

## COMPREHENSIVE STORMWATER MANAGEMENT PERMIT

### HIGH DENSITY DEVELOPMENT

#### SECTION 1 – APPROVAL

Having reviewed the application and all supporting materials, the City of Wilmington has determined that the application is complete and the proposed development meets the requirements of the City of Wilmington's Comprehensive Stormwater Ordinance.

PERMIT HOLDER: **Echo Farms, LLC**  
PROJECT: **Woodlands at Echo Farms - Ph. 1 - Tract 3B**  
ADDRESS: **4114 Echo Farms Boulevard**  
PERMIT #: **2018027**  
DATE: **July 9, 2018**

Therefore, the above referenced site is hereby approved and subject to all conditions set forth in Section 2 of this approval and all applicable provisions of the City of Wilmington Comprehensive Stormwater Management Ordinance.

This permit shall be effective from the date of issuance until July 9, 2028 and shall be subject to the following specified conditions and limitations:

#### Section 2 - CONDITIONS

1. This approval is valid only for the stormwater management system as proposed on the approved stormwater management plans dated June 28, 2018.
2. The project will be limited to the amount and type of built-upon area indicated in Section IV of the Stormwater Management Application Form submitted as part of the approved stormwater permit application package, and per the approved plans.
3. This permit shall become void unless the facilities are constructed in accordance with the approved stormwater management plans, specifications and supporting documentation, including information provided in the application and supplements.
4. The runoff from all built-upon area within any permitted drainage area must be directed into the permitted stormwater control system for that drainage area.



**Public Services**

Engineering  
212 Operations Center Drive  
Wilmington, NC 28412  
910 341-7807  
910 341-5881 fax  
wilmingtonnc.gov  
Dial 711 TTY/Voice

5. The permittee shall submit a revised stormwater management application packet to the City of Wilmington and shall have received approval prior to construction, for any modification to the approved plans, including, but not limited to, those listed below:
  - a. Any revision to any item shown on the approved plans, including the stormwater management measures, built-upon area, details, etc.
  - b. Redesign or addition to the approved amount of built-upon area or to the drainage area.
  - c. Further subdivision, acquisition, lease or sale of any part of the project area.
  - d. Filling in, altering, or piping of any vegetative conveyance shown on the approved plan.
  - e. Construction of any permitted future areas shown on the approved plans.
6. A copy of the approved plans and specifications shall be maintained on file by the Permittee.
7. During construction, erosion shall be kept to a minimum and any eroded areas of the system will be repaired immediately.
8. If the stormwater system was used as an Erosion Control device, it must be restored to design condition prior to operation as a stormwater treatment device, and prior to issuance of any certificate of occupancy for the project.
9. All areas must be maintained in a permanently stabilized condition. If vegetated, permanent seeding requirements must follow the guidelines established in the North Carolina Erosion and Sediment Control Planning and Design Manual unless an alternative is specified and approved by the City of Wilmington.
10. All stormwater treatment systems as well as access to nearest right-of-way must be located in recorded easements.
11. All applicable operation & maintenance agreements and easements pertaining to each stormwater treatment system shall be referenced on the final plat and recorded with the Register of Deeds upon final plat approval. If no plat is recorded for the site the operation and maintenance agreements and easements shall be recorded with the Register of Deeds so as to appear in the chain of title of all subsequent purchasers under generally accepted searching standards.
12. The stormwater management system shall be constructed in its entirety, vegetated and operational for its intended use prior to the construction of any built-upon surface unless prior approval is obtained. City Staff must be notified of any deviation prior to construction of the built-upon surface. Any deviation request shall include justification and must propose an alternative timeline or construction sequence. Notification shall not constitute approval. Any alternative timeline approved by City staff shall become an enforceable component of this permit.



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13. The permittee shall at all times provide the operation and maintenance necessary to assure the permitted stormwater system functions at optimum efficiency. The approved Operation and Maintenance Agreement must be followed in its entirety and maintenance must occur at the scheduled intervals including, but not limited to:
  - a. Scheduled inspections (interval noted on the agreement).
  - b. Sediment removal.
  - c. Mowing and revegetation of slopes and the vegetated areas.
  - d. Maintenance of landscape plants, including those within the landscape buffer and on the vegetated shelf.
  - e. Immediate repair of eroded areas, especially slopes.
  - f. Debris removal and unclogging of outlet structure, orifice device, flow spreader, catch basins and/or piping.
  - g. Access to the outlet structure must be available at all times.
14. Records of inspection, maintenance and repair for the permitted stormwater system must be kept by the permittee for at least 5 years from the date of record and made available upon request to authorized personnel of the City of Wilmington. The records will indicate the date, activity, name of person performing the work and what actions were taken.
15. Upon completion of construction, before a Certificate of Occupancy shall be granted, and prior to operation or intended use of this permitted facility, the applicant shall submit to the City of Wilmington as-built plans for all stormwater management facilities. The plans shall show the final design specifications and the field location, type, depth, invert and planted vegetation of all measures, controls and devices, as-installed. A certification shall be submitted, along with all supporting documentation that specifies, under seal that the as-built stormwater measures, controls and devices are in compliance with the approved stormwater management plans. A final inspection by City of Wilmington personnel will be required prior to issuance of a certificate of occupancy or operation of the permitted facility.
16. This permit is not transferable except after application and approval by the City of Wilmington. In the event of a change of ownership, name change or change of address the permittee must submit a completed Name/Ownership Change form to the City of Wilmington at least 30 days prior to the change. It shall be signed by all applicable parties, and be accompanied by all required supporting documentation. Submittal of a complete application shall not be construed as an approved application. The application will be reviewed on its own merits by the City of Wilmington and may or may not be approved. The project must be in compliance with the terms of this permit in order for the transfer request to be considered. The permittee is responsible for compliance with all permit conditions until such time as the City of Wilmington approves the transfer request. Neither the sale of the project nor the conveyance of common area to a third party should be considered as an approved transfer of the permit.
17. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to enforcement action by the City of Wilmington, in accordance with Sections 18-52 and 18-53 and any other applicable section of the Land Development Code.



