

**Town of Mooresville**  
**NPDES Phase II Stormwater Report**

**Permit number NCS000540**

July 1, 2017 – June 30, 2018

Report submitted on October 26, 2018

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## Introduction

This report documents the Town of Mooresville's compliance with the National Pollutant Discharge Elimination System (NPDES) permit number NCS000540 to discharge stormwater as effective February 20, 2017. This report covers the reporting period from June 1, 2017 through July 31, 2018.

The Town of Mooresville began operating under a National Pollutant Discharge Elimination System (NPDES) Phase II Municipal Separate Storm Sewer System (MS4) Permit on December 1, 2011. The permit has a 5-year cycle. The current permit is effective from February 20, 2017 to February 19, 2022.

The tables within each of the Minimum Control Measure sections indicate the BMPs for each minimum control measure and the associated measurable goal. Documentation is included within each section showing what has been accomplished during the reporting period. Tables detailing the implementation schedule and frequency of each BMP prescribed by the Town of Mooresville's Stormwater Permit can be found at the end of each section.

Based on the US Census Bureau data, the population estimate for the Town of Mooresville in July 2017 is 37,820. In April 2010, the population estimates base for the Town of Mooresville was 34,303. The US Census Bureau data indicates an 10.3% growth in population between April 2010 and July 2017.

The Town of Mooresville MS4 jurisdictional area is approximately 24 square miles. The Town of Mooresville is located in southern Iredell County in the Piedmont region of North Carolina. The Town of Mooresville is within the Catawba and Yadkin/Pee-Dee River Basins and the municipal limits extend into the WS-IV Critical and Protected areas as well as the WS-II Critical Area. According to the Drainage Master Plan completed by ESP in January 2016, the land use composition within the Town of Mooresville is as detailed in the table below:

**Table 1: Town of Mooresville Approximate Land Use Composition**

<b>Land Use Category</b>	<b>% Total Area</b>
Commercial	15%
Industrial	7%
Institutional	6%
Multi-Family	3%
Single-Family – High	19%
Single-Family – Low	5%
Single-Family – Medium	8%
Utility	2%
Woods/Undeveloped	36%

The existing MS4 serving the Town of Mooresville is comprised of a network of open ditches, swales, pipes, culverts and structural SCMs that are within the incorporated limits. The stormwater maintenance crew maintains all stormwater drainage infrastructure within the rights-of-way of Town owned and maintained roads and within easements dedicated to the Town.

The Town of Mooresville MS4 conveyance system discharges to the following streams within the Yadkin/Pee-Dee River Basin: Back Creek, Dye Branch, Rocky River, South Fork Withrow Creek and West Branch Rocky River. It also discharges to the following streams within the Catawba River Basin: Byers Creek, Davidson Creek, McCrary Creek, Reeds Creek and Work Creek. Table 2 below shows the Town of Mooresville receiving waters.

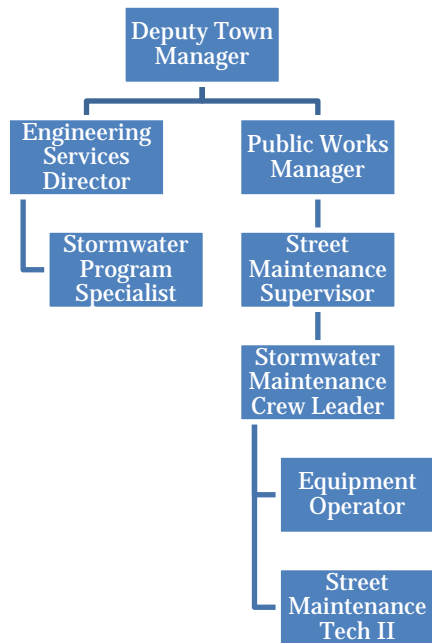
**Table 2: Town of Mooresville Receiving Waters**

River Basin	Receiving Stream Name	Stream Segment	Water Quality Classification	TMDL (Yes/No)
Catawba	Byers Creek	11-89-(1)	WS-IV	No
	Byers Creek	11-89-(2)	WS-IV; CA	No
	Davidson Creek	11-106	WS-IV; CA	No
	McCrary Creek	11-91.	WS-IV,B; CA	No
	Reeds Creek	11-104-(1)	WS-IV,B	No
	Reeds Creek	11-104-(2)	WS-IV,B; CA	No
	WorkCreek	11-105	WS-IV,B; CA	No
Yadkin Pee-Dee	Back Creek	12-108-21-1-(0.5)	WS-II;HQW	No
	Dye Branch	13-7-2	C	No
	Rocky River	13-17	C	No
	South Fork Withrow Creek	12-108-21-3-2	C	No
	West Branch Rocky River	13-7-3	C	No

Maintenance of the Town’s MS4 conveyance system is currently funded using the stormwater utility fee established in January 2015. The annual revenue of the stormwater utility fee for fiscal year 2018 was approximately \$1,679,512 and is used for permit compliance, maintenance of the Town’s MS4 and capital improvements to the Town’s MS4.

Requirements of Watershed Protection Overlay Districts are detailed in the Town of Mooresville Zoning Ordinance, established in accordance with the requirements in North Carolina General Statutes Section 143-214.5. These standards are designed to regulate density and impervious surface cover in water supply watershed areas in order to promote public health, safety, and general welfare through control of non-point source pollution within watershed protection areas.

The figure below displays the organizational structure of the Town of Mooresville stormwater employees.



**Figure 1: Organizational Chart**

## Section 1: Public Education and Outreach Program

The Town of Mooresville's Public Education and Outreach Program educates residents, business owners and other people within the community about the impacts of stormwater on the Town's receiving waters, and what members of the community can do to reduce pollutants in stormwater runoff. The Stormwater Program Specialist is responsible for implementation and the program is funded through the Stormwater Utility Fee. The following sections discuss the BMPs implemented to fulfill these requirements. See Table 8 for the measurable goals, frequency and implementation schedule for each BMP.

### 1.1 Goals and Objectives

The goals and objective of the Town of Mooresville's Public Education and Outreach Program is to educate the community about the impacts of stormwater discharges on water bodies and the steps the public can take to reduce pollutants in stormwater runoff through the distribution of educational materials and/or outreach activities.

