

Rev. #	Drawn By	Description	Date

BULL HILL WIND PROJECT

Project Location
HANCOCK COUNTY, MAINE

Drawing Description
115KV INTERCONNECTION PLAN

Designed By NRM	Drawn By NRM
Date 10/20/2010	Scale 1"=100'
Approved DPE	Checked NSH

Project No. **31001**

Engineer

18 Meadow Road
P.O. Box 722
Augusta, ME 04332
Phone 207-621-1077

RLC
ENGINEERING

Phase
PERMIT

Sheet No.
UG-106

NOT FOR CONSTRUCTION

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Department of Human Services
Division of Health Engineering, Station 10 SHS
(207) 287-5672 FAX (207) 287-4172

PROPERTY LOCATION		>> Caution: Permit Required – Attach In Space Below <<
City, Town, or Plantation	TWP 16 MD	The Subsurface Wastewater Disposal System <i>shall not</i> be installed until a Permit is attached HERE by the Local Plumbing Inspector. The Permit shall authorize the owner or installer to install the disposal system in accordance with this application and the Maine Subsurface Wastewater Disposal Rules.
Street or Road	SUGAR HILL ROAD	
Subdivision, Lot *		
OWNER/APPLICANT INFORMATION		
Name (last, first, MI)	Owner	
BLUE SKY WIND ENERGY		
Mailing Address of	STANTEC c/o BROOKE BARNES	
<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Applicant	30 PARK DRIVE TOPSHAM, ME 04086	
Daytime Tel. *	729-1199	Municipal Tax Map * _____ Lot * _____
Owner or Applicant Statement		Caution: Inspections Required
I state and acknowledge that the information submitted is correct to the best of my knowledge and understand that any falsification is reason for the Department and/or Local Plumbing Inspector to deny a permit.		I have inspected the installation authorized above and found it to be in compliance with the Subsurface Wastewater Disposal Rules Application.
_____ Signature of Owner/Applicant		_____ Local Plumbing Inspector Signature
_____ Date		_____ (1st) Date Approved
		_____ (2nd) Date Approved

PERMIT INFORMATION

TYPE OF APPLICATION 1. <input checked="" type="checkbox"/> First Time System 2. <input type="checkbox"/> Replacement System Type Replaced: _____ Year Installed: _____ 3. <input type="checkbox"/> Expanded System a. <input type="checkbox"/> Minor Expansion b. <input type="checkbox"/> Major Expansion 4. <input type="checkbox"/> Experimental System 5. <input type="checkbox"/> Seasonal Conversion	THIS APPLICATION REQUIRES 1. <input checked="" type="checkbox"/> No Rule Variance 2. <input type="checkbox"/> First Time System Variance a. <input type="checkbox"/> Local Plumbing Inspector Approval b. <input type="checkbox"/> State & Local Plumbing Inspector Approval 3. <input type="checkbox"/> Replacement System Variance a. <input type="checkbox"/> Local Plumbing Inspector Approval b. <input type="checkbox"/> State & Local Plumbing Inspector Approval 4. <input type="checkbox"/> Minimum Lot Size Variance 5. <input type="checkbox"/> Seasonal Conversion Approval	DISPOSAL SYSTEM COMPONENTS 1. <input checked="" type="checkbox"/> Complete Non-Engineered System 2. <input type="checkbox"/> Primitive System (graywater & alt toilet) 3. <input type="checkbox"/> Alternative Toilet, specify: _____ 4. <input type="checkbox"/> Non-Engineered Treatment Tank (only) 5. <input type="checkbox"/> Holding Tank, _____ Gallons 6. <input type="checkbox"/> Non-Engineered Disposal Field (only) 7. <input type="checkbox"/> Separated Laundry System 8. <input type="checkbox"/> Complete Engineered System (2000 gpd- 9. <input type="checkbox"/> Engineered Treatment Tank (only) 10. <input type="checkbox"/> Engineered Disposal Field (only) 11. <input type="checkbox"/> Pre-treatment, specify: _____ 12. <input type="checkbox"/> Miscellaneous components
SIZE OF PROPERTY TBD <input type="checkbox"/> sq. ft. <input type="checkbox"/> acres	DISPOSAL SYSTEM TO SERVE 1. <input type="checkbox"/> Single Family Dwelling, No. of Bedrooms: _____ 2. <input type="checkbox"/> Multiple Family Dwelling, No. of Units: _____ 3. <input checked="" type="checkbox"/> Other: <u>OPERATIONS & MAINTENANCE FACILITY</u> SPECIFY _____ Current Use <input type="checkbox"/> Seasonal <input type="checkbox"/> Year Round <input checked="" type="checkbox"/> Undeveloped	PROPOSED TYPE OF WATER SUPPLY 1. <input checked="" type="checkbox"/> Drilled Well 2. <input type="checkbox"/> Dug Well 3. <input type="checkbox"/> Private 4. <input type="checkbox"/> Public 5. <input type="checkbox"/> Other: _____
SHORELAND ZONING <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

DESIGN DETAILS (SYSTEM LAYOUT SHOWN ON PAGE 3)

TREATMENT TANK 1. <input checked="" type="checkbox"/> Concrete a. <input checked="" type="checkbox"/> Regular b. <input type="checkbox"/> Low Profile 2. <input type="checkbox"/> Plastic 3. <input type="checkbox"/> Other: _____ CAPACITY <u>1000</u> gallons H-20 RATED FOR VEHICULAR TRAFFIC	DISPOSAL FIELD TYPE & SIZE 1. <input checked="" type="checkbox"/> Stone Bed 2. <input type="checkbox"/> Stone Trench 3. <input type="checkbox"/> Proprietary Device a. <input type="checkbox"/> Cluster array c. <input type="checkbox"/> Linear b. <input type="checkbox"/> Regular d. <input type="checkbox"/> H-20 loaded 4. <input type="checkbox"/> Other: _____ SIZE <u>1000</u> <input checked="" type="checkbox"/> sq. ft. <input type="checkbox"/> lin. ft.	GARBAGE DISPOSAL UNIT 1. <input checked="" type="checkbox"/> No 3. <input type="checkbox"/> Maybe 2. <input type="checkbox"/> Yes >> Specify one below a. <input type="checkbox"/> Multi-compartment tank b. <input type="checkbox"/> _____ tanks in series c. <input type="checkbox"/> Increase in tank capacity d. <input type="checkbox"/> Filter on tank outlet	DESIGN FLOW <u>300</u> gallons per day BASED ON: 1. <input type="checkbox"/> Table 501.1 (dwelling unit(s)) 2. <input checked="" type="checkbox"/> Table 501.2 (other facilities) SHOW CALCULATIONS for other facilities - _____ OPERATIONS & MAINTENANCE FACILITY/ VISITORS CENTER 3. <input type="checkbox"/> Section 503.0 (meter readings) ATTACH WATER-METER DATA
SOIL DATA & DESIGN CLASS PROFILE <u>2</u> / CONDITION <u>AIII</u> / DESIGN <u>1</u> AT Observation Hole * <u>TP 105</u> Depth <u>15</u> " Elevation <u>-64</u> " OF MOST LIMITING SOIL FACTOR	DISPOSAL FIELD SIZING 1. <input type="checkbox"/> Small - 2.0 sq.ft./gpd 2. <input type="checkbox"/> Medium - 2.6 sq.ft./gpd 3. <input checked="" type="checkbox"/> Medium-Large - 3.3 sq.ft./gpd 4. <input type="checkbox"/> Large - 4.1 sq.ft./gpd 5. <input type="checkbox"/> Extra-Large - 5.0 sq.ft./gpd	EFFLUENT/EJECTOR PUMP 1. <input checked="" type="checkbox"/> Not required 2. <input type="checkbox"/> May be required 3. <input type="checkbox"/> Required Specify only for engineered systems: DOSE: _____ Gallons	LATITUDE AND LONGITUDE at center of disposal area Lat. <u>44</u> d <u>43</u> m <u>14</u> s Lon. <u>68</u> d <u>08</u> m <u>54</u> s if g.p.s. state margin of error

SITE EVALUATOR STATEMENT

I certify that on 9/22/10 (date) I completed a site evaluation on this property and state that the data reported is accurate and that the proposed system is in compliance with the Subsurface Wastewater Disposal Rules (10-144A CMR 241).

Albert Frick
 Site Evaluator Signature

163
 SE *

10/5/2010
 Date

ALBERT FRICK
 Site Evaluator Name Printed

(207) 839-5563
 Telephone Number

AFA@MAINERR.COM
 E-mail Address

ALBERT FRICK ASSOCIATES - 95A COUNTY ROAD ROAD GORHAM, MAINE 04038 - (207) 839-5563
 Note: Changes to or deviations from the design should be confirmed with the Site Evaluator

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Department of Human Services
Division of Health Engineering, Station 30, SHS
(207) 287-5672 FAX (207) 287-4172

Town, City, Plantation
TWP 16 MD

Street, Road Subdivision
SUGAR HILL ROAD

Owner's Name
BLUE SKY WIND ENERGY

SITE PLAN Scale 1" = 100 Ft. or as shown

SITE LOCATION PLAN (Attach Map from Maine Atlas for New System Variance)



NOTE: PROPERTY INFORMATION PER UNDATED SURVEY PLAN BY TRC

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole **TP 103** Test Pit Boring
Depth of Organic Horizon Above Mineral Soil

SOIL TEST PIT EXCAVATED BY BACKHOE

Texture	Consistency	Color	Mottling
		DARK BROWN 10YR 3/3	
STONY FINE SANDY LOAM	FRIABLE	DARK YELLOWISH BROWN 10YR 4/6	
		YELLOWISH BROWN	
		LIGHT OLIVE BROWN	FEW FAINT
BEDROCK			

Soil Classification	Slope	Limiting Factor	<input type="checkbox"/> Ground Water
2 Profile	AIII/C Condition	0-3% 26-30"	<input type="checkbox"/> Restrictive Layer
			<input checked="" type="checkbox"/> Bedrock
			<input type="checkbox"/> Pit Depth

Observation Hole **TP 104** Test Pit Boring
Depth of Organic Horizon Above Mineral Soil

SOIL TEST PIT EXCAVATED BY BACKHOE

Texture	Consistency	Color	Mottling
		DARK BROWN 10YR 3/3	
FINE SANDY LOAM	FRIABLE	DARK YELLOWISH BROWN 10YR 4/6	NONE EVIDENT
BEDROCK			

Soil Classification	Slope	Limiting Factor	<input type="checkbox"/> Ground Water
2 Profile	AIII Condition	0-3% 24"	<input type="checkbox"/> Restrictive Layer
			<input checked="" type="checkbox"/> Bedrock
			<input type="checkbox"/> Pit Depth

Albert Frick
Site Evaluator Signature

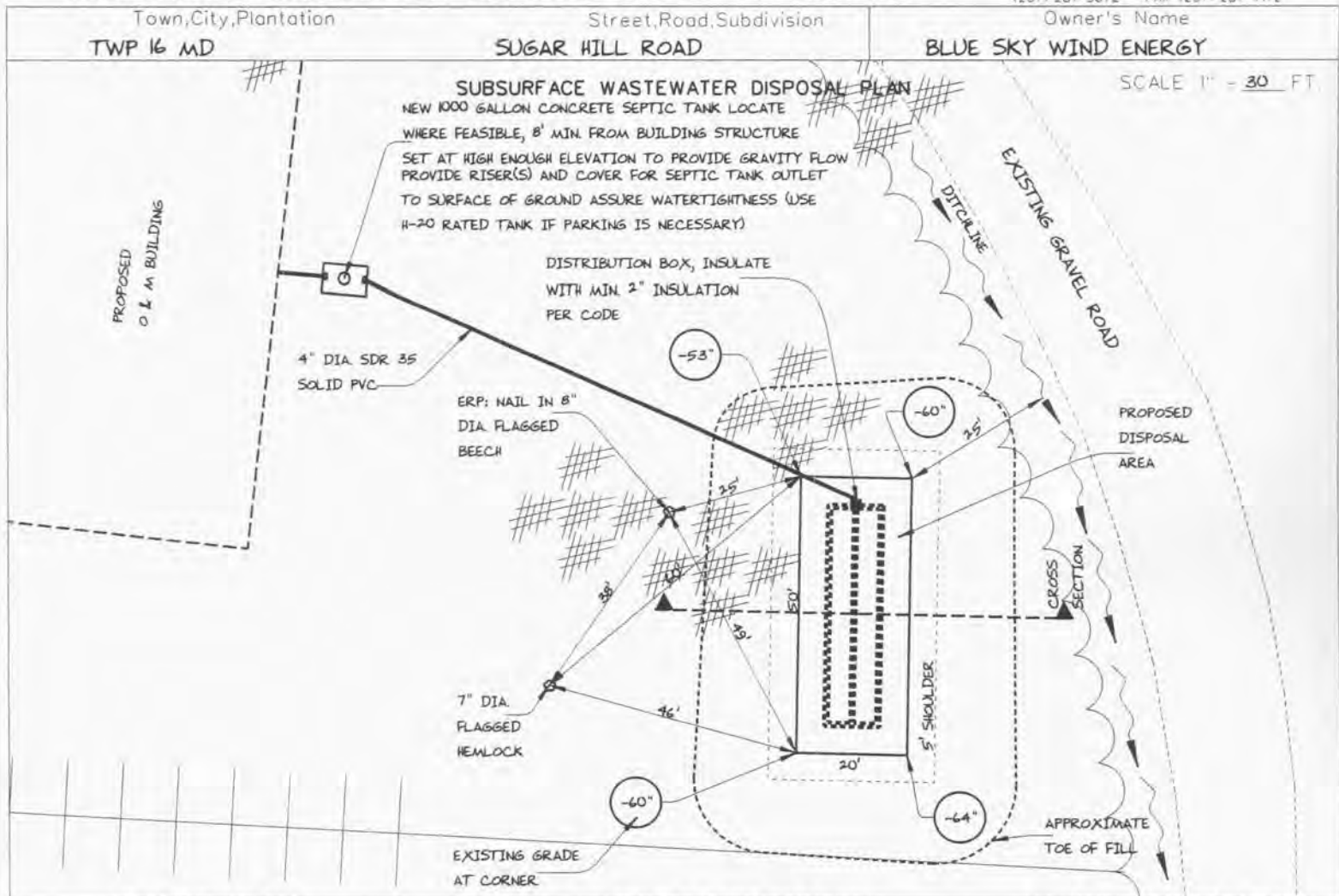
163
SE

10/5/2010
Date

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SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Maine Department of Human Services
 Division of Health Engineering, Station 10_SHS
 (207) 287-5672 FAX (207) 287-4172