**Public Services**

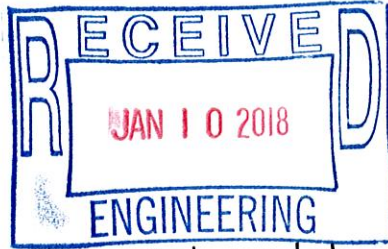
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18. The City of Wilmington may notify the permittee when the permitted site does not meet one or more of the minimum requirements of the permit. Within the time frame specified in the notice, the permittee shall submit a written time schedule to the City of Wilmington for modifying the site to meet minimum requirements. The permittee shall provide copies of revised plans and certification in writing to the City of Wilmington that the changes have been made.
19. The issuance of this permit does not preclude the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state, and federal) having jurisdiction.
20. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by the City of Wilmington, such as the construction of additional or replacement stormwater management systems.
21. The permittee grants City of Wilmington Staff permission to enter the property during normal business hours for the purpose of inspecting all components of the permitted stormwater management facility.
22. The permit issued shall continue in force and effect until revoked or terminated by the City of Wilmington. The permit may be modified, revoked and reissued or terminated for cause. The filing of a request for a permit modification, revocation and re-issuance or termination does not stay any permit condition.
23. The approved stormwater management plans and all documentation submitted as part of the approved stormwater management permit application package for this project are incorporated by reference and are enforceable parts of the permit.
24. The permittee shall submit a renewal request with all required forms and documentation at least 180 days prior to the expiration date of this permit.
25. If any one or more of the conditions of this permit is found to be unenforceable or otherwise invalidated, all remaining conditions shall remain in full effect.

Stormwater Management Permit issued this the 9th day of July, 2018.

A handwritten signature in blue ink, appearing to read 'Sterling Cheatham', is written over a horizontal line.

for Sterling Cheatham, City Manager  
City of Wilmington



**Public Services**  
 Engineering  
 414 Chestnut St, Suite 200  
 Wilmington, NC 28401  
 910 341-7807  
 910 341-5881 fax  
 wilmingtonnc.gov  
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*\*unless noted otherwise*

*NJT # 16083  
 (Tract 3B)*

**STORMWATER MANAGEMENT PERMIT APPLICATION FORM**  
 (Form SWP 2.2)

**I. GENERAL INFORMATION**

1. Project Name (subdivision, facility, or establishment name - should be consistent with project name on plans, specifications, letters, operation and maintenance agreements, etc.):

Woodlands at Echo Farms - PH1 - Tract 3B

2. Location of Project (street address):

4114 Echo Farms Boulevard

City: Wilmington County: New Hanover Zip: 28412

3. Directions to project (from nearest major intersection):

From the intersection of Independence Blvd. & US 421 (Carolina Beach Rd.), travel Southeast ~4,610'. Echo Farms is on the left.

**II. PERMIT INFORMATION**

1. Specify the type of project (check one):  Low Density  High Density  
 Drains to an Offsite Stormwater System  Drainage Plan  Other

If the project drains to an Offsite System, list the Stormwater Permit Number(s):

City of Wilmington: \_\_\_\_\_ State – NCDENR/DWQ: \_\_\_\_\_

2. Is the project currently covered (whole or in part) by an existing City or State (NCDENR/DWQ) Stormwater Permit?  Yes  No

If yes, list all applicable Stormwater Permit Numbers:

City of Wilmington: \_\_\_\_\_ State – NCDENR/DWQ: \_\_\_\_\_

3. Additional Project Permit Requirements (check all applicable):

CAMA Major  Sedimentation/Erosion Control

NPDES Industrial Stormwater  404/401 Permit: Proposed Impacts: \_\_\_\_\_

If any of these permits have already been acquired please provide the Project Name, Project/Permit Number, issue date and the type of each permit:

All required permits have been submitted & are under review.

**III. CONTACT INFORMATION**

1. Print Applicant / Signing Official's name and title (specifically the developer, property owner, lessee, designated government official, individual, etc. who owns the project):

Applicant / Organization: Echo Farms, LLC

Signing Official & Title: Joseph S. Taylor, Manager

- a. Contact information for Applicant / Signing Official:

Street Address: c/o Matrix Development Group, CN 4000, Forsgate Drive

City: Cranbury State: NJ Zip: 00512

Phone: 732-521-2900 Fax: 609-395-8289 Email: jtaylor@matrixcompanies.com

Mailing Address (if different than physical address): Same as Above

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

- b. Please check the appropriate box. The applicant listed above is:

The property owner (Skip to item 3)

Lessee\* (Attach a copy of the lease agreement and complete items 2 and 2a below)

Purchaser\* (Attach a copy of the pending sales agreement and complete items 2 and 2a below)

Developer\* (Complete items 2 and 2a below.)

2. Print Property Owner's name and title below, if you are the lessee, purchaser, or developer. (This is the person who owns the property that the project is on.)

Property Owner / Organization: \_\_\_\_\_

Signing Official & Title: \_\_\_\_\_

- a. Contact information for Property Owner:

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

Mailing Address (if different than physical address): \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

3. (Optional) Print the name and title of another contact such as the project's construction supervisor or another person who can answer questions about the project:

Other Contact Person / Organization: \_\_\_\_\_

Signing Official & Title: \_\_\_\_\_

a. Contact information for person listed in item 3 above:

Street Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

Mailing Address (if different than physical address): \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

**IV. PROJECT INFORMATION**

1. In the space provided below, briefly summarize how the stormwater runoff will be treated.

Stormwater runoff will be treated in four (4) stormwater ponds.

2. Total Property Area: 1,702,026 square feet

Tract 3B (Phase 1)

3. Total Coastal Wetlands Area: 0 square feet

4. Total Surface Water Area: 0 square feet

5. Total Property Area (2) – Total Coastal Wetlands Area (3) – Total Surface Water Area (4) = Total Project Area: 1,702,026 square feet.

6. Existing Impervious Surface within Property Area: 40,575 square feet

(Cart Path)

7. Existing Impervious Surface to be Removed/Demolished: 40,575 square feet

8. Existing Impervious Surface to Remain: 0 square feet

9. Total Onsite (within property boundary) Newly Constructed Impervious Surface (in square feet):

Buildings/Lots	349,600
Impervious Pavement	167,871
Pervious Pavement (adj. total, with 0% credit applied)	0
Impervious Sidewalks	45,969
Pervious Sidewalks (adj. total, with 0% credit applied)	0
Other (describe) MUP	22,392
Future Development	50,779
<b>Total Onsite Newly Constructed Impervious Surface</b>	<b>636,611</b>

10. Total Onsite Impervious Surface

(Existing Impervious Surface to remain + Onsite Newly Constructed Impervious Surface) = 636,611 square feet

11. Project percent of impervious area: (Total Onsite Impervious Surface / Total Project Area) x100 = 37%

37.49%

12. Total Offsite Newly Constructed Impervious Area (improvements made outside of property boundary, in square feet):

Impervious Pavement	5,195
Pervious Pavement (adj. total, with 0 % credit applied)	0
Impervious Sidewalks	1,229
Pervious Sidewalks (adj. total, with 0 % credit applied)	0
Other (describe) MUP	0
<b>Total Offsite Newly Constructed Impervious Surface</b>	<b>6,424</b>

13. Total Newly Constructed Impervious Surface

(Total Onsite + Offsite Newly Constructed Impervious Surface) = 643035 square feet

14. Complete the following information for each Stormwater BMP drainage area. If there are more than three drainage areas in the project, attach an additional sheet with the information for each area provided in the same format as below. Low Density projects may omit this section and skip to Section V.

