch Basins based on the specific application.

Storm drain maintenance can be an effective strategy in urban subwatersheds that have few other feasible options to remove pollutants. For many communities, storm drain maintenance is reactive and conducted in response to complaints from residents. Water quality is not a commonly cited reason for a storm drain cleanout program. When performed properly, regular maintenance can improve water quality and prevent clogging and flooding.

Figure 3-6: Catch Basin Detail

Storm drain cleanout effectiveness is impacted by both the frequency and method of cleanout. Table 3-8 provides estimated pollutant removal rates for catch basin cleanouts.

Table 3-8: Expected Pollutant Removal Rates for Catch Basin Cleanouts (Law et al., 2008)

Frequency	Total Suspended Solids	Total Phosphorus	Total Nitrogen
Annual	18%	<1%	3%
Semi-Annual	35%	2%	6%

A storm drain maintenance program should address the following:

- *Tracking* – the location and maintenance of storm drains is tracked using a database and spatial referencing system (e.g., Global Positioning System, Geographic Information System) as well as with a project management/asset management software. Additionally, knowing the type and era of the storm drain system may be of use since some inlets/catch basins are designed to be self-cleaning while others have some trapping capacity.
- *Frequency* – Catch basins should be inspected and cleaned out according to their priority (see priority matrix in Appendix B):
 - Priority A – Catch basins to be cleaned annually.
 - Priority B – Catch basins to be cleaned at least once every two years.
 - Priority C – Catch basins to be cleaned less frequently than A & B.
- *Technology* – the four common methods of cleaning catch basins are described in Table 3-9.
- *Staff Training* - operators need to be properly trained in catch basin maintenance including waste collection and disposal methods. Staff should also be trained to report water quality problems and illicit discharges.
- *Material Disposal* - since catch basin waste may contain hazardous material, it should be tested and disposed of accordingly. Maintenance personnel should keep a log of the amount of sediment collected and the removal date at the catch basin.

Table 3-9: Equipment Used for Catch Basin and Inlet Cleaning

Equipment	Description
Manual cleaning	Bail out sediment-laden water and shovel into street then truck. Or crew enters catch basin and fill buckets with sediment that are then carried to a dump truck. Clean water is used to refill the catch basin.
Eductor cleaning	Eductor truck evacuates the catchment of the sediment-laden water into a settling tank.
Vacuum cleaning	Air blower of the vacuum truck is used to create a vacuum and the air-solid-liquid material is separated in the vacuum truck unit by gravity separation and baffles.
Vacuum combination jet cleaning (e.g. Vaccon)	A vacuum assisted truck that uses a combination of air, water and hydraulic suction. Suction is used to extract material from storm inlets. Water is used to clear material from storm drain pipes that is not removed by the vacuum. The material is stored in the truck holding tank and transported for disposal. This type of vacuum combination jet cleaning equipment is what is being utilized by Berkeley County for stormwater system maintenance (see following photograph).

The County initiated a comprehensive catch basin/stormwater system cleaning program in April 2017 utilizing a vacuum truck previously owned and operated by the Berkeley County Water and Sanitation Department. This catch basin/stormwater system maintenance program is based on the assessment and prioritization of County owned facilities (as required by the County's NPDES Phase II MS4 Permit) as well as in response to service requests. A summary of the catch basin prioritization matrix for public systems is contained in Appendix B. This summary includes the established rating system with descriptions, criteria for rating and recommendations on the number of suggested scheduled cleanings.



Figure 3-7: Catch Basin Maintenance Operation

3.7 PARK AND LANDSCAPE MAINTENANCE

A community may own or control as much as 10% of all the land within a subwatershed, when all the parks, schools, golf courses, rights-of-way, easements, open space and county/municipal buildings are combined. It is not uncommon for these areas to be managed as vast expanses of turf. The maintenance of these areas frequently includes mowing, fertilization, pesticide application, and supplemental irrigation. Poor turf management and landscaping practices have the potential to create stormwater pollution, particularly in urban areas where soils are compacted, and infiltration is minimized. Potential pollutants generated by landscape and park maintenance include nutrients, herbicides, organic debris, and sediment. Because of their large size and ownership, county/municipal lands are good candidates for pollution prevention/good housekeeping techniques such as riparian reforestation and integrated pest management.

A wide range of pollution prevention/good housekeeping practices can be used to improve the way that park and landscape maintenance activities are conducted within a community. Some of the most commonly used practices are listed in Table 3-10.

Table 3-10: Pollution Prevention/Good Housekeeping Practices Commonly Used to Improve County/Municipal Park and Landscape Maintenance Activities

Activity	Pollution Prevention/Good Housekeeping Practices
Turf Reduction	<ul style="list-style-type: none"> • Plant trees and/or other native vegetation in suitable areas • Consider turf alternatives, such as native or low-water, cool-season turf grass • Allow natural regeneration in suitable areas
Turf Management	<ul style="list-style-type: none"> • Sweep any grass clippings away from paved surfaces after mowing • Use mulching type mowers or dispose of at local composting facility • Use erosion control measures when soils are exposed • Place stockpiled materials away from storm drains
Native Plantings	<ul style="list-style-type: none"> • Provide native and naturalized landscaping guidance and plant lists • Require use of appropriate native and naturalized landscaping on municipally-owned properties
Landscape Management	<ul style="list-style-type: none"> • Collect landscape waste (including grass clippings) and dispose of at a local yard waste recycling/composting facility • Do not use leaf blowers to blow waste into streets, storm drains or ditches
Pesticide/Herbicide Application	<ul style="list-style-type: none"> • Develop an integrated pest management plan that uses pesticides only as a last resort • Apply only when rain is not expected • Do not prepare herbicides or pesticides for application near storm drains • Use manual and/or mechanical methods to remove weeds rather than herbicides • Consider a low or no pesticide approach to maintaining landscaped areas
Fertilizer Application	<ul style="list-style-type: none"> • Never apply fertilizers or pesticides within five feet of pavement, 25 feet of a storm drain inlet, or 50 feet of a stream or water body • Consider a low or no fertilizer approach to maintain turf • Apply only when rain is not expected • Perform a soil test to determine actual fertilization needs and application rate • Calibrate fertilizer spreaders to avoid excessive application • Employ shutoff devices to prevent irrigation after precipitation
Irrigation	<ul style="list-style-type: none"> • Employ shutoff devices to prevent irrigation after precipitation or if a pressure drop occurs due to broken sprinkler heads or lines • Design irrigation systems specific to each landscaped area's water requirements • Select native plant species whenever possible and group together plants with similar water requirements in order to reduce excess irrigation • Use soaker hoses not sprinklers and irrigate in the morning or evening to conserve water
Employee Training	<ul style="list-style-type: none"> • Train employees on the use and appropriate application of pesticides, herbicides and fertilizers • Ensure that designated no mow areas are well advertised • Educate staff on the benefits of trees and native and naturalized species

A field investigation should regularly be done to assess current County pollution prevention/good housekeeping practices for park and landscape maintenance activities. Once the investigation is done a brief implementation plan should be created if it is found that the activities are thought to be causative of pollution.

The plan will summarize the results of the assessment as it relates to the current County pollution prevention/good housekeeping practices and the practices that will be used to reduce any stormwater pollution generated by the park and landscape maintenance activities. The plan will also include a schedule that describes when the prescribed pollution prevention/good housekeeping practices will be implemented. The contents of the implementation plan will be reviewed with the individual who manages the park and landscape maintenance activities.

3.8 ANIMAL SHELTERS

Animal Care and Handling Facilities

Since Berkeley County is currently responsible for an animal shelter on Cypress Gardens Road, included in this Manual is information on pollution prevention practices for these types of facilities. This animal shelter houses small animals (i.e. cats and dogs) as well as occasionally horses and other farm animals.

Pollutant sources at the animal shelter include, but are not limited to, the following:

- Animal washing
- Feeding / grazing
- Urine / feces and manure deposits
- Unpaved or non-vegetated areas

Pollutants can include:

- Coliform bacteria
- Nutrients
- Sediment

Approach

Minimize exposure of rain and runoff to animal care and handling areas by using cover and containment. In and around these areas, use good housekeeping to minimize the generation of pollutants. Make stormwater pollution prevention BMPs a part of standard operating procedures and the employee training program.

Source Control BMPs

Proposed best management practices are listed by activity.