FILL REQUIREMENTS

Depth of Fill (Upslope) : 33" - 40"
 Depth of Fill (Downslope) : 40" - 44"
 DEPTHS AT CROSS-SECTION (shown below)

CONSTRUCTION ELEVATIONS

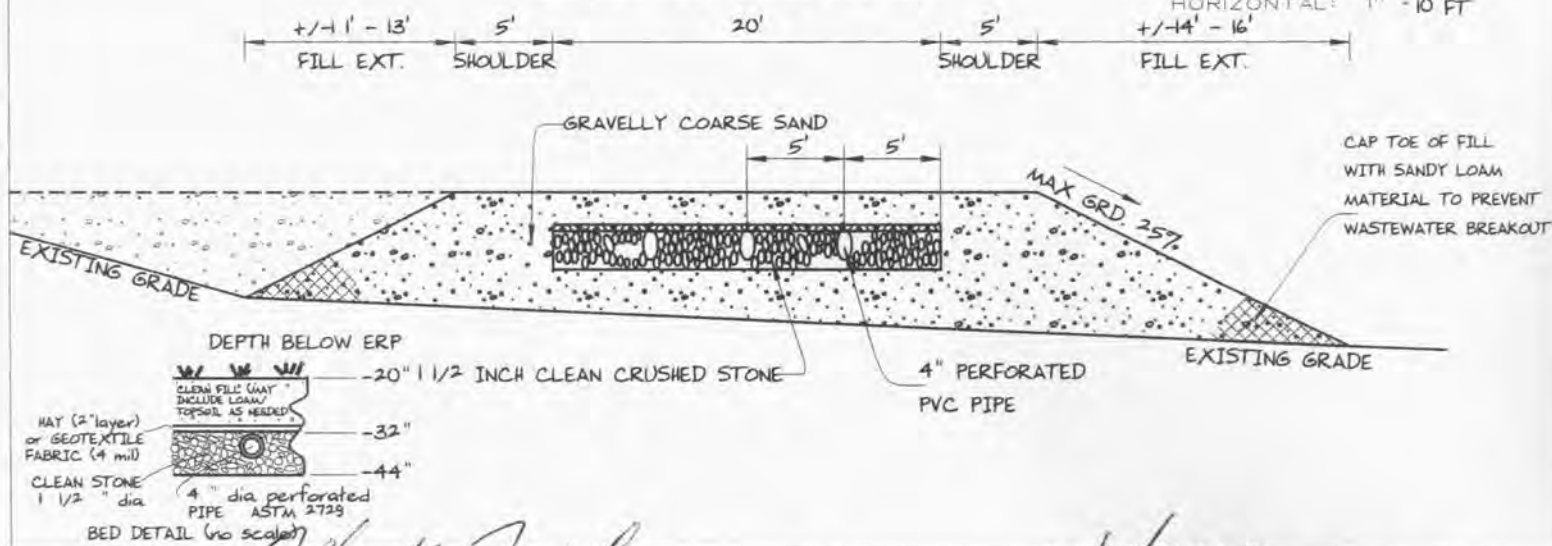
Finished Grade Elevation
 Top of Distribution Pipe
 Bottom of Disposal Area

ELEVATION REFERENCE POINT

SEE DETAIL BELOW
 Location & Description NAIL 20" ABOVE BASE OF 8" DIA FLAGGED BEECH
 Reference Elevation is: 0.0" or -----

DISPOSAL AREA CROSS SECTION

SCALE:
 VERTICAL: 1" = 5 FT
 HORIZONTAL: 1" = 10 FT



Albert Frick
 Site Evaluator Signature

163
 SE *

10/5/2010
 Date

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Albert Frick Associates, Inc.
Soil Scientists & Site Evaluators

95A County Road Gorham, Maine 04038
(207) 839-5563

TWP 16 MD

SUGAR HILL ROAD

BLUE SKY WIND ENERGY

TOWN

LOCATION

APPLICANT'S NAME

- 1) The Plumbing and Subsurface Wastewater Disposal Rules adopted by the State of Maine, Department of Human Services pursuant to 22 M.R.S.A. § 42 (the "Rules") are incorporated herein by reference and made a part of this application and shall be consulted by the owner/applicant, the system installer and/or building contractor for further construction details and material specifications. The system Installer should contact Albert Frick Associates, Inc. 839-5563, if there are any questions concerning materials, procedures or designs. The system installer and/or building contractor installing the system shall be solely responsible for compliance with the Rules and with all state and municipal laws and ordinances pertaining to the permitting, inspection and construction of subsurface wastewater disposal systems.
- 2) This application is intended to represent facts pertinent to the Rules only. It shall be the responsibility of the owner/applicant, system Installer and/or building contractor to determine compliance with and to obtain permits under all applicable local, state and/or federal laws and regulations (including, without limitation, Natural Resources Protection Act, wetland regulations, zoning ordinances, subdivision regulations, Site Location of Development Act and minimum lot size laws) before installing this system or considering the property on which the system is to be installed a "buildable" lot. It is recommended that a wetland scientist be consulted regarding wetland regulations. Prior to the commencement of construction/installation, the local plumbing inspector or Code Enforcement Officer shall inform the owner/applicant and Albert Frick Associates, Inc of any local ordinances which are more restrictive than the Rules in order that the design may be amended. All designs are subject to review by local, state and/or federal authorities. Albert Frick Associates, Inc.'s liability shall be limited to revisions required by regulatory agencies pursuant to laws or regulations in effect at the time of preparation of this application.
- 3) All information shown on this application relating to property lines, well locations, subsurface structures and underground facilities (such as utility lines, drains, septic systems, water lines, etc.) are based solely upon information provided by the owner/applicant and has been relied upon by Albert Frick Associates, Inc. in preparing this application. The owner/applicant shall review this application prior to the start of construction and confirm this information. Well locations on abutting properties but not readily visible above grade should be confirmed by the owner/applicant prior to system installation to assure minimum setbacks.
- 4) Installation of a garbage (grinder) disposal is not recommended. If one is installed, an additional 1000 gallon septic tank or a septic tank filter shall be connected in series to the proposed septic tank. Risers and covers should be installed over the septic tank outlet to allow for easy maintenance.
- 5) The system user shall avoid introducing kitchen grease or fats into this system. Chemicals such as septic tank cleaners and/or chlorine (such as from water treatment units) and controlled or hazardous substances shall not be disposed of in this system. Additives such as yeast or enzymes are discouraged, since they have not been proven to extend system life.
- 6) The septic tank should be pumped within two years of installation and subsequently as recommended by the pump service, but in no event should the septic tank be pumped less often than every three years. All septic tanks, pump stations and additional treatment tanks shall be installed to prevent ground water and surface water infiltration. Risers and covers should be properly installed to provide access while preventing surface water intrusion.

ATTACHMENT TO SUBSURFACE WASTEWATER DISPOSAL APPLICATION

TWP 16 MD	SUGAR HILL ROAD	BLUE SKY WIND ENERGY
TOWN	LOCATION	APPLICANT'S NAME

7) The actual water flow or number of bedrooms shall not exceed the design criteria indicated on this application without a re-evaluation of the system as proposed. If the system is supplied by public water or a private service with a water meter, the water consumption per period should be divided by the number of days to calculate the average daily water consumption [water usage (cu. ft.) x 7.48 cu. ft. (gallons per cu. ft.) ÷ (# of days in period) = gals per day].

8) The general minimum setbacks between a well and septic system serving a single family residence is 100-300 feet, unless the local municipality has a more stringent requirement. A well installed by an abutter within the minimum setback distances prior to the issuance of a permit for the proposed disposal system may void this design.

9) When a gravity system is proposed: BEFORE CONSTRUCTION/INSTALLATION BEGINS, the system installer or building contractor shall review the elevations of all points given in this application and the elevation of the existing and/or proposed building drain and septic tank inverts for compatibility to minimum slope requirement. In gravity systems, the invert of the septic tank(s) outlet(s) shall be at least 4 inches above the invert of the distribution box outlet at the disposal area.

10) When an effluent pump is required: Provisions shall be made to make certain that surface and ground water does not enter the septic tank or pump station, by sealing/grouting all seams and connections, and by placement of a riser and lid at or above grade. An alarm device warning of a pump failure shall be installed. Also, when pumping is required of a chamber system, install a "T" connection in the distribution box and place 3 inches of stone or a splash plate in the first chamber. Insulate gravity pipes, pump lines and the distribution box as necessary to prevent freezing.

11) On all systems, remove the vegetation, organic duff and old fill material from under the disposal area and any fill extension. On sites where the proposed system is to be installed in natural soil, scarify the bottom and sides of the excavated disposal area with a rake. Do not use wheeled equipment on the scarified soil surface. For systems installed in fill, scarify the native soil by roto-tilling or scarifying with teeth of backhoe to a depth of at least 8 inches over the entire disposal and fill extension area to prevent glazing and to promote fill bonding. Place fill in loose layers no deeper than 8 inches and compact before placing more fill (this ensures that voids and loose pockets are eliminated to minimize the chance of leakage or differential setting). Do not use wheeled equipment on the scarified soil area until after 12 inches of fill is in place. Keep equipment off proprietary devices. Divert the surface water away from the disposal area by ditching or shallow landscape swales.

12) Unless noted otherwise, fill shall be gravelly coarse sand which contains no more than 5% fines (silt and clay). Crushed stone shall be clean and free of any rock dust from the crushing process.

13) Do not install systems on loamy, silty, or clayey soils during wet periods since soil smearing/glazing may seal off the soil interface.

14) Seed all filled and disturbed surfaces with perennial grass seed, then mulch with hay or equivalent material to prevent erosion. Alternatively, bark or permanent landscape mulch may be used to cover system. Woody trees or shrubs are not permitted on the disposal area or fill extensions.

15) If an advanced wastewater treatment unit is part of the design, the system shall be operated and maintained per manufacturer's specifications.



Albert Frick Associates, Inc.
Soil Scientists & Site Evaluators
 95A County Road Gorham, Maine 04058
 (207) 859-5563



Federal Aviation Administration

Notice of Proposed Construction or Alteration - Off Airport

Project Name: BLUE -000160520-10

Sponsor: Blue Sky East, LLC

Details for Case : T01 0532.MA.013

[Show Project Summary](#)

Case Status		
ASN:	2010-WTE-15366-OE	
Status:	Accepted	
Date Accepted:	11/19/2010	
Date Determined:		
Letters:	None	
Documents:	11/19/2010 1	
	11/19/2010 1	
Construction / Alteration Information		
Notice Of:	Construction	
Duration:	Permanent	
if Temporary :	Months: Days:	
Work Schedule - Start:		
Work Schedule - End:		
State Filing:	Not filed with State	
Structure Details		
Latitude:	44° 41' 34.06" N	
Longitude:	68° 10' 1.52" W	
Horizontal Datum:	NAD83	
Site Elevation (SE):	570 (nearest foot)	
Structure Height (AGL):	476 (nearest foot)	
<i>* If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.</i>		
Requested Marking/Lighting:	White Paint/Synchronized Red Lights	
Other :		
Recommended Marking/Lighting:		
Current Marking/Lighting:	N/A New Structure	
Other :	<input type="text"/>	
Nearest City:	Mixed Forest	
Nearest State:	Maine	
Description of Location:	Turbine 1 of 19 wind turbines and 4 Met Towers. All structures are White	
<i>On the Project Summary page upload any certified survey.</i>		
Description of Proposal:	Please refer to uploaded lighting plan and map.	
Structure Summary		
Structure Type:	Wind Turbine	
Structure Name:	T01 0532.MA.013	
NOTAM Number:		
FCC Number:		
Prior ASN:		
Common Frequency Bands		
Low Freq	High Freq	Freq Ur
Specific Frequencies		



Notice of Proposed Construction or Alteration - Off Airport

Project Name: BLUE -000160520-10

Sponsor: Blue Sky East, LLC

Details for Case : T03

[Show Project Summary](#)

Case Status			
ASN:	2010-WTE-15368-OE	Date Accepted:	11/19/2010
Status:	Accepted	Date Determined:	
		Letters:	None
		Documents:	None
Construction / Alteration Information		Structure Summary	
Notice Of:	Construction	Structure Type:	Wind Turbine
Duration:	Permanent	Structure Name:	T03
<i>if Temporary :</i>	Months: Days:	NOTAM Number:	
Work Schedule - Start:		FCC Number:	
Work Schedule - End:		Prior ASN:	
State Filing:	Not filed with State		
Structure Details		Common Frequency Bands	
Latitude:	44° 41' 42.20" N	Low Freq	High Freq
Longitude:	68° 9' 39.15" W	Freq Unit	ERP Unit
Horizontal Datum:	NAD83	Specific Frequencies	
Site Elevation (SE):	574 (nearest foot)		
Structure Height (AGL):	476 (nearest foot)		
<i>* If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.</i>			
Requested Marking/Lighting:	White Paint/Synchronized Red Lights		
	Other :		
Recommended Marking/Lighting:			
Current Marking/Lighting:	N/A New Structure		
	Other : <input type="text"/>		
Nearest City:	Mixed Forest		
Nearest State:	Maine		
Description of Location:	Turbine 3 of 19 wind turbines and 4 Met Towers. All structures are White		
<i>On the Project Summary page upload any certified survey.</i>			
Description of Proposal:	Please refer to uploaded lighting plan and map.		



