



BEAUFORT COUNTY
STORMWATER MANAGEMENT UTILITY BOARD
AGENDA

Wednesday, June 4, 2014

2:00 p.m.

Beaufort Industrial Village, Building 3 Conference Room
104 Industrial Village Road, Beaufort
843.255.2805

In accordance with South Carolina Code of Laws, 1976, as amended, Section 30-4-80(d), all local media was duly notified of the time, date, place and agenda of this meeting.

1. CALL TO ORDER – 2:00 p.m.

- A. Approval of Agenda
- B. Approval of Minutes – April 2, 2014 ([backup](#)) and May 7, 2014 ([backup](#))

2. INTRODUCTIONS

3. EXECUTIVE SESSION

- A. “Discussion of negotiations incident to proposed contractual arrangements and proposed sale or purchase of property, the receipt of legal advice where the legal advice relates to a pending, threatened, or potential claim or other matters covered by the attorney-client privilege, settlement of legal claims, or the position of the public agency in other adversary situations involving the assertion against the agency of a claim.”

4. PUBLIC COMMENT

5. REPORTS

- A. Special Presentation – Water Budget Study, Dr. Bud Badr ([backup](#))
- B. Utility Update – Eric Larson, P.E. ([backup](#))
- C. Monitoring Update – Eric Larson, P.E. ([backup](#))
- D. Stormwater Implementation Committee Report – Eric Larson, P.E. ([backup](#))
- E. Stormwater Related Projects – Eric Larson, P.E. ([backup](#))
- F. Upcoming Professional Contracts Report – Eric Larson, P.E. ([backup](#))
- G. Regional Coordination – Eric Larson, P.E. ([backup](#))
- H. Financial Report ([backup](#)) and Incorporating the Capital Improvement Fund ([backup](#)) – Alan Eisenman
- I. FY 2015 Revised Proposed Budget ([backup](#)) including Capital Projects ([backup](#)) – Eric Larson, P.E.
- J. Maintenance Projects Report – Eddie Bellamy ([backup](#))



AGENDA

June 4, 2014

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6. UNFINISHED BUSINESS

A. Stormwater Education Branding Recommendation ([backup](#))

7. NEW BUSINESS

A. Brewer Memorial Park Project ([backup](#))

8. PUBLIC COMMENT

9. NEXT MEETING AGENDA

A. July 2, 2014 ([backup](#))

10. ADJOURNMENT



Beaufort County Stormwater Management Utility Board (SWMU Board)
Meeting Minutes

April 2, 2014 at 2:00 p.m. in Beaufort Industrial Village Building #2 Conference Room
Draft April 24, 2014

Board Members

Present	Absent
Don Smith	
William Bruggeman	
Patrick Mitchell	
Allyn Schneider	
James Fargher	

Ex-Officio Members

Present	Absent
Andy Kinghorn	
Scott Liggett	
Kimberly Jones	
Van Willis	

Beaufort County Staff

Eric Larson
Eddie Bellamy
Danny Polk
Carolyn Wallace
Alan Eisenman

Visitors

Lamar Taylor, City of Beaufort
Bryan McIlwee, Town of Hilton Head Island
Paul Moore, Ward Edwards
Reed Armstrong, Coastal Conservation League
Danielle Mickel, USCB WQ Lab
Mike Monday, USCB WQ Lab
Bill Weiss, Low Country Institute

1. Meeting called to order – Don Smith

- A. Agenda – Approved.
- B. March 5, 2014 Minutes – Approved.

2. Introductions – Completed.

3. Public Comment(s) – Mr. Allyn Schneider voiced concerns that he read an article in the newspaper that the proposed shopping center at the intersection of Highway 46 and 278 is requesting to be allowed to have 20% effective imperviousness (EI). Mr. Eric Larson said this development agreement is mentioned in his SW Manager report. The drainage plan has been submitted for his review for the Natural Resources Committee meeting on Friday. However, he was still reviewing and not prepared to speak to the finding of his review. He will be reviewing the drainage plan on three criteria; volume control, release rate, and water quality. The drainage plan may meet the required numbers for all three of these criteria but not the 10% EI. Discussion ensued. The board member's understanding when the BMP Manual was revised, was that the 10% EI was not a target but a requirement. Mr. Larson said he understood the sentiment of the board and would consider when providing his report to the Natural Resources Committee on Friday.

4. Reports –

- A. **Town of Bluffton** – Ms. Kim Jones provided a presentation on the town's stormwater program ([please see attachment](#)). She discussed the town's inspection program, the May River modeling project, the town's community outreach efforts, and maintenance and street sweep projects performed by the town's Public Works Department.
- B. **Monitoring Update** – Mr. Eric Larson

Mr. Larson submitted his written report in advance ([please see attachment](#)). He discussed the USCB lab and the coordination with the Town of Port Royal on a monitoring plan near shellfish station 15-25.

C. Utility Update – Eric Larson

Mr. Larson submitted his written report in advance ([please see attachment](#)). He provided an update on the implementation of the MS4 program, the development of a pet waste brochure and the purchase of “dog-bone” bag dispensers in partnership with the Solid Waste and Recycling Department to be distributed to new pet owners that adopt from the County Animal Shelter and as giveaways for the upcoming Earth Day events.

Promotions - Mr. Larson also congratulated Danny Polk on his promotion to Stormwater Utility Inspection Supervisor and Seth Stanbery promotion to Stormwater Infrastructure and MS4 / GIS Data Manager. These promotions are some of the first changes to be made to implement the MS4 permit and reflect the utility’s changing needs in inspection and data management. Evelyn Sutton was also promoted to Utility Operations Coordinator to reflect a change with her job duties related to utility locates and pending implementation of providing 811 locates of our stormsewer system.

Jellyball - Mr. Larson is in the process of reviewing the stormwater pollution prevention plan for the proposed Carolina Jellyball processing facility in Lobeco and unloading facility on Golden Dock Road in St. Helena Island.

D. Stormwater Implementation Committee Report – Eric Larson

Mr. Larson submitted his written report in advance ([please see attachment](#)). The SWIC met last month. Mrs. Carolyn Wallace presented the Stormwater Management fee budget for FY15 and the members discussed Illicit Discharge, Detection, and Elimination (IDDE) MCM program needs.

E. Upcoming Professional Contracts Report – Eric Larson

Mr. Larson submitted his written report in advance ([please see attachment](#)).

US 278 retrofit ponds – Bid due date has again been extended again pending changes to one of the ponds and access changes to all four of the ponds. Mr. Polk is trying to get the addendum issued and obtain an easement from Berkeley Hall to use their maintenance road as one of the access points for the pond.

Administration Building Complex Parking Lot – Project still out for bid.

Okatie East Monitoring Program – Mr. Larson has received the proposal from the consultants, Ward Edwards and is in the process of executing the contract.

Trask Parkway and Paige Pointe Overtopping studies – Andrews and Burgess are finishing up these two projects. Results will be added to the list of potential retrofit projects.

A. Financial Report - Alan Eisenman – Mr. Eisenman presented the un-audited February interim financial statements for the Stormwater Utility ([please see attachment](#)). Following are the highlights from his presentation:

- Actual February FY14 revenues are \$381K more than Actual February FY13 revenues. Mr. Eisenman met with the Deputy Treasurer and they analyzed the data and determined that more property owners paid their taxes before the tax sale this last year and more property owners are currently paying their taxes earlier this year causing this surge in revenue.
- Actual February FY14 expenses are at 53% of budget for FY13.
- Unrestricted Fund Balance from Balance Sheet Increased by \$580,000 or 25% since last FY at this time.

Cash from Balance Sheet Increased by \$386,000 or 10% since last FY at this time.

F. Fiscal Year 2015 Proposed Budget – Mrs. Carolyn Wallace

In her presentation of the proposed FY 2015 budget ([please see attachment](#)), Mrs. Wallace presented three proposed new or expanded programs: MS4 Program, Expansion of the Extent of Service (EOS),

and becoming a provider for the South Carolina 811 (SC811) system. She detailed the budgetary needs to include these expanded or new programs.

She reported on ongoing and upcoming accounting changes. This year a third fund is being created for the Capital Improvement Fund. In FY 2016 it is anticipated that a fourth fund for the Regulatory Section will be created to better account for the section's efforts and expenditures and will include all efforts to address the MCMs in the new MS4 permit.

Mr. Schneider asked about the efforts to address the military installations' delinquent SWU fees. Mr. Van Willis said he feels that every citizen benefits to a certain extent from the efforts of the SWU and a portion of the SWU fees should be paid by the military installations. But he also feels that a portion of the fees can be abated if they can get the military to discuss this with the utility.

Discussion ensued concerning the Capital Improvement Fund and the need for a Reserve Policy. Staff will be working on developing a reserve policy in the future.

Mr. Scott Liggett asked about the timeline for the update to the Stormwater Management Master Plan (SMMP). Mrs. Wallace said this is a 10-year plan and the update is due in FY2016. The cost of the SMMP is in the FY 2016 budget but it is crucial that the scope is determined by the SWIC in this upcoming fiscal year 2015 so that the contract can be advertised for bids at the start of FY 2016, to give the consultant, county and municipalities ample time to develop the management plan in FY2016.

G. Maintenance Projects Report – Mr. Eddie Bellamy reported on (2) major projects, Okatie East Retrofit and Forrest Field Subdivision. He presented (13) minor and/or routine maintenance projects in a shortened format. He also mentioned that they investigated the drainage issues for Big Estate. The cause of the drainage issue may be the improvements to the duck ponds in the area. They still have not identified a solution.

5. Unfinished Business – Eric Larson

A. Regional Coordination - Eric Larson

Mr. Larson submitted his written report in advance ([please see attachment](#)).

Battery Creek Pond – Mr. Paul Moore said the surveying is on-going. The wet weather has delayed this effort but they should soon have what they need to start the design work.

B. Forby Tract Land Acquisition – Eric Larson

After receiving two proposals it was decided not to pursue the study or the purchase of the site using Stormwater Utility Funds. Costs for the study work were rather high, probably due to the short deadline, and we were concerned that the project need would not be justified.

6. New Business – Mr. Don Smith mentioned that there will be four mechanical BMPs installed on the Albergotti Bridge project.

7. Public Comment – None.

8. Next Meeting Agenda – Mr. Larson changed the order of his report on the upcoming agenda so that his presentation will flow better. ([Please see attachment](#)).

If possible, the board would like the County Attorney to appear to discuss the military installations' delinquent SWU fees. Agenda approved with this possible addition to the agenda.

9. Meeting Adjourned.

Town of Bluffton-

Stormwater Management Activities 2013 - 2014

April 2, 2014



2013 Projects/Program Overview

- 319 Phase 1 New Riverside Pilot Project Completed
- Inspection Programs
 - Sediment & Erosion Control
 - Stormwater Infrastructure GPS
 - Verdier Cove Flow
 - Water Quality Monitoring
- May River Watershed Modeling Project
 - Land Use Inventory
 - XPSWMM Modeling
- Community Outreach & Participation Programs
 - Septic System Assistance Program/Sewer Master Plan
 - Educational Outreach & Community Participation
- Public Works
 - Ditch Maintenance
 - Street Sweeper & Wash Rack



319 Phase1: New Riverside Pilot Project

Constructed stormwater pond to treat 300 acre sub-watershed



Sediment & Erosion Control

Conducted >2,000 S&EC inspections



GPS Infrastructure & Verdier Cove Flow Monitoring

Collected >1,600 GPS SW infrastructure sites

Conducted >200 Verdier Cove flow inspections



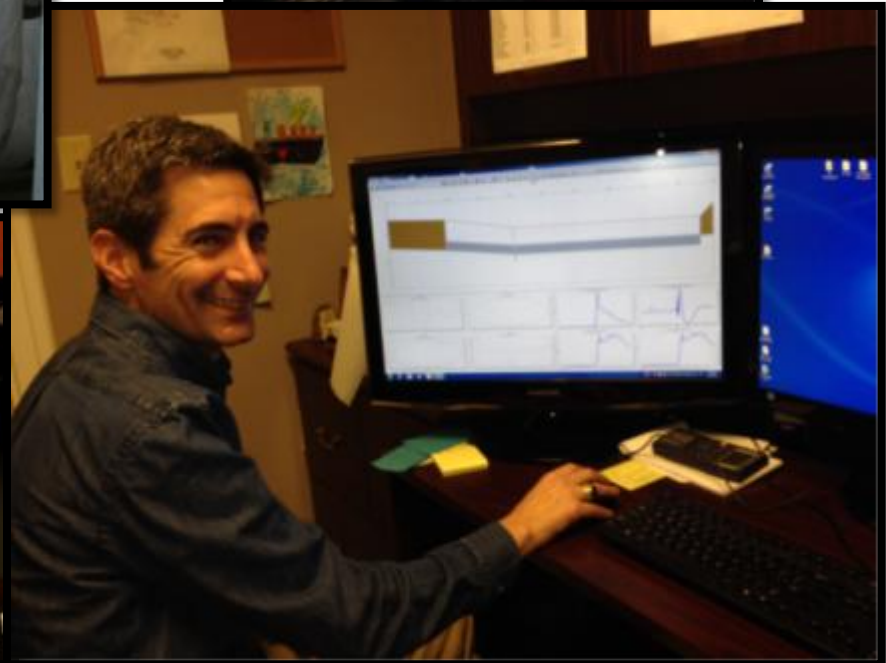
Water Quality Monitoring

Collected nearly 700 water quality test samples



Land Use Inventory & Modeling

Created land use inventory of 2002 & modeled headwaters conditions



Septic System Maintenance Assistance & Sanitary Sewer Connection

Facilitated 20 septic system inspections and pump-outs/repairs within the Town's jurisdiction in the Buck Island/Simmonsville Roads area. Phase 3 of CDBG-supported sewer connection is underway.



Educational Outreach

Conducted ~50 speaking engagements reaching ~3,000 participants



Community Participation

Coordinated 2 community clean-ups with >300 participants and 2 ½ tons of debris collected



Public Works

Purchased an equipment Wash Rack and Street Sweeper which is used on ~16 miles of roads.



May River Watershed Action Plan 2014

- Outreach/Participation
 - 14th Annual May River Cleanup & Earth Day Celebration
 - Educational Kiosk for Town Hall
 - Stormwater Educational Video
 - May River Watershed Road Signs
- Retrofit Projects
 - 319 Phase 2 Pine Ridge
 - RFQ Stormwater Consulting Services
- Funding



14th Annual May River Cleanup & Earth Celebration

Saturday, April 26th

- 9 AM – Noon:
Cleanup @ Oyster
Factory Park
- 11 AM – 4:00 PM:
Earth Day Celebration
off Calhoun St.

Join us at
OYSTER FACTORY PARK
for the

May River Cleanup Elementary School Challenge

Battle against your fellow elementary schools to help clean up and protect the May River. The school with the most participation will win a free Critters of the Lowcountry presentation from Joe Maffo with Critter Management.



where:

Oyster Factory Park, Bluffton

when:

April 26, 2014 from 9AM-12PM

r.s.v.p.

blewis@townofbluffton.com

Our Rivers
Our Responsibility



Educational Kiosk for Town Hall

- Developed with SWU partnership
- Content from Carolina Clear & PRSF



Stormwater Educational Video

Dubois Park Rain Garden

Visit
www.neighborsforcleanwater.org

Brought to you by:



Neighbors for Clean Water
Our Rivers. Our Responsibility

TOWN OF BLUFFTON
SOUTH CAROLINA

TOWN OF BLUFFTON
SOUTH CAROLINA

BEAUFORT COUNTY SOUTH CAROLINA
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May River Watershed Signs



319 Grant Phase 2 Pine Ridge

- Easement signed by Town and POA
- Next Steps -
 - Pre-project flow monitoring
 - Design contract
 - Construction

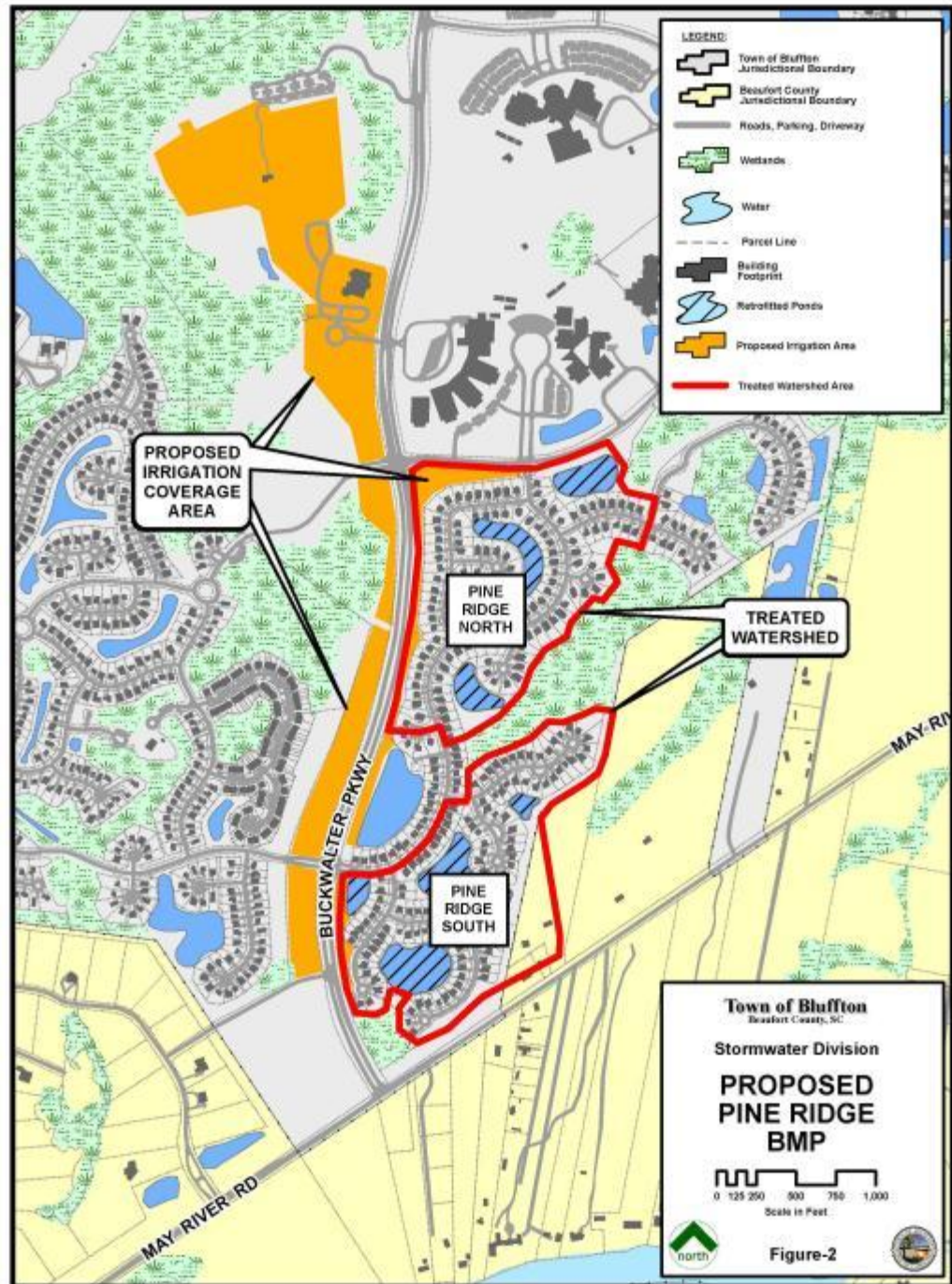
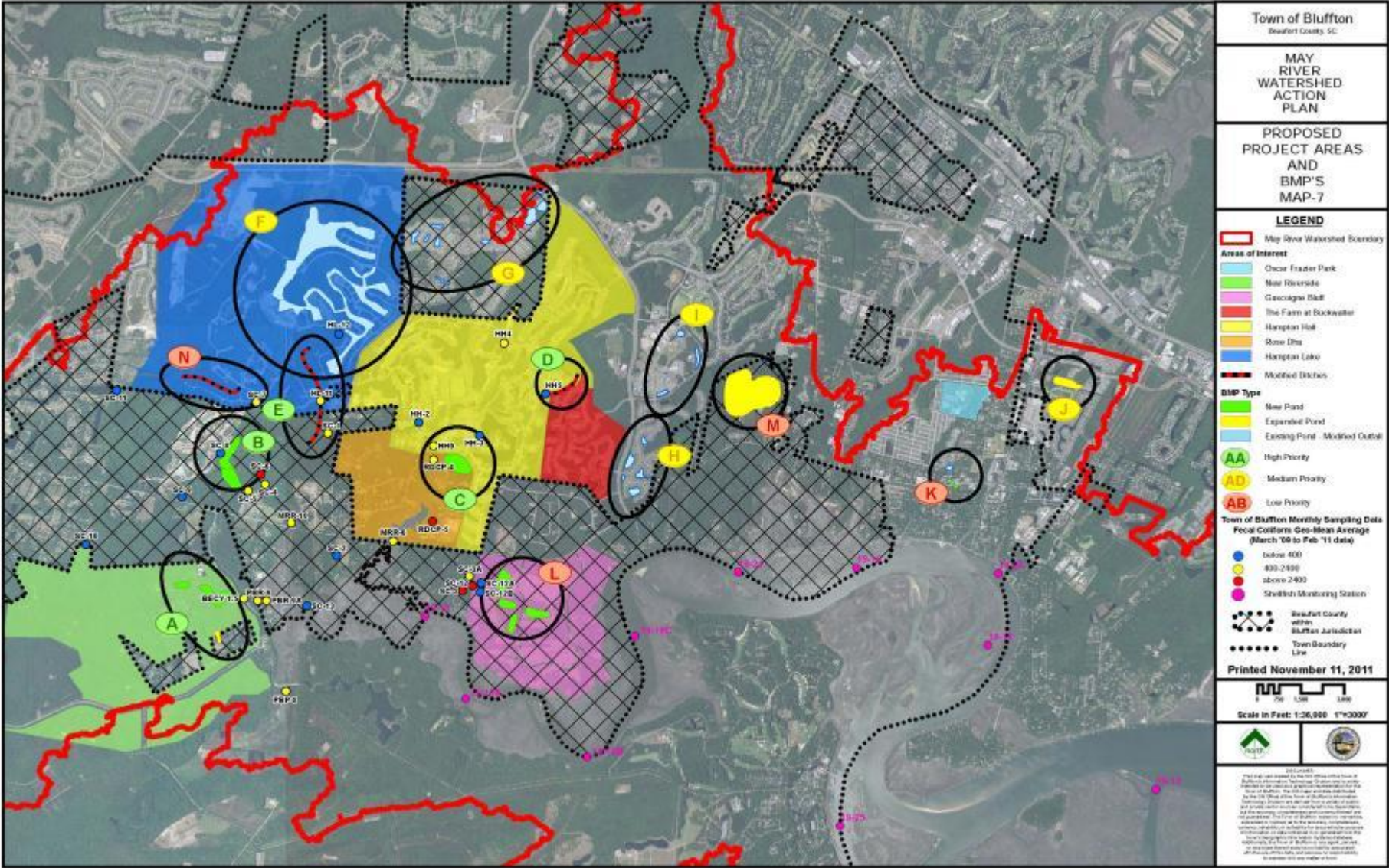
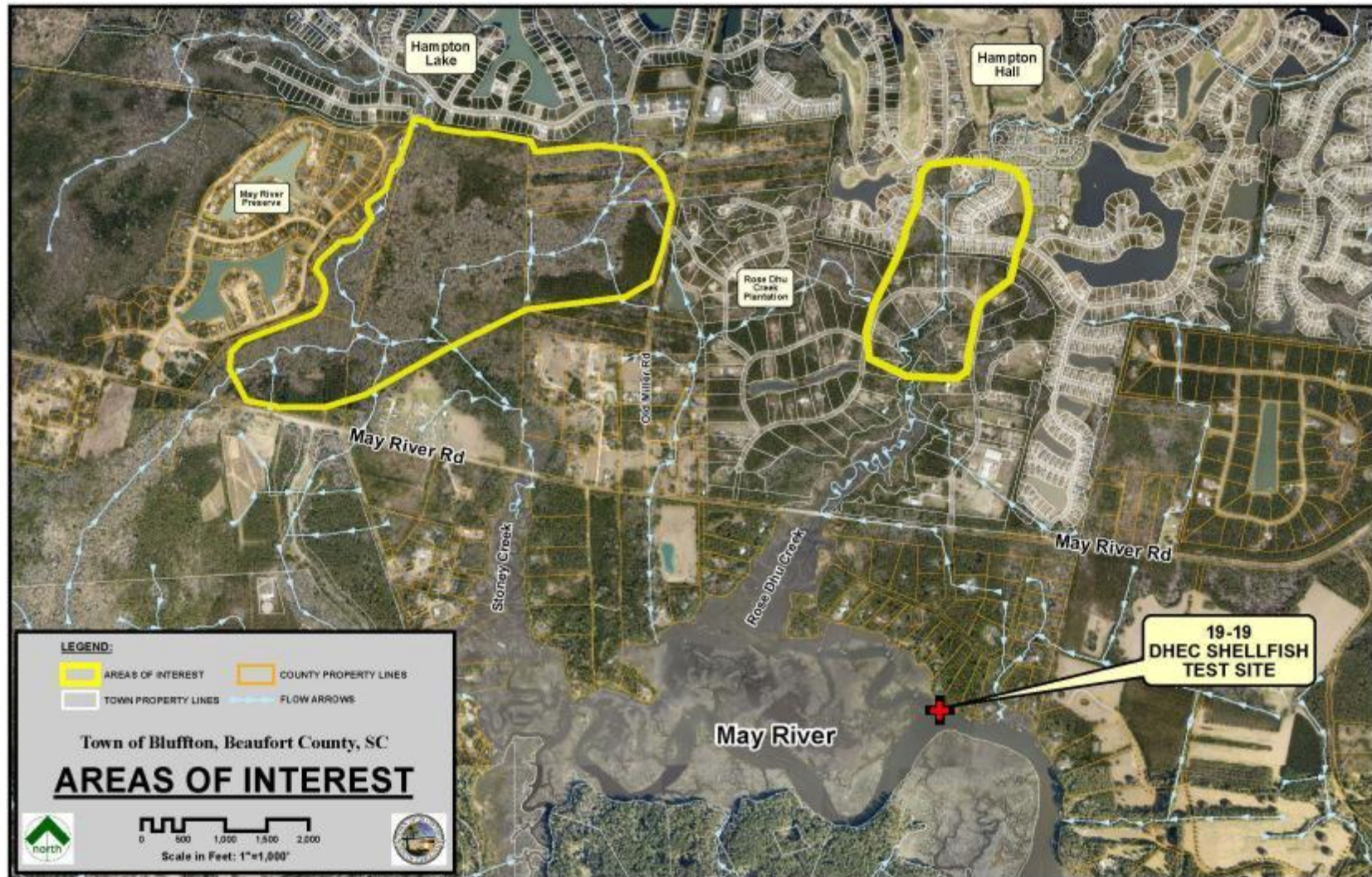


Figure-2

RFQ - Stormwater Consulting Services



Recent DHEC Funding - \$100,000





BLUESTONE BLUFF



BEAUFORT COUNTY STORMWATER UTILITY
120 Shanklin Road
Beaufort, South Carolina 29906
Voice (843) 255-2801 Facsimile (843) 255-9478



April 2, 2014

Stormwater Manager's report for the Stormwater Utility Board Meeting

Utility Update

1. DHEC and MS4 update – We continue to develop a plan for implementation of the MS4 program. I have been interviewing other MS4 programs across the state to learn how others are implementing their programs and how they are sharing tasks between multiple jurisdictions. I will be addressing the Natural Resources Committee in May to provide an overview of the MS4 program and the status of our County Stormwater program.
2. Budget for FY15 – Submitted in early March. We are awaiting feedback from the County Administrator's office.
3. Public Education Effort / Dog Waste Education – We recently partnered with the Solid Waste Division to create a brochure educating pet owners about pollution from fecal deposits. Recycling paid for baggie dispensers that clip onto leashes and Stormwater paid for printing of the brochures. They will be distributed to new pet owners that adopt from the County Animal Shelter.
4. Earth Day 2014 – I am considering partnering with the Friends of the Bluffton Dog Park to distribute dog waste baggie dispensers and brochures during the May River Clean-Up and Earth Day Celebration on Saturday April 26th. We may also distribute materials at other events associated with Earth Day.
5. Larson, Wallace, and Polk will be attending the SESWA spring conference next week. It includes a session by EPA Region 4.
6. Larson, Polk, Kim Jones (Bluffton) and Jeff Buckalew (HHI) attended the quarterly meeting of the SCASM earlier this month. Topics ranged from a DHEC update, post-construction BMP design and inspection, and BMP inventory
7. I attended a training seminar on March 25th. "Current Stormwater Issues in South Carolina". This was training intended for me to get better acclimated to state regulations.
8. Promotions – Danny Polk was promoted to Stormwater Utility Inspection Supervisor and Seth Stanbery was promoted to Stormwater Infrastructure and MS4 / GIS Data Manager. These promotions are some of the first changes to be made to implement the MS4 permit and reflect our changing needs in inspection and data management. Evelyn Sutton was also promoted to Utility Operations Coordinator to reflect a change with her job duties related to utility locates and pending implementation of providing 811 locates of our stormsewer system.

Monitoring Update

1. USCB Lab – County Council has established an action item to develop a strategic plan for the “next steps” of the water quality lab, specifically the implementation of the plan to utilize the lab for all water quality monitoring efforts by the County and others. I have met with Dr. Warren and begun the process of outlining the plan. The Council would like to see the plan in place by January 2015.
2. The Town of Port Royal has asked me to revisit a monitoring plan for the area near shellfish station 15-25. It is located in the Dowlingwood Tributary of Battery Creek. It is the only site impaired within the watersheds within the limits of the Town of Port Royal. Danny Polk and Dan Ahern had looked into this before and performed sampling at several locations in the vicinity of Parris Island Gateway and Savannah Highway intersection. As we move forward, we will try to identify sources of fecal contamination and develop potential project concepts.

Stormwater Implementation Committee (SWIC) Report

1. The SWIC met on March 12th. The topics were the [Stormwater Management fee budget for FY15](#) and Illicit Discharge, Detection, and Elimination (IDDE) program needs. ([See attached draft minutes](#))

Stormwater related Projects

1. Proposed Carolina Jellyball processing facility in Lobeco and unloading facility on Golden Dock Road in St. Helena Island – No action since last report.
2. Drainage issue on H.E. McCracken Circle in Bluffton – I recently met with Town staff to discuss recent field investigations and potential solutions. Town of Bluffton staff is going to conduct more field work. County staff will be assisting with providing cost estimates for alternatives.
3. Bluffton Gateway Development Agreement – I am in the process of reviewing the stormwater design for the proposed site. The applicant has requested a modification to the “10% effective imperviousness” requirement in the BMP Manual. Therefore, before the development agreement is approved by the County Council, the Natural Resources Subcommittee for the agreement has asked me to prepare an opinion on the design and the modification request. A meeting with the sub-committee and the applicant is scheduled for April 4, 2014.
4. Infrastructure crew performed on-going maintenance needs. There are several needs throughout the County that I, as the Stormwater Engineer, will be involved in over the next couple of months trying to find a solution.

Professional Contracts Report

1. US 278 retrofit ponds – Bid due date has again been extended again pending changes to one of the ponds and access changes. Changes are made and an addendum is pending.

Permit modifications with DHEC and the County DRT are in process. SCDOT permits are approved but likely not needed due to plan changes.

2. County Admin. Complex Retrofit Project – The project is currently out for bid. A Per-bid conference was held March 17th.
3. Consultant procurement for the Carolina Jellyball application is still on hold pending a submittal from the applicant.
4. A RFP for a stormwater consultant to assist with the setup of the MS4 program is also on hold pending development of a MS4 implementation strategy.
5. Water Budget Study – I have received a draft of the final report and will be reviewing it over the next month. Dr. Badr will be presenting the findings to the Board in the upcoming months.
6. Okatie East BMP monitoring – I am awaiting a proposal from Ward Edwards to assist the County with data collection and analysis for the volume control study recommended by the Board last month.
7. Forby Tract – After receiving two proposals from firms with previous experience with the site and issues, I, along with the County Administrator's office, decided not to pursue the study or the purchase of the site using Stormwater Utility Funds. Costs for the study work were rather high, probably due to the short deadline, and we were concerned that the project need would not be justified.
8. Trask Parkway and Paige Pointe Overtopping studies – Andrews and Burgess are finishing up these two projects initiated by Mr. Ahern and Mr. Klink last year. Results will be added to our list of potential retrofit projects.

Regional Coordination

1. Battery Creek Pond – Still in design phase. (Lamar Taylor may report)
2. Stoney Creek – RFP for consultant currently is being advertised. (Kim Jones may report)
3. Salinity Study - On going. Nothing new to report.
4. Sea Level Rise and future planning – On going. Nothing new to report.
5. Okatie 391 Grant – Nothing new to report.



SW Utility Funding For FY2015

SWIC Meeting
March 12, 2014

Outline

- 2013 Accomplishments
- On-going Projects and Issues
- Major Challenges
- Total SW Fees Collected in TY2012
- Calculating the Single Family Units (SFUs)
- FY2015 Deliverables
- FY2015 Budget and Budget/SFUs
- FY2015 (& FY2016) Cost-Shares
- Questions

2013 Accomplishments

- Funded development of USCB Lab
- Okatie East Retrofit project
- Cost share with CoB on Battery Creek 319 grant project
- Lidar and 2013 DEM
- Began Salinity Study and Water Budget Study
- Others?

Initiatives In Progress

- Complete the Salinity and Water Budget Studies
- Implementing the WQ Lab
- Improve mapping / determine MS4 outfalls
- Develop a pond maintenance system
- MS4 permit development
- Establishing MS4 programs (IDDE, Const. RO, PC-BMP)

Initiatives In Progress Con't

- Implement priority WQ retrofit projects to include establishing a CIP Fund
 - Highway 278 ponds
 - County Admin Bldg.
 - Others in planning stages

Initiatives In Progress Con't

- Battery Creek, Okatie River, and May River watershed restoration activities
- Expand County's EOS
- Implement 811 system for utility locates
- Others?

Major Challenges

- Continue implementation of the Watershed Restoration Plan
 - Explore incentives
- Developing a new 10-Yr SW Management Plan (FY16)
- Implementing the expected MS4 permit
- Incorporating findings of Water Budget Study and Salinity Study

Major Challenges

- Evolve the SWIC and Utility Board
- Increase level of partnerships on Stormwater programs
- Others?

TY2012 Total Collected (as of Oct. 31, 2013)

	TY2011	TY2012
Port Royal	\$162,333	\$168,765
Beaufort	517,771	840,810
HHI	3,566,876	3,564,900
Bluffton	1,064,664	1,098,409
Unincorp BC	2,834,164	2,818,178
Total Collected	\$8,145,808	\$8,491,062

Single Family Unit Analysis (TY2012 as of Oct. 31, 2013)

Jurisdiction	Collected	SFUs	SFU %
Port Royal (50)	\$ 168,765	3,375	3.02%
Beaufort (105)	840,810	8,008	7.17%
HHI (108.7)	3,564,900	32,796	29.35%
Bluffton (98)	1,098,409	11,208	10.03%
Unincorp BC (50)	2,818,178	56,364	50.44%
Total Billing	\$8,491,062	111,751	100.00%

County Division of Duties

- 3 different units
 - Management
 - Activities (Infrastructure)
 - Capital Projects
- Regulatory (coming later next year)

FY2015 Deliverables

- Implementation of the SMMP
 - Control Regulations – Step 2 Exemptions, Web-program Updates, etc.
 - MS4 program elements
 - IDDE
 - Const. Runoff
 - Post Construction BMPs

FY2015 Deliverables Con't

- Implementation of the SMMP cont.
 - WQ Monitoring – County-wide and weekly fecal testing. This will expand to include the MS4 outfalls and parameters
 - WQ Controls (Existing Development) – Restoration Activities
 - Annual Maintenance (O&M) – Coordination & reimbursement

FY2015 Deliverables Con't

- Public Information/Outreach – Contract management, webcasts, presentations, etc.
- Drainage (PSMS) Enhancement – Review of identified overtoppings, coordination, etc.
- Additional Studies – Water budget study, salinity study, etc.
- Coordination on all levels
 - Meetings/presentations/conference calls

FY2015 Deliverables Con't

- Fee Collection/Distribution
 - Reconciliation & reporting, monthly distributions, tax sale costs, identifying & pursuing delinquent fees
- Fee Determination/Rate Increase
 - 3,586 parcel change reviews, 32,052 reviewed from requested exception reports, SFU rate change, incorporating ordinance change if necessary

FY2015 Deliverables Con't

- Credits
 - Respond to implemented changes to the Credit and Adjustment Manual
- Fee Inquiries
 - 104 inquiries, 84 fee modifications
- Fiscal Requirements
 - Annual budget, budget reconciliation, presentations (SWIC, SW Board), contract reviews

FY2015 Deliverables Con't

- Maintain Easement/Drainage Layers
 - Identifying/incorporating work into drainage Review/incorporating drainage easements
- Admin Support to SW Board
 - Agenda, presentation development, minutes, broadcast & recording
- Maintaining SWU Website
 - Posting documents, updating information, review of usage

FY2015 SFUs

Requested Budget: \$313,460

Requested Budget/SFU: \$2.80

Port Royal (50)	\$ 9,468	(5.61%)
Beaufort (105)	22,462	(4.32%)
HHI (108.7)	91,992	(2.58%)
Bluffton (98)	31,439	(2.86%)
Unincorp BC (50)	<u>158,100</u>	<u>(5.61%)</u>
Total	\$313,460	

Cost Share Proposals for FY2015

- Public Education / Outreach
- Water Quality Monitoring (No. of Broad)

FY2015 Cost-Share Estimate

Public Education/Outreach: \$50,000

		To Be Billed in FY2015
Port Royal	\$1,510	
Beaufort	3,583	
HHI	14,674	
Bluffton	5,015	
Unincorp Beaufort	25,218	
	\$50,000	

FY2015 Cost-Share Estimate

WQ Monitoring North of the Broad: \$60,000

		To Be Billed in FY2015
Port Royal	\$5,001	
Beaufort	11,906	
Unincorp Beaufort	43,093	
	\$60,000	

FY2016 Cost-Share Estimate

SMMP Revision: \$100,000

		To Be Billed in FY2016
Port Royal	\$3,020	
Beaufort	7,166	
HHI	29,347	
Bluffton	10,030	
Unincorp Beaufort	50,437	
	\$100,000	

Deadline Reminders

- Budget Numbers from Towns and City
 - Amount budgeted for County SWI to perform work within your jurisdictional boundary
 - Need ASAP – County budget due NOW!

Deadline Reminders

- Per the IGA, written agreement with the proposed administrative fee is due back to the County by April 15
- Report to the County on SWU fee expenditures for the previous fiscal year due Sept. 1 (for ToHHI, ToPR, and CoB; ToB upon request)

DRAFT Minutes for SWIC March 12, 2014
BJWSA Community Room, 6 Snake Road, Okatie, SC 29909
1:30 pm - 3:30 pm

1. Introductions
Attending: Kim Jones (ToB), Bryan McIlwee (ToHHI), Bates Rambow (ToHHI), Carolyn Wallace (BC), Seth Stanbery (BC), Danny Polk (BC), Eric Larson (BC), Lamar Taylor (CoB), and Tony Maglione (representing ToPR)
2. Approval of Minutes from Jan. 31, 2014
Approved by common consent
3. County Management fee budget for FY 2015 -Presentation by Larson (See attachment of slide presentation)

Comments on accomplishments:

- Seth to coordinate LIDAR delivery.
- Other accomplishments by the County not previously mentioned - education (Kiosk), monitoring.
 - Port Royal mapped all of Outfalls and developed a restoration repair plans for all Outfalls.
 - Town of Bluffton finished their first May River 319 grant.

Other Initiatives in progress not mentioned in the presentation:

- **Danny suggested attending an annual conference offered for pond maintenance. Danny and Eric will get details and share with the group.**
- Town of Bluffton has the Stoney Creek wetland project. RFQ for consulting out now.
- Town of Bluffton has second 319 grant on May River underway.
- Town of Bluffton has continuing system inventory and public outreach.
- ToHHI working on the Upper Broad Creek 319 grant.
- ToHHI is developing an inventory of gated areas.
- Everyone has water quality monitoring ongoing.
- City of Beaufort has several LID projects underway. Duke Street Phase II and Allison Road.
- Town of Bluffton Public Works has ongoing ditch maintenance, CDBG grants for sanitary sewer, streetscape projects with LID.
- ToPR has a new PD station project that will have demonstration project in parking lot. (pervious pavement likely)
- ToPR- ORCM has agreed to allow larger regional stormwater facilities in the Cypress Wetland to reduce need for small on-site detention by development. This is a type of stormwater "banking" for quantity. On site water quality pre-treatment still likely. First project is the Parker's gas station.
- ToPR - Feasibility project underway to intercept Ribaut Road run off and divert to the Cypress Wetland from creek on Old Shell Road. This will allow to restoration of the existing creek.

Major challenges

The concept of an "evolved" Utility Board" was discussed. There is concern that the Board would start mandating how the municipalities would spend their money. Eric noted that this would not

be the intent but rather promote regional, partnering efforts to improve water quality, not day to day operations (partnering efforts on MS4 tasks may be the exception). Eric did note that if the Board was re-organized to have voting members from the Towns and City, there would be implied accountability back to the Board. This is a topic to be discussed further at future SWIC meetings.

Next Steps:

Larson noted the reporting requirements outlined in the IGA. **The format of the report needs to be defined.** This will be an agenda item for a future SWIC meeting.

Action Items for Eric:

Edit slides.

- **Fix City of Beaufort rate typo.**
- **Remove "What If" scenario from official handout.**

Email slides to group.

4. MS4 Program Elements MCM 3 through 5

1. Illicit Discharge Detection and Elimination (IDDE)

a. Ordinance

ToB has IDDE in code but doesn't effectively cover enforcement. CoB, ToPR, and the County don't have one.

ToHHI has draft Ordinance based on Carolina Clear template.

ToB - Regulation is online on their website. Sect 5.10.5 of the Unified Development Ordinance. Language prohibits illicit discharge, allows exceptions, etc. Enforcement is through Article 8 and performed by Code Enforcement.

ToB does not have a written screening program.

ToHHI - Draft ordinance has prohibition and exceptions. They do not have a written screening program.

IDDE SOP / Written Plan - Eric suggested partnering to develop the plan. All agreed. The use of a consultant is questionable. Some think doing in-house is possible and use of a consultant may not be necessary. County may hire someone for them if doing alone and offered to help others no cost. Group consensus was that this is an opportunity to partner and show a cost savings and therefore it should be the **SWIC working together to develop the draft** without consultant help. This can be a working topic for a future SWIC meeting.

b. System Mapping

Beaufort County has GIS mapping that includes ditches, pipes, easement, but it not complete. County is willing to share data with everyone. Seth and Eric noted that the County is migrating to an ArcServer so that all can view data over the web.

ToHHI has inventory. They are mapping all pipes, structures, etc. About 1/3 done.

Should be done by FY19. Study includes master planning, modeling with XPSWWM.

They are using Mark Renew with Sea Island Surveying as consultant for field work.

Using an Arc Pad mobile app. for data collection. They are willing to share application.

County says they also have access to that application. ToHHI is willing to share data.

ToB has two tech doing GIS in house. Doing inventory, citizen complaints, etc. Focus has been in headwaters in May River, which means they are doing un-incorporated areas too. Modeling using XPSWWM. They are willing to share data.

CoB uses County services.

ToPR has mapped Outfalls. They do not have map of all of system but adding as time permits. No deadline. Gives data to County and therefore willing to share. They do not have a GIS system.

c. Public Reporting Mechanism(s)

Beaufort County has phone number and email on website. No one else has a "hotline" phone number or website but do have contact information on their websites.

Eric noted tools such as web based reporting system for citizen use. This might be another opportunity to find a good reporting tool for citizen use and share among the group.

Kim suggested speaking with the "Clean Marine" event from a few years ago. They had a way for citizens to report to public agencies needs for clean-up. Contact information is Amber Von Harten, formerly Sea Grant locally but now in a different division. Carol Murphy with the County may know as well.

d. Inspection program

ToB has two techs. doing inventory and one inspector doing EPSC inspections. They are not planning to expand staff this year. Maybe in FY16.

ToHHI - Existing staff of three, likely to use Code Enforcement for enforcement action. Asking for one new staff in FY15 but may not get funded.

CoB, ToPR, and County don't have anything in place.

e. Staff Training - Not discussed. However, this is a likely need to enable staff to implement the written programs.

2. Construction Run-off - Not discussed.

3. Post-Construction Water Quality - Not discussed.

5. Future meeting schedule

Continue to meet monthly. Next month April 9 won't work due to SESWA conference. Next mtg. April 3 at 1:30pm. **Eric will confirm meeting space.**

Next topic. Public Education and Outreach. It was decided to meet and discuss options before bringing in others to discuss potential partners.

6. Carpooling to SCASM March 19, 2014 - Eric, Danny, Lamar, Kim, Jeff Buckalew, and Jeremy Ritchie going. **Eric offered carpooling.**

7. Adjourn

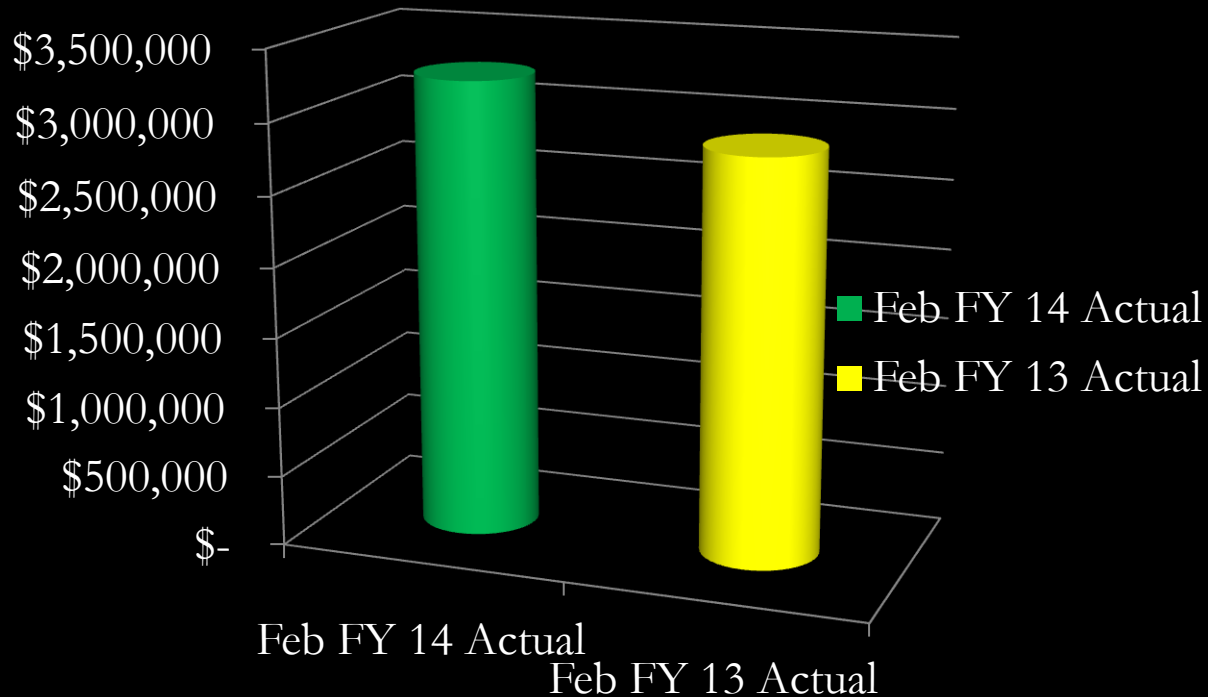


Stormwater Management Utility Meeting Board

STORMWATER FINANCIALS

February Unaudited Financials

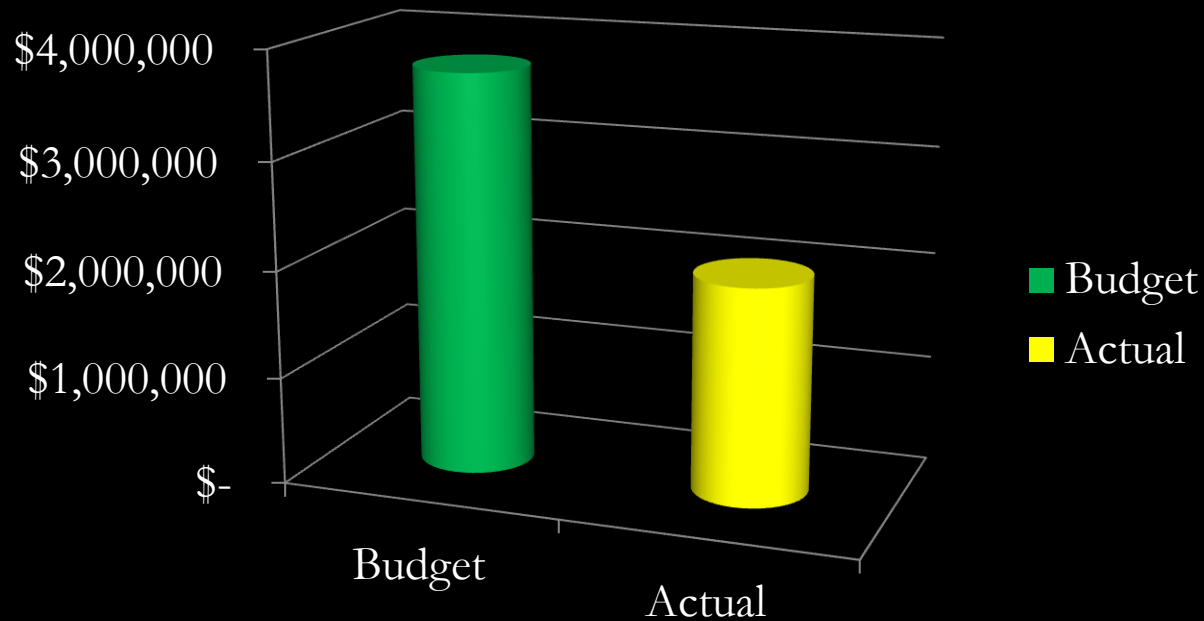
Feb FY 14 Rev vs. Feb FY 13 Rev



Actual FY14 revenues are \$381,000 more or 13% than Actual FY 13 revenues

February Unaudited Financials

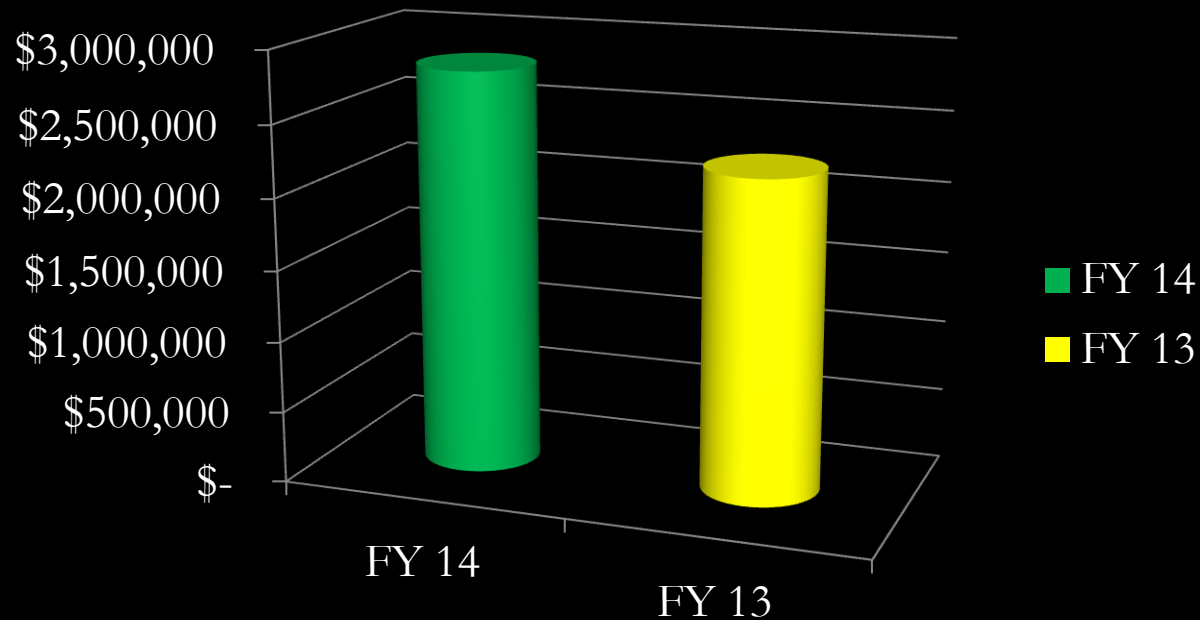
February FY 14 Expenses vs. FY 14 Budget



Actual Feb FY14 expenses are at 53% of budget for FY 14

February Unaudited Financials

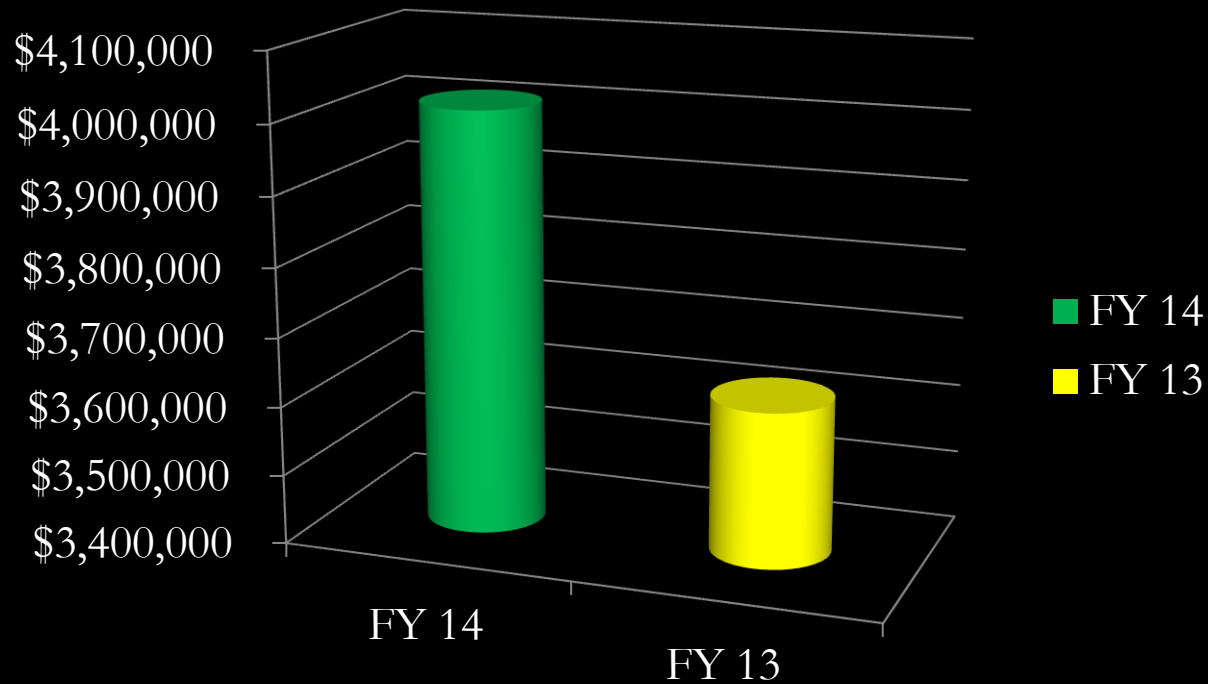
Unrestricted Fund Balance from Balance Sheet



Increased by \$580,000 or 25%

February Unaudited Financials

Cash from Balance Sheet



Increased by \$386,000 or 10%



Stormwater Management Utility FY 2015 Proposed Budget

Outline

- New or Expanded Programs
- Proposed Accounting Changes
- Projected Revenue
- Stormwater Management Proposed Budget
- Utility Activities Proposed Budget
- Change in Capital Assets

New or Expanded Programs

- MS4 Program
 - SW Inspection Superintendent
 - Infrastructure Inspection Technician
 - GIS and MS4 Data Manager
 - Support
 - Professional Services

New or Expanded Programs Con't

- Expansion of the EOS
 - (7) Positions being Re-Funded
 - No additional equipment
 - Support

New or Expanded Programs Con't

- SC811
 - Utility Operations Coordinator
 - Utility Locates Technician
 - PUPS Membership
 - No additional Equipment
 - Support

Proposed Accounting Changes

- Stormwater Management
- Utility Activities
- Capital Improvement Fund
- Regulatory – FY 2016

Proposed Acctg Changes Con't

- Regulatory
 - Control Regulations and MS4 Program
 - Water Quality Monitoring
 - Public Education and Outreach
 - Inventory of Secondary Stormwater System

Projected Revenue

Source	Amount
Admin SWU Fees	\$ 313,460
Utility Activities SWU Fees	2,814,138
Total Revenue from SWU Fees	3,127,598
Reimbursable Projects	2,500
Interest	2,955
Cost-Share for Joint Efforts	41,689
Reserve Utilization	413,581
Total	\$ 3,588,323

SWM & Utility Activities' Budget

Effort	Amount
Stormwater Management	\$ 323,941
UA/Control Regulations	257,274
UA/WQ Monitoring	120,000
UA/Annual Maintenance	2,803,088
UA/Public Education & Outreach	50,000
UA/Drainage Enhancement	19,000
UA/Additional Studies	35,000
Utility Activities Total	3,264,382
Total	\$ 3,588,323

Capital Expenditures & Depreciation

Change in Capital Assets	Amount
Equipment Replacement	\$ 216,944
Regulatory Section	93,660
WQ Monitoring Equipment	30,000
Capital Expenditures Total	340,604
Depreciation	(192,181)
Net	\$ 148,423

Questions?



BEAUFORT COUNTY
STORMWATER MANAGEMENT UTILITY BOARD
Wednesday, May 7, 2014
2:00 p.m.
Beaufort Industrial Village, Building 3 Conference Room
104 Industrial Village Road, Beaufort
843.255.2805

In accordance with South Carolina Code of Laws, 1976, as amended, Section 30-4-80(d), all local media was duly notified of the time, date, place and agenda of this meeting.

1. CALL TO ORDER – 2:00 p.m.
 - A. Approval of Agenda
 - B. Approval of Minutes – April 2, 2014 ([backup](#))
2. INTRODUCTIONS
3. PUBLIC COMMENT
4. REPORTS
 - A. Special Presentation – Bryan McIlwee, Town of Hilton Head Island
 - B. Utility Update – Eric Larson, P.E. ([backup](#))
 - C. Monitoring Update – Eric Larson, P.E. ([backup](#))
 - D. Stormwater Implementation Committee Report – Eric Larson, P.E. ([backup](#))
 - E. Stormwater Related Projects – Eric Larson, P.E. ([backup](#))
 - F. Upcoming Professional Contracts Report – Eric Larson, P.E. ([backup](#))
 - G. Regional Coordination – Eric Larson, P.E. ([backup](#))
 - H. Financial Report ([backup](#))
 - I. Maintenance Project Report – Eddie Bellamy ([backup](#))
5. UNFINISHED BUSINESS
6. NEW BUSINESS
7. PUBLIC COMMENT
8. NEXT MEETING AGENDA
 - A. June 4, 2014 ([backup](#))
9. ADJOURNMENT



Beaufort County Stormwater Management Utility Board (SWMU Board)
Meeting Minutes

May 7, 2014 at 2:00 p.m. in Beaufort Industrial Village Building #2 Conference Room
Draft May 16, 2014

Board Members

Present	Absent
Don Smith	William Bruggeman
Patrick Mitchell	Allyn Schneider
James Fargher	

Ex-Officio Members

Present	Absent
Andy Kinghorn	Van Willis
Scott Liggett	
Kimberly Jones	

Beaufort County Staff

Eric Larson
Eddie Bellamy
Danny Polk
Carolyn Wallace
Josh Gruber

Visitors

Lamar Taylor, City of Beaufort
Bryan McIlwee, Town of Hilton Head Island
Paul Moore, Ward Edwards
Reed Armstrong, Coastal Conservation League
Tony Maglione, ATM

1. Meeting called to order – Don Smith

- A. Agenda – Item (3) “Executive Session” was removed from the agenda because there was no quorum. Item (5A) “MS4 Permit Submittal” was also removed from the agenda.
- B. April 2, 2014 Minutes – Mr. Eric Larson mentioned that most recent draft copy of the March SWIC Minutes were included in the packet for the meeting.

2. Introductions – Completed.

3. Executive Session – Removed from agenda.

4. Public Comment(s) – Mr. Larson congratulated Mr. Andy Kinghorn on his reappointment to the Board.

5. Reports – Mr. Larson submitted his written report in advance ([please see attachment](#)).

- A. Removed from agenda.
- B. **Monitoring Update** – Mr. Eric Larson
USCB Lab – The last piece of equipment arrived the week of April 14th.
Monitoring Plan near Shellfish Station 15-25 – Mr. Larson and Mr Danny Polk met with representatives with the Town of Port Royal to work on expanding the monitoring plan.
- C. **Utility Update** – Eric Larson
DHEC and MS4 Update – He continues to develop a plan for implementation of the MS4 program. His presentation to the Natural Resources Committee was pulled from the meeting’s agenda for May and is part of the reason he requested the special presentation on the “MS4 Permit Submittal” be postponed for now.
Budget for FY15 – Mr. Larson and Mrs. Carolyn Wallace and working on revisions and may be presenting a second draft to the board next month.
- D. **Stormwater Implementation Committee Report** – Eric Larson
April 3rd, 2014 SWIC Meeting - The topic was Public Education.

Public Education Branding – The SWIC has recommended the shared use of the Town Of Bluffton’s “Neighbors for Clean Water” slogan for all public education efforts county wide. Our County Administration concurs.

E. Stormwater Related Projects – Eric Larson

Proposed Carolina Jellyball processing facility in Lobeco and unloading facility on Golden Dock Road on St. Helena Island – The Golden Dock site went before DRT the week of April 7th, 2014. Mr. Larson offered comments to the Planning staff. Mr. James Fargher said that the state is following up on some of the citizens concerns and asked the facility to test their wastewater for toxicity. The jellyfish is toxic to fish and the preliminary results of one test, suggests it is toxic to shellfish.

Bluffton Gateway Development Agreement – County Council has had its third and final reading and the development agreement is approved. The county hired ATM to critique the county’s findings and their review is in the packet.

F. Upcoming Professional Contracts Report – Eric Larson

US 278 retrofit ponds – Bid due date is June 5, 2014. The addendum with the new plans are published. Permit modifications with DHEC and the County DRT are complete.

County Admin. Complex Retrofit Project – The project received no bids. We are evaluating the reasons behind the lack of response and we are discussing options to negotiate a contract with interested contractors.

Consultant procurement for the Carolina Jellyball application for the Lobeco site - on hold pending a submittal from the applicant.

RFP for a stormwater consultant to assist with the setup of the MS4 Program - on hold pending development of a MS4 implementation strategy.

Water Budget Study – The county has received the draft of the final report. Dr. Badr will be presenting the findings to the Board at the June Board meeting.

Okatie East BMP Monitoring – They have started the preliminary stage of the monitoring program. First step is to gather data and establish the Standard Operation Procedure (SOP). Mr. Paul Moore said there is historical fecal data but no historical flow data.

Trask Parkway Overtopping Study – The consultant’s Andrews and Burgess are waiting on the original modeling data from the 2006 Stormwater Management Master Plan.

Paige Pointe Overtopping Study – This study is complete. Report from Andrews and Burgess confirmed the overtopping issue and provided sizing and construction cost options. This project will be added to our list of CIP needs.

G. Regional Coordination - Eric Larson

Battery Creek Pond – Mr. Paul Moore said they are still waiting on the surveyor who is a one-man crew. Mr. Lamar Taylor with the City of Beaufort said the city has approved additional help for the surveyor if needed.

Stoney Creek – Ms. Kimberly Jones said the Town of Bluffton is working through the RFQ procurement process and they will be going to the town council next week to see if they can negotiate with the first and second responders.

Salinity Study - On going. Nothing new to report. Mr. Larson noticed on the agenda for the annual SESWA conference in October, that SCDNR are on the agenda to present the salinity study findings.

Sea Level Rise and future planning – On going. Nothing new to report.

Okatie 319 Grant – The final report was accepted by DHEC.

H. Financial Report - Copies of the March financials were provided.

6. Unfinished Business – Eric Larson

A. 10 Percent Effective Impervious Area discussion and application of the rule to the Bluffton Gateway Development Agreement – Eric Larson and Tony Maglione

Mr. Larson opened the floor for discussion. Discussion ensued. Mr. Kinghorn and Mr. Patrick Mitchell expressed their agreement with Mr. Larson’s analysis of the Bluffton gateway project and how the ordinance was interpreted for this project. Mr. Larson said the ordinance is clear that you have to meet volume, peak flow and water quality and this development meet these three parameters. Imperviousness is an alternative method to reach the goal. Mr. Don Smith said he always considered the 10 percent effective impervious as a safety mechanism and it is useful for planning. Mr. Smith said if the county goes back to review the BMP Manual, he would like the 10 percent effective imperviousness revisited and strengthened. He would prefer to err on the side of caution and he referred to Mr. Tony Maglione report. Mr. Maglione said they investigated the 10 percent rule and could not find definitive data. He suggested if the county is going to use this as a comparison then it needs to be researched.

Mr. Reed Armstrong said that the developer had it memorialized in the agreement that they would be allowed to exceed the 10 percent. But the report provided by Mr. Larson indicated that it was not necessary. He said the developer has removed the language. Mr. Armstrong said this was a good educational opportunity for the elected officials and the public of how we try to approach water quality protection in our county.

The form-based code is going through the planning commission for final adoption. Mr. Larson provided a copy of his submission of the draft form-based codes for stormwater to the planning commission ([please see attachment](#)). He has asked them to add some additional detail back in to the code for clarification. Mr. Larson ended the discussion stating the need to revisit the ordinances and BMP Manual in light of pending MS4 permit requirements, would provide the opportunity to revisit the intent of the effective imperviousness guidance and how they may need to be modified.

7. New Business – None.

8. Public Comment – None.

9. Next Meeting Agenda – “Executive Session” will be added to the June Board meeting.

10. Meeting Adjourned.



BEAUFORT COUNTY STORMWATER UTILITY
120 Shanklin Road
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May 7, 2014

Stormwater Manager's report for the Stormwater Utility Board Meeting

Utility Update

1. DHEC and MS4 update – We continue to develop a plan for implementation of the MS4 program. I have been interviewing other MS4 programs across the state to learn how others are implementing their programs and how they are sharing tasks between multiple jurisdictions. I will be addressing the Natural Resources Committee in May to provide an overview of the MS4 program and the status of our County Stormwater program.
2. Budget for FY15 – Submitted in early March. We are awaiting feedback from the County Administrator's office.
3. Public Education Effort / Dog Waste Education at Earth Day events – We partnered with the Solid Waste / Recycling Division and the Friends of the Bluffton Dog Parks to distribute dog waste baggie dispensers and brochures during the Farmer's Market opening and Carb Festival in Port Royal on April 19th and the May River Clean-Up and Earth Day Celebration on April 26th. We distributed approx. 500 dispensers and 3,000 brochures at the Port Royal Event. At the Bluffton event, we distributed approx. 175 dispensers and 400 brochures.
4. Larson, C. Wallace, and E. Miller attended the SESWA spring conference on April 8 and 9, 2014. Notable "take-aways" are included in the attached memo. ([backup](#))
5. Larson attended the American Planning Association's National Conference last week in Atlanta, GA. Larson was a presenter on the topic of Green Infrastructure. Beaufort County's program was part of the presentation.
6. May River Watershed signs by the Town of Bluffton and Beaufort County – The Town of Bluffton Stormwater Program is making watershed entry signs, similar to what the Port Royal Sound Foundation did, at select locations within the watershed. The County has agreed to partner with the Town on the cost of future signs.

Monitoring Update

1. USCB Lab – The last piece of equipment arrived the week of April 14th. Training on this equipment will occur May or June. Other monitoring activities are on-going.
2. D. Polk and I met with representatives with the Town of Port Royal to revisit the monitoring plan for the area near shellfish station 15-25. It is located in the Dowlingwood Tributary of Battery Creek. It is the only site impaired within the watersheds within the limits of the Town of Port Royal. As we move forward, we will try to identify sources of fecal contamination and develop potential project concepts.

Stormwater Implementation Committee (SWIC) report

1. The SWIC met on April 3rd, 2014. The topic was Public Education. ([See attached draft minutes](#))
2. Public Education Branding – The SWIC has recommended the shared use of the Town Of Bluffton’s “Neighbors for Clean Water” slogan for all public education efforts county wide. Our County Administration concurs. I recommend the Board’s support of the joint branding effort.

Stormwater related Projects

1. Proposed Carolina Jellyball processing facility in Lobeco and unloading facility on Golden Dock Road in St. Helena Island – The Golden Dock site went before DRT the week of April 7th, 2014. I offered comments to Planning staff. The added concrete pad was below the threshold of our requirements for a stormwater plan. However, I did offer advice on requirements that could be included in an environmental study that would cover the process water and potential spills of the water, by-products, or other industrial use related to the site.
2. Drainage issue on H.E. McCracken Circle in Bluffton – Nothing new to report since last month.
3. Bluffton Gateway Development Agreement – I provided my review to the Natural Resources Sub-Committee April 4th, 2014. ([See attached report](#)). I presented to the sub-committee again on April 24th. ([See attached presentation](#)). ATM was hired to review our BMP Manual and present an opinion on my review. ([See attached memo](#)). The topic is continuing to be discussed.
4. US 278 at Kitty’s Crossing Overtopping issue – The Bluffton Gateway project design highlighted the overtopping issue first mentioned in the 2006 Master Plan. Like the Forby Tract site last month, I am looking into the issue, the need for upsizing, and alternative solutions that can be incorporated into the changes proposed by the Bluffton Gateway site.
5. Infrastructure crew performed on-going maintenance needs. Nothing significant to report.

Professional Contracts Report

1. US 278 retrofit ponds – Bid due date is June 5, 2014. A Second pre-bid meeting was held on April 24th to go over the changes to the project. The addendum with the new plans was published. Permit modifications with DHEC and the County DRT are complete.
2. County Admin. Complex Retrofit Project – The project received no bids. We are evaluating the reasons behind the lack of response and we are discussing options to negotiate a contract with interested contractors.
3. Consultant procurement for the Carolina Jellyball application for the Lobeco site is still on hold pending a submittal from the applicant.
4. A RFP for a stormwater consultant to assist with the setup of the MS4 program is also on hold pending development of a MS4 implementation strategy.
5. Water Budget Study – Dr. Badr will be presenting the findings to the Board at the June Board meeting.

6. Okatie East BMP monitoring – D. Polk and I met with Ward Edwards to kick-off the monitoring project.
7. Trask Parkway Overtopping study – Results pending.
8. Paige Pointe Overtopping study – Report from Andrews and Burgess confirmed the overtopping issue and provided sizing and construction cost options. This project will be added to our list of CIP needs.

Regional Coordination

1. Battery Creek Pond – Still in design phase. (Lamar Taylor may report)
2. Stoney Creek – RFP for consultant currently is being advertised. (Kim Jones may report)
3. Salinity Study - On going. Nothing new to report.
4. Sea Level Rise and future planning – On going. Nothing new to report.
5. Okatie 391 Grant – The final report was accepted by DHEC.



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INTEROFFICE MEMORANDUM

TO: Rob McFee, Director of Engineering and Infrastructure

FROM: Eric W. Larson, Stormwater Manager

SUBJECT: Re-Cap of the spring 2014 SESWA Seminar in Atlanta, GA on April 8-9, 2014

DATE: April 21, 2014

Carolyn Wallace, Ezekial Miller, and I attended the SESWA spring seminar in Atlanta, GA on April 8 and 9, 2014.

Noteworthy discussions from EPA representatives revolved around three central topics: 1) Stormwater Rulemaking and permit changes, 2) monitoring programs, and 3) audits/inspections of MS4 programs. EPA has withdrawn its proposal for a revised stormwater rule and is focusing on strengthen permit programs through integrated planning with water and wastewater, promoting LID, and creating a community based incentive program similar to a LEED certification but for a "green community". They also stated that going forward EPA will be focusing on "three pillars of sustainability" including the environment, social, and economics, which to me means they are aware of the pressures of the development community and the cost of stormwater regulations on development.

Strengthen the MS4 permits going forward has many components. Audits of program have found deficiencies in inspection by unqualified staff, failure to perform adequate biological assessment, not performing dry weather screening, and lack of quality assurance in monitoring programs. New permit language will have specific performance standards for BMPs and monitoring. They intend to stress improving programs by utilizing incentive programs to encourage LID and volume control. These were key components of the new stormwater rule they have now withdrawn.

One incentive mentioned that is of particular interest to us is the EPA Campus Rainworks Challenge competitions on college campuses. Since we have the WQ lab, maybe USCB may be interested in forming teams to compete. County could assist in selecting judges and providing prizes. This would be a public education & outreach opportunity and the projects would demo green infrastructure designs.

The City of Chattanooga has a credit program based on volume reduction, not a percentage based on deploying certain BMPs. Part of their credit program includes an annual design challenge to promote LID use. They also have a LID Excellence award, which is a financial award to development for using LID. A program such as this, providing competitive grants to local rate payers interested in retrofitting their site for volume control, could be an opportunity for Beaufort County.

An awareness program mentioned by EPA were project signs highlighting water quality enhancement projects. We could use these signs during and after construction to educate the public on what is being done and demonstrating the use of Utility Fees.

Steve Leo with Gwinnett County, GA spoke on asset management. He stressed the importance of mapping and assessing the system to find maintenance needs and identify capital projects. I agree with that approach and intend to implement an asset management program in FY 2015.

DRAFT Minutes - SWIC Meeting April 3, 2014 - BJWSA Community Room 1:30 pm - 3pm

1. Introductions
 - a. Attendees: Kim Jones, Beth Lewis, Bryan McIlwee, Lamar Taylor, Eric Larson, Tony Maglione
2. Minutes from March 12, 2014 - approved by common consent
3. Public Education and Involvement
 - a. Message(s)
 - i. Pet waste
 - ii. Septic
 - iii. Construction erosion
 - iv. Stormwater 101 (as done previously by ATM) for general audience
 - v. Stormwater Utility credit program
 - vi. Wildlife – “don't feed wildlife”
 - vii. Agricultural / silviculture activities (erosion control)
 - viii. Pesticide and herbicide on AG property, golf courses, residential and commercial applications
 - ix. IDDE - used oil, detergents, straight pipe of washers
 - x. Stormwater pond maintenance
 - b. Audience(s)
 - i. Greater Island Committee
 - ii. Neighbors for Clean Water
 - iii. Friends of Port Royal Sound Foundation
 - iv. SC Coastal Conservation League
 - v. Beaufort County Schools - ToB does all 3rd and 7th grade classes (in Bluffton only) annually
 - vi. Home Builders Associations
 - vii. POA / management companies
 - viii. Golf course managers
 - ix. Festivals throughout the year
 - x. Local Audubon Foundation
 - c. Methods
 - i. It was decided to have the agencies propose back to us on how to best deliver the message rather than dictate how to do it.
 - ii. Possible ideas (not discussed during this meeting but mentioned in past meetings)
 1. Hard copy mailers, stuffers
 2. Video and Audio ads for TV, County Channel, Radio
 3. River Clean Up days
 4. Public Meetings
 5. School Curriculum
 - d. Partners
 - i. Internal Resources
 1. ToHHI has Sally Krebs but OK using something like Carolina Clear to assist.
 2. ToB has Beth Lewis. Due to small cost, will likely join the cost share and OK with using outside consultant.
 - ii. Carolina Clear

1. Overwhelming support by the SWIC on the past efforts of the Carolina Clear program and recommended their continued use.
 2. It was noted the scope from past contract was acceptable to all. Carolina Clear knows the MS4 program and what is needed to satisfy DHEC reporting.
 3. Tony suggested that perhaps Carolina Clear is used to organize efforts and reporting and utilize local organizations to do the work.
 4. It was noted that the last contract had a requirement to utilize local groups (Port Royal Sound Foundation, Low Country Institute, etc.)
- iii. USCB-might be useful for student involvement as part of course work.
 - iv. Technical College of the Low Country - same as USCB but likely to lesser degree due to courses offered.
 - v. Friends of Port Royal Sound / Port Royal Sound Foundation - no one is sure what they're doing.
 - vi. SC Coastal Conservation League - No. Advocacy group, not educators.
 - vii. Sea Grant Consortium - would be good for content, but probably wouldn't do administrative effort of the education program. They do have grant funding and could probably help with funding. Contacts are Rick DeVoe and April Turner.
 - viii. Low Country Institute - Chris Marsh's group. Could be a local contributor but likely not an administrator of the reporting.
 - ix. Together for Beaufort – No. Committee of others, not a stand alone group.
 - x. Neighbors for Clean Water - simply branding of ToB stormwater education program.
 - xi. Beaufort Soil and Conservation District (Denise Parsick) - would be a good option. Kim pointed out they have the skills but not sure about the reporting aspect.
 - xii. Others
 1. Tony suggested Waccamaw SW Consortium. Supported by Coastal Carolina University and Dr. Susan Libes.
 2. Hillary at Town of Mount Pleasant was also mentioned as a reference and advice. Danny Polk stated she ran their education program.
 3. It was suggested to ask Cary Gaffney with ToHHI. He has past knowledge of County educational efforts.
4. Procurement
 - a. Eric should get the past Carolina Clear contract and see how it was laid out.
 - b. Scope should define measurable goals to determine success.
 - c. Would it be possible to sole source someone without going through the RFP process? Eric will ask County Purchasing.
 5. Cost Sharing and Collaboration
 - a. To get CoB and ToPR to buy in, Rob McFee needs to work with Scott Dadson and Van Willis to explain why the contract with Carolina Clear was canceled and why they should voluntarily participate again.
 6. Other issues
 - a. Bryan says we need a consortium name to identify effort, such as Neighbors for Clean Water. Kim says ToB willing to expand the effort and name to all. Kim will look into the ability to expand the use of the name to all.
 7. Next Meeting - May 14, 2015. Topic: MS4 Data Management



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INTEROFFICE MEMORANDUM

TO: Beaufort County Administration
Natural Resources Sub-Committee on the Bluffton Gateway Development Agreement
County Council

FROM: Eric W. Larson, Stormwater Manager

SUBJECT: Bluffton Gateway Development Project – Stormwater Design review

DATE: April 4, 2014

Summary

This report includes a review of the Kimley-Horn and Associates stormwater plan for the proposed site. Review included verification that the plan meets the requirements found in the Beaufort a County BMP Manual for stormwater run-off peak flow rate for the 25 year, 24 hour storm event, pollutant removal criteria for Phosphorus, Nitrogen, and Fecal Coliform Bacteria, and volume reduction for the 95th percentile storm event volume of 1.95". Effective impervious area calculations were reviewed as part of the volume reduction criteria. Sizing of the cross drains for the proposed Connector Road was also reviewed. Additional issues, including the inclusion of the Connector Road in volume and water quality design calculations and the impacts of the required Brownfield mitigation, were considered.

The stormwater design has met the BMP Manual requirements for peak run-off flow rate reduction, pollutant removal, and volume reduction through the use of various BMPs including a wet detention pond, water capture and re-use through irrigation, porous pavement, and bio-retention cells. The effective impervious area calculations indicate that the design of the BMPs has met the criteria of "Maximum Extent Practicable" at an effective impervious rate of 14.4%. The proposed plan appears to meet the "spirit" of the BMP manual through the use of multiple BMPs although the effective impervious area calculation does not demonstrate achieving the target of 10% effective impervious area. The design parameters for irrigation storage and reuse are reasonable, however more information will be needed during the design submittal the Technical Review Team to assure the design will achieve the proper results.

Additional review is needed concerning the cross drains proposed for the proposed Connector Road to assure upstream flooding of structures and diversion of waters into adjacent watersheds does not occur.

Introduction

I have completed a review of the Kimley-Horn and Associates (KH) submittal received March 26, 2014 and subsequent submittals made April 1, 2, and 3 in response to preliminary review comments I made to KH. The following is a summary of my review and recommendations concerning the report.

My review was intended to assure compliance with our current requirements for stormwater design, found in the Beaufort County Manual for Stormwater Best Management and Design Practices (BMP Manual). Review was three parts:

1. Peak Run-off rate reduction for the 25 year – 24 hour storm event
2. Pollutant removal for Phosphorus, Nitrogen, and Fecal Coliform Bacteria, and
3. Volume reduction for the 95th percentile storm event, or the 1.95" volume.

Included in the volume reduction analysis, I reviewed the effective impervious area calculations. This requirement is in the BMP Manual and compliments the review of the 95th percentile storm volume reduction.

Peak runoff rate analysis

Our BMP Manual requires the analysis of the discharge rates from a detention basin for the 25 year - 24 hour storm event. KH provided analysis for the 2, 10, 25, 50 and 100 year - 24 hour events to satisfy County requirements as well as those of the USCAE, DHEC and SCDOT. With the exception of the 100 year storm event, which we do not regulate, the post-development rate of discharge from the site is below pre-development conditions. Therefore, this criterion has been met.

Storm Events	Pre Development Discharge (cfs)	Post Development Discharge (cfs)
2-Year, 24-Hour	18.45	16.04
10-Year, 24-Hour	42.39	41.98
25-Year, 24-Hour	66.91	61.12
50-Year, 24-Hour	92.68	92.10
100-Year, 24-Hour	122.02	138.04

Pollutant Removal

KH has provided pollutant removal efficiency calculations for a series of effective imperviousness scenarios as part of a cost - benefit analysis (see more discussion below). In the 10%, 14.4%, 15.2% and 19.8% effective imperviousness analysis, removal requirements for Phosphorus, Nitrogen, and Fecal Coliform Bacteria have been met. Nitrogen removal requirements were not met in the 24.5% effective imperviousness analysis. Therefore, any level of effective imperviousness at or below 19.8% will meet this criterion.

Volume Reduction

Our BMP Manual requires that the post-development run-off volume not exceed that of pre-development. The run-off volume is calculated based on the 95th percentile rain event. For this area, it is generally accepted as 1.95" of rainfall and is defined within the manual as the standard. Based on the development of the site, KH has calculated a post-development volume of 67,631 cf, or an increase of 43,442 cf from the pre-development condition.

Volume Reduction is met through a combination of pervious BMPs implementation and water capture and re-use through irrigation. The wet detention pond has a permanent irrigation pool with a volume of 156,233 cf; therefore the BMP for irrigation re-use has the potential to store all runoff, not just the increase from pre-development. The irrigation re-use volume is based on capturing 4" of rainfall from

approximately 10 acres of roof tops and impervious pavements on the site. This equates to a volume of 145,200 cf, which exceeds the post-development runoff volume and is contained within the irrigation basin.

In order to assure that the capture and re-use volume is appropriate, I requested an analysis of the application of the irrigation water and drawdown of the irrigation pond. KH has quoted 2013 weather data of approx. 52" of annual rainfall, which is consistent with the generally accepted 50"/yr., 20 year average for the area. They are recommending an application rate of 1.5"/week over approx. 8.2 acres. It is also generally accepted that irrigation rates of 1" - 2" / week are acceptable for the area, therefore the recommendation is reasonable. Based on an analysis of pump drawdown and horizontal infiltration into the soil, KH has estimated that the 4" volume within the irrigation pool could be drained dry within 15 days. Given the average annual rainfall of approx. 48"-52" and a 95th percentile event of 1.95", the area averages a design storm event every 14 days. Therefore, it is a reasonable assumption that the basin will have adequate capacity to store most storm events.

The Design Review Team may choose an additional step to assure compliance with the volume reduction proposed by the applicant. In similar irrigation re-use BMPs in the County, the issuance of stormwater fee credits to several residential developments has included the condition of annual reporting to verify the minimum irrigation volume was collected and re-used over the previous year. This would give the County the opportunity to revisit the design approval should the BMP fail to function as designed.

The method of irrigation pool filling has not been clearly defined. The plan seems to indicate that the basin will fill during a 25 year design storm event through gravity flow and will be captured and prevented from release via a berm within the wet detention pond. To be effective in volume reduction as proposed, the basin will need to be designed so that the irrigation pool is filled during every storm event either by gravity or pumping from the water quality portion of the basin.

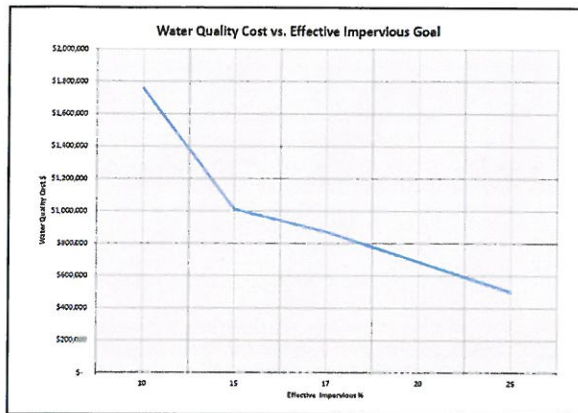
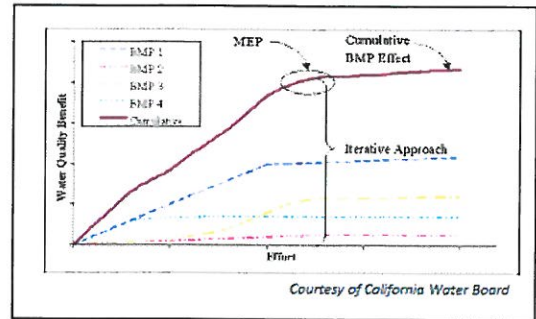
Effective Impervious Area

KH has provided a series of effective impervious area calculations. 10%, 14.4%, 15.2%, 19.8%, and 24.5% effective imperviousness site designs are considered. With each analysis, a summary of the BMP practices to be used and the incremental cost of construction were provided. As stated above, any scenario with an effective imperviousness at approx. 20% would meet pollutant removal criteria. However, throughout Section 3 of the manual, the use of primary and secondary BMPs is outlined to reduce stormwater run-off volume to achieve a volume control target of 10% effective impervious area for the site. (Section 3.1, pg. 3-22). Further, the states that a post development site that reduces impervious surface runoff so that it is equivalent to the pre-development surface runoff would have an effective imperviousness of 0%. (Section 3.1, pg. 3.6). Therefore, based on the Volume Reduction discussion above, it could be assumed the effective impervious area for this site is 0%.

Through my review of the BMP Manual, I have concluded that the "spirit" of the BMP Manual is to promote Low Impact Development, or Green Infrastructure, to minimize our impact to the environment. The BMP Manual states that BMPs should be used to the Maximum Extent Technically Feasible (METF) to achieve the 10% effective impervious area target. I interpret that to mean that the extensive use of a variety of different BMPs in a treatment train should be utilized to achieve the target. To varying degrees, the five scenarios proposed by KH do this. KH has included the following BMPs within the scenarios: run-off reduction through irrigation reuse, bio-retention (rain garden), wet detention, and porous pavement.

Another important definition used in regulation by the US EPA and SC-DHEC is Maximum Extent Practicable (MEP) (EPA Stormwater Phase II Final Rule - 64 Federal Register 68722 & SC NPDES General Permit for Storm Water Discharges from Regulated Small Municipal Separate Storm Sewer Systems, January 1, 2014). Recently at a South Carolina Association of Stormwater Managers meeting (3/19/14), representatives from DHEC defined MEP as "if a permittee employs all applicable BMPs, except those which are not technically feasible for the

location and whose cost would exceed the benefit of implementation, MEP has likely been met. If a permittee only selects a few, low cost and /or ineffective BMPs, MEP has likely not been met."



KH has provided a cost-benefit analysis for the 10%, 14.4%, 15.2%, 19.8%, and 24.5% effective impervious area scenarios. On a chart comparing cost to effective impervious area, there is a notable change in the slope of the curve at approx. 15% effective impervious area, meaning cost increases at a higher rate than the decrease in impervious area. Based on the definition of MEP, it can be applied that MEP is met at this inflection point along the slope. Given that the 14.4% scenario provided by KH includes the use of porous pavement, and the 15.2% scenario does not, I suggest that the 14.4% scenario should be considered MEP.

However, MEP, as defined by KH, does not meet the target of 10% effective impervious area. Therefore, I decided to explore the establishment of this threshold. The BMP Manual notes research by (Tom) Schueler that suggests that a relatively low percentage of impervious cover (10-15%) can induce adverse and irreversible changes in stream water quality. It is the continued discussion within the BMP Manual concerning pollutant loading as it relates to run-off volume that apparently established the 10% target (Appendix A, Section A.7). I read the article titled "The Importance of Imperviousness" authored by Schueler that this cite was apparently based on. In this article, it clarifies that the range of 10-15% impervious cover is that within a watershed that produces run-off volumes that being to degrade the receiving stream by destabilizing the stream bank through erosion (due to increased volume and velocity over a longer period of time). Ironically, the end of the article it cautions that "while the research on impervious cover and stream quality is compelling, it is doubtful whether it can serve as the sole foundation for legally defensible zoning and regulatory actions." Therefore, the KH scenario of 14.4% effective impervious area appears to meet the "spirit" of the BMP Manual.

Due to the lesser amount of pervious surfaces being utilized for infiltration and irrigation water absorption, and the extensive use of stormwater reuse by irrigation, the calculation of effective impervious area is skewed so that the criteria for volume control and pollutant reduction can be met without having to employ additional BMPs to reach the 10% target.

Connector Road Culvert Analysis

The stormwater design also includes the sizing of cross drains under the proposed Connector Road to convey upstream off-site water through the wetlands and downstream to the 2 existing 42" RCP culvert crossings under US 278. This location along US 278 is identified in the 2006 Beaufort County Master Plan as an insufficient pipe size that will result in an overtopping situation during a 100 year flood event.

Modeling by KH of the existing culverts under US 278 indicates that the impoundment of stormwater during the 50 year event (as required by SCDOT) at an elevation of 21.42 ft. Review of County GIS data shows the impoundment extending south towards the Bluffton Parkway and the May River watershed. Two notable issues currently exist - (1) the apparent watershed boundary between the Colleton River and the May River is above 22 ft., and (2) at least one structure is located in the flood impoundment area. Review via Pictometry suggests it is non-residential in nature, however I have not made any further review of the use or finished floor elevation.

KH has proposed two 4'x6' box culverts under the proposed Connector Road. KH modeling of the proposed culverts indicates the 25 year storm event will impound flood waters to an elevation of 22.32 ft. (The BMP manual only requires the evaluation of the 25 year storm event.). According to the KH report, it is the tailwater condition on the proposed culvert, a result of the undersized pipes under US 278, which hinders the proposed culverts to convey the flood waters without an increase in headwater (flood) elevation. Without more information, I am unable to determine if the increased flood elevation will cause additional impact to existing structures or result in flow of stormwater into adjacent watersheds.

Inclusion of the proposed Connector Road in the stormwater design

The impervious area of the new road has been included in the calculations for peak run-off rate reduction, pollutant removal, and volume reduction for the 95th percentile storm event. However, for the calculation of the effective impervious area, the impervious areas within the future County right-of-way were not included. As explained by KH, these areas were not included since they are not part of the developed site.

Impervious encapsulation for the Brownfield mitigation plan

The KH plan proposes several bio-retention cells within the area identified for encapsulation. According to an email provided by the environmental consultant for the mitigation plan, "installation of a few shallow rain gardens in the areas of contaminated ground water should not have an adverse effect on the environmental situation." Therefore, the need to create an approx. 5 acre impervious area on the site is not an issue for determining the effective impervious area.

Conclusion and Recommendation

The stormwater design prepared by Kimley-Horn and Associates has met the BMP Manual requirements for peak run-off flow rate reduction, pollutant removal, and volume reduction through the use of various BMPs including a wet detention pond, water capture and re-use through irrigation, porous pavement, and bio-retention cells. The proposed plan appears to meet the "spirit" of the BMP manual through the use of multiple BMPs although the effective impervious area calculation does not demonstrate achieving the target of 10% effective impervious area. The design parameters for irrigation storage and reuse are reasonable, however more information will be needed during the design submittal the Technical Review Team to assure the design will achieve the proper results.

Additional review is needed concerning the cross drains proposed for the proposed Connector Road to assure upstream flooding of structures and diversion of waters into adjacent watersheds does not occur.



**Beaufort County
Stormwater Design**

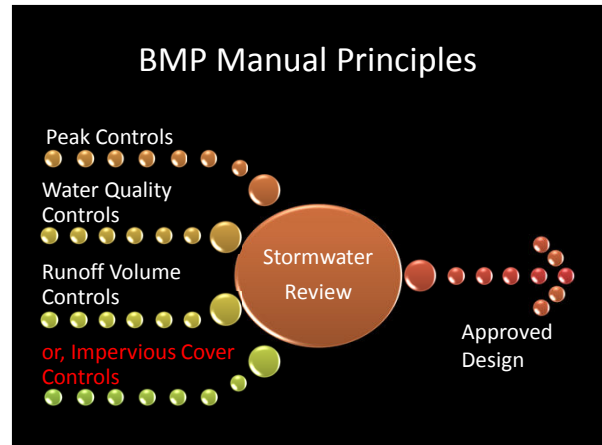
Explanation of the review process
and its application on the Bluffton
Gateway Development Plan

The Regulation

- Code of Ordinances
 - Chapter 106 – Z.D.S.O.
 - Article XIII – Sub'd & Land Development Stds.
 - Division 4 – Stormwater Mgt. Stds.
 - » Section 106-2856. Purpose
 - (c) All development and redevelopment shall provide adequate stormwater runoff water treatment and volume control in accordance with the **latest version of the county's manual for Stormwater Best Management Practices (BMPs).**

The Regulation, cont.

(d) To the maximum extent technically feasible, **no development or redevelopment shall cause post-development stormwater rates, quality or volume to increase above predevelopment levels** or to cause an adverse increase in the surface runoff reaching adjacent or surrounding property or receiving waters. Surface runoff rate and volume shall be dissipated by detention or retention on the development parcel, percolation into the soil, evaporation, transpiration, reuse or by transport by natural or manmade drainageway or conduit (protected by legal easement) to a county-approved point of discharge.



Note on Bluffton Gateway Design

- The site design prepared by Kimley – Horn includes the buildings, parking areas, outparcels, and the proposed Connector Road to be built and dedicated to the County
- The stormwater design routes all runoff from the site and the road through the primary BMP, a Wet Detention Pond
- Therefore, County Road and outparcels runoff **are** accounted for in the Peak, Water Quality, and Volume Reduction Controls
- However, the County Road and outparcel surface area **are not** included in the Impervious Cover Control analysis

BMP Manual Guidelines

- Peak Controls
 - BMP Manual Section 2.3.4 (2) – Peak discharge for post-development design storm **shall not exceed** the peak discharge of the pre-development or existing conditions (for the 25-year, 24-hour design storm event).

Bluffton Gateway - Peak Control

- Ordinance requires the 25-year, 24-hour event to be considered
- Kimley – Horn Design exceeds our requirements

Storm Events	Pre Development Discharge (cfs)	Post Development Discharge (cfs)
2-Year, 24-Hour	18.45	16.04
10-Year, 24-Hour	42.39	41.98
25-Year, 24-Hour	66.91	61.12
50-Year, 24-Hour	92.68	92.10
100-Year, 24-Hour	122.02	138.04

BMP Manual Guidelines

- Water Quality Controls
 - BMP Manual Section 3.2, supported by Appendix A.7 (paraphrased) – “Antidegradation” **goal** for total phosphorus and total nitrogen is based on annual average loads expected to be generated by land uses with an overall imperviousness of approximately 10%. The load **target** for fecal coliform bacteria should be based on an overall imperviousness of 5%. BMPs are selected based on removal efficiencies.

Bluffton Gateway - Water Quality Control

- Kimley – Horn Design utilizes a Wet Detention Pond as primary BMP for nutrient and bacteria removal
- This analysis considers % impervious cover
- Kimley-Horn submitted analyses for 10%, 14.4%, 15.2%, 19.8%, 24.5% effective impervious area
- Any level of effective impervious at or below 19.8% meet this criterion

BMP Manual Guidelines

- Runoff Volume Controls
 - BMP Manual Section 2.3.4 (4) – Facility design will control and retain total volume by retention and other methods so stormwater runoff levels **will not exceed** pre-development levels (for the design storm event).

Bluffton Gateway - Runoff Volume Control

- Based on the 95th percentile design storm event, Kimley – Horn determined:
 - Pre-Development Volume = 24,189 CF
 - Post-Development Volume = 67,631 CF
 - Increase = 43,442 CF
- Irrigation capture and reuse BMP provides 156,233 CF storage
- Therefore, 100% of site runoff volume is captured

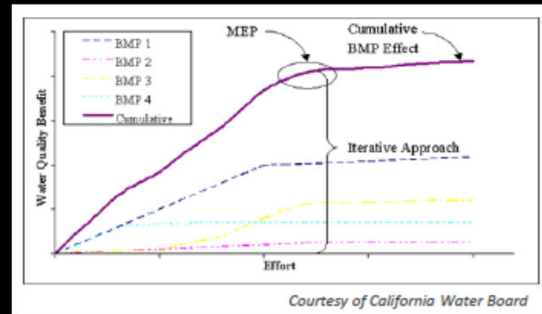
BMP Manual Guidelines

- Impervious Cover Controls
 - BMP Manual Section 3.1, supported by Appendix A.6 (paraphrased) – Volume control **target** is a threshold of 10% effective impervious area. It is consistent with the water quality framework in Appendix A.7 and consistent with the ordinance that requires post-development stormwater volume to be controlled for storm events up to the 95th percentile event, or daily rainfall of 1.95”.

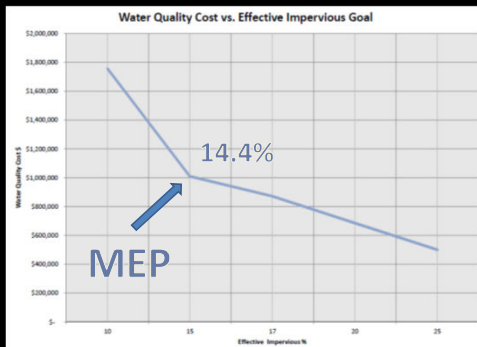
Bluffton Gateway - Impervious Cover Control

- Kimley-Horn submitted analyses for 10%, 14.4%, 15.2%, 19.8%, 24.5% effective impervious area
- Design utilizes these BMPs:
 - Wet Detention Pond
 - Bio-swales / Rain Gardens
 - Runoff capture and reuse for irrigation
 - Porous Pavement
- The range of values was intended to demonstrate Maximum Extent Practicable (MEP)

MEP defined



MEP on Bluffton Gateway site



The Logic of the “10% Rule”

- ...runoff volume controls (are) a different way to handle stormwater runoff and not an additional set of controls.
- ...by utilizing volume controls, most water quality and some of the peak shaving requirements are also addressed.
- ...in addressing a runoff volume requirement, volume quantity and quality requirements can be integrated by utilization of Equivalent (effective) Impervious Cover (method).

- D. Ahern, R. Wagner, R. Klink (2012)

Conclusion

- 4 separate analyses, but
- Impervious Cover Control review has basis as an alternate approach to review the other three main components and applies a performance standard in those three components.
- The BMP Manual allows compliance with the three main components yet not meet the Impervious Cover Control approach.
- Section 3.1 Volume Control – “if post – development impervious surface runoff is equal or less than pre-development pervious surface runoff, then the effective impervious area is 0%.

Conclusion cont.

- The BMP Manual does not mandate the use of specific BMPs. Instead, it offers a variety of BMP alternatives that can be used on a project that have found to be effective in reducing volume and pollutants.
- All BMPs are engineered solutions that require maintenance to remain effective in reducing volume and pollutants.
- The BMP Manual does not prohibit the use of “engineered solutions” for BMPs.



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Technical Memorandum

To: Eric Larson, PE Stormwater Manager
From: Tony Maglione
Date: April 11, 2014
Re: Application of 10% Effective Impervious Concept
Gateway Development, Beaufort County, SC

Introduction:

ATM was requested to review the information prepared by the County Stormwater Staff related to the stormwater management system design for the Gateway development. Concerns have been raised by various parties as to whether or not the site should or could meet the 10% Effective Impervious Area concepts outlined in the County's Manual for Stormwater Best Management Practices. ATM has reviewed:

- Mr. Larson's *Bluffton Gateway Development Project – Stormwater Design review* dated April 4, 2011
- Section 106-2856 of the County ZDSO Stormwater Management Standards
- Section 106-2860 of the County ZDSO General Planning and Design Requirements
- Section 3 of the Stormwater Best Management Practices

Part of the stormwater design computations is preparation of a worksheet that computes the percentage of Effective Impervious Area. One major concern that has been raised is what percentage of Effective Impervious area that can be achieved on this site? Many believe that the project must demonstrate that it can achieve an Effective Impervious Area of 10%. However, the ZDSO does not address Effective Impervious Area. The Effective Impervious Area is only referred to the Stormwater Best Management Practices Manual. The Stormwater Best Management Practices Manual Section 1, 1.1 Background states "*The recommended goal set for new developments is 10% effective impervious.*" (*Emphasis added*). Thus an Effective Impervious area of 10% is not a requirement but is a goal to be strived for with the understanding, that because of nature of the computations used in the Stormwater Best Management Practices Manual, that not all sites will be capable of achieving the 10% Effective Impervious Area even if they meet all the other requirements for stormwater pollutant removal and discharge volume controls.

The Gateway project appears to be one such project. In reviewing Mr. Larson's analysis of the proposed project site contains some unique site conditions that may impact results of the Effective Impervious Area worksheet computations. In addition, based upon Mr. Larson's review, the calculations demonstrate that the site will meet the requirements for fecal coliform and nutrient removal as well as stormwater volumetric controls. However, the

Mr. Eric Larson, PE
April 11, 2014
Page 2 of 2

worksheets for Effective Impervious Area contained in the Stormwater Best Management Practices Manual does not allow for adjustments for unique site conditions.

Recommendations:

The inability of the Gateway project to achieve the 10% Effective Impervious goal is a result of the mathematical calculations used to compute this value. As the Gateway project appears to meet all other critical stormwater pollutant and volume controls stipulated in the Stormwater Best Management Manual, it should not be forced to meet the 10% Effective Impervious Area goal simply because of a mathematical anomaly. We concur with Mr. Larson's review that the proposed stormwater system design is protective.

ATM was heavily involved with the development of the Stormwater Volume Control Ordinance but was not involved in the development of the Effective Impervious Area goals nor the changes to the Stormwater Best Management Practices that implemented the same. We believe that the 10% Effective Impervious Area concept is not supported in sound science and should have been studied more thoroughly before implementation. The computations presented in the Stormwater Best Management Practices Manual used to determine if a project can meet this goal leave no room for interpretation and, such as in the case of the Gateway project, creates unnecessary burdens on development that have no measurable benefits.

The Effective Impervious Area concept was developed after the Stormwater Volume Control ordinance was developed and was created by County staff who are no longer with the County. As there are a number of technical issues surrounding the practical application of the Effective Impervious Area process and given the complexity of the concept as presented in the Stormwater Best Management Practices Manual, we would strongly recommend that the County have an outside third party engineering firm revisit the Effective Impervious Area process, the 10% goal to determine if it is based on sound science, identify anomalies in the process and make recommendations to the County as to how best to modify this process so it can be properly applied, clearly understood and conflicts, such as the one surrounding the Gateway project, can be avoided in the future.

Division 5.12: Stormwater Standards

Sections:

5.12.10	Purpose
5.12.20	Applicability
5.12.30	Stormwater Standards
5.12.40	Enforcement

5.12.10 Purpose


The purpose of these standards is to protect the County's water resources by ensuring that development and redevelopment, including highways, shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the pre-development hydrology of the property with regard to the temperature, rate, volume, quality and duration of the water flow¹

5.12.20 Applicability

- A. **Exemptions.** The standards established in this Division shall apply to all proposed development within the County, except for the following exemptions:
1. Any maintenance, alteration, renewal use or improvement to an existing drainage structure as approved by the County Engineer which does not create adverse environmental or water quality impacts and does not increase the temperature, rate, quality, or volume or location of stormwater runoff discharge;
 2. Development where adequate drainage exists of fewer than four residential dwelling units that are not part of a phase of a larger development, not involving a main drainage canal;
 3. Site work on existing one-acre sites or less where impervious area is increased by less than two percent;
 4. Site work on existing one-acre sites or less where impervious area is increased by less than two percent, and any earthwork that does not increase runoff and/ or eliminate detention/retention facilities and/or stormwater storage or alter stormwater flow rates or discharge location(s);
 5. Agricultural activity not involving relocation of drainage canals; or
 6. Work by agencies or property owners required to mitigate emergency flooding conditions. If possible, emergency work should be approved by the duly appointed officials in charge of emergency preparedness or emergency relief. Property owners performing emergency work will be responsible for any damage or injury to persons or property caused by their unauthorized actions. Property owners will restore the site of the emergency work to its approximate pre-emergency condition within a period of 60 days following the end of the emergency period.
 7. Golf courses are required to comply with the latest version of the County's Manual for Stormwater BMPs and all site runoff volume and water quality control and drainage planning and design requirements. However, both golf courses and private lagoons shall be exempt from the flood control requirements of BMP manual Control Design, subject to clear demonstration by the design engineer that no damaging flooding will

Summary of Comments on Division 5-12 Stormwater 1-27_14 with ewl comments 05052014.pdf

Page: 1

 Number: 1 Author: elarson Subject: Highlight Date: 5/5/2014 1:41:13 PM
Add the following sentence:

No development or redevelopment shall cause postdevelopment stormwater rates, quality, or volume to increase above predevelopment levels or to cause an adverse increase in the surface runoff reaching adjacent or surrounding property or receiving waters.

occur during the 100-year/24-hour storm and that all other safety concerns are addressed.

- B. **Private Drainage Systems Not County Responsibility.** Where private drainage systems and easements have been previously approved as private facilities, prior to 4/26/1999, as well as all new development and redevelopment, and have not been accepted by the County, such facilities shall not become County responsibility, and are to be so noted on any new subdivision plat or land development plan, as well as in the respective covenants and agreements which control or follow the property.
- C. **On-Lot Volume Control.** If single-family homes are not covered by an approved development volume control, the Building Permit will require controls as specified in the current edition of the County’s Stormwater BMP manual.

5.12.30 Stormwater Standards


- A. All development and redevelopment require both stormwater runoff volume control and runoff pollution load control as well as peak runoff rate controls. Standards for volume and runoff pollution load control are based on anti-degradation goals tied to “effective imperviousness” values. Current standards are as follows:

Table 5.12.30.A Effective Imperviousness Values	
Loads	Equivalent Effective Imperviousness
Runoff Volume Control	10%
Phosphorus and Nitrogen Loads	10%
Bacteria	5%

- B. Standards for peak runoff rate control are that peak post-development flows for the 25 year design storm is less than or equal to the peak pre-development flow for the same design storm. Currently the 24 hour/ 25 year design storm is 8.0 inches. All these standards are to be achieved in accordance with the latest version of the County’s Manual for Stormwater Best Management and Design Practices (BMP), which is incorporated herein by reference.
- C. All development and redevelopment shall utilize and integrate Stormwater BMPs which are appropriate to their location and environment, and contribute to the overall character of a proposal. BMPs implemented at the development scale shall be integrated into civic and open space networks to the maximum extent possible in accordance with the standards found in Division 2.8, Civic and Open Space Types. Stormwater BMPs should be selected in keeping with the applicable transect zone or conventional zone, as indicated in Table 5.12.30.C. BMPs may be designed as a singular practice or as part of various supplemental pre-treatment BMPs in series to achieve the effective imperviousness goals.
- E. Planning for stormwater should commence at project inception. As the requirements set forth above and elsewhere in BMP manual will require stormwater management to become a vital aspect of all development and redevelopment projects within the County, planning for stormwater management, in accordance with this Section shall commence at the time of initial project inception and presentation to the Director. Review of stormwater management for development and redevelopment projects will be undertaken during all phases of the development review process.

5.12.40 Enforcement

The County has the right to enter, enforce maintenance and/or cause maintenance of any stormwater management facility, either privately or publicly owned.

 Number: 1 Author: elarson Subject: Highlight Date: 5/5/2014 1:36:51 PM
Replace with:
technically feasible


 Number: 2 Author: elarson Subject: Highlight Date: 5/5/2014 1:43:39 PM
I recommend changing these three words as follows:
runoff volume, runoff pollution load, and peak runoff rate control standards.

Table 5.12.30.C: Stormwater BMP Type Standards

	Stormwater BMP Type	Allowed In								
	<p>Vegetated Swales are shallow drainage ways that employ landscaping to provide water quality treatment via biofiltration. They are designed to remove silt and sediment associated pollutants before discharging to storm sewers and to reduce volume if soils allow for infiltration. The treatment area can be planted in a variety of grasses, sedges and rushes, while the side slopes can be planted with shrubs and groundcover. Check dams are added to aid infiltration.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	<p>Green Roofs are a way of managing stormwater in urban areas with limited space for more land intensive BMPs. Green roofs are able to store stormwater in the soil medium during rain events, helping to detain runoff. Some of the stormwater will be taken up by the roots of the plants and some will be evaporated from the soil medium, reducing the amount of runoff from the roof.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	<p>Pervious Paving Systems allow water to pass freely through the interstitial space ingrained throughout the paving matrix, thereby transforming traditionally impervious surfaces. Several examples are pervious concrete and asphalt, interlocking pavers, and reinforced gravel and grass paving.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	<p>Rain Gardens are flat-bottomed landscaped depressions that can be built to any size or shape. Also known as 'bioretention cells', they are designed to allow water to settle and infiltrate into the soil. They reduce the peak discharge rate from a site via detention. Water quality improvements are achieved through particle settling, nutrient uptake, and filtration as water soaks into the ground.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	<p>Disconnected Downspouts. In lower density residential areas downspouts should be disconnected from storm drain systems and directed towards landscaped areas or other BMP devices. This reduces the burden on the storm drain network and allows runoff to slow and infiltrate before overflowing to storm drains.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	<p>Wet Detention Ponds. The pond consists of a permanent pool of water into which storm water runoff from each rain event is detained and treated in the pond until it is displaced by runoff from the next storm. Sedimentation processes remove particulates, organic matter, and metals, while dissolved metals and nutrients are removed through biological uptake.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							

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Key

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Table 5.12.30.C: Stormwater BMP Type Standards (continued)		Allowed In								
Stormwater BMP Type										
	Vegetated Flood Plains can be integrated with parks, playing fields, or unmanaged landscapes. Frequent storm events can be detained by smaller decentralized means, while larger storm events should be directed to non-priority vegetated landscapes for temporary detention.	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	Urban Flood Plain. Urban hardscapes can be used for temporary storage of large storm events. Smaller events should be mitigated by decentralized means, while the larger events can be directed toward non-priority spaces which are planned and designed for the temporary storage of stormwater flows.	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	Riffle Pools. Connected landscapes provide retention of runoff by integrating intermittent vertical drops and damming in a watercourse. The retained runoff is then allowed to infiltrate into the groundwater table or conveyed for further treatment.	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	Flow-through Planters are landscape features that also provide stormwater runoff control and treatment. Flow-through planters are sealed on all sides and fitted with an underdrain. They only absorb as much water as soil and plants in the planter can accommodate. Once the planter is at capacity, water is then discharged through the underdrain. They are ideal for receiving roof runoff from downspouts and can be incorporated into foundation walls.	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	Infiltration Trenches are subsurface facilities designed to provide on-site stormwater retention in areas of good infiltration by collecting and recharging stormwater runoff into the ground. Trenches filter pollutants to improve water quality and contribute towards groundwater recharge. They are relatively low maintenance and can be easily retrofitted into existing sidewalk areas and medians.	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	A Natural Channel is a meandering, vegetated watercourse with natural banks. It is buffered from development zones by large uncultivated landscape.	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
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Table 5.12.30.C: Stormwater BMP Type Standards (continued)

	Stormwater BMP Type	Allowed In								
	<p>Tree Box Filters are containers filled with a soil mixture, a mulch layer, under-drain system and a shrub or tree similar to flow through planters. The compact size of tree box filters allow volume and water quality control to be tailored to specific site characteristics and are well suited to urban areas. Tree box filters provide the added value of aesthetics while making efficient use of available land for stormwater management.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	<p>Urban Channels are narrow vegetated or stone lined conveyances framed by vertical stone or concrete banks abutting cultivated landscapes or hardscapes.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	<p>Level Spreaders are structures that are designed to uniformly distribute concentrated flow over a large area to mimic natural sheet flow. Concentrated flow enters the spreader through a pipe, ditch or swale; the flow is retarded, energy is dissipated; the flow is distributed throughout a long linear shallow trench or behind a low berm; water then flows over the berm/ditch uniformly (in theory) along the entire length.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	<p>Rain Barrels are connected directly to downspouts to capture and store runoff for future use. Stormwater discharge is slowed down and water can be reused for irrigation. Fifty gallons of storage is suggested as a minimum. Barrels must also have a cover to prevent insect and debris collection.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	<p>Cisterns function similar to rain barrels by collected stormwater and storing it for reuse, but on a much larger scale. Cisterns can be stored above ground, buried below ground, or located inside of buildings. They typically store rainwater for reuse in irrigation, mechanical uses, toilet flushing, and fire prevention.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
T1	T2	T3	T4							
C3	C4	C5	SI							
	<p>Dry detention ponds are basins whose outlets have been designed to detain stormwater runoff for some minimum time (e.g., 24 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool of water. However, they are often designed with small pools at the inlet and outlet of the basin. They can also be used to provide flood control by including additional flood detention storage.</p>	<table border="1"> <tr> <td>T1</td> <td>T2</td> <td>T3</td> <td>T4</td> </tr> <tr> <td>C3</td> <td>C4</td> <td>C5</td> <td>SI</td> </tr> </table>	T1	T2	T3	T4	C3	C4	C5	SI
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BEAUFORT COUNTY STORMWATER UTILITY
120 Shanklin Road
Beaufort, South Carolina 29906
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June 4, 2014

Stormwater Manager's report for the Stormwater Utility Board Meeting

Utility Update

1. DHEC and MS4 update – After much discussion with the County Administration and our counterparts in the Towns of Hilton Head and Bluffton, we have concluded that the County will need to submit for MS4 permit coverage independently of the other MS4s. As the permit is implemented, we plan to find opportunities to partner with them to decrease cost and provide uniformity in the separate programs. We have notified DHEC of our intent to become permitted effective January 1, 2015. We are awaiting the notification letter from DHEC setting these timeframe.
2. Budget for FY15 –The County Administrator's office has reviewed a series of proposed changes to our budget and has verbally agreed that the budget is acceptable. [A summary of the revisions](#) is included in the June board packet and will be explained during the meeting.
3. Larson, E. Miller, D. Polk, and Charles Bush attended the Charleston Area Pond Conference on May 22, 2014. It had very good content on pond design, maintenance, water quality benefits, problems often associated with use (including hazard material disposal of dredged sediment), and concluded the day with a keynote address from David Wilson, Chief of the DHEC Bureau of Water.
4. Eric Larson's [summary report on the APA Conference in April](#) is attached.
5. Josh Gruber will provide an update on various topics in an Executive Session during the meeting.

Monitoring Update

1. USCB Lab – Other monitoring activities are on-going. The lab and our office have set a full implementation date of the lab for county monitoring services to be in the spring of 2015. See attached [draft schedule](#) which is subject to revision.

Stormwater Implementation Committee (SWIC) report

1. The SWIC met on May 15, 2014. The topic was Data Management. ([See attached draft minutes](#))
2. ACTION REQUESTED = Public Education Branding – The SWIC has recommended the shared use of the Town Of Bluffton's "Neighbors for Clean Water" slogan for all public education efforts county wide. Our County Administration concurs. I recommend the Board's support of the joint branding effort.

Stormwater related Projects

1. Proposed Carolina Jellyball processing facility in Lobeco and unloading facility on Golden Dock Road in St. Helena Island – Nothing new to report since last month.
2. Drainage issue on H.E. McCracken Circle in Bluffton – Nothing new to report since last month.
3. US 278 at Kitty's Crossing Overtopping issue – Nothing new to report since last month.
4. Infrastructure crew performed on-going maintenance needs. Nothing significant to report.
5. ACTION REQUESTED = Brewer Memorial Park – Possible Stormwater project – The Open Land Trust has asked us to consider a detention basin project to retrofit an existing pond. [See attached draft letter proposal.](#) I recommend the Board's endorsement of the project.

Professional Contracts Report

1. US 278 retrofit ponds – Bid due date is June 5, 2014.
2. County Admin. Complex Retrofit Project – We are soliciting proposals from interested contractors.
3. Consultant procurement for the Carolina Jellyball application for the Lebeco site is still on hold pending a submittal from the applicant.
4. A RFP for a stormwater consultant to assist with the setup of the MS4 program will be advertised soon for services to begin in FY2015.
5. Water Budget Study – Dr. Badr will be presenting the findings to the Board during the June Board meeting. A [copy of the report](#) was sent to the Board earlier this past month.
6. Okatie East BMP monitoring – Ongoing. Nothing new to report since last month.
7. Trask Parkway Overtopping study – The project is on hold pending review of available modeling data.
8. SC 170 widening and stormwater – Due to some concerns raised by an adjacent property owner, Mr. Kubic asked me to review the stormwater design for the project. I am developing a concept plan to enhance the project design to address the project runoff as well as the west branch of the Okatie headwaters. I will report more in the future as concepts are developed.

Regional Coordination

1. Battery Creek Pond funded by an EPA 319 grant – Still in design phase. (Lamar Taylor may report)
2. Stoney Creek watershed plan funded by an EPA 319 grant – Proposals from consultants are currently being reviewed. (Kim Jones may report)
3. Salinity Study - On going. Nothing new to report.
4. Sea Level Rise and future planning – On going. The committee met on May 15th and discussed the sea level rise model and brainstormed planning and development issues that need to be addressed concerning this topic.

Beaufort County Public Works Stormwater Utility

Preliminary Budget Comparison

Revised Date: May 19, 2014

Unaudited Projected Revenue

	FY2014 Requested Board Budget	FY2015 Requested Board Budget	FY2015 Revised Budget
Revenue			
Admin SWU Fees	312,064	313,460	313,460
Utility Activities SWU Fees	3,162,936	2,814,138	2,766,881
Revenue from SWU Fees	3,475,000	3,127,598	3,080,341
Reimbursable Projects	2,500	2,500	2,500
Interest	6,923	2,955	2,955
Cost-Share for Joint Efforts	57,522	41,689	41,689
Reserve Utilization			
Del Webb Agreement Fund	-	-	
Stormwater Utility	-	413,581	351,091
	3,541,945	3,588,323	3,478,576

Efforts (Expenditures)

	FY2014 Requested Board Budget	FY2015 Requested Board Budget	FY2015 Revised Budget
Admin	312,064	323,941	313,460
Utility Activities			
UA/Control Reg	73,147	257,274	216,956
UA/WQ Monitoring	160,000	120,000	120,000
UA/WQ Controls	200,000	-	-
UA/Annual Maintenance	2,679,069	2,783,108	2,736,160
UA/Public Information/Outreach	67,665	50,000	50,000
UA/Drainage Enhancement	25,000	19,000	7,000
UA/Additional Studies	25,000	35,000	35,000
<i>Utility Activities Subtotal</i>	3,229,881	3,264,382	3,165,116
*Reserve Utilization			
<i>Reserve Utilization Subtotal</i>	-	-	-
Efforts Total	3,541,945	3,588,323	3,478,576

*Efforts funded by utilizing the reserve are spread among all utility activities.

Change in Capital Assets On Balance Sheet

	FY2014 Requested Board Budget	FY2015 Requested Board Budget	FY2015 Revised Budget
Capital Assets Additions	455,991	340,604	166,561
Depreciation	(242,119)	(192,181)	(182,523)
	213,872	148,423	(15,962)

SUMMARY

	FY2014 Requested Board Budget	FY2015 Requested Board Budget	FY2015 Revised Budget
Cash Balance	-	-	1,611,101
Revenue	-	-	3,127,485
Revenue - SFU Rate Increase	-	-	
Expenditures (Includes Depreciation)	-	-	(3,478,576)
Capital Purchases	-	-	(166,561)
Reserve Policy	-	-	-
Capital Projects	-	-	(845,999)
	-	-	247,450
Operating Income (Loss) (15.1% of SWI Personnel Budget)	-	-	278,366
Reserve	-	-	525,816



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INTEROFFICE MEMORANDUM

TO: Rob McFee, Director of Engineering and Infrastructure

FROM: Eric W. Larson, Stormwater Manager

SUBJECT: Re-Cap of the APA National Conference in Atlanta, GA on April 26-30, 2014

DATE: May 9, 2014

I attended the American Planning Association national annual conference in Atlanta, GA on April 26 to April 30, 2014. Even though it was a Planning conference and I do not actively work in Planning, there was a full agenda of stormwater related topics that I was able to attend.

There is a large focus on sustainability related to climate change and sea level rise. Many presentations I attended focused on planning development in coastal areas to minimize future damages by storm surge and sea level rise, as well as recovery plans. I sat in on discussions on the Georgia Coast, Florida Gulf Coast, and New Orleans area. All three had common themes: modeling sea level rise, planning for critical infrastructure (roads and buildings) within these areas, strategies to improve them, and policies to re-build them if damaged by a storm event or eventual inundation by higher water levels.

Another trend in topics was legal issues related to “takings”. Ironically, many of the recent cases that APA is educating its members on are related to takings due to stormwater related restrictions on properties, such as buffers and building restrictions for water elevation freeboard. Most cases were in favor of the defendant, or property owner / developer. The key argument seems to be on whether or not the property owner has been denied all economic use of the property. Buffer restrictions that don’t allow any use or disturbance would be an example of a total taking while a buffer that allows viewshed clearing, passive parks, or similar feature provides a value and not considered a total taking. Rob Merchant in our Planning Department told me our regulations are careful to allow economic use of the property in buffers to avoid such legal challenges.

A third category was based on economic development through green infrastructure. Several presentations tied urban blight and redevelopment efforts to sustainable development that created pedestrian friendly, new urbanism type improvements. Most, if not all, of these ideas use green infrastructure practices such as bioswales and pervious pavements to improve the aesthetics of the area without the need for traditional stormwater infrastructure. I was particularly interested in this topic since it is in line with the discussion our administration has been having concerning redevelopment of the Buckingham Plantation / Anolyn Ct. area.

Of course, the reason I attended the conference was my participation as moderator and presenter on a panel discussion of green infrastructure and barriers often encountered trying to implement the same. I presented as a case study the proposed Form Based Code along with past green infrastructure projects developed at the University of Kentucky during my tenure. The session was well attended with standing room only.

April 23, 2014

Draft timeline for USCB Lab "Next Steps" Strategic Plan

Developed by Eric Larson and Dr. Alan Warren

1. Complete equipment purchase - April 2014
2. Training on new equipment - April 2014
3. Field training on County monitoring stations and equipment - Feb. 2014 to June 2014
4. Begin duplicate sampling with County (to establish certification data) - June 2014
5. Town of Bluffton renewed contract with USCB Lab - July 2014
6. Lab offers services to property management entities within the County (eg. Palmetto Bluff, Sea Pines, Palmetto Dunes, others) for routine water quality monitoring - ongoing
7. Lab submits certification applications to DHEC for all certifiable methods per County's monitoring needs - January 2015
8. Discontinue use of GEL Engineering services for the County - ongoing as individuals assays are approved beginning January 2015 through April 2015 (subject to DHEC schedule)
9. County begins re-assessment of monitoring needs, with USCB lab support, to develop a MS4 compliant program. Begin additional certifications as needed - January 2015.
10. USCB Lab and County to begin discussions with Town of Hilton Head Island to join the County's collaborative effort to utilize the lab of stormwater monitoring. (The Town of Hilton Head renewed a contract with GEL Engineering in the spring of 2014) - January 2015.
11. USCB Lab reassesses workload and capabilities to expand services beyond local government and current clients - Spring 2015
12. USCB Lab and County to begin discussions with military installations to join the County's collaborative effort to utilize the lab of stormwater monitoring - Fall 2015.
13. USCB Lab and County to begin discussions with private industries to join the County's collaborative effort to utilize the lab of stormwater monitoring - 2016.
14. USCB and County begin to discuss development of a water quality curriculum to support sampling and testing workload, develop professional for internships and degrees in the field, and provide public education and outreach efforts for the community - 2016.

DRAFT Minutes - SWIC Meeting May 15, 2014 - BJWSA Community Room 1:30 pm - 3pm

1. Introductions

- a. Attendees: Kim Jones, Carl Norris, Bryan McIlwee, Bates Rambow, Lamar Taylor, Eric Larson, Seth Stanbery
- b. Not present - Tony Maglione

2. Minutes from April 3, 2014 - approved by common consent.

3. MS4 data management / Asset Management Software(s)

a. Product(s)

- i. EnerGov - City of Charleston and County of Charleston going to it. Bryan says Tyler Technologies is working on a MS4 module. The software is customizable but requires Tyler to do the changes. Seth says Horry County has been using it for years. They recommended against it. Horry Co. is using it for initial building permitting, and const. inspections, plan review, and code enforcement. GIS is tied to tax map number, not GIS coordinate, so subdividing losses history of records.
- ii. Cityworks - Horry County also used this in the past and present. It has a good mapping component. Citizen complaint / Work order request module, IDDE, Post Const. inspections, reporting, and mobile based. Seth says it appears that Cityworks and EnerGov are the two softwares that most SC communities are using.
- iii. Permit Tracker and Gilware - Old softwares developed by Woolpert and formerly used by Charleston County.
- iv. Geosync Go - Eric noted it is cheap and web based. Does asset management.
- v. MS4web - Carl and Eric noted this software. Eric has used it. Good software but lacked GIS interface with ERSI. Carl noted with a sales flyer that they are now advertising that it does. Also very cheap license. Web based.
- vi. Iworq - Eric mentioned it but didn't recommend it.

b. Existing tool(s)

- i. ToB uses Munis for Finance. EnerGov for building permits, stormwater for EPSC inspections, Certificates of Compliance and CO. Migrating to enterprise version. Bill is looking into what modules are needed to make it work for MS4 reporting.
- ii. ToHHI uses Munis for Finance. EnerGov for building permits, stormwater for EPSC inspections, Certificates of Compliance and CO. Just went live using it last week.
- iii. BC does not have anything but looks as if will need to use Munis for inspections.
- iv. CoB doesn't have anything that they use as of now. Use hard copy files and scanned files. No software.
- v. ToPR not present but it was assumed they do not use anything software at this time.
- vi. Issues with EnerGov are that it does not work well with Esri GIS then though it is marketed that way.
- vii. ArcGIS -Bates says it works well for inventory. Keeps inspections but can't do scheduling of future inspections. Asset management can be done if the fields are set up properly. Scheduling it probably possible using a Microsoft product but it would require someone to custom program the module(s). Bates presented the example of Gwinnett County, GA and how they do analysis of asset based on scoring.

- c. Software Needs
 - i. MCM 1 and 2.
 - 1. Pub Ed. Tracking.
 - 2. Citizen Complaints.
 - ii. MCM 3
 - 1. Citizen Complaints.
 - 2. Complaint response.
 - 3. Mapping / Inventory.
 - 4. Routine Inspections of outfalls. - local gov. add in for water systems from Esri works well, according to Bates.
 - 5. Enforcement.
 - 6. Training.
 - iii. MCM 4
 - 1. Plan review.
 - 2. Inspections.
 - 3. Enforcement.
 - 4. Training - staff and public.
 - iv. MCM 5
 - 1. Plan review.
 - 2. Inspection post-construction.
 - 3. Enforcement.
 - 4. Training - staff, public for maintenance.
 - v. MCM 6
 - 1. Inventory of facilities and structural controls.
 - 2. Routine inspections.
 - 3. Training.
 - vi. MCM 7 - Monitoring
 - 1. Field sampling events.
 - 2. Data analysis.
 - vii. Non-NPDES tasks
 - 1. Work orders for O&M.
- 4. Action Items
 - a. Do demo of MS4web. Seth and Eric will set up.
 - b. Do demo of Geosync Go. Seth and Eric will set up.
 - c. Research ESRI GIS for asset management. Seth, Bates, and Carl to continue to review.
 - d. Permit tracking - Everyone will be doing own thing but it appears will be using similar softwares so user group sharing of ideas may be possible..
 - e. Tara and Bill with ToB to discuss how EnerGov can be used for stormwater reporting.
- 5. Procurement
 - a. See #6.
 - b. EnerGov and Munis is already owned by all so likely not an issue.
- 6. Cost Sharing and Collaboration
 - a. County willing to pay for MS4 software if less than \$20,000 (corrected). This is the budgeted amount currently proposed in the SWU Management fee.
- 7. Other issues
 - a. None noted.

8. Next Meeting - July 9, 2014. June meeting to be canceled due to schedule conflicts. Topic: MCM6- Good Housekeeping. Ask Tony M. to run the meeting due to his experience with writing SC MS4 permits and in an effort to share leadership roles among the municipalities in the SWIC.
9. Adjourned approx. 3:00 p.m.



BEAUFORT COUNTY STORMWATER UTILITY
120 Shanklin Road
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May 28, 2014

Mr. Josh Bell
Land Protection Coordinator
Beaufort Open Land Trust
1001 Bay Street
Beaufort, SC 29901

RE: Brewer Memorial Park – Proposed Stormwater Demonstration Project

Dear Mr. Bell,

In review of the plan to create this park, you and I recently discussed a potential conversion of an existing and abandoned fish bait pond on the site into a stormwater detention facility. Given the high profile site, I believe this project to be an excellent opportunity to create a demonstration project featuring a stormwater best management practice (BMP) to capture, retain, and treat runoff before it is discharged into the adjacent Factory Creek.

I have recommended that the Beaufort County Stormwater Utility support the development of the demonstration site through a series of phases, the first being a feasibility study by an engineering consultant. This study will investigate the existing hydrology and hydraulics of the area to determine if the pond can be built and provide a benefit. Should this study prove viable, the next phases would be design and construction. These phases would be funded by the Utility with the understanding that the Beaufort Open Land Trust and its partners would fund site amenities such as a boardwalk, landscaping, and viewing access to allow visitors to enjoy this feature and learn more about water quality through the use of this BMP.

Budget would be as follows:
Feasibility Study = \$9,500
Design Phase = \$20,000
Construction Phase = \$50,000
Site Amenities = TBD

On June 4, 2014, the Beaufort County Stormwater Utility Board reviewed and endorsed this project. This letter serves as a proposal to the Beaufort Open Land Trust Board for consideration.

If you have any questions, please contact me at (843) 255-2805 or elarson@bcgov.net.

Sincerely,

Eric W. Larson, PE, CPSWQ, AICP, CFM
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QUANTIFYING WATER BUDGETS IN BEAUFORT COUNTY, SC

BY

SOUTHERN WATER RESOURCES

A.W. BADR, PH.D.

VIA

CLEMSON UNIVERSITY

AGREEMENT WITH

BEAUFORT COUNTY ENGINEERING DIVISION

2014

INTRODUCTION

Water budgets are needed primarily to determine the volume of fresh water that is being discharged into local tidal creeks and to determine how development is affecting components of the water budget. Areas of interest include the upper reaches of the Okatie River, which is part of a watershed that is fully developed and includes the retirement community of Sun City.

To address this issue, Southern Water Resources proposed to Beaufort County a network of surface- and ground-water monitoring stations strategically located within the watershed that will quantify precipitation, runoff, and changes in ground-water and surface-water storage. This network was installed in 2011 and 2012. Evapotranspiration was also estimated using a temperature-based approach. Data collected from the monitoring network was used as the basis for developing a water budget for a watershed within the Sun City development. Southern Water Resources also assisted the Beaufort County in the analysis and interpretation of this data.

Water Budgets

In its simplest terms, a water budget is an accounting of the volume of water entering a watershed (inputs), the volume of water leaving a watershed (outputs), and changes in the volume of water that is stored in the watershed (storage), over a fixed time interval. It is generally expressed by the equation:

$$Q_{in} - Q_{out} = \Delta S \text{ ----- (1)}$$

where Q_{in} is the volume of water coming into the system (watershed) per unit of time, Q_{out} is the volume of water leaving the system per unit of time, and ΔS is the change in the volume of water in storage per unit of time. Three to four week time steps were used in the water budget analysis for this study.

Water enters a watershed primarily in the form of rainfall where it runs off to surface water bodies, evaporates and/or transpires from plants, or seeps into the ground. In this case, the water-budget equation above can be more accurately expressed as:

$$R - (Q_o + ET) = \Delta S \text{ ----- (2)}$$

where P is precipitation, Q_o is runoff, and ET is evapotranspiration.

The above equation can be customized depending on the objectives and scale of a project, and depending on the complexity of the system that is being studied. Other inputs, for example, may include

water that is transferred from other watersheds or pumped from confined aquifers and used for irrigation in the watershed (Q_{ir}). The water budget equation would then be expressed as:

$$(R + Q_{ir}) - (Q_o + ET) = \Delta S \text{ ----- (3)}$$

Once calculated, a water budget is a valuable management tool that can be used to assess the availability and sustainability of water supplies within a watershed. Long-term (10 years or more) monitoring of the various components of a water budget can be used to assess the impacts that climate change and land-use modifications have on the water resources of an area.

OBJECTIVES

Watersheds commonly have different water budgets, reflecting differences in land cover, land use, soil characteristics, precipitation, geology, topography, and drainage patterns. Development can also alter the natural flow and distribution of water in a watershed and can change a water budget. Comparisons of water budgets between undeveloped and developed watersheds can be used to draw conclusions regarding the natural effects that soil characteristics, geology, or vegetation have on the water resources of the watershed. Comparisons of water budgets from undeveloped and developed watersheds can lend insights into the effects that human activities have on the water resources of the watershed.

The purpose of this project was to develop a water budget for the Sun City community in the Okatie River area, which is located in a part of a watershed that is fully developed. Runoff coefficients, or the ratio of runoff (Q_o) to rainfall (R), were also computed and compared to regional runoff coefficients determined from stream gaging stations monitored by the United States Geological Survey (USGS).

Specific objectives of this study were to:

- 1) quantify the amount of rainfall falling on the watershed (R),
- 2) quantify the amount of water imported into the watershed for irrigation purposes for both residences and golf courses (Q_{ir}),
- 3) quantify the amount of water discharging into the Okatie River as surface-water runoff (Q_o),
- 4) quantify the change in storage of the shallow water-table aquifer (ΔS_{wt}),
- 5) quantify the change in storage of the storm water ponds (ΔS_{tp}),
- 6) estimate the amount of water lost to the atmosphere by evapotranspiration (ET),

7) and compare runoff coefficients for the watershed with regional runoff coefficients.

The general water budget described above can be expressed in more detail for this study as:

$$(R + Q_{ir}) - (Q_O + ET) = \Delta S_{wt} + \Delta S_{rp}. \text{-----} (4)$$

Scope of Work

Southern Water Resources was responsible for:

- 1) developing a plan to monitor the watershed with recommendations on which water budget components to monitor,
- 2) providing technical assistance on the siting of monitoring stations and the selection of appropriate equipment,
- 3) and evaluating data and developing a water budget for the watershed.

Beaufort County was responsible for:

- 1) purchasing the monitoring equipment,
- 2) installing the equipment,
- 3) maintaining the equipment,
- 4) installing monitoring wells,
- 5) collecting data from the monitoring stations,
- 6) collecting water use data for imported water and groundwater pumped from confined aquifers,
- 7) surveying elevations of monitoring wells and recorders in detention ponds,
- 8) and quality control.

Southern Water Resources' first responsibility was to develop a monitoring plan for the watershed that would focus on the principal objective of quantifying the water budget. Fiscal budget constraints, however, limited the number of sites that could be monitored and the number of wells that could be drilled. Site visits were necessary to evaluate the outfall areas, to determine where weather stations could be installed without obstructions and where monitoring wells could be drilled without interfering with other construction projects in the study area. Details of the number and locations of monitoring stations including stream gages, weather stations, pond gages, and monitoring wells are

presented in the Methods section. Monitoring wells were sited in each of the major hydrologic soil types that are represented in the watershed.

Southern Water Resources' second responsibility was to analyze the data that was collected from the various monitoring stations in order to generate the water budget for the study area. The water budget was computed for 3 to 4 week intervals and periods of analysis were limited by physical constraints at the weir outlet (see below).

METHODS

Water budget components for the study watershed located at Sun City are discussed below. Inputs to the watershed include rainfall (R) and the reuse of wastewater for irrigation purposes (Q_{ir}). Outputs from the watershed include surface water runoff (Q_O) and evapotranspiration (ET). Potential Evapotranspiration (PET) was computed to estimate the maximum amount of ET that could occur for the study watershed. Time periods for the water budget analysis were limited by periods when reliable surface runoff estimates were available (see below).

Rainfall (R)

Rainfall was measured by a manual rain gage located on the Palmetto Bluff watershed. Rainfall was typically recorded on a daily basis from Monday through Friday while rainfall totals during weekends were recorded on Monday mornings. To estimate daily rainfall on the weekends, totals recorded on Monday mornings were divided equally over Friday, Saturday and Sunday. Rainfall amounts were summed over the same 3 and 4-week periods for which flow was estimated as described below and presented in units of inches. Rainfall amounts for the selected time periods are presented in Table 1.

Water imported to watershed for irrigation (Q_{ir})

Wastewater from Sun City is reused for irrigation purposes within the study watershed, and thus, is treated as an additional inflow to the watershed. Wastewater reuse was estimated by prorating Sun City's total water use based on the percentage of houses located in the study watershed and assuming that this prorated amount is entirely returned to the watershed via irrigation. Water use data, in millions of gallons per month (MGM) were obtained from the applicable BJWSA treatment facility. Eighty percent of the water from this facility is used by Sun City. Average daily water use was estimated from the monthly water use data, and then total water use was summed over the time periods discussed below for the water budget based on the daily average values. The total water use for the selected time periods was then divided by the area of the watershed to determine the water use per unit area and converted to inches.

These values, included in Table 1, represent the amount of additional water added to the watershed from the reuse of wastewater for irrigation.

Runoff (Q_o)

Runoff or surface water outflow was estimated from a contracted rectangular weir located at the watershed outlet using the Francis equation (Gils, 1962). The form of the equation used computes outflow in cubic feet per second. The location of the weir is presented in Figure 1. The head or stage above the weir crest was measured with a pressure transducer at 5-minute intervals. Specifications for the weir allowed for outflow to be measured only when heads were equal to or less than 0.625 feet. During higher flow events, heads exceeded the 0.625 ft threshold at which the Francis equation is no longer valid for this weir. As a result of this limitation, outflow for high flow events could not be determined.



Figure 1. Groundwater and surface water monitoring sites on the study watershed.

Two periods of low to moderate flows were selected for analysis. The first period was from June 17, 2012 through August 4, 2012, and the second period was from September 16, 2012 through January 26, 2013. The second period included two flow events where heads above the weir crest briefly exceeded the 0.625 threshold limit and for each of these events the flow computed represents a minimum flow for

the event. Flow volumes were determined by taking the average head over each 5-minute interval and computing the resulting flow rate over the 5-minute interval using the Francis equation. Flow volumes were computed for each 5 minute interval, normalized to the drainage area of the watershed (1000 acres) to compute outflows in units of feet and then converted to inches. Outflows were then summed over 4-week intervals for the time periods described above (each of the two time periods discussed above included one 3-week interval as well). Outflows for the selected periods are presented in Table 1.

Runoff-rainfall coefficients, the ratio of outflow to rainfall (Q_o/R), was also computed and presented in Table 1. These coefficients were compared to regional basin coefficients determined for the Salkehatchie and Coosawhatchie basins (see below) by computing percent differences in the coefficients. Ratios of runoff to the sum of rainfall and wastewater reuse ($Q_o/(R+Q_{ir})$) were also computed and presented in Table 1.

Potential Evapotranspiration (PET)

Potential Evapotranspiration (PET) for the study watershed was estimated using the Hamon method (Hamon, 1963). The Hamon method utilizes average daily temperature and daylight length, which is determined from the latitude of the study site. Temperature data was taken from the Beaufort MCAS station (ID NBC), which was approximately 19 miles from the study watershed. Daily PET in inches was computed from the average daily temperature and daylight length and then summed over appropriate time periods (the same 4-week periods for which outflows were estimated) for inclusion in the water budget. PET estimates for the selected time periods are presented in Table 1. PET is the maximum amount of evapotranspiration (ET) that can occur if soil moisture conditions are not limited. During drier periods, actual ET will be less than the PET.

Pond Stages

Surface-water levels were measured at two ponds on the study watershed. The ponds are labeled SCW-1 and SCW-5 (the largest onsite pond) in Figure 1. Levels were measured on an hourly basis with an unvented pressure transducer. The unvented transducer measured total pressure in feet of water and the hourly readings were compensated by using an onsite barometric sensor to remove the effects of barometric pressure. After compensation, water levels were converted to elevations in feet above sea level.

Groundwater Levels

Groundwater levels were measured at three sites on the study watershed. These sites are labeled as SCW-2, SCW-3 and SCW-4 in Figure 1. Levels were measured on an hourly basis with a vented pressure transducer. The unvented transducer measured total pressure in feet of water and the hourly readings were compensated by using an onsite barometric sensor to remove the effects of barometric pressure. After compensation, groundwater levels were converted to elevations in feet above sea level.

Each monitoring station in the study was surveyed to determine its latitude and longitude coordinates using the North American Datum of 1983 (NAD83) as the horizontal control datum, and leveled to determine its elevation above mean sea level using the North American Vertical Datum of 1988 (NAVD88) as the vertical control datum. All of the measurements made during the course of the study were referenced to a common datum allowing for computations of horizontal and vertical hydraulic gradients and other parameters.

Runoff coefficients for regional, unregulated watershed

The undeveloped, Palmetto Bluff watershed was originally included in the scope of this project. The runoff from that watershed was to be used for a comparison against the developed, Sun City watershed. The data collected from the Palmetto Bluff watershed shows that infiltrating rainfall moves downward into the deep sand layers of the watershed, and very little, if any, moves out of the watershed as runoff. The South Carolina Department of Natural Resources (DNR) recently made a geologic map of the Pritchardville quadrangle in Beaufort and Jasper counties. This geologic map shows an abundance of sand deposits and silted streams in the area of the Palmetto Bluff watershed. All collected data from the Palmetto Bluff watershed are given in Appendix B.

Two alternative watersheds were used for the comparison against the Sun City watershed. The selected watersheds are similar to the Okatie watershed where they are subject to tides and weather patterns (Figure 2). USGS data from the Coosawhatchie River near Hampton (02176500) gage was selected because the flow is unregulated and the hydrologic unit is the same as the Okatie River unit near Bluffton (03050208). Flow data has been collected at this site since 1951. The drainage area at this station is 203 square miles and has an average annual runoff of 10.6 in. The second selected site of unregulated flow is the Salkehatchie River near Miley (02175500) gage where the flow has been measured since 1951. The drainage area of this site is 341 square miles and has an average annual runoff of 12.8 in. The hydrologic unit of this site is 03050207 and is adjacent to the 03050208 hydrological unit. Average rainfall in the Salkehatchie and Coosawhatchie basins is approximately 48 in based on the review of several rainfall gaging stations located in these basins. Average runoff coefficients for the

Coosawhatchie and Salkehatchie basins for the period 1951 – 2012 are 0.22 and 0.26, respectively. The coefficient that was used in this study was an average of the two watersheds (0.24).

The state average runoff-rainfall coefficient was established from the State water budget (Figure 3) discussed in the State Water Plan. The state average coefficient is:

$$(21 \text{ in} - 8 \text{ in})/48 \text{ in} = 0.27.$$

The average is higher in the Upstate and Piedmont region because of the bedrocks and lack of coastal, shallow soil aquifers. The average is lower in the Coastal area because of the presence of the shallow soil aquifer system and the high storage ability in the soil profile.

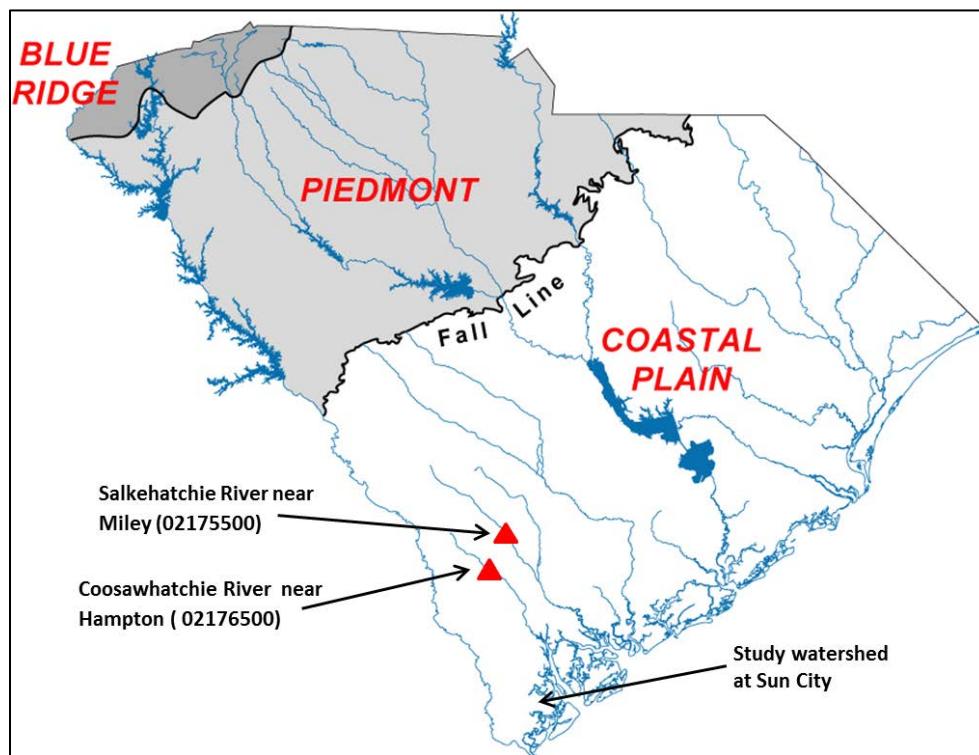


Figure 2. Location of unregulated gaging sites used to compute regional runoff-rainfall coefficients.

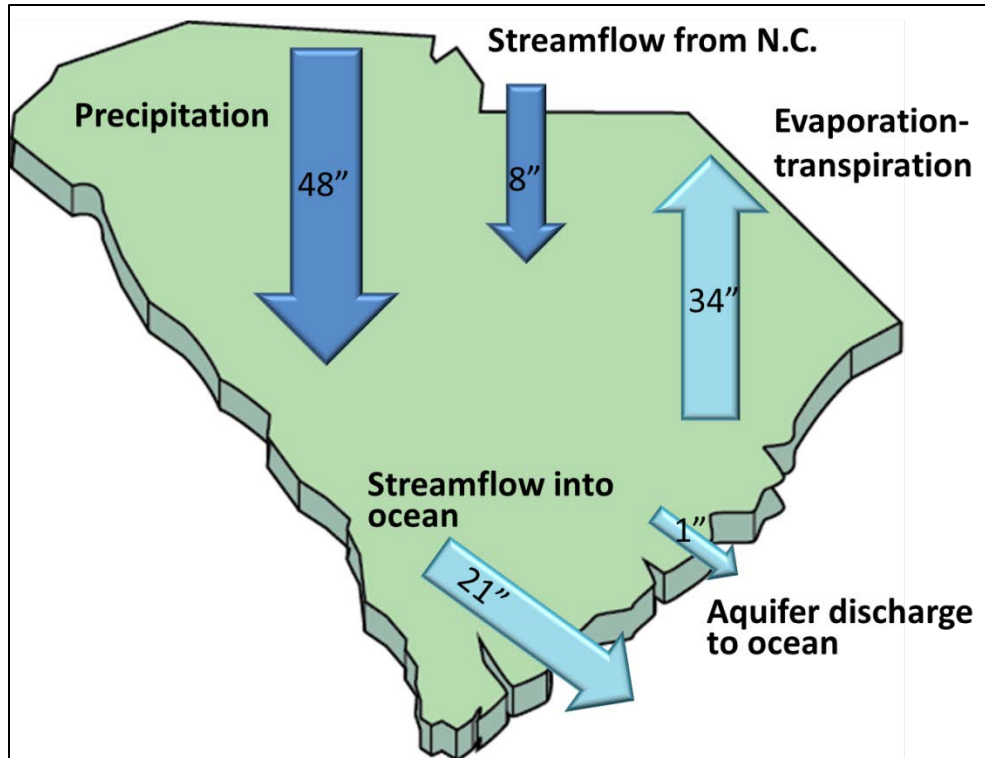


Figure 3. South Carolina's water budget.

DISCUSSION

Water Budget Results

Precipitation and runoff are major components of the water budget in the study area. Therefore, it is critical that these two parameters be measured as accurately as possible using the best instrumentation available. Evapotranspiration is also a significant component of the water budget. Actual evapotranspiration will vary depending upon temperature and other meteorological variables. If an evaporation pan can be properly maintained or if an automated evaporation pan can be installed, it would greatly benefit any future studies on the watershed. For this study, potential evapotranspiration (PET) was used as a surrogate for actual evapotranspiration (ET).

Pond 5(SCW-5) is the largest pond in the Sun City development. While groundwater levels fluctuate due to rainfall and location, it is assumed that the groundwater levels in the watershed and SCW-5's surface water elevations are trying to reach equilibrium at all times. Therefore, SCW-5 water levels were used to approximate the change in storage on the watershed.

Equation (3) was used to calculate the change of storage for each time unit in Table 1. For example, the total change in storage for the second period was:

$$(P + Q_{ir}) - (Q_o + ET) = (5.17 + 1.02) - (2.28 + 10.92) = -7.0 \text{ in.}$$

The measured change in storage was -7.7 in. Therefore, the percent error is:

$$[(7.7 - 7.0) / 7.7] \times 100\% = 9.2\%$$

The water budget results for the period from September 2012 through January 2013 in Table 1 gives a calculated change in storage within 10% of the observed changes in storage at pond SCW-5. However, measurement errors of runoff can be up to $\pm 15\%$ for USGS streamflow gaging stations and compounded errors in the water budget can rise up to $\pm 45\%$ according to the USGS.

The runoff-rainfall coefficients were calculated and included in Table 1 for each period. A coefficient was also calculated by dividing the runoff by the sum of the rainfall and additional water added to the system. The totals for the second period of analysis shows a significant increase in runoff where the coefficient measured in the Sun City watershed was more than 50% greater than the average annual runoff coefficient determined from the Coosawhatchie and Salkehatchie river basins.

Groundwater Well Data and Pond Stage Data Review

The observed water levels in groundwater wells and ponds are given the Figures 4 – 8 along with daily rainfall measured for the study period. Overall, water levels in the ponds and the wells were at their highest during August of 2012 when total monthly rainfall exceeded 13 inches and in February 2013, when monthly rainfall totals were approximately 9.5 inches. Levels were generally at their lowest during July 2012 owing to lack of rainfall and increased ET rates; however, SCW-3, SCW-4 and SCW-5 also experienced low level conditions in the fall of 2012.

Surface water levels in pond SCW-1 responded rapidly to rainfall events and increased as much as 2.5 ft during a large event in August 2012 (Figure 4). Levels in the pond also returned rapidly to pre-event levels. Levels in the pond typically showed little to no variation between rainfall events.

Groundwater levels at SCW-2 also responded to rainfall events, but levels at the site also experienced drawdowns on the order of several feet during the summer of 2012 (Figure 5). In the fall of 2012 and winter of 2012-2013, water levels were relatively stable, owing to lack of significant rainfall, until two large rainfall events in late 2012 and early 2013, resulting in significant increases in water levels. Groundwater levels observed at SCW-3 responded to rainfall events, but also receded very rapidly. Significant drawdowns are observed in the fall and early winter of 2012.

Groundwater levels at SCW-4 also responded to rainfall events, but levels at the site also experienced drawdowns on the order of several feet during the summer of 2012 (Figure 5). Levels exceeded 10 ft, amsl, and never receded much below 10 ft, amsl, which is consistent with the influence of the large pond (SCW-5), which held water from 11 to 12 ft, amsl during the study period. Levels in the pond rarely dipped below 11 ft, amsl. SCW-5 (Figure 8) also responded to rainfall events, increasing above 13 ft, amsl on several occasions, but also receded during the fall and early winter of 2012.

The weekly change in water levels for all rivers and ponds are found in Appendix A (Figures 9 – 13).

Q_{ir} (in)	$^1 \Delta S_{obs}$ (in)	ΔS_{calc} (in)	2 % Diff. for ΔS	Q_0/R
0.28	-3.28	-2.40	26.7	0.47
0.26	-6.91	-1.92	72.3	0.17
0.22	-0.77	-1.39	-80.7	0.45
0.16	4.96	0.25	94.9	0.34
0.10	-1.70	-1.55	9.3	9.26
1.02	-7.70	-7.00	9.2	0.44

Table 1.
Water budget results for the Sun City watershed for select periods.

r (in)	$^1 \Delta S_{obs}$ (in)	ΔS_{calc} (in)	2 % Diff. for ΔS	Q_0/R
0.28	-3.28	-2.40	26.7	0.47
0.26	-6.91	-1.92	72.3	0.17
0.22	-0.77	-1.39	-80.7	0.45
0.16	4.96	0.25	94.9	0.34
0.10	-1.70	-1.55	9.3	9.26
1.02	-7.70	-7.00	9.2	0.44

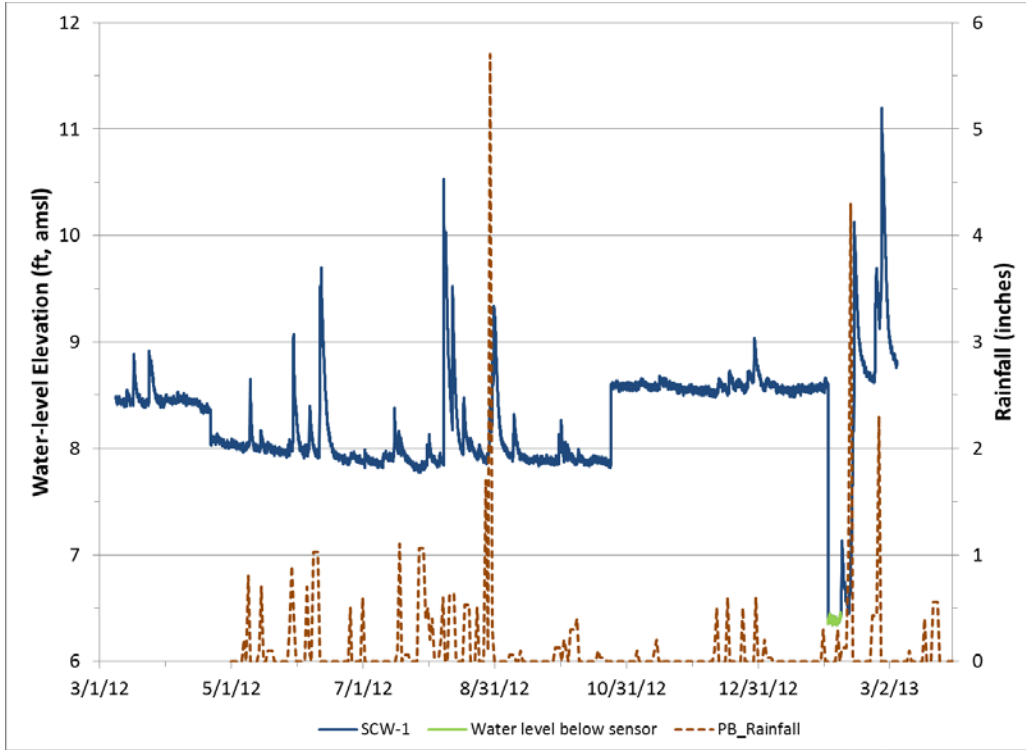


Figure 4. Water-level elevations for Pond 1 (SCW-1).

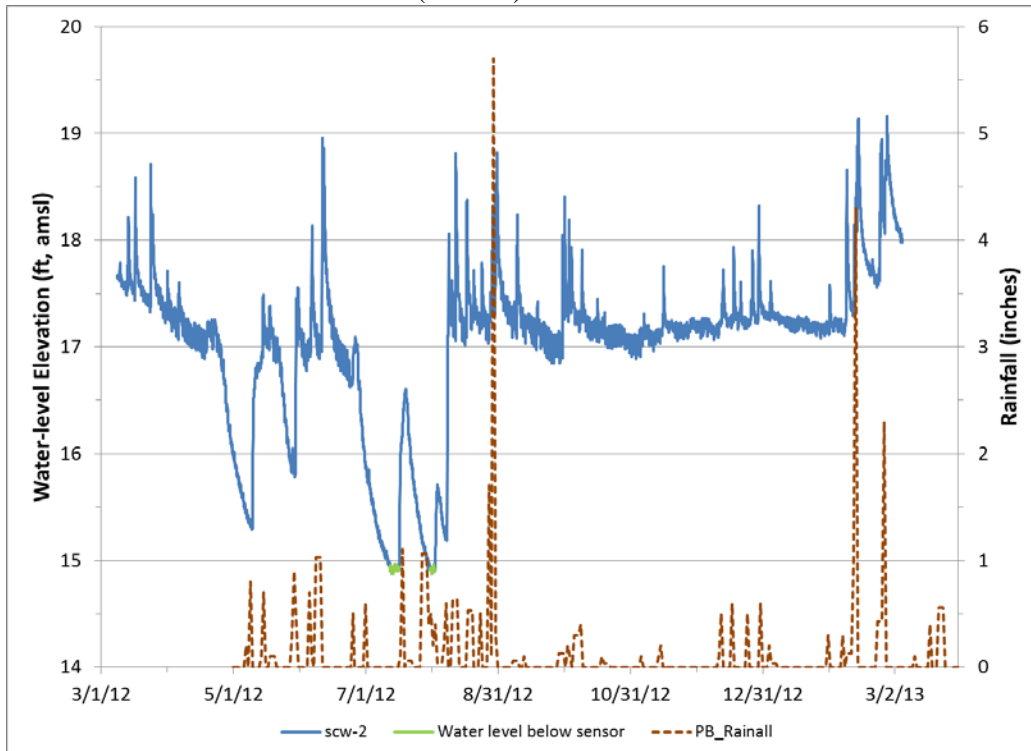


Figure 5. Groundwater-level elevations for SCW-2.

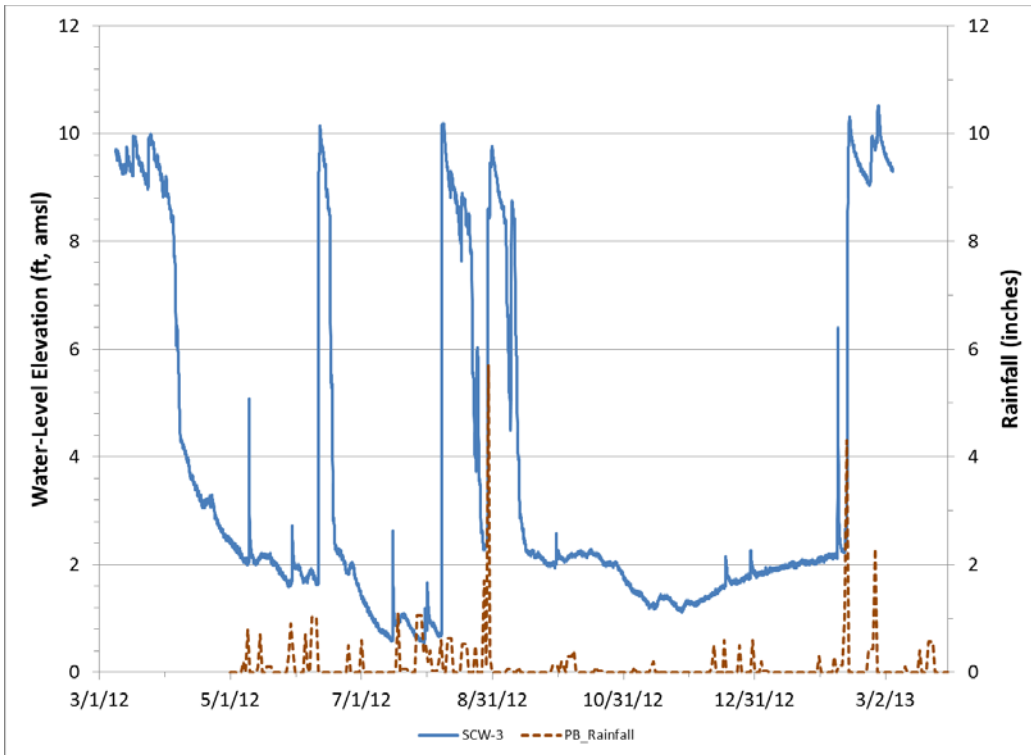


Figure 6. Groundwater-level elevations for SCW-3.

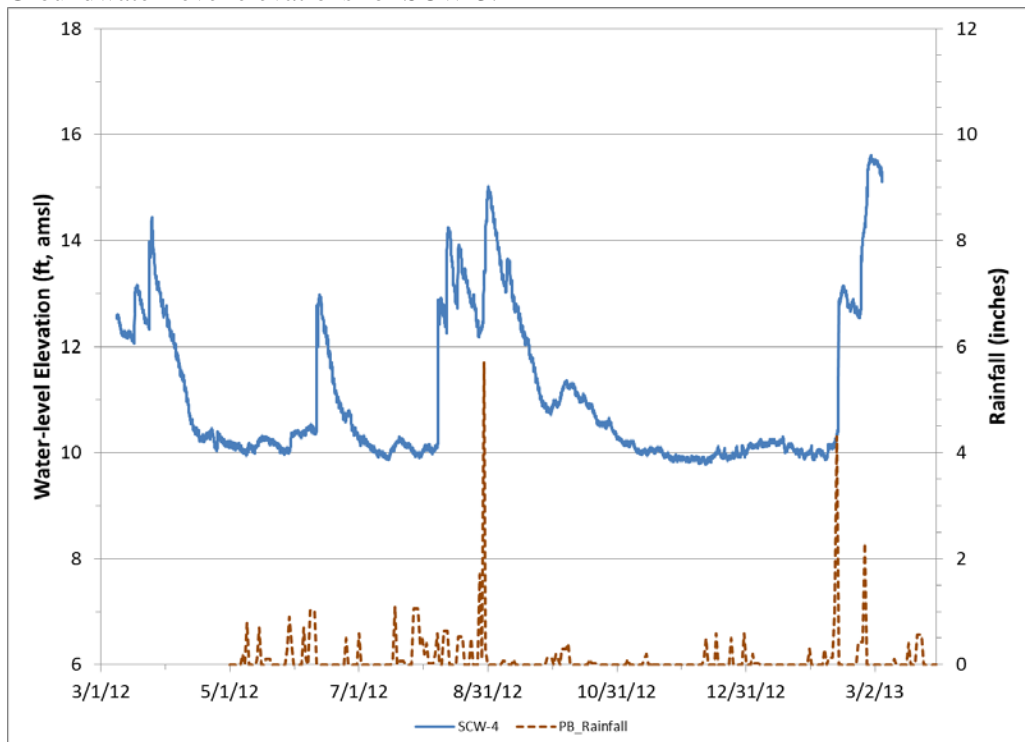


Figure 7. Groundwater-level elevations for SCW-4.

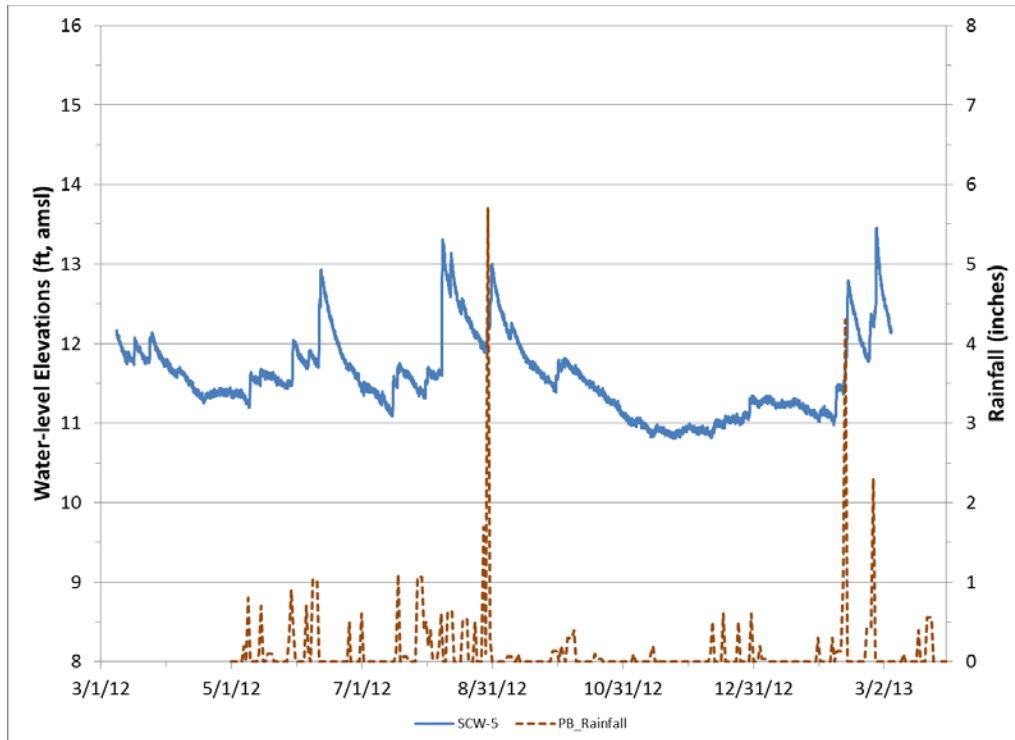


Figure 8. Water-level elevations for Pond 5 (SCW-5).

RECOMMENDATIONS

Data analysis on the Sun City watershed and the Coosawatchie and Salkewatchie basins indicates an increase of more than 50 percent in the volume of water entering the headwaters of the May River as a result of land development.

Irrigated water added to the watershed was more than 20% of the natural rainfall during the monitoring period. The amount of available storage in the soil matrix was reduced due to the rising of the water table and the higher pond levels. Both the additional water and the higher water tables have increased the volumes and peak flows of runoff.

Surface runoff was not measured during high to very high rainfall events due to the physical limitation of the weir. Such volumes should be measured in future studies to quantify flows into the headwaters of the May River during these events.

Longer monitoring periods as well as additional monitoring stations are needed to measure more accurate runoff and rainfall during flood and drought events.

There was little to no stress on water availability in the developed area during the study period. During drier periods, the runoff was significantly less and the evapotranspiration was high, but stored water in the ponds was used to supplement the available effluent for golf course irrigation. Groundwater was available via two groundwater wells in the developed area; however, groundwater was not used during this monitoring period for irrigation.

To control the developed watershed's runoff and mimic the natural runoff, the following can be applied:

Aquifer Storage and recovery (ASR)

Aquifer storage and recovery (ASR) systems involve the injection and storage of potable water into an aquifer and the recovery of this water at a later time, usually to supplement water supplies. Most ASR projects in South Carolina are employed in coastal areas to meet high seasonal demands and to provide emergency supplies as needed. Treated surface water is injected into an aquifer during the off-peak season when demands are low and later recovered by pumping the treated water out of the aquifer to meet peak seasonal demands. Water injected into the aquifer must meet state and federal water-quality standards and ASR wells must be permitted by the S.C. Department of Health and Environmental Control (DHEC) in accordance with the S.C. Underground Injection Control Regulation (R. 61-87).

Currently four water suppliers operate ASR systems in the State: Grand Stand Water and Sewer Authority in Horry County; Mount Pleasant Waterworks in Charleston County; Kiawah Island Utility, Inc. in Charleston County; and Beaufort-Jasper Water and Sewer Authority in Beaufort and Jasper Counties.

The Orangeburg Department of Public Utilities, which uses the North Fork Edisto River as its drinking-water source, is in the process of installing two ASR wells, one in the Black Creek aquifer and the other in the Middendorf aquifer. The primary reason for developing this ASR system is not to have additional capacity during droughts when stream flows are low, but to improve the efficiency of their water treatment operations. During periods of low stream flow, when treatment of water from the North Fork Edisto is least expensive, treated water will be injected into the aquifers; during periods of high stream flow, when treatment of surface water is more expensive, the already-treated water stored underground will be recovered and made available for use with minimal additional treatment.

This suggested application of ASR is very unique in that extra runoff during normal and high flow periods will be harvested, treated and injected in a deep aquifer at the development site. The injection well will be used to supplement water supply demands during water shortages and drought

periods. Adding water to the deep aquifers in the Coastal area can significantly help control salt water intrusion into the State's aquifers. State environmental agencies like DNR and DHEC as well as local governments should have a special interest in this application.

Normal Storm Water Management

Storm water ponds should be kept drained at all times to receive the extra runoff during normal and high flow periods. The stored water should be released slowly as non-flood flows downstream. This application controls the peak of the flow downstream and does not reduce the volume of extra runoff.

REFERENCES

Badr, A.W., Wachob A., and Gellici, J.A., 2004, South Carolina Water Plan - Second Edition.

Gils, Ranald V., 1962 *Fluid Mechanics and Hydraulics*, Schaum McGraw-Hill, page 135.

Hamon, W.R., 1963. Computation of Direct Runoff Amounts From Storm Rainfall. Int. Assoc. Sci. Hydrol. Pub. 63:52-62.

APPENDIX A

Weekly Change in Water Levels for Groundwater Wells and Ponds in the Sun City Watershed

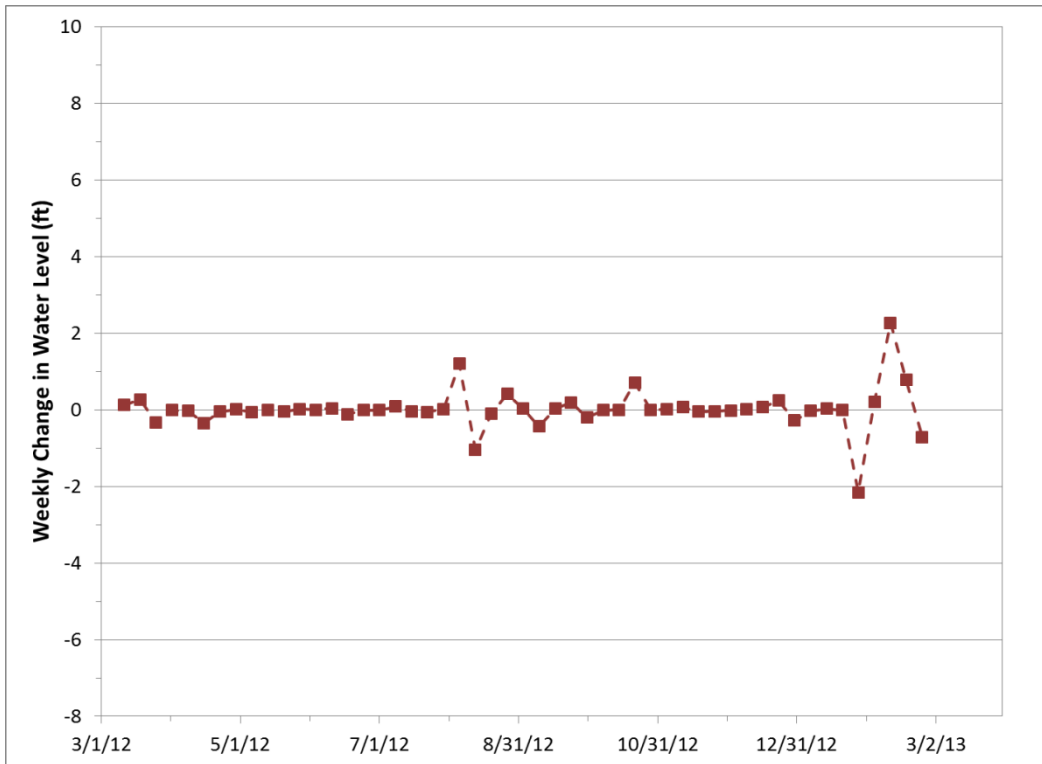


Figure 9. Weekly changes in water level at SCW-1.

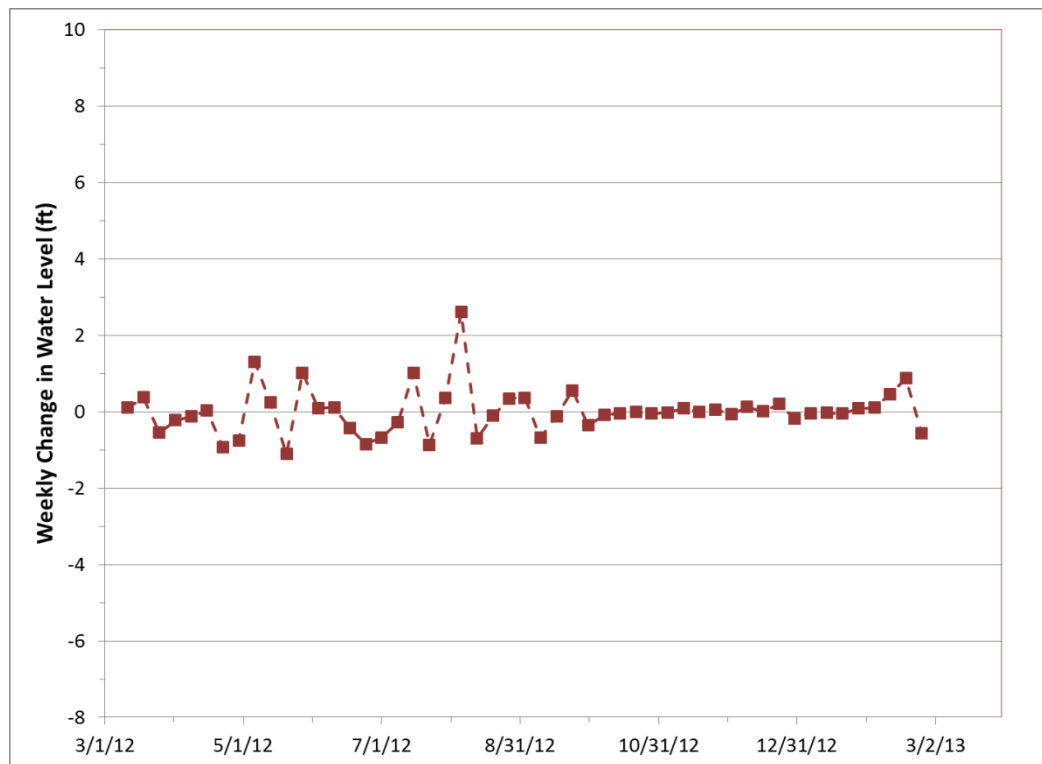


Figure 10. Weekly changes in water level at SCW-2.

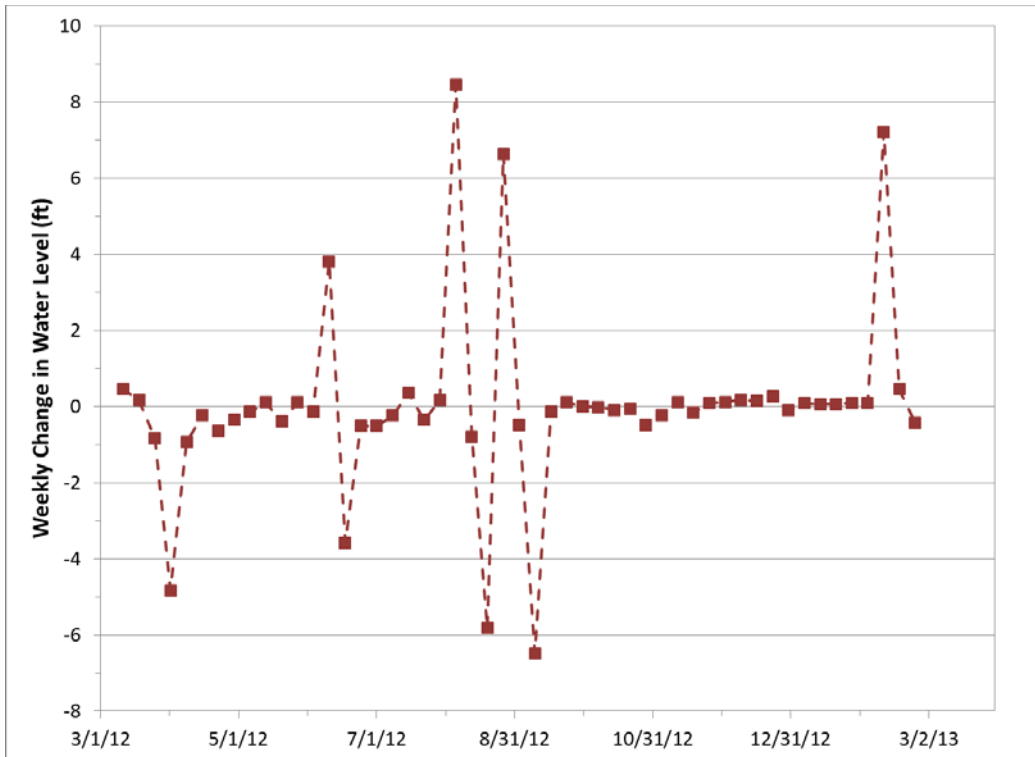


Figure 11. Weekly changes in water level at SCW-3.

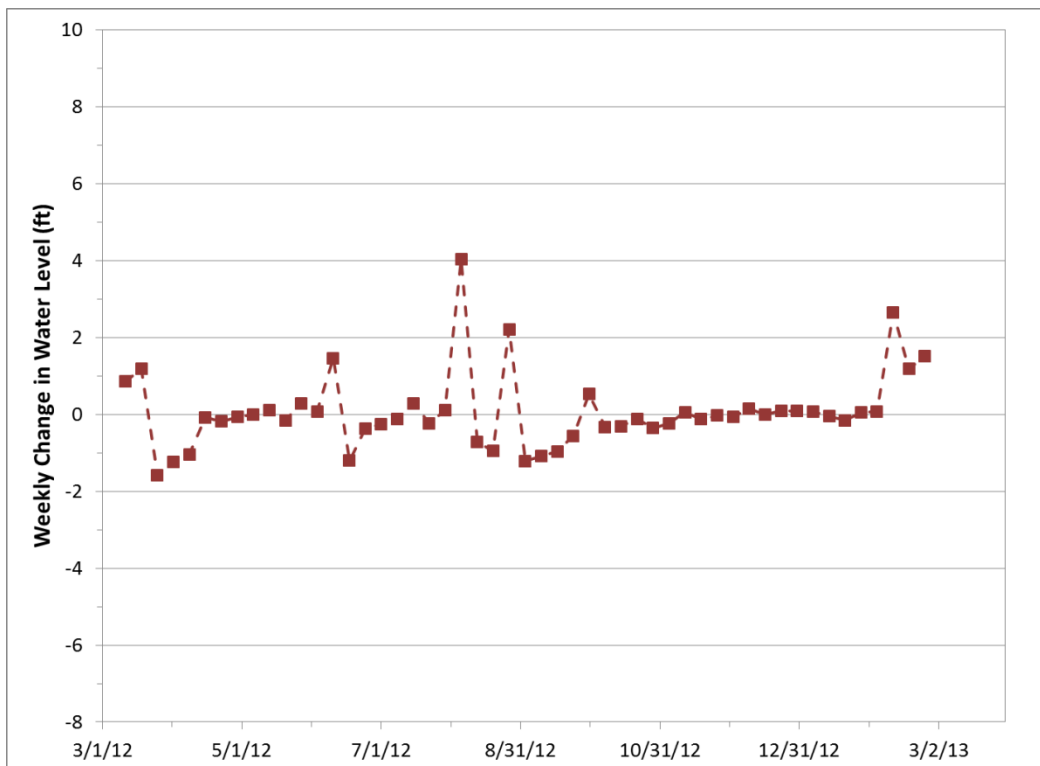


Figure 12. Weekly changes in water level at SCW-4.

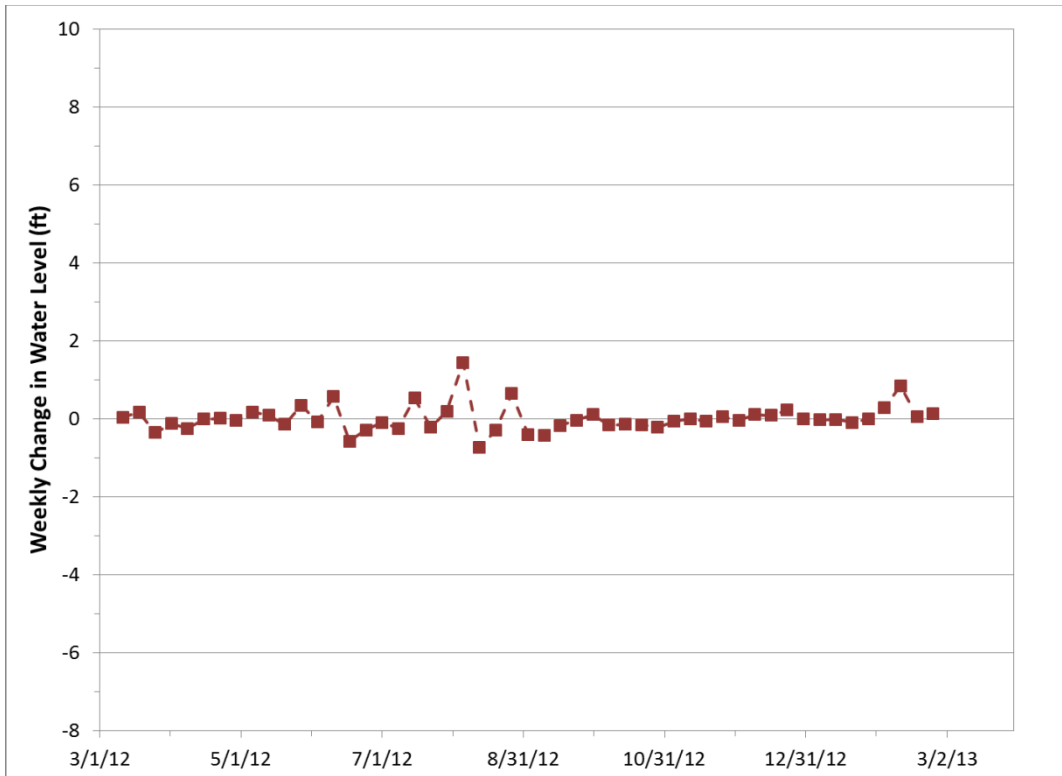


Figure 13. Weekly changes in water level at SCW-5.

APPENDIX B

Outlet Stage and Groundwater-level Elevations in the Palmetto Bluff Watershed

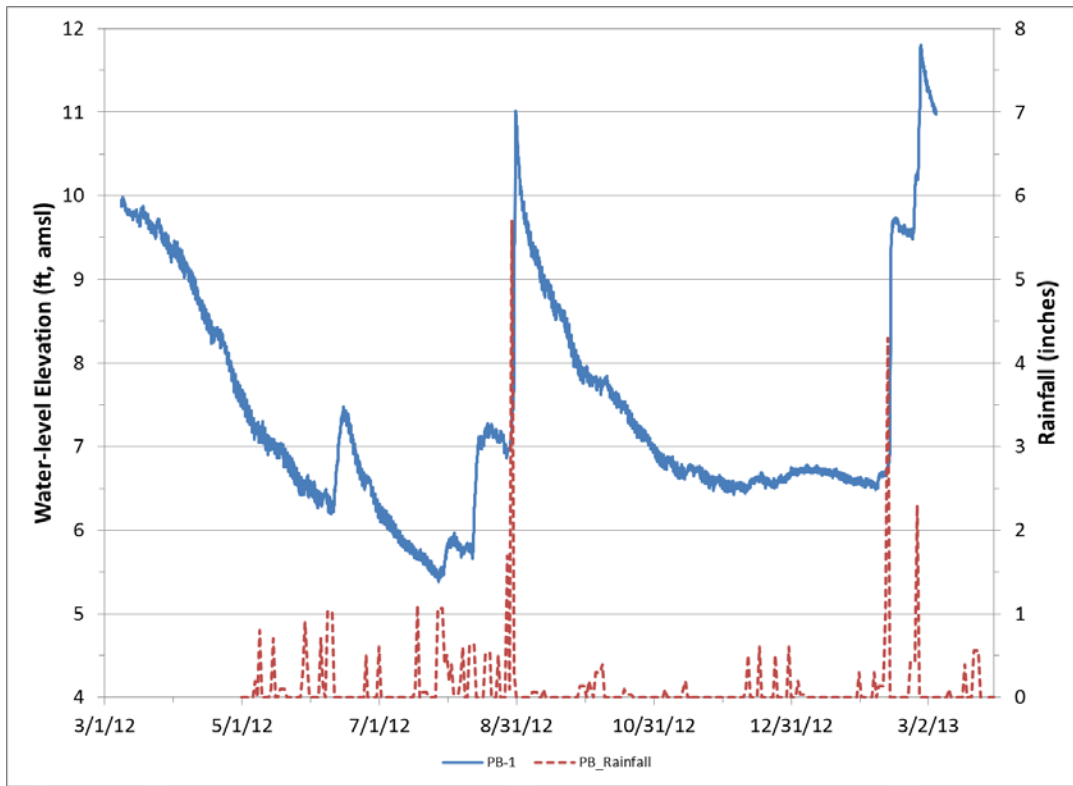


Figure 14. Groundwater-level elevations at PB-1.

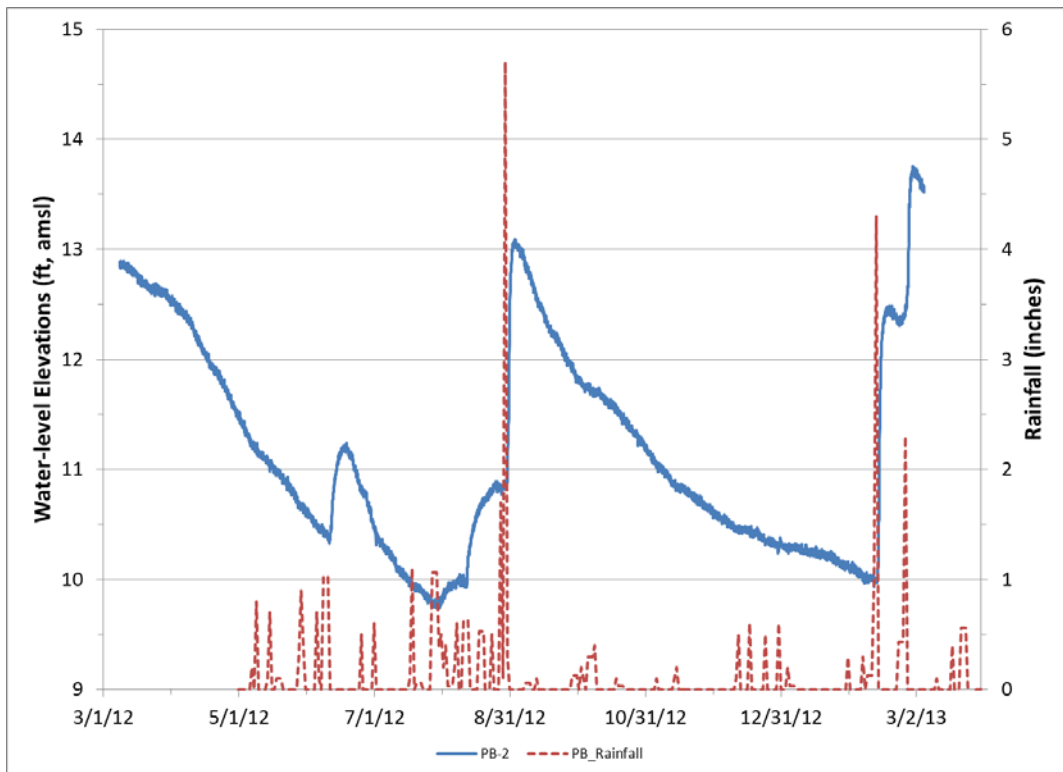


Figure 15. Groundwater-level elevations at PB-2.

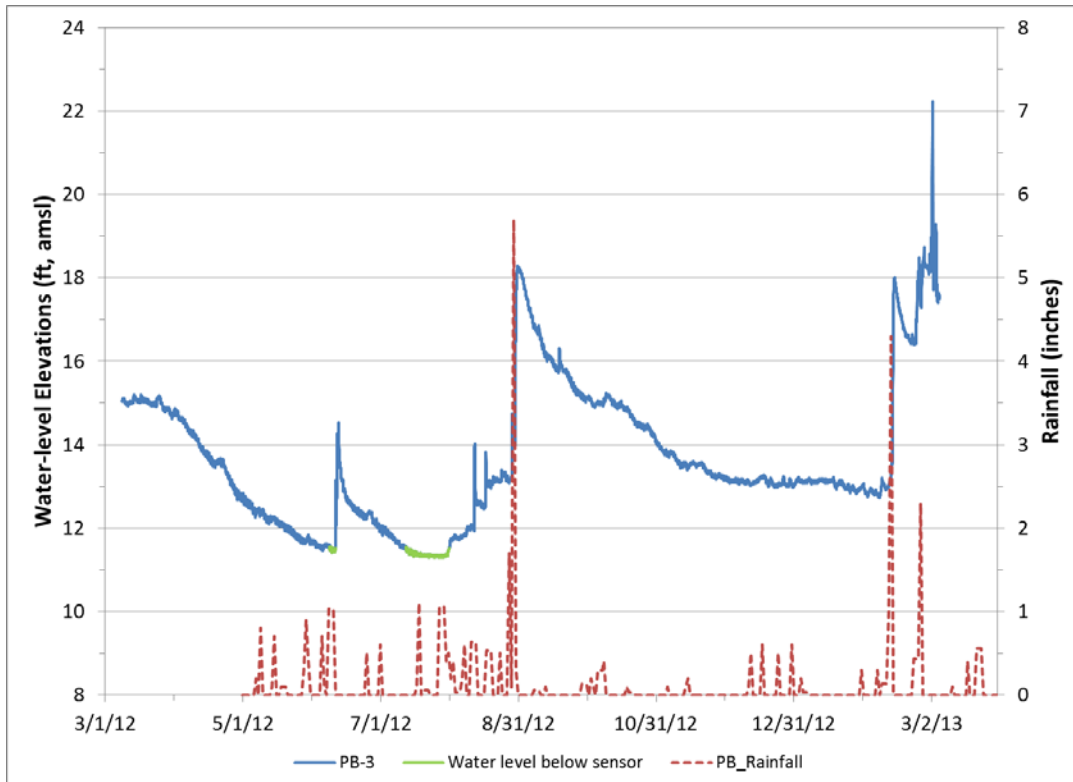


Figure 16. Groundwater-level elevations at PB-3.

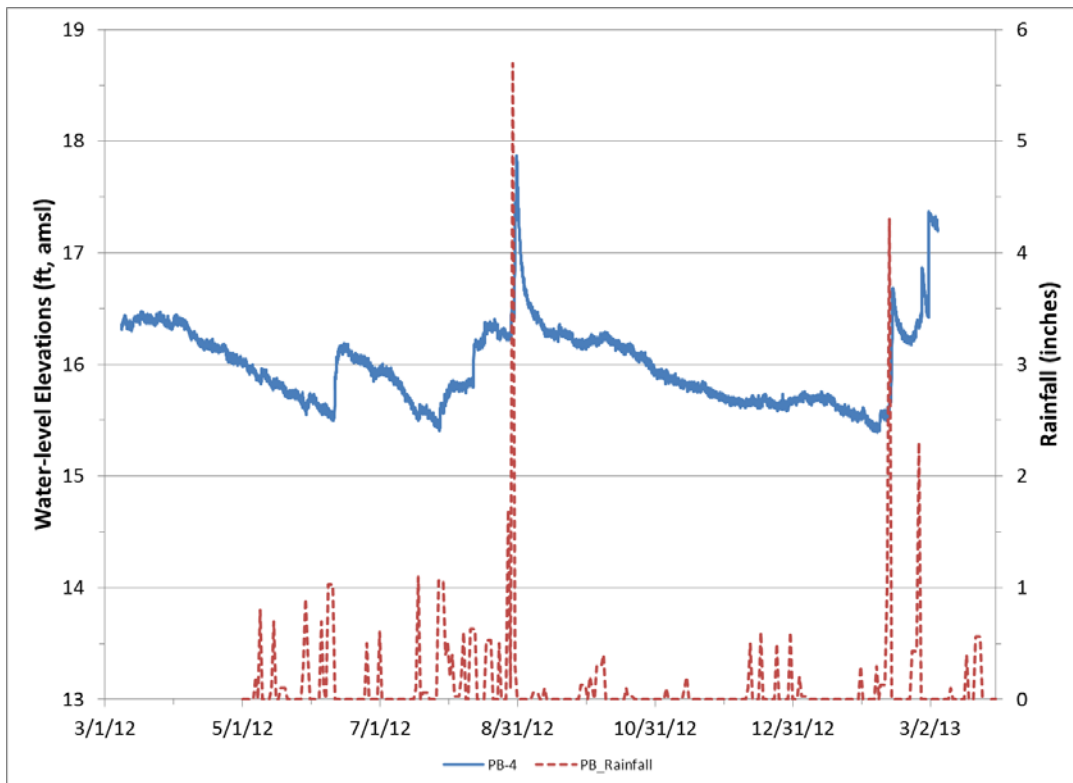


Figure 17. Groundwater-level elevations at PB-4.

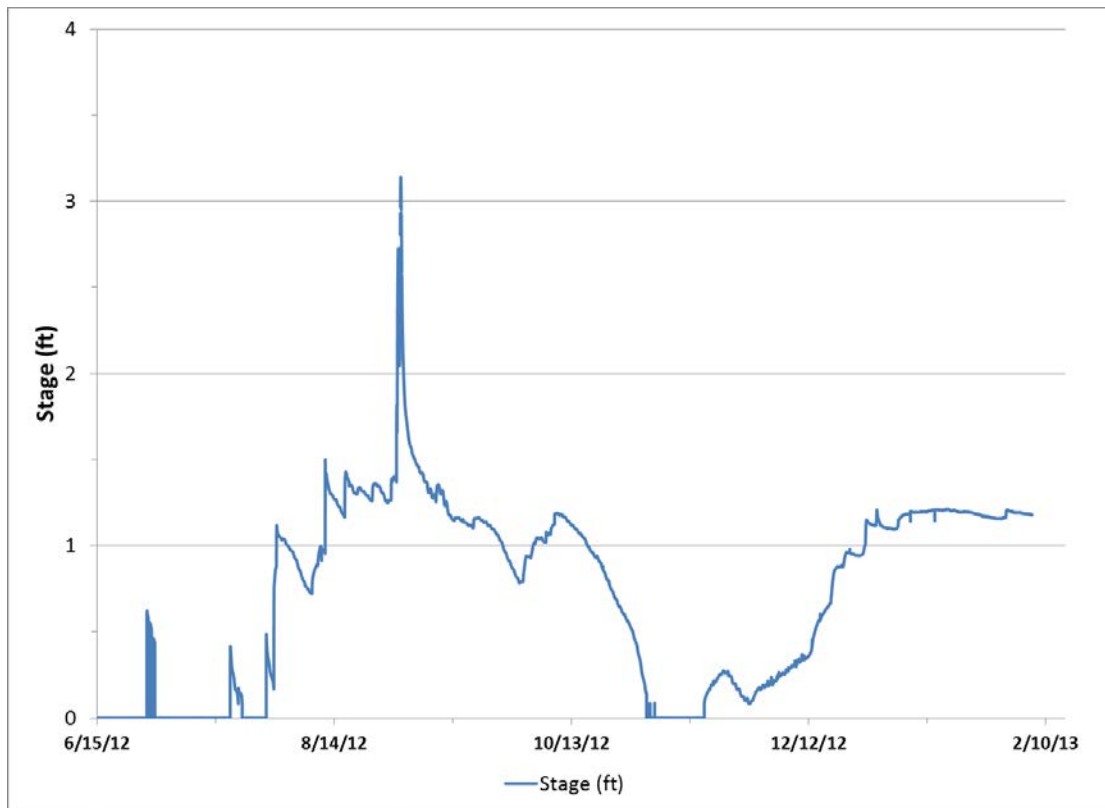


Figure 18. Outlet stage at the Palmetto Bluff watershed.

UNAUDITED AND PRELIMINARY
BEAUFORT COUNTY, SOUTH CAROLINA
STATEMENT OF NET ASSETS
Stormwater Utility and Capital Improvement Funds
April 30, 2014 & April 30, 2013

	Stormwater Utility Fund April 30, 2014	Capital Improvement Fund April 30, 2014	Stormwater Utility Fund April 30, 2013
<u>ASSETS</u>			
Current Assets			
Cash and Investments with Trustee	\$ 2,395,506	811,313	\$ 3,037,509
Receivables, Net	109,334	-	2,334
Inventories	92,511	-	102,941
Total Current Assets	<u>2,597,351</u>	<u>811,313</u>	<u>3,157,077</u>
Capital Assets	2,976,411	-	2,841,893
Accumulated Depreciation	<u>(2,142,794)</u>	<u>-</u>	<u>(2,068,828)</u>
	833,617	-	773,065
Total Assets	\$ 3,430,968	811,313	\$ 3,930,142
<u>LIABILITIES</u>			
Liabilities			
Account Payable	225,680	-	57,400
Accrued Payroll	46,883	-	69,791
Accrued Compensated Absences	6,247	-	4,470
Total Current Liabilities	<u>278,810</u>	<u>-</u>	<u>131,661</u>
Long Term Liabilities			
Accrued Compensated Absences	55,379	-	64,937
Net Other Postemployment Benefits Obligation	<u>831,027</u>	<u>-</u>	<u>690,547</u>
Total Long Term Liabilities	<u>886,406</u>	<u>-</u>	<u>755,484</u>
Total Liabilities	1,165,216	-	887,145
<u>NET ASSETS</u>			
Invested in Capital Assets, Net of Related Debt	833,617	-	773,065
Reserved for Encumbrances	130,455	-	323,002
Reserved for Capital Improvement Unrestricted	<u>-</u>	<u>811,313</u>	<u>-</u>
	1,301,680	-	1,946,930
Total Net Assets	<u>\$ 2,265,752</u>	<u>\$ 811,313</u>	<u>\$ 3,042,997</u>

Unaudited and Preliminary
BEAUFORT COUNTY, SOUTH CAROLINA
STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET ASSETS
Stormwater Capital Improvement Fund
For the Period Ended April 30, 2014

	Budget FY 2014	April 30, 2014	Budget to Actual	Percent of Budget
Transfers In from Stormwater Utility Fund				
Administration Complex Parking Lot Retrofit	\$ -	\$ 329,650	329,650	100%
Okatie East Retrofit	-	60,237	60,237	100%
Highway 278 Retrofit	-	222,600	222,600	100%
Okatie West Land Purchase	-	100,000	100,000	100%
Upper Battery Creek Retrofit	-	147,218	147,218	100%
Total Transfers In	<u>-</u>	<u>859,705</u>	<u>859,705</u>	<u>100%</u>
Capital Improvement Expenses				
Administration Complex Parking Lot Retrofit	-	981	981	100%
Okatie East Retrofit	-	17,925	17,925	100%
Highway 278 Retrofit	-	14,878	14,878	100%
Okatie West Land Purchase	-	-	-	0%
Upper Battery Creek Retrofit	-	14,608	14,608	100%
Total Operating Expenses	<u>-</u>	<u>48,392</u>	<u>48,392</u>	<u>#DIV/0!</u>
Change in Net Assets by Project				
Administration Complex Parking Lot Retrofit	-	328,669	328,669	100%
Okatie East Retrofit	-	42,312	42,312	100%
Highway 278 Retrofit	-	207,722	207,722	100%
Okatie West Land Purchase	-	100,000	100,000	100%
Upper Battery Creek Retrofit	-	132,610	132,610	100%
Total Change in Net Assets by Project	<u>-</u>	<u>811,313</u>	<u>811,313</u>	<u>100%</u>
Net Assets, Beginning	<u>-</u>	<u>-</u>		
Net Assets, Ending	<u>\$ -</u>	<u>\$ 811,313</u>	811,313	100%

Unaudited and Preliminary
 BEAUFORT COUNTY, SOUTH CAROLINA
 STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET ASSETS
 Stormwater Utility Fund
 For the Period Ended April 30, 2014

	Budget FY 2014	April 30, 2014	Budget to Actual	Percent of Budget
Operating Revenues				
Stormwater Utility Fees	\$ 3,475,000	\$ 2,928,439	(546,561)	84%
Stormwater Utility Project Billings	60,023	110,272	50,249	184%
Total Operating Revenues	<u>3,535,023</u>	<u>3,038,711</u>	<u>(496,312)</u>	<u>86%</u>
Operating Expenses				
Personnel	2,160,475	1,586,099	(574,376)	73%
Purchased Services	961,864	476,399	(485,465)	50%
Supplies	381,446	260,533	(120,913)	68%
Depreciation	242,119	201,770	(40,349)	83%
Total Operating Expenses	<u>3,745,904</u>	<u>2,524,801</u>	<u>(1,221,103)</u>	<u>67%</u>
Operating Income (Loss)	(210,881)	513,910	724,791	-244%
Non-Operating Revenues (Expenses)				
Gain (Loss) on Sale of Capital Assets	-	(31,113)	(31,113)	-100%
Interest Earned	6,922	-	(6,922)	0%
Total Non-Operating Revenues (Expenses)	<u>6,922</u>	<u>(31,113)</u>	<u>(38,035)</u>	<u>0%</u>
Transfers Out To Capital Improvement Fund	-	859,705	859,705	100%
Change in Net Assets	(203,959)	(376,908)	(172,949)	185%
Net Assets, Beginning	<u>2,642,660</u>	<u>2,642,660</u>		
Net Assets, Ending	<u>\$ 2,438,701</u>	<u>\$ 2,265,752</u>	(172,949)	93%

Unaudited and Preliminary
 BEAUFORT COUNTY, SOUTH CAROLINA
 STATEMENT OF REVENUES, EXPENSES AND CHANGES IN NET ASSETS
 Stormwater Utility Fund
 For the Period Ended April 30, 2013

	Budget FY 2013	April 30, 2013	Budget to Actual	Percent of Budget
Operating Revenues				
Stormwater Utility Fees	\$ 3,469,180	\$ 2,932,407	(536,773)	85%
Stormwater Utility Project Billings	370,664	20,299	(350,365)	5%
Total Operating Revenues	<u>3,839,844</u>	<u>2,952,706</u>	<u>(887,138)</u>	<u>77%</u>
Operating Expenses				
Personnel	2,014,323	1,515,782	(498,541)	75%
Purchased Services	1,296,188	660,589	(635,599)	51%
Supplies	426,597	239,024	(187,573)	56%
Depreciation	273,545	227,960	(45,585)	83%
Total Operating Expenses	<u>4,010,653</u>	<u>2,643,355</u>	<u>(1,367,298)</u>	<u>66%</u>
Operating Income (Loss)	(170,809)	309,351	480,160	-181%
Non-Operating Revenues (Expenses)				
Interest Earned	11,389	-	(11,389)	0%
Total Non-Operating Revenues (Expenses)	<u>11,389</u>	<u>-</u>	<u>(11,389)</u>	<u>100%</u>
Change in Net Assets	(159,420)	309,351	468,771	-194%
Net Assets, Beginning	<u>2,733,646</u>	<u>2,733,646</u>		
Net Assets, Ending	<u>\$ 2,574,226</u>	<u>\$ 3,042,997</u>	468,771	118%



BEAUFORT COUNTY STORMWATER UTILITY
 120 Shanklin Road
 Beaufort, South Carolina 29906
 Voice (843) 255-2801 Facsimile (843) 255-9478



February 5, 2013

TO: Bryan Hill, Deputy Administrator

VIA: David Starkey, Chief Financial Officer *DS*
 Robert Klink, County Engineer *RK*
 Dave Thomas, Purchasing Director *DT*
 Monica Spells, Compliance Officer

FROM: Robert McFee, P.E., Stormwater Manager *RM*
 Alan Eisenman, Finance Supervisor *AE*

Handwritten signatures and initials: DS, RK, DT, RM, AE

SUBJ: **Capital Improvement Budget Transfer for the Stormwater Utility**

BACKGROUND. On July 19, 2012 a Balance Utilization Plan was developed based on a July 13, 2012 request to develop a plan to where the Stormwater Utility cash balance in the month of November/December would be near zero. This plan focused on funding retrofit projects to implement the 5-year watershed restoration plan that was approved by the County Council in January 2012. This plan identified eight restoration activities ranging in cost from \$107,000 to \$4,095,000 for an estimated total cost of \$9,279,000. Since the lowest cash balance in fiscal year 2011 was \$847,658, there will be issues with trying to fund the larger retrofit projects when they are ready.

This issue was discussed at the November 7, 2012 Stormwater Utility Board and they made a suggestion of considering a capital improvement fund to direct funds to these watershed restoration projects. Staff discussed their suggestion, but rather recommends making a budget transfer from unrestricted net assets to capital project expense accounts to fund these projects. This offers a method of meeting our cash balance goal and having adequate funds to complete the restoration projects as they proceed during the 5-year watershed restoration period. Projects to utilize the funds will be identified separately in the 5-year budget of the Utility.

DISCUSSION. It is proposed to request a capital improvement budget transfer that will be restricted to fund large Watershed Restoration Projects that cannot be supported with funds available in a single fiscal year budget. The initial capital improvement budget transfer will be for the projects expected to be funded in the next year. These will be:

		<i>Less FY 13 Exp</i>	<i>FY 14 Transfer</i>
<i>SW1-11</i> Administration Complex Parking Lot Retrofit	\$330,000	- 350	= 329,650
<i>SW2-12</i> Okatie East Retrofit	\$107,000	- 46,762.66	= 60,237.34
<i>SW3-13</i> Highway 278 Retrofit (SWU portion)	\$231,000	- 8,400	= 222,600
<i>SW4-14</i> Okatie West Land Purchase	\$100,000	- 0	= 100,000
Total	\$768,000	<u>55,512.66</u>	<u>712,487.34</u>

In the future, as additional unrestricted net asset balances become available Stormwater Utility will request a capital improvement budget transfer to fund future watershed retrofit projects.

RECOMMENDATION: A Stormwater Utility Capital Improvement Budget Transfer made for \$768,000 to fund Watershed Restoration Projects necessary to restore designated water uses and comply with Total Maximum Daily Load (TMDL) requirements.



Beaufort County Public Works Stormwater Utility

Budget Comparison

Revised Date: December 31, 2013

Revenue/Reserve Utilization

	Board Budget	FY2013 Unaudited Actuals	Variance	FY 2014 Approved Budget
Revenue				
Admin SWU Fees	\$ 309,117	\$ 311,086	\$ (1,969)	\$ 312,064
Utility Activities SWU Fees	3,160,063	2,759,703	400,360	3,162,936
Total Revenue from SWU Fees	3,469,180	3,070,789	398,391	3,475,000
Reimbursable Projects	63,000	33,808	29,192	2,500
Interest	11,389	2,955	8,434	6,923
Other Charges	-	(2,920)	2,920	-
Cost-Share for Joint Efforts	307,664	50,403	257,261	57,522
Reserve Utilization				
Del Webb Agreement Fund	-	-	-	-
Stormwater Utility	159,420	90,986	68,434	-
	\$ 4,010,653	\$ 3,246,022	\$ 764,631	\$ 3,541,945

Efforts (Expenditures)

	FY2013			FY2014
Admin	\$ 309,117	\$ 244,053	\$ 65,064	\$ 312,064
Utility Activities				
UA/Control Reg	113,560	78,147	35,413	73,147
UA/WQ Monitoring	148,200	174,766	(26,566)	160,000
UA/WQ Controls	440,580	60,248	380,332	200,000
UA/Annual Maintenance	2,364,776	2,376,048	(11,272)	2,679,069
UA/Public Information/Outreach	75,000	67,665	7,335	67,665
UA/Drainage Enhancement	25,000	2,700	22,300	25,000
UA/Additional Studies	375,000	242,394	132,606	25,000
<i>Utility Activities Subtotal</i>	3,542,116	3,001,968	540,148	3,229,881
*Reserve Utilization				
UA/WQ Controls	159,420	-	159,420	-
<i>Reserve Utilization Subtotal</i>	159,420	-	159,420	-
Efforts Total	\$ 4,010,653	\$ 3,246,022	\$ 764,631	\$ 3,541,945

carolynw:
 \$350 - BC Admin Bldg
 \$4,735.10 - Shanklin Rd
 WQ Retrofit (includes
 Ward Edwards Invoices)
 \$8,400 - Hwy 278
 \$46,762.66 - Okatie East

*Efforts funded by utilizing the reserve are spread among all utility activities.

Change in Capital Assets On Balance Sheet

	FY2013			FY2014
Capital Assets Additions	\$ 126,367	\$ 146,212	\$ (19,845)	\$ 455,991
Depreciation	(273,545)	(248,463)	(25,082)	(242,119)
	\$ (147,178)	\$ (102,250)	\$ (44,928)	\$ 213,872

Hickman, Maggie

From: Thomas East [teast@cityofbeaufort.org]
Sent: Wednesday, July 03, 2013 10:13 AM
To: McFee, Robert
Cc: Hickman, Maggie; Scott Dadson; Isiah Smalls; Lamar Taylor
Subject: Letter of Commitment
Attachments: DOC011.pdf; 319 County Grant Commitment.doc

Rob,

Good morning. We are approaching the 319 Grant deadline of July 15th and need Mr. Gary Kubic's letter of commitment. This is the only grant application document requiring his signature as well as Scott Dadson's signature.

Attached is a copy of the letter signed by Scott and the Word document for preparing Mr. Kubic's letter for signature. You will need to add these words to a County letterhead then print for his signature.

The 319 Grant pays up to 60% requiring a local match of 40%. The 40% local match will be split evenly between the City and the County. Ward Edwards estimates the total cost to be \$736,088 requiring the City and County to provide a local match of \$147,217.60 each.

Once Mr. Kubic signs this on County letterhead, please scan and email it to me.

Thanks,

Thomas East, Accountant

City of Beaufort
1911 Boundary Street
Beaufort, SC 29902
Ph: 843-525-7071
Fax: 843-986-5606
www.cityofbeaufort.org

STATE OF SOUTH CAROLINA)
) INTERGOVERNMENTAL AGREEMENT
COUNTY OF BEAUFORT)

This Intergovernmental Agreement (“Agreement”) was developed February xx, 2013 between the City of Beaufort (hereinafter referred to as the “City”) and Beaufort County, South Carolina (hereinafter referred to as the “County”) and together with the City, (“Parties”, each a “Party”) to define and implement environmental initiatives related to the protection of Upper Battery Creek Watershed.

WHEREAS, the City and County realize that the protection of this watershed and other outstanding natural water resources are of utmost importance to our community; and

WHEREAS, drainage to Upper Battery Creek are located in both City and unincorporated County boundaries; and

WHEREAS, the City and County understand that the development of a partnership for safeguarding of the watersheds and other outstanding natural water resources is of the utmost importance; and

WHEREAS, the City and County understand that water quality monitoring indicates that the drainage from the Cross Creek area is contributing the highest known levels of bacteria loads to the Upper Battery Creek;

NOW, THEREFORE, for and in consideration of mutual promises, undertakings, and covenants set forth herein, the receipt and sufficiency of which is acknowledged and affirmed by the City and the County, the Parties hereto agree to this amendment as follows:

1. **Establish a cost sharing mechanism on the initial Cross Creek area (Burton Hill) retrofit project.** It is the intent of the Parties that cost sharing should be on an equal basis with each party contributing 50% of the local cost. This includes the cost of preparing the watershed base plan and the 319 grant application by Ward Edwards, estimated to be \$13,200. Should the City and County be awarded the grant, the remaining cost will be split on an even basis with each party contributing 50% of the remaining cost after applying the grant funds.
2. **Implementation of Burton Hill retrofit project**
 - a. Through a competitive RFQ process, the City has selected an engineering firm for an Indefinite Delivery Contract. The selected engineer, Ward Edwards, Inc., will be responsible for the design of the project. Design shall be broken into two parts, the first of which will be preliminary

engineering and surveying to determine the feasibility and performance of the proposed retrofit described as Burton Hill M2. If this initial work demonstrates the likely benefit to water quality, final design will commence and encompass all work required successfully complete necessary project designs and drawings.

- b. The City will take lead in the project and be the decision maker throughout the project. Should the City and County be awarded the 319 Federal Grant, the City will be the named Grantee. The City will be responsible for paying all invoices related to the project. The City will request reimbursement from the Grantor on a quarterly basis. The City will submit an invoice to the County for their share on a quarterly basis. The County must reimburse the City within 30 days of the invoice date.
 - c. Parties will proceed with construction as budgets allow.
3. **Term.** This agreement shall remain in force until the completion of Cross Creek retrofit known also as the Burton Hill M2 retrofit. Additional retrofit projects, if needed, will be addressed in separate agreements.

IN WITNESS WHEREOF, the Parties hereto have affixed their signatures hereto the date first written hereinabove.

Dated this 30th day of August 2013

BEAUFORT COUNTY

By _____

Date _____

Address:
P.O. Drawer 1228
Beaufort, SC 29901-1228

CITY OF BEAUFORT

By _____

Date _____

Address:
1911 Boundary Street
Beaufort, SC 29902

	Budget FY 2015	Budget FY 2016	Budget FY 2017	Budget FY 2018	Budget FY 2019	Budget FY 2020	Budget FY 2021	Budget FY 2022	Budget FY 2023	Budget FY 2024		
CAPITAL PROJECTS												
SC170/Okatie West	60,000	315,000	600,000								=	975,000
Hwy 278 Retrofit (Ttl estimate \$231K)	216,122										=	216,122
Admin Bldg Parking Lot (Ttl estimate \$330K)	327,768										=	327,768
Battery Creek (Revised estimate for cost-share \$147K)	132,609										=	132,609
Buckingham Plantation	100,000	400,000	400,000								=	900,000
Sawmill Creek Overtopping/Forby (land \$100K/design \$25K/\$25K Construction)		125,000	25,000								=	150,000
Brewer Memorial Park Demonstration Wet Pond Porject (Feasibility \$9.5K/Design \$20K/Construction \$50K)	9,500	20,000		50,000							=	79,500
Salt Creek South M1 (\$245K Design/\$400K ROW/\$1.4M Construction)				245,000	400,000	1,400,000					=	2,045,000
Shanklin Road M2 (\$330K Design/ \$660K ROW/\$2.35K Construction)				330,000	660,000		2,350,000				=	3,340,000
Factory Creek M2(\$200K Design/\$340K ROW/\$1.2M Construction)				200,000		340,000		1,200,000			=	1,740,000
Grober Hill M2 (\$225K Design/\$900K ROW/\$1.4M Construction)				225,000		900,000		1,400,000			=	2,525,000
Camp St. Mary M2 (\$342K Design/\$165K ROW/\$3.25M Construction)							342,000	165,000	3,250,000		=	3,757,000
Battery Creek West M1(\$375K Design/\$165K ROW/\$3.6M Construction)								375,000	165,000	3,600,000	=	4,140,000
Paige Point Overtopping Design (\$30K/\$305K Construction)									30,000	305,000	=	335,000
	845,999	860,000	1,025,000	1,050,000	1,060,000	2,640,000	2,692,000	3,140,000	3,445,000	3,905,000	=	20,662,999

County Retrofit Project: SC170/Okatie West
Activity: Regional/Retrofit BMP
Township: Bluffton

Project Schedule: FY 2015-2017

Project Cost: \$975,000
 \$60,000 (2015)
 \$315,000 (2016)
 \$600,000 (2017)



Drainage

TYPE	
	River
	Creek/Stream
	River/Creek/Marsh BANK
	Channel (fka Outfall)
	Channel Pipe
	Lateral
	Lateral Pipe
	Roadside
	Roadside Pipe
	Road Pipe
	Crossline Pipe
	Driveway Pipe
	Access Pipe
	Bleeder Pipe



1 inch = 3,771 feet

Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: The Okatie River watershed has been identified as a high priority watershed for water quality improvements due to bacteria contamination. The east branch of the headwaters was improved in FY2014 with a wetland enhancement project near Island West golf course and subdivision. A similar enhancement or detention basin is planned for the west branch. Increased runoff from the widening of SC170 in the west branch subwatershed basin adds to the need for a retrofit to the watershed to improve stormwater runoff water quality and reduce runoff volume. The project is a series of detention basins along SC170.

County Retrofit Project: Hwy 278 Retrofit
Activity: Retrofit BMP
Township: Bluffton

Project Schedule: FY 2015

Project Cost: \$216,122



Drainage

TYPE	
River	River
Creek/Stream	Creek/Stream
River/Creek/Marsh BANK	River/Creek/Marsh BANK
Channel (fka Outfall)	Channel (fka Outfall)
Channel Pipe	Channel Pipe
Lateral	Lateral
Lateral Pipe	Lateral Pipe
Roadside	Roadside
Roadside Pipe	Roadside Pipe
Road Pipe	Road Pipe
Crossline Pipe	Crossline Pipe
Driveway Pipe	Driveway Pipe
Access Pipe	Access Pipe
Bleeder Pipe	Bleeder Pipe



1 inch = 2,468 feet

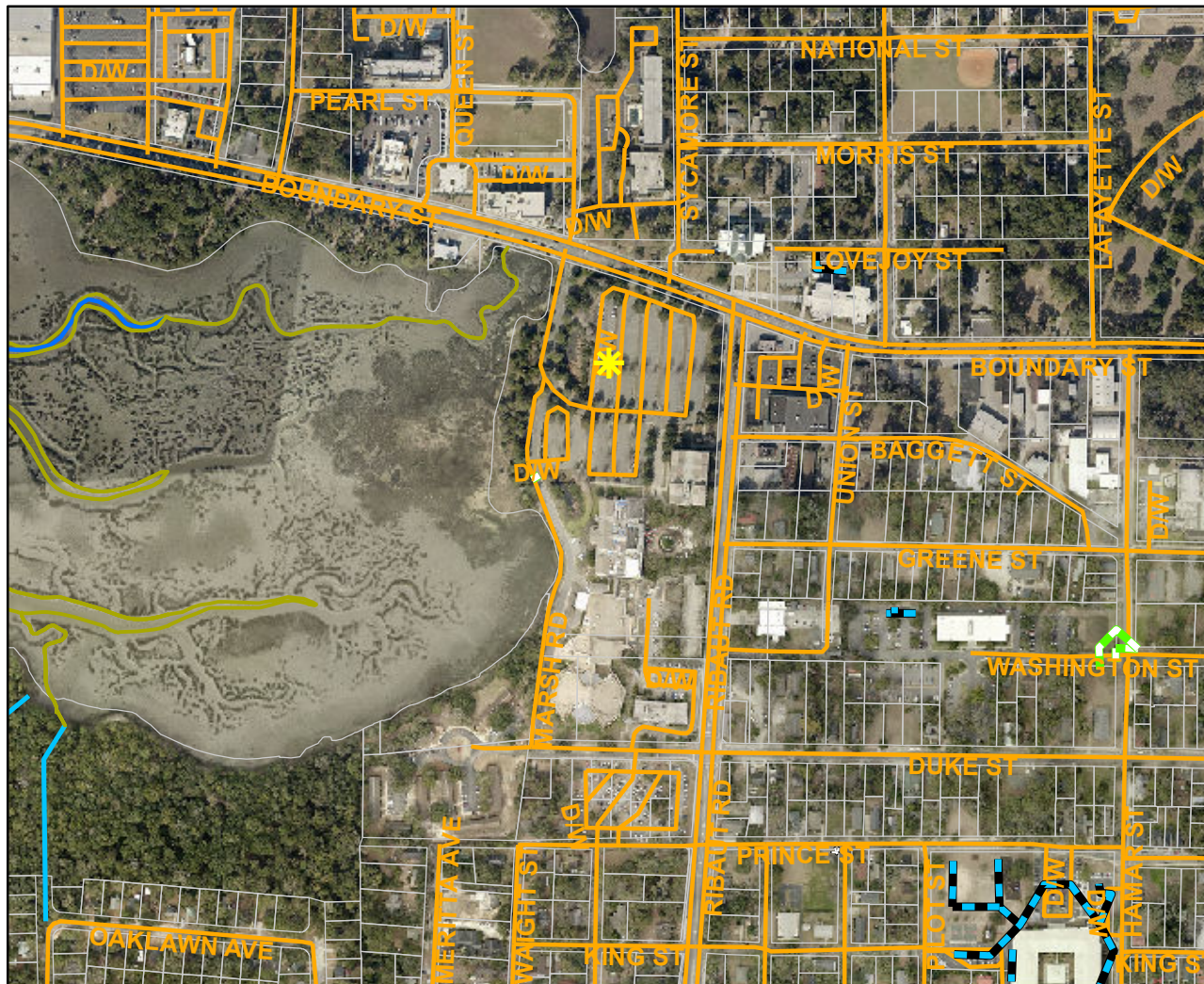
Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Construct four detention basins along US 278 between Pickney Colony Road and SC170 to intercept stormwater runoff, provide water quality treatment, and reduce volume into the Okatie River. The Okatie is impaired by bacteria pollution, a major source being urban runoff.

County Retrofit Project: Beaufort County Administration Parking Lot
Activity: Demonstration BMP
Township: Port Royal Island

Project Schedule: FY 2015

Project Cost: \$327,768



Drainage	
TYPE	
River	— River
Creek/Stream	— Creek/Stream
River/Creek/Marsh BANK	— River/Creek/Marsh BANK
Channel (fka Outfall)	— Channel (fka Outfall)
Channel Pipe	— Channel Pipe
Lateral	— Lateral
Lateral Pipe	— Lateral Pipe
Roadside	— Roadside
Roadside Pipe	— Roadside Pipe
Road Pipe	— Road Pipe
Crossline Pipe	— Crossline Pipe
Driveway Pipe	— Driveway Pipe
Access Pipe	— Access Pipe
Bleeder Pipe	— Bleeder Pipe



1 inch = 563 feet

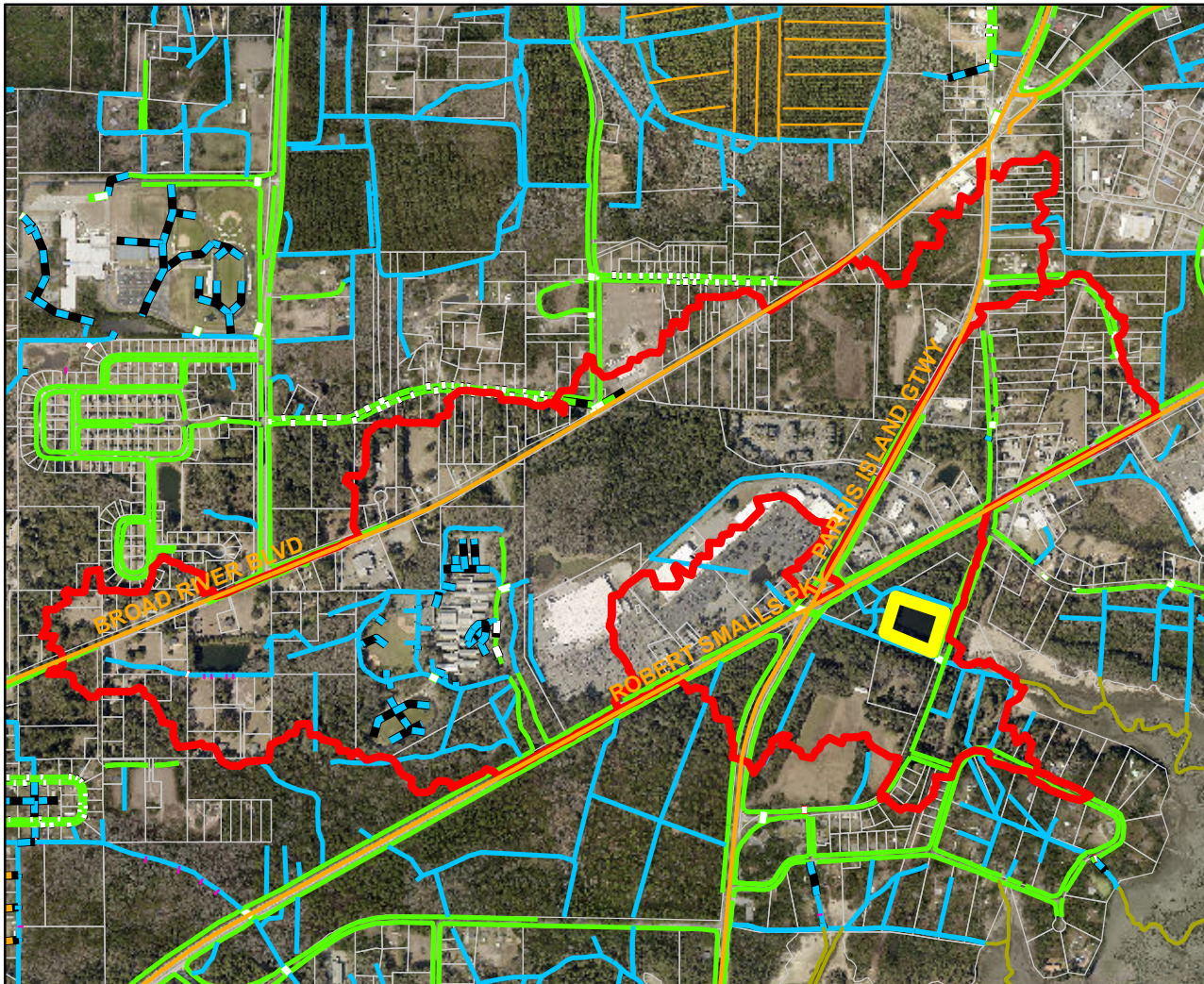
Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Retrofit a portion of the parking lot at the County Administration Building on Ribaut Road with pervious pavement and bio-swales to reduce stormwater runoff volume and provide water quality treatment prior to discharge into the Battery Creek. This project is envisioned as a demonstration project due to the high profile location and provides an opportunity to educate the public on stormwater pollution and best management practices to address the same. Battery Creek is impaired by bacteria pollution, a major source being urban runoff.

County Retrofit Project: Battery Creek 319
Activity: Regional BMP
Township: Port Royal Island

Project Schedule: FY 2015

Project Cost: \$132,609



Drainage	
TYPE	
River	— Roadside
Creek/Stream	— Roadside Pipe
River/Creek/Marsh BANK	— Road Pipe
Channel (fka Outfall)	— Crossline Pipe
Channel Pipe	— Driveway Pipe
Lateral	— Access Pipe
Lateral Pipe	— Bleeder Pipe



1 inch = 1,426 feet

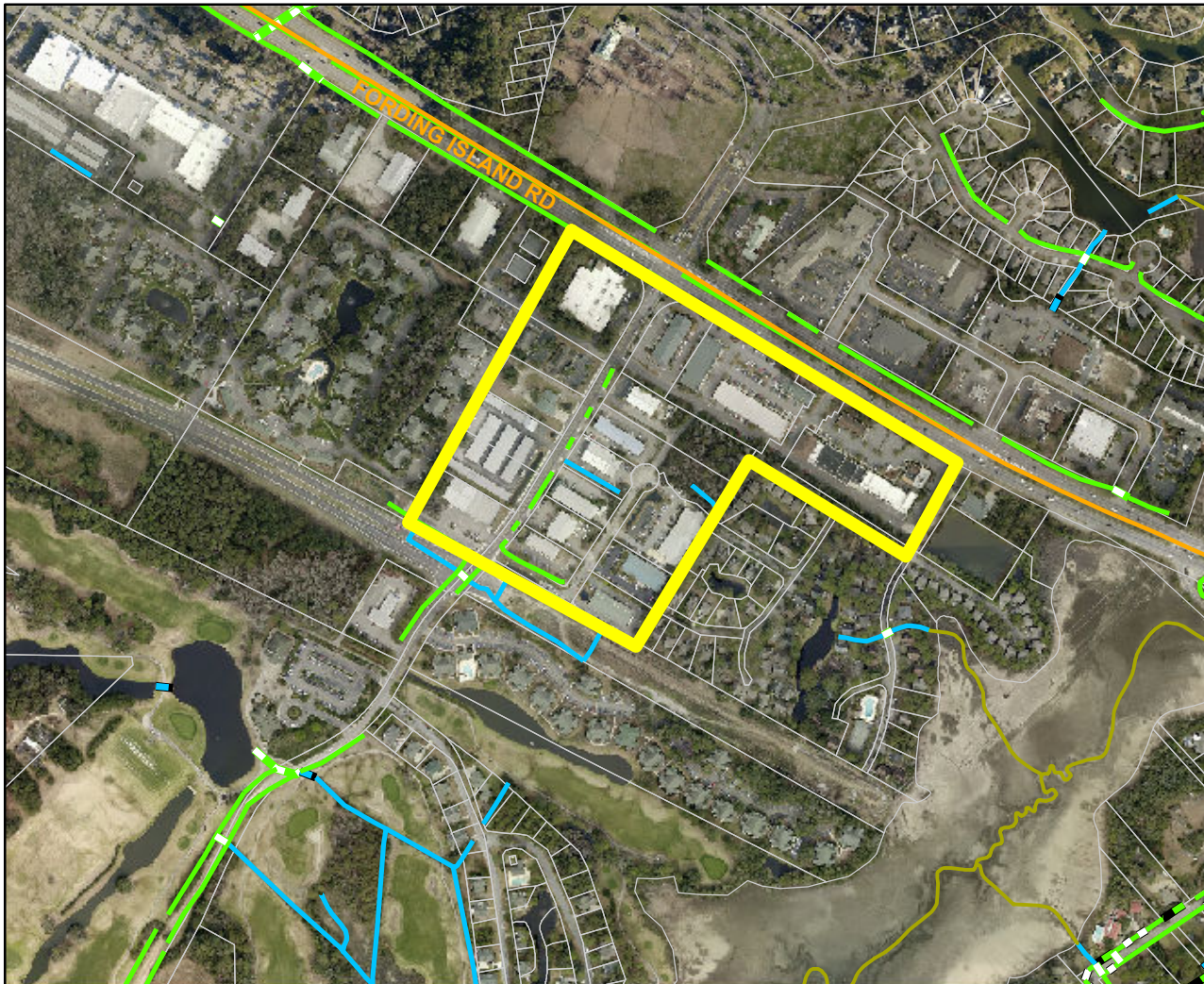
Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Construct a detention pond to intercept stormwater runoff from an densely developed urban area of the BatteryCreek watershed near SC170 and the US 21and the Cross Creek Shopping Center. The Project is partially funded by a US EPA Section 319 grant with the match being shared by the City of Beaufort and Beaufort County. Battery Creek is impaired by bacteria pollution, a major source being urban runoff.

County Retrofit Project: Buckingham Plantation Stormwater Retrofit
Activity: Retrofit BMP
Township: Bluffton

Project Schedule: FY 2015-2017

Project Cost: \$900,000
 \$100,000 (2015)
 \$400,000 (2016)
 \$400,000 (2017)



Drainage	
TYPE	
	River
	Creek/Stream
	River/Creek/Marsh BANK
	Channel (fka Outfall)
	Channel Pipe
	Lateral
	Lateral Pipe
	Roadside
	Roadside Pipe
	Road Pipe
	Crossline Pipe
	Driveway Pipe
	Access Pipe
	Bleeder Pipe



1 inch = 628 feet

Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Upgrading Buckingham Plantation Drive and Anolyn Ct. with water quality best management practices to provide stormwater runoff treatment and volume reduction. This project will be in conjunction with other area improvements designed to promote economic redevelopment of the area.

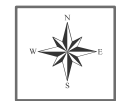
County Retrofit Project: Sawmill Creek Overtopping/Forby Land
Activity: Mitigation BMP
Township: Bluffton

Project Schedule: FY 2016-2017

Project Cost: \$150,000
\$125,000 (2016)
\$25,000 (2017)



Drainage	
TYPE	
River	Roadside
Creek/Stream	Roadside Pipe
River/Creek/Marsh BANK	Road Pipe
Channel (fka Outfall)	Crossline Pipe
Channel Pipe	Driveway Pipe
Lateral	Access Pipe
Lateral Pipe	Bleeder Pipe



1 inch = 667 feet

Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Overtopping of US 278 near Sawmill Creek Road during a 100 - year storm event was identified in the 2006 Stormwater Master Plan. US 278 serves as an evacuation route during a hurricane. The project scope is to construct a detention pond via a wetland enhancement to slow stormwater discharge to the existing culverts under US 278 and to provide water quality treatment and runoff volume reduction. The project will be in conjunction with another project to construct a frontage road in the location providing additional interconnectivity along the south side of the highway.

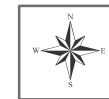
County Retrofit Project: Brewer Memorial Park Demonstration Wet Pond Project Feasibility
Activity: Demonstration BMP
Township: Lady's Island

Project Schedule: FY 2015, 2016 & 2018

Project Cost: \$79,500
\$9,500 (2015)
\$20,000 (2016)
\$50,000 (2018)



Drainage	
TYPE	
River	Roadside
Creek/Stream	Roadside Pipe
River/Creek/Marsh BANK	Road Pipe
Channel (fka Outfall)	Crossline Pipe
Channel Pipe	Driveway Pipe
Lateral	Access Pipe
Lateral Pipe	Bleeder Pipe



1 inch = 167 feet

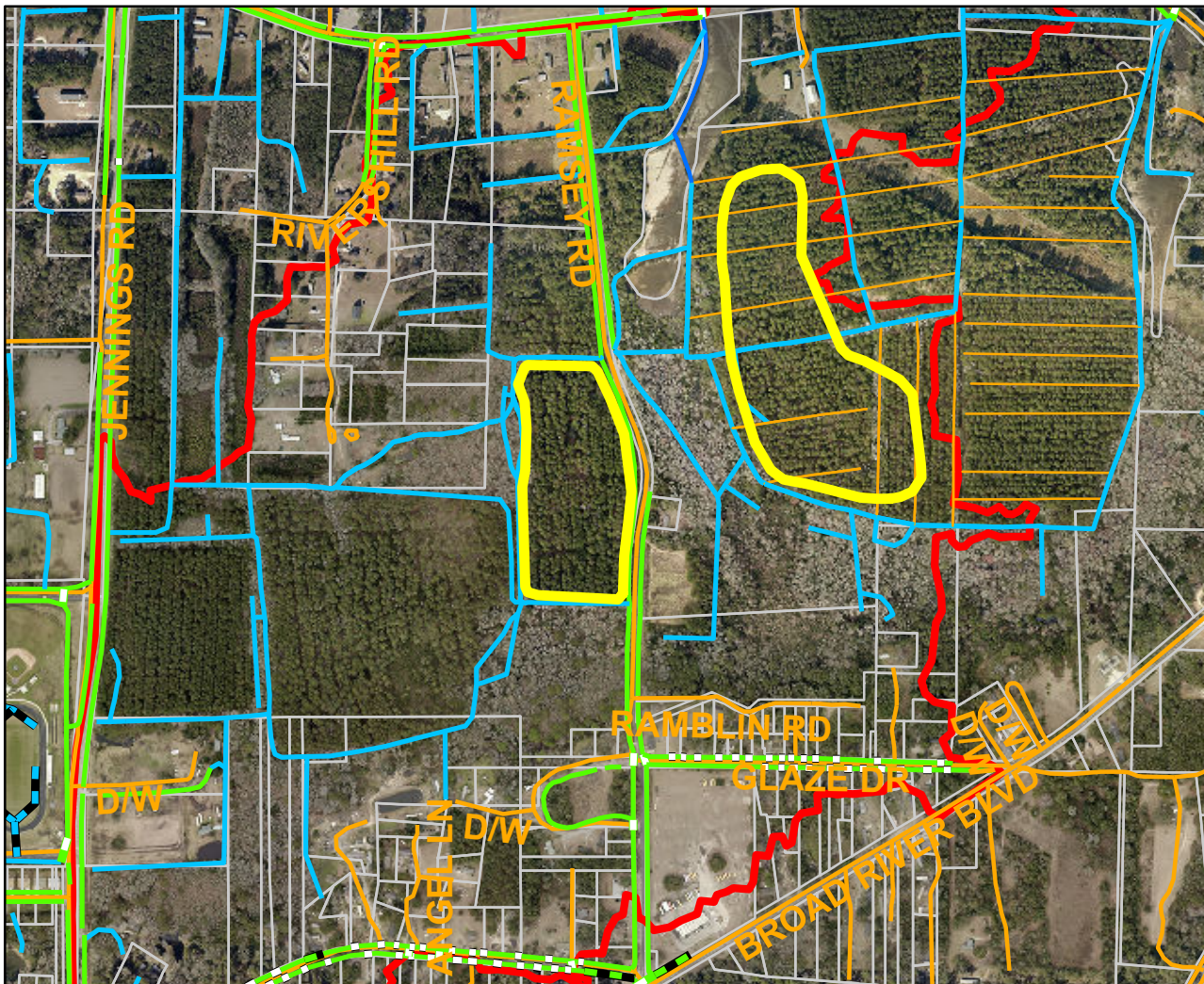
Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Retrofit a former bait pond at the Brewer Memorial Park on Lady's Island. The site has runoff from Sea Island Parkway and adjacent properties that discharges directly to Factory Creek without water quality treatment or volume reduction. The site is envisioned as a demonstration site due to the high profile location. The park is being built with separate funding through the Beaufort Open Land Trust and will include a boardwalk and landscaping around the pond, providing opportunity for viewing and public education.

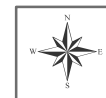
County Retrofit Project: Salt Creek South M1
Activity: Regional BMP
Township: Port Royal Island

Project Schedule: FY 2018-2020

Project Cost: \$2,045,000
\$245,000 (2018)
\$400,000 (2019)
\$1,400,000 (2020)



Drainage	
TYPE	
River	Roadside
Creek/Stream	Roadside Pipe
River/Creek/Marsh BANK	Road Pipe
Channel (fka Outfall)	Crossline Pipe
Channel Pipe	Driveway Pipe
Lateral	Access Pipe
Lateral Pipe	Bleeder Pipe



1 inch = 833 feet

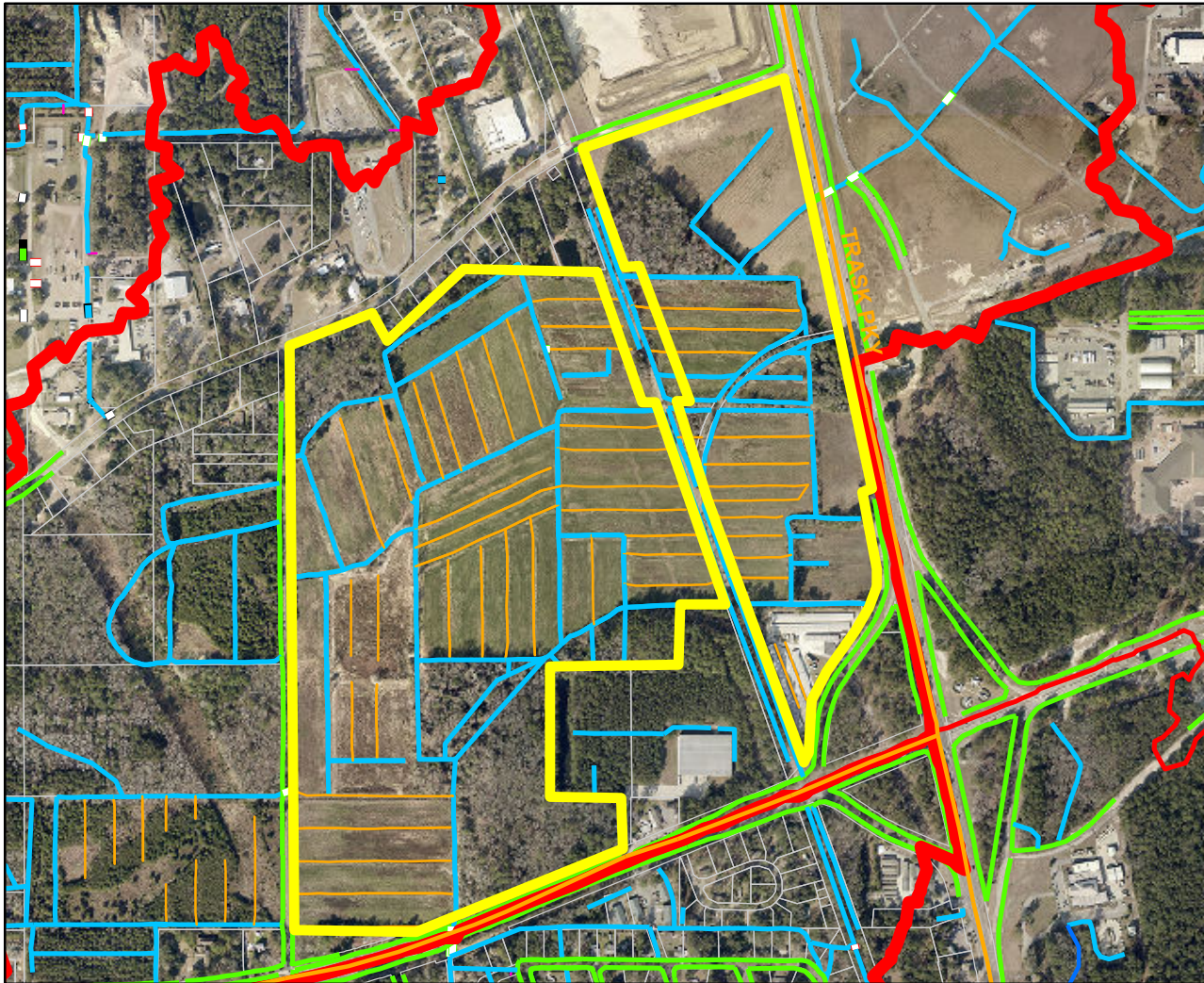
Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Development in the Salt Creek South hydrologic sub-basin in the Albergotti Creek watershed includes approx. 330 acres of rural and single family development built prior to stormwater regulations. There are no stormwater best management practices, such as detention facilities, in the area. The project would be to construct a regional detention facility to provide stormwater runoff water quality treatment and volume reduction. Due to the presence of multiple wetlands in the area, project design would involve delineation and avoidance of the wetlands, making construction cost a limiting factor for project implementation. Albergotti Creek is impaired by bacteria pollution, a major source being urban runoff. The Creek is being proposed for reclassification to allow shellfish harvesting, making this project a higher priority than in the past. The watershed of the site is located within Beaufort County.

County Retrofit Project: Shanklin Road M2
Activity: Regional BMP
Township: Port Royal Island

Project Schedule: FY 2018-2019 & FY 2021

Project Cost: \$3,340,000
\$330,000 (2018)
\$660,000 (2019)
\$2,350,000 (2021)



Drainage	
TYPE	
River	Roadside
Creek/Stream	Roadside Pipe
River/Creek/Marsh BANK	Road Pipe
Channel (fka Outfall)	Crossline Pipe
Channel Pipe	Driveway Pipe
Lateral	Access Pipe
Lateral Pipe	Bleeder Pipe



1 inch = 917 feet

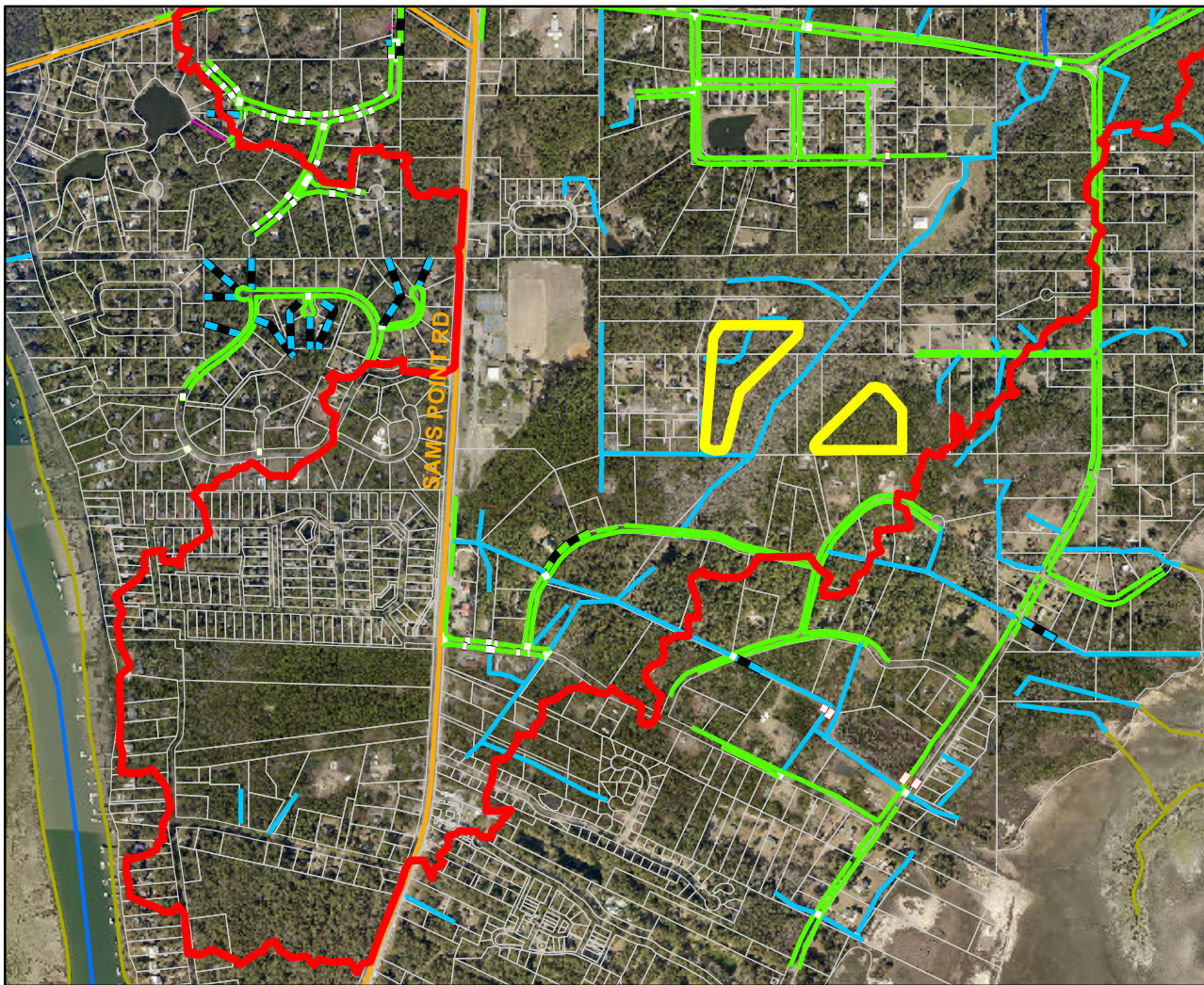
Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Development in the Shanklin Road hydrologic sub-basin in the Albergotti Creek watershed includes approx. 600 acres of rural, single family development, commercial, and industrial built prior to stormwater regulations. There are no stormwater best management practices, such as detention facilities, in the area. The project would be to construct a regional detention facility to provide stormwater runoff water quality treatment and volume reduction. Due to the presence of multiple wetlands in the area, project design would involve delineation and avoidance of the wetlands, making construction cost a limiting factor for project implementation. Albergotti Creek is impaired by bacteria pollution, a major source being urban runoff. The Creek is being proposed for reclassification to allow shellfish harvesting, making this project a higher priority than in the past. The watershed of the site is located within Beaufort County.

County Retrofit Project: Factory Creek M2
Activity: Regional BMP
Township: Lady's Island

Project Schedule: FY 2018, 2020 & 2022

Project Cost: \$1,740,000
\$200,000 (2018)
\$340,000 (2020)
\$1,200,000 (2022)



Drainage	
TYPE	
River	Roadside
Creek/Stream	Roadside Pipe
River/Creek/Marsh BANK	Road Pipe
Channel (fka Outfall)	Crossline Pipe
Channel Pipe	Driveway Pipe
Lateral	Access Pipe
Lateral Pipe	Bleeder Pipe



1 inch = 1,207 feet

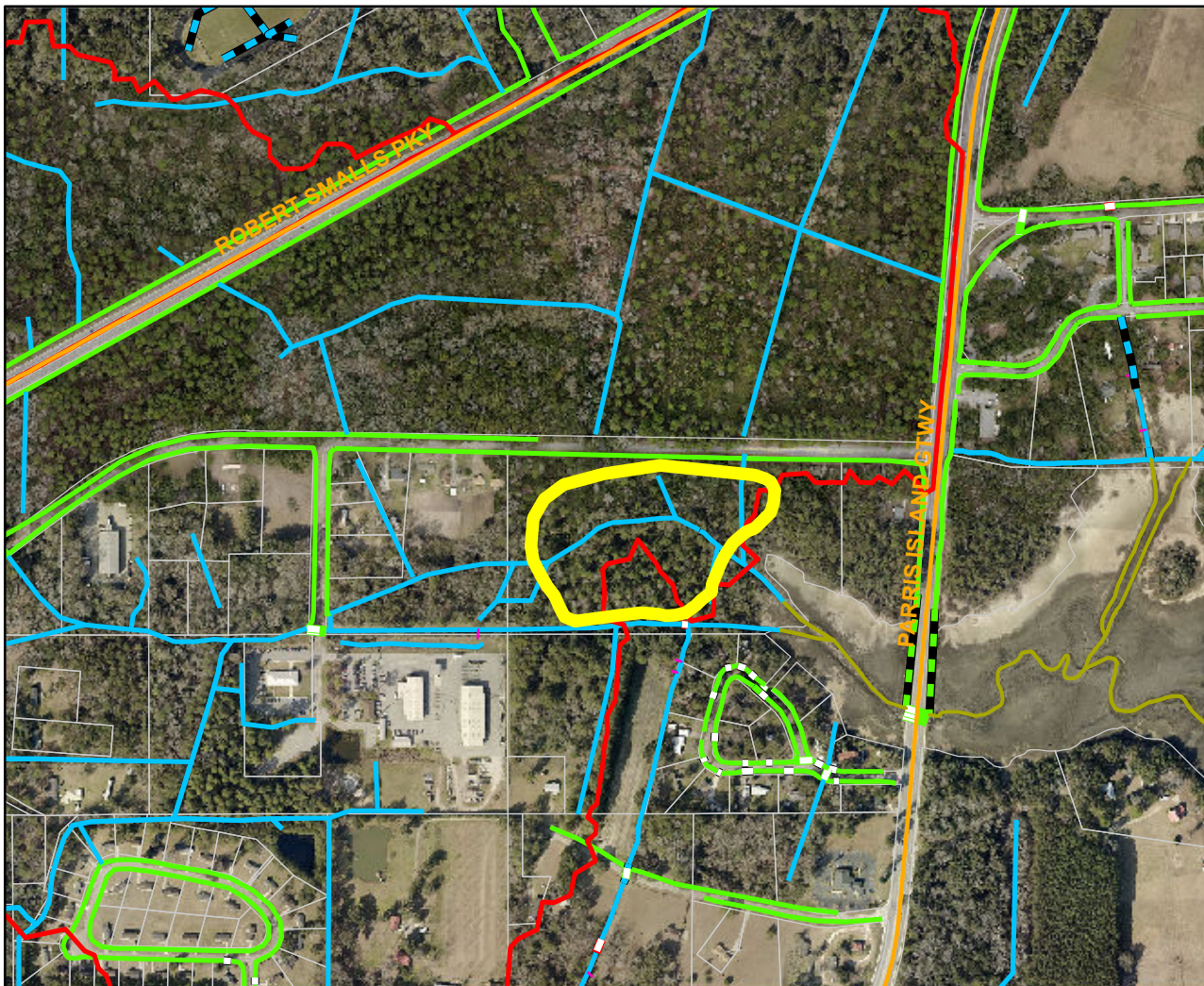
Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Development in the Factory Creek hydrologic sub-basin in the Rock Springs Creek watershed includes approx. 300 acres of a mix of single family development, and commercial/institutional development built prior to stormwater regulations. There are only a few stormwater best management practices, such as detention basins, in the area. The project would be to construct a regional detention facility to provide stormwater runoff water quality treatment and volume reduction. Due to the grades of the area and the "stop gap measure" to construct a ditch to drain a portion of the wetland, construction will involve a large amount of earthwork, making project cost a limiting factor for project implementation. Rock Springs Creek drains into the Morgan River, which is impaired by bacteria pollution, a major source being urban runoff. The site is located in Beaufort County on Lady's Island.

County Retrofit Project: Grober Hill M2
Activity: Regional BMP
Township: Port Royal Island

Project Schedule: FY 2018,2020 & 2022

Project Cost: \$2,525,000
\$225,000 (2018)
\$900,000 (2020)
\$1,400,000 (2022)



Drainage

TYPE	
	River
	Creek/Stream
	River/Creek/Marsh BANK
	Channel (fka Outfall)
	Channel Pipe
	Lateral
	Lateral Pipe
	Roadside
	Roadside Pipe
	Road Pipe
	Crossline Pipe
	Driveway Pipe
	Access Pipe
	Bleeder Pipe



1 inch = 667 feet

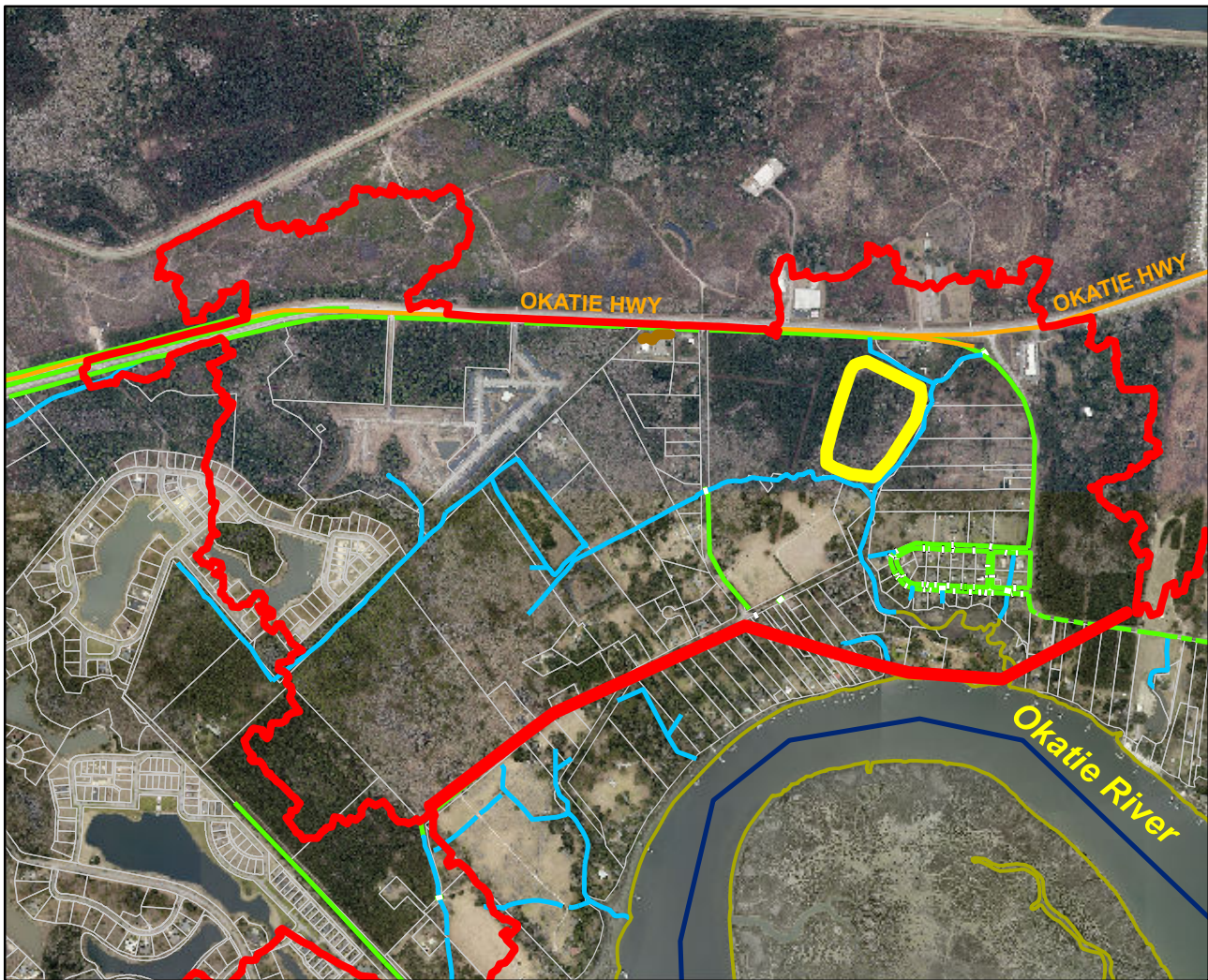
Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Development in the Grober Hill hydrologic sub-basin in the Battery Creek watershed includes approx. 130 acres of single family development built prior to stormwater regulations. There are no stormwater best management practices, such as detention facilities, in the area. The project would be to construct a regional detention facility to provide stormwater runoff water quality treatment and volume reduction. Due to the grades of the area, construction will involve a large amount of earthwork, making project cost a limiting factor for project implementation. Battery Creek is impaired by bacteria pollution, a major source being urban runoff. The site is located in the City of Beaufort.

County Retrofit Project: Camp St. Mary's M2
Activity: Regional BMP
Township: Bluffton

Project Schedule: FY 2021-2023

Project Cost: \$3,757,000
\$342,000 (2021)
\$165,000 (2022)
\$3,250,000 (2023)



Drainage	
TYPE	
—	Roadside
—	Roadside Pipe
—	Road Pipe
—	Creek/Stream
—	River/Creek/Marsh BANK
—	Channel (fka Outfall)
—	Channel Pipe
—	Lateral
—	Lateral Pipe
—	Crossline Pipe
—	Driveway Pipe
—	Access Pipe
—	Bleeder Pipe



1 inch = 1,457 feet

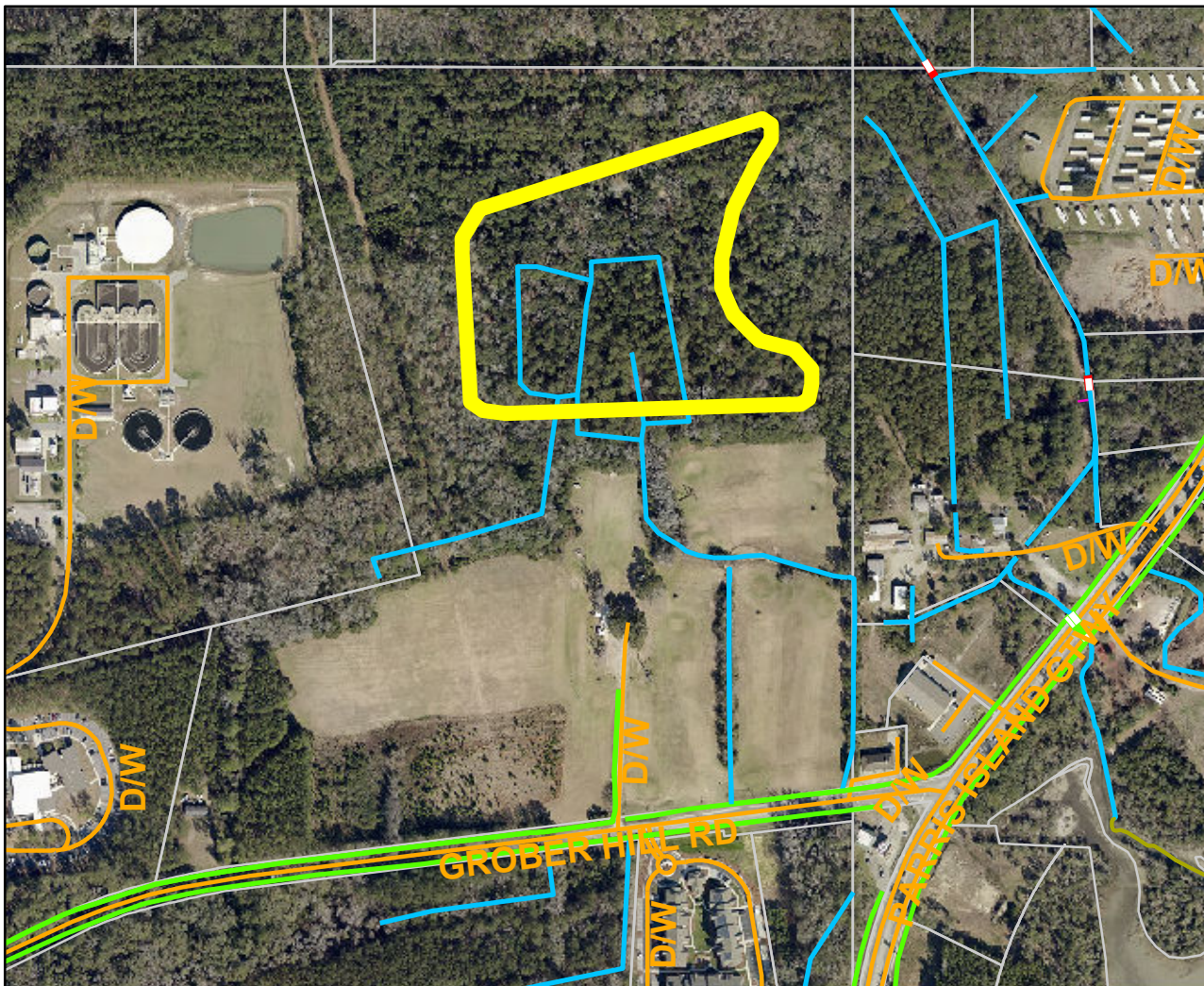
Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Development in the Camp St. Mary hydrologic sub-basin in the Okatie River watershed includes approx. 500 acres of rural and single family development built prior to stormwater regulations. There are no stormwater best management practices, such as detention facilities, in the area. The project would be to construct a regional detention facility to provide stormwater runoff water quality treatment and volume reduction. Due to the presence of multiple wetlands in the area, project design would involve delineation and avoidance of the wetlands, making construction cost a limiting factor for project implementation. Okatie River is impaired by bacteria pollution, a major source being urban runoff. The watershed of the site is located within both Beaufort and Jasper Counties.

County Retrofit Project: Battery Creek West M1
Activity: Regional BMP
Township: Port Royal Island

Project Schedule: FY 2022-2024

Project Cost: \$4,140,000
\$375,000 (2022)
\$165,000 (2023)
\$3,600,000 (2024)



Drainage	
TYPE	
River	Roadside
Creek/Stream	Roadside Pipe
River/Creek/Marsh BANK	Road Pipe
Channel (fka Outfall)	Crossline Pipe
Channel Pipe	Driveway Pipe
Lateral	Access Pipe
Lateral Pipe	Bleeder Pipe



1 inch = 500 feet

Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Development in the Battery Creek West hydrologic sub-basin in the Battery Creek watershed includes approx. 500 acres of a mix of single family development and commercial development built prior to stormwater regulations. There are only a few stormwater best management practices, such as hydrodynamic separators, in the area. The project would be to construct a regional detention facility to provide stormwater runoff water quality treatment and volume reduction. Due to the grades of the area, construction will involve a large amount of earthwork, making project cost a limiting factor for project implementation. Battery Creek is impaired by bacteria pollution, a major source being urban runoff. The site is located in the Town of Port Royal.

County Retrofit Project: Paige Point Rd Overtopping Design
Activity: Mitigation BMP
Township: Sheldon

Project Schedule: FY 2023-2024

Project Cost: \$335,000
\$30,000 (2023)
\$305,000 (2024)



Drainage

TYPE	
	River
	Creek/Stream
	River/Creek/Marsh BANK
	Channel (fka Outfall)
	Channel Pipe
	Lateral
	Lateral Pipe
	Roadside
	Roadside Pipe
	Road Pipe
	Crossline Pipe
	Driveway Pipe
	Access Pipe
	Bleeder Pipe



1 inch = 833 feet

Prepared By: BC Stormwater Management Utility
 Date Print: 5/19/14

Description: Historic complaints about road overtopping support the findings of the 2006 Stormwater Master Plan, which identified this location as a flooding hazard during a 100 - year storm event. A 2013 study by the County confirmed the flooding problem and proposes raising a portion of the road and up-sizing the storm drain under the road.



Beaufort County Public Works Stormwater Infrastructure Project Summary

Project Summary: Clydesdale Circle

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Mar-14

Project improved 2,388 L.F. of drainage system. Bush hogged 908 L.F. of channel. Cleaned out 1,480 L.F. of channel. Replaced (1) crossline pipe. Repaired (2) washouts. Jetted (3) crossline pipes and (3) driveway pipes. Installed rip rap and hydroseeded for erosion control.

2014-576 / Clydesdale Circle	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	1.0	\$20.46	\$0.00	\$0.00	\$0.00	\$13.23	\$33.69
CLPJT / Crossline Pipe - Jetted	5.0	\$119.88	\$110.80	\$15.76	\$0.00	\$82.35	\$328.79
CPRPL / Crossline Pipe - Replaced	50.0	\$1,072.41	\$120.25	\$452.61	\$0.00	\$696.00	\$2,341.27
DPJT / Driveway Pipe - Jetted	20.0	\$432.56	\$221.60	\$81.60	\$0.00	\$286.80	\$1,022.56
HAUL / Hauling	113.5	\$2,493.65	\$1,218.57	\$1,446.24	\$0.00	\$1,651.60	\$6,810.05
HYDR / Hydroseeding	6.0	\$126.27	\$23.30	\$104.81	\$0.00	\$79.38	\$333.76
LM / Loading Materials	10.0	\$216.30	\$72.76	\$49.19	\$0.00	\$132.30	\$470.55
ODBH / Outfall ditch - bushhogged	37.0	\$799.77	\$56.81	\$32.88	\$0.00	\$529.64	\$1,419.10
ODCO / Outfall ditch - cleaned out	133.0	\$2,926.86	\$415.05	\$88.79	\$0.00	\$1,949.36	\$5,380.06
ONJV / Onsite Job Visit	66.0	\$2,200.58	\$238.92	\$145.04	\$0.00	\$1,522.72	\$4,107.25
PROFS / Professional Services	0.0	\$0.00	\$0.00	\$0.00	\$1,180.87	\$0.00	\$1,180.87
RPWO / Repaired Washout	12.0	\$256.04	\$10.86	\$10.32	\$0.00	\$162.36	\$439.58
UTLOC / Utility locates	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
WSDR / Workshelf - Dressed	20.0	\$432.60	\$200.36	\$135.54	\$0.00	\$264.60	\$1,033.10
WSL / Workshelf - Level	8.0	\$168.35	\$51.04	\$58.48	\$0.00	\$101.76	\$379.63
2014-576 / Clydesdale Circle Sub Total	482.0	\$11,275.95	\$2,740.32	\$2,621.25	\$1,180.87	\$7,478.71	\$25,297.10
Grand Total	482.0	\$11,275.95	\$2,740.32	\$2,621.25	\$1,180.87	\$7,478.71	\$25,297.10

Before



During



After



**Project: Clydesdale
Circle Map 1**

**Activity: Routine/
Preventive
Maintenance**

**Project #:
2014-576**















**Township: Port
Royal Island**

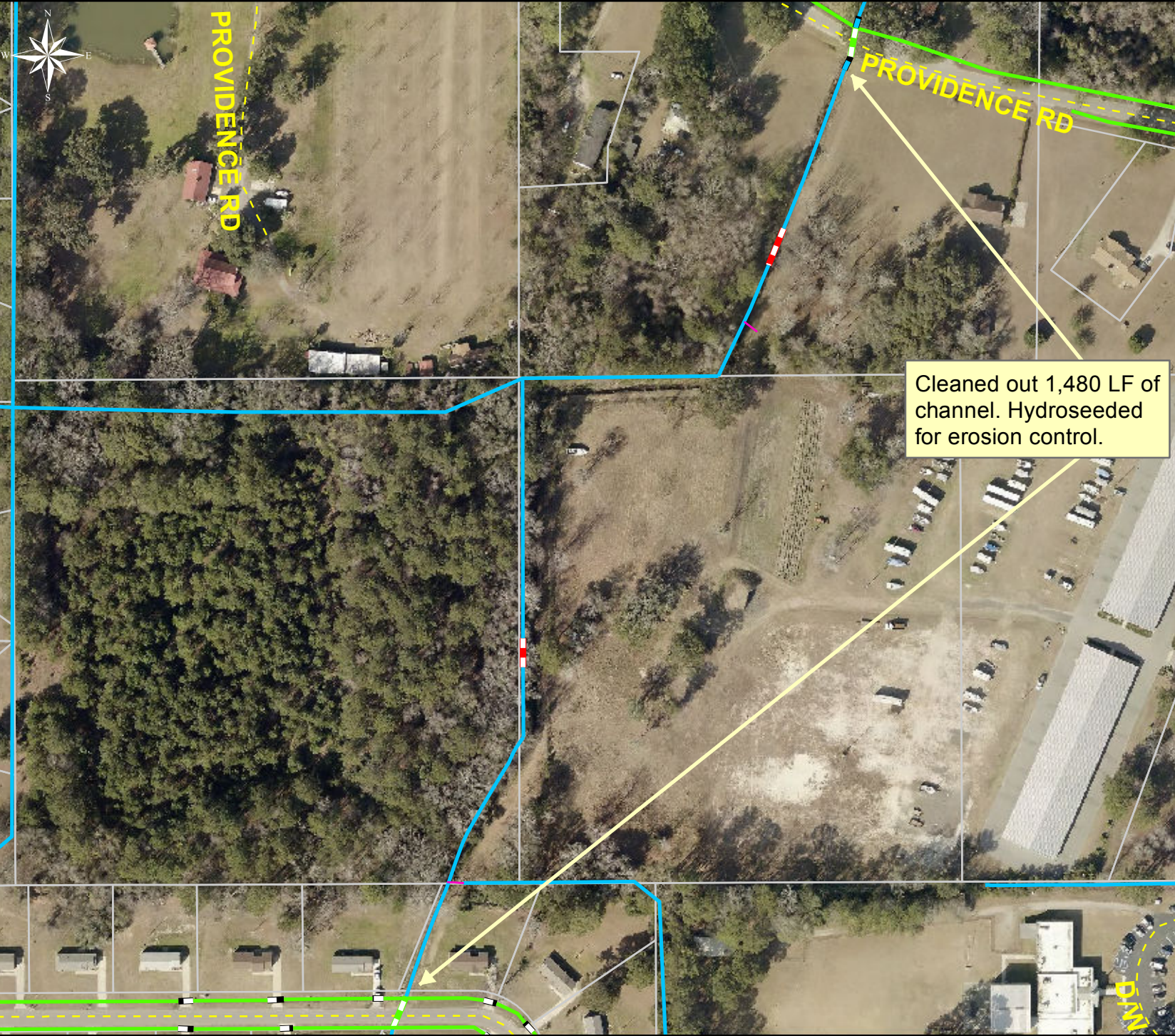
**Completed:
March 2014**

Cleaned out 1,480 LF of
channel. Hydroseeded
for erosion control.

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe



1 inch = 179 feet

Project: Clydesdale Circle Map 2

Activity: Vacuum Truck

Project #: 2014-576

Township: Port Royal Island

Completed: March 2014



Legend

TYPE

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe



1 inch = 208 feet

Prepared By: BC Stormwater Management Utility

Date Print: 5/22/14

File: C:/sethdata/projects/projectmaps/Vac/Clydesdale Cir 2014-576 Map2

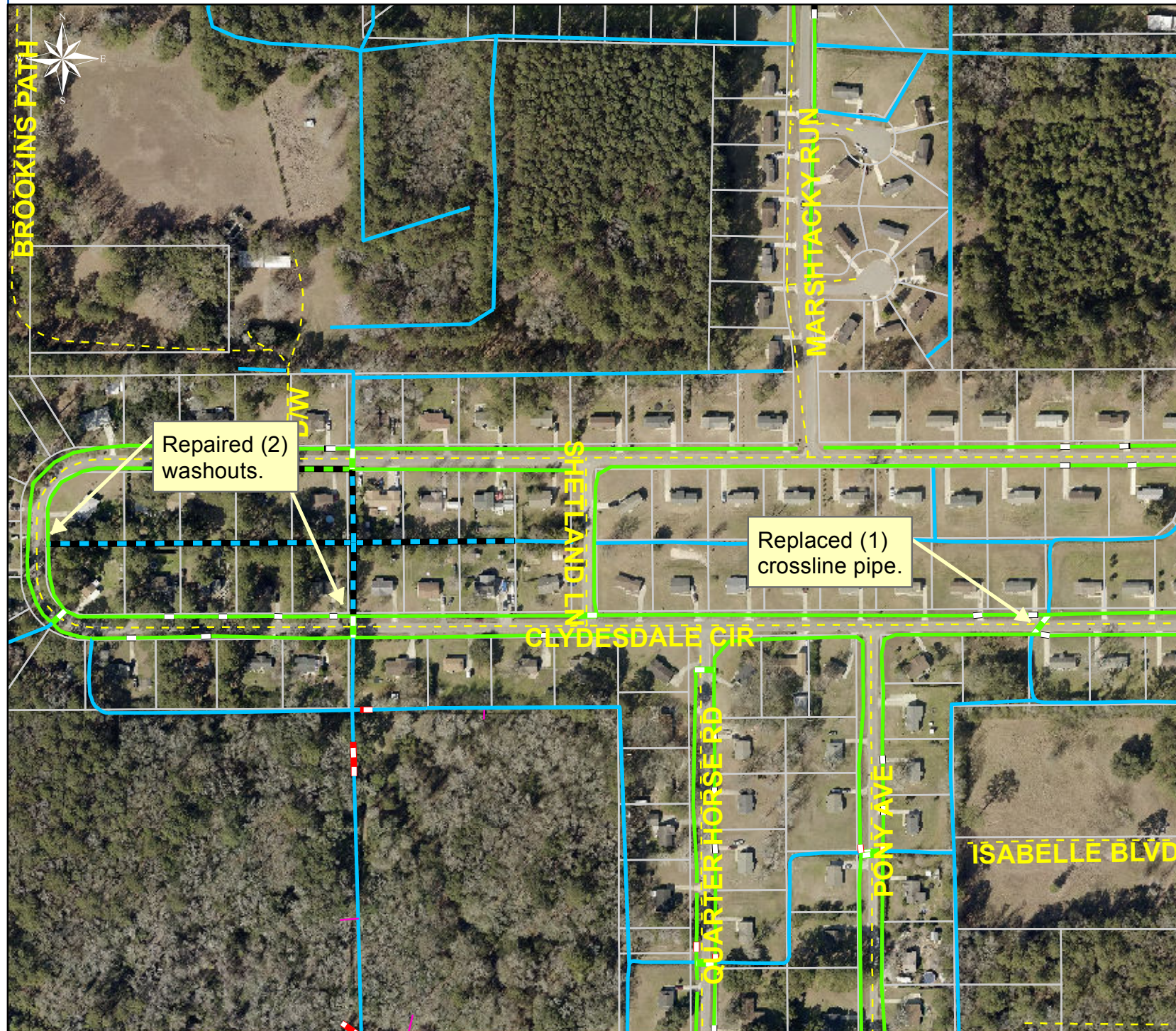
Project: Clydesdale Circle Map 3

Activity: Routine/ Preventive Maintenance

Project #: 2014-576















Township: Port Royal Island

Completed: March 2014



Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe



1 inch = 268 feet

Prepared By: BC Stormwater Management Utility

Date Print: 5/1/14

File: C:\sethdata\projects\projectmaps\Clydesdale Cir 2014-576 Map3



Beaufort County Public Works Stormwater Infrastructure Project Summary

Project Summary: Holly Hall Road

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Project improved 1,788 L.F. of drainage system. Cleaned out 1,788 L.F. of roadside ditch. Installed (1) access pipe. Reinstalled (1) access pipe to correct elevation. Repaired sinkhole.

Completion: Mar-14

2014-606 / Holly Hall Road	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
APINS / Access pipe - installed	62.0	\$1,295.86	\$160.01	\$295.57	\$0.00	\$660.39	\$2,411.82
AUDIT / Audit Project	1.0	\$20.46	\$0.00	\$0.00	\$0.00	\$13.23	\$33.69
HAUL / Hauling	139.0	\$3,040.54	\$1,487.30	\$652.46	\$0.00	\$2,055.63	\$7,235.93
ONJV / Onsite Job Visit	55.0	\$1,781.35	\$199.10	\$184.59	\$0.00	\$1,230.80	\$3,395.84
SG / Shoot Grade	21.0	\$455.98	\$25.34	\$23.67	\$0.00	\$273.63	\$778.62
TC / Traffic Control - Jobsite	30.0	\$663.20	\$36.20	\$17.20	\$0.00	\$441.60	\$1,158.20
UTLOC / Utility locates	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
2014-606 / Holly Hall Road Sub Total	723.5	\$16,116.42	\$3,359.05	\$1,700.54	\$0.00	\$10,039.09	\$31,215.10
Grand Total	723.5	\$16,116.42	\$3,359.05	\$1,700.54	\$0.00	\$10,039.09	\$31,215.10

Before



During



After



Project: Holly Hall Road

**Activity: Routine/
Preventive
Maintenance**
















**Project #:
2014-606**

**Township: Lady's
Island**

**Completed:
April 2014**

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe
-  Catch Basin



1 inch = 299 feet



Beaufort County
Public Works
Stormwater Infrastructure
Project Summary

Project Summary: Mroz Road Wetlands Channel Crossing

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Project improved 3,495 L.F. of drainage system. Removed 3,495 L.F. of blockage from flowline by hand.

Completion: Feb-14

2014-567 / Mroz Road Wetlands Channel Crossing	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
ONJV / Onsite Job Visit	2.0	\$66.36	\$7.24	\$14.30	\$0.00	\$48.94	\$136.84
RB / Remove blockage from flowline	19.0	\$404.12	\$18.10	\$9.93	\$0.00	\$216.75	\$648.90
UTLOC / Utility locates	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
2014-567 / Mroz Road Wetlands Channel Crossing	22.0	\$490.94	\$25.34	\$24.23	\$0.00	\$278.92	\$819.43
Sub Total							
Grand Total	22.0	\$490.94	\$25.34	\$24.23	\$0.00	\$278.92	\$819.43

Before



During



After



**Project: Mroz Road
Wetlands Channel**

**Activity: Routine/
Preventive
Maintenance**
















**Project #:
2014-567**

**Township: Port
Royal Island**

**Completed:
February 2014**

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe
-  Catch Basin

Removed 3,495 LF of
blockage from flowline
by hand.



1 inch = 377 feet



Beaufort County Public Works

Stormwater Infrastructure

Project Summary

Project Summary: Sheldon Bush Hog

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Mar-14

Second Rotation from October 2013 to March 2014. Project improved 98,173 L.F. of drainage system. Bush hogged 98,173 L.F. of channel. This project consisted of the following areas: Browns Island Road (3,981 L.F.), Stroup Road (1,829 L.F.), Gum Tree Road (3,475 L.F.), Hunt Ter (3,463 L.F.), Middlefield Circle (5,252 L.F.), Oakhurst Road (2,203 L.F.), Lightsey Road (4,357 L.F.), Coakley Drive (684 L.F.), Dan Drive (842 L.F.), Coker Lane (1,691 L.F.), Keans Neck Road (845 L.F.), Mount Pisgah Church Road (650 L.F.), Honeybee Island Road (816 L.F.), Wimbee Landing Road (12,851 L.F.), Old Dawson Acres (6,097 L.F.), River Oak Road (2,474 L.F.), Seigler Road (475 L.F.), Dean Hall Road (348 L.F.), Horace Dawson Lane (5,881 L.F.), Stroban Road (2,794 L.F.), Jenkins Road (635 L.F.), Albertha Fields Circle (2,102 L.F.), Horse Tail Road (4,232 L.F.), African Baptist Church Road (1,092 L.F.) Big Estate Road (2,022 L.F.), Joseph Lane (1,459 L.F.), L.F.), Newberry Circle (1,051 L.F.), Sheldon Fire Station (1,409 L.F.), Swallowtail Lane (2,265 L.F.), Gray Road (1,332 L.F.), Cuthbert Farm Road (1,070 L.F.), George Williams Lane (2,935 L.F.), Big Estate Circle (727 L.F.), Twickenham Plantation Road (7,960 L.F.), William Campbell Road (1,624 L.F.), Rail Bed Road (1,966 L.F.) Mitchell Road (1,850 L.F.) and Prescott Road (1,164 L.F.)

2014-303A / Sheldon Bush Hog	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	2.0	\$40.92	\$0.00	\$0.00	\$0.00	\$26.46	\$67.38
HAUL / Hauling	16.0	\$337.33	\$227.04	\$73.42	\$0.00	\$162.72	\$800.51
ODBH / Outfall ditch - bushhogged	1,022.0	\$21,231.34	\$15,784.61	\$3,274.91	\$0.00	\$8,860.33	\$49,151.18
ONJV / Onsite Job Visit	21.0	\$683.42	\$76.02	\$114.27	\$0.00	\$488.91	\$1,362.62
STBY / Stand By	20.0	\$409.07	\$36.20	\$17.58	\$0.00	\$144.20	\$607.05
TC / Traffic Control - Jobsite	8.0	\$170.68	\$80.14	\$50.07	\$0.00	\$76.20	\$377.09
WSREP / Workshelf - Repair	6.0	\$126.26	\$29.14	\$30.96	\$0.00	\$79.38	\$265.74
2014-303A / Sheldon Bush Hog Sub Total	1,095.0	\$22,999.01	\$16,233.15	\$3,561.21	\$0.00	\$9,838.20	\$52,631.57
Grand Total	1,095.0	\$22,999.01	\$16,233.15	\$3,561.21	\$0.00	\$9,838.20	\$52,631.57

Before



During



After





Beaufort County Public Works

Stormwater Infrastructure

Project Summary

Project Summary: Burton Wells Road

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Mar-14

Installed (1) driveway pipe.

2014-603 / Burton Wells Road	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
DPINS / Driveway Pipe - Installed	60.0	\$1,276.88	\$185.28	\$313.46	\$0.00	\$777.60	\$2,553.21
DWASPH / Driveway - Asphalt	35.0	\$748.91	\$94.82	\$49.43	\$0.00	\$450.24	\$1,343.40
HAUL / Hauling	22.0	\$480.61	\$235.40	\$701.70	\$0.00	\$319.69	\$1,737.40
ONJV / Onsite Job Visit	17.0	\$521.71	\$61.54	\$11.72	\$0.00	\$325.64	\$920.61
PROFS / Professional Services	0.0	\$0.00	\$0.00	\$0.00	\$479.30	\$0.00	\$479.30
UTLOC / Utility locates	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
2014-603 / Burton Wells Road Sub Total	135.0	\$3,048.57	\$577.04	\$1,076.31	\$479.30	\$1,886.40	\$7,067.62
Grand Total	135.0	\$3,048.57	\$577.04	\$1,076.31	\$479.30	\$1,886.40	\$7,067.62

Before



During



After



Project: Burton Wells Road

**Activity: Routine/
Preventive
Maintenance**

**Project #:
2014-603**

**Township: Port
Royal Island**















**Completed:
March 2014**



Installed (1)
driveway pipe.

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe



1 inch = 122 feet

Prepared By: BC Stormwater Management Utility

Date Print: 4/7/14

File:C:/sethdata/projects/projectmaps/Burton Wells Rd 2014-603



Beaufort County Public Works

Stormwater Infrastructure

Project Summary

Project Summary: Folly Road Channel #2

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Project improved 1,488 L.F. of drainage system. Cleaned out 1,488 L.F. of channel.

Completion: Mar-14

2014-590 / Folly Road Channel #2	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HAUL / Hauling	35.0	\$757.17	\$203.62	\$130.72	\$0.00	\$505.24	\$1,596.75
ODCO / Outfall ditch - cleaned out	20.0	\$449.40	\$152.61	\$56.42	\$0.00	\$301.20	\$959.63
ONJV / Onsite Job Visit	8.0	\$265.44	\$28.96	\$20.51	\$0.00	\$195.76	\$510.67
PL / Project Layout	15.0	\$318.60	\$18.10	\$27.49	\$0.00	\$189.30	\$553.49
PS / Push up soil	14.0	\$294.61	\$80.18	\$45.41	\$0.00	\$185.22	\$605.42
RMTRW / Remove trees - Workshelf	9.0	\$195.45	\$10.86	\$17.20	\$0.00	\$129.93	\$353.44
2014-590 / Folly Road Channel #2 Sub Total	101.5	\$2,290.90	\$494.33	\$297.74	\$0.00	\$1,513.27	\$4,596.24
Grand Total	101.5	\$2,290.90	\$494.33	\$297.74	\$0.00	\$1,513.27	\$4,596.24

Before



During



After



Project: Folly Road Channel #2

Activity: Routine/ Preventive Maintenance

Project #: 2014-590

Township: St. Helena Island

Completed: March 2014



Legend	
TYPE	
	River
	Creek/Stream
	River/Creek/Marsh BANK
	Channel (fka Outfall)
	Channel Pipe
	Lateral
	Lateral Pipe
	Roadside
	Roadside Pipe
	Road Pipe
	Crossline Pipe
	Driveway Pipe
	Access Pipe
	Bleeder Pipe



1 inch = 125 feet



Beaufort County Public Works Stormwater Infrastructure Project Summary

Project Summary: Vineyard Point Road Channel #1

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Mar-14

Project improved 656 L.F. of drainage system. Cleaned out 628 L.F. of roadside ditch. Jetted (1) driveway pipe, (1) access pipe and 28 L.F. of outfall pipe.

2014-591 / Vineyard Point Road Channel #1	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
DLO / Ditch Layout	12.0	\$253.32	\$10.86	\$10.95	\$0.00	\$162.99	\$438.12
DPJT / Driveway Pipe - Jetted	4.0	\$86.51	\$44.32	\$37.36	\$0.00	\$57.36	\$225.55
HAUL / Hauling	19.0	\$407.19	\$203.30	\$127.85	\$0.00	\$273.98	\$1,012.32
ODCO / Outfall ditch - cleaned out	40.0	\$846.80	\$152.61	\$58.48	\$0.00	\$555.60	\$1,613.49
OPPJ / Outfall Pipe - Jetted	2.0	\$47.96	\$44.32	\$31.96	\$0.00	\$32.94	\$157.18
ONJV / Onsite Job Visit	5.0	\$155.88	\$18.10	\$14.65	\$0.00	\$103.63	\$292.26
UTLOC / Utility locates	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
2014-591 / Vineyard Point Road Channel #1 Sub Total	83.0	\$1,818.12	\$473.51	\$281.25	\$0.00	\$1,199.73	\$3,772.61
Grand Total	83.0	\$1,818.12	\$473.51	\$281.25	\$0.00	\$1,199.73	\$3,772.61

Before



During



After



Project: Vineyard Point Road Channel #1 Map 1

Activity: Routine/ Preventive Maintenance















Project #: 2014-591

Township: St. Helena Island

Completed: March 2014

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe

Cleaned out 628 LF of roadside ditch.



1 inch = 153 feet

Prepared By: BC Stormwater Management Utility

Date Print: 4/16/14

File:C:/sethdata/projects/projectmaps/Vineyard Pt Rd 2014-591

Project: Vineyard Point Road Channel #1 Map 2

Activity: Vacuum Truck

Project #: 2014-591

Township: St. Helena Island

Completed: March 2014



Legend

TYPE

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe



1 inch = 102 feet



Beaufort County Public Works Stormwater Infrastructure Project Summary

Project Summary: Peaches Hill Circle

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Mar-14

Project improved 865 L.F. of drainage system. Cleaned out 865 L.F. of roadside ditch.

2014-592 / Peaches Hill Circle	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HAUL / Hauling	6.0	\$143.88	\$64.20	\$68.80	\$0.00	\$98.82	\$375.70
HYDR / Hydroseeding	4.0	\$84.18	\$14.59	\$79.22	\$0.00	\$55.30	\$233.29
ODCO / Outfall ditch - cleaned out	42.0	\$901.43	\$411.06	\$129.76	\$0.00	\$555.74	\$1,997.99
2014-592 / Peaches Hill Circle	52.5	\$1,139.72	\$489.85	\$277.78	\$0.00	\$716.47	\$2,623.82
Sub Total							
Grand Total	52.5	\$1,139.72	\$489.85	\$277.78	\$0.00	\$716.47	\$2,623.82

Before



During



After



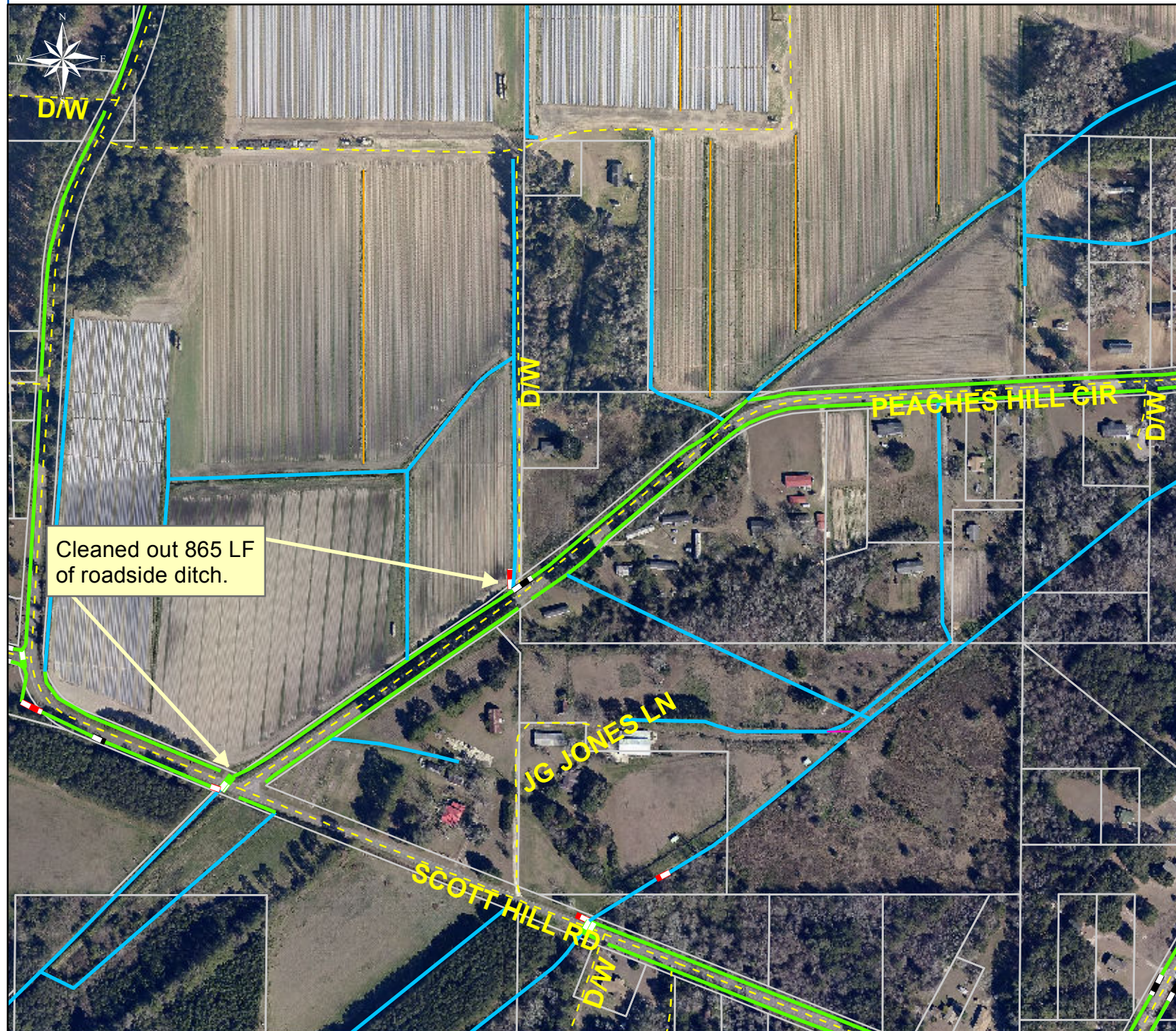
Project: Peaches Hill Circle

**Activity: Routine/
Preventive
Maintenance**

**Project #:
2014-592**

**Township: St.
Helena Island**

**Completed:
April 2014**



Cleaned out 865 LF
of roadside ditch.

Legend

TYPE

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe



1 inch = 358 feet

Prepared By: BC Stormwater Management Utility

Date Print: 5/6/14

File: C:/sethdata/projects/projectmaps/Peaches Hill Cir 2014-592



Beaufort County Public Works Stormwater Infrastructure Project Summary

Project Summary: Scott Hill Road Channel #3

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Project improved 1,200 L.F. of drainage system. Cleaned out 1,200 L.F. of channel. Jetted (1) access pipe. Hydroseeded for erosion control.

Completion: Mar-14

2014-593 / Scott Hill Road Channel #3	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
APJT / Access pipe - jetted	2.0	\$43.26	\$22.16	\$24.36	\$0.00	\$28.68	\$118.46
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
BKFILL / Back Fill	70.0	\$1,499.08	\$387.49	\$184.93	\$0.00	\$971.65	\$3,043.15
DLO / Ditch Layout	40.0	\$856.00	\$36.20	\$24.85	\$0.00	\$563.70	\$1,480.75
HAUL / Hauling	38.0	\$820.68	\$406.60	\$373.24	\$0.00	\$547.96	\$2,148.48
HYDR / Hydroseeding	20.0	\$428.02	\$61.08	\$138.28	\$0.00	\$281.85	\$909.23
ODCO / Outfall ditch - cleaned out	48.0	\$1,046.40	\$190.96	\$74.87	\$0.00	\$693.60	\$2,005.83
ONJV / Onsite Job Visit	13.0	\$454.59	\$47.06	\$38.09	\$0.00	\$327.86	\$867.60
2014-593 / Scott Hill Road Channel #3 Sub Total	231.5	\$5,158.26	\$1,151.55	\$858.62	\$0.00	\$3,421.91	\$10,590.34
Grand Total	231.5	\$5,158.26	\$1,151.55	\$858.62	\$0.00	\$3,421.91	\$10,590.34

Before



During



After



**Project: Scott Hill Road Channel #3
Map 1**

**Activity: Routine/
Preventive
Maintenance**















**Project #:
2014-593**

**Township: St.
Helena Island**

**Completed:
March 2014**

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe

Cleaned out 1,200 LF
of channel. Hydroseeded
for erosion control.

SHA VASIA LN

SCOTT HILL RD

D/W

D/W

LUTHER LN



1 inch = 136 feet

Prepared By: BC Stormwater Management Utility

Date Print: 4/10/14

File:C:/sethdata/projects/projectmaps/Scott Hill Rd 2014-593 Map1

**Project: Scott Hill Road Channel #3
Map 2**

**Activity: Vacuum
Truck**















**Project #:
2014-593**

**Township: St.
Helena Island**

**Completed:
March 2014**

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe



1 inch = 136 feet

Prepared By: BC Stormwater Management Utility

Date Print: 4/17/14

File:C:/sethdata/projects/projectmaps/Vac/Scott Hill Rd 2014-593 Map2



Beaufort County Public Works Stormwater Infrastructure *Project Summary*

Project Summary: Luther Lane Channel #1

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Mar-14

Project improved 396 L.F. drainage system. Cleaned out 396 L.F. of channel. Hydroseeded for erosion control.

2014-594 / Candy Johnson Dr Channel #1	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HAUL / Hauling	17.0	\$364.77	\$181.90	\$99.76	\$0.00	\$245.14	\$891.57
HYDR / Hydroseeding	30.0	\$590.20	\$115.88	\$159.06	\$0.00	\$254.40	\$1,119.54
ODCO / Outfall ditch - cleaned out	72.0	\$1,543.10	\$203.65	\$110.89	\$0.00	\$978.05	\$2,835.69
2014-594 / Candy Johnson Dr Channel #1 Sub Total	119.5	\$2,508.30	\$501.43	\$369.71	\$0.00	\$1,484.20	\$4,863.64
Grand Total	119.5	\$2,508.30	\$501.43	\$369.71	\$0.00	\$1,484.20	\$4,863.64

Before



During



After



**Project: Luther Lane
Channel #1**

**Activity: Routine/
Preventive
Maintenance**















**Project #:
2014-594**

**Township: St.
Helena Island**

**Completed:
March 2014**

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe



1 inch = 130 feet

Prepared By: BC Stormwater Management Utility

Date Print: 4/29/14

File:C:/sethdata/projects/projectmaps/Luther Ln 2014-594



Beaufort County Public Works Stormwater Infrastructure Project Summary

Project Summary: Hale Drive

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Project improved 1,448 L.F. of drainage system. Cleaned out 1,448 L.F. of roadside ditch. Jetted (2) crossline pipes and (3) access pipes.

Completion: Mar-14

2014-596 / Hale Drive	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
APJT / Access pipe - jetted	24.0	\$519.07	\$265.92	\$114.12	\$0.00	\$344.16	\$1,243.27
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HAUL / Hauling	46.0	\$1,006.57	\$492.20	\$227.04	\$0.00	\$680.25	\$2,406.06
ODBH / Outfall ditch - bushhogged	16.0	\$337.72	\$47.74	\$6.88	\$0.00	\$213.24	\$605.58
ONJV / Onsite Job Visit	12.0	\$384.80	\$43.44	\$38.09	\$0.00	\$268.68	\$735.01
RSDCL / Roadside Ditch - Cleanout	142.0	\$3,004.99	\$402.17	\$144.96	\$0.00	\$1,903.83	\$5,455.95
TC / Traffic Control - Jobsite	3.0	\$63.63	\$0.00	\$0.00	\$0.00	\$43.26	\$106.89
UTLOC / Utility locates	1.0	\$20.46	\$0.00	\$0.00	\$0.00	\$13.23	\$33.69
2014-596 / Hale Drive Sub Total	244.5	\$5,347.47	\$1,251.47	\$531.09	\$0.00	\$3,473.27	\$10,603.30
Grand Total	244.5	\$5,347.47	\$1,251.47	\$531.09	\$0.00	\$3,473.27	\$10,603.30

Before



During



After



Project: Hale Drive Map 1

**Activity: Routine/
Preventive
Maintenance**















**Project #:
2014-596**

**Township: Port
Royal Island**

**Completed:
March 2014**

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe



1 inch = 144 feet

Project: Hale Drive Map 2

Activity: Vacuum Truck

Project #: 2014-596

Township: Port Royal Island

Completed: March 2014



Legend

TYPE

	River
	Creek/Stream
	River/Creek/Marsh BANK
	Channel (fka Outfall)
	Channel Pipe
	Lateral
	Lateral Pipe
	Roadside
	Roadside Pipe
	Road Pipe
	Crossline Pipe
	Driveway Pipe
	Access Pipe
	Bleeder Pipe



1 inch = 144 feet



Beaufort County Public Works Stormwater Infrastructure Project Summary

Project Summary: Burton Wells Road

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Mar-14

Installed (1) driveway pipe.

2014-603 / Burton Wells Road	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
DPINS / Driveway Pipe - Installed	60.0	\$1,276.88	\$185.28	\$313.46	\$0.00	\$777.60	\$2,553.21
DWASPH / Driveway - Asphalt	35.0	\$748.91	\$94.82	\$49.43	\$0.00	\$450.24	\$1,343.40
HAUL / Hauling	22.0	\$480.61	\$235.40	\$701.70	\$0.00	\$319.69	\$1,737.40
ONJV / Onsite Job Visit	17.0	\$521.71	\$61.54	\$11.72	\$0.00	\$325.64	\$920.61
PROFS / Professional Services	0.0	\$0.00	\$0.00	\$0.00	\$479.30	\$0.00	\$479.30
UTLOC / Utility locates	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
2014-603 / Burton Wells Road Sub Total	135.0	\$3,048.57	\$577.04	\$1,076.31	\$479.30	\$1,886.40	\$7,067.62
Grand Total	135.0	\$3,048.57	\$577.04	\$1,076.31	\$479.30	\$1,886.40	\$7,067.62

Before



During



After



Project: Burton Wells Road

Activity: Routine/ Preventive Maintenance

Project #: 2014-603

Township: Port Royal Island















Completed: March 2014



Installed (1) driveway pipe.

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe



1 inch = 122 feet

Prepared By: BC Stormwater Management Utility

Date Print: 4/7/14

File:C:/sethdata/projects/projectmaps/Burton Wells Rd 2014-603



Beaufort County Public Works Stormwater Infrastructure *Project Summary*

Project Summary: Polowana Road Channel #1

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Mar-14

Project improved 420 L.F. of drainage system. Removed trash and blockages from flowline. Cleaned out 420 L.F. of channel.

2014-604 / Polowana Road Channel #1	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HAUL / Hauling	7.5	\$162.23	\$80.25	\$580.09	\$0.00	\$108.15	\$930.72
ODCO / Outfall ditch - cleaned out	15.0	\$331.60	\$68.53	\$27.52	\$0.00	\$220.80	\$648.45
ONJV / Onsite Job Visit	3.0	\$132.81	\$10.86	\$8.79	\$0.00	\$101.88	\$254.34
2014-604 / Polowana Road Channel #1 Sub Total	26.0	\$636.87	\$159.64	\$616.40	\$0.00	\$437.44	\$1,850.35
Grand Total	26.0	\$636.87	\$159.64	\$616.40	\$0.00	\$437.44	\$1,850.35

Before



During



After



Project: Polowana Road Channel #1

**Activity: Routine/
Preventive
Maintenance**

**Project #:
2014-604**

**Township: St.
Helena Island**

**Completed:
March 2014**

Legend

TYPE

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe



1 inch = 167 feet

Prepared By: BC Stormwater Management Utility

Date Print: 4/16/14

File:C:/sethdata/projects/projectmaps/Polowana Rd 2014-604



Beaufort County Public Works

Stormwater Infrastructure

Project Summary

Project Summary: Powell Drive

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Mar-14

Project improved 52 L.F. of drainage system. Replaced 52 L.F. of damaged roadside pipe. Installed rip rap and hydroseeded for erosion control.

2014-607 / Powell Drive	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HAUL / Hauling	20.0	\$420.90	\$214.00	\$462.32	\$0.00	\$276.50	\$1,373.72
ONJV / Onsite Job Visit	12.0	\$375.85	\$43.44	\$14.65	\$0.00	\$240.73	\$674.67
RSPI / Roadside Pipe - Installed	60.0	\$1,276.86	\$240.68	\$972.68	\$0.00	\$777.60	\$3,267.82
SD / Soft Digging	4.0	\$86.51	\$44.32	\$58.00	\$0.00	\$57.36	\$246.19
UTLOC / Utility locates	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
2014-607 / Powell Drive Sub Total	97.0	\$2,180.58	\$542.44	\$1,507.65	\$0.00	\$1,365.42	\$5,596.09
Grand Total	97.0	\$2,180.58	\$542.44	\$1,507.65	\$0.00	\$1,365.42	\$5,596.09

Before



During



After



Project: Powell Drive















**Activity: Routine/
Preventive
Maintenance**

**Project #:
2014-607**

**Township: Port
Royal Island**

**Completed:
March 2014**

Replaced 52 LF of damaged roadside pipe. Installed rip rap and hydroseeded for erosion control.

Legend	
TYPE	
	River
	Creek/Stream
	River/Creek/Marsh BANK
	Channel (fka Outfall)
	Channel Pipe
	Lateral
	Lateral Pipe
	Roadside
	Roadside Pipe
	Road Pipe
	Crossline Pipe
	Driveway Pipe
	Access Pipe
	Bleeder Pipe



1 inch = 84 feet



**Beaufort County
Public Works
Stormwater Infrastructure
Project Summary**

Project Summary: Washington Farm Road Channel #1

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Project improved 400 L.F. of drainage system. Removed blockage from flowline due to beaver dam. Cleaned out 400 L.F. of creek.

Completion: Apr-14

2014-581 / Washington Farm Road Channel #1	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HAUL / Hauling	6.0	\$132.13	\$64.20	\$51.89	\$0.00	\$88.57	\$336.79
ODCO / Outfall ditch - cleaned out	15.0	\$331.60	\$137.38	\$34.40	\$0.00	\$220.80	\$724.18
ONJV / Onsite Job Visit	13.0	\$387.92	\$47.06	\$28.13	\$0.00	\$236.99	\$700.10
WSREP / Workshelf - Repair	9.0	\$184.10	\$30.66	\$36.18	\$0.00	\$116.01	\$366.95
2014-581 / Washington Farm Road Channel #1	54.0	\$1,278.10	\$311.85	\$178.12	\$0.00	\$823.54	\$2,591.62
Sub Total							
Grand Total	54.0	\$1,278.10	\$311.85	\$178.12	\$0.00	\$823.54	\$2,591.62

Before



During



After



Project: Washington Farm Road Channel #1

Activity: Routine/ Preventive Maintenance
















Project #: 2014-581

Township: Sheldon

Completed: April 2014

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe
-  Catch Basin

Removed blockage from flowline due to beaver dam.

Cleaned out 400 LF of creek.



1 inch = 235 feet



Beaufort County Public Works

Stormwater Infrastructure

Project Summary

Project Summary: Jay Street

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Apr-14

Project improved 945 L.F. of drainage system. Cleaned out 921 L.F. of roadside ditch and (2) catch basins. Jetted (1) crossline pipe, (9) driveway pipes, 8 L.F. of channel pipe and 16 L.F. of roadside pipe.

2014-595 / Jay Street	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
CBCO / Catch basin - clean out	6.0	\$129.77	\$66.48	\$51.12	\$0.00	\$86.04	\$333.41
DPJT / Driveway Pipe - Jetted	24.0	\$519.07	\$265.92	\$118.82	\$0.00	\$344.16	\$1,247.98
HAUL / Hauling	38.0	\$791.58	\$406.60	\$178.88	\$0.00	\$521.78	\$1,898.84
ONJV / Onsite Job Visit	8.0	\$274.26	\$28.96	\$32.23	\$0.00	\$189.78	\$525.23
RSDCL / Roadside Ditch - Cleanout	88.0	\$1,857.46	\$329.09	\$84.98	\$0.00	\$1,221.44	\$3,492.97
UTLOC / Utility locates	1.0	\$20.46	\$0.00	\$0.00	\$0.00	\$13.23	\$33.69
2014-595 / Jay Street Sub Total	165.5	\$3,602.83	\$1,097.05	\$466.03	\$0.00	\$2,383.04	\$7,548.96
Grand Total	165.5	\$3,602.83	\$1,097.05	\$466.03	\$0.00	\$2,383.04	\$7,548.96

Before



During



After



**Project: Jay Street
Map 1**

**Activity: Routine/
Preventive
Maintenance**
















**Project #:
2014-595**

**Township: Port
Royal Island**

**Completed:
April 2014**

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe
-  Catch Basin



1 inch = 52 feet

**Project: Jay Street
Map 2**

**Activity: Vacuum
Truck**
















**Project #:
2014-595**

**Township: Port
Royal Island**

**Completed:
April 2014**

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe
-  Catch Basin

Jetted (4) driveway pipes.

HALE DR

JAY ST

Jetted (5) driveway pipes,
(1) crossline pipe. Cleaned
out (1) catch basin.

Jetted 8 LF of channel pipe and
16 LF of roadside pipe. Cleaned
out (1) catch basin.



1 inch = 52 feet



Beaufort County Public Works

Stormwater Infrastructure

Project Summary

Project Summary: Mint Farm Drive Channel #1

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Project improved 1,751 L.F. of drainage system. Cleaned out 1,751 L.F. of channel.

Completion: Apr-14

2014-600 / Mint Farm Drive Channel #1	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HAUL / Hauling	10.0	\$239.80	\$107.00	\$44.72	\$0.00	\$164.70	\$556.22
ODCO / Outfall ditch - cleaned out	50.0	\$1,037.10	\$152.61	\$41.28	\$0.00	\$555.20	\$1,786.19
ONJV / Onsite Job Visit	4.0	\$126.04	\$14.48	\$11.72	\$0.00	\$85.40	\$237.64
2014-600 / Mint Farm Drive Channel #1	65.0	\$1,423.40	\$274.09	\$97.72	\$0.00	\$818.53	\$2,613.74
Sub Total							
Grand Total	65.0	\$1,423.40	\$274.09	\$97.72	\$0.00	\$818.53	\$2,613.74

Before



After





Project: Mint Farm Drive Channel #1

Activity: Routine/ Preventive Maintenance

Project #: 2014-600

Township: Port Royal Island

Completed: April 2014

Legend

TYPE

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- Channel Pipe
- Lateral
- Lateral Pipe
- Roadside
- Roadside Pipe
- Road Pipe
- Crossline Pipe
- Driveway Pipe
- Access Pipe
- Bleeder Pipe



1 inch = 333 feet



Beaufort County Public Works Stormwater Infrastructure Project Summary

Project Summary: Scott Hill Road

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Apr-14

Project improved 855 L.F. of drainage system. Cleaned out 445 L.F. of roadside ditch. Jetted 410 L.F. of roadside pipe.

2014-602 / Scott Hill Road	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HYDR / Hydroseeding	4.0	\$84.18	\$14.59	\$140.86	\$0.00	\$52.92	\$292.55
ODCO / Outfall ditch - cleaned out	50.0	\$1,072.30	\$190.07	\$65.04	\$0.00	\$585.80	\$1,913.21
ONJV / Onsite Job Visit	2.0	\$88.54	\$7.24	\$11.72	\$0.00	\$67.92	\$175.42
RSDCL / Roadside Ditch - Cleanout	25.0	\$536.15	\$86.63	\$35.80	\$0.00	\$292.90	\$951.48
RSPJ / Roadside Pipe - Jetted	4.0	\$86.51	\$44.32	\$37.36	\$0.00	\$57.36	\$225.55
UTLOC / Utility locates	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
WSREP / Workshelf - Repair	6.0	\$125.10	\$18.28	\$24.46	\$0.00	\$77.34	\$245.18
2014-602 / Scott Hill Road Sub Total	92.0	\$2,013.23	\$361.13	\$315.24	\$0.00	\$1,147.47	\$3,837.07
Grand Total	92.0	\$2,013.23	\$361.13	\$315.24	\$0.00	\$1,147.47	\$3,837.07

Before



During



After



Project: Scott Hill Road

**Activity: Routine/
Preventive
Maintenance**















**Project #:
2014-602**

**Township: St.
Helena Island**

**Completed:
April 2014**

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe



Cleaned out 445 LF
of roadside ditch.

Jetted 410 LF of
roadside pipe.

D/W



1 inch = 258 feet



Beaufort County Public Works

Stormwater Infrastructure

Project Summary

Project Summary: Sun City Fire Station

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Apr-14

Reconstructed (1) catch basin lid to correct elevation. Installed sod for erosion control.

2014-610 / Sun City Fire Station	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HAUL / Hauling	3.0	\$71.94	\$32.10	\$46.59	\$0.00	\$49.41	\$200.04
MHRA / Manhole Cover - Raised	33.0	\$713.87	\$69.14	\$131.66	\$0.00	\$435.33	\$1,350.00
ONJV / Onsite Job Visit	9.0	\$268.56	\$32.58	\$46.88	\$0.00	\$164.07	\$512.09
SI / Sod - Installation	16.0	\$327.27	\$14.48	\$20.64	\$0.00	\$208.28	\$570.67
2014-610 / Sun City Fire Station Sub Total	61.5	\$1,391.87	\$148.30	\$245.77	\$0.00	\$863.71	\$2,649.65
Grand Total	61.5	\$1,391.87	\$148.30	\$245.77	\$0.00	\$863.71	\$2,649.65

Before



During



After



Project: Sun City Fire Station

Activity: Routine/ Preventive Maintenance

















Project #: 2014-610

Township: Bluffton

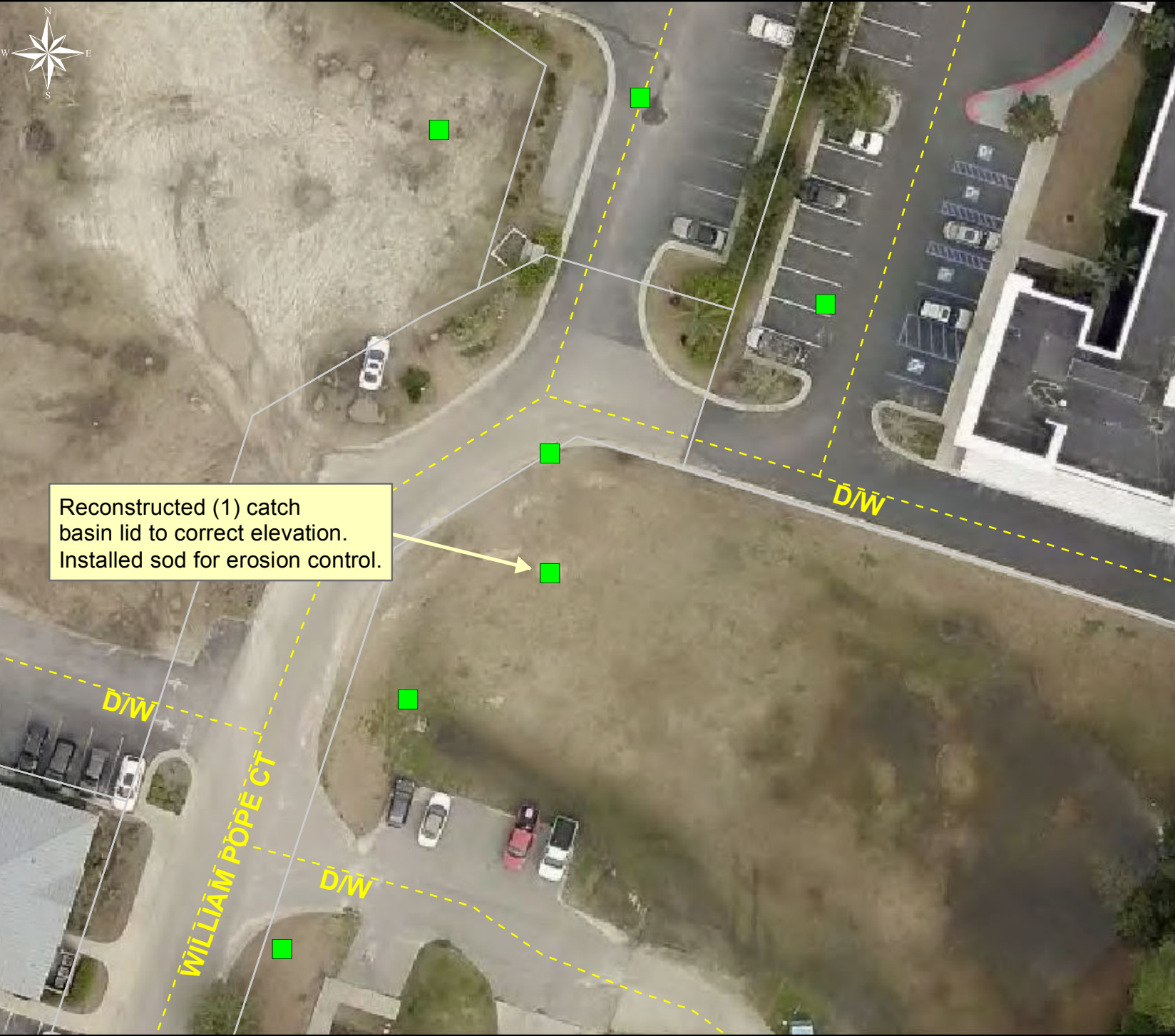
Completed: April 2014

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe
-  Catch Basin

Reconstructed (1) catch basin lid to correct elevation. Installed sod for erosion control.



1 inch = 39 feet



Beaufort County Public Works Stormwater Infrastructure Project Summary

Project Summary: Newberry Circle

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Completion: Apr-14

Project improved 1,432 L.F. of drainage system. Cleaned out 1,432 L.F. of channel. Installed (1) bleeder pipe and (1) access gate. Repaired workshelf.

2014-612 / Newberry Circle	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
HAUL / Hauling	30.5	\$726.69	\$411.95	\$794.69	\$0.00	\$493.82	\$2,427.15
ODCO / Outfall ditch - cleaned out	128.5	\$2,689.20	\$392.44	\$533.36	\$0.00	\$1,638.49	\$5,253.49
ONJV / Onsite Job Visit	16.0	\$530.88	\$57.92	\$61.53	\$0.00	\$391.52	\$1,041.85
STBY / Stand By	4.0	\$95.92	\$42.80	\$58.48	\$0.00	\$65.88	\$263.08
WSREP / Workshelf - Repair	24.0	\$496.68	\$96.88	\$62.81	\$0.00	\$323.84	\$980.21
2014-612 / Newberry Circle Sub Total	203.5	\$4,549.60	\$1,001.99	\$1,510.87	\$0.00	\$2,920.16	\$9,982.62
Grand Total	203.5	\$4,549.60	\$1,001.99	\$1,510.87	\$0.00	\$2,920.16	\$9,982.62

Before



During



After



Project: Newberry Circle

**Activity: Routine/
Preventive
Maintenance**

**Project #:
2014-612**

**Township:
Sheldon**

**Completed:
April 2014**

Legend

TYPE

- River
- Creek/Stream
- River/Creek/Marsh BANK
- Channel (fka Outfall)
- ▬ Channel Pipe
- Lateral
- ▬ Lateral Pipe
- Roadside
- ▬ Roadside Pipe
- ▬ Road Pipe
- ▬ Crossline Pipe
- ▬ Driveway Pipe
- ▬ Access Pipe
- Bleeder Pipe

Installed (1) bleeder pipe.

Repaired workshelf.

Installed (1) access gate.

Cleaned out 1,432 LF of channel.

Repaired workshelf.



1 inch = 161 feet



**Beaufort County
Public Works
Stormwater Infrastructure
Project Summary**

Project Summary: Ardmore Avenue

Activity: Routine/Preventive Maintenance

Narrative Description of Project:

Repaired sinkhole.

Completion: May-14

2014-620 / Ardmore Avenue	Labor Hours	Labor Cost	Equipment Cost	Material Cost	Contractor Cost	Indirect Labor	Total Cost
AUDIT / Audit Project	0.5	\$10.23	\$0.00	\$0.00	\$0.00	\$6.62	\$16.85
CBREP / Catch basin - repaired	20.0	\$428.00	\$18.10	\$31.39	\$0.00	\$220.80	\$698.28
2014-620 / Ardmore Avenue	20.5	\$438.23	\$18.10	\$31.39	\$0.00	\$227.41	\$715.13
Sub Total							
Grand Total	20.5	\$438.23	\$18.10	\$31.39	\$0.00	\$227.41	\$715.13

Before



After



Project: Ardmore Avenue

**Activity: Routine/
Preventive
Maintenance**





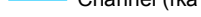




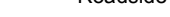


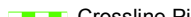


**Project #:
2014-620**

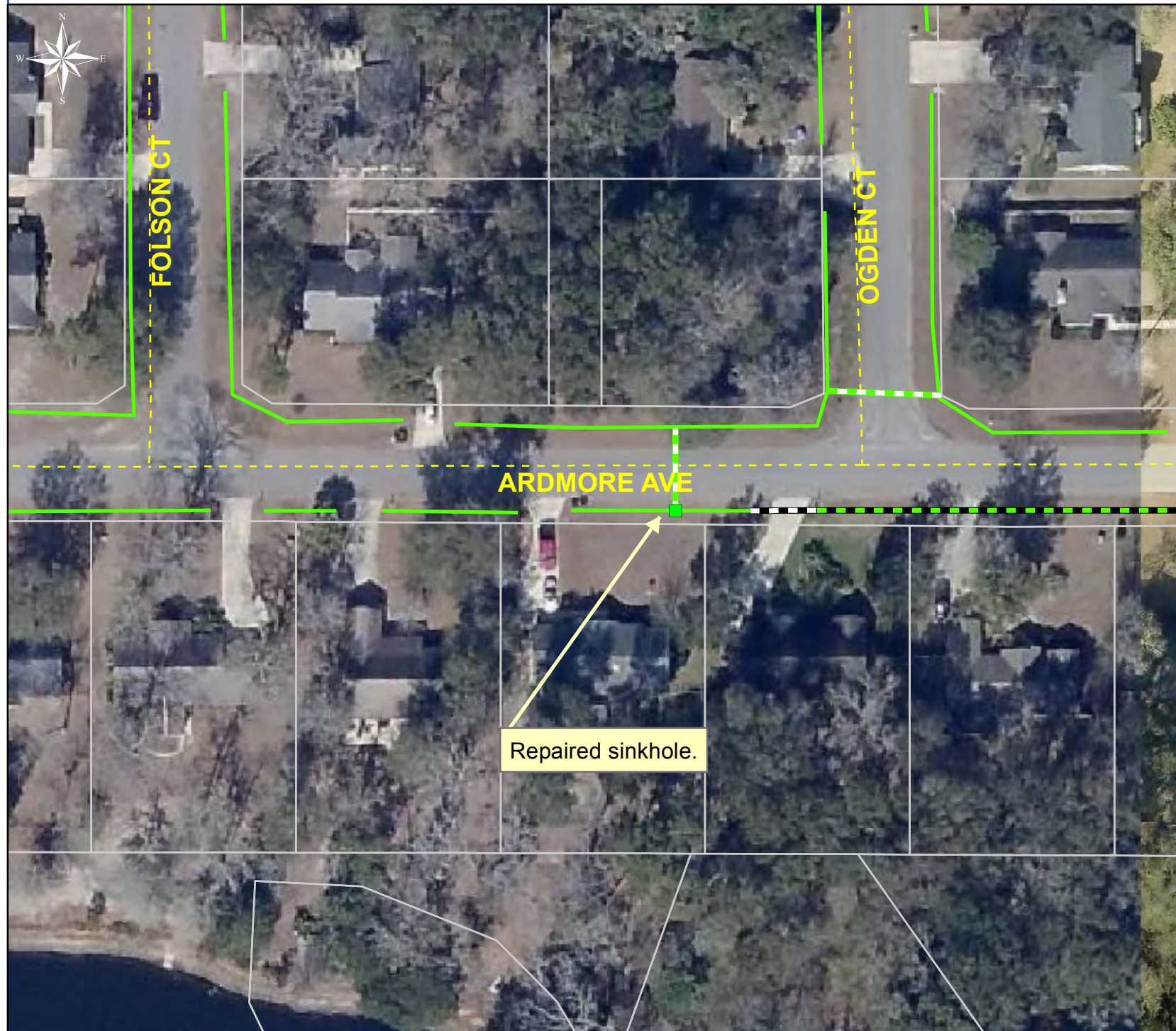
**Township: Lady's
Island**

**Completed:
May 2014**

Legend

TYPE

-  River
-  Creek/Stream
-  River/Creek/Marsh BANK
-  Channel (fka Outfall)
-  Channel Pipe
-  Lateral
-  Lateral Pipe
-  Roadside
-  Roadside Pipe
-  Road Pipe
-  Crossline Pipe
-  Driveway Pipe
-  Access Pipe
-  Bleeder Pipe
-  Catch Basin



1 inch = 58 feet

Prepared By: BC Stormwater Management Utility

Date Print: 5/21/14

File:C:/sethdata/projects/projectmaps/Ardmore Ave 2014-620



BEAUFORT COUNTY
STORMWATER MANAGEMENT UTILITY BOARD
AGENDA

Wednesday, July 2, 2014

2:00 p.m.

Beaufort Industrial Village, Building 3 Conference Room
104 Industrial Village Road, Beaufort
843.255.2805

In accordance with South Carolina Code of Laws, 1976, as amended, Section 30-4-80(d), all local media was duly notified of the time, date, place and agenda of this meeting.

1. CALL TO ORDER – 2:00 p.m.
 - A. Approval of Agenda
 - B. Approval of Minutes – June 4, 2014 ([backup](#))
2. INTRODUCTIONS
3. PUBLIC COMMENT
4. REPORTS
 - A. Special Presentation – Lamar Taylor, City of Beaufort ([backup](#))
 - B. Utility Update – Eric Larson, P.E. ([backup](#))
 - C. Monitoring Update – Eric Larson, P.E. ([backup](#))
 - D. Stormwater Implementation Committee Report – Eric Larson, P.E. ([backup](#))
 - E. Stormwater Related Projects – Eric Larson, P.E. ([backup](#))
 - F. Upcoming Professional Contracts Report – Eric Larson, P.E. ([backup](#))
 - G. Regional Coordination – Eric Larson, P.E. ([backup](#))
 - H. Financial Report ([backup](#))
 - I. Maintenance Projects Report – Eddie Bellamy ([backup](#))
5. UNFINISHED BUSINESS
6. NEW BUSINESS
7. PUBLIC COMMENT
8. NEXT MEETING AGENDA
 - A. August 6, 2014 ([backup](#))
9. ADJOURNMENT