Table 3-11: Pollution Prevention/Good Housekeeping Practices Commonly Used for Animal Handling Facilities

Activity	Pollution Prevention/Good Housekeeping Practices
Animal Handling/Washing	<ul style="list-style-type: none"> • Use dry cleaning methods (i.e. sweeping or vacuuming) to clean animal handling areas regularly. • Properly dispose of droppings, uneaten food, and other potential contaminants. • Do not discharge wash water to storm water drains or other conveyances. • Block the storm drain and contain the runoff for proper disposal. • Wash water should be collected and pumped to the sanitary sewer, do not allow wash water to enter storm drains. DO NOT discharge wash water to sanitary sewer until contacting the local sewer authority to find out if pretreatment is required. • Keep animals in paved and covered areas, if feasible. • If keeping animals in covered areas is not feasible, cover the ground with vegetation or some other type of ground cover such as mulch. • Prevent animals from moving away from controlled areas where BMPs are in use (e.g. fencing, leashing, etc.).

Horse Management	<ul style="list-style-type: none"> • Site Layout Considerations <ul style="list-style-type: none"> ◦ Site barns, manure storage, and other high-use areas on higher ground when possible or on the portion of property that drains away from storm drains, conveyances, or waterways. • Use grassed ditches, berms, or subsurface drains and properly sized roof gutters and downspouts to divert clean runoff around barnyard manure and sediment. • Divert contaminated runoff from manured areas away from storm drains or conveyances. • Focus on protecting the handling area's soil and vegetative cover. Prevent bare areas from forming. • Keep animals away from wet fields when possible. • During heavy rainfall, consider indoor feeding. • Clean up manure and soiled bedding regularly, especially during wet weather. • After cleanup, during the arid summer, water the areas where horses frequently deposit manure to promote decomposition. • Store horse waste in sturdy, insect-resistant, and seepage-free units that have an impervious surface bottom and a cover to prevent leaching and runoff, such as: <ul style="list-style-type: none"> ◦ Plastic garbage cans with lids ◦ Fly-tight wooden or concrete storage sheds ◦ Composters • Compost. Keep compost piles moist, and well aerated to promote decomposition. • Give away composted material to local greenhouses, nurseries and botanical gardens. • Transport manure to topsoil companies or composting centers.
Maintenance	<ul style="list-style-type: none"> • Clean storm drain inlets on a regular schedule and after large storms. • Maintain BMPs to reduce potential sediment runoff from outside exposed areas and any unpaved parking lot(s).
Training	<ul style="list-style-type: none"> • Install and alert employees to no dumping stencils on storms drains/inlets. • Train employees on BMPs, stormwater discharge prohibitions, and wastewater discharge requirements. • Train employees on proper spill containment and cleanup. • Establish a regular training schedule, train all new employees, and conduct annual refresher training. • Use a training log or similar method to document training.
Chemical Management	<ul style="list-style-type: none"> • Use Integrated Pest Management (IPM) or less-toxic methods for insect and weed control. • Use chemical insecticides and herbicides as a last resort. Always properly store and dispose of chemical pesticides.

3.9 EMPLOYEE TRAINING

County/municipal employees that are educated about the link between their work and stormwater quality can assist in reducing the amount of stormwater pollution that is conveyed into receiving waters. In order for county/municipal pollution prevention/good housekeeping programs to achieve success, employees must be trained on how to incorporate pollution prevention/good housekeeping practices into their everyday activities.

County/municipal employees must be provided with specific information about the actions they can take to prevent or reduce stormwater pollution. Table 3-11 presents the range of training topics that can be provided for each county/municipal operation. If they are not already familiar with the requirements of the NPDES Phase II permit, a general training session is a good opportunity to educate employees about them.

The most effective pollution prevention/good housekeeping training programs are the ones that provide the right information to the right employees. For example, employees engaged in landscape and park maintenance should be trained in landscaping techniques that use less fertilizer and pesticides, while employees responsible for maintaining fleet vehicles should be trained in the proper disposal of waste automotive fluids and how to correctly deal with leaky or disabled vehicles. Any County employees that are frequently in the field should be trained on how to identify and report any suspected illicit discharges.

There are a variety of methods that can be used to educate county/municipal employees on stormwater pollution prevention/good housekeeping practices, including:

- Annual Performance Reviews
- Brochures
- Conferences
- Meetings
- Training Sessions
- Videos
- Walkthroughs
- Workplace Posters
- Workshops

Employee turnover is an important consideration when developing an employee training and education program. The key to an effective program is to ensure that institutional knowledge about pollution prevention/good housekeeping practices is maintained over time. A tracking system, such as a sign in sheet that identifies the county/municipal staff members that have received training is critical to ensure the effectiveness of a pollution prevention/good housekeeping employee training program.

Table 3-12: Employee Training Programs – Presenting the Right Information to the Right Audience

County/Municipal Operation	Training Targets	Training Topics
Hotspot Facility Management	<ul style="list-style-type: none"> • Facility managers • Building maintenance staff • Fleet maintenance staff 	<ul style="list-style-type: none"> • Vehicle maintenance and repair procedures • Vehicle washing procedures • Materials loading and unloading procedures • Materials storage procedures (outdoor storage) • Spill prevention and response • Dumpster management • Building repair and maintenance procedures
Construction Project Management	<ul style="list-style-type: none"> • Contract administration staff • Building services staff • Plan review staff • Site inspection staff 	<ul style="list-style-type: none"> • Considering erosion and sediment control and stormwater management during contractor selection • Plan review techniques • Erosion and sediment control practices • Ordinance enforcement procedures
Post-Construction Stormwater Management	<ul style="list-style-type: none"> • Storm drain staff • Site inspection staff • Maintenance staff 	<ul style="list-style-type: none"> • Post-Construction stormwater BMP inspection procedures • Post-Construction stormwater BMP maintenance procedures

Street Repair and Maintenance	<ul style="list-style-type: none"> • Street maintenance staff • Vehicle operators 	<ul style="list-style-type: none"> • Road maintenance procedures • Winter road maintenance procedures • Handling and application of pesticides and other chemicals
Storm Drain Maintenance	<ul style="list-style-type: none"> • Storm drain staff • Street maintenance staff • Vehicle operators 	<ul style="list-style-type: none"> • Storm drain maintenance procedures • Materials disposal • Vacuum truck maintenance
Park and Landscape Maintenance	<ul style="list-style-type: none"> • Parks and recreation staff • Community forestry staff • Landscaping staff • Mowing staff 	<ul style="list-style-type: none"> • Use an appropriate application of pesticides, herbicides and fertilizers • No mow areas • Benefits of trees, native and naturalized species
Animal Shelters	<ul style="list-style-type: none"> • Animal shelter staff • Landscaping staff 	<ul style="list-style-type: none"> • Animal handling and washing • Waste management • Maintenance • Chemical management

Berkeley County has implemented a progressive pollution prevention/good housekeeping employee training program that now includes participants from the Cities of Goose Creek and Hanahan. The training program has historically consisted of workshops that includes Powerpoint presentations, videos, question and answer sessions and occasionally a short quiz on good housekeeping as well illicit discharge detection and elimination (IDDE).

The training workshops target key County and municipal personnel to include stormwater staff, roads and bridges, maintenance garage, fleet management, facilities and grounds, mosquito abatement, and building and codes. A template of an agenda and sample completion certification utilized by Berkeley County for the pollution prevention/good housekeeping training workshops can be found in Appendix E.