Notice of Proposed Construction or Alteration - Off Airport

Project Name: BLUE -000160520-10

Sponsor: Blue Sky East, LLC

Details for Case : T04

[Show Project Summary](#)

Case Status		Date Accepted: 11/19/2010	
ASN: 2010-WTE-15369-OE		Date Determined:	
Status: Accepted		Letters: None	
		Documents: None	
Construction / Alteration Information		Structure Summary	
Notice Of: Construction		Structure Type: Wind Turbine	
Duration: Permanent		Structure Name: T04	
if Temporary : Months: Days:		NOTAM Number:	
Work Schedule - Start:		FCC Number:	
Work Schedule - End:		Prior ASN:	
State Filing: Not filed with State			
Structure Details		Common Frequency Bands	
Latitude: 44° 41' 45.91" N		Low Freq	High Freq Freq Unit ERP ERP Unit
Longitude: 68° 9' 28.89" W		Specific Frequencies	
Horizontal Datum: NAD83			
Site Elevation (SE): 576 (nearest foot)			
Structure Height (AGL): 476 (nearest foot)			
<i>* If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.</i>			
Requested Marking/Lighting: White Paint Only			
	Other :		
Recommended Marking/Lighting:			
Current Marking/Lighting: N/A New Structure			
	Other : <input type="text"/>		
Nearest City: Mixed Forest			
Nearest State: Maine			
Description of Location: Turbine 4 of 19 wind turbines and 4 Met Towers. All structures are White			
<i>On the Project Summary page upload any certified survey.</i>			
Description of Proposal: Please refer to uploaded lighting plan and map.			



Notice of Proposed Construction or Alteration - Off Airport

Project Name: BLUE -000160520-10

Sponsor: Blue Sky East, LLC

Details for Case : T05

[Show Project Summary](#)

Case Status		Date Accepted: 11/19/2010	
ASN: 2010-WTE-15370-OE		Date Determined:	
Status: Accepted		Letters: None	
		Documents: None	
Construction / Alteration Information		Structure Summary	
Notice Of: Construction		Structure Type: Wind Turbine	
Duration: Permanent		Structure Name: T05	
if Temporary : Months: Days:		NOTAM Number:	
Work Schedule - Start:		FCC Number:	
Work Schedule - End:		Prior ASN:	
State Filing: Not filed with State			
Structure Details		Common Frequency Bands	
Latitude: 44° 41' 51.00" N		Low Freq	High Freq
Longitude: 68° 9' 14.02" W		Freq Unit	ERP Unit
Horizontal Datum: NAD83		Specific Frequencies	
Site Elevation (SE): 578 (nearest foot)			
Structure Height (AGL): 476 (nearest foot)			
<i>* If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.</i>			
Requested Marking/Lighting:	White Paint/Synchronized Red Lights		
	Other :		
Recommended Marking/Lighting:			
Current Marking/Lighting:	N/A New Structure		
	Other : <input type="text"/>		
Nearest City:	Mixed Forest		
Nearest State:	Maine		
Description of Location:	Turbine 5 of 19 wind turbines and 4 Met Towers. All structures are White		
<i>On the Project Summary page upload any certified survey.</i>			
Description of Proposal:	Please refer to uploaded lighting plan and map.		



Notice of Proposed Construction or Alteration - Off Airport

Project Name: BLUE -000160520-10

Sponsor: Blue Sky East, LLC

Details for Case : T08

[Show Project Summary](#)

Case Status		Date Accepted: 11/19/2010	
ASN: 2010-WTE-15373-OE		Date Determined:	
Status: Accepted		Letters: None	
		Documents: None	
Construction / Alteration Information		Structure Summary	
Notice Of: Construction		Structure Type: Wind Turbine	
Duration: Permanent		Structure Name: T08	
if Temporary : Months: Days:		NOTAM Number:	
Work Schedule - Start:		FCC Number:	
Work Schedule - End:		Prior ASN:	
State Filing: Not filed with State			
Structure Details		Common Frequency Bands	
Latitude: 44° 42' 40.11" N		Low Freq	High Freq
Longitude: 68° 9' 6.15" W		Freq Unit	ERP Unit
Horizontal Datum: NAD83		Specific Frequencies	
Site Elevation (SE): 584 (nearest foot)			
Structure Height (AGL): 476 (nearest foot)			
<i>* If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.</i>			
Requested Marking/Lighting: White Paint/Synchronized Red Lights			
Other :			
Recommended Marking/Lighting:			
Current Marking/Lighting: N/A New Structure			
Other : <input type="text"/>			
Nearest City: Mixed Forest			
Nearest State: Maine			
Description of Location: Turbine 8 of 19 wind turbines and 4 Met Towers. All structures are White			
<i>On the Project Summary page upload any certified survey.</i>			
Description of Proposal: Please refer to uploaded lighting plan and map.			



Notice of Proposed Construction or Alteration - Off Airport

Project Name: BLUE -000160520-10

Sponsor: Blue Sky East, LLC

Details for Case : T09

[Show Project Summary](#)

Case Status			
ASN:	2010-WTE-15374-OE	Date Accepted:	11/19/2010
Status:	Accepted	Date Determined:	
		Letters:	None
		Documents:	None
Construction / Alteration Information		Structure Summary	
Notice Of:	Construction	Structure Type:	Wind Turbine
Duration:	Permanent	Structure Name:	T09
if Temporary :	Months: Days:	NOTAM Number:	
Work Schedule - Start:		FCC Number:	
Work Schedule - End:		Prior ASN:	
State Filing:	Not filed with State		
Structure Details		Common Frequency Bands	
Latitude:	44° 42' 57.95" N	Low Freq	High Freq
Longitude:	68° 9' 4.95" W	Freq Unit	ERP Unit
Horizontal Datum:	NAD83	Specific Frequencies	
Site Elevation (SE):	586 (nearest foot)		
Structure Height (AGL):	476 (nearest foot)		
<i>* If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.</i>			
Requested Marking/Lighting:	White Paint/Synchronized Red Lights		
	Other :		
Recommended Marking/Lighting:			
Current Marking/Lighting:	N/A New Structure		
	Other : <input type="text"/>		
Nearest City:	Mixed Forest		
Nearest State:	Maine		
Description of Location:	Turbine 9 of 19 wind turbines and 4 Met Towers. All structures are White		
<i>On the Project Summary page upload any certified survey.</i>			
Description of Proposal:	Please refer to uploaded lighting plan and map.		



Notice of Proposed Construction or Alteration - Off Airport

Project Name: BLUE -000160520-10	Sponsor: Blue Sky East, LLC
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Details for Case : T18

[Show Project Summary](#)

Case Status		Date Accepted: 11/19/2010	
ASN: 2010-WTE-15383-OE		Date Determined:	
Status: Accepted		Letters: None	
		Documents: None	
Construction / Alteration Information		Structure Summary	
Notice Of: Construction		Structure Type: Wind Turbine	
Duration: Permanent		Structure Name: T18	
if Temporary : Months: Days:		NOTAM Number:	
Work Schedule - Start:		FCC Number:	
Work Schedule - End:		Prior ASN:	
State Filing: Not filed with State			
Structure Details		Common Frequency Bands	
Latitude: 44° 44' 6.98" N		Low Freq High Freq Freq Unit ERP ERP Unit	
Longitude: 68° 9' 3.71" W			
Horizontal Datum: NAD83		Specific Frequencies	
Site Elevation (SE): 604 (nearest foot)			
Structure Height (AGL): 476 (nearest foot)			
<i>* If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.</i>			
Requested Marking/Lighting: White Paint Only			
	Other :		
Recommended Marking/Lighting:			
Current Marking/Lighting: N/A New Structure			
	Other : <input type="text"/>		
Nearest City: Mixed Forest			
Nearest State: Maine			
Description of Location: Turbine 18 of 19 wind turbines and 4 Met Towers. ALI structures are White			
<i>On the Project Summary page upload any certified survey.</i>			
Description of Proposal: Please refer to uploaded lighting plan and map.			



Notice of Proposed Construction or Alteration - Off Airport

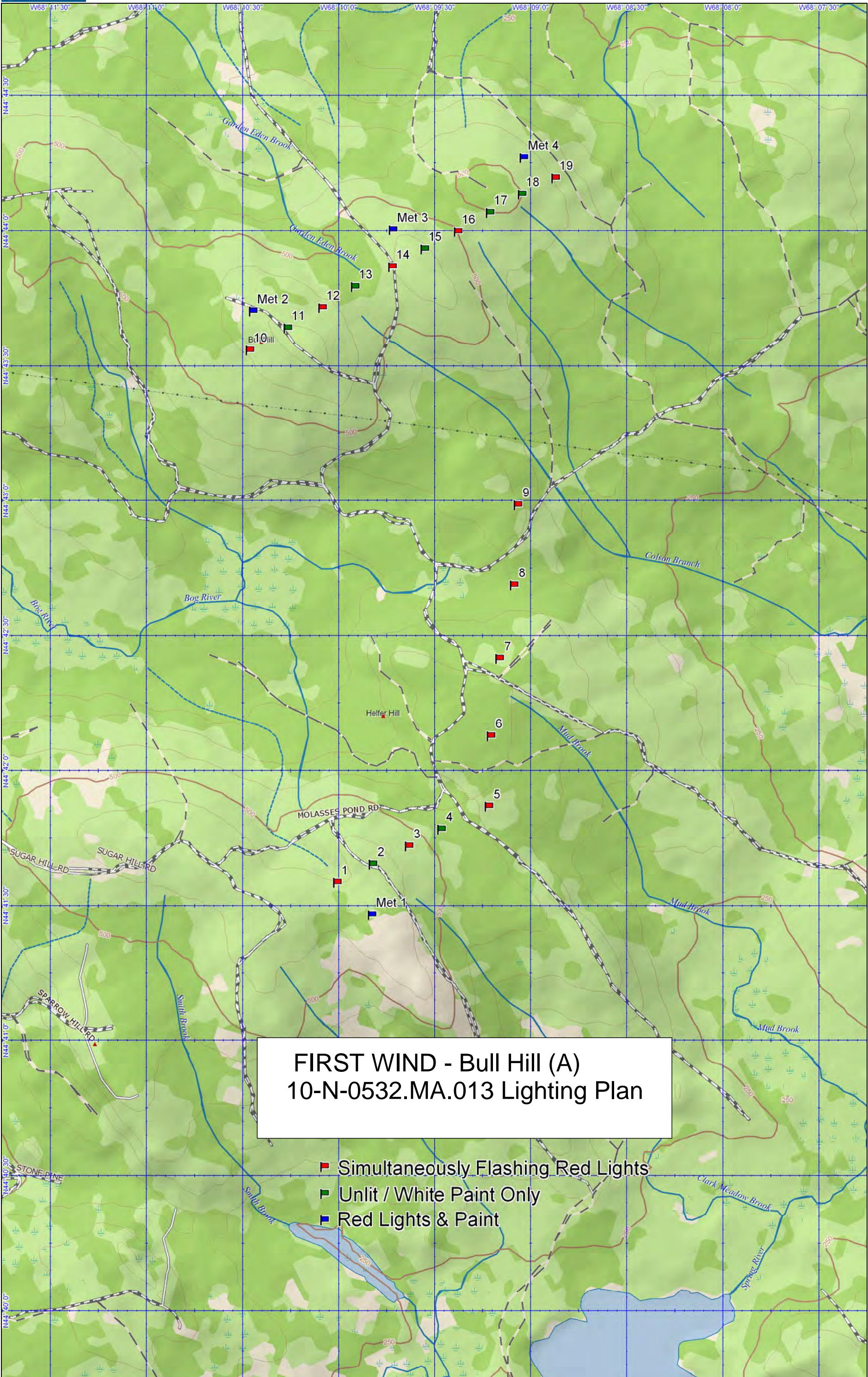
Project Name: BLUE -000160520-10

Sponsor: Blue Sky East, LLC

Details for Case : Met1

[Show Project Summary](#)

Case Status		Date Accepted: 11/19/2010	
ASN: 2010-WTE-15385-OE		Date Determined:	
Status: Accepted		Letters: None	
		Documents: None	
Construction / Alteration Information		Structure Summary	
Notice Of: Construction		Structure Type: Met Tower	
Duration: Permanent		Structure Name: Met1	
if Temporary : Months: Days:		NOTAM Number:	
Work Schedule - Start:		FCC Number:	
Work Schedule - End:		Prior ASN:	
State Filing: Not filed with State			
Structure Details		Common Frequency Bands	
Latitude: 44° 41' 26.91" N		Low Freq	High Freq Freq Unit ERP ERP Unit
Longitude: 68° 9' 50.65" W		Specific Frequencies	
Horizontal Datum: NAD83			
Site Elevation (SE): 608 (nearest foot)			
Structure Height (AGL): 476 (nearest foot)			
<i>* If the entered AGL is a proposed change to an existing structure's height include the current AGL in the Description of Proposal.</i>			
Requested Marking/Lighting: Red lights and paint			
Other :			
Recommended Marking/Lighting:			
Current Marking/Lighting: N/A New Structure			
Other : <input type="text"/>			
Nearest City: Mixed Forest			
Nearest State: Maine			
Description of Location: Met Tower 1 of 4 and 19			
<i>On the Project Summary page upload any certified survey.</i>	Wind Towers. ALL structures are White		
Description of Proposal:	Please refer to uploaded lighting plan and map.		



**FIRST WIND - Bull Hill (A)
10-N-0532.MA.013 Lighting Plan**

- Simultaneously Flashing Red Lights
- Unlit / White Paint Only
- Red Lights & Paint



JOHN ELIAS BALDACCI
GOVERNOR

STATE OF MAINE
DEPARTMENT OF CONSERVATION
22 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0022

ELIZA TOWNSEND
ACTING COMMISSIONER

Marcia Spencer-Famous, LURC
22 State House Station
Augusta, Maine 04333

Re: Impact of Bull Hill Wind Project on Local Wildland Fire Protection Services

Dear Marcia,

I have reviewed the materials associated with Blue Sky East LLC's development of a 34MW wind power project in the Bull Hill area of T16 MD, an unorganized territory in Hancock County. According to these materials, this project consists of 19 turbines, a substation and O&M facility. Road construction and alterations will be minimal as an extensive timber management road network already exists.

I serve as the forest ranger responsible for the forest fire protection for this area on behalf of the Maine Forest Service. We are charged with providing wildland fire prevention and suppression and as such are not a structural fire agency. However, we would lend assistance to the level that we are trained and equipped. I have determined, based upon discussions and my review of the materials provided, that this project will be reasonably self-sufficient and will have little, if any impact on the services that we provide to this area.

This project does not appear to necessitate any additional resources or requirements on our agency's part; not does it appear that alteration or modification of current prevention or suppression efforts or practices would be required.

If you have any further questions of concern please feel free to contact me at (207) 667-2070 or at ranger.rick.henion@gmail.com.

