AUBURN

UNIVERSITY

MUNICIPAL STORM SEWER SYSTEM (MS4) ANNUAL REPORT
REPORTING PERIOD APRIL 1, 2012 – MARCH 31, 2013

Prepared by

AUBURN UNIVERSITY

STORMWATER MANAGEMENT COMMITTEE

Submitted March 22, 2013

Contents

Introduction

This Annual Report was developed in accordance with the guidelines provided in Title 40 Code of Federal Regulations (CFR), Part 122.26(d) incorporated by reference in the Alabama Administrative Code 335-6 as administered by the Alabama Department of Environmental Management (ADEM) and NPDES ALR040030 Phase II General Permit effective February 1, 2011.

The purpose of this Annual Report is to describe the compliance efforts reflected in the University's Stormwater Management Plan (SWMP). The Annual Report will identify the control measure specific efforts undertaken by Auburn University from April 1, 2012 through March 31, 2013 to reduce the discharge of pollutants from Auburn University's main campus to the maximum extent practicable (MEP) to protect water quality and to satisfy the appropriate water quality requirements of the Clean Water Act (CWA).

The information contained within this Annual Report has been provided by those individuals that were responsible for the development of the Stormwater Management Plan and represent individuals from both academic and operational areas of campus. The collaborative effort was strengthened by its diversity and includes the following individuals and their areas of responsibility or interest:

Mr. Donny Addison, Facilities Management - Waste Management & Recycling
Dr. Eve Brantley, Alabama Cooperative Extension Services (ACES)
Ms. Kaye Christian, Agronomy & Soils
Mr. Jeffrey Dumars, Facilities Management - Office of Campus Planning & Space Management
Mr. Gregory Forthofer, Facilities Management - Design Services
Dr. Sam Fowler, Water Resources Center
Mr. Steve Johnston, Facilities Management - Landscape Services
Mr. Mike Kensler, Office of Sustainability
Mr. Dan King, Facilities Management
Mr. Eric Kleypas, Athletic Department Field Management
Ms. Charlene Lebleu, School of Architecture, Planning & Landscape Architecture
Mr. Malcolm Dailey, Facilities Management – Utilities & Energy
Mr. Tom McCauley, Risk Management & Safety
Mr. Buster Reese, Facilities Management, Construction Management
Mr. Ray Womack, Krebs Engineering & Architecture

MS4 Description

Auburn University is a large teaching and research institution located in Auburn, Lee County, Alabama comprised of approximately 1800 acres of contiguous property. Auburn University is one of the major land grant/ liberal arts and science universities in the southeast. The area surrounding Auburn University consists of residential property to the east and southeast, agricultural property to the southwest and west and urban city property to the north and east.

Control Measures

Stormwater management controls or Best Management Practices (BMPs) will be implemented to prevent pollution in stormwater discharges from Auburn University's main campus. State and federal regulations require BMPs addressing six minimum control measures to be part of the SWMP. Consistent with Part V.C. of the Permit, the Annual Report will describe the University's efforts performed during this reporting period to implement the established BMPs (Public Education & Outreach, Public Involvement & Participation, Illicit Discharge Detection & Elimination, Construction Site Stormwater Runoff Control, Post Construction Stormwater Management in New and Redevelopments and Pollution Prevention / Good Housekeeping for Municipal Operations) and will include:

1. The status of AU's compliance with Permit conditions, an assessment of the appropriateness of the identified BMPs, and progress towards achieving the statutory goal for each of the minimum control measures.
2. Results of information collected and analyzed, if any, during this reporting period, including any monitoring data used to assess the success of the SWMP at reducing discharge of pollutants to the MEP.
3. A summary of stormwater activities the University plans to undertake during the next reporting cycle.
4. Proposed changes to the University's SWMP.
5. All monitoring results collected during the reporting period in accordance with Part V. of the Permit.

BMP: Public Education and Outreach on Stormwater Impacts

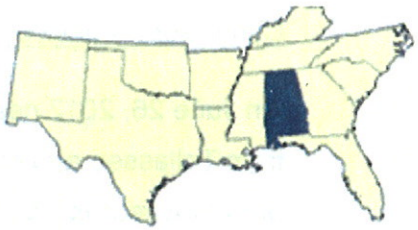
Stormwater pollution prevention education leads to an informed and knowledgeable campus community that is more likely to support and comply with the BMP provisions. The targeted "Public" audiences of the University's SWMP are Auburn University faculty, staff, students and visitors, which populate the campus on any given day. Within these populations, only students in residence housing live on campus. All other students, employees and visitors reside in the surrounding communities.

Throughout this reporting period, Auburn University initiated activities consistent with the Stormwater Management Plan as follow:

Presentations and Events

Multiple presentations were offered by Auburn University throughout the course of this reporting period to promote water quality and stormwater management principles. Presentations were offered by a variety of different AU entities and for diverse AU and non-AU audiences.

Applying knowledge to improve water quality
Alabama
State Water Program
A Partnership of USDA NIFA
& Land Grant Colleges and Universities



Low Impact Design Workshop (May 2012)

A technical design workshop focused on Low Impact Development (LID) stormwater control measures was conducted in Auburn, Alabama on May 1-2, 2012. Dr. Bill Hunt and Mr. Ryan Winston, North Carolina State University, presented current design recommendations and recent stormwater research in the field of LID.

Lee County Water Festival

The Lee County Water Festival (May 2012)

The 9th annual Lee County Water Festival was hosted by Auburn University and attended by more than 1700 Lee County 4th graders. The two day festival rotated the children through three separate educational activities to help them better understand the importance of clean water. The festival's continued success is attributed to the commitment from a multitude of municipalities and organizations including Auburn University, the cities of Auburn, Opelika and Smith Station, National Resource Conservation Service, the Lee County Soil Water Conservation District, AL Department of Environmental Management, the Al Cooperative Extension System, USDA Forest Services as well as many private citizens and local Lee County groups.