4.0 REFERENCES

- Bannerman, R., D. Owens, R. Dodds and N. Hornewer. 1993. "Sources of Pollutants in Wisconsin Stormwater". *Water Science and Technology*. 28:3-5, 241-259.
- Berryman and Henigar. 2003. *Street Sweeping Study Report*. Prepared for City of Concord, California. Berryman and Henigar. San Diego, CA.
- California Stormwater Quality Association (CASQA). 2003. *California Stormwater BMP Handbook: Municipal*. California Stormwater Quality Association. Livermore, CA.
- Center for Watershed Protection (CWP) and R. Pitt. 2004. *Illicit Discharge Detection and Elimination Manual: A Guidance Manual for Program Development and Technical Assessments*. Center for Watershed Protection. Ellicott City, MD.
- Center for Watershed Protection (CWP). 2006a. *Technical Memorandum 1. Literature Review. Research in Support of an Interim Pollutant Removal Rate for Street Sweeping and Storm Drain Cleanout Activities*. Center for Watershed Protection. Ellicott City, MD.
- CWP. 2006b. *Technical Memorandum 2. Summary of Municipal Practices Survey. Research in Support of an Interim Pollutant Removal Rate for Street Sweeping and Storm Drain Cleanout Activities*. Center for Watershed Protection. Ellicott City, MD.
- Brown, E.W. and D.S. Caraco. 2000. "Muddy Water In, Muddy Water Out". *The Practice of Watershed Protection*. Eds. T. Schueler and H. Holland. Center for Watershed Protection. Ellicott City, MD.
- Lager, J., W. Smith, R. Finn and E. Finnemore. 1997. *Urban Stormwater Management and Technology: Update and Users' Guide*. U.S. Environmental Protection Agency. EPA-600/8-77-014. Washington, DC.
- Law, N.L., K. DiBlasi and U. Ghosh. 2008. *Deriving Reliable Pollutant Removal Rates for Municipal Street Sweeping and Storm Drain Cleanout Programs in the Chesapeake Bay Basin*. Prepared for the Chesapeake Bay Program. Center for Watershed Protection. Ellicott City, MD.
- Maryland Department of the Environment (MDE). *MDE Spill Report Form*. MDE Spill Response Division. Baltimore, MD. Available Online: <http://www.mde.state.md.us/assets/document/emergency/mdespillreport.pdf>
- Mineart, P. and S. Singh. 1994. *Storm Inlet Pilot Study*. Prepared for Alameda County Urban Runoff Clean Water Program. Woodward-Clyde Consultants. Oakland, CA.
- Partland, J. 2001. "A Clean Sweep to Swipe Pollutants". *Stormwater*. 12(4). Available Online: http://www.forester.net/sw_0106_toc.html
- Pitt, R. and P. Bissonette. 1984. *Bellevue Urban Runoff Program. Summary Report. Characterizing and Controlling Urban Runoff Through Street and Sewerage Cleaning*. U.S. Environmental Protection Agency. EPA-600/S2-85/038. Washington, DC.
- South Carolina DHEC OCRM BMP Field Manual, July 2005. Available Online: http://www.scdhec.gov/environment/ocrm/docs/Field_Manual/OCRMLDHECFIELDMANUALSTRUCTURAL.pdf
- Sutherland, R.C. and S.L. Jelen. 1997. "Contrary to Conventional Wisdom: Street Sweeping can be an Effective BMP". *Advances in Modeling the Management of Stormwater Impacts. Volume 5*. Ed. W. James. Guelph, Canada.

U.S. EPA Office of Emergency and Remedial Response. 1990. *Hazmat Team Planning Guidance*. Office of Emergency and Remedial Response. U.S. Environmental Protection Agency. Washington, DC.

U.S. Fire Administration. 1999. *Guide to Developing Effective Standard Operating Procedures for Fire and EMS Departments*. Federal Emergency Management Agency. Washington, DC.

United States Environmental Protection Agency (U.S. EPA). 2000. *Stormwater Phase II Final Rule Fact Sheet 2.8: Pollution Prevention/Good Housekeeping Minimum Control Measure*. EPA-833-F-00-010. U.S. EPA. Office of Water. Washington, DC.

U.S. EPA. 2000. *Stormwater Phase II Final Rule Fact Sheet 2.6: Construction Site Runoff Control Minimum Control Measure*. EPA-833-F-00-008. U.S. EPA. Office of Water. Washington, DC.

Waschbush, R.J. 2003. *Data and Methods of a 1999-2000 Street Sweeping Study on an Urban Freeway in Milwaukee County, Wisconsin*. Open File Report 03-93. U.S. Department of the Interior. U.S. Geological Survey.

Wright, T., C. Swann, K. Cappiella and T. Schueler. 2005. *Urban Subwatershed Restoration Manual 11: Unified Subwatershed and Site Reconnaissance: A User's Manual*. Center for Watershed Protection. Ellicott City, MD. __

Appendix A
List of Berkeley County, Cities of Goose Creek and Hanahan
Owned/Operated Facilities

LIST OF BERKELEY COUNTY GOVERNMENT FACILITIES

Facilities & Grounds Dept. Description of Services

- Yellow = Building & Grounds Maintenance with custodial services**
- Light Green = Building & Grounds Maintenance only**
- Blue = Building Maintenance only when requested.**
- Green = Grounds Maintenance Only**
- Orange = Floor Plan Available**
- Limited to Structure Maintenance per Lease**

SC = Santee Cooper
 BEC= Berkeley Elec. Coop.
 SCE&G = S.C. Electric & Gas

Facility Occupied By----- C=County
 S=State
 O=Other

Berkeley County Facilities	Year Built	Address	Approx. Sq. Ft.	Utilities Paid by:		Berkeley County is the:	Occupied By:	Retention		
								C	S	O
223 North Live Oak Bldg.	1952/2007	223 North Live Oak Dr., Moncks Corner, SC29461	48,000	F&G	SC	Owner	See (a) thru (e)			
(a) Sheriff		Complete Bldg Renovated in 2007-8	20,000				Sheriff's staff	X		
(b) Central Summary Court			15,000				Magistrate's staff	X		
© EPD/EOC			3,400				Emergency Operations Center	X		
Mech. Rm/ /Data/			7,900				Mech,Data,Bath. Rm, stairwell,closet etc.	X		
(e) I.T./ Back up 911			1,400				I.T. staff /Back up call center	X		
Training/Sheriff			1,300				Sheriff training Media room	X		
Sheriff Annex Bldgs.		202 Factory St. M.C. Aquired 2018	14,500	F&G			Marine Rescue K-9	X		
			0							
EMS Logistics Building	1990	223 North Live Oak Dr., Moncks Corner, SC29461	2,091	F&G	SC	Owner	911 Communications staff	X		
Guardian AD LITEM		111 Pine Street, Moncks Corner, SC 29461	900	Guardian AD LITEM		Owner	Guardian AD LITEM		X	
Facilities & Grounds	Mid-70's	223 North Live Oak Dr., Moncks Corner, SC29461	10,140	F&G	SC	Owner	F&G Employees	X		
Portable Storage Unit		2 units 320sqft. Each	320				F&G Employees	X		
Portable Storage Unit			320				In use/Admin Services/Records Storage	X		
Public Works Building	Mid-70's	223 North Live Oak Dr., Moncks Corner, SC29461	16,470	F&G	SC	Owner	See (a) thru (d)			
(a) Roads & Bridges			8,355				Roads and Bridges staff	X		
(b) Purchasing			3,290				Purchasing staff	X		
(c) Garage			10,080				Garage staff	X		
<i>Garage Portable Storage Unit</i>			320				Vehicle/Equipment Parts Storage	X		
(d) EMS Storage			576				Public Works staff	X		
Hoover Building-PWD/Radio Shop	2004	223 North Live Oak Dr., Moncks Corner, SC29461	900	F&G	SC	Owner	Small engine repair shop	X		
Mosquito Abatement Office Bldg	2013	223 North Live Oak Dr., Moncks Corner, SC29461	2655			Owner	Mosquito Abatement staff	X		
Mosquito Abatement Storage	2013	223 North Live Oak Dr., Moncks Corner, SC29461	2655			Owner	Chemicals Trucks	X		
Maude Callen Building	1983	Belt Drive, Moncks Corner, SC 29461	26,700			Owner	See (a) thru (d)			
(a) DSS		4 Belt Drive, Moncks Corner, SC 29461	8,900	F&G	SC	Owner	Unoccupied/ Records Storage			
(b) D.S.S.		2 Belt Drive, Moncks Corner, SC 29461	12,342	D.S.S.		Lessor	D.S.S. staff		X	
(c) Admin. Services		6 Belt Drive, Moncks Corner, SC 29461	3,317	F&G	SC		Election Commission staff	X		
(d) Administrative Services		Belt Drive, Moncks Corner, SC 29461	2,141	F&G	SC		Admin. Services staff	X		
Guard House	1984	223 North Live Oak Dr., Moncks Corner, SC29461	80	F&G		Owner	Security Guards			X
Training Center	1996	474 Reid Hill Road, Moncks Corner, SC 29461	12,088	Training Ctr. Budget		Bldg. Owner	Land leased from Santee Cooper	X		
Records Storage Building	2000	223 North Live Oak Dr., Moncks Corner, SC29461	2,800	F&G	SC	Owner	Records Storage	X		
EMS Headquarters Bldg	2000	223 North Live Oak Dr., Moncks Corner, SC29461	2,800	F&G	SC	Owner	EMS Administrative staff	X		
Animal Shelter	2021	131 Central Berkeley Drive	6,885	F&G	BEC	Owner		X		
Berkeley Admin. Bldg.	1981/2005	1003 Highway 52, Moncks Corner, SC 29461	71,604	F&G	SC	Owner	Office space/New roof over entrance 2017	X		
Home Telephone		Complete Bldg renovation in 2004/2005	312	Home Telephone			Leases 312 Sq. ft. for Sub Station			
Suite A			4000				County Supervisor Suite	X		
Suite B			2100				Finance Dept.	X		
Suite C			3325				Human Resources Dept.	X		
Suite D			1000				Legal Dept.	X		
Suite E			1891				Del. Tax Collector Dept.	X		
Suite F			5920				Planning, Permits, B&C, Animal Control	X		
Suite G			1980				GIS, 911 Addressing	X		