Sincerely,

Rick A Henson
Forest Ranger II
Maine Forest Service

Cc: Stantec Consulting Services, Brook Barnes,
B. Williams, MEFS
B. Hamilton, MEFS
C Hammond, MEFS

www.maine.gov/doc
PHONE: 207-287-4900
FAX: 207-287-2400
TTY: 888-577-6690

William F. Clark
Sheriff



Richard D. Bishop
Chief Deputy

Hancock County Sheriff's Department
50 State Street, Suite 10
Ellsworth, Maine 04605
(207) 667-7575
Fax (207) 667-7516

October 12, 2010

Brooke Barnes
Stantec Consulting Services
30 Park Drive
Topsham, Maine 04086

RE: Bull Hill Wind Project, T16MD

Dear Mr. Barnes,

In response to your inquiry, this letter is an acknowledgement by the Hancock County Sheriff's Office that Blue Sky East, LLC is putting together a permit application to the Land Use Regulation Commission for a 19 turbine wind power project in Township 16.

I have reviewed a project description and map of the project, and have determined the project would not pose an additional burden on my law enforcement division. The area of the project is reasonably accessible and my patrol deputies are familiar with the access routes both from Route 9 in Aurora and Sugar Hill Road in Eastbrook.

Sincerely,

A handwritten signature in blue ink that reads "William F. Clark". The signature is fluid and cursive, with the first name being the most prominent.

William F. Clark
Sheriff



Operated By NEWSME Landfill Operations, LLC

October 27, 2010

Mr. Brooke Barnes
Stantec Consulting
30 Park Drive
Topsham, Maine 04086

RE: Capacity Statement
Bull Hill Wind Project
T16 MD, Maine

Dear Mr. Barnes:

This letter is to confirm that Juniper Ridge Landfill, located in Old Town, Maine has the capacity to accept and dispose of the estimated 250 cubic yards of construction & demolition debris material to be generated by the proposed Bull Hill Wind Project.

If you should have any further questions, please feel free to contact me at 862-4200, extension 245.

Sincerely,

Tom Gilbert
Environmental Compliance Manager
Juniper Ridge Landfill

Cc: Wayne Boyd, JRL

1.0 INTRODUCTION

This erosion and sedimentation control plan has been developed to (1) satisfy the requirements of the Land Use Regulation Commission (LURC) Chapter 10 Rules and Standards and (2) identify road construction and stormwater management techniques that will minimize unreasonable soil erosion and prevent potential reductions in the water storage capacity of existing soils. The erosion control plan is included on Sheets C-600 through C-608 of the project design plans located in Exhibit 1. The plan identifies Best Management Practices (BMPs) that can be implemented during project construction to minimize and control soil erosion. The plans, details, and specifications included in the plan identify appropriate BMPs for various soil and environmental conditions, explain the basis for their use, and provide details for their installation.

2.0 OVERVIEW OF EROSION AND SEDIMENTATION CONCERNS

Activities that may potentially cause erosion during project construction primarily consist of grading of the access and crane path roads and grading and site preparation for the 19 wind turbine clearings (i.e., foundations, crane pads, and rotor assembly areas). As part of the project, approximately 0.9 mile of 24-foot wide access road and 3.9 miles of 36-foot wide crane path roads will be constructed. Each turbine clearing will consist of approximately 0.8 to 1.3 acres of temporary clearing and 0.28 acre of permanent clearing, for a total of approximately 1.1 to 1.6 acres of proposed clearing for each wind turbine location. As project design plans are further developed, the geometry of these clearings will likely be reduced and tailored to the specific site conditions (e.g., existing grades, depth to bedrock and soil types) to minimize steep grades and extended fill zones. In addition to the roads and turbine clearings, approximately 9.6 acres of the project site will be cleared for use as laydown areas for construction materials and equipment. This is summarized in Table 1.

Table 1. Cleared Acreage for Bull Hill Wind Project		
Cleared Acreage		
19 Turbine Pads	27.4 Acres	Total Clearing = Turbine pads and grading
Temporary clearing	22.1 Acres	
Permanent clearing	5.3 Acres	
New Crane Path Segments	40.5 Acres	Total Clearing = Roadway, ditching, and grading
Temporary clearing	23.5 Acres	
Permanent clearing	17.0 Acres	
New Access Roads		
Permanent clearing	1.3 Acres	
Existing Roads, Widening	0.2 Acres	
Temporary clearing		
Lay down areas		
Temporary clearing	9.6 Acres	
Met Towers		
Permanent clearing	13.3 Acres	
Collector line corridor		
Permanent clearing	0.5 Acres	
Temporary Clearing		55.4 Acres
Permanent Clearing		37.4 Acres
Total Project Clearing		92.8 Acres

3.0 EROSION AND SEDIMENTATION CONTROL MEASURES

The proposed erosion and sedimentation control plan includes installation of silt fencing/erosion control mix berms, erosion control mulch, riprap slope protection, rock sandwich road construction, dewatering safeguards, ditch turnouts and level spreaders. These BMPs will be designed in accordance with the following standard references on erosion and sedimentation control in the State of Maine:

- *Maine Erosion and Sedimentation Control Best Management Practices* [Maine Department of Environmental Protection (MDEP), 2003];
- *Erosion and Sediment Control Handbook for Maine Timber Harvesting Operations – Best Management Practices* (1991); and
- *Land Use Handbook – Section 6 – Erosion Control on Logging Jobs and Revision (Supplement)* (effective January 5, 1981).

Erosion and sedimentation control design plans, details, and specifications will be reviewed by a State of Maine licensed Professional Engineer and Certified Professional in Erosion and Sediment Control who specializes in design and implementation of erosion control methods.

If winter or early spring construction occurs, the recommended winter construction BMPs will be followed. These include application of hay mulch at twice the standard rate and installing a double row of sediment barriers for areas within 75 feet of a wetland. Winter construction specifications are also provided on Sheet C3.

Following is a brief summary of the implementation of each of the BMPs in the proposed erosion and sedimentation control plan. Typical details for each BMP are included with the turbine site and road plans in Exhibit 1.

Silt Fence

Silt fence, or a combination of silt fencing and erosion control mulch, will be installed down-gradient of construction and clearing activities. In critical areas, particularly near wetlands, a double layer of silt fencing may be installed. Multiple rows of silt fencing may also be necessary in long areas of cuts. The final layout will be prepared in accordance with typical design methods for these BMPs included in the above references. Silt fence should not be used in areas of concentrated stormwater runoff.

Erosion Control Mulch

Erosion control mulch will be used to provide cover for denuded or hydroseeded areas until vegetation is established for slope stabilization. Mulch placed on slopes less than 10 percent will be anchored by applying water or another tackifier; mulch placed on slopes steeper than 10 percent will be covered with fabric netting and anchored with staples as deemed necessary. Wood mulch generated by grinding stumps and other cleared woody vegetation will be used to provide cover material over bare slopes as an erosion control material. Depending on up-gradient slopes, erosion control mulch may also be bermed on the uphill side of silt fences. Erosion control mulch should not be used in areas of concentrated stormwater runoff.

Riprap

Steeply sloped ditches along project roadways will be armored with appropriately sized riprap armoring to stabilize the ditch. Cross culverts may also be necessary as part of this project. Plunge pools, check dams, and level spreaders will be used to dissipate concentrated flows that might cause erosion and thereby protect culvert outlets.

Rock Sandwich Road Construction

The erosive potential of water that may be concentrated in ditches will be minimized by the use, where applicable, of “rock sandwich” road construction as suggested by State Soil Scientist David Rocque. Rock sandwich construction will be used in fill areas at the bottom of any low points with high ground water or poor soils to enable water to flow down to cross slopes that are intercepted by the project roadway. This will eliminate the concentration of flows in a ditch on the uphill side of the road and allow water from uphill areas to continue flowing under the road in a layer of coarse gravel.

Ditch Turnouts and Level Spreaders

Where ditches are necessary, primarily in cut sections of the roadway, appropriately sized and located cross-culverts and ditch turnouts will be used to dissipate collected stormwater runoff back to sheet flow. These ditches will be designed as suggested by MDEP and LURC Chapter 10 criteria, which requires a ditch turnout ending with a level spreader every 250 feet if both sides of a crowned road are being diverted, and every 400 feet if only one side of the road is discharged through the ditch and level spreader. In areas of long deep cuts, MDEP has found that the creation of the level spreaders themselves are an unnecessary disturbance and has allowed longer runs and oversized spreaders at the end of the cut section. The final erosion and sedimentation control plan will reflect these findings.

Sediment retention when dewatering

A high water table exists at several turbine pad locations throughout the project which will require dewatering during construction. As a result, the use of settlement ponds or sediment control devices such as "dirtbags" shall be employed to separate sediments from dewatering activities. Pumped water will be directed away from protected resources to natural buffer areas or other acceptable stabilized areas.

3.1 Site Plans

James W. Sewall Company prepared the road and turbine site design plans for the site development application that identify vegetation types and locations, slopes, and other nature features near the disturbed areas. The plans and accompanying details show and describe temporary and permanent erosion control measures.

3.2 Sequence of Construction

In general, erosion control measures will be implemented down-gradient of each work area before earthwork begins. Construction activities will be sequenced to minimize the project area that is disturbed and unstabilized at any point in time. Disturbed and stockpiled soil will be temporarily stabilized at the end of each workday. Temporary erosion control measures will be the first items installed and the last items to be removed after healthy vegetation is established.

After preliminary layout and staking of the new road segments and areas to be cleared, erosion control measures will be installed. As the roads are constructed and areas are cleared, additional measures will be implemented. As roads reach final grade, permanent measures, such as ditch turnouts and level spreaders, will be constructed.

Cleared areas will receive temporary mulching and seeding. Topsoil stockpiles will be protected by double measures such as temporary seeding and silt fences. After turbines are installed, a significant portion of each turbine clearing will be regraded with the stockpiled topsoil and permanently stabilized with mulch.

Because stabilization of areas following completion of final grading is important to prevent erosion, areas will be stabilized within seven days of work completion. Final stabilization will consist of coarse gravel or blast rock (project roadways), mulch (turbine clearings), permanent seeding and erosion control mulch/matting (less steep cut and fill slopes), and riprap (steep cut/fill slopes, ditches and culvert outlets).

3.3 Maintenance and Inspection of Erosion Control Measures

Maintenance of erosion control measures is key to their successful operation. BMPs will be inspected at least weekly and after any rainstorm greater than 0.5 inch by the project General Contractor, who will be certified in erosion control practices by the MDEP, and periodically by a Third-Party Inspection personnel under direct supervision of a licensed Professional Engineer. Inspections will be documented in writing and be made available to LURC upon request. Workers on-site will be instructed to report problems as they occur so remedial action can be taken as soon as possible.

For all projects, it is the size and location of the development that determines the standards that must be met. Projects creating over one acre of impervious ground cover and that are within a lake watershed must meet the phosphorous standard, and with very few exceptions, all other watersheds must meet the general standard. Projects that will create over three acres of impervious must meet the flooding standard.

The Bull Hill Wind Project lies within the Graham Lake, Narraguagus River, Narraguagus Lake and Spectacle Pond Watersheds. According to the Maine Department of Environmental Protection, Graham Lake is an exception because its algal productivity is not currently limited by phosphorus. It is a large, fairly shallow, man-made lake, with a lot of water level fluctuation. When the lake is drawn down, which is fairly often, and the wind blows, the bottom sediments, particularly in the large Union River delta in the north half of the lake, are re-suspended, and the lake becomes quite cloudy. The secchi disc readings are often less than 2 meters, but the chlorophyll concentrations indicate very low algal productivity because the suspended sediment is limiting light penetration and therefore limiting algal production. Because of this, the phosphorus standard is not applicable. The runoff from the Graham Lake and Narraguagus River watersheds are required to meet the general standards. Narraguagus Lake and Spectacle Pond need to meet phosphorous standards. The entire project is required to meet the flooding standard.

The Graham Lake watershed is required to meet the general standard, 75 percent of the linear portion of the development must be treated. The project proposes 7.17 acres of new impervious in this watershed, and 75.50 percent is being treated through a combination of buffers.

The Narraguagus River watershed is also required to meet the general standard, 75 percent of the linear portion of the development must be treated. The project proposes 13.38 acres of new impervious in this watershed, and 76.29 percent is being treated through a combination of buffers.

Spectacle Pond lies within a lake watershed that is required to meet the phosphorous standard. The current calculated pound per acre phosphorus allocation (P) is 0.062 pounds/acre/year. T16 MD has 489 acres that are within the direct watershed of Spectacle Pond that are available to be developed. The Small Watershed Threshold is 24 acres. The project area for the phosphorous calculations is 22.49 acres. This results in a budget of 1.394 lbs P/year to be exported off the site. 1.21 acres of new impervious is being proposed in this watershed. The total proposed export is 1.196 lbs P/year which meets the standard. This standard was met by using a combination of buffers.

Narraguagus Lake lies within a lake watershed that is required to meet the phosphorous standard. The current calculated pound per acre phosphorus allocation (P) is 0.041 pounds/acre/year. T16 MD has 1,075 acres that are within the direct watershed of Narraguagus Lake that are available to be developed. The Small Watershed Threshold is 54 acres. The project area for the phosphorous calculations is 2.48 acres. This results in a budget of 0.102 lbs P/year to be exported off the site. 0.11 acres of new impervious is being proposed in this watershed. The total proposed export is 0.080 lbs P/year which meets the standard. This standard was met by using a combination of buffers.

The Operations and Maintenance (O&M) building is located within the Narraguagus River watershed and is required to meet the general standard. The O&M building is considered to be nonlinear and must treat 95 percent of the impervious area and 80 percent of the developed area. The project proposes 2.37 acres of impervious area, and 100 percent is being treated. A total of 3.57 acres of developed area (including the impervious area) is being proposed for the O&M building site, and 87.81 percent is being treated through buffers.

The entire project must comply with the flooding standard, the post development runoff rate must be less than or equal to the pre development runoff rate. The table below summarizes the rates and compares the pre and post development conditions. The North analysis point (Spectacle Pond) shows an insignificant increase. Once the runoff reaches the property line there will be no increase in the rate.