SW Pond 3.1 SW Pond 3.2 SW Pond 3.3

Basin Information	(Type of BMP) BMP # 1	(Type of BMP) BMP # 2	(Type of BMP) BMP # 3
Receiving Stream Name	Barnard's Creek	Barnard's Creek	Barnard's Creek
Receiving Stream Index Number	18-80	18-80	18-80
Stream Classification	C; SW	C; SW	C; SW
Total Drainage Area (sf)	664524	974303	251790
On-Site Drainage Area (sf)	618893	863364	225595
Off-Site Drainage Area (sf)	45631	110939	26195
<b>Total Impervious Area (sf)</b>	<b>300374</b>	<b>353758</b>	<b>84721</b>
Buildings/Lots (sf)	85900	208200	36500
Impervious Pavement (sf)	35966	88611	23383
Pervious Pavement, <del>0</del> % credit (sf)	0	0	0
Impervious Sidewalks (sf)	9967	22968	7383
Pervious Sidewalks, <del>0</del> % credit (sf)	0	0	0
Other (sf) MUP	817	17319	1930
Future Development (sf)	167724	16660	10000
Existing Impervious to remain (sf)	0	0	2635
Offsite (sf) New	0	0	2890
Percent Impervious Area (%)	45.2%	36.31%	33.65%

\* offsite

15. How was the off-site impervious area listed above determined? Provide documentation:

GIS & Survey

\* Offsite existing that drains into pond from existing Echo Development.



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16083  
(Tract 3B)

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Revised 4-5-18



12. Total Offsite Newly Constructed Impervious Area (improvements made outside of property boundary, in square feet):

Impervious Pavement	
Pervious Pavement (adj. total, with % credit applied)	0
Impervious Sidewalks	
Pervious Sidewalks (adj. total, with % credit applied)	0
Other (describe)	
<b>Total Offsite Newly Constructed Impervious Surface</b>	<b>0</b>

13. Total Newly Constructed Impervious Surface

(Total Onsite + Offsite Newly Constructed Impervious Surface) = 0 square feet

14. Complete the following information for each Stormwater BMP drainage area. If there are more than three drainage areas in the project, attach an additional sheet with the information for each area provided in the same format as below. Low Density projects may omit this section and skip to Section V.

SW Pond 3.4

Total

Basin Information	(Type of BMP) BMP # 4	(Type of BMP) BMP #	(Type of BMP) BMP #
Receiving Stream Name	Barnard's Creek		
Receiving Stream Index Number	18-80		
Stream Classification	C; SW		
Total Drainage Area (sf)	169185	0	0
On-Site Drainage Area (sf)	148196		
Off-Site Drainage Area (sf)	20989		
<b>Total Impervious Area (sf)</b>	<b>64054</b>	<b>0</b>	<b>0</b>
Buildings/Lots (sf)	19000		
Impervious Pavement (sf)	19011		
Pervious Pavement, <del>0</del> % credit (sf)	0		
Impervious Sidewalks (sf)	4276		
Pervious Sidewalks, <del>0</del> % credit (sf)	0		
Other (sf)	2126		
Future Development (sf)	10000		
Existing Impervious to remain (sf)	7850		
Offsite (sf)	1791		
Percent Impervious Area (%)	37.86%		

\*offsite

15. How was the off-site impervious area listed above determined? Provide documentation:

GIS & Survey

\*offsite existing that drains into pond from existing Echo Development.

## V. SUBMITTAL REQUIREMENTS

1. Supplemental and Operation & Maintenance Forms - One applicable City of Wilmington Stormwater BMP supplement form and checklist must be submitted for **each** BMP specified for this project. One applicable proposed operation and maintenance (O&M) form must be submitted for **each type** of stormwater BMP. Once approved, the operation and maintenance forms must be referenced on the final plat and recorded with the register of deeds office.
2. Deed Restrictions and Restrictive Covenants - For all subdivisions, outparcels, and future development, the appropriate property restrictions and protective covenants are required to be recorded prior to the sale of any lot. Due to variability in lot sizes or the proposed BUA allocations, a table listing each lot number, lot size, and the allowable built-upon area must be provided as an attachment to the completed and notarized deed restriction form. The appropriate deed restrictions and protective covenants forms can be downloaded at the link listed in section V (3). Download the latest versions for each submittal.

In instances where the applicant is different than the property owner, it is the responsibility of the property owner to sign the deed restrictions and protective covenants form while the applicant is responsible for ensuring that the deed restrictions are recorded.

**By the notarized signature(s) below, the permit holder(s) certify that the recorded property restrictions and protective covenants for this project, if required, shall include all the items required in the permit and listed on the forms available on the website, that the covenants will be binding on all parties and persons claiming under them, that they will run with the land, that the required covenants cannot be changed or deleted without concurrence from the City of Wilmington, and that they will be recorded prior to the sale of any lot.**

3. Only complete application packages will be accepted and reviewed by the City. A complete package includes all of the items listed on the City Engineering Plan Review Checklist, including the fee. Copies of the Engineering Plan Review Checklist, all Forms, Deed Restrictions as well as detailed instructions on how to complete this application form may be downloaded from:

<http://www.wilmingtonnc.gov/PublicServices/Engineering/PlanReview/StormwaterPermits.aspx>

The complete application package should be submitted to the following address:

City of Wilmington – Engineering  
Plan Review Section  
414 Chestnut Street, Suite 200  
Wilmington, NC 28402

**VI. CONSULTANT INFORMATION AND AUTHORIZATION**

1. Applicant: Complete this section if you wish to designate authority to another individual and/or firm (such as a consulting engineer and /or firm) so that they may provide information on your behalf for this project (such as addressing requests for additional information).

