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

June 13, 2018 at 2:00 p.m. in Executive Conference Room, Administration Building, Beaufort County Government Robert Smalls Complex, 100 Ribaut Road, Beaufort, South Carolina

**Board Members**

| **Present** | **Absent** |
|---|---|
| Don Smith | Patrick Mitchell |
| Marc Feinberg | Allyn Schneider |
| William Bruggeman | |
| James Fargher | |

**Ex-Officio Members**

| **Present** | **Absent** |
|---|---|
| Van Willis | Kim Jones |
| Andy Kinghorn | |
| Scott Liggett | |

**Beaufort County Staff**
Eric Larson
David Wilhelm
Melissa Allen

**Visitors**
Dr. Alan Warren, USCB Lab
Bill Baugher, Town of Bluffton
York Glover, County Council
Ellen Comeau, Clemson Extension
Sam Connor, Beaufort County Resident
Alan Beach, Beaufort County Resident

**1. Meeting called to order –** Don Smith

A. Agenda – Approved.
B. May 9, 2018 Minutes – Approved.

**2. Introductions –** Completed.

**3. Public Comment(s) –** None.

**4. Reports –** Mr. Eric Larson and Mr. David Wilhelm provided a written report which is included in the posted agenda and can be accessed at: http://www.bcgov.net/departments/Administrative/beaufort-county-council/boards-and-commissions/council-appointed/board-list/stormwater-management-utility-board/agendas/2018/061318.pdf

**A. Utility Update –** Eric Larson

In reference to item #1, regionalization is moving forward. Mr. Eric Larson indicated that there are a series of meetings happening later this month (June 18th and June 26th) and encourages board members to attend. The budget ordinance (item #3) had its third and final reading on June 11th and was approved.

In reference to special presentations, Mr. Larson indicated DHEC is willing to speak; staff is working out dates. Mr. Don Smith recommended having DHEC come speak soon after the shellfish report is released each year. In reference to military site stormwater management,

Mr. Larson mentioned he has had conversation with the operator at Naval Hospital, but they have not met.

**B. Monitoring Update –** Eric Larson

In reference to item #2, that the County is working on an updated monitoring plan, a new sampling protocol to meet the new TMDLs, in addition to what is already being done.

Mr. Billy Bruggeman asked as the impairment moves down the Okatie if extra monitoring takes place. Mr. Larson indicated if it picks up another County owned and maintained system that is discharging (i.e. near Callawassie causeway) then the County does.

**C. Stormwater Implementation Committee (SWIC) Report –** Eric Larson

Please reference the report, no additional updates.

**D. Stormwater Related Projects** – Eric Larson

Update to item# 1, the USACE permit for the diversion was received. Substantial completion for project by June 30th and then will wrap up the grant paperwork.

In reference to #2, County Council approved a plan A and plan B for Bessie Ln/Young Cir, which was different than that board's recommendation. They have asked staff to make another attempt for voluntary easement and if that does not work then to proceed with condemnation.

**E. Professional Contracts Report –** Eric Larson

Please reference the report, no additional updates.

**F. Regional Coordination** – Eric Larson

In reference to item #1, Mr. Larson shared that the subdivision was appealed by the neighborhood, but that doesn't affect the outcome of the project, as the stormwater pond is separate from the development.

Mr. Smith asked about the problems with the pond at Dr. Gray's property. Mr. Larson indicated corrective repairs are needed to the inlet structure and there were concerns the outlet structure was plugged, but is unsure of an update. Mr. Smith asked if trash/debris was part of the problem. Mr. Larson said he wouldn't target it to just trash. Mr. Andy Kinghorn mentioned there was an issue in that the water level was not dropping very fast after a storm (storage capacity). Mr. Larson indicated that if the problem wasn't resolved following routine maintenance then the plan is to next look at the design.

**G. Municipal Reports –** Eric Larson

Mr. Scott Liggett shared that Town Council issued the final approval for the budget. Mr. Larson mentioned that he heard that City of Beaufort may be considering a utility rate change, but they are not required to submit that to County utility staff until July 1st.

**H. Municipal Separate Storm Sewer System (MS4 Update) –** Eric Larson

Mr. Marc Feinberg asked if the County submits an MS4 report to DHEC. Mr. Larson replied yes, one in submitted in January. He explains that the County Administrator signs it and the reporting runs December 1st through November 30th. A question was asked if the

County received feedback. Mr. Larson indicated the County has not received any feedback for the previous reports submitted.

Ms. Ellen Comeau shared several upcoming events she has planned or will be participating in; these include a pond management workshop, buffer workshop, healthy ponds workshop series, cost-benefits research project on BMPs, and speaking at Green Drinks.

In reference to #5, construction permitting, the development community is upset that the process is taking extra time, money and paperwork to get all the permitting requirements. They feel as though it is double permitting as they are required to get a local permit, as well as DHEC permit. The local process isn't slowing them down. The County has been proactive meeting with different groups to work this out and educate the community.

In response to a question, Mr. Larson explained the HBA is asking politicians why DHEC won't create a delegated program for the MS4 program.

In reference to the MS4 statewide permit, the five-year general permit is up for renewal at the end of the year. One thing being discussed is if they want to include a qualified local program for delegated plan review in the new permit. There is also discussion about having more than one MS4 general permit; one of which would be tailored to coastal communities.

In reference to #9, the construction permit has been expired and DHEC is looking to make a minor change and get it approved within the next 60 days. See item #5 for more info on construction permitting.

**I. Maintenance Projects Report** – Eric Larson

There were no major projects to report. All projects came in close to the goal of $5.00 per liner foot with the exception of McCracken Cir, it came in slightly higher due to some issues.

The crew is currently finishing a project on Pinewood, a channel outfall cleanout which will be reported at a future meeting. Projects awaiting easements are May River Plantation (Bluffton) and Horse Island (St. Helena). Wallace Road on Lady's Island has 18 homeowners experiencing flooding; the area is low lying and challenging. Andrews Engineering has been retained to help come up with a permanent solution.

The new vac-truck has arrived and is replacing a 2004 truck. The sweeper truck should arrive in the next two weeks. An equipment operator will be running this in the evenings.

Public Works is working on a design for a truck wash. There is no sewer on Shanklin Road so the project would require a decanting facility or an alternative location.

The full-time litter crew (3 staff) has picked up over 10,000 pounds of litter. There have been two special events; 14 Marines picked up 4,000 pounds of litter along Trask Parkway and 7,800 pounds was picked up during an employee clean-up day.

A question asked if trash was being picked up the old fashion way. Mr. Wilhelm replied, yes. He indicated they have ordered a few pieces of equipment, a vacuum with a large wand to put on the back of the Gator.

In response to a comment, Mr. Wilhelm shared that there are 103 active Adopt-A-Highway (AAH) groups and explained that the County litter crew is supplementing AAH if they notice a road is full of litter shortly following a clean-up.

Mr. Larson shared that the County will be doing water patrol during Water Festival with a boat that has been wrapped with a litter message. He also mentioned there will also be a coloring contest/ naming campaign through the schools to name the new vac-truck and sweeper truck.

**5. Unfinished Business**

**A. *Regionalization – Selection of Consultant for Regional Stormwater Standard* –** Mr. Larson summarized the memo to the SoLoCo Board from the SoLoCo Stormwater Technical Subcommittee. The subcommittee recommends the selection of the Center for Watershed Protection, as the stormwater consultant to assist with the development of regional stormwater design standards and recommends splitting the cost by population. This recommendation would put Beaufort County's share at $105,302, which has already been budgeted and approved.

Mr. Don Smith asked if Center for Watershed Protection has a local presence. Mr. Larson said yes, Bill Hodges is in Bluffton and is listed as the project manager.

A motion was made to recommend the proposed SoLoCo regional stormwater standard development based on population. The motion was approved 4/0. SoLoCo Memo attached.

**6. New Business**

**A. *Special Presentation – Drop Off Center Facility Plan*-** Mr. Larson summarized information from the Solid Waste Drop Off Center Water Quality Retrofit Planning document that was prepared by McLaughlin Consulting. MCM6 (Good Housekeeping) is required to have an evaluation and take measures to avoid pollutants. The Drop Off Centers were identified at high risk facilities in the permit. This permit year requires an analysis of the pollutant potentials and recommendations both structurally and non-structurally to the facilities to make them compliant with MS4. Standard Operating Procedures (SOP) and Stormwater Spill Prevention Countermeasure and Control (SPCC) Plan are items that staff will be trained on how to use as the non-structural component.

The Daufuskie Island center was not included, as it should be shutting down in the near future. County Council is currently taking action to partner with a private company to service the island. The regional centers are considered to be more modern and in compliance facilities. The new waste oil tanks are not in the report, as they are in the process of being upgraded by Public Works. All recommendations are all water quality improvements; these are planning level costs that can be used by Public Works staff.

The mechanical pretreatment device mentioned in the report is a baffle box that is recommended and costs around $20,000 each. Water goes in and is trapped temporarily and pollutants separate out. The hatches can be opened and vac-truck can be used to clean out the sediment and debris that was filtered out.

Recommendations for each DOC:

- Big Estates – Sedimentation Pond
- Bluffton – Installation of 2 Baffle Boxes
- Coffin Point – Sedimentation Pond (need property acquisition; not space on site)
- Cuffy – Sedimentation Pond
- Gates – Sedimentation Pond and Rock Area (stabilize the site).
- Hilton Head – Baffle Box
- Lobeco – Sedimentation Pond
- Pritchardville – Sedimentation Pond and Rock Area (recycle entrance)
- Shanklin – Baffle Box
- Sheldon – Sedimentation Pond and Parking Stop near waste oil storage
- St. Helena – Existing grassed filter strip

The Solid Waste Drop Off Center Water Quality Retrofit Planning Level Cost Estimates document is attached.

**7. Public Comment(s)** – None.

**8. Next Meeting Agenda** – Approved.

**9. Meeting Adjourned**

**M E M O R A N D U M**

TO: Members of the Southern Lowcountry Regional Board (SoLoCo)
Elected representatives of the City of Beaufort, & Towns of Port Royal & Yemassee

FROM: SoLoCo Stormwater Technical Subcommittee (incl. staff from BC, JC, ToB, CoB, CoH, and ToPR)

DATE: June 18, 2018

SUBJECT: Recommendations to select a consultant and fund a project to develop a regional stormwater technical standard and model ordinance

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**Recommendation:**
The Stormwater Technical Subcommittee recommends the elected officials of SoLoCo and throughout the Lowcountry region agree to the procurement of the Center for Watershed Protection, a stormwater consultant, to assist with the development of regional stormwater design standards and a model ordinance. Further, the subcommittee recommends that the cost of said project be shared among all jurisdictions based on a distribution using population figures. The project cost will be $179,554.

**Background:**
As directed by our elected officials, making up the membership of the SoLoCo, at the December 5, 2017 meeting, staff members representing participating jurisdictions of the SoLoCo have met multiple times to develop a plan to write a unified regional stormwater technical standard that could be implemented uniformly throughout the region. Understanding the importance of the regional approach, these staff members invited staff from other jurisdictions not part of the SoLoCo, namely the City of Beaufort and Town of Port Royal. This subcommittee has been working to develop a scope of work to achieve these goals. Staff members quickly realized this is an effort that cannot be done within the limited resources, budget, and time of existing departments.

On March 27, 2018, the subcommittee presented a proposal to the SoLoCo Board to hire a consultant and co-fund the project in the amount of $179,554. During that meeting, the Towns of Ridgeland and Hilton Head Island stated they would not be participating in the project. The SoLoCo Board voted that the members of the Board should consider the request as each jurisdiction prepared their annual budgets. They further agreed to reconvene at the June meeting and state their commitment to participate and fund the project as proposed.

Following that meeting, discussions among the subcommittee members concluded that with a 3-month window until a decision would be made that we should do a 2nd Request for Qualifications and solicit additional proposals. Our scope of services was identical to the scope presented in March. In summary, the project will:

- Benchmark the region among similar communities in SC and the southeast coast
- Define stormwater design standards that are consistent with our mission statement
- Engage stakeholders before, during, and after the standards are developed

The subcommittee received two proposals: 1) The Center for Watershed Protection, and 2) Wood Environment & Infrastructure Solutions. The subcommittee convened on June 1, 2018 to review and rank proposals. In general, both teams were found to be qualified for the project. However, the fee proposals were significantly different, $179,554 and $223,420, respectively. Without an overwhelming reason to pay more for the same end product, the subcommittee selected the Center for Watershed Protection without further deliberation.