Center for Forest Sustainability Water Fun Day (June 2012)

On June 26, 2012 nearly 50 young people from Tallassee and other area summer programs learned about environmental sciences and urban forestry at this outreach day hosted by the AU School of Forestry and Wildlife Sciences' Center for Forest Sustainability (CFS). The children participated in exercises designed to help them understand the interface between urban and natural worlds as well as other research conducted at the CFS. The Enviroscape session, led by water program specialist Kathryne Christian, highlighted pollution and water issues with an interactive model showing how different contaminants flow into local water systems.

Birmingham Young Water Ambassador (BYWA) Program (June 2012)

Over 100 high school juniors and seniors from the Birmingham Al area participated in the BYWA. The objective of the program is to increase the student's awareness of water quality, conservation and pollution. The two day event was conducted by faculty, staff and students from the College of Agriculture, College of Science and Mathematics, Alabama Cooperative Extension System, the Alabama Agricultural Experiment Station and the Department of Risk Management & Safety. Educational sessions were provided on a variety of topics including water quality, wetlands, stream assessments, water harvesting, conservation, fish population sampling and aquaculture.

UNIV1100: EarthSmart (Every AU Semester)

Experiential Learning Project: Parkerson Mill Creek Restoration

The Parkerson Mill Creek Restoration project orients students to the concept of stream cleanup, restoration, and conservation. Students explore the topic through interviews with an expert on the subject, library research, and participation in the stream restoration project.

Rain Garden Certification Class (Dec 2012)

The Rain Garden Certification Program was available to professionals that design, install and/or maintain rain gardens. The class provided an opportunity for participants to learn how to properly construct a rain garden in a residential or commercial setting.

Urban Stream Restoration Implementation (March 13-14, 2013)

Workshop accompanied an urban stream restoration project in Auburn, Alabama. Participants gained knowledge of natural channel design concepts for stream and floodplain restoration projects, especially related to infrastructure protection. Participants worked through the concepts of stream channel design, in-stream structures, permitting, construction, and vegetation. Other topics included stormwater management and habitat enhancement features.

Web Resources

Information related to water quality and stormwater management continues to be provided from a wide variety of Auburn University web sites. The Department of Risk Management and Safety provides the central resource specific to the SWMP and the requirements of the Phase II General Permit NPDES ALR040030. Other University websites which provide information relating to stormwater BMPs and research supporting BMPs include: the Alabama Cooperative Extension System, the Alabama Water Watch Association, the Colleges of Building Sciences, Science & Mathematics, Engineering, Environmental Institute, Fisheries and Allied Aquaculture, Natural Resource Management Development Institute, the Office of Sustainability and Facilities Management.

Auburn University Arboretum Tourhttp://www.youtube.com/watch?feature=player_embedded&v=-LO6aGhRfXU#t=0s

During this reporting year, the University's Donald E. Davis Arboretum developed a stormwater tour in an effort to educate the public on best practices for handling stormwater in the landscape. During this reporting period, the Arboretum installed an 11-stop stormwater tour. The tour takes participants through the arboretum landscape while highlighting features that deal with stormwater management.

Measure Specific Evaluation

Auburn University has been successful in providing a variety of information related to stormwater management, water quality and water conservation. This information has been integrated into course curriculums, training and events offered by Auburn University as well as being made generally available through the AU websites. The creation of the Arboretum's stormwater tour is an excellent mechanism to illustrate the uses of LID stormwater strategies.

In addition, the University strives to engage all students to serve the community and to become more involved in making an impact. For example, the EarthSmart Learning community provides incoming freshman an opportunity to learn more about environmental issues.

Measure specific activities planned for the next reporting period

During this next reporting period, Auburn University plans to expand the Public Education and Outreach best management measures to include:

1. Offer rain water harvesting workshop scheduled for April 2013
2. Host the 10th annual Lee County Water Festival scheduled for May 2013
3. Release of the Alabama Low Impact Development Handbook which is being developed by Alabama Cooperative Extension Service and AU's College of Architecture, Design and Construction's Program of Landscape Architecture.
4. Continued promotion of Parkerson Mill Creek (PMC) and the PMC Watershed Management Plan.

BMP: Public Involvement & Participation

Consistent with the Public Education and Outreach measures previously identified, Auburn University continued to involve others within the University community to become better aware of the responsibilities and activities associated with stormwater management. In addition, Auburn University partners with other state entities to pursue research and advances in the management of stormwater.

Auburn University is an active member of **ALOAS**, a citizen's advisory committee comprised of representatives from the City of **A**uburn, **L**ee County, the City of **O**pelika, **A**uburn University and added during this reporting period, the City of **S**mith Station. The committee allows individuals from the community to interact with the ALOAS entities and provide and receive feedback related to stormwater activities planned. This also promotes a positive forum for the community to participate in the developments of the committee. The committee has authority and direct input into regional stormwater management efforts. The ALOAS committee met on a quarterly basis throughout this reporting period to discuss issues and coordinate community activities related to stormwater management. During this reporting period, ALOAS was responsible for the production of two publications entitled "**Parkerson Mill Creek Watershed**" and "**Emerging Contaminants**" to further promote water quality and the importance of protecting drinking water supplies and managing stormwater. Links to these publications and others created by ALOAS can be found at the Department of Risk Management and Safety's website: https://cws.auburn.edu/rms/stormWater.aspx .

Auburn University continued to be an active member in local watershed improvement and protection organizations including Save our Saugahatchee (SOS) and The Friends of the Chewacla Creek and the Uphapee Watershed. The organizations are dedicated to the restoration, preservation and enhancement of the watershed to include Parkerson Mill Creek. This involvement has proven to be beneficial as ideas and observations are commonly shared related to watershed preservation and protection.