### 1.2 Target Pollutants and/or Stressors

Table 3 below describes the pollutants and pollutant sources targeted for the public education and outreach program for the current permit cycle. Educational information provided will include the impacts of stormwater pollution on water bodies and the steps the public can take to reduce pollutants in stormwater runoff. Target pollutants are chosen based on citizen complaints and requests for service, and information provided by Town staff.

**Table 3: Target Pollutants for the Public Education and Outreach Program**

<b>Target Pollutant</b>	<b>Pollution Source</b>
Grass Clippings, leaves and yard waste	Residential areas, landscaped areas
Automotive Fluids	Residential areas
Pet Waste	Residential areas, public open areas
Trash	Garbage and litter Illegal Dumping Dumpsters

The Stormwater Program Specialist has provided education and stormwater pollution prevention information for the targeted pollutants through the distribution of flyers at town events such as Race City Festival and the Know-It-All Fair, the distribution of door hangers after volunteer storm drain marking events, and articles published in the Town Voice newsletter included with the utility bill. See Section 1.6 for additional information regarding the distribution of educational information addressing target pollutants and/or stressors.

### 1.3 Target Audiences

Homeowners and business owners are the target audiences for the public education and outreach program. Homeowners were chosen as a target audience for the Public Education and Outreach program because they are most likely to engage in activities that produce or involve the target pollutants listed in Table 3. The Town of Mooresville has a wide variety of businesses which have the potential to contribute to stormwater pollution. A selection of businesses and facilities (such as restaurants) which conduct activities that produce the target pollutants will



receive targeted education providing information regarding stormwater pollution prevention specific to their business.

### 1.4 Residential and Industrial/Commercial Issues

The following residential and industrial/commercial stormwater issues will be addressed in the Town’s Public Education and Outreach Program.

**Table 4: Pollutants associated with residential and industrial/commercial issues**

<b>Issue</b>	<b>Pollutant</b>	<b>Impacts</b>
Lawn and garden care activities	Grass clippings, leaves, yard waste	Excess nutrients discharged from the Town’s MS4 and into receiving waters increase algae growth which negatively impacts aquatic plants and wildlife.
Automotive Maintenance	Automotive Fluids	Negative environmental impacts on the Town’s receiving waters.
Pet Waste	Pet Waste	Excess nutrients and bacteria discharged from the Town’s MS4 can negatively impact the Town’s receiving waters.
Littering in neighborhoods, Dumpsters and Trash Cans	Trash	Increase in bacteria in stormwater runoff which can negatively impact human health.

Public education handouts and other distributed material addresses the pollutants listed above that are associated with residential and industrial/commercial issues. Distributed materials address the pollutants listed in the table above. Specifically, handouts are being distributed to restaurants that address stormwater pollution issues typical to restaurants and other issues are addressed in articles in a newsletter distributed to both residents and businesses who receive a utility bill. See Sections 1.6 and 1.8 for further information regarding distributed educational materials.

### 1.5 Informational Website

A website containing information on the Town’s stormwater program is maintained by the Stormwater Program Specialist. The link for the website is:

<http://www.ci.mooreville.nc.us/Stormwater>

The website includes a link to the Town of Mooresville Post Construction and Illicit Discharge and Connection Ordinance, contact information for the Stormwater Program Specialist, forms for post construction stormwater control measures and general stormwater pollution prevention information.

### 1.6 Distribution of Public Education Materials

Educational information about stormwater, stormwater pollution, and stormwater pollution prevention is distributed periodically through the utility bill mailer and through flyers and handouts distributed at various events in Mooresville throughout the year.

The Stormwater Program Specialist attends events within the Town and distributes handouts to citizens. These handouts contain information regarding stormwater pollution and stormwater pollution prevention tips including: don't litter, pick up after your pet and pile leaves, grass clippings and other yard waste above the curb and away from storm drains. Below is a table containing information on the date, event and approximately how many citizens were reached at each event.

**Table 5: Events attended by Stormwater Program Specialist in fiscal year 2018 (July 1, 2017-June 30, 2018)**

<b>Date of Event</b>	<b>Event</b>	<b>Approximate Number of Citizens Reached</b>
4/28/2018	Household Hazardous Waste Collection Event	260 vehicles
5/12/2018	Race City Festival	25
5/26/2018	Touch-A-Truck	100
6/2/2018	Know-It-All Fair	100

Articles focused on stormwater pollution prevention information or on topics related to stormwater are published in the Town of Mooresville utility mailing, the Town Voice, several times per year. Approximately 14,500 residents and businesses receive a copy of the Town Voice every month and it is also available online at <http://ci.mooresville.nc.us/478/Town-Voice-Newsletter>. Stormwater specific article topics are chosen based on citizen reports, complaints and requests for service as well as information provided by Town of Mooresville staff. See the table below for the article topics published this year.

**Table 6: Stormwater-related articles published in Town of Mooresville Town Voice Newsletter in fiscal year 2018 (July 1, 2017-June 30, 2018)**

<b>Month</b>	<b>Article Topic</b>	<b>Article Description</b>
July 2017	Fats, Oils & Grease (Town of Mooresville F.O.G program)	Article includes information advising citizens to never pour grease or used oil into the storm drains or in the ground.
August 2017	Car Maintenance and Stormwater	Article describes how byproducts of automotive maintenance can pollute local waters and how citizens can prevent stormwater pollution while performing maintenance on their vehicles.
October 2017	Keep Storm Drains Free of Debris	Article requests help from citizens in monitoring storm drains and keeping storm drains from being blocked by debris.
December 2017	Reporting Illicit Discharges	Article provides a definition of illicit discharge, how to report an illicit discharge, and tips that can be used to prevent illicit discharges.
May 2018	Rain Barrels	Article describes what a rain barrel is and how it can be used to reduce a water utility bill, conserve water, and reduce potential pollutants entering the storm drainage system.

<b>Month</b>	<b>Article Topic</b>	<b>Article Description</b>
June 2018	Water Saving Landscaping Tips	Article includes information on how to increase your water efficiency and help plants survive in drought conditions. One tip provided is to capture rain water using rain barrels.

Door hangers are distributed in residential neighborhoods following a volunteer storm drain marking event in that neighborhood. Door hangers help to bring attention to the storm drain markers and provide information about stormwater pollution prevention. Stormwater pollution prevention tips for residents include requesting that citizens pile leaves, grass clippings and other yard waste above the curb and away from storm drains. From July 2017 through June 2018, 78 door hangers have been delivered to residents within the Town of Mooresville and 199 storm drains have been marked by volunteers in the storm drain marking program.