The following options for a cost sharing arrangement among the participating jurisdictions for this scope of work are as follows. Based on statements made to the SoLoCo Board at the March 27, 2018 meeting, the Towns of Hilton Head Island and Ridgeland have been removed from the proposed cost share:

| Cost Share for Regional SW Std. Development | **Split by Population** [2] | | *Split by land mass (sq. mi)* [3] | | *Even Distribution* |
|---|---|---|---|---|---|
| Port Royal | **12,785 (7.6%)** | **$13,669** | *19.0 (1.8%)* | *$3,282* | *$29,925* |
| Beaufort, City | **13,445 (8.0%)** | **$14,374** | *24.7 (2.4%)* | *$4,260* | *$29,926* |
| HHI [4] | **N/A** | **$0** | *N/A* | *$0* | *$0* |
| Bluffton | **18,897 (11.3%)** | **$20,203** | *52.2 (5%)* | *$9,015* | *$29,926* |
| Unincorp. BC | **98,494 (58.7%)** | **$105,302** | *267.8 (26.0%)* | *$46,703* | *$29,926* |
| Yemassee [1] | **N/A** | **$0** | *N/A* | *$0* | *$0* |
| Unincorp, Jasper | **18,603 (11.1%)** | **$19,889** | *624.2 (60.0%)* | *$107,717* | *$29,926* |
| Hardeeville | **5,721 (3.4%)** | **$6,116** | *49.7 (4.8%)* | *$8,576* | *$29,925* |
| Ridgeland [4] | **N/A** | **$0** | *N/A* | *$0* | *$0* |
| Total | | **$179,554** | | *$179,554* | *$179,554* |

[1] Beaufort County will assume this cost wholly on behalf of the Town of Yemassee.
[2] Source: Vintage July 1, 2016 Population Estimates: Population Estimates
[3] Source: Beaufort County GIS data for BC, Wikipedia search, JC Comp. Plan for JC. (excludes water areas)
[4] Hilton Head Island and Ridgeland have chosen not to participate in the regional effort.

After careful consideration of the pros and cons for each option, the subcommittee came to consensus on a distribution of cost based on population. While annexations can shift costs, the impacts of growth from development is most evident in population changes. It is the opinion of the subcommittee that the need for uniform regional stormwater standards for future growth is equally as great in “built out” communities facing redevelopment pressures. Population figures more fairly represent needs now and in the future. Thus, the subcommittee recommends a cost share based on population figures. Once the project is underway, the needs and concerns of all jurisdictions participating should be addressed evenly without preference to the larger financial contributors.

The Stormwater Technical Subcommittee thanks you for your continued commitment to regionalism and this important environmental and development topic.

# Solid Waste DOC Water Quality Retrofit Planning Level Cost Estimates

**Prepared for Beaufort County Public Works**

June 2018

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McLaughlin Consulting

## Summary

11 drop off centers were inspected and considered for stormwater quality retrofits. Based upon those inspections, a desktop analysis and discussions with staff, a planning level cost estimate for recommended retrofits is below.

| DOC Name | Planning Level Cost |
|---|---|
| **Big Estate** | $46,000 |
| **Sheldon** | $5,200 |
| **Lobeco** | $8,700 |
| **Coffin Point** | $11,000 |
| **Gate** | $13,700 |
| **Pritchardville** | $9,800 |
| **Cuffy** | $6,000 |
| **St. Helena** | $0 |
| **Shanklin** | $20,000 |
| **Hilton Head** | $20,000 |
| **Bluffton** | $40,000 |
| **Total** | $180,400 |

## Background

Inspections were performed of all of the County's Drop off Centers (DOCs) except for Daufuskie on February 12-13. These inspections were performed by Tanner Powell, Beaufort County, and Beth McLaughlin, McLaughlin Consulting. The goals of the inspections were to determine the need for stormwater quality improvements and pollution prevention needs. Inspection reports were completed for each DOC. An initial report was prepared to inform staff about observed trends and initial concepts. The next task was to develop retrofit concepts with planning level cost estimates to aid in decision-making. This report describes those retrofit structural and non-structural concepts as well as planning level costs for the structural retrofits.

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## DOC Facilities Included

DOC facilities that were inspected in February have been grouped into regional and local facilities. Regional facilities are those that are larger, paved DOCs, and local facilities are smaller with a paved ramp and concrete roll-off pads. **Regional facilities** are in bold type in the list below.

DOC Facilities Inspected February 12-13

| | |
|---|---|
| Big Estate | **St. Helena** |
| Sheldon | **Shanklin** |
| Lobeco | **Hilton Head** |
| Coffin Point | **Bluffton** |
| Gate | |
| Pritchardville | |
| Cuffy | |

## Non-structural stormwater quality and pollution prevention practices

Non-structural activities recommended for all facilities are described below.

**Training and behavior changing**. These practices focus on changing behavior of DOC facility staff. SWPPPs and standard operating procedures have been developed for all facilities. These components will be included in staff training at least annually (or more frequently where ongoing issues are noted). A concerted effort must be continuously made towards training and education to realize effectiveness. Training can simply focus on going over DOC facility SOPs to ensure all staff are aware of the best practices. Annual evaluations of the effectiveness of the training should occur in coordination with the MS4 annual report preparation or other ongoing annual requirement.

**Pollution prevention practices.** While the DOCs have pollution prevention practices in place, most were not being maintained. Pollution prevention practices include absorbent socks around the waste oil storage tanks, spill cleanup materials available on the site, and covering household garbage roll-offs. SOPs for each facility will focus on practice installation and long-term operation and maintenance.

**Used waste oil tanks.** In the February inspections, most of the used oil tanks were in need of maintenance. Specifically, the absorbent socks in the spill reservoirs needed to be replaced with a new sock or with a sock of a different size. During discussions with County staff, these issues have been or are being resolved. Therefore, costs for those structural controls are not included in this document.

## DOC retrofits with planning level cost estimates

The following section provides a summary of the structural retrofits recommended for each site, as well as a planning level cost estimate. These retrofit options were developed with input from Public Works staff. Assumptions for the retrofits and cost estimates are below:

**Assumptions**:

- Concepts were developed to address water quality treatment, not water quantity.

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- The baseline water quality design is to capture and treat the first 1 inch of runoff from impervious surfaces. Where feasible, pretreatment was included to address potential pollutants from roll-off leakage.
- Pond construction costs, including the first year of maintenance, were estimated at $6.80 per cubic foot of storage needed. This cost estimate came from EPA's *Methodology for Developing Cost Estimates for the Opti-Tool* document (February 2016).
- These planning level costs do not include design or survey costs.
- Where rock is to be placed as a stabilization practice, geotextile fabric should be placed first. The geotextile fabric prevents the rock from being pressed into the soil and also provides a more stable base upon which to drive. A 2400 lb tensile strength geotextile fabric is recommended with a 4-inch depth of 2-inch stone on top. If a lower tensile strength fabric is used, the depth of rock on top should be increased. For cost estimating purposes, the Mirafi HP270 geotextile fabric was used. More information on this geotextile product can be found in Appendix A.
- Where pretreatment is recommended, a manufactured treatment device (MTD) was recommended as pretreatment prior to discharging to ponds. Pretreatment removes the larger portion of pollutants in runoff beyond sediment and solids, such as nutrients and other pollutants associated with leaking roll-off bins. Pretreatment devices also decrease the amount of maintenance needed on ponds. For cost estimating purposes, a MTD type, size and cost were needed. The MTD used as an example in this report is the Suntree Nutrient Separating Baffle Box (NSBB). The NSBB is a filtering type MTD, which will require attention/maintenance over time to ensure its proper function. Note that this is not the only option available to the County. MTDs generally have a maximum treatment flow rate associated with a treatment criteria, such as 80% TSS reduction. Most maximum treatment flow rates for MTDs are low and require either a flow regulator upgradient from the MTD or small drainage areas. For the purposes of this cost estimation, pretreatment was only designed for the area around the roll-off bins and was assumed generally to be about 0.25-0.5 acres in size. Given these assumptions, the following cost applies to the pretreatment device:
    - Nutrient Separating Baffle Box 3-6 is $20,000. Maximum treatment flow rate is 1.4 cfs for a 50% TSS reduction (as certified by NJDEP).

  This cost does not include grading, additional stormwater system pipes, or labor to install. More information can be found on the NSBB in Appendix B.

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***Big Estate (63 Big Estate Rd)*** ***Planning Level Cost Estimate: $46,000***

**Site information.** Big Estate is a local facility with a paved ramp and paved roll-off container pads. The tract is 1.2 acres. The northwest corner may be the best option for a pond to treat water quality. Based upon a desktop analysis, 1 acre of treatment would be needed. The pond should be 3350 $ft^2$ at 2 ft depth. Pollution prevention and training are needed for managing used oil collection tank area, cleanup materials and absorbent sock replacement. The household waste roll-off bin was covered, but the other bins for bulky materials and yard waste were not covered. Pollution prevention training should focus on ensuring proper sorting of all trash before being placed in a roll-off. Also, concrete pads under the roll-offs should be cleaned at least weekly so leaks are more visible and can be cleaned up.

**Retrofit information.**
Water quality treatment needed: 6700 $ft^3$
Constraints: Unpaved areas around roll offs make pretreatment infeasible. No stormwater system installed on the site.

| **BMP Type** | **Size** | **Planning Level Cost Estimate** |
|---|---|---|
| Pond | 84' x 40' x 2' deep | $46,000 |
| Pretreatment | N/A | N/A |
| Other | | |
| - Drainage ditch | 250' in length; ditch to drain | County forces, County equipment |

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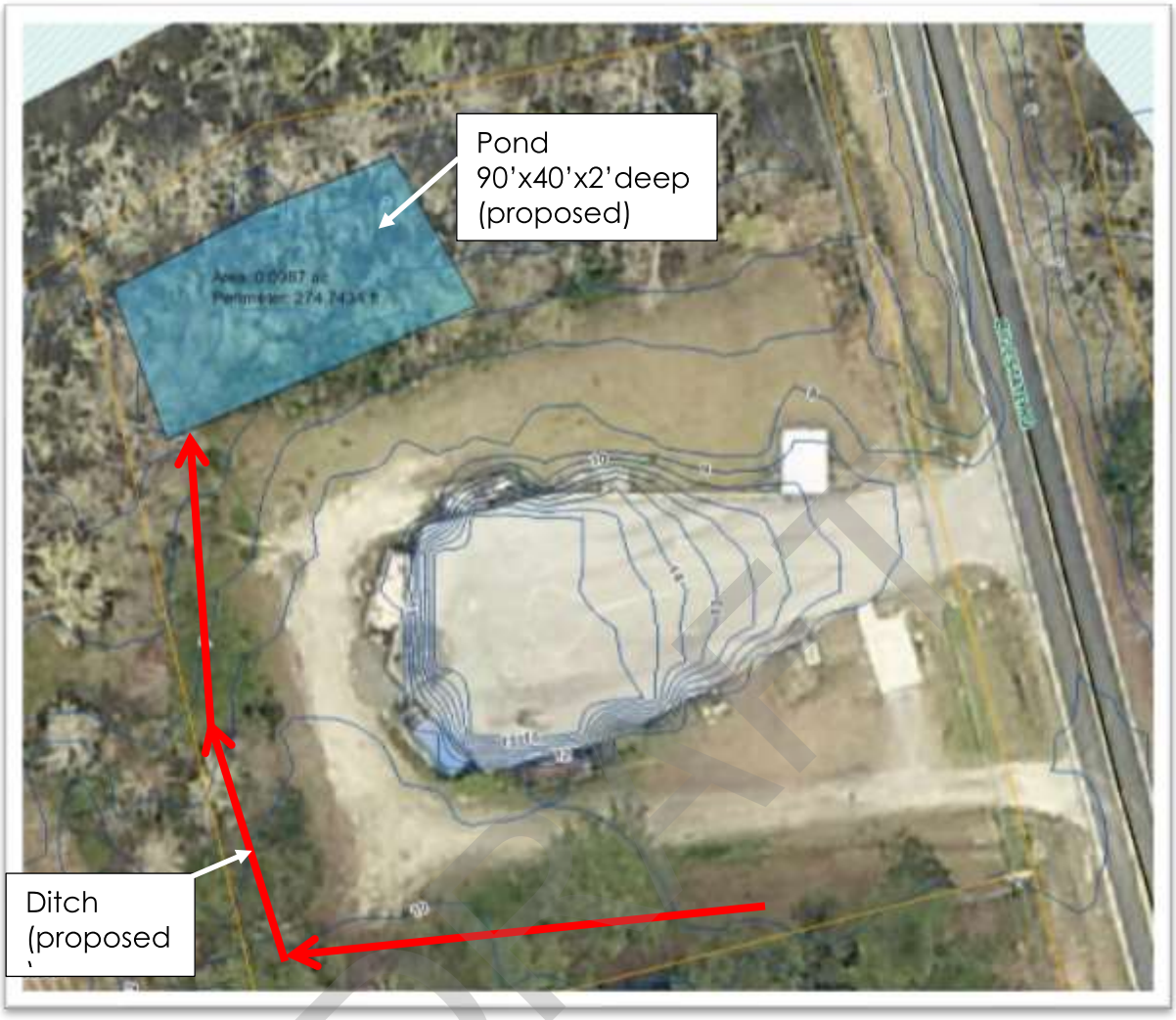
**Figure 1 Big Estate DOC Retrofit Sketch**

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***Bluffton (104 Simmonsville Rd)*** ***Planning Level Cost Estimate: $40,000***

**Site information.** The Bluffton facility is a 7.5 acre regional facility with paved traffic lanes, roll-off areas and other collection areas. A storm drain system was observed on the site, with 2 drop inlets near the roll-off containers and a culvert in the grassy area in the middle of the traffic lanes. The County GIS did not include the drop inlets or connecting storm drain pipes. A pond is located between Bluffton Parkway and the DOC. Pretreatment should be considered to treat roll-off leakage before entering the storm drain system and pond.