The Alabama Department of Environmental Management awarded a Section 319 Nonpoint Source Management grant to the Alabama Cooperative Extension Program and the Auburn University Department of Landscape Architecture to develop an Alabama Low Impact Development (LID) Handbook. The LID Handbook will provide guidance to site selection, stormwater control measure design, native vegetation options, maintenance, and model codes and ordinances. This handbook includes design examples and informative graphics to assist practitioners and decision makers in understanding the link between innovative stormwater management and functional, attractive landscape management.

The Parkerson Mill Creek Watershed Plan (PMCWP) is a long-term effort, with the ultimate goal of attaining the TMDL for Parkerson Mill Creek and restoring the stream to its fish and wildlife use status. Federal monies were previously awarded to Auburn University through the Clean Water Act to assist with implementation of the objectives of the PMCWP. During this reporting period, these funds enabled several LID measures to be installed at Auburn University to include:

Auburn University's Plant Science Research Center (PSRC)

PSRC partnered with stakeholders of the PMCWP to host an Open House and Rain Garden Workshop. Interested participants took part in a guided tour of the PSRC highlighting some of the projects and research taking place. The open house was followed by a workshop and planting of two rain water harvest beds at the entrance of the building.

Auburn University's Southeastern Raptor Center Cistern and Rain Garden

Facilities Management and Department of Landscape Architecture successfully installed a rain garden (receives parking lot runoff), 2 swales (receives overflow from cistern) and a cistern for rainwater harvesting which provides water for bathroom facilities.

Auburn University Dudley Hall Cistern and Rain Garden

Facilities Management and Department of Landscape Architecture successfully installed a cistern to receive roof runoff which will allow for local irrigation. The rain garden will receive overflow from the cistern.

The Alabama Water Resource Research Institute (WRRI) located within the Office of Vice President for Research provides support to research and training that is responsive to the identified problems of our State and the Southeastern Region of the United States. Funding solutions are provided by the National Institutes for Water Resources and US Geological Survey through awarding annual grants under the USGS 104(G) Competitive Grant Program. The following research efforts began during this reporting period:

1. Development of an In-situ Capable Method for Detecting Pathogenic Bacteria in Alabama Water Supplies. Auburn University Principal Investigator Ahjeong Son
2. Quantitative PCR-Based Assays for Detection of Wildlife and Pet Fecal Pollution in Water. Auburn University Principal Investigator Yucheng Feng

Auburn University performed a variety of community events including stream clean-ups along Parkerson Mill Creek and waste reduction campaigns to further promote awareness and measures that can be taken to better protect our watershed. The following table provides a summary of the events that took place during this reporting period.

Location	Date	Participation	Participants
Campus Wide	Spring 2012	120	AU Students (Impact)
Campus Wide	Fall 2012	120	AU Students (Impact)
Lem Morrison to Shug	09-26-2012	6	USCG Eagle Detachment
Samford to Lem Morrison	10-11-2012	4	APhiO service fraternity
Extension Loop	10-23-2012	5	APhiO service fraternity
Samford to Lem Morrison	02-23-2013	34	AU Students & Staff
Samford to Biggio	02-26-2013	12	AU Students (Impact)

Measure Specific Evaluation

Throughout this reporting period, Auburn University has fostered an open and collaborative relationship with the many different groups on and off campus through engagement in the PMCWP, water quality monitoring and stream cleanup activities. In addition, collaborative efforts such as the creation of an Alabama LID Handbook will benefit those beyond our State's borders to provide practical and innovative stormwater management techniques.

Measure specific activities planned for the next reporting period

Auburn University will continue to implement the Public Involvement & Participation measures as defined in the University's SWMP. During the next reporting period, the following activities are planned:

1. Completion and publication of the Low Impact Development (LID) Handbook.
2. Hosting and participation in open forums promoted through ALOAS, Friends of Chewacla, Save Our Saugahatchee, Office of Sustainability's Brown Bag Seminars and others to further engage the public to become involved with their MS4 communities.
3. The installation of storm-drain markers depicted below throughout campus that were designed and approved during this reporting period.

BMP: Illicit Discharge Detection & Elimination

During this reporting period, Auburn University completed an extensive modeling effort of campus stormwater conveyances as required by Section III(b)(i) of the Permit. The effort was performed by Auburn University's Facilities Management Utilities and Energy Division. An updated map is attached to this report and identifies the current stormwater conveyance system maintained by the University.

The project offered findings and recommendations regarding the construction and performance of the storm drainage collection system and drainage area. Approximately 95% of the campus stormwater system drains south west to Parkerson Mill Creek with the remaining 5% flowing east to Town Creek.

The stormwater conveyance system assessment was performed in order to determine the condition of the existing manholes; grate inlets; open throat inlets; detention basins, both above and below ground; open channel drainage ways, both natural and manmade; pipes; box culverts; headwalls; and outfalls. The storm drainage conduits were only evaluated for condition at the storm junction boxes. The recommendations contained in the assessment report are intended to note issues such as degraded or collapsing structures, clogging, mosquito nesting, odor issues, corrugated metal pipes (notorious for high failure rates), and sanitary sewer cross connections. In addition to the notation of problems within the system, the report will be used as

an inventory tool to assist the Auburn University Facilities Management Division in the maintenance of each structure and to develop a list of improvement needs for the system.