Consulting Engineer: John S. Tunstall, P.E. or T. Jason Clark, P.E.

Consulting Firm: Norris & Tunstall Consulting Engineers, P.C.

a. Contact information for consultant listed above:

Mailing Address: 902 Market Street

City: Wilmington State: NC Zip: 28401

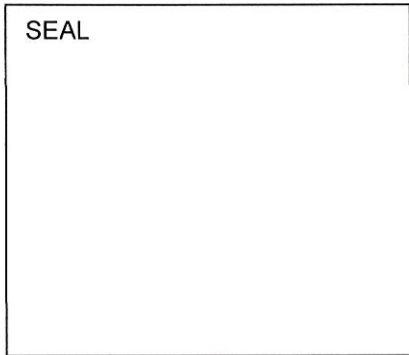
Phone: 910-343-9653 Fax: 910-343-9604 Email: jtunstall@ntengineers.com or jclark@ntengineers.com

**VII. PROPERTY OWNER AUTHORIZATION** (If Section III(2) has been filled out, complete this section)

I, *(print or type name of person listed in Contact Information, item 2)* \_\_\_\_\_, certify that I own the property identified in this permit application, and thus give permission to *(print or type name of person listed in Contact Information, item 1)* \_\_\_\_\_ with *(print or type name of organization listed in Contact Information, item 1)* \_\_\_\_\_ to develop the project as currently proposed. A copy of the lease agreement or pending property sales contract has been provided with the submittal, which indicates the party responsible for the operation and maintenance of the stormwater system.

As the legal property owner I acknowledge, understand, and agree by my signature below, that if my designated agent *(entity listed in Contact Information, item 1)* dissolves their company and/or cancels or defaults on their lease agreement, or pending sale, responsibility for compliance with the City of Wilmington Stormwater Permit reverts back to me, the property owner. As the property owner, it is my responsibility to notify the City of Wilmington immediately and submit a completed Name/Ownership Change Form within 30 days; otherwise I will be operating a stormwater treatment facility without a valid permit. I understand that the operation of a stormwater treatment facility without a valid permit is a violation of the City of Wilmington Municipal Code of Ordinances and may result in appropriate enforcement including the assessment of civil penalties.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

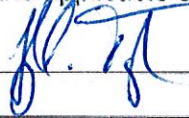


I, \_\_\_\_\_, a Notary Public for the State of \_\_\_\_\_, County of \_\_\_\_\_, do hereby certify that \_\_\_\_\_ personally appeared before me this day of \_\_\_\_\_, \_\_\_\_\_, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

\_\_\_\_\_  
My commission expires: \_\_\_\_\_

**VIII. APPLICANT'S CERTIFICATION**

I, (print or type name of person listed in Contact Information, Item 1), Joseph S. Taylor, Manager certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans, that the required deed restrictions and protective covenants will be recorded, and that the proposed project complies with the requirements of the applicable stormwater rules under.

Signature:  Date: 12-19-2017

SEAL

I, Jennifer A. Torre, a Notary Public for the State of NEW JERSEY, County of MONMOUTH, do hereby certify that JOSEPH S. TAYLOR personally appeared before me this day of DECEMBER 19TH 2017, and acknowledge the due execution of the application for a stormwater permit. Witness my hand and official seal,

Jennifer A. Torre

My commission expires: \_\_\_\_\_



**High Density Residential Subdivisions**  
**Deed Restrictions & Protective Covenances**

NT#16083  
(Tract 3B)

In accordance with Article 14, Division III of the City of Wilmington Land Development Code, deed restrictions and protective covenants are required for High Density Residential Subdivisions where lots will be subdivided and sold and runoff will be treated in an engineered stormwater control facility. Deed restrictions and protective covenants are necessary to ensure that the development maintains a "built-upon" area consistent with the design criteria used to size the stormwater control facility.

I, Joseph S. Taylor, Manager of Echo Farms, LLC, acknowledge, affirm and agree by my signature below, that I will cause the following deed restrictions and covenants to be recorded prior to the sale of any lot:

1. *The following covenants are intended to ensure ongoing compliance with the city of Wilmington Stormwater Management Permit Number \_\_\_\_\_, as issued by the City of Wilmington/Engineering*
2. *The City of Wilmington is made a beneficiary of these covenants to the extent necessary to maintain compliance with the stormwater management permit.*
3. *These covenants are to run with the land and be binding on all persons and parties claiming under them.*
4. *The covenants pertaining to stormwater may not be altered or rescinded without the express written consent of the City of Wilmington.*
5. *Alteration of the drainage as shown on the approved plan may not take place without the concurrence of the City of Wilmington*
6. *The maximum allowable built-upon area per lot is 3,800 square feet. This allotted amount includes any built-upon area constructed within the lot property boundaries, and that portion of the right-of-way between the front lot line and the edge of the pavement. Built upon area includes, but is not limited to, structures, asphalt, concrete, gravel, brick, stone, slate, coquina and parking areas, but does not include raised, open wood decking, or the water surface of swimming pools.*
7. *All runoff from the built-upon areas on the lot must drain into the permitted system. This may be accomplished through a variety of means including roof drain gutters which drain to the street, grading the lot to drain toward the street, or grading perimeter swales to collect the lot runoff and directing them into a component of the stormwater collection system. Lots that will naturally drain into the system are not required to provide these additional measures.*
8. *Lot 17 extends into 12.5 foot line of the Conservation Resource. Due to this, the allowable ~~built~~ built within this 12.5 foot line is limited to 1,386 SF.*

Signature: \_\_\_\_\_ Date: 3/22/18

I, Jennifer A. Torre, a Notary Public in the State of New Jersey,  
County of Monmouth, do hereby certify that Joseph S. Taylor  
personally appeared before me this 22nd day of March, 2018, and acknowledge the due execution of the foregoing instrument. Witness my hand and official seal,

SEAL.