	Property Line	Watershed	Flow (cfs) from Hydrocad		
			2-year	10-year	25-year
PRE	North	Spectacle Pond	25.95	79.21	108.67
POST	North	Spectacle Pond	26.97	82.74	113.53
	CHANGE		1.02	3.53	4.86
PRE	East	Narraguagus River	176.95	542.19	742.39
POST	East	Narraguagus River	176.95	542.19	742.39
	CHANGE		0.00	0.00	0.00
PRE	South	Narraguagus Lake	31.52	94.98	130.12
POST	South	Narraguagus Lake	31.52	94.98	130.12
	CHANGE		0.00	0.00	0.00
PRE	West	Graham Lake	108.51	330.51	453.61
POST	West	Graham Lake	108.51	330.51	453.61
	CHANGE		0.00	0.00	0.00

The attached stormwater calculations include computations that address meeting the Phosphorous Standard, the General Standard, and the Flooding Standard for the project.

Project Name **Bull Hill** BA=Buffer Adjacent to Small Imp RB=Roadside buffer BRS=Roadside Buffer with Rock Sandwich
 Project Number **74490E** BL=Buffer w/level spreader DB=Detention basin
 Date **10/12/2010** DT=Buffer w/ditch turnout WP=Wet pond
 Done by **JAO** USF=Underdrain Soil Filter INF=Infiltration

QUALITY CALCULATIONS FOR LINEAR PORTION

Graham Lake (T16 MD)

Phosphorous Requirement

Watershed per acre phosphorus budget (Appendix C): P N/A # P/acre/year Total ac of devel. parcel: TA acres
 Small Watershed Threshold (Appendix C) SWT acres NWI wetland acreage: WA acres
 Allowable increase in Town's share of annual phos (App C) FC lbs P/year Steep slope acreage: SA acres
 Area avail. For development (App C) AAD acres Existing imp area (Pre 1980) EIA_B acres
 Project acreage: A = TA - (WA + SA + EIA_B + EIA_A) A acres Existing imp area (post 1980) EIA_A acres
 A/AAD R

Project Phos Budget: PPB = P x A **PPB N/A lbs P/year**
 Project Phos Budget with small watershed adjustment: **PPB N/A lbs P/year**

Total Post Development Phos Export (lbs P/yr)= **0.0000** <= **N/A** Access rd width(Const)= **24** Crane path width(Const)= **36**
 % of Project Treated for WS= **75.50%** >= **75%** Access rd width(Perm)= **24** Crane path width(Perm)= **36**
 Total Impervious Area for WS= **7.17** Acres Turbine pad imp area(Perm)= **12350** sq ft Met Tower Rd width= **12**

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	SIDE OF RD T: RIGHT, LEFT BOTH	BMP cover Forest Meadow	Imp. Area (acres)	Treatment Factor	Export Coefficient	Pre-Treatment lbs P/Year	Post Treatment lbs P/year
T10	Turbine			100%	B10		Forest	0.2835	0.4			
NS	Crane	224	830	50%	BL1	RIGHT	Forest	0.2504	0.4			
NS	Crane	224	350	50%	B10	LEFT	Forest	0.0521	0.4			
NS	Crane	600	830	50%	BL21	LEFT	Forest	0.0950	0.4			
NS	Crane	830	1180	100%	BL2	BOTH	Forest	0.2893	0.4			
NS	Crane	1180	1300	100%	BL3	BOTH	Forest	0.0992	0.4			
NS	Crane	1300	1525	50%	B11	LEFT	Forest	0.0930	0.4			
NS	Crane	1300	1575	50%	BL3	RIGHT	Forest	0.1136	0.4			
T11	Turbine			100%	B11		Forest	0.2835	0.4			
T1-4	Crane	100150	100250	100%	NONE	BOTH		0.0826	1			
T1-4	Crane	100250	100550	50%	RB3	RIGHT	Forest	0.1240	0.4			
T1-4	Crane	100250	100650	50%	NONE	LEFT		0.1653	1			
T1-4	Crane	100650	101250	50%	RB4	LEFT	Forest	0.2479	0.4			
T1-4	Crane	100550	101025	50%	NONE	right		0.1963	1			
T1-4	Crane	101025	101100	50%	RB5	RIGHT	Forest	0.0310	0.4			

T1-4	Crane	101100	101600	50%	BL15	RIGHT	Forest	0.2066	0.4		
T1-4	Crane	101600	102100	100%	BL17	BOTH	Forest	0.4132	0.4		
T1-4	Crane	102100	102500	100%	BL18	BOTH	Forest	0.3306	0.4		
T1-4	Crane	102500	102850	50%	BL19	RIGHT	Forest	0.1446	0.4		
T1-4	Crane	102500	102750	50%	BL19	LEFT	Forest	0.1033	0.4		
T1-4	Crane	102850	103200	50%	NONE	RIGHT		0.1446	1		
T1-4	Crane	102750	103000	50%	B2	LEFT		0.1033	0.4		
T2	Turbine			100%	B2		Forest	0.2835	0.4		
T1-4	Crane	103200	103700	50%	RB6	RIGHT	Forest	0.2066	0.4		
T1-4	Crane	103000	103575	50%	NONE	LEFT		0.2376	1		
T1-4	Crane	103700	103850	50%	BL20	RIGHT	Meadow	0.0620	0.4		
T1	Turbine			100%	B1		Forest	0.2835	0.4		
T1-4	Crane	103575	103700	50%	NONE	LEFT		0.0517	1		
T1-4	Crane	103700	104050	50%	BL27	LEFT	Forest	0.1446	0.4		
T1-4	Crane	104050	104235	50%	NONE	LEFT	Forest	0.0764	1		
T1-4	Crane	103850	104235	50%	B1	RIGHT	Forest	0.1591	0.4		
T5-6	Crane	500050	500450	100%	NONE	BOTH		0.3306	1		
T8	Turbine			50%	B8		Forest	0.1418	0.4		
T7	Crane	50000	50350	100%	BL8	BOTH	Forest	0.2893	0.4		
T7	Crane	50350	50500	50%	BL25	LEFT	Meadow	0.0620	0.4		
T7	Crane	50500	50900	50%	B7	LEFT	Forest	0.1653	0.4		
T7	Crane	50350	50900	50%	BL26	RIGHT	Forest	0.2273	0.4		
T7 STUB	Crane	100	250	100%	BL8	BOTH	Forest	0.1240	0.4		
T8-9 STUB A	Crane	200	300	100%	NONE	BOTH		0.0826	1		
T8-9 STUB B	Crane	200	300	100%	NONE	BOTH		0.0826	1		
MET TOWER 1	Met	0	250	100%	NONE	BOTH		0.0689	1		
MET TOWER 2	Met	0	195	100%	NONE	BOTH		0.0537	1		
Yellow Gate Rd	Improvements							0.1835	1		

Total Impervious **7.170** acres Total Pre Tx Phos **0.0000** lbs P/year Total Post Tx Phos **0.0000** lbs P/year

Project Name **Bull Hill** BA=Buffer Adjacent to Small Imp RB=Roadside buffer BRS=Roadside Buffer with Rock Sandwich
 Project Number **74490E** BL=Buffer w/level spreader DB=Detention basin
 Date **10/12/2010** DT=Buffer w/ditch turnout WP=Wet pond
 Done by **JAO** USF=Underdrain Soil Filter INF=Infiltration

QUALITY CALCULATIONS FOR LINEAR PORTION

Narraguagus Lake (T16 MD)

Phosphorous Requirement

Watershed per acre phosphorus budget (Appendix C): P 0.041 # P/acre/year Total ac of devel. parcel: TA 2.48 acres
 Small Watershed Threshold (Appendix C) SWT 54 acres NWI wetland acreage: WA acres
 Allowable increase in Town's share of annual phos (App C) FC 8.78 lbs P/year Steep slope acreage: SA acres
 Area avail. For development (App C) AAD 1075 acres Existing imp area (Pre 1980) EIA_B acres
 Project acreage: A = TA - (WA + SA + EIA_B + EIA_A) A 2.48 acres Existing imp area (post 1980) EIA_A acres
 A/AAD R 0.002

Project Phos Budget: PPB = P x A **PPB 0.102 lbs P/year**
 Project Phos Budget with small watershed adjustment: **PPB N/A lbs P/year**

Total Post Development Phos Export (lbs P/yr)= **0.0804** <= **0.1017** Access rd width(Const)= 24 Crane path width(Const)= 36
 % of Project Treated for WS= **100.00%** >= 75% Access rd width(Perm)= 24 Crane path width(Perm)= 36
 Total Impervious Area for WS= 0.11 Acres Turbine pad imp area(Perm)= 12350 sq ft Met Tower Rd width= 12

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	SIDE OF RD Tx RIGHT, LEFT BOTH	BMP cover Forest or Meadow	Imp. Area (acres)	Treatment Factor	Export Coefficient	Pre-Treatment lbs P/Year	Post Treatment lbs P/year
MET TOWER 1	Met	250	667	100%	BL35	BOTH	Forest	0.1149	0.4	1.75	0.2010	0.0804

Total Impervious **0.115** acres Total Pre Tx Phos **0.201033058** lbs P/year Total Post Tx Phos **0.0804132** lbs P/year

Project Name **Bull Hill** BA=Buffer Adjacent to Small Imp RB=Roadside buffer BRS=Roadside Buffer with Rock Sandwich
 Project Number **74490E** BL=Buffer w/level spreader DB=Detention basin
 Date **10/12/2010** DT=Buffer w/ditch turnout WP=Wet pond
 Done by **JAO** USF=Underdrain Soil Filter INF=Infiltration

QUALITY CALCULATIONS FOR LINEAR PORTION

Narraguagus River (T16 MD)

Phosphorous Requirement

Watershed per acre phosphorus budget (Appendix C): P N/A # P/acre/year Total ac of devel. parcel: TA acres
 Small Watershed Threshold (Appendix C) SWT acres NWI wetland acreage: WA acres
 Allowable increase in Town's share of annual phos (App C) FC lbs P/year Steep slope acreage: SA acres
 Area avail. For development (App C) AAD acres Existing imp area (Pre 1980) EIA_B acres
 Project acreage: A = TA - (WA + SA + EIA_B + EIA_A) A acres Existing imp area (post 1980) EIA_A acres
 A/AAD R

Project Phos Budget: PPB = P x A **PPB N/A lbs P/year**
 Project Phos Budget with small watershed adjustment: **PPB N/A lbs P/year**

Total Post Development Phos Export (lbs P/yr)= **0.0000** <= **N/A** Access rd width(Const)= **24** Crane path width(Const)= **36**
 % of Project Treated for WS= **76.29%** >= **75%** Access rd width(Perm)= **24** Crane path width(Perm)= **36**
 Total Impervious Area for WS= **13.38** Acres Turbine pad imp area(Perm)= **12350** sq ft Met Tower Rd width= **12**

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	SIDE OF RD T RIGHT, LEFT BOTH	BMP cover Forest Meadow	Imp. Area (acres)	Treatment Factor	Export Coefficient	Pre-Treatment lbs P/Year	Post Treatment lbs P/year
NS	Crane	1920	2210	100%	BL22	BOTH	Forest	0.2397	0.4			
NS	Crane	2210	2635	50%	BL5	RIGHT	Forest	0.1756	0.4			
NS	Crane	2210	2425	50%	B12	LEFT	Forest	0.0888	0.4			
NS	Crane	2425	2635	50%	BL5	LEFT	Forest	0.0868	0.4			
NS	Crane	2635	3000	50%	BL6	RIGHT	Forest	0.1508	0.4			
T12	Turbine			100%	B12		Forest	0.2835	0.4			
NS	Crane	2635	2975	50%	RB1	LEFT	Forest	0.1405	0.4			
T13	Turbine			50%	BL32		Forest	0.1418	0.4			
NS STUB 13	Crane	10000	10300	100%	BL32	BOTH	Forest	0.2479	0.4			
NS	Crane	2975	3000	50%	NONE	LEFT		0.0103	1			
NS	Crane	3000	3300	100%	NONE	BOTH		0.2479	1			
NS	Crane	3300	3610	50%	BL32	LEFT	Forest	0.1281	0.4			
NS	Crane	3300	3400	50%	NONE	RIGHT		0.0413	1			
NS	Crane	3400	3610	50%	BL32	RIGHT	Forest	0.0868	0.4			
NS	Crane	3610	4150	100%	BL7	BOTH	Forest	0.4463	0.4			
NS	Crane	4400	4725	100%	BL33	BOTH	Forest	0.2686	0.4			
NS	Crane	4725	5000	100%	BL9	BOTH	Forest	0.2273	0.4			
NS	Crane	5000	5200	100%	BL9	BOTH	Forest	0.1653	0.4			
NS	Crane	5200	5700	100%	BL10	BOTH	Forest	0.4132	0.4			
T16	Turbine			100%	B16		Forest	0.2835	0.4			
NS	Crane	5700	5950	50%	B16	LEFT		0.1033	0.4			
NS	Crane	5700	5950	50%	BL11	RIGHT	Forest	0.1033	0.4			