The proper management of waste and the prohibition of illicit discharges on campus were promoted through a variety of mechanisms on campus including:

Chemical Waste Management Guide

https://cws.auburn.edu/rms/ConMan/ConMan_FileDownload.aspx?FileName=EM-ChemicalWasteManagementGuide.pdf

Medical Waste Guide

https://cws.auburn.edu/rms/ConMan/ConMan_FileDownload.aspx?FileName=EM-MedicalWasteGuide.pdf

Pharmaceutical Waste Job Aid

https://cws.auburn.edu/RMS/ConMan/ConMan_FileDownload.aspx?FileName=env_pharm-waste.pdf

Used Battery Job Aid

https://cws.auburn.edu/RMS/ConMan/ConMan_FileDownload.aspx?FileName=battery.pdf

Used Fluorescent Bulbs Job Aid

https://cws.auburn.edu/RMS/ConMan/ConMan_FileDownload.aspx?FileName=EM-UsedHGLampGuidance.pdf

Additionally, Facilities Management promotes proper materials management and prohibits activities that will result in illicit discharges through front end contract documents that require adherence to all local, state and federal requirements. Failure to do so will subject the contractor to fines, penalties and enforcement actions.

Measure Specific Evaluation

Throughout this reporting period, Auburn University was successful in meeting the objectives of the Illicit Discharge Detection Elimination measure as defined in the University's SWMP. The completion of the assessment and modeling of the University's storm system will strengthen efforts to prioritize maintenance and repair needs. Auburn University will continue efforts to identify illicit discharges through assessment evaluations, visual inspection, use of a mobile camera system and bacteriological monitoring as needed. Investigations will involve the University's Facilities Management Utilities and Energy personnel and equipment as well as Risk Management and Safety. These investigations will serve as a tool to locate potential sources of illicit discharges and enable actions to be taken to eliminate their reoccurrence.

Measure specific activities planned for the next reporting period

Auburn University will continue the Illicit Discharge Detection and Elimination measures as defined in the University's SWMP. During the next reporting period, the following activities are planned:

1. Evaluate the assessment and model completed this reporting period and prioritize a schedule for repair and maintenance.
2. Further promote the objectives of the measure through educative and outreach efforts.

BMP: Construction Site Stormwater Runoff Control

In accordance with Part III (B) (4) of NPDES Permit No ALR040030, Auburn University developed the Construction Site Stormwater Runoff Control Best Management Practice. Auburn University's Facilities Management is responsible for all construction projects on campus and implementation of this measure.

Auburn University Design and Construction Standards were revised to strengthen the stormwater management efforts on all University construction sites including the following sections.

Section G10 – Site Preparation

http://www.auburn.edu/administration/facilities/contractor-documents/design-standards/g10-site-preparation/index.html

Section G10 of the Design and Construction Standards was modified to provide the Contractor a contractual responsibility to meet the objectives of the General NPDES Permit. This section requires that the Contractor:

- Meet the requirements outlined in the Alabama Handbook for Erosion and Sediment Control and Stormwater Management of Construction Sites and Urban Areas and the ALOA developed Erosion and Sediment Control Policy.
- Demonstrate compliance with the ADEM registration requirements prior to initiating any earthwork at the site.
- Ensure that site runoff not exceed 50 NTU turbidity standard.

Auburn University will conduct routine turbidity monitoring to determine the effectiveness of the on-site controls design, installation and maintenance. Section G10 further identifies the procedures that will be taken by the Auburn University should non-compliance be identified to include withholding payment and notification to ADEM.

Appendix N – Erosion and Sediment Control Details

http://www.auburn.edu/administration/facilities/contractor-documents/design-standards/appendix-n/index.html

Appendix N of the Design and Construction Standards were modified to reinforce Section G10 with a sequential narrative a Contractor can follow to meet Auburn University's requirements for the Construction Site Stormwater Runoff Control BMP. Appendix N includes the erosion and sediment control details to be used on campus.

Two erosion and sediment control training sessions were provided to the Facilities Management's Design and Construction Project Managers to promote the requirements and changes to the Design and Construction Standards. University personnel also attended the

annual Erosion and Sediment Control Workshop sponsored by the City of Auburn to learn more of the NPDES Phase II requirements.

Measure Specific Evaluation

The requirements identified in Part III (B) (4) of NPDES Permit No ALR040030, required Auburn University to revise the existing construction documents. The resulting revisions establish a measurable performance standard to qualify the effectiveness of on-site controls. These modifications demonstrate Auburn University's commitment to hold the Contractor accountable for construction site stormwater runoff control..

Measure specific activities planned for the next reporting period

Auburn University will continue implementing Construction Site Stormwater Runoff Control as defined in the University's Stormwater Management Plan. During the next reporting period, the following activities are planned:

1. Develop turbidity monitoring program and requirements.
2. Develop training program for contractors to better understand these G10 & Appendix N requirements.

BMP: Post Construction Stormwater Runoff Control

For the first time in Auburn's history, a formal Landscape Master Plan is being developed as part of the Comprehensive Campus Master Plan. The campus landscape includes all open space, roadways, and parking and takes into consideration both cultural and ecological considerations. The Landscape Master Plan will embrace a sustainable environment, including an emphasis on stormwater management that will look at best management practices for maintenance and implementation schedules, as well as Parkerson Mill Creek restoration opportunities.

Auburn University engaged Nelson Byrd Woltz Landscape Architects, jb&a, Inc. and Vanesse Hangen Brustlin, Inc. to assist with creation of the Comprehensive Landscape Master Plan. During this reporting period, the following was accomplished:

1. Assessment of Existing Stormwater Management Conditions – Existing conditions were analyzed and documented large volumes of stormwater and associated sediments and pollutants typically discharge directly into Parkerson Mill Creek. The stream has become eroded, widened and degraded in terms of water quality and habitat. It is estimated that 87% of the stream channel within campus boundaries is in poor condition, and with much of the original stream in pipes, the natural presence of the stream as a valued resource /natural amenity within the core campus has been lost. The most heavily developed urbanized areas of Auburn University (Core Campus) are located in the headwaters of the Parkerson Mill Creek Watershed. Portions of the original stream and its tributaries are piped beneath the core campus. While this area has the highest percent impervious area on campus, it only has two significant stormwater storage areas. The two large stormwater detention basins (1.2 Million Gallons and 0.8 Million Gallons) are positioned in the upper reaches of the campus basin and were designed with the intent of controlling and storing stormwater running onto campus via the City of Auburn's collection system. New developments on campus are required to provide storage structures with controlled discharges, but the majority of developed areas on campus were constructed before these requirements were in place. These combined factors have resulted in large stormwater flow volumes and velocities being discharged to the collection system including the culverted portions of Parkerson Mill Creek and ultimately to the open channel sections downstream.
2. Stormwater Strategies – The Campus Landscape Master Plan emphasizes the use of BMPs designed to ensure that runoff from new construction does not significantly exceed the volume and velocity of pre-construction runoff. A design rainfall with intensity up to a 1-year/ 24-hour storm event is the basis for the design and implementation of post construction BMPs. Stormwater BMPs can range from vegetated practices to maintenance guidelines. The Campus Landscape Master Plan outlines BMPs which are appropriate for Auburn University and are divided into structural practices (post construction and construction related) and non-structural practices (educational, operation and maintenance and program/evaluations).
3. Stormwater Regulatory Mechanism – The Campus Landscape Master Plan will serve as a compliment to the University's Master Plan to ensure that the objectives relative to post construction stormwater management are met.
4. Implementation and Maintenance Plan – As shown in the figure below, the Campus Landscape Master Plan provides a brief description of the Stormwater Management

Practice, the management goal it supports, and if available, the estimated pollutant removal of the practice based on the best available local resource data. General cost estimates and general operation and maintenance requirements are also identified.

STORMWATER MANAGEMENT PRACTICE	DESCRIPTION	PERFORMANCE METRICS		APPLICATION AT AUBURN UNIVERSITY		TYPICAL BUDGET ALLOWANCE	RELATIVE LEVEL OF MAINTENANCE
		MANAGEMENT GOALS & COMPLIANCE[3]	POLLUTANT REMOVAL	LANDSCAPE TYPES (AS DEFINED BY SASAKI)	CAMPUS AREA		
Subsurface Infiltration Systems 	Subsurface infiltration systems may be comprised of: • open bottom concrete vaults/tanks/chambers • perforated pre-cast concrete vaults/ tanks/chambers • perforated plastic storage chambers • series of perforated plastic pipes	TMDL Compliance MS4 Compliance Volume Reduction Flow Reduction Temperature Reduction	TSS: 80% Nutrients: 60% Metals: 90% Pathogens: 90%[4]				**Medium:** Annual inspection, depending on accumulation of materials may need a vactor for cleaning.
Underground Detention 	Underground detention is typically pre-cast concrete vaults/tanks/chambers or plastic storage chambers or pipes that are sealed. They do not infiltrate into the subsurface soils, but have an outlet control structure similar to a surface detention basin that holds the water temporarily and lets the water leave the storage area at a slower controlled rate via small outlets designed to mimic natural flow patterns.	MS4 Compliance Volume Reduction Flow Reduction		Civic Spaces, Pedestrian Concourses, Quadrangles, Building-related Plazas, Gardens and Courtyards, Sports, Landscapes, Parking Services Landscapes			**Medium:** Annual inspection, depending on accumulation of materials may need a vactor for cleaning.
Rainwater Harvesting 	The process of capturing stormwater runoff typically from roofs, terrace, walkways, turf areas, and sometimes from pavements in subsurface storage chambers ("cisterns") for re-use. Collected rainwater often used for nearby landscape irrigation and non-potable demands.	MS4 Compliance Volume Reduction Flow Reduction	Volume Reduction TSS reduction Nutrient removal if reused as irrigation water	Sports Landscapes, Agricultural Landscapes and Ag Heritage Park, Building-related Plazas, Gardens and Courtyards		$4 - $6/gallon of storage depending on site geometry and system configuration (pumping, filtration, distribution, etc.).	**Low:** Inspection of equipment, cleaning of filters and sediment accumulation collection area. Replacement of pumping systems may be required every 10-15 years.
Stream Restoration 	Restoration of natural channel dimensions, pattern and profile of channel designed to establish a stable channel and floodplain for the developed watershed conditions. May include instream rock structures and riparian plant installations.	TMDL Compliance PMC WMP Action Plan Volume & Flow Attenuation Aquatic/riparian habitat improvement	TSS reduction 	Stream Corridors		$150-$400 per linear foot depending on nature of work	**Low:** Self sustaining after initial grow in of plant materials 

Measure Specific Evaluation

During this reporting period, Auburn University took tremendous strides towards the development of a Campus Landscape Master Plan. Through these efforts the University has identified opportunities to use the landscape as stormwater infrastructure, and to incorporate stormwater infrastructure in the landscape to achieve the goals of flood protection, resource protection, regulatory stormwater management requirements and intended land uses without compromising aesthetic goals. This integrated approach will allow for evaluation of big picture cost savings as larger stormwater management projects and goals may be incorporated into the overall campus plans rather than on a project by project basis after other plans are set.

Measure specific activities planned for the next reporting period

Auburn University will continue implementation of Post Construction Stormwater Management in new development and redevelopment as defined in the University's SWMP. During the next reporting period, the following activities are planned:

1. The completion of the Campus Landscape Master Plan and its presentation to the Auburn University Board of Trustees for approval.
2. The formation of a stormwater committee or other review/approval process to ensure that the stormwater objectives outlined in the Campus Landscape Master Plan are implemented.