Flyers of Stormwater Pollution Prevention Information for Restaurants are currently being distributed to restaurants within the Town of Mooresville by the Town of Mooresville F.O.G. department staff. These flyers encourage restaurant staff to use best management practices such as to properly dispose of all waste, regularly check outdoor dumpsters and trash cans for leaks and debris and to not direct wash water towards storm drains. Approximately 15 handouts have been distributed to restaurants in the Town of Mooresville by F.O.G staff. These flyers will continue to be distributed by the F.O.G. Compliance Officers in welcome packets and during inspections.

### **1.7 Hotline/Helpline**

A stormwater hotline/helpline for requesting assistance with stormwater related issues is maintained and advertised on the Town’s stormwater website. (<http://www.ci.mooresville.nc.us/Stormwater>). The hotline/helpline is also listed on distributed educational materials.

The Stormwater Program Specialist received and documented a total of 58 calls on the phone number listed on the stormwater website. Service requests and work orders are used to track issues reported by citizens that may require maintenance. In fiscal year 2018, a total of 88 service requests were entered on behalf of citizens and addressed by Town staff.

### **1.8 Public Education and Outreach Program**

The Town’s Stormwater Public Education and Outreach Program provides educational information to residents about how they can protect water quality and reduce stormwater pollution. Information is provided through Town Voice articles, the Town of Mooresville Stormwater website, handouts and door hangers. Educational demonstrations and presentations are also available upon request.

The Stormwater Program Specialist has participated in several events around the Town of Mooresville to distribute information as well as conducted several educational demonstrations. See Section 1.6 for more information regarding the events attended by the Stormwater Program Specialist and how many citizens or businesses were reached using distributed educational materials. The Stormwater Program Specialist conducted several educational demonstrations

for children through programs operated by the Town of Mooresville Recreation Department. See Table 7 below for more information.

**Table 7: Public Education Demonstrations given by the Stormwater Program Specialist in fiscal year 2018 (July 1, 2017-June 30, 2018)**

<b>Date</b>	<b>Event</b>	<b>Number Reached</b>	<b>Topic of demonstration</b>
9/6/2018	Environmental Protection Commission Meeting	10	General information and an update on the stormwater program.
9/28/2017	Citizen's Academy	Approximately 10 citizens	Stormwater Program Specialist discussed the six minimum measures detailed in the Town's NPDES Phase II Stormwater permit and maintenance of Town owned and maintained stormwater infrastructure.
6/18/2018	Summer Camp at Selma Burke Center	29 summer camp attendees	Stormwater Program Specialist used the watershed model to demonstrate the connection between storm drains and neighboring water bodies. Demonstration also discussed common sources of stormwater pollution and how to reduce stormwater pollution.
6/19/2018	Summer Camp at Selma Burke Center	15 summer camp attendees	Stormwater Program Specialist used the watershed model to demonstrate the connection between storm drains and neighboring water bodies. Demonstration also discussed common sources of stormwater pollution and how to reduce stormwater pollution.
6/25/2018	Summer Camp at Winnie Hooper Center	25 summer camp attendees	Stormwater Program Specialist used the watershed model to demonstrate the connection between storm drains and neighboring water bodies. Demonstration also discussed common sources of stormwater pollution and how to reduce stormwater pollution.
6/26/2018	Summer Camp at Winnie Hooper Center	20 summer camp attendees	Stormwater Program Specialist used the watershed model to demonstrate the connection between storm drains and neighboring water bodies. Demonstration also discussed common sources of stormwater pollution and how to reduce stormwater pollution.
6/27/2018	Summer Camp at Winnie Hooper Center	15 summer camp attendees	Stormwater Program Specialist discussed bioretention areas and how they work with summer camp attendees during a field trip to Town Hall to see the bioretention areas located there.

The Town of Mooresville is a member of the Regional Stormwater Partnership of the Carolinas (RSP). The RSP provides an opportunity for municipalities in the region to collaborate on projects related to public education, outreach and training. The RSP maintains an educational website with stormwater information and information on how to report an illicit discharge, <http://regionalstormwater.org> . The RSP completed a media campaign that ran between March and July 2018 in the area.

**Table 8: Public Education and Outreach BMP Table**

<b>No.</b>	<b>BMP</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>	<b>Frequency</b>
1.1	Goals and Objectives	Defined goals and objectives of the Local Public Education and Outreach Program based on community wide issues.	Implemented in year one of the permit cycle.	Review annually and update if needed.
1.2	Describe target pollutants and/or stressors	The permittee shall maintain a description of the target pollutants and/or stressors and likely sources.	Target pollutants and/or stressors are identified in year one of the permit cycle.	Review annually and update if needed.
1.3	Describe target audiences	The permittee shall maintain a description of the target audiences likely to have significant storm water impacts and why they were selected.	Target audiences are identified in year one of the permit cycle.	Review annually and update if needed.
1.4	Describe residential and industrial/commercial issues	The permittee shall describe issues, such as pollutants, likely sources of those pollutants, impacts, and the physical attributes of stormwater runoff, in their education/outreach program.	Residential and industrial/commercial issues are identified in year one of the permit cycle.	Review annually and update if needed.
1.5	Informational Web Site	The permittee shall promote and maintain, an internet web site designed to convey the program's message.	Informational website will continue to be maintained throughout permit cycle.	Review annually and update if needed.
1.6	Distribute public education materials to identified target audiences and user groups. For example, schools, homeowners, and/or businesses.	The permittee shall distribute stormwater educational material to appropriate target groups. Instead of developing its own materials, the permittee may rely on Public Education and Outreach materials supplied by the state, and/or other entities through a cooperative agreement, as available, when implementing its own program.	Public education materials will be distributed beginning in year one of permit cycle.	Public education materials will be distributed at least twice per year throughout the permit cycle.
1.7	Maintain Hotline/Help line	The permittee shall promote and maintain a stormwater hotline/helpline for the purpose of public education and outreach.	Hotline/Helpline will continue to be maintained throughout the permit cycle.	Continuously maintained.
1.8	Implement a Public Education and Outreach Program.	The permittee's outreach program, including those elements implemented locally or through a cooperative agreement, shall include a combination of approaches designed to reach the target audiences. For each media, event or activity, including those elements implemented locally or through a cooperative agreement the permittee shall estimate and record the extent of exposure.	Public Education and Outreach program will be continued throughout the permit cycle.	Review annually and update if needed.