**Retrofit information**.
Water quality treatment needed: 15,066 $ft^3$ in existing pond; pretreatment in drop inlets
Constraints: No mapping of the storm drain system near the roll-off bins including the drop inlets was available. If these inlets are connected, it could be that just one NSBB is needed in the lower drop inlet. The planning level cost estimate assumes a worst-case scenario where the drop inlets are on separate lines and treatment is needed in both.

| BMP Type | Size | Cost estimate |
|---|---|---|
| Pond | Existing pond along Bluffton Pkwy | -- |
| Pretreatment | | |
| - 2- Nutrient Separating Baffle Boxes in the 2 drop inlets | NSBB Model 3-6 | $20,000 each |

**Figure 2 Bluffton DOC Retrofit Sketch**

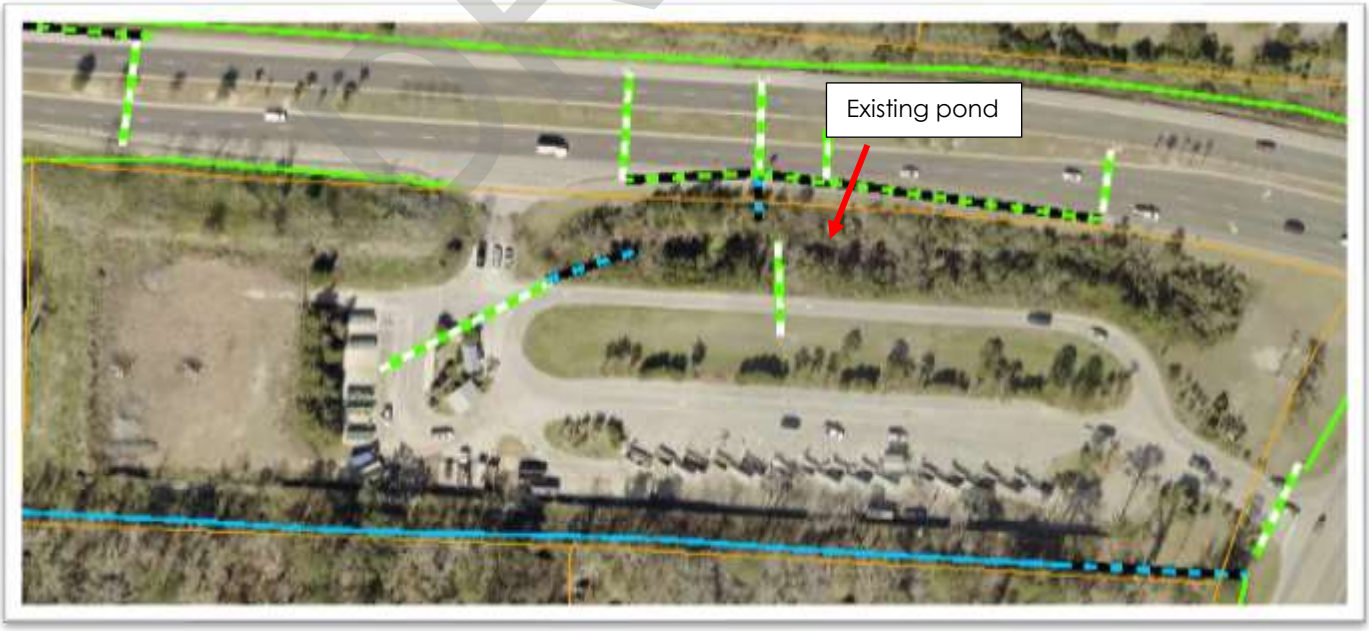


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**Figure 3. Bluffton drop inlet locations**


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***Coffin Point (20 Cee Cee Rd)*** ***Planning Level Cost Estimate: $11,000***

**Site information.** Coffin is a local facility with a paved ramp and paved roll-off container pads. The used oil recycling area is at the upgradient end of the site, with the low point on the lower eastern side of the site. Based upon a desktop analysis, there is not enough surface area on the tract to include a pond on the lower end. The southeastern adjacent property appears to be an access road to several properties behind and beside the Coffin site. In addition, the septic holding tank is located beside the ramp on the southeast. The household waste roll-off bin was covered, but the other bins for bulky materials and yard waste were not covered. Pollution prevention training should focus on ensuring proper sorting of all trash before being placed in a roll-off. Also, concrete pads under the roll-offs should be cleaned at least weekly so leaks are more visible and can be cleaned up. Training should focus on the importance of these activities as well as on maintenance needs of any structural pollution prevention practices.

**Retrofit information.**
Water quality treatment needed: 1140 $ft^3$
Constraints: Low point for property appears to be in the southeast corner of the property, where the surface area for treatment is limited. The septic tank is located on the lower end of the ramp, close to where the pond is suggested. The pond should be set back far enough to allow septic tank servicing. A portion of the adjoining property should be purchased to allow the septic tank maintenance access and installation of the pond and ditch. Land purchase may be difficult due to what appears to be an access road to several properties.

| **BMP Type** | **Size** | **Cost estimate** |
|---|---|---|
| Pond | 30' x 20' x 2' deep | $8,160 |
| Pretreatment | N/A | |
| Other | | |
| - Purchase property along eastern property line | 200' x 20-30' minimum | @$14,000/ac, ~$2000 |
| - install ditch | 100' | None; County forces to construct |

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**Figure 4 Coffin Point Retrofit Sketch**

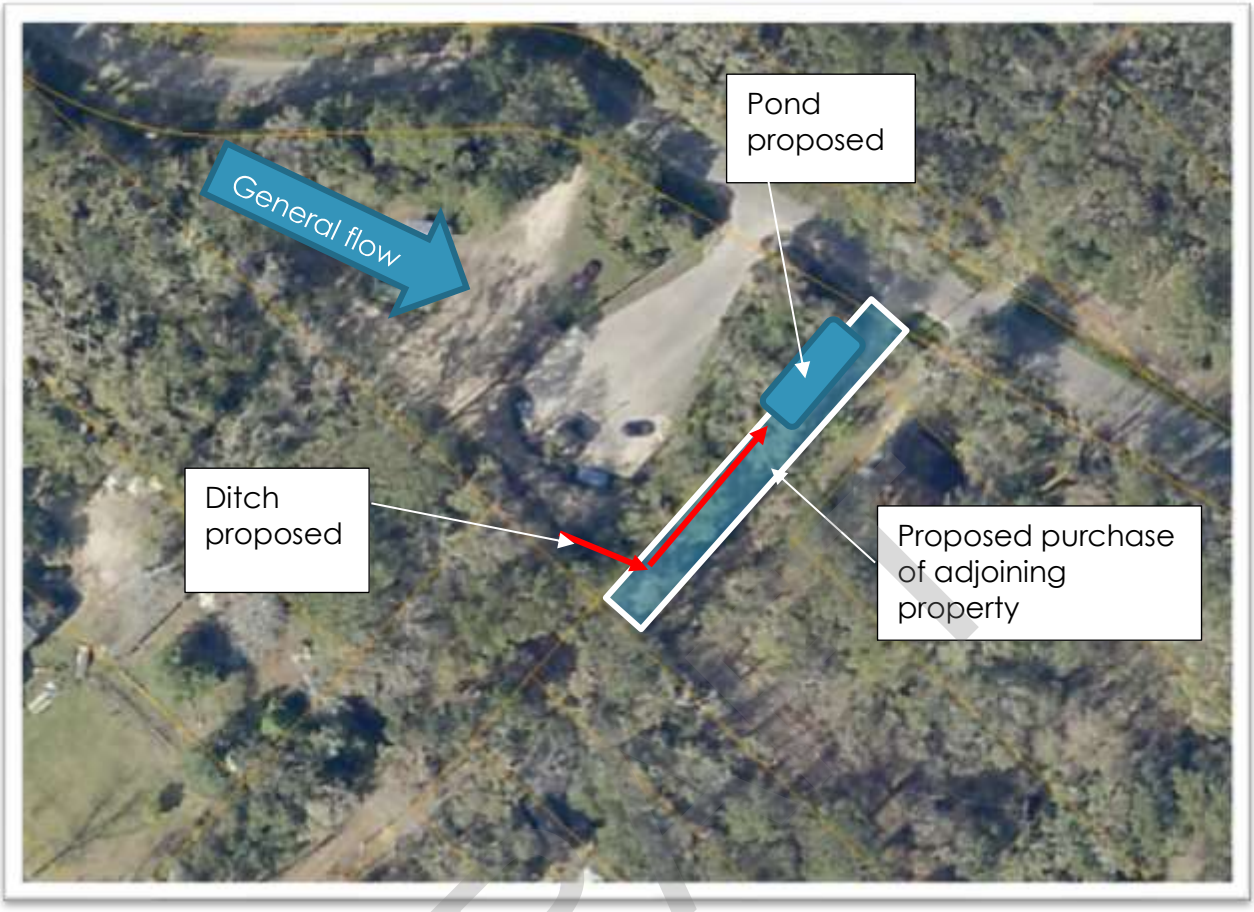


**Figure 5 Coffin property with adjacent properties shown**

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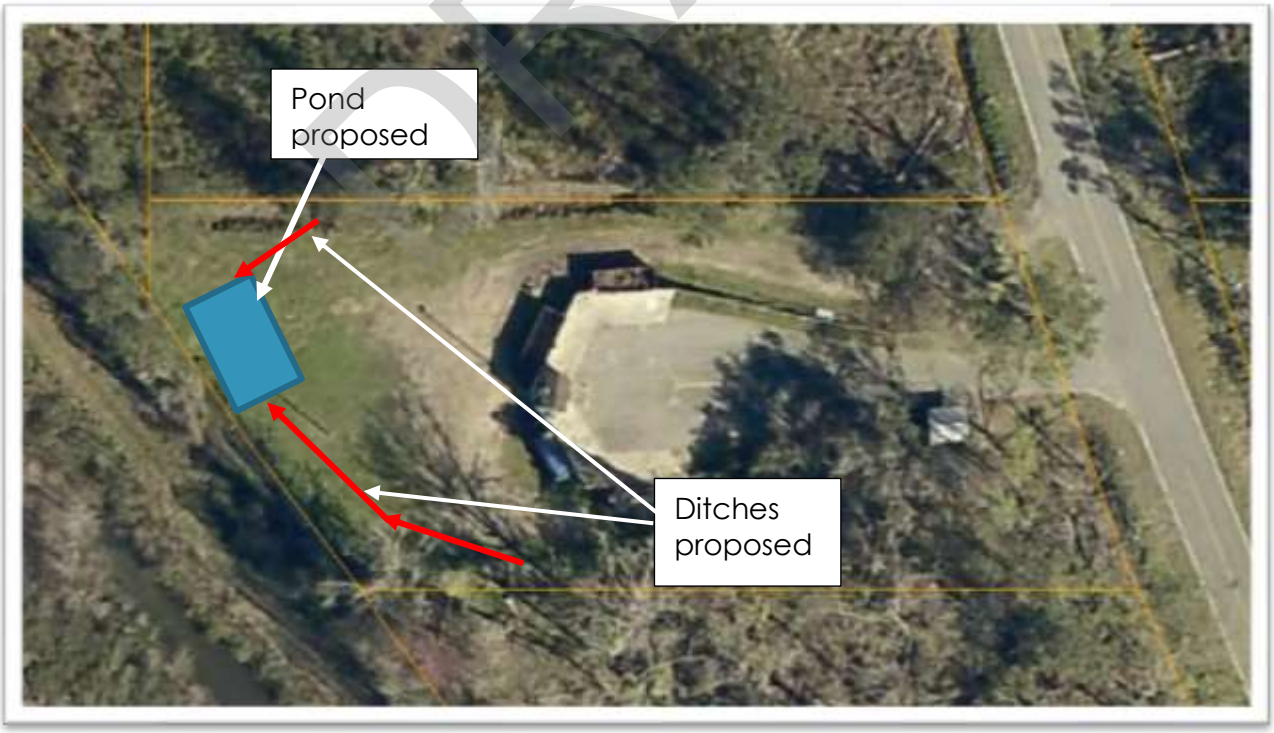
***Cuffy (138 Cuffy Rd)*** ***Planning Level Cost Estimate: $6,000***

**Site information**. Cuffy is a 1-acre local facility with a paved ramp and paved roll-off pads. Based upon a desktop analysis, the site has 11,000 $ft^2$ of impervious surfaces equating to 1700 $ft^3$ of treatment required. An area to the northwest could be retrofitted with a pond to meet the treatment needs. The household waste roll-off bin was covered, but the other bins for bulky materials and yard waste were not covered. Pollution prevention training should focus on ensuring proper sorting of all trash before being placed in a roll-off. Also, concrete pads under the roll-offs should be cleaned at least weekly so leaks are more visible and can be cleaned up. Training should focus on the long term maintenance of absorbent socks and general pollution prevention for the site.

**Retrofit information.**
Water quality treatment needed: 1700 $ft^3$
Constraints: Roll-off area is mostly unpaved, making pretreatment infeasible. No other known constraints.

| BMP Type | Size | Cost estimate |
|---|---|---|
| Pond | 20' x 43' x 2' deep | $5,848 |
| Pretreatment | N/A | |
| Other<br>- ditches | 75-100' | To be constructed by County staff |

**Figure 6 Cuffy Retrofit Sketch**

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***Gates (316 Castle Rock Rd)*** ***Planning Level Cost Estimate: $13,700***

**Site information**. Gates is a local facility at the intersection of two roads. The tract of land is 1 acre and triangular in shape. There are two entrances: one off of Castle Rock Rd to the unpaved portion containing the used oil storage area and another on Grober Hill Rd. to the paved drop off ramp. The entrance on Castle Rock needs to have rock placed so mud and dirt isn't tracked onto the roadway. The unpaved portion has a storm drain system in place, with the culvert inlet in the middle and its outlet to the west discharging into a wetland. The household waste roll-off bin was covered, but the other bins for bulky materials and yard waste were not covered. Pollution prevention training should focus on ensuring proper sorting of all trash before being placed in a roll-off. Also, concrete pads under the roll-offs should be cleaned routinely so leaks are more visible and can be cleaned up. A pond could be installed to meet water quality requirements. The treatment volume needed to offset the impervious surfaces on the site is 1550 $ft^3$. Pollution prevention training should focus on trash and debris cleanup and maintenance of any pretreatment device and other pollution prevention practices on the site.

**Retrofit information.**
Water quality treatment needed: 1550 $ft^3$
Constraints: Large area around roll-offs and near recyclables is unpaved. A culvert inlet is in the middle of the unpaved area and discharges directly to a wetland. Placing geotextile fabric and at least 6 inches of stone in this area will prevent sediment from entering the culvert and discharging to the wetland. With both garbage trucks and public vehicles accessing the site from Caste Rock Rd, a heavier duty (2400 lb tensile strength) geotextile fabric with 4" of stone should be placed in the area.

| **BMP Type** | **Size** | **Cost estimate** |
|---|---|---|
| Pond | 575 $ft^2$ x 2' deep (triangular 25' x 25' x 70' x 2' deep) | $7,800 |
| Pretreatment | N/A | |
| Other | | |
| - Rock area from Castle Rock Rd to around the culvert inlet and in front of recycling area | 0.2 acres surface area<br>Geotextile fabric<br>2"clean stone (No. 4) 4" deep – approximately 100 tons | Geotextile: Mirafi HP270 2400 lb tensile strength or equivalent – 950 $yd^2$ @ $1.25/$yd^2$ = $1200<br><br>Stone: $47/ton delivered; $4,700 |

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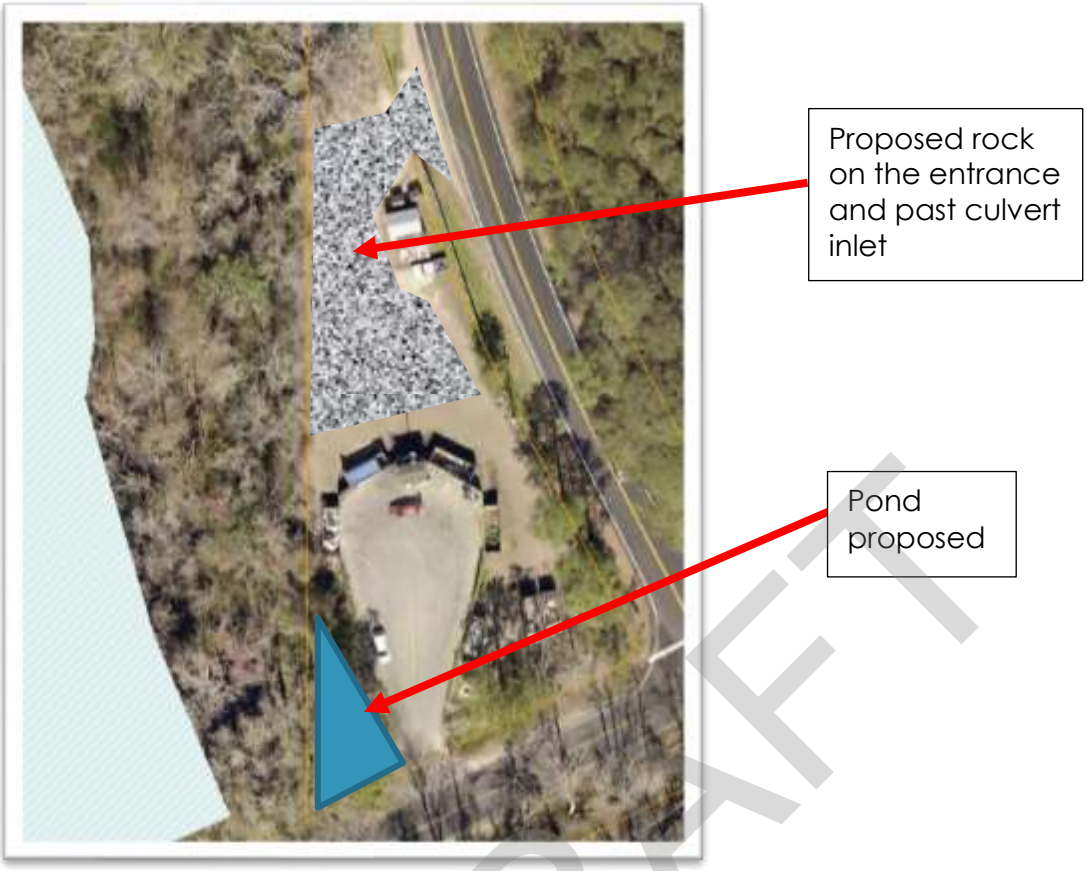
**Figure 7 Gates Retrofit Sketch**

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***Hilton Head (Summit Drive)*** ***Planning Level Cost Estimate: $20,000***

**Site information**. The Hilton Head DOC is a regional facility located on a portion of a 66-acre parcel near the Hilton Head airport. Based upon a desktop analysis, the DOC site has approximately 35,000 $ft^2$ of impervious surfaces. The site also has a storm drain system installed with drop inlets located close to the roll-off bins. Roll-offs are covered; however, evidence of stains from leaks below the roll-offs was present during the annual inspection. No pretreatment of runoff before entering the storm drain system was noted. The storm drain system on the DOC discharges to a pond to the northeast of the site. A pretreatment device in a drop inlet is recommended to remove pollutants from leaking roll-off bins. In addition, training on used oil storage should be provided to the DOC staff to focus on spill cleanup and replacement of the absorbent socks on the tank.

**Retrofit information**.
Water quality treatment needed: 5400 $ft^3$
Constraints: No known constraints. The site has numerous drop inlets and a curb inlet. An existing pond is to the northeast of the site, so only pretreatment is needed.

| **BMP Type** | **Size** | **Cost estimate** |
|---|---|---|
| Pond | N/A – existing pond | N/A |
| Pretreatment | 1 Nutrient Separating Baffle Boxes | $20,000 |
| Other | N/A | |

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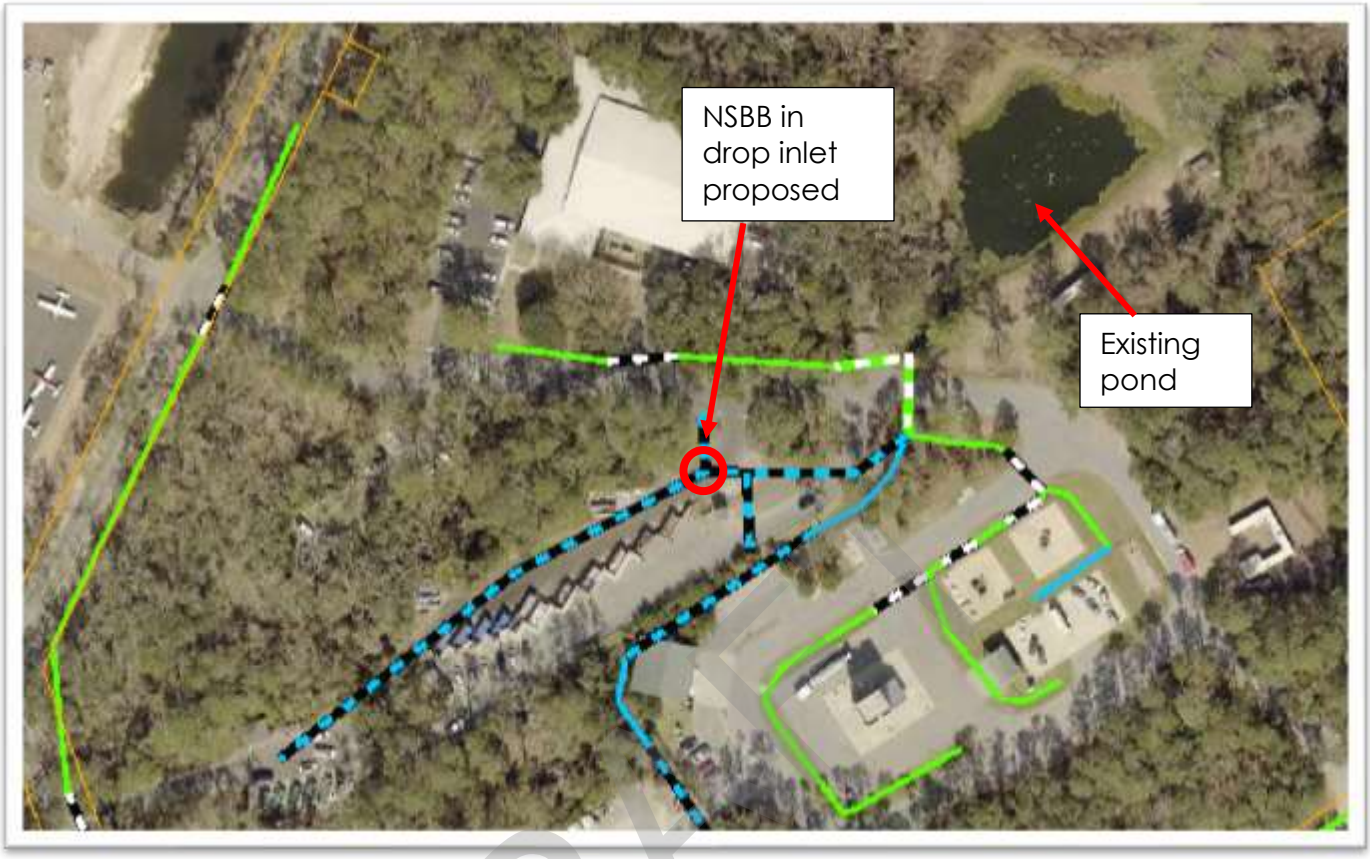
**Figure 8 Hilton Head Retrofit Sketch**