BMP: Pollution Prevention / Good Housekeeping

Parking Lot, Parking Deck Cleaning Program

Facility Management's Landscape Services utilizes street sweepers on a daily basis to address the removal of accumulated debris from parking lots, parking decks, streets, pedestrian walkways and sidewalks. Landscape Services provides daily inspections of streets, street drains and curbs. During Fall and Winter months, Landscape Services removes leaves and other debris on a daily basis throughout campus. Landscape Services also incorporates the use of a large vacuum that allows the landscape debris, which is harvested on campus grounds, to be removed before it is introduced into a storm drain system. The supervisors utilize mulching equipment on mowers to pulverize leaves, limbs and debris on site which reduces possible storm drain blockage. This process is reduced during the Spring and Summer months unless storms or high winds cause leaves, limbs and debris to cover our campus grounds and streets; at that point we use the same procedures as the Fall and Winter removal. This system not only reduces the problem of storm drain blockage, but allows AU to compost the harvested material and eventually incorporate it back into campus landscape.

Stormwater Conveyance System Cleaning Program

Auburn University Landscape Services inspects all stormwater conveyance outfalls periodically throughout the year. This is done after each heavy rain or storm activity. If any large limbs, trees, debris are blocking the area it is removed as quickly as possible. Throughout this reporting period, a considerable effort was taken to enhance the vegetated buffer that surrounds Parkerson Mill Creek. Mechanical mulching efforts were implemented along Lem Morrison Drive, Donahue Drive and Hemlock Drive. This effort allowed better accessibility to Parkerson Mill Creek. On-going efforts to remove invasive vegetative species and replace with native species have further enhanced Parkerson Mill Creek. Throughout this reporting period, Landscape Services calculated the removal of approximately 1,065 cubic yards of landscape debris.

Solid Waste / Recycling Collection and Processing Areas

Auburn University provides waste reduction opportunities, materials management, and quality routine recycling services to campus clients. Auburn University collects and recycles metals, plastics, cardboard, paper, batteries, motor oil, used cooking oil scrap tires, toner cartridges, universal waste mercury containing fluorescent lamps and electronics in excess of 1.4 million pounds annually. Facilities Management's Waste Reduction and Recycling Department provides annual training to University and contracted staff on litter prevention, spill clean-up and storm water management. The training outlines the steps that both University and contracted

staff use to prevent and clean-up hydraulic oil spills. Topics covered in this annual training include:

Litter Prevention Training:

- Ensure that all waste and recycling containers are serviced on a routine schedule. All missed pick-ups are handled within 24 hours of the container being missed.
- Make sure all debris around dumpsters is cleaned up each day that the trash or recycling containers are serviced. All collection containers are monitored weekly to ensure that there site locations are clean and free of loose debris.

Annual Hydraulic Spill Prevention & Clean-up:

Both University and contracted staff are to report any liquid waste or hydraulic oil spills to the Waste Reduction and Recycling Department as soon as possible. Once a spill has been reported the following spill clean-up procedures will be followed.

Spill Clean-up Procedures:

The following spill clean-up procedures will be used to properly maintain, capture and remove any liquid waste or hydraulic oil spills from entering a storm drain:

Spills during Dry Weather Conditions:

- Report spill to Waste Reduction and Recycling Department.
- Notify Risk Management & Safety of spill by calling (844-4870)
- Contain spill by using oil dry and/or drain covers to absorb liquid waste or hydraulic oil.
- Once liquid waste or hydraulic oil has been absorbed, remove the oil dry from the affected area; place it in a garbage bag and contact Risk Management and Safety (844-4870) for disposal recommendations.

Spills during Wet Weather Conditions:

- Report spill to Waste Reduction and Recycling Department.
- Notify Risk Management & Safety of spill by calling (844-4870)

Educational guidelines for both the municipal solid waste and recycling disposal are being established for the Auburn University campus and will be posted on the Waste Reduction and Recycling Department website by August of 2013. These guidelines will review where certain types of waste can be disposed of and how. These guidelines will also list contact information for departments on campus that are responsible for different types of specialty waste such as universal waste (batteries), electronics, chemicals and bio-hazard

Waste Reduction and Recycling Department personnel perform periodic inspection of containers and equipment on campus that collect solid waste and recycled materials that are next to or near (within 100 feet) of a storm drain. Inspection evaluates for the following:

- Does the container have any leaks or holes in which material or liquids could be released?
- Are there any leaks in the hydraulic hoses?
- Are all of the lids and doors on each piece of equipment working properly?
- Other comments and observations?

Facilities Management Waste Reduction and Recycling Department has operational responsibility for the management of these containers and equipment. Any observed malfunctions or releases are addressed upon discovery mitigated and tracked to ensure that they are fully functional and operationally compliant. The Waste Reduction and Recycling Department maintains a map of all campus trash and recycling collection points. This map is updated annually during June of each year.

Spill Prevention Control & Countermeasure (SPCC) Program

Auburn University maintains compliance efforts consistent with 40 CFR 112 and the University's SPCC Plan. The SPCC Plan addresses the University's program to manage oil and other petroleum products defined by 40 CFR 112.7(2) and 40 CFR 112.7(4). This includes the management of fuel oils, gasoline, jet fuel, lubricating oils, hydraulic and dielectric fluids as they are utilized and stored on Auburn University's main campus. The University inspects all applicable containers (fuel tanks, generators, elevators and drums) monthly and all transformers annually. These routine inspections evaluate the condition of the containers to ensure proper functionality and management to prevent releases to the environment.

Applicable SPCC containers	Number of Inspections	Volume of SPCC applicable oil (gallons)
Tanks, Generators, Drums	480	86253
Elevators	1488	14785
Pad Mount Transformers	215	57777
Satellite Equipment	27	4256

Annual training is provided to oil handling personnel employed by Auburn University to promote the objectives of the SPCC Plan, the regulatory responsibility associated with these regulated materials and to address in-house procedures necessary to respond to spills or releases from them. During this reporting period, 415 employees were trained.

Used Oil Recycling Program

Auburn University's Department of Risk Management & Safety routinely collects and recycles used oil from campus operations. Currently, the Department of Risk Management & Safety uses Metro Environmental based out of Sylacauga AL for removal and recycling of campus generated used oil. Throughout this reporting period, the Department of Risk Management & Safety collected 880 gallons of used oil from campus operations.

Used Cooking Oil Recycling Program

Auburn University's Dining Services collects and recycles all used cooking oil generated from the University's dining facilities. During this reporting period, 5,051 gallons of used cooking oil was collected under contract with Perfect Circle, Inc. and converted into 3,000 gallons of biodiesel fuel.

Measure Specific Evaluation

Throughout this reporting period, the on-going preventative measures taken by multiple groups on campus have removed items that could have been ultimately been destined to our local landfill, groundwater and or surface waters. The University promotes e-waste minimization through reuse and recycling. The University has developed sound practices to manage equipment and operations to minimize releases to the environment and provides training to University and contractual employees on these best management practices.

Measure specific activities planned for the next reporting period

Auburn University will continue to perform and promote sound pollution prevention good housekeeping management practices. During this next reporting period the following actions are planned:

1. Strengthen the management of used cooking oil generated by the dining facilities located on campus.
2. Waste Reduction and Recycling Department will develop and promote solid waste and recycling guidelines.
3. Research the possibility of establishing a University composting facility to receive landscape debris, bedding waste generated from the College of Agricultural operations, the College of Veterinary Medicine (CVM) and AU Dining.

Monitoring Plan for Pathogen Impairment

The Parkerson Mill Creek Watershed is located in Lee County; the watershed is part of the Chewacla Watershed, in the lower Tallapoosa River Basin. The 9.3 square mile (5,981 acres) watershed contains 21,000 meters (68,500 ft.) of main stem perennial stream and approximately 86,000 meters (282,152 ft.) of tributary stream length. The stream network empties into Chewacla Creek, just south of the H.C. Morgan Water Pollution Control Facility

The watershed includes the City of Auburn, Auburn University and the surrounding areas. The headwaters of Parkerson Mill Creek are approximately 3,000 meters (9,845.5 ft.) in length and are located on the campus of Auburn University.

In 2007, ADEM listed Parkerson Mill Creek as impaired on Alabama's 303(d) List of Impaired Waters based on a series of Auburn/Opelika Intensive Fecal Coliform Studies. The listed impairment is for pathogens from point source and non-point sources, primarily urban runoff and storm sewer connections. As such, Auburn University monitors Parkerson Mill Creek by performing bacteriological analysis through the Alabama Water Watch (AWW) program's laboratory contained on the main campus. The results of the monitoring effort for this reporting period are contained in Appendix A of this Annual Report.

Appendix A

Parkerson Mill Creek
Water Quality Monitoring
April 1, 2012 through March 31, 2013

AWW Site Code 7011035
Location Description Thach Ave near Rugby Field

Sample Date	air temp	water temp	E-coli (1)	E-coli (2)	E-coli (3)	Calc Mean
4-Apr-12	24	21	5	5	4	466.67
25-Apr-12	27	18.5	3	2	0	166.67
16-May-12	24	21.5	3	2	5	333.33
19-Jun-12	26	22	30	32	36	3266.67
24-Jul-12	28.5	26	9	9	9	900.00
15-Aug-12	28.5	26	2	0	1	100.00
19-Sep-12	-	-	0	3	1	133.33
26-Sep-12	26	24	3	4	7	466.67
5-Oct-12	-	-	5	1	0	200.00
7-Oct-12	-	-	0	0	2	66.67
24-Oct-12	-	-	2	8	5	500.00
28-Oct-12	-	-	2	11	9	733.33
31-Oct-12	17	11	5	8	9	733.33
4-Nov-12	-	-	29	31	34	3133.33
13-Nov-12	-	-	21	17	11	1633.33
28-Nov-12	15	13	18	19	18	1833.33
22-Jan-13	7	9	14	12	10	1200.00
27-Feb-13	18	22	3	2	2	233.33
11-Mar-13	13	13	9	12	6	900.00

AWW Site Code 7007010
Location Description Wire Road and Samford Avenue

Sample Date	air temp	water temp	E-coli (1)	E-coli (2)	E-coli (3)	Calc. Mean
4-Apr-12	24	21	5	2	6	433.33
25-Apr-12	29	19	2	2	1	166.67
16-May-12	25	23	1	0	1	66.67
19-Jun-12	26.5	23.5	2	4	4	333.33
24-Jul-12	28	25	16	15	21	1733.33
15-Aug-12	27	23.5	3	1	3	233.33
26-Sep-12	25.5	22.5	7	8	10	833.33
31-Oct-12	17	13.5	0	0	1	33.33
13-Nov-12	8	11.5	14	8	7	966.67
28-Nov-12	16.5	14	9	6	8	766.67
22-Jan-13	4	8	7	5	8	666.67
27-Feb-13	13	11.5	3	5	1	300.00
11-Mar-13	15.5	13	8	4	4	533.33

AWW Site Code	7021001
Location Description	Behind McWorter Center

Sample Date	air temp	water temp	E-coli (1)	E-coli (2)	E-coli (3)	Calc. Mean
4-Apr-12	23	20.5	4	3	4	366.67
25-Apr-12	27	20	1	0	0	33.33
16-May-12	19.5	19.5	2	0	2	133.33
19-Jun-12	22	22	2	2	3	233.33
24-Jul-12	27.5	19.5	3	8	5	533.33
15-Aug-12	22	22	0	2	1	100.00
26-Sep-12	26	22	16	21	12	1633.33
31-Oct-12	17	9.5	0	0	1	33.33
28-Nov-12	20	12	6	6	6	600.00
22-Jan-13	6	8	4	1	1	200.00
27-Feb-13	11.5	11.5	9	0	0	300.00
11-Mar-13	13	13	3	3	1	233.33

AWW Site Code	7012004
Location Description	Bridge on Samford Ave near Women's Soccer Field

Sample Date	air temp	water temp	E-coli (1)	E-coli (2)	E-coli (3)	Calc. Mean
4-Apr-12	24	20.5	3	0	3	200.00
25-Apr-12	26.5	20	1	0	1	66.67
16-May-12	23	20	7	6	8	700.00
31-May-12	30	23	39	47	44	4333.33
19-Jun-12	26	22	5	6	8	633.33
24-Jul-12	27	24	3	5	5	433.33
15-Aug-12	24.8	22.5	6	5	8	633.33
16-Sep-12	29	22.5	18	16	24	1933.33
19-Sep-12	-	-	3	1	3	233.33
23-Sep-12	-	-	100	111	105	10533.33
26-Sep-12	26	22	0	0	1	33.33
5-Oct-12	-	-	3	1	2	200.00
7-Oct-12	-	-	4	6	6	533.33
24-Oct-12	-	-	1	1	1	100.00
28-Oct-12	-	-	0	2	0	66.67
31-Oct-12	16.5	12.5	1	2	0	100.00
11-Apr-12	-	-	0	0	0	0.00
13-Nov-12	6	12	9	3	6	600.00
28-Nov-12	15	14	132	129	141	13400.00
3-Dec-12	-	-	0	0	1	33.33
10-Dec-12	-	-	2	4	1	233.33
22-Jan-13	4	9	0	3	2	166.67
27-Feb-13	13.5	14	3	1	3	233.33
11-Mar-13	15	14.5	2	3	4	300.00

AWW Site Code	7007008
Location Description	Lem Morrison Bridge

Sample Date	air temp	water temp	E-coli (1)	E-coli (2)	E-coli (3)	Calc. Mean
4-Apr-12	23.5	20	3	2	0	166.67
25-Apr-12	29	20.5	1	1	2	133.33
16-May-12	21	20	8	4	3	500.00
19-Jun-12	25	21.5	4	7	10	700.00
24-Jul-12	29	25	8	7	6	700.00
15-Aug-12	22	22	3	3	1	233.33
26-Sep-12	27	23.5	5	6	3	466.67
31-Oct-12	17	11.5	3	1	0	133.33
28-Nov-12	14.5	12	33	31	33	3233.33
22-Jan-13	4	6.5	1	3	2	200.00
27-Feb-13	15	12.5	0	0	0	0.00
11-Mar-13	13.5	13	0	8	2	333.33

AWW Site Code	7018002
Location Description	Shug Jordan near AU Beef Unit

Sample Date	air temp	water temp	E-coli (1)	E-coli (2)	E-coli (3)	Calc. Mean
4-Apr-12	24.5	20.5	0	2	0	66.67
25-Apr-12	28	18.5	1	1	1	100.00
16-May-12	26.5	20	0	0	2	66.67
19-Jun-12	30.5	21	0	2	3	166.67
24-Jul-12	28	25	1	4	1	200.00
15-Aug-12	28	25	1	2	4	233.33
26-Sep-12	27	23.5	0	1	2	100.00
31-Oct-12	16	11.5	1	2	3	200.00
13-Nov-12	12	12	28	23	27	2600.00
28-Nov-12	19	15	25	7	8	1333.33
22-Jan-13	6	8	4	2	1	233.33
27-Feb-13	14	11	3	1	2	200.00
11-Mar-13	17.5	13	2	2	0	133.33

AWW Site Code	7011036					
Location Description	Beard Eaves Memorial Coliseum					
19-Sep-12	-	-	1	1	3	166.67
23-Sep-12	-	-	20	13	14	1566.67
5-Oct-12	-	-	2	4	6	400.00
7-Oct-12	-	-	8	6	6	666.67
24-Oct-12	-	-	1	2	1	133.33
28-Oct-12	-	-	2	1	1	133.33
2-Nov-12	-	-	0	0	5	166.67
4-Nov-12	-	-	2	4	3	300.00
10-Dec-12	-	-	136	149	138	14100.00
12-Dec-12	-	-	7	2	4	433.33

AWW Site Code	No Code
Location Description	Sigma Nu Fraternity on Magnolia
Elevated e-coli concentrations identified were refferred to the City of Auburn	

Sample Date	air temp	water temp	E-coli (1)	E-coli (2)	E-coli (3)	Calc. Mean
23-Sep-12	-	-	250	250	250	25000.00
5-Oct-12	-	-	11	21	24	1866.67
7-Oct-12	-	-	250	250	250	25000.00
24-Oct-12	-	-	99	84	99	9400.00
28-Oct-12	-	-	140	122	135	13233.33
2-Nov-12	-	-	8	5	1	466.67
4-Nov-12	-	-	30	42	56	4266.67
10-Dec-12	-	-	0	0	2	66.67
13-Feb-13	-	-	7	13	4	800.00
13-Mar-13	-	-	1	1	0	66.67
18-Mar-13	-	-	0	0	0	0.00

AWW Site Code	No Code
Location Description	Up Pipe of Sigma Nu on Magnolia Ave.
Elevated e-coli concentrations identified were refferred to the City of Auburn	

Sample Date	air temp	water temp	E-coli (1)	E-coli (2)	E-coli (3)	Calc. Mean
5-Oct-12	-	-	250	250	250	25000.00
7-Oct-12	-	-	250	250	250	25000.00
24-Oct-12	-	-	272	280	260	27066.67
28-Oct-12	-	-	42	53	47	4733.33
2-Nov-12	-	-	640	640	480	58666.67
4-Nov-12	-	-	6	9	5	666.67
10-Dec-12	-	-	1	1	0	66.67
13-Feb-13	-	-	9	16	12	1233.33
13-Mar-13	-	-	0	0	0	0.00
18-Mar-13	-	-	0	1	0	33.33