Suite H			4326				Real Property Services Dept.	X		
Suite J			2500				Auditor Dept.	X		
Suite K			6144				Clerk to Council, Assembly Room	X		
Suite L			1170				Clemson Extension	X		
Old Engineering			1574				Temp. Offices	X		
Suite M			5800				Information Technology Dept. Server Rm.	X		
Suite N			2430				Treasurer Dept.	X		
Suite P			7400				Register Of Deeds	X		
Admin. Expansion	1981/2020	Hwy 52 & 52 Bypass, Moncks Corner, SC 29461	31,569	F&G	SC	Owner	<i>DMV-Finance -Engineering-Voters-EOC/911</i>	x	x	
Nesbitt Hse/Chamber of Commerce	1800's	1004 Old Hwy 52, Moncks Corner, SC 29461	2,470	Chamber of Comm.		Owner	Chamber of Commerce			X
Moncks Corner Health Dept.	1932/1999	109 West Main St, Moncks Corner, SC 29461	28,832	Health Dept.		Owner	New roof 2018			
(a) Health Dept. employees		Complete Bldg renovated in 1999	17,325				Dept.of Health & Human Services		X	
(b) Berkeley County D.J.J.			2320				Dept. of DJJ		X	
(d) Probation & Parole			1,710				Probation & Parole staff		X	
Court House Annex	1991	300-B California Ave, Moncks Corner, SC 29461	29,548	F&G	SC	Owner	See (a) thru (e)			
(a) Clerk of Court			24,202				Clerk of Court/Family Court staff	X		
(b) Solicitor			2,946				Solicitor's staff	X		
(c) Master-in-Equity			526				Master-in-Equity staff	X		
(d) Probate Court			1,872				Probate Judge & staff	X		
Old Court House	1896/1966	300 California Ave, Moncks Corner, SC 29461	15,936	F&G	SC	Owner	See (a) thru (d)			
(a) Sheriff		Added on to in 1966 and renovated	1,000				Sheriff's staff	X		
(b) Clerk of Court		Windows, soffit & trim upgraded 2002/03	11,000				Clerk of Court/Family Court staff	X		
(c) Probation & Parole		Roof Replacement 2002/03	1,120				Probation & Parole staff		X	
(d) I.T.			500				I.T. staff	X		
(e) Coroner Office			900				Coroner & staff	X		
(f) PTI Solicitor			1200				Pre-Trial Interv. Staff- Solicitor	X		
Hill Finklea Detention Center	1994/2008	300 California Ave, Moncks Corner, SC 29461	73,408	F&G	SC	Owner	Addition 2008/New roof 2018	X		
Jail Storage Buildings	2000	111 Pine St. Moncks Corner, SC 29461	1800	F&G	SC	Owner	Storage in use			
Narcotic's Trailer Office		182 Dog Pound Road, Moncks Corner, SC 29461	2,220	F&G	SC	Owner	Sheriff Staff	X		
Narcotic's Trailer Storage Bldg			1,116	F&G	SC	Owner	Storage in use	X		
Forensics' Building	2021	233 N. Live Oak Dr. Moncks Corner, SC 29461	6,685	F&G	SC	Owner	Sheriff Staff	X		
Morgue Building	1989/2007	223 North Live Oak Dr., Moncks Corner, SC29461	1,260	F&G	SC	Owner	Coroner & staff	X		
Morgue itself			700							
Storage			560				Storage			
Airport/Terminal Building	2005	616 Whitesville Rd, Moncks Corner, SC 29461	2,625	F&G	BEC	Owner	Airport staff	X		
Shade Hangar Bldg #1			11,507	F&G	BEC	Owner				
Shade Hangar Bldg. #2			13,209	F&G	BEC	Owner				
Shade Hangar Bldg. #3			11,507	F&G	BEC	Owner				
T-Hangar Building			15,311	F&G	BEC	Owner				
Corporate Hangar			10,000	F&G	BEC	Owner				
Maintenance Hangar			4,600	F&G	BEC	Owner/Lessor	Leased/New roof 2018			X
Runway Light Vault			120	F&G	BEC	Owner				
Moncks Corner Senior Center	1999/2014	222 Heatley St, Moncks Corner, SC 29461	4,450	Berkeley Seniors		Owner	New roof 2018			X
Moncks Corner Library	1981/2005	1003 Highway 52, Moncks Corner, SC 29461	15,082	Library	SC	Owner	New roof partial 2018	X		
Library Admin. Building		100 Library St, Moncks Corner, SC 29461	7,873	Library		Owner	Library staff	X		
Goose Creek Library	1992	325 Old Moncks Corner Rd, Goose Creek SC	16,462	Library		Owner	Needs new roof	X		
Sangaree Library	2006	595 Sangaree Parkway, Summerville, SC 29483	6,510	Library		Owner	Library staff	X		
Daniel's Island Library	2007	2301 Daniels Island Dr, Charleston, SC 29492	6,690	Library		Owner	Library staff	X		
			0							
Hanahan Library	2013	1216 Old Murray Ct. Hanahan SC	7,000	Library		Owner	Library staff	X		
Cainhoy Community Center	early-80's	2442 Cainhoy Rd, Cainhoy SC	2,000	F&G	BEC	Owner	Community use/New roof 2019			X
Spiers Landing		1505 Spiers Landing Road, Cross SC 29436	1,976	F&G	SCE&G	Lease agreement	Open to Public Management contract			
			0							

St. Stephen Senior Center		1266 Russellville Rd, St. Stephens SC	6,438	Senior Citizens	Lessee	Senior Center staff			X
Building A			3,450						
Building B			2,988						
Goose Creek Service Center	2005	303 Goose Creek Blvd, Goose Creek SC	11,252	F&G	BEC	Lessee	See (a) thru (d) <i>Cleaning Contracted</i>		
(a) Goose Creek Magistrate			8,148				Magistrate staff	X	
			0	Inc. in Above				X	
			0	Inc. in Above			Veteran Affairs staff	X	
Goose Creek Health Dept.	1985	106 West View Drive, Goose Creek, SC	6,000		BEC	Owner	Health Dept staff		X
St. Stephen Magistra /Library	2015	113 Ravenell St. St. Stephen S.C. 29479	9,500	F&G	Lib	Owner	Mag. Staff /Lib	X	
Cypress Gardens		3030 Cypress Gardens Road, Goose Creek SC	31,692	Cypress Gardens	Owner		Cypress Garden's staff/open to Public	X	
Visitors Center	1991		2,660						
Nature Center	2006		1,442						
Environmental Classroom		Gate house Demo March 2019	0						
Butterfly House			3,285						
Aquarium	1994		4,900						
Heritage Room	2002		2,993						
Dean Hall	1994		7,000						
Conference Cottage	1986		780						
Double Gazebos			1,152						
Restrooms (2)			578						
Maint. Office/Supply Storage Bldg.			276						
Maintenance Shop			589						
Maintenance Tool Shed			200						
Horticulture Supply Shed			544						
Green House			2,660						
Storage Containers (3)			320						
Horticulture Trailer			320						
Gift Shop Storage Trailer			552						
			0						
Sangaree Sheriff's Sub Station	N/A	345 Sangaree Parkway	600	F&G	BEC	Agreement BCWS	Sheriff agreement with BCWS for use	X	
Goose Creek Senior Center	1995/2005	103 Thurgood Rd. Goose Creek, S.C.	6,250	F&G	Rec. Comm	Owner	New Roof 2019		X
Medic 1 - Goose Creek	N/A	907 Redbank Rd, Goose Creek SC	0	Goose Creek Fire Dept.		Agreement	EMS/Goose Creek Fire Dept.	X	X
Medic 2 - Summerville	2001	137 Farmington Rd, Summerville, SC	1,500	F&G	BEC	Owner	EMS	X	
Medic 3 - Moncks Corner	2002	223 North Live Oak Dr., Moncks Corner, SC29461	2,800	F&G	SC	Owner	EMS	X	
Medic 4 - Cross	N/A	1659 Old Hwy 6 Cross SC 29436	2090	F&G	SCE&G	Owner	EMS/Sheriff Sub-station	X	
Medic 5 - St. Stephens	1999	336 Ravenell Dr, St. Stephens, SC	1,500	F&G	BEC	Owner	EMS	X	
Medic 6 - Jamestown	N/A	1052 Bee Drive, Jamestown, SC	1,200	F&G	BEC	Owner Oct. 2014	EMS	X	
Medic 7 - Cainhoy	1999	1501 Rec Road, Cainhoy SC	3,600	F&G	BEC	Owner	EMS	X	
Medic 8 - Daniel's Island	N/A	235 Seven Farms Dr, Charleston, SC	0			Agreement	EMS/City of Chas. Fire Dept.	X	X
Medic 9 Fire station	N/A	Myers Rd. Summerville	0			Agreement	Ambulance & Crew Pine Ridge FD		X
Medic 10 - Highway 176	2003	2355 State Rd, Summerville, SC	2,214	F&G	BEC	Owner	EMS	X	
Communications Towers:	N/A		0				911-Communication Radio Equipment		
Cainhoy Tower Building		2167 Cainhoy Rd. Cainhoy, SC BCWS	48				Communication Equipment		
Sandridge Tower Building		4594 State Rd. Ridgeville, SC	48				Communication Equipment		
Hwy 17A & 45 Tower Building		3659 N. Hwy 17A Jamestown, SC	48				Communication Equipment		
Hwy 27 Tower Building		1516 Old Gilliard Rd. Ridgeville/ Not in use	48				Communication Equipment		
Hwy 52 Tower Building		441 Drive In Lane Walmart Site	48				Communication Equipment		
Hwy 41 Tower Building		4796 HWY 41 BEC Huger Site	48				Communication Equipment		
Landfill Tower Building		555 Oakley Rd. Moncks Corner, SC	200	Communications	Owner		Communication Equipment		
Cross Tower Building		1338 Ranger Dr.- BCWS Water Tower	48				Communication Equipment		
Shulerville Tower Building		2115 Sulerville Rd. Jamestown, SC	48				Communication Equipment		
Russellville Site		138 Broadcast Lane- RCC Tower	0				Communication Equipment		
BC Central Communications		223 North Live Oak Dr.	0	F&G	SC	Owner	Communication Equipment		

New Hope Site		1046 Jedburg Rd. Summerville, SC	0			Owner		Communication Equipment			
RCC Shop GC		102 Farm Rd. GC	0					Communication Equipment			
Goose Creek Site		Water Tower Rd. G.C.	0					Communication Equipment			
Live Oak Tower Site		223 North Live Oak Dr.	400	F&G				Communication Equipment			
Cordesville Tower Site		411 Zee Lane Cordesville, SC	48	Dispatch pays %				Communication Equipment			
M.C. Fairgrounds Property		327 Rembert C. Dennis Boulevard	0	16.07 Acres		Owner					
Coroner New Office	1985-86	102 Gulledege St.	3,000	F&G	SC	Owner		Coroner Staff		X	
		Sum of All	896,001								
		Sum of Total in Red	626,290								
		Sum of Total in Black	269,711								

List of City of Goose Creek Government Owned Property

Description of Services

Light Green = Building & Grounds Maintenance

Yellow = Building Maintenance only

Green = Grounds Maintenance Only

Blue = SW BMP On-site/BMP Type/BMP Maintenance when necessary

Orange = no maintenance performed

Facility Occupied By----- C=City
S=State
O=Other

City of Goose Creek Facilities	Year Built	Address	Approx. Area	City of Goose Creek is the:	Occupied By:	C	S	O	BMP Type
Fire Station II	2002	950 Crowfield Boulevard	5,000 Sqft	owner	Fire & Safety Staff	X			1-pond
Berkeley Seniors Center	1996/2005	103 Thurgood Road	6,528 Sqft	Agreement W/ Berkeley County	Citizens			X	
Municipal Complex - Offices, Administration, Court, Police, IT	1999	519 N Goose Creek Boulevard	32,720 Sqft	owner	Municipal Staff	X			
Goose Creek Community Center- Gym	2005/2017	519 N Goose Creek Boulevard	37,000 Sqft	owner	Gym Staff	X			1-pond
Felkel Field - Baseball / Softball / Concession / Playground / Restrooms / Equipment Maintenance TMS# 2351308017	1989/1992 /1993	101 Lucy Drive	14,708 Sqft.	owner	Maintenance staff	X			1-pond
Crowfield Golf and Country Club- Golf Course / Clubhouse / Pool / Tennis Courts / Golf Cart Maintenance	1989	301 Hamlet Circle	180.44 Acres	owner	Golf Course Staff				11-ponds
Fire Station I	Unknown	101 Button Hall Avenue	6,000 Sqft.	owner	Fire & Safety Staff	X			
Department of Public Works- Water / Sanitation / Maintenance / Garage / Vehicle & Equipment Maintenance	1991	200 Button Hall Avenue	unknown	owner	Public Works Staff	X			1-pond
Central Creek Park (Eubanks Park)	Unknown	147 Old Moncks Corner Road	14,750 Sqft bldg. 9.38 Acres	owner	unoccupied				
John McCants Veterans Park	1992	351 Anita Drive	4 Acres	owner	unoccupied				
Dogwood Park - Picnic / Football / Grill / Playground / Soccer	unknown	460 Liberty Hall Road	1,728 Sqft bldg 15.5 Acres	owner	unoccupied				
Etling Park - Basketball / Picnic / Playground	unknown	100 Ellen Street	unknown	owner	unoccupied				
Eubanks Park - Basketball / Picnic / Grill / Playground / Volleyball / Tennis	See Central Creek Park	Old Moncks Corner Road	See Central Creek Park	See Central Creek Park	See Central Creek Park				
Fairfax Park - Grill / Picnic / Playground	Unknown	13 Waterford Place	unknown	owner	unoccupied				
Forest Lawn Park - Grill / Picnic / Playground	Unknown	181 Giles Drive	unknown	owner	unoccupied				
Foster Creek Park - Concession / Picnic / Playground / Soccer	2008	224 Foster Creek Road	34.14 Acres	owner	unoccupied				
Lake Greenview Park - Picnic / Grill / Picnic / Playground / Trails	Unknown	1 East Pandora Drive	unknown	owner	unoccupied				

Oak Creek Park Picnic / Grill / Playground	Unknown	100 Persimmon Circle	unknown	owner	unoccupied				
Ryan Creek Park - Benches / Playground	Unknown	Janice Street	unknown	owner	unoccupied				
Shannon Park - Picnic / Playground	Unknown	101 Old Moncks Corner Road	unknown	owner	unoccupied				
Fire Station HQ & Meeting Facility	2016	201 Button Hall Avenue	34,525 Sqft bldg. 9.16 Acres	owner	Fire & Safety Staff	X			1-pond & 1-Bioswale
Fire Station III	2015	535 Old Mount Holly Road	10,000 Sqft bldg 3.9 Acres	owner	Fire & Safety Staff	X			2-ponds
St. James III Park - Picnic / Grill / Playground	Unknown	1084 Willowood Avenue	2.79 Acres	owner	unoccupied				
St. James Park - Picnic / Playground / Tennis	Unknown	188 Westminster Boulevard	unknown	owner	unoccupied				
Santee Cooper/Goose Creek Water Tower	Unknown	634 Saint James Avenue	unknown	owner	unoccupied				
TMS# 235-00-00-037 - Municipal Complex Park/Walking Trails	Unknown	No site address/ Adjoining 519 N Goose Creek Blvd	unknown	owner	unoccupied				2-ponds

List of City of Hanahan Government Owned Property

Description of Services

Light Green = Building & Grounds Maintenance

Yellow = Building Maintenance only

Green = Grounds Maintenance Only

Blue = SW BMP On-site/BMP Type/BMP Maintenance when necessary

Orange = no maintenance performed

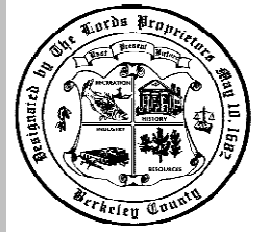
Facility Occupied By----- C=City
S=State
O=Other

City of Hanahan Facilities	Year Built	Address	Approx. Area	City of Hanahan is the:	Occupied By:	C	S	O	BMP Type
2511200098 - Vacant Parcel		NO SITE ADDRESS		Owner	unoccupied				
2521303035- Park Adjoining Goose Creek Reservoir		NO SITE ADDRESS - End of VENICE AVENUE	1 Acre	Owner	unoccupied				
2590000059- City of Hanahan Recs & Parks Grounds		3000 RAILROAD AVE.	24.14 Acres	Owner					
2590000065 - Tennis Court & Recycling		S. BASILICA AVE.	2.5 Acres	Owner	unoccupied				
2590000087- Fire Station 2	1994	1200 S. BASILICA AVE.	4,355 sqft	Owner	Fire & Safety	X			1-pond
2590000092- City of Hanahan Recs & Parks Grounds & Bettis Boat Landing		BETTIS BOAT LANDING RD.	11.26 Acres	Owner	unoccupied				
2590000093- City of Hanahan Recs & Parks Bldg. Senior Center, & Amphitheater	2005	3100 & 3102 MABELINE RD.	27,415 sqft	Owner	Recreation Dept. Staff & Public	X		X	1-pond
2590000105- Fire Station #3 & Public Works Department	Fire Dept-2008 & Public Works 2015	1101 WILLIAMS LN.	14,316 Sqft	Owner	Fire & Safety and Public Works Staff	X			1-pond
2590000149- Vacant Parcel		NO SITE ADDRESS/EAGLE LANDING	5.13 Acres	Owner	unoccupied				2-ponds
2650200026- Vacant Parcel		NO SITE ADDRESS		Owner	unoccupied				
2650702053- Vacant Parcel		NO SITE ADDRESS		Owner	unoccupied				
2650803058 - Old Public Works Facility		5920 STEWARD ST.		Owner	unoccupied				
2650804016 - Old Public Works Facility		5920 STEWARD ST.	5,400 sqft	Owner	Public Works Staff	X			
2651503062 - Temporary Storage		5819 ROBINSON ST.		Owner	unoccupied				
2651201020 - Vacant Parcel		NO SITE ADDRESS		Owner	unoccupied				
2651208001 - Vacant Parcel/ SW Drainage		NO SITE ADDRESS		Owner	unoccupied				
2651208021 - Vacant Parcel/ SW Drainage		NO SITE ADDRESS	3.88 Acres	Owner	unoccupied				
2651503060- City of Hanahan Gym Parking		5821 & 5823 ROBINSON ST.		Owner	unoccupied				
2651602055 - Rhodes Pond/Park		NO SITE ADDRESS	3.18 Acres	Owner	unoccupied				
2651503059 - Municipal Complex, Fire Station #1, and Gym		5826 CAMPBELL ST	10,444 sqft	Owner	Municipal Staff, Fire & Safety, Gym Staff	X			
		1265 YEAMANS HALL RD				X			
		1255 YEAMANS HALL RD	19,496			X			
2590000150- Vacant Parcel		NO SITE ADDRESS/EAGLE LANDING	1.54 Acres	Owner	unoccupied				1-pond
2590000104- Bowens Corner Elem. School		1173 WILLIAMS LN.	21.44 Acres	Agreement	Berkeley County School Dist.			X	
2660503071- Effluent Pump Station		Corner of EAST LAKESIDE DRIVE & WEST LAKE SIDE DRIVE		Agreement	unoccupied				
2590000189 - Hawks Nest	2023	1177 WILLIAMS LANE	53.31 Acres	Owner	Recreation Dept. Staff & Public				4-ponds
2651205030- Park		Corner of YEAMANS HALL RD. & PARK RD.		Owner	unoccupied				

Appendix B
Prioritization Matrix for Catch Basins in Public Systems

<u>Rating (A, B, or C)</u>	<u>Discription of Rating</u>	<u>Criteria for Rating</u>	<u>Number of Suggested Scheduled Cleanings</u>
C	Moderate to Significant Need for Maintenance	Pipe size of less than fifteen (15) inches associated with Catch Basin, but basin made of solid material	Once every two years
B	High Need for Maintenance	Has a deficient material but pipe size is greater than fifteen (15) inches	Once every year
A	Very High Need for Maintenance	Basin is of deficient material and pipe size is less than fifteen (15)inches	Twice every year

Appendix C
Spill Prevention and Response Plan



BERKELEY COUNTY STORMWATER MANAGEMENT PROGRAM

212 Oakley Plantation Drive
Moncks Corner, SC 29461-5036
843.719.2697 843.723.3800 843.412.7313
843.719.4695 fax

SPILL PREVENTION & RESPONSE PLAN

Spill Prevention & Response Plan For

(enter facility name and address)

Berkeley County Stormwater Management recommends our fleet maintenance, facilities fueling, vehicle washing, and vehicle storage areas and operations develop and implement a spill prevention and response plan that includes an employee training component and has the ultimate goal of preventing or reducing pollutant runoff from our municipally controlled and operated facilities, and to promote good housekeeping practices within each facility. Even with the best preventative efforts in place, spills may still occur. When spills do occur, it is up to facility personnel to respond quickly and effectively to clean-up any spilled material or notify someone who can. This Spill Prevention and Response Plan is designed as a template for Fleet Maintenance facilities and fueling operations to develop site-specific individual Spill Prevention and Response Plans. The plan should be kept in a central location that is easily accessible for employees and updated as site-specific operations change.

INSTRUCTIONS

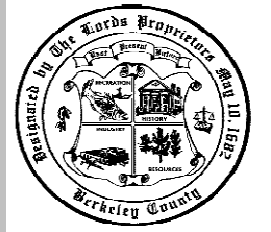
Each facility can use this template by filling in the blanks and completing the attached:

- _____ Spills that require Special Cleanup
- _____ Materials Inventory
- _____ Maximum Cleanup Amounts
- _____ Facility Map
- _____ Spill Kit Inventory and associated labeling
- _____ Employee Training Log

Once completed, this Plan becomes the facility's individual Plan and must be properly implemented and maintained. The finished Plan should be reviewed and updated at least annually and or as site specific changes occur.

Plan Implementation Date: _____

Plan Revision Date(s): _____



BERKELEY COUNTY STORMWATER MANAGEMENT PROGRAM

212 Oakley Plantation Drive
Moncks Corner, SC 29461-5036
843.719.2697 843.723.3800 843.412.7313
843.719.4695 fax

SPILL PREVENTION & RESPONSE PLAN

Facility's Responsible Person(s) in charge of spill response planning, implementation and maintenance of the Plan:

Name

Phone #

RESPONSIBILITIES

- Each "**Facility Responsible Person**" has the primary responsibility for coordinating the response to emergencies, this will include hazardous material spills.
- All **Supervisors** should ensure that their respective employees are familiar with these spill prevention and response procedures and receive the necessary training deemed appropriate for their role in spill prevention and spill response.
- **All employees** should follow these procedures in the event of a chemicals spill.

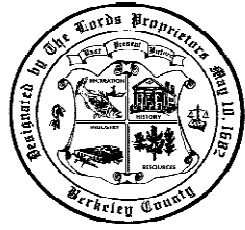
EMERGENCY CONTACT NUMBERS

The following telephone numbers should be posted near telephones and any other obvious locations near high potential spill locations:

- Outside emergency services (police, fire department, ambulance service): 911
- National Response Center: 800-424-8802
- South Carolina Department of Health and Environmental Control: 1-888-481-0125
- South Carolina Emergency Management Division: 803-737-8500
- Berkeley County Emergency Preparedness: 843-719-4166
 - Safety Department: (if applicable): _____

CLEAN-UP PROCEDURES

Spilled hazardous materials should be quickly contained and effectively cleaned up. Employees should clean up spills themselves, **only if properly trained and protected**. Employees who are NOT trained in spill cleanup procedures should immediately report the spill to the Responsible Person(s) listed above, warn other employees in the area, and leave the area as soon as possible and if necessary.



BERKELEY COUNTY STORMWATER MANAGEMENT PROGRAM

212 Oakley Plantation Drive
Moncks Corner, SC 29461-5036
843.719.2697 843.723.3800 843.412.7313
843.719.4695 fax

SPILL PREVENTION & RESPONSE PLAN

The Maximum Cleanup Amounts that properly trained employees can cleanup **are listed on pages 8**. In the event of spills greater than the amounts listed on pages 8, contact the aforementioned appropriate responders listed in the Emergency Contact Numbers.

Berkeley County Stormwater recommends that the following generalized guidelines should be followed for evacuation of areas where hazardous material spills have occurred, spill control and containment, notification of proper authorities, and general emergency response procedures in the event of a spill incident in which there is potential for a significant release of hazardous materials:

1. Evacuation

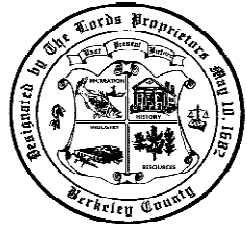
Personnel in the immediate vicinity of a spill should *immediately evacuate* the premises (except for employees with training in spill response for specific circumstances described below) if the material poses an immediate health hazard. If the spill is of “medium” or “large” size, or if the spill seems hazardous, immediately notify emergency response personnel.

2. Spill Control Techniques

Once a spill has occurred, the properly trained personnel needs to decide whether the spill is small enough to handle without outside assistance. Only employees with training in spill response should attempt to contain or clean up a spill.

NOTE: If you are properly trained for cleaning up a spill yourself, make sure you are aware of the hazards associated with the material spilled by referencing the on-site MSDS, make sure you have adequate ventilation, and make sure you have proper personal protective equipment on prior to initiating any cleaning activities. Treat all residual chemical and clean-up materials used throughout the course of the spill as a hazardous waste.

Spill control equipment should be located wherever significant quantities of hazardous materials are received, stored, or used. MSDSs, absorbents, over-pack container, container patch kits, spill dams, shovels, floor dry, acid/base neutralizers, and “caution-keep out” signs are common items to be utilized during a spill response.



BERKELEY COUNTY STORMWATER MANAGEMENT PROGRAM

212 Oakley Plantation Drive
Moncks Corner, SC 29461-5036
843.719.2697 843.723.3800 843.412.7313
843.719.4695 fax

SPILL PREVENTION & RESPONSE PLAN

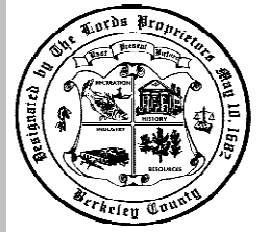
3. Spill Responses and Cleanup

Most hazardous material spills can be divided into three categories: Small, Medium and Large. Response and cleanup procedures can vary depending on the size of a spill. Using the information below, determine the extent and type of spill. If the spill is large, if there has been a release to the environment or if there is no one knowledgeable about spill clean-up available, contact the Facility Responsible Person or 911. Additionally, always refer to page 8 for the maximum clean-up amounts associated with each specific type of material.

Small Spills: Any spill where the major dimensions are less than 18 inches in diameter. Small spills are generally handled by properly trained internal personnel and usually do not require an emergency response by police or fire department HAZMAT teams.

- Quickly control the spill by stopping or securing the spill source.
This could be as simple as up righting a container and using floor-dry or absorbent pads to soak up the spilled material. Be sure to wear gloves and protective clothing if necessary.
- Put spill material and absorbents in secure containers if any are available.
- Consult the Facility Responsible Person and the MSDS for the spill and waste disposal procedures.
- In most instances, the area of the spill should **NOT** be washed with water. Use Dry Cleanup Methods and **never** wash spills down the drain, onto a storm drain or onto the driveway or parking lot.
- Both the spilled material and the absorbent may be considered hazardous waste and must be disposed of in compliance with state and federal environmental regulations.

Medium Spills: Spills where the majority of the dimensions exceed 18 inches, but are less than 6 feet. Outside emergency response personnel



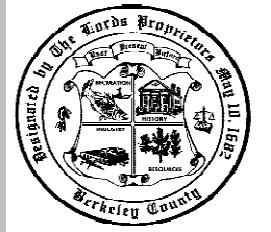
BERKELEY COUNTY STORMWATER MANAGEMENT PROGRAM

212 Oakley Plantation Drive
Moncks Corner, SC 29461-5036
843.719.2697 843.723.3800 843.412.7313
843.719.4695 fax

SPILL PREVENTION & RESPONSE PLAN

(police and fire department HAZMAT teams) may need to be called for medium sized spills. However, common sense and a certain degree of caution should dictate when it is necessary to call them.

- Immediately attempt to contain the spill at its original source by simple measures. Simple measures consist of quickly up-righting a container, or putting a lid on a container, if possible. Only use absorbents if they are immediately available. If you have made an attempt to contain the spill, and you have quickly determined you cannot take any short-term containment measures, leave the area and alert Emergency Responders. Closing doors behind you while leaving will help contain the fumes occurring from the spill(s). Give Emergency Responders accurate enough information that they are aware of the exact location, chemical, and estimated amount of the spill.
- Immediately assess the area surrounding the spill. Engines and electrical equipment near the spill area need to be turned off. This will minimize potential sources of ignition in the area. If engines and electrical sources can't be turned off prior to leaving, advise Emergency Responders of such. Furthermore, advise them on how to turn off engines or electrical sources. Do not attempt to go back into the area of the spill once you have left. Assist emergency responders by helping them determine where and how to shut off heating, air conditioning equipment, or air circulating equipment, if necessary.
- Be sure to follow all Emergency Responder instructions.
- Be prepared to assist Emergency Responders with any other information that may be necessary, such as MSDSs, questions about the facility, and appropriate Berkeley County personnel. Emergency Responders or trained personnel with proper personal protective equipment will then clean up the spill residue once it has been contained. Do not attempt to re-enter the area of the spill until the responder in charge says the area is acceptable for occupancy.



BERKELEY COUNTY STORMWATER MANAGEMENT PROGRAM

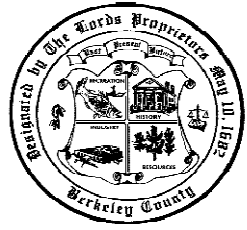
212 Oakley Plantation Drive
Moncks Corner, SC 29461-5036
843.719.2697 843.723.3800 843.412.7313
843.719.4695 fax

SPILL PREVENTION & RESPONSE PLAN

- All appropriate reports must be filed with proper authorities. It is the responsibility of the spiller to inform both his/her supervisor and the emergency responders as to what caused the spill. The response for large spills is similar to the procedures for medium spills, except that the exposure danger is greater.

Large Spills: Any spill involving flammable liquid where the major dimension exceeds 6 feet in diameter; and or any “running” spill, where the source of the spill has not been contained or flow has not been stopped.

- Immediately leave the area of the spill and notify Emergency Responders. Give the operator the spill location, chemical name, and approximate amount.
- Attempt to get MSDS information for the spilled chemical for the Emergency Responders to use, only if the MSDS information is located in a safe area away from the spill. Furthermore, be prepared to advise responders as to any ignition sources, engines, electrical power, or air conditioning/ventilation systems that are still running. Provide responders of any absorbents, containers, or spill control equipment that may be available. This should be done in a remote area, because the evacuation should place the spiller far away from the spill. Radios or phones can be used to assist from a distance, if necessary.
- Emergency Response personnel, in accordance with their own established procedures, should be the only personnel that handle any spills greater than 6 feet in any dimension or that are continuous or running. Once the Emergency Responders or HAZMAT team are on-site cleaning up spills and or putting out fires, the entire area will be under their control and no one may reenter the area until the responder in charge says the area is acceptable for occupancy.
- Provide information for reports to supervisors and responders, just as indicted in the medium spills.