NS	Crane	5950	6200	100%	NONE	BOTH	Forest	0.2066	1			
NS	Crane	6200	6600	100%	NONE	BOTH		0.3306	1			
NS	Crane	6600	7350	50%	RB2	RIGHT	Forest	0.3099	0.4			
NS	Crane	6600	6850	50%	NONE	LEFT	Forest	0.1033	1			
NS	Crane	6850	7200	50%	BL12	LEFT	Forest	0.1446	0.4			
NS	Crane	7200	7500	50%	BL29	LEFT	Forest	0.1240	0.4			
NS	Crane	7350	7500	50%	BL29	RIGHT	Forest	0.0620	0.4			
T17	Turbine			100%	B17		Forest	0.2835	0.4			
T18	Turbine			100%	BL13		Forest	0.2835	0.4			
NS	Crane	7500	7700	50%	NONE	LEFT		0.0826	1			
NS	Crane	7700	8025	50%	BL13	LEFT	Forest	0.1343	0.4			
NS	Crane	7500	8025	50%	BL13	RIGHT	Forest	0.2169	0.4			
NS	Crane	8025	8425	50%	BL14	BOTH	Forest	0.1653	0.4			
NS	Crane	8425	8725	50%	BL36	LEFT	Forest	0.1240	0.4			
NS	Crane	8425	8800	50%	BL30	RIGHT	Forest	0.1550	0.4			
NS	Crane	8800	8815	50%	NONE	RIGHT		0.0062	1			
NS	Crane	8725	8815	50%	NONE	LEFT		0.0372	1			
T19	Turbine			100%	BL36		Forest	0.2835	0.4			
T1-4	Crane	101250	101600	50%	BL16	LEFT	Forest	0.1446	0.4			
T4	Turbine			100%	B4		Forest	0.2835	0.4			
T3	Turbine			100%	B3		Forest	0.2835	0.4			
T5-6	Crane	500450	500800	100%	NONE	BOTH		0.2893	1			
T5-6	Crane	500800	501025	50%	BL28	RIGHT	Forest	0.0930	0.4			
T5-6	Crane	500800	501025	50%	BL28	RIGHT	Forest	0.0930	0.4			
T5-6	Crane	501025	501400	50%	B5	RIGHT	Forest	0.1550	0.4			
T5	Turbine			100%	B5		Forest	0.2835	0.4			
T5-6	Crane	501025	502600	50%	NONE	LEFT		0.6508	1			
T5-6	Crane	501400	501550	50%	NONE	RIGHT		0.0620	1			
T5-6	Crane	501550	501800	50%	RB8	RIGHT	Forest	0.1033	0.4			
T5-6	Crane	501800	502525	50%	NONE	RIGHT		0.2996	1			
T5-6	Crane	502525	503100	50%	B6	RIGHT	Forest	0.2376	0.4			
T5-6	Crane	502600	503100	50%	BL23	LEFT	Forest	0.2066	0.4			
T6	Turbine			100%	B6		Forest	0.2835	0.4			
T8	Turbine			50%	B8		Forest	0.1418	0.4			
T8-9	Crane	100000	100275	50%	B8	LEFT	Forest	0.1136	0.4			
T8-9	Crane	100000	100175	50%	NONE	RIGHT		0.0723	1			
T8-9	Crane	100175	100400	50%	BL24	RIGHT	Forest	0.0930	0.4			
T8-9	Crane	100275	100400	50%	BL24	LEFT	Forest	0.0517	0.4			
T8-9	Crane	100400	100650	50%	BL24	LEFT	Forest	0.1033	0.4			
T8-9	Crane	100400	100650	50%	BL24	RIGHT	Forest	0.1033	0.4			
T8-9	Crane	100650	100850	50%	RB9	RIGHT	Forest	0.0826	0.4			
T8-9	Crane	100650	100850	50%	NONE	LEFT		0.0826	1			
T8-9	Crane	100850	101350	100%	BL31	BOTH	Forest	0.4132	0.4			
T8-9	Crane	101350	102240	50%	RB10	RIGHT	Forest	0.3678	0.4			
T8-9	Crane	101350	102570	50%	NONE	LEFT		0.5041	1			
T8-9	Crane	102240	102570	50%	NONE	RIGHT		0.1364	1			
T9	Turbine			100%	B9		Forest	0.2835	0.4			
MET TOWER 4	Met	0	70	50%	BL13	LEFT	Forest	0.0096	0.4			
MET TOWER 4	Met	0	70	50%	NONE	RIGHT		0.0096	1			
MET TOWER 4	Met	70	220	100%	BL34	BOTH	Forest	0.0413	0.4			
MET TOWER 4	Met	220	845	100%	RB11	BOTH	Forest	0.1722	0.4			

Total Impervious **13.38** acres Total Pre Tx Phos **0.0000** lbs P/year Total Post Tx Phos **0.0000** lbs P/year

Project Name **Bull Hill** BA=Buffer Adjacent to Small Imp RB=Roadside buffer BRS=Roadside Buffer with Rock Sandwich
 Project Number **74490E** BL=Buffer w/level spreader DB=Detention basin
 Date **6/23/2010** DT=Buffer w/ditch turnout WP=Wet pond
 Done by **JAO** USF=Underdrain Soil Filter INF=Infiltration

QUALITY CALCULATIONS FOR LINEAR PORTION

Spectacle Pond (T16 MD)

Phosphorous Requirement

Watershed per acre phosphorus budget (Appendix C): P 0.062 # P/acre/year Total ac of devel. parcel: TA 22.49 acres
 Small Watershed Threshold (Appendix C) SWT 24 acres NWI wetland acreage: WA acres
 Allowable increase in Town's share of annual phos (App C) FC 6.08 lbs P/year Steep slope acreage: SA acres
 Area avail. For development (App C) AAD 489 acres Existing imp area (Pre 1980) EIA_B acres
 Project acreage: A = TA - (WA + SA + EIA_B + EIA_A) A 22.49 acres Existing imp area (post 1980) EIA_A acres
 A/AAD R 0.046

Project Phos Budget: PPB = P x A **PPB 1.394 lbs P/year**
 Project Phos Budget with small watershed adjustment: **PPB N/A lbs P/year**

Total Post Development Phos Export (lbs P/yr)= **1.196** <= **1.3944** Access rd width(Const)= 24 Crane path width(Const)= 36
 % of Project Treated for WS= **69.30%** >= 75% Access rd width(Perm)= 24 Crane path width(Perm)= 30
 Total Impervious Area for WS= 1.21 Acres Turbine pad imp area(Perm)= 12350 sq ft Met Tower Rd width= 12

Roadway Alignment or Turbine Site	Access Crane Turbine	Station to Station		% of area	BMP No. (or none)	SIDE OF RD Tx RIGHT, LEFT BOTH	BMP cover Forest Meadow	Imp. Area (acres)	Treatment Factor	Export Coefficient	Pre-Treatment lbs P/Year	Post Treatment lbs P/year
T14	Turbine			100%	B14		Forest	0.2835	0.4	1.75	0.4962	0.1985
NS	Crane	4150	4250	50%	B14	LEFT	Forest	0.0344	0.4	1.75	0.0603	0.0241
NS	Crane	4150	4250	50%	NONE	RIGHT		0.0344	1	1.75	0.0603	0.0603
NS	Crane	4250	4400	100%	NONE	BOTH	Forest	0.1033	1	1.75	0.1808	0.1808
T15	Turbine			100%	B15		Forest	0.2835	0.4	1.75	0.4962	0.1985
NS	Crane	1575	1920	100%	BL4	BOTH	Forest	0.2376	0.3	1.75	0.4158	0.1247
T13	Turbine			50%	NONE			0.1418	1	1.75	0.2481	0.2481
MET TOWER 3	Met	0	335	100%	NONE	BOTH		0.0923	1	1.75	0.1615	0.1615

Total Impervious **1.211** acres Total Pre Tx Phos **2.119** lbs P/year Total Post Tx Phos **1.196** lbs P/year

Project Name **Bull Hill**
 Project Number **74490E**
 Date **10/12/2010**
 Done by **JAO**

RB=Roadside Buffer
 Imp=Impervious area
 Land=Landscaped Area

L=Length
 W=Width
 B=Buffer

REQUIRED BUFFER FLOW PATH LENGTHS
~BUFFER ADJACENT TO DOWN HILL SIDE OF ROAD~

# of Travel Ways to Buffer	Length of Flow Forest	Length of Flow Meadow
1	35	50
2	55	80

* Buffer slopes may not exceed 20%

** Buffers may not be located in a wetland

*** Roadside slopes may be included in a meadow buffer if the slope is less than 4:1 and if the soils allow infiltration

Graham Lake (TM)

BMP Type & #	Roadway Align. or Turbine Site	# of Travel Ways (1 or 2)	Buffer Type (Forest or Meadow)	Treatment Factor	Standard Buffer Length (ft)	Adjusted Buffer Length (ft)
RB3	T1-4	1	Forest	0.40	35	35
RB4	T1-4	1	Forest	0.40	35	35
RB5	T1-4	1	Forest	0.40	35	35
RB6	T1-4	1	Forest	0.40	35	35

Spectacle Pond (TM)

BMP Type & #	Roadway Align. or Turbine Site	# of Travel Ways (1 or 2)	Buffer Type (Forest or Meadow)	Treatment Factor	Standard Buffer Length (ft)	Adjusted Buffer Length (ft)

Narraguagus River (TM)

BMP Type & #	Roadway Align. or Turbine Site	# of Travel Ways (1 or 2)	Buffer Type (Forest or Meadow)	Treatment Factor	Standard Buffer Length (ft)	Adjusted Buffer Length (ft)
RB2	NS	1	Forest	0.40	35	35
RB8	T5-6	1	Forest	0.40	35	35
RB9	T8-9	1	Forest	0.40	35	35
RB10	T8-9	1	Forest	0.40	35	35

Project Name **Bull Hill**
 Project Number **74490E**
 Date **10/12/2010**
 Done by **JAO**

BL=Buffer with a Level Lip Sprear L=Length
 Imp=Impervious area W=Width
 Land=Landscaped Area B=Buffer
 C1=Loamy Sand or Sandy Loam C2=Silt Loam, Clay Loam or Silty Clay Loam

REQUIRED BUFFER FLOW PATH LENGTHS
~BUFFERS WITH LEVEL LIP SPREADERS~

0-8% Buffer Slope

9-15% Buffer Slope

Soils	Length of Flow Thru Buffer (ft)	Berm L for Forested Buffer(ft)		Berm L for Meadow Buffer(ft)	
		Per acre Imp	Per acre Land	Per acre Imp	Per acre Land
A	75	75	25	125	35
	100	65	20	75	25
	150	50	15	60	20
B	75	100	30	150	45
	100	80	25	100	30
	150	65	20	75	25
C1	75	125	35	150	45
	100	100	30	125	35
	150	75	25	100	30
C2	100	150	45	200	60
	150	100	30	150	45
D	150	150	45	200	60

Length of Flow Thru Buffer (ft)	Berm L for Forested Buffer(ft)		Berm L for Meadow Buffer(ft)	
	Per acre Imp	Per acre Land	Per acre Imp	Per acre Land
75	90	30	150	42
100	78	24	90	30
150	60	18	72	24
75	120	36	180	54
100	96	30	120	36
150	78	24	90	30
75	150	42	180	54
100	120	36	150	42
150	90	30	120	36
100	180	54	240	72
150	120	36	180	54
150	180	54	240	72

Graham Lake (TM)

from table from table

BMP Type & #	Roadway Align. or Turbine Site	Imp (acres)	Buffer Type (forest/meadow)	Treatment Factor	Soil Type	Buffer Slope	Standard Buffer Length (ft)	L of Berm per ac. imp	Standard Berm Length (ft)	Adjusted Buffer Length (ft)
BL1	NS	0.2504	Forest	0.4	C	6.0%	100	150	38	100
BL2	NS	0.2893	Forest	0.4	C	6.5%	100	150	43	100
BL3	NS	0.2128	Forest	0.4	C	7.0%	150	100	21	150
BL15	T1-4	0.2066	Forest	0.4	C	3.5%	100	150	31	100
BL17	T1-4	0.4132	Forest	0.4	C	10.5%	150	120	50	150
BL18	T1-4	0.3306	Forest	0.4	C	6.5%	100	150	50	100
BL19	T1-4	0.2479	Forest	0.4	C	6.0%	100	150	37	100
BL20	T1-4	0.0620	Meadow	0.4	C	6.0%	100	200	12	100
BL21	NS	0.0950	Forest	0.4	C	4.0%	100	150	14	100
BL25	T7	0.0620	Meadow	0.4	C	6.5%	100	200	12	100
BL26	T7	0.2273	Forest	0.4	C	4.0%	100	150	34	100
BL27	T1-4	0.1446	Forest	0.4	C	5.0%	100	150	22	100
BL8	T7	0.4132	Forest	0.4	C	4.0%	150	100	41	150

Project Name **Bull Hill**
 Project Number **74490E**
 Date **10/12/2010**
 Done by **JAO**

BA=Buffer Adjacent to Small Imp
 BL=Buffer w/level spreader
 DT=Buffer w/ditch turnout
 USF=Underdrain Soil Filter

RB=Roadside buffer
 DB=Detention basin
 WP=Wet pond
 INF=Infiltration

QUALITY CALCULATIONS FOR NON LINEAR PORTION

Total NEW NONLIN impervious area for project= 103341 sf = 2.37 acres
 Total NEW NONLIN landscaped area for project= 52138 sf = 1.20 acres
 Total NEW NONLINEAR area of project= 155479 sf = 3.57 acres

Subcatchment #	BMP Type & #	NONLinear Area		Description If Applicable
		Imp (sf)	Land (sf)	
1		68200	0	Substation
2	B27	8058	0	
3	B29	3417	18951	
4	B28	23666	14236	
TOTAL		103341	33187	

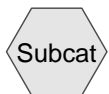
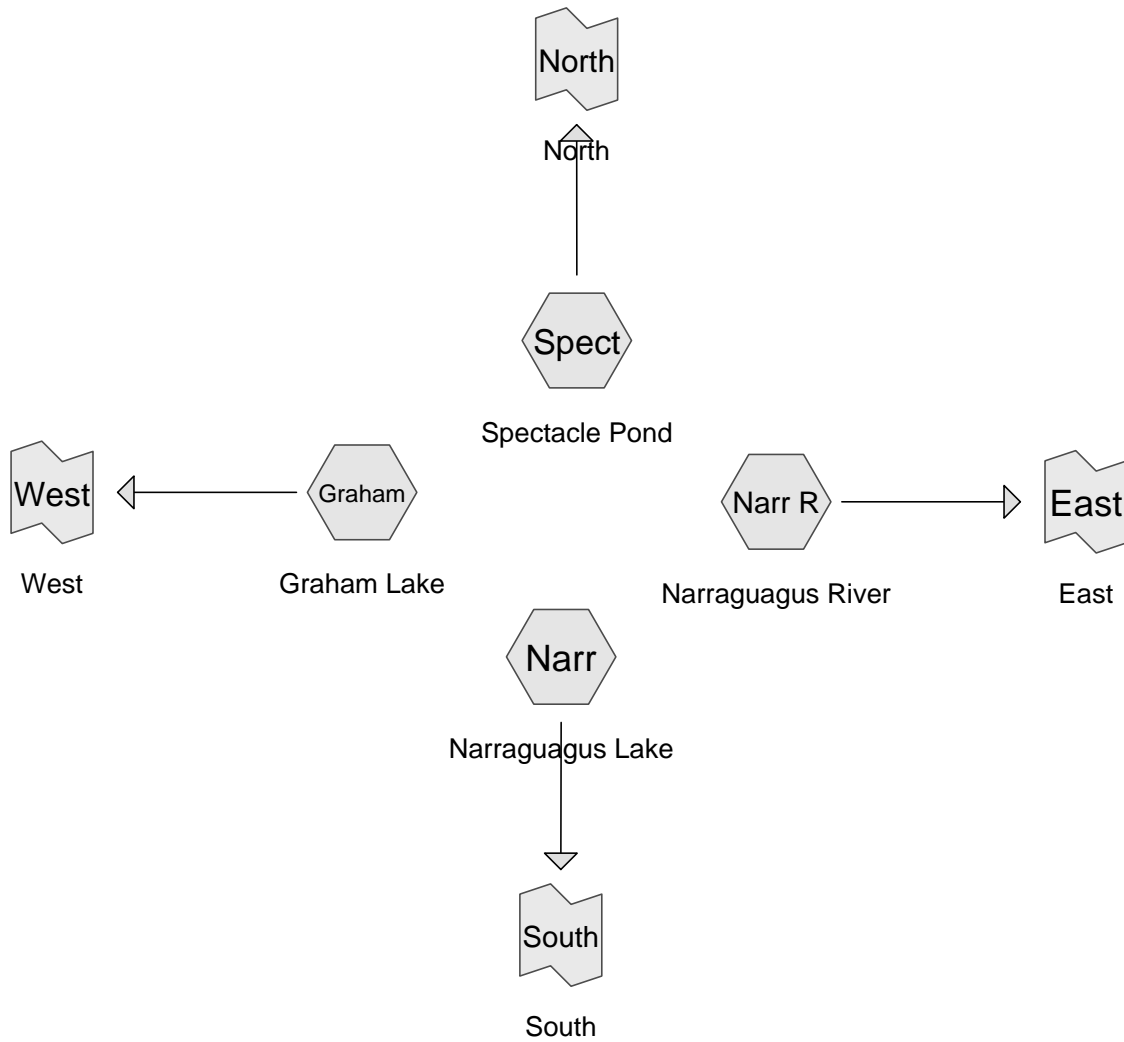
SUMMARY FOR THE NONLINEAR PORTION OF THE PROJECT