## **Section 2: Public Involvement and Participation Program**

The Town of Mooresville implements a Public Involvement and Participation Program with the goal of involving the citizens of the Town of Mooresville in the Stormwater Program and complying with State and Local notice requirements. The Stormwater Program Specialist is responsible for implementation and the program is funded through the Stormwater Utility Fee. The following sections discuss the BMPs implemented to fulfill these requirements. See Table 9 for the measurable goal, frequency and implementation schedule for each BMP.

### **2.1 Public Review and Comment on Stormwater Plan**

The Town of Mooresville Stormwater Plan is posted on the Town's Stormwater website (<http://www.ci.mooresville.nc.us/Stormwater>). The Stormwater Program Specialist is available to respond to any questions or comments from citizens.

### **2.2 Target Pollutants and/or Stressors**

See Section 1.2 for information regarding targeted pollutants and/or stressors.

### **2.3 Target Audiences**

Volunteers with the storm drain marking program are encouraged to mark storm drains in lower-income neighborhoods to provide additional education through the Public Involvement and Participation program for these areas. This group was chosen because a higher number of illicit discharges were noted in the lower income neighborhoods within the Town of Mooresville. Neighborhoods where volunteer storm drain marking events take place also receive additional education through doorhangers. These doorhangers have general stormwater pollution prevention information in English and Spanish.

### **2.4 Residential and Commercial Issues**

See Section 1.4 for information regarding residential and commercial issues.

**Table 9: Public Involvement and Participation BMP Table**

<b>No.</b>	<b>BMP</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>	<b>Frequency</b>
2.1	Allow the public an opportunity to review and comment on the Stormwater Plan	The permittee shall conduct at least one public meeting during the term of the permit to allow the public an opportunity to review and comment on the Stormwater Plan.	Stormwater Plan is made available to the public throughout the permit cycle.	Stormwater Plan will be available throughout the permit cycle.
2.2	Describe target pollutants and/or stressors	The permittee shall maintain a description of the target pollutants and/or stressors and likely sources.	Target pollutants and/or stressors are identified in year one of the permit cycle.	Review annually and update if needed.
2.3	Describe target audiences	The permittee shall maintain a description of the target audiences likely to have significant storm water impacts and why they were selected.	Target audiences are identified in year one of the permit cycle.	Review annually and update if needed.
2.4	Describe residential and industrial/commercial issues	The permittee shall describe issues, such as pollutants, likely sources of those pollutants, impacts, and the physical attributes of stormwater runoff, in their education/outreach program.	Residential and industrial/commercial issues are identified in year one of the permit cycle.	Review annually and update if needed.



## **Section 3: Illicit Discharge Detection and Elimination Program**

The Town of Mooresville implements an Illicit Discharge Detection and Elimination program with the goal of detecting, eliminating and prohibiting non-stormwater discharges. The Stormwater Program Specialist is responsible for implementation and the program is funded through the Stormwater Utility Fee. The following sections discuss the BMPs implemented to fulfill these requirements. See Table 11 for the measurable goal, frequency and implementation schedule for each BMP.

### **3.1 Illicit Discharge Detection and Elimination Program**

The Illicit Discharge Detection and Elimination Program and the procedures associated with it are detailed in the IDDE Program and Procedures Manual. The manual describes how to investigate and track illicit discharges, how to conduct dry weather outfall inspections, enforcement procedures, and how the program is to be evaluated. This manual also describes how the Wastewater Treatment Plant and the Water Sewer Maintenance Department is involved with the Illicit Discharge Detection and Elimination Program.

### **3.2 Legal Authorities**

The Town of Mooresville Post Construction and Illicit Discharge and Connection Ordinance became effective September 2, 2014. Article V of the Post Construction and Illicit Discharge and Connection Ordinance defines illicit discharges and illicit connections. Article VI of the ordinance discusses enforcement and the procedure to be followed in the event of violations of the ordinance. There have been no updates to the ordinance since the chapter took effect on September 2, 2014.

### **3.3 Storm Sewer System Map of Major Outfalls**

The Town of Mooresville maintains a GIS map of the municipal storm sewer system including inlets, pipes, outfalls and major outfalls. This map also shows rivers and streams in the area. This map is updated periodically to reflect new construction and new information.

Per the Engineering Department GIS Specialist, 1462 new features were added to the drainage structures dataset and 368 new features were added to the drainage pipes dataset in fiscal year 2018.

### **3.4 Dry Weather Flow Detection Program**

Details and written procedures associated with the dry weather flow detection program are detailed in the Illicit Discharge Detection and Elimination program and procedures manual.

### **3.5 Investigate Sources of Identified Illicit Discharges**

Article VI, Section 25-31 of the Phase II Post Construction and Illicit Discharge and Connection Ordinance details the procedure for investigating reported illicit discharges. The Illicit Discharge Detection and Elimination Program and Procedures Manual also details the process for investigating illicit discharges.

In fiscal year 2018, 25 illicit discharge reports were made, 11 reports of which were made by citizens. Out of these 25 reported suspected illicit discharges, 12 were determined to be illicit discharges. The Stormwater Program Specialist addressed illicit discharges through letters or phone calls. If the Stormwater Program Specialist requests action to be taken by the responsible party to correct the illicit discharge, a follow up investigation is conducted to confirm the required action has been taken.

### **3.6 Track and Document Investigations of Illicit Discharges**

Each report of an illicit discharge is tracked using a spreadsheet. Data tracked for each report includes: the date(s) the illicit discharge was observed and reported, the results of the investigation, any follow-up that was required, and the date the investigation was closed. This database and all other documentation of illicit discharges is maintained by the Stormwater Program Specialist. Locations of illicit discharges are tracked using ArcGIS.

### **3.7 Employee Training**

All employees who as part of their normal job responsibilities may come into contact with or otherwise observe an illicit discharge will receive stormwater-related training at least once per year. Training will include information on how to recognize an illicit discharge and how to report the illicit discharge. Training can be in the form of posters, handouts and presentations. Documentation of training will be kept by the Stormwater Program Specialist.

Training was provided to departments most likely to encounter illicit discharges during normal activities. The Police Department has incorporated a training presentation with illicit discharge information with normal training. As of October 19, 2017, 4 members of the police department had completed this training in fiscal year 2018. A flyer showing examples of illicit discharges, the information needed to report an illicit discharge and the contact information to use when reporting an illicit discharge was posted in or distributed to the managers of several facilities with employees that would be likely to encounter illicit discharges during normal daily activities. The following table shows the facility, the date the flyer was posted or sent to the manager of that facility, and the number of individuals that had the potential to be exposed to the training information.

**Table 10: Illicit Discharge Training in fiscal year 2018**

<b>Facility</b>	<b>Date</b>	<b>Departments Trained</b>	<b>Number of Employees Potentially Exposed to Training</b>
Public Services Operations Facility	10/26/2017	Engineering, Streets Maintenance, Water Sewer Maintenance, Sanitation	86
Buildings and Grounds Maintenance Shop	11/1/2017	Buildings and Grounds Maintenance	12
Water Treatment Plant	11/1/2017	Water Treatment Plant Staff	13
Wastewater Treatment Plant	11/1/2017	Wastewater Treatment Plant Staff	18
Fire Department Stations	11/1/2017	Fire Department Staff	95

### **3.8 Public Education**

During fiscal year 2018, an article on illicit discharges was published in the Town Voice newsletter. This newsletter is included with the utility bill and is sent to approximately 14,500 customers. The article discussed the definition of an illicit discharge, what citizens can do to prevent illicit discharges, and how citizens can report suspected illicit discharges.

### **3.9 Public Reporting**

The Town’s stormwater website includes a section on illicit discharges which includes a phone number and email address that the public is encouraged to use to report suspected illicit discharges. The report of an illicit discharge will prompt the Stormwater Program Specialist to begin carrying out procedures detailed in Article VI of the Phase II Post Construction and Illicit Discharge and Connection Ordinance and the Illicit Discharge Detection and Elimination Program and Procedures Manual. In fiscal year 2018, 11 of the 25 reports of suspected illicit discharges were made by citizens.

### **3.10 Enforcement of the IDDE Ordinance**

A spreadsheet with data showing the date and address for each NOV issued is maintained by the Stormwater Program Specialist. This database can be used to track the number of NOVs sent to each address over time so that chronic violators can be recognized, and appropriate measures can be pursued.

**Table 11: Illicit Discharge Detection and Elimination Program BMP Table**

<b>No.</b>	<b>BMP</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>	<b>Frequency</b>
3.1	Maintain an Illicit Discharge Detection and Elimination Program	Maintain a written Illicit Discharge Detection and Elimination Program, including provisions for program assessment and evaluation and integrating program.	A written IDDE program is maintained throughout the permit cycle.	IDDE program will be reviewed and updated as needed.
3.2	Maintain adequate legal authorities	The permittee shall maintain IDDE ordinances or other regulatory mechanisms that provides the legal authority to prohibit illicit connections and discharges.	Phase II Post Construction and Illicit Discharge and Connection Ordinance became effective September 2, 2014.	Review annually and update if needed.
3.3	Maintain a Storm Sewer System Map of Major Outfalls.	The permittee shall maintain a current a map showing major outfalls and receiving streams.	Map of storm sewer system with major outfalls is updated periodically throughout the permit cycle.	Map will be updated as needed.
3.4	Implement a program to detect dry weather flows	The permittee shall maintain a program for conducting dry weather flow field observations in accordance with written procedures.	Dry weather flow detection program is maintained throughout the permit cycle.	Review annually and update if needed.
3.5	Investigate sources of identified illicit discharges.	The permittee shall maintain written procedures for conducting investigations of identified illicit discharges.	Procedures for investigation of identified illicit discharges are implemented during year one of the permit cycle.	Review annually and update if needed.
3.6	Track and document investigations illicit discharges	For each case the permittee shall track and document 1) the date(s) the illicit discharge was observed; 2) the results of the investigation; 3) any follow-up of the investigation; and 4) the date the investigation was closed.	Tracking and documentation of illicit discharges is implemented at the start of the permit cycle.	Illicit discharge investigations will be tracked and documented throughout the permit cycle.

3.7	Provide Employee Training	The permittee shall implement and document a training program for appropriate municipal staff, who as part of their normal job responsibilities, may come into contact with or otherwise observe an illicit discharge or illicit connection.	Employee training for appropriate municipal staff is implemented in the first year of the permit cycle.	Appropriate municipal staff will receive training at least once per year.
3.8	Provide Public Education	The permittee shall inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.	Public education materials will be distributed beginning in year one of permit cycle.	Public education materials will be distributed at least once per year throughout the permit cycle.
3.9	Provide a public reporting mechanism	The permittee shall promote, publicize, and facilitate a reporting mechanism for the public and staff to report illicit discharges and establish and implement citizen request response procedures.	A public reporting mechanism is provided and maintained throughout the permit cycle.	Continuously provided and maintained throughout the permit cycle.
3.10	Enforcement of the IDDE ordinance	The permittee shall implement a mechanism to track the issuance of notices of violation and enforcement actions as administered by the permittee. This mechanism shall include the ability to identify chronic violators for initiation of actions to reduce noncompliance.	A mechanism to track the enforcement of the IDDE ordinance is maintained throughout the permit cycle.	Enforcement of the IDDE ordinance will be tracked and documented throughout the permit cycle.

## **Section 4: Construction Site Runoff Controls Program**

The Town of Mooresville relies upon the North Carolina Division of Energy, Mineral, and Land Resources Sediment and Erosion Control Program and Iredell County Erosion Control Section to comply with this minimum measure. The Town of Mooresville and Iredell County entered into an Interlocal Agreement for Enforcement Services of Iredell County Soil Erosion and Sediment Control Ordinance on September 15, 2009.

As of August 2017, a spreadsheet was created and will be maintained by the Stormwater Program Specialist that details reported construction site runoff issues and communication with Iredell County Erosion Control Section. The Town of Mooresville Stormwater Program Specialist will continue to document reports of issues with construction site runoff controls and reports to Iredell County Erosion Control Section.

## **Section 5: Post Construction Site Runoff Controls Program**

The Town of Mooresville implements and enforces a Post-Construction Site Runoff Controls Program with the goal of addressing stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into the MS4. Another objective of this program is to address post-construction runoff with the Phase II Post Construction and Illicit Discharge and Connection Ordinance and to ensure long-term operation and maintenance of stormwater control measures. The Stormwater Program Specialist is responsible for implementation and the program is funded through the Stormwater Utility Fee. The following sections discuss the BMPs implemented to fulfill these requirements. See Table 12 for the measurable goal, frequency and implementation schedule for each BMP.

### **5.1 Legal Authorities**

The Town of Mooresville adopted the Post Construction and Illicit Discharge and Connection Ordinance, effective September 2, 2014. This ordinance establishes the legal authorities to meet the objectives of the Post Construction Site Runoff Controls program.

The ordinance details requirements for stormwater control measures and refers to the Town of Mooresville Land Development Standards, which references the latest edition of the Stormwater Best Management Practices Manual prepared by NCDENR, for the design requirements. The ordinance establishes design and review criteria for the construction, function and use of structural stormwater control measures (SCMs) that may be used to meet the standards established by this ordinance and the Town of Mooresville Land Development Standards as well as the administrative procedures for the submission, review, approval and disapproval of stormwater management plans, and for the inspection of approved projects. Plan reviews and inspections are carried out by Planning Department and Engineering Department staff.

Owners of post-construction structural SCMs are required to record and submit an Operation and Maintenance agreement for each SCM. The operation and maintenance agreement includes a statement that the Stormwater Program Specialist has the right to enter the facility if they have

reason to believe it has become necessary to inspect, monitor, maintain, repair or reconstruct the SCM. Owners are also required to submit annual inspection reports that have been signed by a qualified professional as defined by the ordinance beginning January 1<sup>st</sup> of the calendar year after the date of the as-built certification and each year thereafter on or before March 31<sup>st</sup> of that calendar year.

## **5.2 Strategies which include SCMs appropriate for the MS4**

The Town of Mooresville Land Development Standards states that structural stormwater control measures are to be designed using the latest version of the Stormwater Design Manual prepared by NCDEQ.

## **5.3 Plan Reviews**

The Land Development process is described on the Land Development website, <https://ci.mooresville.nc.us/231/Land-Development>. Plan reviews and approvals are conducted by Planning Department and Engineering Department staff. In fiscal year 2018, 25 plans with a total lot size over 1 acre were approved for construction by Town staff.

## **5.4 Inventory of Projects with Post-Construction Structural Stormwater Control Measures**

An inventory of post-construction structural stormwater control measures located within the Town's corporate limits and required by the Phase II Post Construction and Illicit Discharge and Connection Ordinance is maintained by the Stormwater Program Specialist.

## **5.5 Deed Restrictions and Protective Covenants**

The Town of Mooresville issues plan approval for the final construction plans. Once the construction begins Town staff inspects the project for plan compliance throughout the entire process. Once construction is complete the Town requires as-builts and certifications from the consulting engineer that all infrastructure is built according to plan and subsequently Town standards.

Stormwater Operation and Maintenance Agreements, signed by owners of Post Construction Stormwater Control Measures, include a statement that the owner of the SCM agrees to notify the Town of Mooresville of any problems with the system or prior to any changes to the system or responsible party.

## **5.6 Mechanism to require long-term operation and maintenance of Stormwater Control Measures (SCMs)**

The Phase II Post Construction and Illicit Discharge and Connection Ordinance requires that all owners of post construction structural stormwater control measures installed as a requirement of this ordinance to submit an Operation and Maintenance Agreement to the Stormwater Program Specialist. The Operation and Maintenance Agreement requires the owner to continuously operate and maintain the stormwater control and management facilities. The agreements also detail the important maintenance procedures and inspection activities to be performed for the specific type of structural stormwater control measure. Owners of these structural stormwater control measures are also required by the ordinance to submit annual

inspection reports performed by a qualified professional as defined by the ordinance. Operation and maintenance plans and annual inspection reports for Town owned and maintained stormwater control measures are maintained by the Stormwater Program Specialist. In fiscal year 2018, 12 new Operation and Maintenance Agreements for Stormwater Control Measures were recorded with Iredell County Record of Deeds and submitted to the Stormwater Program Specialist.

### **5.7 Inspections**

Procedures for inspections are included in the Operation and Maintenance Agreement signed, recorded and submitted by the owning entity of the structural stormwater control measure. The Town of Mooresville requires that owners of post-construction structural stormwater control measures submit an annual inspection report performed by a qualified professional, as defined by the ordinance, beginning January 1<sup>st</sup> of the calendar year after the date of the as-built certification and each year thereafter on or before March 31<sup>st</sup> of that calendar year. All inspection reports and any related documentation submitted to the Town of Mooresville is maintained by the Stormwater Program Specialist.

### **5.8 Educational materials and training for developers**

The Land Development Process Manual gives an overview of the land development process for plan review. This manual refers to the Land Development Standards for design standards. After plan approval, the developer receives a checklist that details requirements including recording and submitting the Operation and Maintenance Agreement.

### **5.9 Enforcement**

The Stormwater Program Specialist tracks information regarding issued notices of violation and any enforcement actions taken including the property owner and location of the structural stormwater control measure. Letters were mailed to two owners of post-construction stormwater control measures in fiscal year 2018 for not submitting annual inspection reports by March 31, as required by the Town of Mooresville Post Construction and Illicit Discharge and Connection Ordinance. As of September 13, 2018, annual inspection reports have been submitted by the owners of post-construction stormwater control measures who received these letters.



**Table 12: Post Construction Site Runoff Controls Program BMP Table**

No.	BMP	Measurable Goal	Implementation Schedule	Frequency
5.1	Adequate legal authorities	<p>Maintain through ordinance, or other regulatory mechanism, adequate legal authorities to meet the objectives of the Post-Construction Site Runoff Controls Stormwater Management program.</p> <p>The permittee shall have the authority to review designs and proposals for new development and redevelopment to determine whether adequate stormwater control measures will be installed, implemented, and maintained.</p> <p>The permittee shall have the authority to request information such as stormwater plans, inspection reports, monitoring results, and other information deemed necessary to evaluate compliance with the Post-Construction Stormwater Management Program.</p> <p>The permittee shall have the authority to enter private property for the purpose of inspecting at reasonable times any facilities, equipment, practices, or operations related to stormwater discharges to determine whether there is compliance the Post-Construction Stormwater Management Program.</p>	The Phase II Post Construction and Illicit Discharge and Connection Ordinance became effective September 2, 2014.	Review annually and update if needed.
5.2	Strategies which include Stormwater Control Measures (SCMs) appropriate for the MS4	Strategies with include Stormwater Control Measures (SCMs) appropriate for the MS4, include, but are not limited to compliance with 15A NCAC 02H Section .1000 effectively meets the Post-construction Stormwater Runoff control requirements	Post Construction and Illicit Discharge and Connection Ordinance became effective September 2, 2014	Review annually and update if needed.

5.3	Plan reviews	The permittee shall conduct site plan reviews of all new development and redeveloped sites that disturb greater than or equal to one acre (including sites that disturb less than one acre that are part of a larger common plan of development or sale). The site plan review shall address how the project applicant meets the performance standards and how the project will ensure long-term maintenance.	Implemented during first year of permit cycle.	Plan reviews conducted as required throughout permit cycle.
5.4	Inventory of projects with post-construction structural stormwater control measures	The permittee shall maintain an inventory of projects with post-construction structural stormwater control measures installed and implemented at new development and redeveloped sites, including both public and private sector sites located within the permittee's corporate limits that are covered by its post-construction ordinance requirements.	An inventory is maintained throughout the permit cycle.	Review annually and update if needed.
5.5	Deed Restrictions and Protective Covenants	The permittee shall provide mechanisms such as recorded deed restrictions and protective covenants that ensure development activities will maintain the project consistent with approved plans.	Implemented as part of the plan approval and construction inspection process.	Review and update as needed.
5.6	Provide a mechanism to require long-term operation and maintenance of Stormwater Control Measures (SCMs)	The permittee shall implement or require an operation and maintenance plan for the long-term operation of the SCMs required by the program. The operation and maintenance plan shall require the owner of each SCM to perform and maintain a record of annual inspections of each SCM. Annual inspection of permitted SCMs shall be performed by a qualified professional.	Operation and Maintenance Agreements and annual inspection reports are required per the Post Construction and Illicit Discharge and Connection Ordinance, which became effective September 2, 2014	Operation and Maintenance Plans are required to be submitted upon as-built certification. Annual inspection reports are required to be submitted by March 31 <sup>st</sup> of each year.

5.7	Inspections	<p>To ensure that all stormwater control measures meet the permittee's performance standards and are being maintained pursuant to the maintenance agreement, the permittee shall develop and implement a written inspection program for structural stormwater controls installed pursuant to the permittee's post-construction program.</p> <p>The permittee shall document and maintain records of inspections, findings and enforcement actions and make them available for review by the permitting authority.</p>	<p>Written procedures per the Post Construction and Illicit Discharge and Connection Ordinance, effective September 2, 2014. Inspection records</p>	<p>Written procedures will be reviewed annually and updated if needed. Inspection records submitted annually to the Town will be maintained continuously throughout permit cycle.</p>
5.8	Educational materials and training for developers	<p>The permittee shall make available through paper or electronic means, ordinances, post-construction requirements, design standards checklist, and other materials appropriate for developers. New materials may be developed by the permittee, or the permittee may use materials adopted from other programs and adapted to the permittee's new development and redevelopment program.</p>	<p>Information available throughout the permit cycle.</p>	<p>Information and materials will be available to developers throughout the permit cycle.</p>
5.9	Enforcement	<p>The permittee shall track the issuance of notices of violation and enforcement actions. This mechanism shall include the ability to identify chronic violators for initiation of actions to reduce noncompliance.</p>	<p>Implemented in year one of the permit cycle.</p>	<p>Enforcement will be tracked and documented continuously throughout the permit cycle.</p>

## **Section 6: Good Housekeeping and Pollution Prevention for Municipal Operations**

The Town of Mooresville implements a Good Housekeeping and Pollution Prevention Program for municipal operations with the goal of preventing or reducing pollutant runoff from municipal operations. This program includes employee training to prevent and reduce stormwater pollution from municipal activities. The Stormwater Program Specialist is responsible for implementation and the program is funded through the Stormwater Utility Fee. The following sections discuss the BMPs implemented to fulfill these requirements. See Table 13 for the measurable goals, frequency and implementation schedule for each BMP.

### **6.1 Inventory of municipally owned or operated facilities**

An inventory of all municipally owned or operated facilities that have the potential to generate polluted stormwater runoff has been developed and is maintained by the Stormwater Program Specialist.

### **6.2 Operation and Maintenance (O&M) for municipally owned or operated facilities**

All municipally owned or operated facilities identified by the inventory as having the potential to generate polluted stormwater runoff have a Stormwater Operation and Maintenance (O&M) Plan. Stormwater O&M Plans detail the stormwater pollution prevention and good housekeeping practices utilized by the employees at that facility. Each Stormwater O&M Plan also details the frequency of facility inspections and the regular maintenance activities. Stormwater O&M Plans for each facility are located either at the facility or in the Stormwater Program Specialist's office if it is impractical to keep the plan at the facility. Operation and Maintenance Plans for each facility are reviewed periodically and amended as needed. Amendments to the Operation and Maintenance Plans are documented in the Operation and Maintenance Plan for the facility.

### **6.3 Spill Response Procedures**

The Stormwater O&M Plan for each facility contains Spill Response Procedures and a Spill Response Log to be completed in the event of a spill.

### **6.4 Streets, roads, and public parking lots maintenance**

The Town of Mooresville implements BMPs to reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots. The Town of Mooresville utilizes a street sweeper to clean municipal streets and roads regularly and parking lots as needed. The Stormwater Program Specialist tracks the streets swept by the street sweeper using an ArcGIS map which is updated monthly. The Sanitation Department hauled 95.68 tons of sediment and debris from the decant area to the Iredell County Landfill in fiscal year 2018. The decant area is primarily used by the street sweeper but is also used by various other departments such as streets maintenance and buildings and grounds maintenance.

## **6.5 Operation and Maintenance (O&M) for municipally-owned or maintained catch basins and conveyance systems**

The stormwater maintenance staff is responsible for maintaining the municipally-owned and maintained catch basins and conveyance systems. Stormwater maintenance staff conducts routine maintenance as well as respond to maintenance requests from citizens. The Town of Mooresville also issues contracts to outside contractors for improvements to existing municipally owned drainage systems that cannot be handled by Town of Mooresville staff or are part of a larger infrastructure improvement project.

The Town of Mooresville has two projects currently designed with plans to construct. The Town is including one to two projects every year in the five-year Capital Improvement Plan for the Stormwater Utility to improve the stormwater infrastructure in areas of Mooresville identified as having drainage issues by the Drainage Master Plan completed by ESP in January 2016.

## **6.6 Identify municipally owned or maintained structural stormwater controls**

An inventory of all municipally owned or maintained structural stormwater controls installed for compliance with the Town of Mooresville Post Construction and Illicit Discharge and Connection Ordinance will be maintained by the Stormwater Program Specialist. The list of municipally-owned stormwater control measures is updated periodically as new stormwater control measures are constructed.

## **6.7 O&M for municipally-owned or maintained structural stormwater controls**

All municipally owned or maintained structural stormwater controls installed for compliance with the Town of Mooresville Post Construction and Illicit Discharge and Connection Ordinance will be operated and maintained in accordance with the guidelines in the NCDEQ Stormwater Design Manual at the time of construction and according to the engineered plans for the control measure. These structural stormwater control measures will be regularly inspected by the Stormwater Program Specialist or their designee. Inspection and maintenance records will be maintained by the Stormwater Program Specialist.

## **6.8 Pesticide, Herbicide and Fertilizer Application Management**

All employees who are required to apply pesticide, herbicide and/or fertilizer as part of their regular duties possess the proper training and certifications to do so. Records of the necessary training and certifications for each employee are maintained by the employee's supervisor as part of the employee's personnel file.

## **6.9 Staff Training**

Employees involved in implementing pollution prevention and good housekeeping practices are to receive training from the Stormwater Program Specialist at least once per year, every year of the permit cycle. Training will cover the stormwater pollution prevention and good housekeeping practices utilized at that employee's facility or stormwater pollution prevention information to be used while performing regular duties.

All new employees that attend new employee orientation receive stormwater training that discusses general stormwater information such as the definition of stormwater, stormwater pollution, and what employees can do to prevent or minimize stormwater pollution. This training is conducted either through a training video or a handout. During fiscal year 2018, 51 new employees received this training. New employees based in the maintenance departments at the Public Operations Services facility receive additional training in the form of a New Employee checklist. The checklist describes specific actions employees can take to minimize or prevent stormwater pollution at the Public Services Operations Center as well as at their work sites. This checklist has been completed by 17 new employees in fiscal year 2018.

In November 2017, flyers were distributed to managers of the Buildings and Grounds facility, the Water Treatment Plant, the Wastewater Treatment Plant, Fire Department, and Public Service Operations Center. These flyers show examples of common examples of illicit discharges, detail why it is important to prevent illicit discharges, and how to report a potential illicit discharge.

### **6.10 Prevent or Minimize Contamination of Stormwater Runoff from all areas used for Vehicle and Equipment Cleaning**

Employees are encouraged to use the vehicle wash bay located in the Fleet Services Building at the Public Services Operations Facility. This vehicle wash bay drains to an oil/water separator and then to the sanitary sewer system. If the vehicle cannot be washed in the vehicle wash bay, employees are encouraged to wash their vehicle at a commercial car wash facility.

Fire Station vehicles are washed per the instructions in the Fire Administration and Operations Department Apparatus Washing General Order. This General Order requires that Mooresville Fire Rescue limit the amount of water discharged during cleaning or washing of vehicles, use a hose with a low GPM discharge of water, and not discharge chemical of any type into storm drains or environment.

**Table 13: Good Housekeeping and Pollution Prevention Program BMP Table**

<b>No.</b>	<b>BMP</b>	<b>Measurable Goal</b>	<b>Implementation Schedule</b>	<b>Frequency</b>
6.1	Inventory of municipally owned or operated facilities	The permittee shall maintain a current inventory of facilities and operations owned and operated by the permittee with the potential for generating polluted stormwater runoff.	Inventory is maintained throughout the permit cycle.	Review annually and update if needed.
6.2	Operation and Maintenance (O&M) for municipally owned or operated facilities	The permittee shall maintain and implement, evaluate annually and update as necessary an Operation and Maintenance (O&M) program for municipal owned and operated facilities with the potential for generating polluted stormwater runoff. The O&M program shall specify the frequency of inspections and routine maintenance requirements.	Implemented in first year of permit cycle.	Review annually and update if needed.
6.3	Spill Response Procedures	The permittee shall have written spill response procedures for municipal operations.	Implemented in first year of permit cycle.	Review annually and update if needed.
6.4	Streets, roads, and public parking lots maintenance	The permittee shall evaluate existing and new BMPs annually that reduce polluted stormwater runoff from municipally-owned streets, roads, and public parking lots within their corporate limits. The permittee must evaluate the effectiveness of these BMPs based on cost and the estimated quantity of pollutants removed.	Implemented in first year of permit cycle.	BMPs are evaluated annually and updated if needed.
6.5	Operation and Maintenance (O&M) for municipally-owned or maintained catch basins and conveyance systems	The permittee shall develop and implement an O&M program for the stormwater sewer system including catch basins and conveyance systems that it owns and maintains.	Implemented in first year of permit cycle.	Review annually and update if needed.

6.6	Identify municipally owned or maintained structural stormwater controls	The permittee shall maintain a current inventory of municipally-owned or operated structural stormwater controls installed for compliance with the permittee's post-construction ordinance.	Implemented in first year of permit cycle.	Reviewed and updated as needed.
6.7	O&M for municipally-owned or maintained structural stormwater controls	<p>The permittee shall maintain and implement an O&amp;M program for municipally-owned or maintained structural stormwater controls installed for compliance with the permittee's post-construction ordinance.</p> <p>The O&amp;M program shall specify the frequency of inspections and routine maintenance requirements.</p> <p>The permittee shall inspect and maintain municipally-owned or maintained structural stormwater controls in accordance with the schedule developed by permittee. The permittee shall document inspections and maintenance of all municipally-owned or maintained structural stormwater controls.</p>	Implemented in first year of permit cycle.	Review annually and update if needed.
6.8	Pesticide, Herbicide and Fertilizer Application Management.	The permittee shall ensure municipal employees and contractors are properly trained and all permits, certifications, and other measures for applicators are followed.	Implemented in first year of permit cycle.	All training and certifications are continuously maintained and updated as needed.
6.9	Staff training	The permittee shall implement an employee training program for employees involved in implementing pollution prevention and good housekeeping practices.	Implemented in first year of permit cycle.	Staff training for the employees described here will be conducted at least once per year.



6.10	Prevent or Minimize Contamination of Stormwater Runoff from all areas used for Vehicle and Equipment Cleaning	The permittee shall describe and implement measures to prevent or minimize contamination of the stormwater runoff from all areas used for vehicle and equipment cleaning.	Implemented in year one of permit cycle.	Review annually and update if needed.
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