BERKELEY COUNTY STORMWATER MANAGEMENT PROGRAM

212 Oakley Plantation Drive
Moncks Corner, SC 29461-5036
843.719.2697 843.723.3800 843.412.7313
843.719.4695 fax

SPILL PREVENTION & RESPONSE PLAN

REPORTING SPILLS

All hazardous material spills, regardless of their size, should be reported immediately to the **Facility Responsible Person**. It will be the responsibility of the Facility Responsible Person to determine if the spill has the potential for any environmental impacts outside of the facility and those that must be reported to 911, the National Response Center at 800-424-8802, the South Carolina Department of Health and Environmental Control at 1-888-481-0125, the South Carolina Emergency Management Division at 803-737-8500, and the Berkeley County Emergency Preparedness at 843-719-4166.

South Carolina Law requires reports of spills & releases that may impact the environment. Do not delay reporting! Calling a local DHEC office DOES NOT COUNT legally as reporting a spill. You must call the 24-hour SCDHEC Emergency Response number at 1-888-481-0125.

SPILLED MATERIALS THAT REQUIRE SPECIAL CLEANUP

Describe any material used in your facility that requires special materials and procedures for cleanup beyond those listed above. Provide details regarding hazards associated with these.

Material

Hazards

MATERIAL INVENTORY

List all materials or waste that may require clean up. List the average and maximum amounts on site and their storage locations. *(Ignore any that do not apply and add other materials of concern that are onsite. Use additional sheets if necessary).*

<u>Material</u>	<u>Amount (avg./max)</u>	<u>Location(s)</u>
Antifreeze	_____	_____
Used Oil	_____	_____
Motor Oil	_____	_____
Degreaser	_____	_____
Hydraulic Oil	_____	_____
Solvents	_____	_____
Brake Cleaner	_____	_____
Diesel Fuel	_____	_____
Fuel Additive	_____	_____
Unleaded Fuel	_____	_____
Other	_____	_____

Spill Kits

- Label each spill kit prominently with the words „SPILL KIT” or “Absorbent” etc.
- Label or stencil the necessary emergency telephone number(s) or pager of the persons to be contacted in case of a spill or leak that is beyond the training and equipment available on or near each spill kit location.

Facility Responsible Person/Phone Number: _____ / () - _____

Spill Response Contractor (if any)/Phone Number: _____ / () - _____

State Emergency Release and Incident Hotline: 1-(888)-481-0125

Spill Kit Inventory

List all response equipment that will be maintained in each spill kit location (refer to MSDSs to determine recommended clean-up methods PPE and supplies):

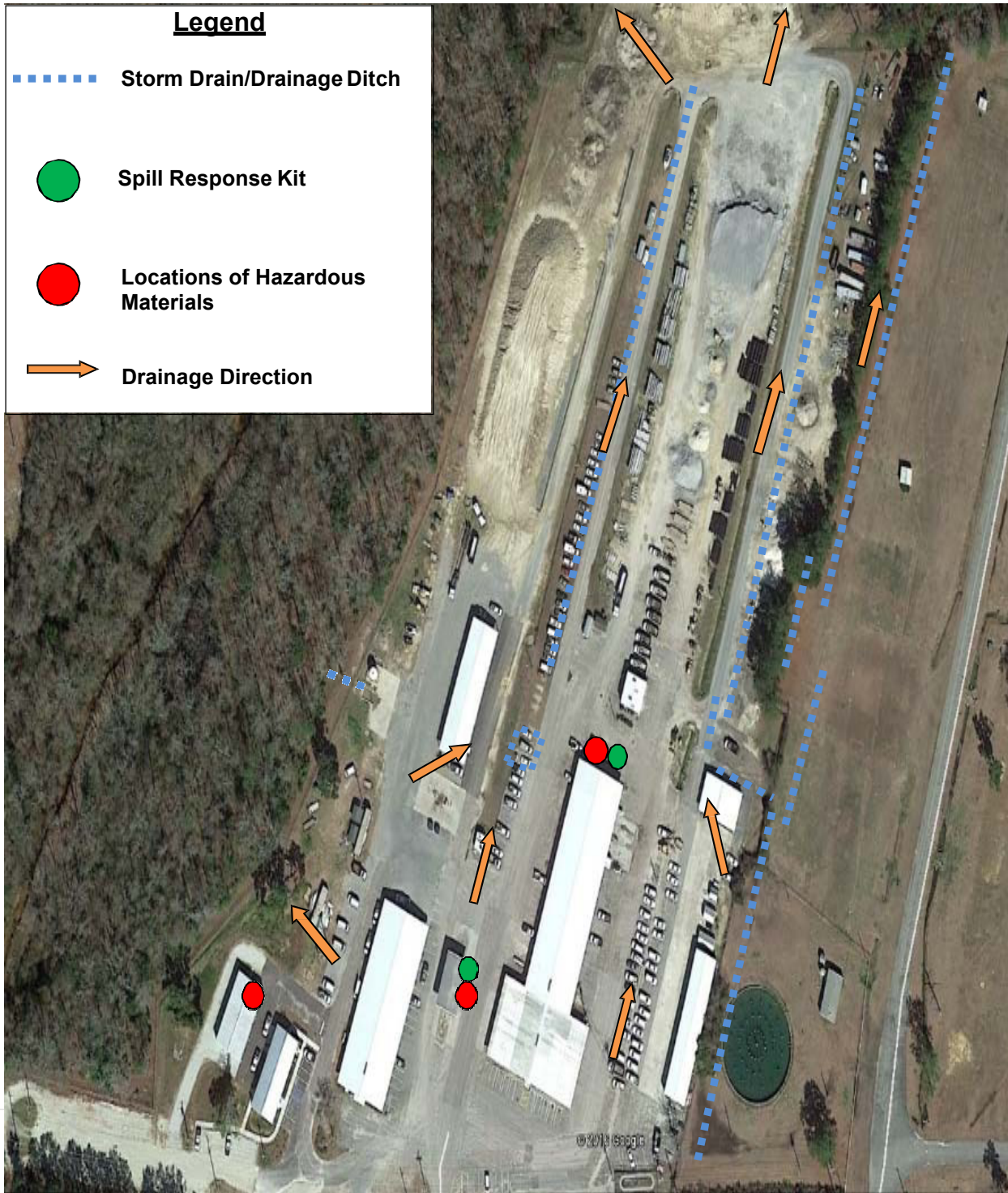
LOCATION	ABSORBENTS (bags or loose absorbent, pags, neutralizing agent, etc.	TOOLS (shovels, brooms, waste containers, etc.	PERSONAL PROTECTIVE EQUIPMENT (impervious gloves, goggles, aprons, boots,	OTHER SUPPLIES (warning tape, labels, markers, MSDSs, etc.)

PERSON RESPONSIBLE FOR MAINTAINING THIS INVENTORY:

FACILITY MAP

Attach a map or sketch of the facility showing:

- the locations of each spill response kit.
- the locations where the material identified on page 8 are normally stored or used.
- the location of each storm drain or drainage ditch.



Appendix D
Good Housekeeping/IDDE Training Template and Example Certificate



AGENDA

Event: Illicit Discharge Detection and Elimination Training – Good Housekeeping Training

Date:

Time:

Location: Assembly Room, 1003 US-52, Moncks Corner, SC 29461

Attendees: Stormwater Management Program:

Roads & Bridges:

Maintenance Garage:

Fleet Management:

City Staff:

8:00am – 8:45am Introduction & Program Descriptions

- I. Sign-in.
- II. SWMP introduction and program description.
- III. Introduction of attendees and a description of daily activities as it relates to stormwater.

8:45am – 10:15am Good Housekeeping

- I. A presentation about good housekeeping practices.
- II. A few short videos about good housekeeping practices.
- III. Question and answer session.
- IV. A short quiz to be taken about the material just covered.

10:15am – 10:30am Break

10:30am – 12:00pm Illicit Discharge Detection and Elimination

- I. A presentation about how to detect illicit discharges and how to report.
- II. A few short videos about illicit discharges and how to detect them.
- III. Question and answer session.
- IV. A short quiz to be taken about materials just covered.

12:00pm Adjourn

CERTIFICATE OF ATTENDANCE

BERKELEY COUNTY

in cooperation with
Berkeley County Stormwater Management Program

This certifies that

XXXXXXXXXX

BERKELEY COUNTY (DEPARTMENT)

Attended the *Stormwater Employee Training for
Illicit Discharge Detection & Elimination – Good Housekeeping Workshop*
MM/DD/YYYY



Nelson Morgan

Instructor: XXXXXX
Berkeley County Stormwater Management Program