IMP Area Required area to be treated (sf)= 98173.95
Total NONLIN IMP Area Being Treated (sf)= 103341 100.0% >=95%
 DEVEL Area Required area to be treated (sf)= 124383.20
Total NONLIN DEVEL Area Being Treated (sf)= 136528 87.81% >=80%
 NONLinear Area Not Being Treated (sf)= 18951

Project Name **Bull Hill**
 Project Number **74490E**
 Date **11/12/2010**
 Done by **JAO**

Pre & Post Development Summary

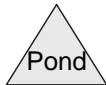
	Subcatchment		Flow (cfs) from Hydrocad		
	Property Line	#	2-year	10-year	25-year
PRE	North	Spectacle Pond	25.95	79.21	108.67
POST	North	Spectacle Pond	26.97	82.74	113.53
	CHANGE		1.02	3.53	4.86
	Percent Increase		3.93%	4.46%	4.47%
PRE	East	Narraguagus River	176.95	542.19	742.39
POST	East	Narraguagus River	176.95	542.19	742.39
	CHANGE		0.00	0.00	0.00
	Percent Increase		0.00%	0.00%	0.00%
PRE	South	Narraguagus Lake	31.52	94.98	130.12
POST	South	Narraguagus Lake	31.52	94.98	130.12
	CHANGE		0.00	0.00	0.00
	Percent Increase		0.00%	0.00%	0.00%
PRE	West	Graham Lake	108.51	330.51	453.61
POST	West	Graham Lake	108.51	330.51	453.61
	CHANGE		0.00	0.00	0.00
	Percent Increase		0.00%	0.00%	0.00%



Subcat



Reach



Pond



Link

Drainage Diagram for 2010-11-10 Pre Hydrology
 Prepared by James Sewall Co., Printed 11/15/2010
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Summary for Subcatchment Graham: Graham Lake

Runoff = 108.51 cfs @ 13.67 hrs, Volume= 29.952 af, Depth> 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2YR Rainfall=2.70"

Area (ac)	CN	Description
776.000	70	Woods, Good, HSG C
776.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
56.3	150	0.0200	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
24.7	1,788	0.0580	1.20		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.8	460	0.0170	0.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.8	736	0.0190	0.69		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
110.6	3,134	Total			

Summary for Subcatchment Narr: Narraguagus Lake

Runoff = 31.52 cfs @ 14.44 hrs, Volume= 10.513 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 2YR Rainfall=2.70"

Area (ac)	CN	Description
284.000	70	Woods, Good, HSG C
284.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.7	150	0.0070	0.03		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
25.8	1,248	0.0260	0.81		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	306	0.0460	1.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
43.4	2,637	0.0410	1.01		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
158.3	4,341	Total			

2010-11-10 Pre Hydrology

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Subcatchment Narr R: Narraguagus River

Runoff = 176.95 cfs @ 13.47 hrs, Volume= 45.041 af, Depth> 0.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 2YR Rainfall=2.70"

Area (ac)	CN	Description
1,155.000	70	Woods, Good, HSG C
1,155.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
66.9	150	0.0130	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
29.7	1,594	0.0320	0.89		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
96.6	1,744	Total			

2010-11-10 Pre Hydrology

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Subcatchment Spect: Spectacle Pond

Runoff = 25.95 cfs @ 13.62 hrs, Volume= 7.008 af, Depth> 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 2YR Rainfall=2.70"

Area (ac)	CN	Description
181.000	70	Woods, Good, HSG C
181.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
61.6	150	0.0160	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
22.6	1,268	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
22.3	1,100	0.0270	0.82		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
106.5	2,518	Total			

2010-11-10 Pre Hydrology

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Link East: East

Inflow Area = 1,155.000 ac, 0.00% Impervious, Inflow Depth > 0.47" for 2YR event
Inflow = 176.95 cfs @ 13.47 hrs, Volume= 45.041 af
Primary = 176.95 cfs @ 13.47 hrs, Volume= 45.041 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

2010-11-10 Pre Hydrology

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Link North: North

Inflow Area = 181.000 ac, 0.00% Impervious, Inflow Depth > 0.46" for 2YR event
Inflow = 25.95 cfs @ 13.62 hrs, Volume= 7.008 af
Primary = 25.95 cfs @ 13.62 hrs, Volume= 7.008 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link South: South

Inflow Area = 284.000 ac, 0.00% Impervious, Inflow Depth > 0.44" for 2YR event
Inflow = 31.52 cfs @ 14.44 hrs, Volume= 10.513 af
Primary = 31.52 cfs @ 14.44 hrs, Volume= 10.513 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

2010-11-10 Pre Hydrology

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Link West: West

Inflow Area = 776.000 ac, 0.00% Impervious, Inflow Depth > 0.46" for 2YR event
Inflow = 108.51 cfs @ 13.67 hrs, Volume= 29.952 af
Primary = 108.51 cfs @ 13.67 hrs, Volume= 29.952 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment Graham: Graham Lake

Runoff = 330.51 cfs @ 13.57 hrs, Volume= 82.315 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 10YR Rainfall=4.20"

Area (ac)	CN	Description
776.000	70	Woods, Good, HSG C
776.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
56.3	150	0.0200	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
24.7	1,788	0.0580	1.20		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.8	460	0.0170	0.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.8	736	0.0190	0.69		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
110.6	3,134	Total			

Summary for Subcatchment Narr: Narraguagus Lake

Runoff = 94.98 cfs @ 14.25 hrs, Volume= 29.151 af, Depth> 1.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 10YR Rainfall=4.20"

Area (ac)	CN	Description
284.000	70	Woods, Good, HSG C
284.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.7	150	0.0070	0.03		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
25.8	1,248	0.0260	0.81		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	306	0.0460	1.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
43.4	2,637	0.0410	1.01		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
158.3	4,341	Total			

2010-11-10 Pre Hydrology

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Type III 24-hr 10YR Rainfall=4.20"

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Summary for Subcatchment Narr R: Narraguagus River

Runoff = 542.19 cfs @ 13.38 hrs, Volume= 123.504 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 10YR Rainfall=4.20"

Area (ac)	CN	Description
1,155.000	70	Woods, Good, HSG C
1,155.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
66.9	150	0.0130	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
29.7	1,594	0.0320	0.89		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
96.6	1,744	Total			

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Type III 24-hr 10YR Rainfall=4.20"

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Summary for Subcatchment Spect: Spectacle Pond

Runoff = 79.21 cfs @ 13.50 hrs, Volume= 19.246 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 10YR Rainfall=4.20"

Area (ac)	CN	Description
181.000	70	Woods, Good, HSG C
181.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
61.6	150	0.0160	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
22.6	1,268	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
22.3	1,100	0.0270	0.82		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
106.5	2,518	Total			

Summary for Link East: East

Inflow Area = 1,155.000 ac, 0.00% Impervious, Inflow Depth > 1.28" for 10YR event

Inflow = 542.19 cfs @ 13.38 hrs, Volume= 123.504 af

Primary = 542.19 cfs @ 13.38 hrs, Volume= 123.504 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link North: North

Inflow Area = 181.000 ac, 0.00% Impervious, Inflow Depth > 1.28" for 10YR event
Inflow = 79.21 cfs @ 13.50 hrs, Volume= 19.246 af
Primary = 79.21 cfs @ 13.50 hrs, Volume= 19.246 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link South: South

Inflow Area = 284.000 ac, 0.00% Impervious, Inflow Depth > 1.23" for 10YR event
Inflow = 94.98 cfs @ 14.25 hrs, Volume= 29.151 af
Primary = 94.98 cfs @ 14.25 hrs, Volume= 29.151 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link West: West

Inflow Area = 776.000 ac, 0.00% Impervious, Inflow Depth > 1.27" for 10YR event
Inflow = 330.51 cfs @ 13.57 hrs, Volume= 82.315 af
Primary = 330.51 cfs @ 13.57 hrs, Volume= 82.315 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Subcatchment Graham: Graham Lake

Runoff = 453.61 cfs @ 13.52 hrs, Volume= 111.303 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25YR Rainfall=4.90"

Area (ac)	CN	Description
776.000	70	Woods, Good, HSG C
776.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
56.3	150	0.0200	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
24.7	1,788	0.0580	1.20		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.8	460	0.0170	0.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.8	736	0.0190	0.69		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
110.6	3,134	Total			

Summary for Subcatchment Narr: Narraguagus Lake

Runoff = 130.12 cfs @ 14.24 hrs, Volume= 39.500 af, Depth> 1.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type III 24-hr 25YR Rainfall=4.90"

Area (ac)	CN	Description
284.000	70	Woods, Good, HSG C
284.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.7	150	0.0070	0.03		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
25.8	1,248	0.0260	0.81		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	306	0.0460	1.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
43.4	2,637	0.0410	1.01		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
158.3	4,341	Total			

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Type III 24-hr 25YR Rainfall=4.90"

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Summary for Subcatchment Narr R: Narraguagus River

Runoff = 742.39 cfs @ 13.35 hrs, Volume= 166.908 af, Depth> 1.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 25YR Rainfall=4.90"

Area (ac)	CN	Description
1,155.000	70	Woods, Good, HSG C
1,155.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
66.9	150	0.0130	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
29.7	1,594	0.0320	0.89		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
96.6	1,744	Total			

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Type III 24-hr 25YR Rainfall=4.90"

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Summary for Subcatchment Spect: Spectacle Pond

Runoff = 108.67 cfs @ 13.47 hrs, Volume= 26.019 af, Depth> 1.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 25YR Rainfall=4.90"

Area (ac)	CN	Description
181.000	70	Woods, Good, HSG C
181.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
61.6	150	0.0160	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
22.6	1,268	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
22.3	1,100	0.0270	0.82		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
106.5	2,518	Total			

Summary for Link East: East

Inflow Area = 1,155.000 ac, 0.00% Impervious, Inflow Depth > 1.73" for 25YR event

Inflow = 742.39 cfs @ 13.35 hrs, Volume= 166.908 af

Primary = 742.39 cfs @ 13.35 hrs, Volume= 166.908 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link North: North

Inflow Area = 181.000 ac, 0.00% Impervious, Inflow Depth > 1.73" for 25YR event
Inflow = 108.67 cfs @ 13.47 hrs, Volume= 26.019 af
Primary = 108.67 cfs @ 13.47 hrs, Volume= 26.019 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link South: South

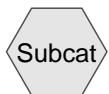
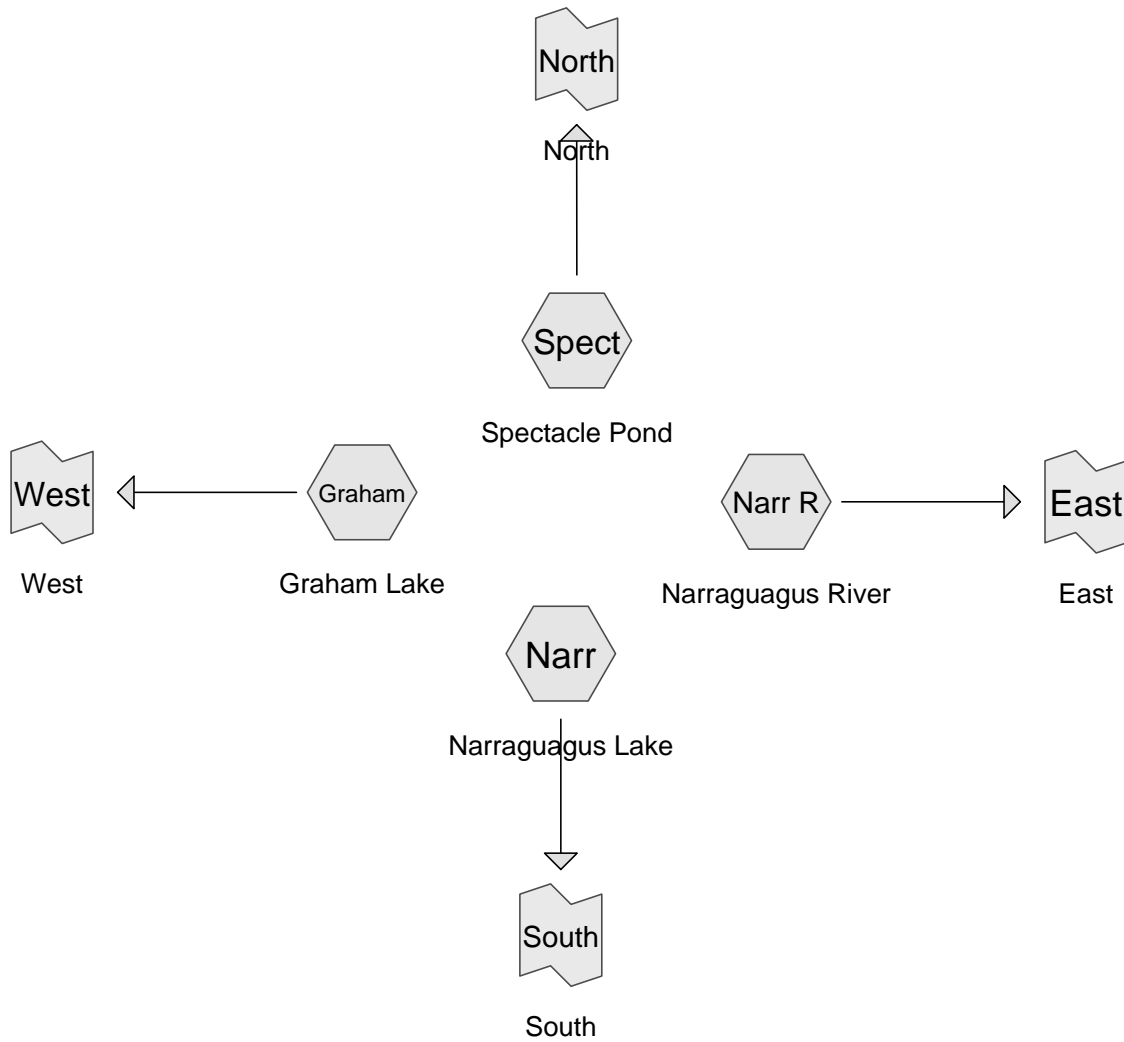
Inflow Area = 284.000 ac, 0.00% Impervious, Inflow Depth > 1.67" for 25YR event
Inflow = 130.12 cfs @ 14.24 hrs, Volume= 39.500 af
Primary = 130.12 cfs @ 14.24 hrs, Volume= 39.500 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link West: West