Signature \_\_\_\_\_  
*Jennifer A. Torre*

My Commission expires \_\_\_\_\_



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**APR 9 2018**  
**ENGINEERING**



# WET POND

Woodlands at Echo Farms - PH1 - Tract 3B

16083  
(Tract 3B)  
Revised  
4-5-18

<b>THE DRAINAGE AREA</b>		1	
Drainage area number	Pond 3.1	Break down of BUA in the drainage area (both new and existing):	
Total coastal wetlands area (sq ft)	0 sf	- Parking / driveway (sq ft)	35,966 sf
Total surface water area (sq ft)	0 sf	- Sidewalk (sq ft)	9,967 sf
Total drainage area (sq ft)	664,524 sf	- Roof (sq ft)	85900 sf
BUA associated with existing development (sq ft)	0 sf	- Roadway (sq ft)	817 sf
Proposed new BUA (sq ft)	300374 sf	- Other, please specify in the comment box below (sq ft)	167724 sf
Percent BUA of drainage area	45.2%	Total BUA (sq ft)	300374 sf

## COMPLIANCE WITH THE APPLICABLE STORMWATER PROGRAM

Stormwater program(s) that apply (please specify):	Design rainfall depth (in)	1.5 in
2017 Coastal SW Rules	Minimum volume required (cu ft)	37945 cf
	Design volume of SCM (cu ft)	40,962 sf

## GENERAL MDC FROM 02H .1050

#1 Is the SCM sized to treat the SW from all surfaces at build-out?	Yes	#7 If applicable, with the SCM be cleaned out after construction?	Yes
#2 Is the SCM located on or near contaminated soils?	No	#8 Does the maintenance access comply with General MDC (8)?	Yes
#3 What are the side slopes of the SCM (H:V)?	3:1, 6:1, 2:1	#9 Does the drainage easement comply with General MDC (9)?	Yes
#3 Does the SCM have retaining walls, gabion walls or other engineered side slopes?	No	#10 If the SCM is on a single family lot, does the plat comply with General MDC (10)?	No
#4 Are the inlets, outlets, and receiving stream protected from erosion (10-year storm)?	Yes	#11 Is there an O&M Agreement that complies with General MDC (11)?	Yes
#5 Is there a a bypass for flows in excess of the design flow?	Yes	#12 Is there an O&M Plan that complies with General MDC (12)?	Yes
#6 What is the method for dewatering the SCM for maintenance?	Pump (preferred)	#13 Was the SCM designed by an NC licensed professional?	yes

## WET POND MDC FROM 02H .1053

#1 Method used	SAVDA	#6 Width of the vegetated shelf (feet)	6 ft
#1 Surface area of the main permanent pool (square feet)	13,862 sf	#6 Location of vegetated shelf	Submerged
#1 Volume of the main permanent pool (cubic feet)	53412 cf	#6 Elevation of top of shelf (fmsl)	10 ft
#2 Average depth of the main pool (feet)	5.1 ft	#6 Elevation of bottom of shelf (fmsl)	9 ft
#2 Was the vegetated shelf included in the calculation of average depth?	No	#6 Slope of vegetated shelf (H:V)	6:1
#2 Elevation of the bottom of the permanent pool (fmsl)	Sediment Removal Elev.	#7 Diameter of drawdown orifice (inches)	3.0 in
#2 Elevation of the top of the permanent pool (fmsl)		#7 Drawdown time for the temporary pool (hours)	59 hrs
#2 Elevation of the top of the temporary pool (fmsl)		#7 Does the orifice drawdown from below the top surface of the permanent pool?	yes
#3 Depth provided for sediment storage (inches)		#8 Does the pond minimize impacts to the receiving channel from the 1-yr, 24-hr storm?	yes
#4 Are the inlet(s) and outlet located in a manner that avoids short-circuiting?	Yes	#9 Are fountains proposed?	no
#4 Describe any measures, such as berms or baffles, that will be taken to improve the flow path:		#9 If yes, is documentation provided per Wet Pond MDC (9)?	No
N/A		#10 Is a trash rack or other device provided to protect the outlet system?	YES
#5 Volume of the forebay (cubic feet)	9,518	#11 Are the dam and embankment planted in non-clumping turf grass?	YES
#5 Is this 15-20% of the volume in the main pool?	yes	#11 Species of turf that will be used on the dam and embankment	Bermuda
#5 Depth of forebay at entrance (inches)	60 in	#11 Describe the planting plan for the vegetated shelf:	
#5 Depth of forebay at exit (inches)	48 in	Minimum of 3 diverse species of herbaceous, native species. Minimum 50 plants per 200 SF of shelf.	
#5 Does water flow out of the forebay in a non-erosive manner?	yes		
#5 Clean-out depth for forebay (inches)	48 in		
#5 Will the forebay be cleaned out when the depth is reduced to less than the above?	yes		

## ADDITIONAL INFORMATION

Please use this space to provide any additional information about this wet pond that you think is relevant to the review:

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16083 (Tract 3B) Revised 04-05-18

Woodlands at Echo Farms - PH1 - Tract 3B

2

**WET POND**

THE DRAINAGE AREA	
Drainage area number	Pond 3.2
Total coastal wetlands area (sq ft)	0 sf
Total surface water area (sq ft)	0 sf
Total drainage area (sq ft)	974303 sf
BUA associated with existing development (sq ft)	0 sf
Proposed new BUA (sq ft)	353758 sf
Percent BUA of drainage area	36.31%

Break down of BUA in the drainage area (both new and existing):

- Parking / driveway (sq ft)	88611 sf
- Sidewalk (sq ft)	22968 sf
- Roof (sq ft)	208,200 sf
- Roadway (sq ft)	17319 sf
- Other, please specify in the comment box below (sq ft)	16660 sf
<b>Total BUA (sq ft)</b>	<b>353758 sf</b>

*mvf*  
*Future*

**COMPLIANCE WITH THE APPLICABLE STORMWATER PROGRAM**

Stormwater program(s) that apply (please specify):	Design rainfall depth (in)	1.5 in
2017 Coastal SW Rules	Minimum volume required (cu ft)	45887 cf
	Design volume of SCM (cu ft)	48071 cf

**GENERAL MDC FROM 02H .1050**

#1 Is the SCM sized to treat the SW from all surfaces at build-out?	yes	#7 If applicable, with the SCM be cleaned out after construction?	yes
#2 Is the SCM located on or near contaminated soils?	no	#8 Does the maintenance access comply with General MDC (8)?	yes
#3 What are the side slopes of the SCM (H:V)?	3:1, 6:1, 2:1	#9 Does the drainage easement comply with General MDC (9)?	yes
#3 Does the SCM have retaining walls, gabion walls or other engineered side slopes?	no	#10 If the SCM is on a single family lot, does the plat comply with General MDC (10)?	no
#4 Are the inlets, outlets, and receiving stream protected from erosion (10-year storm)?	yes	#11 Is there an O&M Agreement that complies with General MDC (11)?	yes
#5 Is there a bypass for flows in excess of the design flow?	yes	#12 Is there an O&M Plan that complies with General MDC (12)?	yes
#6 What is the method for dewatering the SCM for maintenance?	Pump (preferred)	#13 Was the SCM designed by an NC licensed professional?	yes

**WET POND MDC FROM 02H .1053**

#1 Method used	SA/DA	#6 Width of the vegetated shelf (feet)	6 ft
#1 Surface area of the main permanent pool (square feet)	22955 sf	#6 Location of vegetated shelf	Submerged
#1 Volume of the main permanent pool (cubic feet)	83189 cf	#6 Elevation of top of shelf (fmsl)	5 ft
#2 Average depth of the main pool (feet)	3.5 ft	#6 Elevation of bottom of shelf (fmsl)	4 ft
#2 Was the vegetated shelf included in the calculation of average depth?	no	#6 Slope of vegetated shelf (H:V)	6:1
#2 Elevation of the bottom of the permanent pool (fmsl)	0, 2.2	#7 Diameter of drawdown orifice (inches)	4.0 in
#2 Elevation of the top of the permanent pool (fmsl)	5 ft	#7 Drawdown time for the temporary pool (hours)	50.4 hrs
#2 Elevation of the top of the temporary pool (fmsl)	6.2 ft	#7 Does the office drawdown from below the top surface of the permanent pool?	yes
#3 Depth provided for sediment storage (inches)	12 in	#8 Does the pond minimize impacts to the receiving channel from the 1-yr, 24-hr storm?	yes
#4 Are the inlet(s) and outlet located in a manner that avoids short-circuiting?	yes	#9 Are fountains proposed?	no
#4 Describe any measures, such as berms or baffles, that will be taken to improve the flow path:		#9 If yes, is documentation provided per Wet Pond MDC (9)?	no
N/A		#10 Is a trash rack or other device provided to protect the outlet system?	yes
#5 Volume of the forebay (cubic feet)	16,242	#11 Are the dam and embankment planted in non-clumping turf grass?	yes
#5 Is this 15-20% of the volume in the main pool?	yes	#11 Species of turf that will be used on the dam and embankment	Bermuda
#5 Depth of forebay at entrance (inches)	48 in	#11 Describe the planting plan for the vegetated shelf:	
#5 Depth of forebay at exit (inches)	36 in	Minimum of 3 diverse species of herbaceous, native species. Minimum 50 plants per 200 SF of shelf.	
#5 Does water flow out of the forebay in a non-erosive manner?	yes		
#5 Clean-out depth for forebay (inches)	36 in		
#5 Will the forebay be cleaned out when the depth is reduced to less than the above?	yes		

*Sediment Removal*

**ADDITIONAL INFORMATION**

Please use this space to provide any additional information about this wet pond that you think is relevant to the review.  
Pond is made up of 3 separate ponds, connected by equalization piping.

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# WET POND

16083 (Tract 3B) Revised 04-05-18

Woodlands at Echo Farms - PH1 - Tract 3B

3

THE DRAINAGE AREA		Pond 3.3	Break down of BUA in the drainage area (both new and existing):
Drainage area number		0 sf	- Parking / driveway (sq ft)
Total coastal wetlands area (sq ft)		0 sf	- Sidewalk (sq ft)
Total surface water area (sq ft)		251790 sf	- Roof (sq ft)
Total drainage area (sq ft)		0 sf	- Roadway (sq ft) <b>MUP</b>
BUA associated with existing development (sq ft)		84721 sf	- Other, please specify in the comment box below (sq ft)
Proposed new BUA (sq ft)			<b>Total BUA (sq ft)</b>
Percent BUA of drainage area	<b>33.05%</b>	<b>34%</b>	

COMPLIANCE WITH THE APPLICABLE STORMWATER PROGRAM	
Stormwater program(s) that apply (please specify):	1.5 in
2017 Coastal SW Rules	11105 cf
	16672 cf

GENERAL MDC FROM 02H .1050			
#1 Is the SCM sized to treat the SW from all surfaces at build-out?	Yes	#7 If applicable, with the SCM be cleaned out after construction?	Yes
#2 Is the SCM located on or near contaminated soils?	No	#8 Does the maintenance access comply with General MDC (8)?	Yes
#3 What are the side slopes of the SCM (H:V)?	3:1, 6:1, 2:1	#9 Does the drainage easement comply with General MDC (9)?	Yes
#3 Does the SCM have retaining walls, gabion walls or other engineered side slopes?	No	#10 If the SCM is on a single family lot, does the plat comply with General MDC (10)?	No
#4 Are the inlets, outlets, and receiving stream protected from erosion (10-year storm)?	Yes	#11 Is there an O&M Agreement that complies with General MDC (11)?	Yes
#5 Is there a bypass for flows in excess of the design flow?	Yes	#12 Is there an O&M Plan that complies with General MDC (12)?	Yes
#6 What is the method for dewatering the SCM for maintenance?	Pump (preferred)	#13 Was the SCM designed by an NC licensed professional?	Yes

WET POND MDC FROM 02H .1053			
#1 Method used	SA/DA	#6 Width of the vegetated shelf (feet)	6 ft
#1 Surface area of the main permanent pool (square feet)	17301 sf	#6 Location of vegetated shelf	Submerged
#1 Volume of the main permanent pool (cubic feet)	55642 cf	#6 Elevation of top of shelf (fmsl)	13 ft
#2 Average depth of the main pool (feet)	4.4 ft	#6 Elevation of bottom of shelf (fmsl)	12 ft
#2 Was the vegetated shelf included in the calculation of average depth?	No	#6 Slope of vegetated shelf (H:V)	6:1
#2 Elevation of the bottom of the permanent pool (fmsl)	7, 9 ft	#7 Diameter of drawdown orifice (inches)	2.5 in
#2 Elevation of the top of the permanent pool (fmsl)	13 ft	#7 Drawdown time for the temporary pool (hours)	56.64 hrs
#3 Elevation of the top of the temporary pool (fmsl)	13.75 ft	#7 Does the orifice drawdown from below the top surface of the permanent pool?	Yes
#3 Depth provided for sediment storage (inches)	12 in	#8 Does the pond minimize impacts to the receiving channel from the 1-yr, 24-hr storm?	Yes
#4 Are the inlet(s) and outlet located in a manner that avoids short-circuiting?	Yes	#9 Are fountains proposed?	No
#4 Describe any measures, such as berms or baffles, that will be taken to improve the flow path:		#9 If yes, is documentation provided per Wet Pond MDC (9)?	
N/A		#10 Is a trash rack or other device provided to protect the outlet system?	Yes
#5 Volume of the forebay (cubic feet)	10524	#11 Are the dam and embankment planted in non-clumping turf grass?	Yes
#5 Is this 15-20% of the volume in the main pool?	Yes	#11 Species of turf that will be used on the dam and embankment	Bermuda
#5 Depth of forebay at entrance (inches)	60 in & 72 in	#11 Describe the planting plan for the vegetated shelf:	
#5 Depth of forebay at exit (inches)	48 in & 60 in	Minimum of 3 diverse species of herbaceous, native species. Minimum 50 plants per 200 SF of shelf.	
#5 Does water flow out of the forebay in a non-erosive manner?	Yes		
#5 Clean-out depth for forebay (inches)	48 in & 60 in		
#5 Will the forebay be cleaned out when the depth is reduced to less than the above?	Yes		

**ADDITIONAL INFORMATION**  
Please use this space to provide any additional information about this wet pond that you think is relevant to the review:  
\*BUA - Other - 10,000 SF Future; 5,525 SF Offsite.

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THE DRAINAGE AREA		Pond 3.4	Break down of BUA in the drainage area (both new and existing):
Drainage area number		0 sf	- Parking / driveway (sq ft)
Total coastal wetlands area (sq ft)		0 sf	- Sidewalk (sq ft)
Total surface water area (sq ft)		169185 sf	- Roof (sq ft)
Total drainage area (sq ft)		0 sf	- Roadway (sq ft) <b>mup</b>
BUA associated with existing development (sq ft)		64054 sf	- Other, please specify in the comment box below (sq ft)
Proposed new BUA (sq ft)		<del>3877</del>	<b>Total BUA (sq ft)</b>
Percent BUA of drainage area		<b>31.86%</b>	

**COMPLIANCE WITH THE APPLICABLE STORMWATER PROGRAM**

Stormwater program(s) that apply (please specify):  
2017 Coastal SW Rules

**GENERAL MDC FROM 02H .1050**

#1 Is the SCM sized to treat the SW from all surfaces at build-out?	Yes	#7 If applicable, with the SCM be cleaned out after construction?	Yes
#2 Is the SCM located on or near contaminated soils?	No	#8 Does the maintenance access comply with General MDC (8)?	Yes
#3 What are the side slopes of the SCM (H:V)?	3:1, 6:1, 2:1	#9 Does the drainage easement comply with General MDC (9)?	Yes
#3 Does the SCM have retaining walls, gabion walls or other engineered side slopes?	No	#10 If the SCM is on a single family lot, does the plat comply with General MDC (10)?	No
#4 Are the inlets, outlets, and receiving stream protected from erosion (10-year storm)?	Yes	#11 Is there an O&M Agreement that complies with General MDC (11)?	Yes
#5 Is there a bypass for flows in excess of the design flow?	Yes	#12 Is there an O&M Plan that complies with General MDC (12)?	Yes
#6 What is the method for dewatering the SCM for maintenance?	Pump (preferred)	#13 Was the SCM designed by an NC licensed professional?	Yes

**WET POND MDC FROM 02H .1053**

#1 Method used	SA/DA	#6 Width of the vegetated shelf (feet)	6 ft
#1 Surface area of the main permanent pool (square feet)	5060 sf	#6 Location of vegetated shelf	Submerged
#1 Volume of the main permanent pool (cubic feet)	13745 cf	#6 Elevation of top of shelf (fmsl)	6.25 ft
#2 Average depth of the main pool (feet)	3.9 ft	#6 Elevation of bottom of shelf (fmsl)	5.25 ft
#2 Was the vegetated shelf included in the calculation of average depth?	No	#6 Slope of vegetated shelf (H:V)	6:1
#2 Elevation of the bottom of the permanent pool (fmsl)	0 ft	#7 Diameter of drawdown orifice (inches)	1.5 in
#2 Elevation of the top of the permanent pool (fmsl)	6.25 ft	#7 Drawdown time for the temporary pool (hours)	71.04 hrs
#3 Elevation of the top of the temporary pool (fmsl)	7.5 ft	#7 Does the orifice drawdown from below the top surface of the permanent pool?	Yes
#3 Depth provided for sediment storage (inches)	12 in	#8 Does the pond minimize impacts to the receiving channel from the 1-yr, 24-hr storm?	Yes
#4 Are the inlet(s) and outlet located in a manner that avoids short-circuiting?	Yes	#9 Are fountains proposed?	No
#4 Describe any measures, such as berms or baffles, that will be taken to improve the flow path:		#9 If yes, is documentation provided per Wet Pond MDC (9)?	No
N/A		#10 Is a trash rack or other device provided to protect the outlet system?	Yes
#5 Volume of the forebay (cubic feet)	2584	#11 Are the dam and embankment planted in non-clumping turf grass?	Yes
#5 Is this 15-20% of the volume in the main pool?	Yes	#11 Species of turf that will be used on the dam and embankment	Bermuda
#5 Depth of forebay at entrance (inches)	75 in	#11 Describe the planting plan for the vegetated shelf:	
#5 Depth of forebay at exit (inches)	63 in	Minimum of 3 diverse species of herbaceous, native species. Minimum 50 plants per 200 SF of shelf.	
#5 Does water flow out of the forebay in a non-erosive manner?	Yes		
#5 Clean-out depth for forebay (inches)	33 in		
#5 Will the forebay be cleaned out when the depth is reduced to less than the above?	Yes		

**ADDITIONAL INFORMATION**

Please use this space to provide any additional information about this wet pond that you think is relevant to the review.

\*BUA - Other - 10,000 SF Future; 9,641 SF Offsite.

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# Operation & Maintenance Agreement

**Project Name:** Woodlands at Echo Farms - PH1 - Tract 3B  
**Project Location:** 4114 Echo Farms Boulevard, Wilmington, NC

## Cover Page

Maintenance records shall be kept on the following BMP(s). This maintenance record shall be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired, or replaced **immediately**. These deficiencies can affect the integrity of structures, safety of the public, and the pollutant removal efficiency of the BMP(s).

NWT #16083  
(Tract 3B)

The BMP(s) on this project include (check all that apply & corresponding O&M tables will be added automatically):

Bioretention Cell	Quantity:		Location(s):	
Dry Detention Basin	Quantity:		Location(s):	
Grassed Swale	Quantity:		Location(s):	
Green Roof	Quantity:		Location(s):	
Infiltration Basin	Quantity:		Location(s):	
Infiltration Trench	Quantity:		Location(s):	
Level Spreader/VFS	Quantity:		Location(s):	
Permeable Pavement	Quantity:		Location(s):	
Proprietary System	Quantity:		Location(s):	
Rainwater Harvesting	Quantity:		Location(s):	
Sand Filter	Quantity:		Location(s):	
Stormwater Wetland	Quantity:		Location(s):	
Wet Detention Basin	Quantity:	4	Location(s):	See Plans
Disconnected Impervious Area	Present:	No	Location(s):	
User Defined BMP	Present:	No	Location(s):	

I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed for each BMP above, and attached O&M tables. I agree to notify NCDENR of any problems with the system or prior to any changes to the system or responsible party.

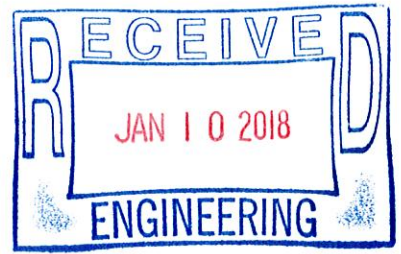
* Responsible Party:	Joseph S. Taylor
Title & Organization:	Manager of Echo Farms, LLC
Street address:	c/o Matrix Development Group, CN 4000, Forsgate Drive
City, state, zip:	Cranbury, NJ 00512
Phone number(s):	732-521-2900
Email:	jtaylor@matrixcompanies.com

Signature: \_\_\_\_\_

Date: 12-19-2017

I, Jennifer A. Torre, a Notary Public for the State of NEW JERSEY  
 County of MONMOUTH, do hereby certify that JOSEPH S. TAYLOR  
 personally appeared before me this 19<sup>TH</sup> day of DECEMBER, 2017 and  
 acknowledge the due execution of the Operations and Maintenance Agreement.

Witness my hand and official seal, Jennifer A. Torre





## Wet Detention Pond Maintenance Requirements

- The wet detention basin system is defined as the wet detention basin, pretreatment including forebays and the vegetated filter if one is provided.

### Important maintenance procedures:

- Immediately after the wet detention basin is established, the plants on the vegetated shelf and perimeter of the basin should be watered twice weekly if needed, until the plants become established (commonly six weeks).
- No portion of the wet detention pond should be fertilized after the first initial fertilization that is required to establish the plants on the vegetated shelf.
- Stable groundcover should be maintained in the drainage area to reduce the sediment load to the wet detention basin.
- If the basin must be drained for an emergency or to perform maintenance, the flushing of sediment through the emergency drain should be minimized to the maximum extent practical.
- Once a year, a dam safety expert should inspect the embankment.

After the wet detention pond is established, it should be inspected **once a month and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County)**. Records of operation and maintenance should be kept in a known set location and must be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

BMP element:	Potential problem:	How I will remediate the problem:
<b>The entire BMP</b>	Trash/debris is present.	Remove the trash/debris.
<b>The perimeter of the BMP</b>	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately six inches.
<b>The inlet device</b>	The pipe is clogged.	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged.	Replace the pipe.
	Erosion is occurring in the swale.	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.
	Stone verge is clogged or covered in sediment (if applicable).	Remove sediment and replace with clean stone.
<b>The forebay</b>	Sediment has accumulated to a depth greater than the original design depth for sediment storage.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
<b>The vegetated shelf</b>	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.

**Wet Detention Pond Maintenance Requirements (Continued)**

<b>The main treatment area</b>	Sediment has accumulated to a depth greater than the original design sediment storage depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Algal growth covers over 50% of the area.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the basin surface.	Remove the plants by wiping them with pesticide (do not spray).
<b>The embankment</b>	Shrubs have started to grow on the embankment.	Remove shrubs immediately.
	Evidence of muskrat or beaver activity is present.	Use traps to remove muskrats and consult a professional to remove beavers.
	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by an appropriate professional shows that the embankment needs repair. (if applicable)	Make all needed repairs.
<b>The outlet device</b>	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
<b>The receiving water</b>	Erosion or other signs of damage have occurred at the outlet.	Contact the local NC Department of Environment and Natural Resources Regional Office.
<p align="center">The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.</p>		

**Wet Detention Pond Design Summary**

**Wet Pond Diagram**

WET POND ID	FOREBAY	MAIN POND
3.1	3.1B-1A + 3.1B-2A	3.1B-1 + 3.1B-2
Pretreatment other than forebay? <input type="checkbox"/> No	Permanent Pool El: 10 Temporary Pool El: 12 Clean Out Depth: 4 Sediment Removal El: 6 Bottom Elevation: 5	Permanent Pool El: 10 Temporary Pool El: 12 Clean Out Depth: 7 Sediment Removal El: 3 Bottom Elevation: 2
Has Veg. Filter? <input type="checkbox"/> No		
3.2	3.2B-2A + 3.2B-3A	3.2B-1 3.2B-3
Pretreatment other than forebay? <input type="checkbox"/> No	Permanent Pool El: 5 Temporary Pool El: 6.2 Clean Out Depth: 3 Sediment Removal El: 2 Bottom Elevation: 1	Permanent Pool El: 5 Temporary Pool El: 6.2 Clean Out Depth: 5 Sediment Removal El: 0 Bottom Elevation: -1
Has Veg. Filter? <input type="checkbox"/> No		
3.3	3.3B-1A + 3.3B-1B	3.3B-1 3.3B-2
Pretreatment other than forebay? <input type="checkbox"/> No	Permanent Pool El: 13 Temporary Pool El: 13.75 Clean Out Depth: 4 Sediment Removal El: 9 Bottom Elevation: 7	Permanent Pool El: 13 Temporary Pool El: 13.75 Clean Out Depth: 6 Sediment Removal El: 7 Bottom Elevation: 6
Has Veg. Filter? <input type="checkbox"/> No		
3.4		
Pretreatment other than forebay? <input type="checkbox"/> No	Permanent Pool El: 6.25 Temporary Pool El: 7.5 Clean Out Depth: 2.75 Sediment Removal El: 3.5 Bottom Elevation: 0	Permanent Pool El: 6.25 Temporary Pool El: 7.5 Clean Out Depth: 6.25 Sediment Removal El: 0 Bottom Elevation: -1
Has Veg. Filter? <input type="checkbox"/> No		

5/25/18 by PAC

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