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***Lobeco (16 Keans Neck)*** ***Planning Level Cost Estimate: $8,700***

**Site information.** Lobeco is a local DOC situated on approximately 1 acre. While the site itself doesn't have a storm drain system, there is a drop inlet at the entrance of the site at the bottom of the entrance ramp. However, County GIS includes stormwater piping along the southern and western property lines. It appears these lines tie into the SCDOT system near the road and entrance. The desktop analysis found approximately 8000 $ft^2$ of impervious surfaces. To provide stormwater quality treatment, approximately 1276 $ft^3$ of storage is needed. There appears to be plenty of room for a pond towards the south and west of the ramp. In addition, the used oil tank should be changed out to a tank that provides more storage in the reservoir at the bottom of the tank or a properly sized absorbent sock should be installed in the reservoir. During the February inspection, a significant amount of trash was noted on the DOC site and outside of the gate. Pollution prevention training should focus on trash pick up, maintenance of pollution prevention practices and spill clean up. The household waste roll-off bin was covered, but the other bins for bulky materials and yard waste were not covered. Pollution prevention training should focus on ensuring proper sorting of all trash before being placed in a roll-off. Also, concrete pads under the roll-offs should be cleaned at least weekly so leaks are more visible and can be cleaned up.

**Retrofit Information.**
Water quality treatment needed: 1276 $ft^3$
Constraints: The ramp drains towards the road, where there is an existing storm drain drop inlet owned by SCDOT. Based upon the GIS information, it appears that County-owned stormwater drainage culverts connect to the SCDOT system at or near the drop inlet. Since the stormwater system is owned and operated by SCDOT, treatment cannot be placed in the drop inlet at the bottom of the ramp. Emphasis should be placed on educating DOC staff regarding cleanup after spills and trash dumping so these materials do not migrate into the SCDOT stormwater system or off-site. The location of the County stormwater system pipes should be verified before installing the pond. The pond should be constructed near the southeast corner of the property. Comparing the contour lines and wetland area from GIS to field conditions, it appears that the wetland is not on the property and the contours are more realistic. However, before constructing the pond, the wetland boundary should be also verified.

| BMP Type | Size | Cost estimate |
|---|---|---|
| Pond | 20' x 32' x 2' deep | $8,700 |
| Pretreatment | N/A | |
| Other | N/A | |

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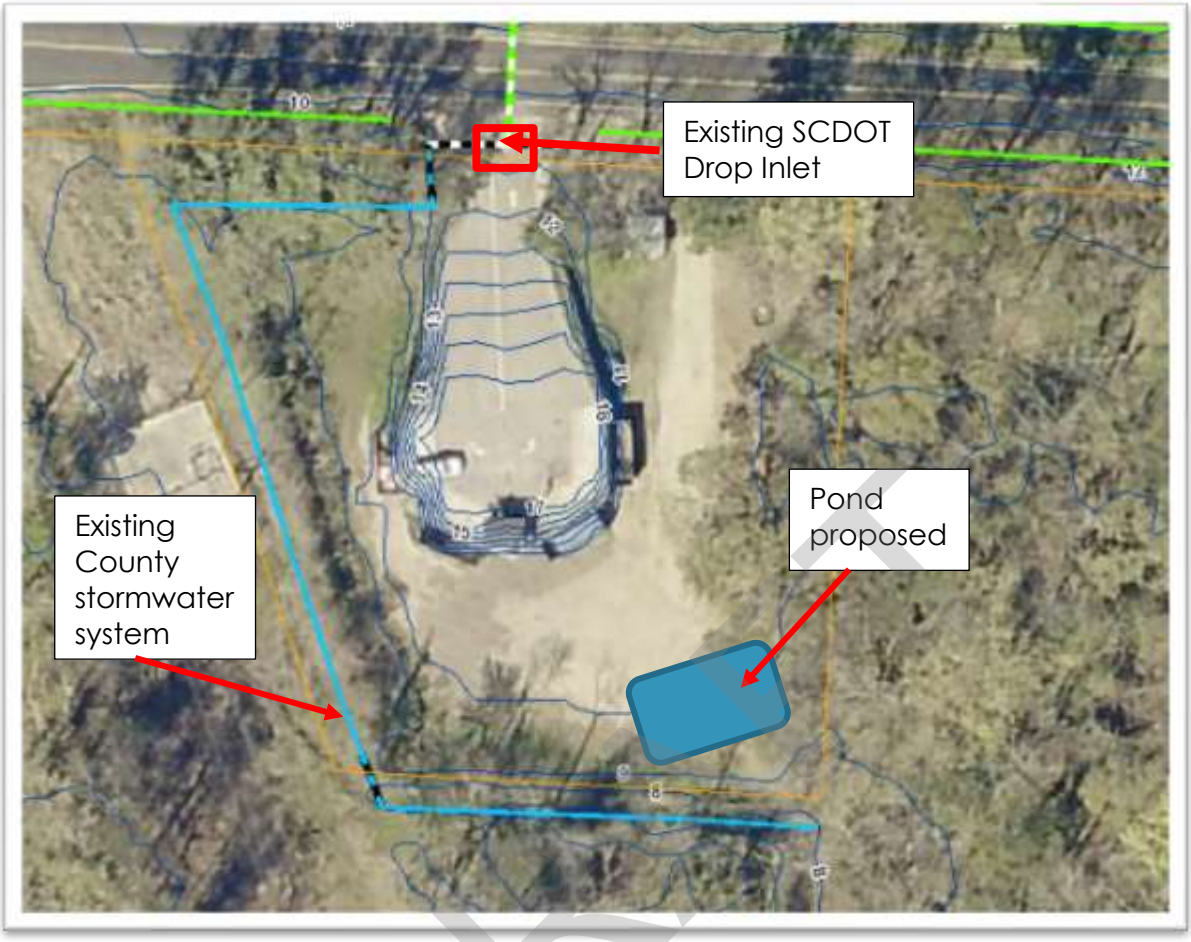
**Figure 9 Lobeco Retrofit Sketch**

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***Pritchardville (54 Gibbet Rd)*** ***Planning Level Cost Estimate: $9,800***

**Site information**. Pritchardville DOC is a local facility located on 0.8 acres of land. The DOC includes a paved ramp and an unpaved portion containing the oil storage and recyclables. There are 3 entrances: the entrance to the paved roll-off drop off area, the unpaved truck access area to service the bins, and the recyclable area. The entrance to the recyclable area has been stabilized with rock. However, the truck access entrance has not. Rock should be placed on this entrance as well to prevent dirt from being tracked off the site. Based upon a desktop analysis, the site has approximately 8300 $ft^2$ of impervious surfaces and needs 1300 $ft^3$ of treatment to meet the stay on volume. The northeast and northwest portions of the site could be retrofitted with a pond to provide this volume of storage. The used oil tank spill reservoir is undersized and barely fits absorbent socks. This tank should be exchanged for a tank with greater storage or a properly sized absorbent sock installed in the reservoir. The household waste roll-off bin was covered, but the other bins for bulky materials and yard waste were not covered. Pollution prevention training should focus on ensuring proper sorting of all trash before being placed in a roll-off. Also, concrete pads under the roll-offs should be cleaned at least weekly so leaks are more visible and can be cleaned up. Training should focus on proper maintenance of entrances to prevent track out, maintenance of the area around the used oil tank and spill clean-up.

**Retrofit information.**
Water quality treatment needed: 1300 $ft^3$
Constraints: It appears that the wetland is well off the parcel. There are 2 constraints to consider: 1) truck maneuvering and 2) overcoming elevation in the southeast corner to bring runoff to the northeast corner. The storage required is fairly small, and constructing it in a triangular shape should keep the pond mostly out of the way. The estimated pond size is 30'x30'x45', 2' deep.

| **BMP Type** | **Size** | **Cost estimate** |
|---|---|---|
| Pond | 30'x30'x45' by 2 ' deep | $8,840 |
| Pretreatment | N/A | |
| Other | | |
| - Drainage ditches | 260' | County staff to construct |
| - Stone at recyclable entrance | Approx 20 tons, 4" deep 2" clean stone<br>Geotextile fabric 20' wide x 50' long | Stone: $47/ton - $940<br><br>Geotextile: Mirafi HP270 2400 lb tensile strength or equivalent – 110 $yd^2$ @ $1.25/$yd^2$ ≈$140 |

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**Figure 10 Pritchardville Retrofit Sketch**


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***Shanklin (Shanklin Rd)*** ***Planning Level Cost Estimate: $20,000***

**Site information**. The Shanklin DOC is a regional facility that includes a white goods drop off area. The tract of land is 24 acres with the DOC collocated with the mosquito control center and other County buildings. The main DOC area is paved, though the access roads around the white goods drop-off area are not. A series of 2 dry ponds are at the front of the DOC, as are drop inlets and a connected storm drain system. Perimeter ditches manage runoff around the white goods storage area. Based upon a desktop analysis, the DOC has 2 acres of impervious surfaces and will need 13,400 $ft^3$ of treatment for water quality. The surface area of the 2 dry ponds is roughly 13,400 $ft^3$. The residence time of runoff in the ponds is unknown. The first pond had very notable evidence of high pollutant loads, in that the vegetation on the bottom of the pond appeared to be dead, and the pond bottom was black. Some type of pretreatment MTD should be installed in the storm drain system prior to discharging to the pond.

**Retrofit information**.
Water quality treatment needed: 13,400 ft3
Constraints: No known constraints. This site already has 2 dry ponds installed towards the entrance of the facility, with the storm drain system around the roll off containers draining to pond 1. Discharge from pond 1 goes to pond 2 and then discharges from the site (note that the County's GIS drainage layer contains incorrect information about the location of drainage pipes on this DOC). The white goods storage area behind the DOC has a drainage ditch dug completely around the area, and if disposal rules are followed, the ditches in place should manage that runoff. The biggest concern for this site is the roll off drainage discharging untreated into the unlined, dry pond. A manufactured treatment device that provides filtering – not just settling - should be installed at the lower drop inlet, if feasible, to provide pretreatment before discharging into pond 1.

| BMP Type | Size | Cost estimate |
|---|---|---|
| Pond | 2 existing, with approximately 9000ft2 of surface area | N/A |
| Pretreatment | Nutrient separating baffle box or similar | $20,000 |
| Other | N/A | |

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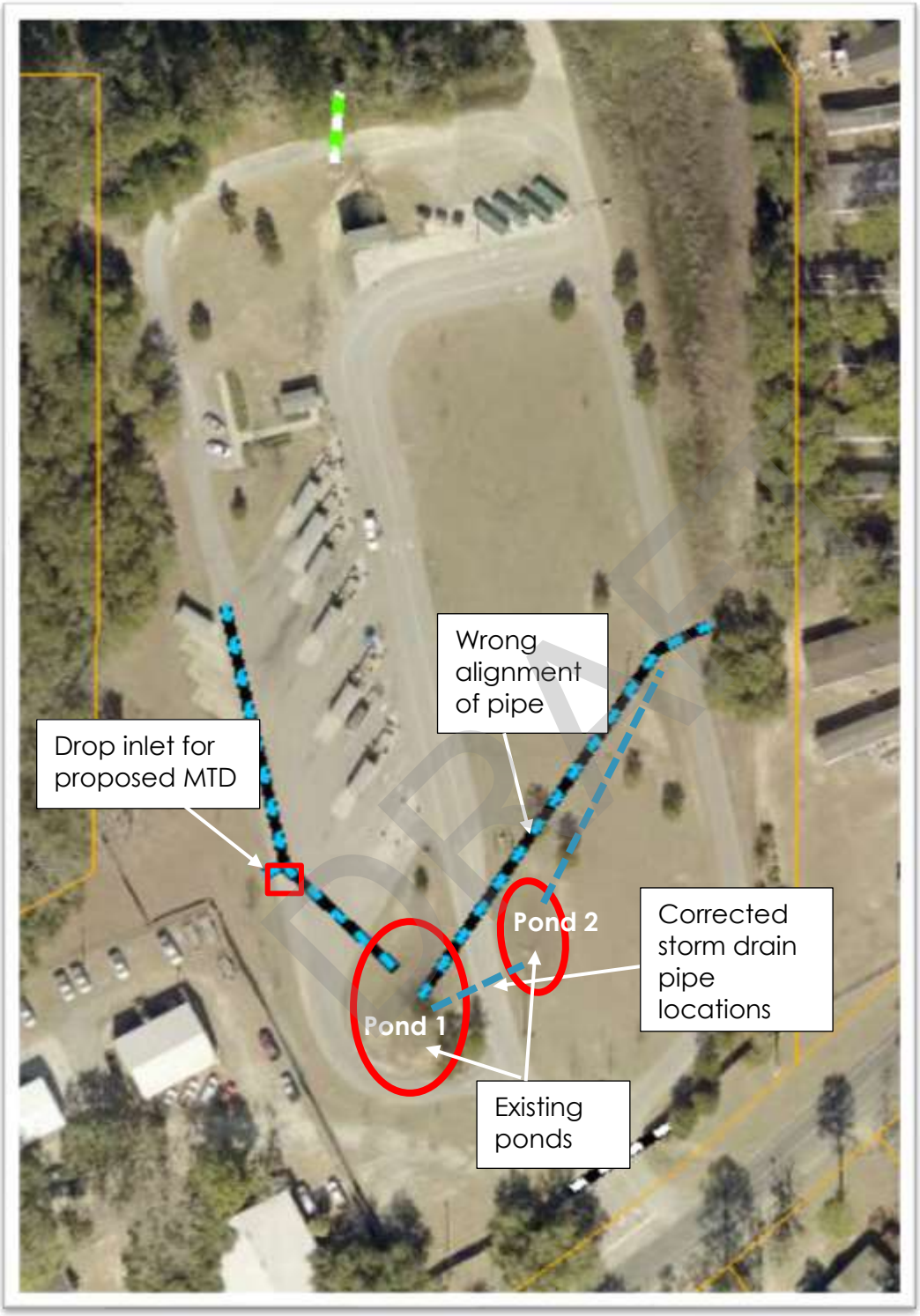
**Figure 11 Shanklin Retrofit Sketch**



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***Sheldon (208 Page Point Rd)*** ***Planning Level Cost Estimate: $5,200***

**Site information.** Sheldon is a local facility with a paved ramp and paved roll-off pads on 1.25 acres. The site has a porta potty with no plumbing. The used oil storage area pavement appears to be lower than the adjacent ramp so that runoff sheet flows across the pad. Historic spills were evident near the used oil tank, and little storage was available in the used oil tank reservoir. Installation of a curb at the upgradient side of the pad to direct water away will alleviate this issue. In addition, the tank should be replaced with a used oil storage tank with a larger spill reservoir or a properly sized absorbent sock should be placed in the reservoir.. Based upon a desktop analysis, the impervious area on the site is 7000 $ft^2$ and the required treatment volume is 1100 $ft^3$. The northern end of the property has space to allow a pond of this size. The household waste roll-off bin was covered, but the other bins for bulky materials and yard waste were not covered. Pollution prevention training should focus on ensuring proper sorting of all trash before being placed in a roll-off. Also, concrete pads under the roll-offs should be cleaned at least weekly so leaks are more visible and can be cleaned up. Training should focus on general pollution prevention, spill clean up, and porta potty maintenance.

**Retrofit information.**
Water quality treatment needed: 1100 $ft^3$
Constraints: No known constraints. Runoff flows across the waste oil storage concrete pad. A curb should be installed at the upgradient (ramp) side of the waste oil storage area to direct runoff away. Drainage ditch ownership should be investigated, as the drainage ditch to the west and north is tagged in GIS as "drains state". Orient the pond such that it intersects the western drainage ditch and discharges into the northern drainage ditch.

| BMP Type | Size | Cost estimate |
|---|---|---|
| Pond | 40' x 20' by 1.5' deep | $5,050 |
| Pretreatment | N/A | |
| Other | | |
| - Curb at waste oil storage | Plastic yellow curbing similar to the one shown below | ~$150 |

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**Figure 12. ULINE curb stop example**

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**Figure 13 Sheldon Retrofit Sketch**

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***St Helena (639 Sea Island Rd)*** ***Planning Level Cost Estimate: $-0-***

**Site information.** The St Helena DOC site is located on 8 acres, and the drop off area is paved. There is a wet pond at the front of the site (south side) but outside of the site fence. There does not appear to be a storm drain system on the DOC site; it appears all runoff sheet flows untreated to the pond. Based upon a desktop analysis, there is 55,000 $ft^2$ of impervious surfaces on the site that will require 8500 $ft^3$ of treatment. The pond's surface area is approximately 6500 $ft^2$. The depth of the pond should be verified, as at least 1.5 ft of depth is needed to provide the treatment. Maintain the grass filter strip as a pretreatment device for the pond. In addition, the used oil storage tanks should be replaced with a used oil storage tank with a larger spill reservoir or the absorbent sock should be properly sized for the spill reservoir. Training should focus on spill prevention and cleanup, pond maintenance, materials storage, and trash and debris pick up.

**Retrofit information.**
Water quality treatment needed: 8500 $ft^3$
Constraints: No stormwater pipes or channels on the DOC. A wet pond exists towards the front of the property. It appears that a drainage channel is part of the outlet. In the County GIS system, that drainage channel is identified as "drains private". However, if it drains the DOC, the drainage should change to "drains County". No pretreatment is recommended as the DOC does not have an internal storm drain system. However, the grassed shoulder between the pond and paved portion of the DOC should be maintained in good condition to act as a filter strip.

| BMP Type | Size | Cost estimate |
|---|---|---|
| Pond | Existing pond has 6500 $ft^2$ surface area. If the pond is 1.5' deep, it provides the water quality treatment necessary. | N/A |
| Pretreatment | Existing grass filter strip | N/A |
| Other | N/A | |

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**Figure 14. St. Helena – Wet pond on the south side of site, outside fence**

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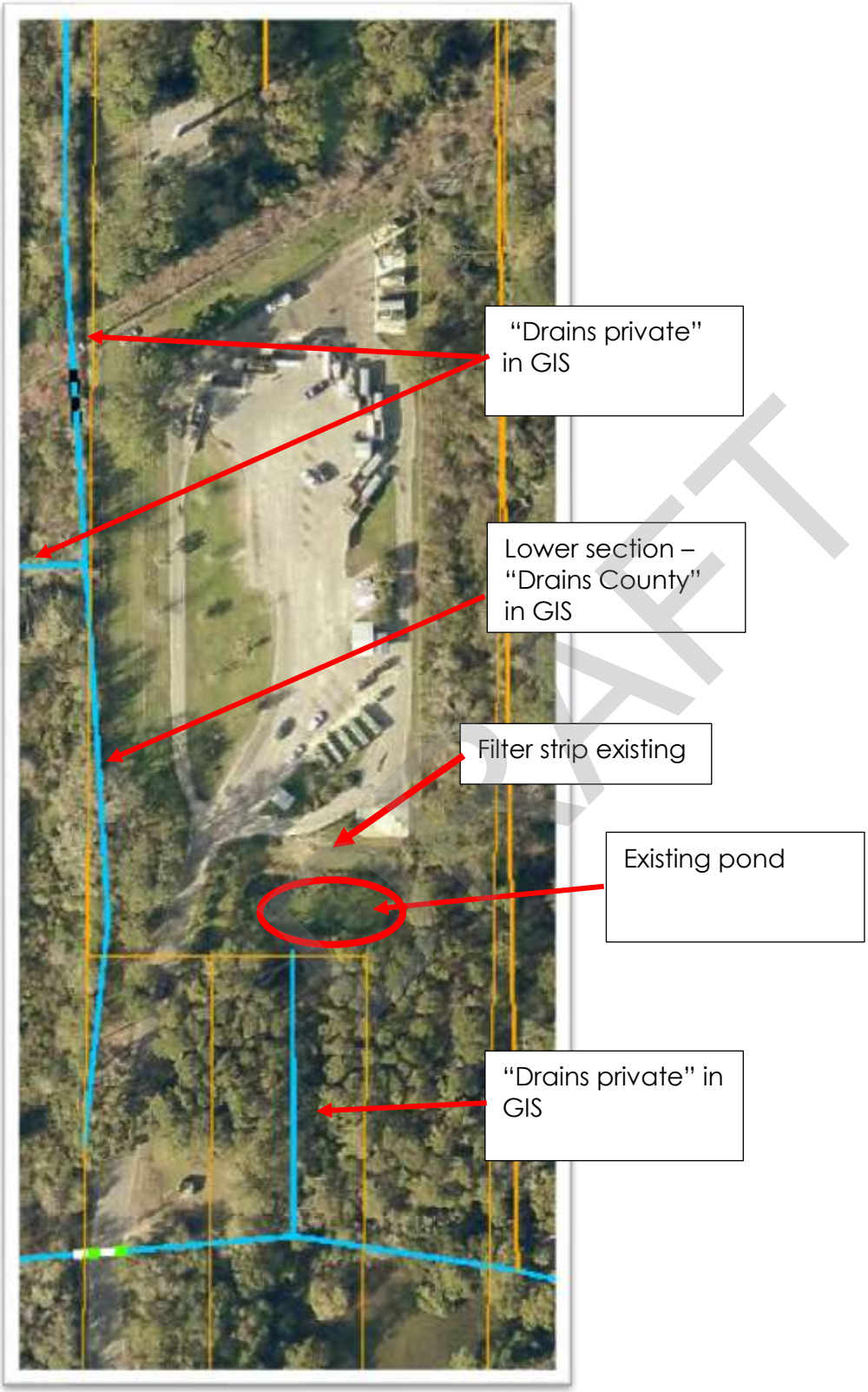
**Figure 15 St. Helena Island Retrofit Sketch**

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Appendix A: Geotextile information

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TENCATE Mirafi

Filtration Separation Soil Reinforcement

# Mirafi® HP270

Mirafi® HP270 geotextile is composed of high-tenacity polypropylene yarns, which are woven into a network such that the yarns retain their relative position. Mirafi® HP270 geotextile is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

| Mechanical Properties | Test Method | Unit | Minimum Average Roll Value | |
|---|---|---|---|---|
| | | | MD | CD |
| Tensile Strength (at ultimate) | ASTM D 4595 | kN/m (lbs/ft) | 38.5 (2640) | 35.9 (2460) |
| Tensile Strength (at 2% strain) | ASTM D 4595 | kN/m (lbs/ft) | 7.0 (480) | 8.6 (588) |
| Tensile Strength (at 5% strain) | ASTM D 4595 | kN/m (lbs/ft) | 17.7 (1212) | 19.8 (1356) |
| Tensile Strength (at 10% strain) | ASTM D 4595 | kN/m (lbs/ft) | 34.1 (2340) | 35.2 (2412) |
| Factory Seam Strength | ASTM D 4884 | kN/m (lbs/ft) | 18.4 (1250) | |
| Flow Rate | ASTM D 4491 | l/min/m$^2$ (gal/min/ft$^2$) | 2037 (50) | |
| Permeability | ASTM D 4491 | cm/sec | 0.04 | |
| Permittivity | ASTM D 4491 | sec$^{-1}$ | 0.70 | |
| Apparent Opening Size (AOS) [1] | ASTM D 4751 | mm (U.S. Sieve) | 0.60 (30) | |
| UV Resistance (at 500 hours) | ASTM D 4355 | % strength retained | 80 | |

[1] ASTM D 4751: AOS is a Maximum Opening Diameter Value
NOTE: To obtain Secant Modulus, divide tensile strength by the appropriate strain level
(i.e. Secant Modulus at 5% = 1,212/0.05 = 24,240 lbs/ft)

| Physical Properties | Test Method | Unit | Typical Value |
|---|---|---|---|
| Mass/Unit Area | ASTM D 5261 | g/m$^2$ (oz/yd$^2$) | 227 (6.7) |
| Roll Dimensions (width x length) | -- | m (ft) | 4 (13.1) x 50 (164) |
| Roll Area | -- | m$^2$ (yd$^2$) | 201 (239) |
| Estimated Roll Weight | --- | kg (lbs) | 46 (102) |

**Disclaimer:** TenCate assumes no liability for the accuracy or completeness of this information or for the ultimate use by the purchaser. TenCate disclaims any and all express, implied, or statutory standards, warranties or guarantees, including without limitation any implied warranty as to merchantability or fitness for a particular purpose or arising from a course of dealing or usage of trade as to any equipment, materials, or information furnished herewith. This document should not be construed as engineering advice.

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Appendix B: MTD information

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State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Nonpoint Pollution Control
Division of Water Quality
401-02B
Post Office Box 420
Trenton, New Jersey 08625-0420
609-633-7021 Fax: 609-777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

CHRIS CHRISTIE
*Governor*

KIM GUADAGNO
*Lt. Governor*

BOB MARTIN
*Commissioner*

**November 3, 2016**

Tom Happel, President
Suntree Technologies, Inc.
798 Clearlake Rd
Cocoa, FL 32922

Re: MTD Lab Certification
Nutrient Separating Baffle Box® (NSBB) with Hydro-Variant Technology Stormwater Treatment Device by Suntree Technologies, Inc.

**TSS Removal Rate 50%**

Dear Mr. Happel:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7 (c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Suntree Technologies Inc. has requested an MTD Laboratory Certification for the Nutrient Separating Baffle Box® with Hydro-Variant Technology (NSBB®) stormwater treatment device.

The verification is subject to the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated October 2016) for this device is published online at http://www.njcat.org/verification-process/technology-verification-database.html.

**The NJDEP certifies the use of the Nutrient Separating Baffle Box® with Hydro-Variant Technology (NSBB®) stormwater treatment device by Suntree Technologies, Inc. at a TSS removal rate of 50% when designed, operated, and maintained in accordance with the information provided in the Verification Appendix and the following conditions:**

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1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5.

2. The NSBB® stormwater treatment device shall be installed using the same configuration reviewed by NJCAT and shall be sized in accordance with the criteria specified in item 6 below.

3. This NSBB® stormwater treatment device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.

4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at www.njstormwater.org.

5. The maintenance plan for a site using this device shall incorporate, at a minimum, the maintenance requirements for the NSBB® stormwater treatment device. A copy of the maintenance plan is attached to this certification. However, it is recommended to review the maintenance website at http://www.suntreetech.com/files/Documents/Products/Nutrient-Separating-Baffle-Box/O&M%20Manual%20_%20New%20Jersey%20(3).pdf for any changes to the maintenance requirements.

6. Sizing Requirements:

   The example below demonstrates the sizing procedure for the NSBB®:

   Example: A 0.25 acre impervious site is to be treated to 50% TSS removal using a NSBB®. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

   Maximum Treatment Flow Rate (MTFR) Evaluation:

   The site runoff (Q) was based on the following:
   time of concentration = 10 minutes
   i=3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)
   c=0.99 (runoff coefficient for impervious)
   Q=ciA=0.99x3.2x0.25=0.79 cfs

   Given the site runoff is 0.79 cfs and based on Table 1 below, the NSBB® Model 3-6 with an MTFR of 1.4 cfs would be the smallest model approved that could be used for this site that could remove 50% of the TSS from the impervious area without exceeding the MTFR.

   The sizing table corresponding to the available system models is noted below. Additional specifications regarding each model can be found in the Verification Appendix under Table A-1 and Table A-2.

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Table 1 NSBB®-HVT Models

| NSBB-HVT Model No. | Inside Length. (feet) | Inside Width, (feet) | Depth Below Invert, (feet) | **Maximum Treatment Flow Rate (MTFR), cfs** | 50% Maximum Sediment Storage Volume, ($ft^3$) | Sediment Removal Interval (months) |
|---|---|---|---|---|---|---|
| 2-4 | 4.00 | 2.00 | 2.7 | 0.62 | 3.88 | 44.5 |
| 3-6 | 6.00 | 3.00 | 3.00 | 1.40 | 8.63 | 44.0 |
| 3-8 | 8.00 | 3.00 | 3.00 | 1.87 | 11.6 | 44.5 |
| 4-8 | 8.00 | 4.00 | 3.00 | 2.49 | 15.0 | 43.0 |
| 5-10 | 10.00 | 5.00 | 4.10 | 3.89 | 23.8 | 43.6 |
| 6-12 | 12.00 | 6.00 | 4.80 | 5.60 | 34.3 | 43.7 |
| 6-13.75 | 13.75 | 6.00 | 5.40 | 6.42 | 39.5 | 44.0 |
| 7-14 | 14.00 | 7.00 | 5.50 | 7.62 | 46.7 | 43.7 |
| 7-15 | 15.00 | 7.00 | 5.90 | 8.17 | 50.2 | 43.9 |
| 8-14 | 14.00 | 8.00 | 6.20 | 8.71 | 53.3 | 43.7 |
| 8-16 | 16.00 | 8.00 | 6.20 | 9.96 | 61.3 | 44.0 |
| 9-18 | 18.00 | 9.00 | 6.90 | 12.60 | 76.5 | 43.4 |
| 10-17 | 17.00 | 10.00 | 7.60 | 13.22 | 80.0 | 43.2 |
| 10-20 | 20.00 | 10.00 | 7.60 | 15.56 | 95.0 | 43.6 |
| 12-21 | 21.00 | 12.00 | 9.00 | 19.60 | 120 | 43.7 |
| 12-24 | 24.00 | 12.00 | 9.00 | 22.40 | 138 | 44.0 |

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Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Practices Manual.

If you have any questions regarding the above information, please contact Mr. Titus Magnanao of my office at (609) 633-7021.

Sincerely,

James J. Murphy, Chief
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

cc: Chron File
Richard Magee, NJCAT
Vince Mazzei, DLUR
Ravi Patraju, NJDEP
Gabriel Mahon, BNPC
Titus Magnanao, BNPC

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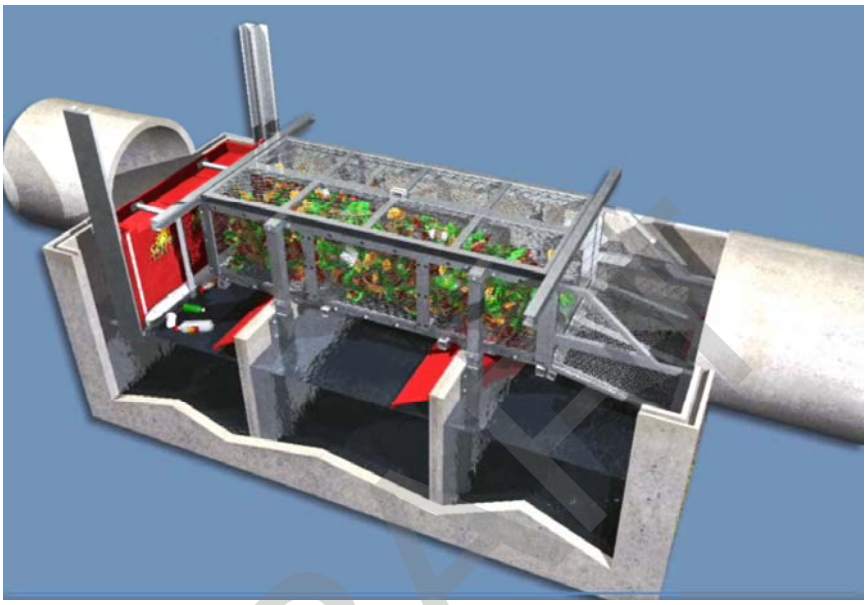
# Operation, Maintenance, Inspection and Cleaning Manual - New Jersey

# Nutrient Separating Baffle Box®



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DATE: _____

NSBB MODEL: _____

JOB LOCATION: _____

Suntree Technologies Inc.

Suntree Technologies, Inc. ®, 798 Clearlake Road, Suite 2, Cocoa, FL 32922 (321) 637-7552

**WWW.SUNTREETECH.COM**

**READ THE FOLLOWING INFORMATION, WARNINGS AND INSTRUCTIONS BEFORE INSPECTING, PERFORMING MAINTENANCE OR CLEANING THIS STORMWATER TREATMENT DEVICE**

This manual is intended to explain the specifics of the Suntree Technologies Inc® Nutrient Separating Baffle Box®, and to review the common aspects of the existing regulations and safety procedures. It is the responsibility of all personnel to familiarize themselves with, understand, and comply with all applicable local, state and federal laws, **BEFORE** attempting to inspect or service this unit.

All precautions and procedures in this manual are current at the time of printing if this manual and are subject to change based on new processes and procedures. Suntree Technologies, Inc. assumes no responsibility and will be held harmless for any injuries, fines, penalties or losses that occur involving any procedure in this manual or other non-addressed actions taken. The Nutrient Separating Baffle Box performance is based on the procedures being followed in this manual. Non-Compliance with these measures will be the responsibility of the owner.

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# Table of Contents

# Section 1

## GENERAL INFORMATION

The Nutrient Separating Baffle Box is a key component of your stormwater management program. To maintain proper operation, maintenance of these units is important. The Nutrient Separating Baffle Box manufactured by Suntree Technologies, Inc. contains patented and patent pending technologies to effectively treat stormwater. The NSBB is highly effective in capturing total suspended solids (TSS), total phosphorus (TP), total nitrogen (TN), organics, trash, litter, oils and grease. Independent testing has shown the NSBB is capable of capturing up to 95% trash and litter, up to 95% of TSS, up to 90% Organics and up to 60% TP.

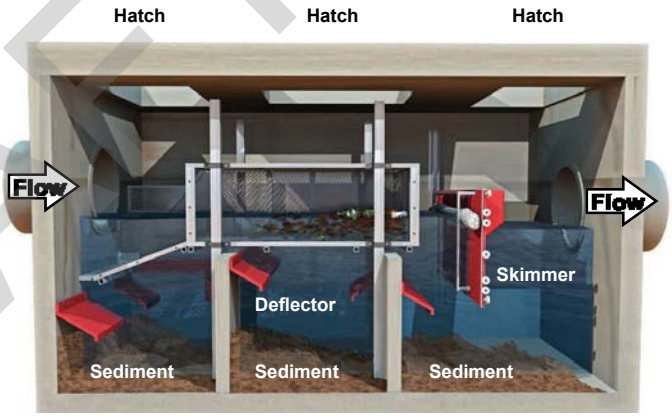
Local and State regulations may require inspections and cleanings every 90 days for any BMP (Best Management Practice). Suntree Technologies, Inc. recommends inspections be conducted four (4) times a year. This will allow the NSBB to obtain the best pollutant removal efficiency.

## Functional Description

### DURING THE STORM EVENT

The inflow pipe is recommended to be the same size as the outflow pipe.

Turbulence defectors prevent captured sediment from re-suspending.



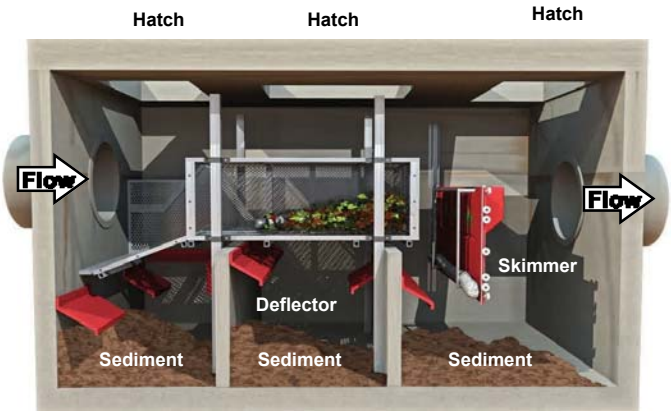

Nutrient rich vegetation and litter are captured in filtration screen system.

***THE SYSTEM STAYS HEALTHY!***

### AFTER THE STORM EVENT

Nutrient pollutant load is not lost to static water and flushed out during the next storm event.

Separating organic matter from the static water prevents bacterial buildup.




* During servicing, the screen system has hinged doors to give easy access to the sediment collected in the lower chambers.

Vegetation and litter is stored above the static water and dries out between storm events.

With the organic pollutant load separated from the water, the system does not go septic.

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# Section 2

## INSPECTION INFORMATION

Suntree Technologies recommends the following inspection guidelines: After installation and the site has stabilized inspections should be conducted after every runoff event for the first Thirty (30) days. To insure that the Nutrient Separating Baffle Box obtains optimal pollutant removal efficiencies, subsequent inspections of sediment accumulation should be conducted a minimal of four (4) times per year. In the event the sediment accumulation equals or exceeds 50% of the Minimum Sediment Storage Volume (fig 2.1) then all accumulated sediment must be removed. All inspections must be documented (fig 2.2).

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**Typical Inspection Procedures:**

1: Visually inspect the unit from the surface.

2: Open access points (i.e. Manhole Covers or Hatches) and secure properly.

3: A visual inspection should be made of the basket screen system to determine the capacity of debris.

4: A visual inspection should be done of the sediment chambers. This may require opening the bottom doors of the screen system (if possible).

5: A visual inspection should be made of the overall condition of the vault. Typically joint areas as well as inflow and outflow pipe grout areas.

# Section 2

## 2.1 Approximate Dimensions and Characteristics of New Jersey NSBB Models

| NSBB-HVT Model No. | Inside Length (L), ft | Inside Width (W), ft | Partition Height (PH), ft | Partition Thickness (PT), in | Floor Area (FA)[1], $ft^2$ | Maximum Sediment Storage Volume, $ft^3$ | Depth from Top of Baffles to Maximum Sediment Storage Depth, ft. | Depth from Top of Baffles to Maximum Sediment Storage Depth, in. |
|---|---|---|---|---|---|---|---|---|
| 2-4 | 4.00 | 2.00 | 2.70 | 0.75 | 7.75 | 7.75 | 1.7 | 20.4 |
| 3-6 | 6.00 | 3.00 | 3.00 | 1.50 | 17.3 | 17.3 | 2.0 | 24.0 |
| 3-8 | 8.00 | 3.00 | 3.00 | 1.50 | 23.3 | 23.3 | 2.0 | 24.0 |
| 4-8 | 8.00 | 4.00 | 3.00 | 3.00 | 30.0 | 30.0 | 2.0 | 24.0 |
| 5-10 | 10.00 | 5.00 | 4.10 | 3.00 | 47.5 | 47.5 | 3.1 | 37.2 |
| 6-12 | 12.00 | 6.00 | 4.80 | 3.50 | 68.5 | 68.5 | 3.8 | 45.6 |
| 6-13.75 | 13.75 | 6.00 | 5.40 | 3.50 | 79.0 | 79.0 | 4.4 | 52.8 |
| 7-14 | 14.00 | 7.00 | 5.50 | 4.00 | 93.3 | 93.3 | 4.5 | 54.0 |
| 7-15 | 15.00 | 7.00 | 5.90 | 4.00 | 100 | 100 | 4.9 | 58.8 |
| 8-14 | 14.00 | 8.00 | 6.20 | 4.00 | 107 | 107 | 5.2 | 62.4 |
| 8-16 | 16.00 | 8.00 | 6.20 | 4.00 | 123 | 123 | 5.2 | 62.4 |
| 9-18 | 18.00 | 9.00 | 6.90 | 6.00 | 153 | 153 | 5.9 | 70.8 |
| 10-17 | 17.00 | 10.00 | 7.60 | 6.00 | 160 | 160 | 6.6 | 79.2 |
| 10-20 | 20.00 | 10.00 | 7.60 | 6.00 | 190 | 190 | 6.6 | 79.2 |

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# Section 2

## 2.2 Inspection Checklist and Maintenance Guidance

## Nutrient Separating Baffle Box

**( To be completed at time of inspection or maintenance )**

**Location:** _____

**Owner Name:** _____

**Address:** _____

**Phone:** _____

**Date**_____ **Time** _____ **Site Conditions** _____

| Inspection Items | Condition | Recommended Interval | Comments |
|---|---|---|---|
| 1. Access Openings | | Quarterly | |
| 2. Screen System | | Quarterly | |
| 3. Rear Skimmer and Storm Boom | | Quarterly | |
| 4. Sediment Chambers | | Quarterly | |
| 5. Vault Condition | | Quarterly | |

1. Inspection items are to determine accessibility into Nutrient Separating Baffle Box.
2. Visually inspect screen system for volume of debris and broken or missing parts.
3. Visually inspect sediment chambers for estimated quantity.
4. Visually inspect general condition of vault for any clogged areas.

| Maintenance Items | Approximate Volume Collected | Date | Comments |
|---|---|---|---|
| 1. Screen System | | | |
| 2. Sediment Chambers | | | |

1. After opening access vacuum out screen system—estimate volume collected.
2. After cleaning screen system—open bottom doors and vacuum out sediment chambers—estimate volume collected.

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# Notes

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# Section 3

**CAUTION!! ANY SERVICE WORK CONDUCTED IN TRAFFIC AREAS MUST MEET ALL DOT GUIDELINES FOR ROADWAY WORK AND ADDITIONAL SAFETY PROCEDURES WILL BE NESSESSARY**

## SERVICE INFORMATION

Maintenance activities including the removal of captured sediment and debris. Maintenance can be performed from outside the NSBB through access points such as manhole covers or hatches installed in the vault surface above the sediment chambers. During maintenance, the screen system may have either SunGlide® Sliding Top Doors or SunGlide® Hinged Doors. These top doors open to gain access to the debris captured by the screen system. The screen system also has bottom doors that open to give access to the sediment collected in the settling chambers. A vacuum truck is required for debris removal. Although not every circumstance can be covered in this manual, a situation may arise when the structure needs to be entered. Servicing can be preformed without the need for specialized tools.

**CAUTION!! All OSHA confined space requirements should be met while cleaning NSBB structures.**

TYPICAL SERVICE PROCEDURES:

Step 1: Open the access openings on top of the Baffle Box. These access openings are typically manhole covers, hatches, or grates.

Step 2: Vacuum the debris captured by the screen system to expose the sediment collection chambers.

Step 3: Open the bottom doors to the basket system to expose the sediment collection chambers. These doors are provided with eyebolts to attach a hook to lift open the doors which will hinge off to the side (fig 3.1).

Step 4: Vacuum each of the lower sediment chambers until they are empty.

Step 5: After cleaning the sediment chambers close the bottom screen doors of the screen system. Lower / Slide the top doors and assure they lock correctly (if equipped with SunGlide® Lids).

Step 6: When all maintenance work is completed, close the access covers or hatches.

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# Section 3

## Minimum Equipment Requirements:

A standard vacuum truck is required for the servicing of the Nutrient Separating Baffle Box. Safety equipment will be determined by local, state and federal guidelines.

## Structural Components:

The structural components are designed to have a life span of several decades. Structural inspections are not required unless stipulated in guidelines set by the local municipality, state, or federal agencies.

## Replacement Parts:

All interior components are designed and sized to be unassembled and removed from the Nutrient Separating Baffle Box for servicing or replacement. For replacement parts and instructions please contact us at:

**Suntree Technologies, Inc.®**

**798 Clearlake Road, Suite 2**

**Cocoa, FL 32922**

**Ph: (321) 637-7552**

**www.suntreetech.com**

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# Section 3

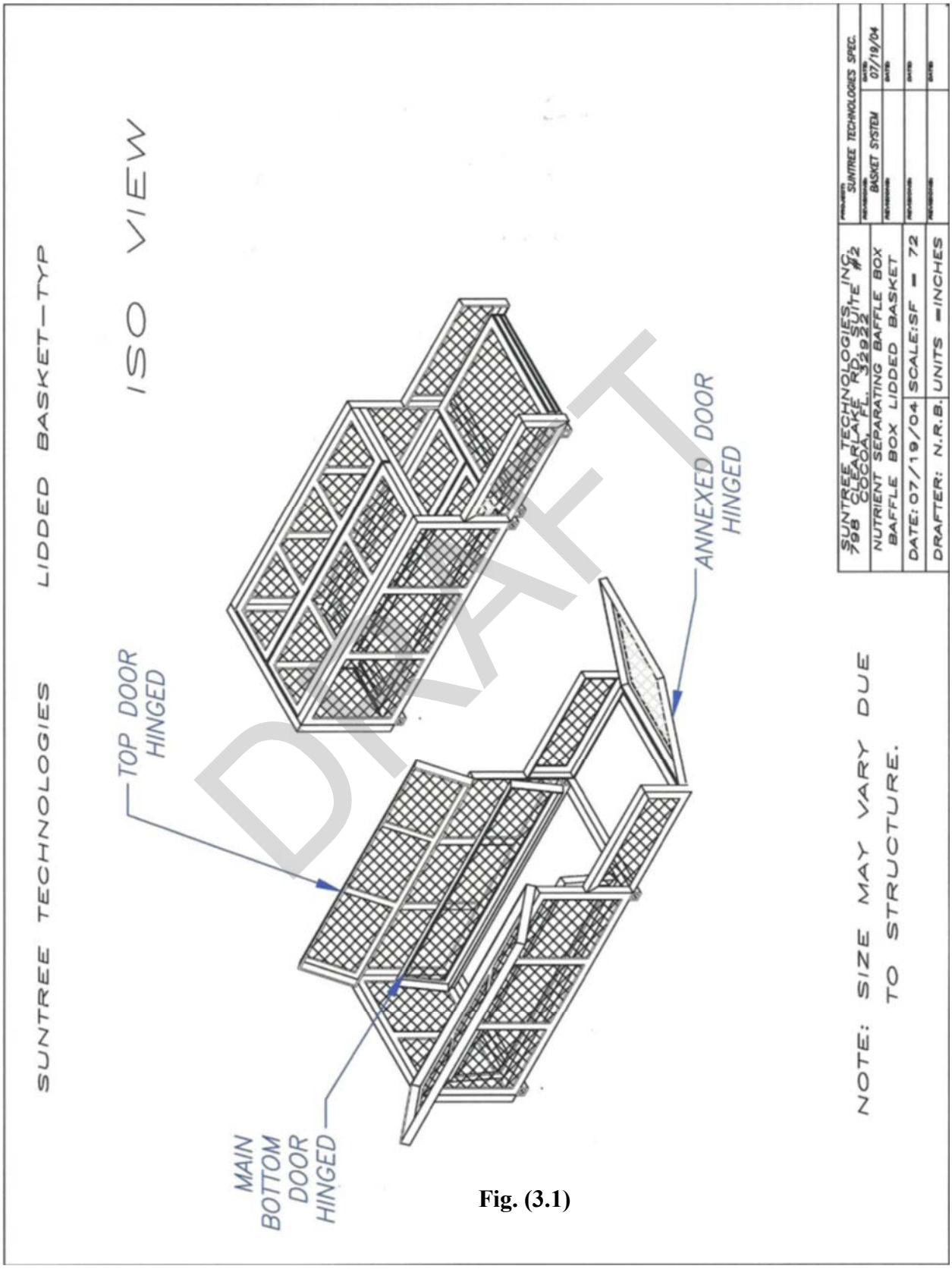


**Fig. (3.1)**

# Section 4

**PARTS INFORMATION**

**Job Specific Information**

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# Section 4

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## PARTS INFORMATION

### Job Specific Information

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## PARTS INQUIRIES

**Contact Information:**

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Tel: (321) 637-7552

Fax: (321) 637-7554

Mobile (321) 288-7249

Email: martin@suntreetech.com

# Section 5

## WARRANTY INFORMATION

Suntree Technologies, Inc.® products are engineered and manufactured with the intent of being a permanent part of the infrastructure. Suntree Technologies warranties it's products to be free from manufactures defects for a period of five (5) years from the date of purchase. Suntree Technologies warranties that the materials used to manufacture it's products will be able to withstand and remain durable to environmental conditions for a period of five (5) years from the date of purchase. If a warranty claim is made and determined to be valid, Suntree Technologies will replace or repair the product, at the discretion of Suntree Technologies. Warranty claims must be submitted, evaluated, and approved by Suntree Technologies for the claim to be determined to be valid. All warranty work and/or corrective actions must be authorized by Suntree Technologies prior to work beginning not covered by this warranty. There are no warranties either expressed or implied other than what is specifically specified herein. Abusive treatment, neglect, or improper use of the Nutrient Separating Baffle Box manufactured by Suntree Technologies will not be covered by this warranty.

Below is the list of products covered by this warranty:

- Grate Inlet Skimmer Box®
- Nutrient Separating Baffle Box®
- Nutrient Separating Screen System
- Turbulence Deflector System
- Curb Inlet Basket®
- Hydrocarbon Flume Filter
- Trash Flume Filter
- Golf Green Filter

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## WARRANTY INQUIRIES

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Email: martin@suntreetech.com

Visit **www.suntreetech.com** for in depth information on all of our products.