Inflow Area = 776.000 ac, 0.00% Impervious, Inflow Depth > 1.72" for 25YR event
Inflow = 453.61 cfs @ 13.52 hrs, Volume= 111.303 af
Primary = 453.61 cfs @ 13.52 hrs, Volume= 111.303 af, Atten= 0%, Lag= 0.0 min

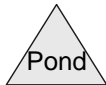
Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs



Subcat



Reach



Pond



Link

Drainage Diagram for 2010-11-10 Post Hydrology
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2010-11-10 Post Hydrology

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Subcatchment Graham: Graham Lake

Runoff = 108.51 cfs @ 13.67 hrs, Volume= 29.952 af, Depth> 0.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 2YR Rainfall=2.70"

Area (ac)	CN	Description
768.830	70	Woods, Good, HSG C
7.170	98	Paved parking, HSG C
776.000	70	Weighted Average
768.830		99.08% Pervious Area
7.170		0.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
56.3	150	0.0200	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
24.7	1,788	0.0580	1.20		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.8	460	0.0170	0.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.8	736	0.0190	0.69		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
110.6	3,134	Total			

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Subcatchment Narr: Narraguagus Lake

Runoff = 31.52 cfs @ 14.44 hrs, Volume= 10.513 af, Depth> 0.44"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 2YR Rainfall=2.70"

Area (ac)	CN	Description
283.890	70	Woods, Good, HSG C
0.110	98	Paved parking, HSG C
284.000	70	Weighted Average
283.890		99.96% Pervious Area
0.110		0.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.7	150	0.0070	0.03		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
25.8	1,248	0.0260	0.81		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	306	0.0460	1.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
43.4	2,637	0.0410	1.01		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
158.3	4,341	Total			

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Subcatchment Narr R: Narraguagus River

Runoff = 176.95 cfs @ 13.47 hrs, Volume= 45.041 af, Depth> 0.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 2YR Rainfall=2.70"

Area (ac)	CN	Description
1,141.620	70	Woods, Good, HSG C
13.380	98	Paved parking, HSG C
1,155.000	70	Weighted Average
1,141.620		98.84% Pervious Area
13.380		1.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
66.9	150	0.0130	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
29.7	1,594	0.0320	0.89		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
96.6	1,744	Total			

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Subcatchment Spect: Spectacle Pond

Runoff = 26.97 cfs @ 13.57 hrs, Volume= 7.034 af, Depth> 0.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2YR Rainfall=2.70"

Area (ac)	CN	Description
179.790	70	Woods, Good, HSG C
1.210	98	Paved parking, HSG C
181.000	70	Weighted Average
179.790		99.33% Pervious Area
1.210		0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.1	150	0.0530	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
0.2	42	0.0470	3.25		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.3	235	0.0330	11.39	91.13	Trap/Vee/Rect Channel Flow, Bot.W=0.00' D=2.00' Z= 2.0 '/' Top.W=8.00' n= 0.022 Earth, clean & straight
0.2	50	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
32.3	150	0.0800	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
30.3	1,930	0.0450	1.06		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
101.4	2,557	Total			

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Summary for Link East: East

Inflow Area = 1,155.000 ac, 1.16% Impervious, Inflow Depth > 0.47" for 2YR event
Inflow = 176.95 cfs @ 13.47 hrs, Volume= 45.041 af
Primary = 176.95 cfs @ 13.47 hrs, Volume= 45.041 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Link North: North

Inflow Area = 181.000 ac, 0.67% Impervious, Inflow Depth > 0.47" for 2YR event
Inflow = 26.97 cfs @ 13.57 hrs, Volume= 7.034 af
Primary = 26.97 cfs @ 13.57 hrs, Volume= 7.034 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Link South: South

Inflow Area = 284.000 ac, 0.04% Impervious, Inflow Depth > 0.44" for 2YR event
Inflow = 31.52 cfs @ 14.44 hrs, Volume= 10.513 af
Primary = 31.52 cfs @ 14.44 hrs, Volume= 10.513 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 2YR Rainfall=2.70"

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Summary for Link West: West

Inflow Area = 776.000 ac, 0.92% Impervious, Inflow Depth > 0.46" for 2YR event
Inflow = 108.51 cfs @ 13.67 hrs, Volume= 29.952 af
Primary = 108.51 cfs @ 13.67 hrs, Volume= 29.952 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 10YR Rainfall=4.20"

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Summary for Subcatchment Graham: Graham Lake

Runoff = 330.51 cfs @ 13.57 hrs, Volume= 82.315 af, Depth> 1.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 10YR Rainfall=4.20"

Area (ac)	CN	Description
768.830	70	Woods, Good, HSG C
7.170	98	Paved parking, HSG C
776.000	70	Weighted Average
768.830		99.08% Pervious Area
7.170		0.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
56.3	150	0.0200	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
24.7	1,788	0.0580	1.20		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.8	460	0.0170	0.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.8	736	0.0190	0.69		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
110.6	3,134	Total			

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Type III 24-hr 10YR Rainfall=4.20"

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Summary for Subcatchment Narr: Narraguagus Lake

Runoff = 94.98 cfs @ 14.25 hrs, Volume= 29.151 af, Depth> 1.23"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 10YR Rainfall=4.20"

Area (ac)	CN	Description
283.890	70	Woods, Good, HSG C
0.110	98	Paved parking, HSG C
284.000	70	Weighted Average
283.890		99.96% Pervious Area
0.110		0.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.7	150	0.0070	0.03		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
25.8	1,248	0.0260	0.81		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	306	0.0460	1.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
43.4	2,637	0.0410	1.01		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
158.3	4,341	Total			

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Type III 24-hr 10YR Rainfall=4.20"

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Summary for Subcatchment Narr R: Narraguagus River

Runoff = 542.19 cfs @ 13.38 hrs, Volume= 123.504 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 10YR Rainfall=4.20"

Area (ac)	CN	Description
1,141.620	70	Woods, Good, HSG C
13.380	98	Paved parking, HSG C
1,155.000	70	Weighted Average
1,141.620		98.84% Pervious Area
13.380		1.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
66.9	150	0.0130	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
29.7	1,594	0.0320	0.89		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
96.6	1,744	Total			

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Type III 24-hr 10YR Rainfall=4.20"

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Summary for Subcatchment Spect: Spectacle Pond

Runoff = 82.74 cfs @ 13.42 hrs, Volume= 19.302 af, Depth> 1.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 10YR Rainfall=4.20"

Area (ac)	CN	Description
179.790	70	Woods, Good, HSG C
1.210	98	Paved parking, HSG C
181.000	70	Weighted Average
179.790		99.33% Pervious Area
1.210		0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.1	150	0.0530	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
0.2	42	0.0470	3.25		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.3	235	0.0330	11.39	91.13	Trap/Vee/Rect Channel Flow, Bot.W=0.00' D=2.00' Z= 2.0 '/' Top.W=8.00' n= 0.022 Earth, clean & straight
0.2	50	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
32.3	150	0.0800	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
30.3	1,930	0.0450	1.06		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
101.4	2,557	Total			

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Type III 24-hr 10YR Rainfall=4.20"

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Summary for Link East: East

Inflow Area = 1,155.000 ac, 1.16% Impervious, Inflow Depth > 1.28" for 10YR event

Inflow = 542.19 cfs @ 13.38 hrs, Volume= 123.504 af

Primary = 542.19 cfs @ 13.38 hrs, Volume= 123.504 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link North: North

Inflow Area = 181.000 ac, 0.67% Impervious, Inflow Depth > 1.28" for 10YR event
Inflow = 82.74 cfs @ 13.42 hrs, Volume= 19.302 af
Primary = 82.74 cfs @ 13.42 hrs, Volume= 19.302 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link South: South

Inflow Area = 284.000 ac, 0.04% Impervious, Inflow Depth > 1.23" for 10YR event
Inflow = 94.98 cfs @ 14.25 hrs, Volume= 29.151 af
Primary = 94.98 cfs @ 14.25 hrs, Volume= 29.151 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 10YR Rainfall=4.20"

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Summary for Link West: West

Inflow Area = 776.000 ac, 0.92% Impervious, Inflow Depth > 1.27" for 10YR event
Inflow = 330.51 cfs @ 13.57 hrs, Volume= 82.315 af
Primary = 330.51 cfs @ 13.57 hrs, Volume= 82.315 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25YR Rainfall=4.90"

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Summary for Subcatchment Graham: Graham Lake

Runoff = 453.61 cfs @ 13.52 hrs, Volume= 111.303 af, Depth> 1.72"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 25YR Rainfall=4.90"

Area (ac)	CN	Description
768.830	70	Woods, Good, HSG C
7.170	98	Paved parking, HSG C
776.000	70	Weighted Average
768.830		99.08% Pervious Area
7.170		0.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
56.3	150	0.0200	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
24.7	1,788	0.0580	1.20		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
11.8	460	0.0170	0.65		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
17.8	736	0.0190	0.69		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
110.6	3,134	Total			

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Type III 24-hr 25YR Rainfall=4.90"

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Summary for Subcatchment Narr: Narraguagus Lake

Runoff = 130.12 cfs @ 14.24 hrs, Volume= 39.500 af, Depth> 1.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 25YR Rainfall=4.90"

Area (ac)	CN	Description
283.890	70	Woods, Good, HSG C
0.110	98	Paved parking, HSG C
284.000	70	Weighted Average
283.890		99.96% Pervious Area
0.110		0.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
85.7	150	0.0070	0.03		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
25.8	1,248	0.0260	0.81		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.4	306	0.0460	1.50		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
43.4	2,637	0.0410	1.01		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
158.3	4,341	Total			

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Type III 24-hr 25YR Rainfall=4.90"

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Summary for Subcatchment Narr R: Narraguagus River

Runoff = 742.39 cfs @ 13.35 hrs, Volume= 166.908 af, Depth> 1.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Type III 24-hr 25YR Rainfall=4.90"

Area (ac)	CN	Description
1,141.620	70	Woods, Good, HSG C
13.380	98	Paved parking, HSG C
1,155.000	70	Weighted Average
1,141.620		98.84% Pervious Area
13.380		1.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
66.9	150	0.0130	0.04		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
29.7	1,594	0.0320	0.89		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
96.6	1,744	Total			

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Type III 24-hr 25YR Rainfall=4.90"

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Summary for Subcatchment Spect: Spectacle Pond

Runoff = 113.53 cfs @ 13.41 hrs, Volume= 26.091 af, Depth> 1.73"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25YR Rainfall=4.90"

Area (ac)	CN	Description
179.790	70	Woods, Good, HSG C
1.210	98	Paved parking, HSG C
181.000	70	Weighted Average
179.790		99.33% Pervious Area
1.210		0.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
38.1	150	0.0530	0.07		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
0.2	42	0.0470	3.25		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
0.3	235	0.0330	11.39	91.13	Trap/Vee/Rect Channel Flow, Bot.W=0.00' D=2.00' Z= 2.0 '/' Top.W=8.00' n= 0.022 Earth, clean & straight
0.2	50	0.0100	5.26	6.46	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
32.3	150	0.0800	0.08		Sheet Flow, Woods: Dense underbrush n= 0.800 P2= 2.70"
30.3	1,930	0.0450	1.06		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
101.4	2,557	Total			

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Type III 24-hr 25YR Rainfall=4.90"

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Summary for Link East: East

Inflow Area = 1,155.000 ac, 1.16% Impervious, Inflow Depth > 1.73" for 25YR event

Inflow = 742.39 cfs @ 13.35 hrs, Volume= 166.908 af

Primary = 742.39 cfs @ 13.35 hrs, Volume= 166.908 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Link North: North

Inflow Area = 181.000 ac, 0.67% Impervious, Inflow Depth > 1.73" for 25YR event
Inflow = 113.53 cfs @ 13.41 hrs, Volume= 26.091 af
Primary = 113.53 cfs @ 13.41 hrs, Volume= 26.091 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25YR Rainfall=4.90"

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Summary for Link South: South

Inflow Area = 284.000 ac, 0.04% Impervious, Inflow Depth > 1.67" for 25YR event
Inflow = 130.12 cfs @ 14.24 hrs, Volume= 39.500 af
Primary = 130.12 cfs @ 14.24 hrs, Volume= 39.500 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

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Type III 24-hr 25YR Rainfall=4.90"

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Summary for Link West: West

Inflow Area = 776.000 ac, 0.92% Impervious, Inflow Depth > 1.72" for 25YR event
Inflow = 453.61 cfs @ 13.52 hrs, Volume= 111.303 af
Primary = 453.61 cfs @ 13.52 hrs, Volume= 111.303 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs