

Site Location of Development
TECHNICAL REVIEW MEMORANDUM
Bureau of Land and Water Quality

TO: **Donald Murphy, Project Manager, LURC**
FROM: **David A. Waddell -- Division of Watershed Management**
DATE: **May 5, 2011**
RE: **T16MD – Bull Hill Wind Project**

I have reviewed the additional information that was submitted by the applicant in response to my memo of 3/9/11. I have found that this response has addressed all of my concerns with this project at this time and that the project appears to meet the standards set forth in the Chapter 500 rules. I recommend approval of the project in its current form.

The following information may be useful to your process:

PLANS USED FOR REVIEW:

Pre-development: Plan Sheet C-701, "Pre Development Drainage Plan," dated 11/12/2010, revised 4/15/11.

Post-development: Plan Sheet C-702, "Post Development Drainage Plan," dated 11/12/2010, revised 4/15/11.

Erosion and Sediment Control Plans: Plan Sheets C-601 thru C-608, "Erosion Sedimentation Control Plan," dated 11/12/2010, revised 4/15/11.

Note: Other plans may have been reviewed that are not noted here.

STORMWATER MANAGEMENT

The applicant is proposing a 19 turbine windfarm on Bull Hill and Heifer Hill in T16MD and called Bull Hill Wind Project. This project lies within the watersheds of Narraguagus River, Narraguagus Lake, Spectacle Pond and Graham Lake. This proposed project will create 25.44 acres of developed area and 24.24 acres of impervious area. This project has been required to meet the "Stormwater Law" rules and as such must meet the Basic, General, and Flooding Standards. Under the General Standards the applicant is applying the phosphorus methodology to address impacts to Narraguagus Lake and Spectacle Pond. As such, the applicant is required to use the Phosphorous Methodology outlined in "Phosphorous Control in Lake Watersheds: A Technical Guide to Evaluating New Development" to assess the development.

This project is being reviewed under the 2006 Stormwater Management rules and the design and sizing of the proposed BMPs for this project are based on the "Stormwater Management for Maine" January 2006.

Stormwater quality treatment will be achieved with numerous buffers.

Stormwater flooding mitigation will be achieved with disconnected impervious area and lengthening of flow paths.

The following comments need to be addressed:

BASIC STANDARDS:

Note: *As always the applicant's erosion control plan is a good starting point for providing protection during construction. However, based on site and weather conditions during construction, additional erosion and sediment control measures may necessary to stop soil from leaving the site. In addition, other measures may be necessary for winter construction. All areas of instability and erosion must be repaired immediately during construction and need to be maintained until the site is fully stabilized or vegetation is established. Approval of this plan does not authorize discharges from the site.*

Proposed Condition: Due to the level of disturbance, steep slopes, and its close proximity to on site water resources, an independent third party site inspector reviewing erosion and sedimentation control is

suggested for this project. The applicant will retain the services of an approved site inspector to inspect the erosion and sedimentation controls on the site. Inspections shall consist of weekly visits to the site to inspect erosion and sedimentation controls from initial ground disturbance to final stabilization. If necessary, the inspecting engineer will interpret the erosion and sedimentation control plans and notes for the contractor. Once the site has reached final stabilization, the inspector will notify the department in writing within 14 days to state that the construction has been completed. Accompanying the engineer's notification must be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit.

Approval recommended for this section.

GENERAL STANDARDS

Non-linear Portion

Percent of Impervious Treated: 100% (95% required)
 Percent of Developed Treated: 86.12% (80% required)

Linear Portion

Percent of Impervious Treated: 76.54% (75% required)
 Percent of Developed Treated: 76.54% (50% required) **

** Due to the lack of landscaped and lawn area associated with the road system the developed area and the impervious area are the same.

Phosphorus to Spectacle Pond

Per Acre Phosphorus Budget (PAPB):	0.062	lbs / acre / yr
Project Acreage (eligible for allocation)(A):	22.49	acres
Project Phosphorus Budget (PPB):	1.394	lbs / yr

Total Phosphorous Mitigation Credit (SEC + STC):	0.00	lbs / yr
Total Pre-treatment Phosphorus Export (Pre-PPE):	2.589	lbs / yr
Total Post-treatment Phosphorous Export (Post-PPE):	1.372	lbs / yr

Project Phosphorus Export:	1.372	lbs / yr
Level of Control:	adequate	

Phosphorus to Narraguagas Lake

Per Acre Phosphorus Budget (PAPB):	0.041	lbs / acre / yr
Project Acreage (eligible for allocation)(A):	2.48	acres
Project Phosphorus Budget (PPB):	0.102	lbs / yr

Total Phosphorous Mitigation Credit (SEC + STC):	0.00	lbs / yr
Total Pre-treatment Phosphorus Export (Pre-PPE):	0.201	lbs / yr
Total Post-treatment Phosphorous Export (Post-PPE):	0.0804	lbs / yr

Project Phosphorus Export:	0.0804	lbs / yr
Level of Control:	adequate	

Approval recommended for this section.

Proposed Condition: The applicant will retain the services of a professional engineer to provide "as-built" plans that detail any portions of the project that significantly deviate from the approved plans. Any changes in layout, grading, stormwater system, impervious area, or other changes that affect the stormwater quality need to be located and addressed as to how these changes have been treated and

meet the general standard. Significant changes in the proposed project may trigger the need for an amendment of the approved department order. This requirement is for the portion of the project constructed as common property. The applicant's agent will notify the department in writing within 14 days of final acceptance of the project to state that the project has been completed. Accompanying the engineer's notification must be updated project plan sheets (if necessary), a report on the changes in treatment and how they meet standard (if necessary), and a copy of the Notice of Termination (NOT) for the project.

Proposed Condition: The applicant will retain the services of a professional engineer to inspect the construction and stabilization of the stone bermed level spreaders and ditch turnouts to be built on the site. Inspections shall consist of weekly visits to the site to inspect each level spreaders /turnout construction, stone berm material and placement, settling basin from initial ground disturbance to final stabilization of the level spreader. If necessary, the inspecting engineer will interpret the stone bermed level lip spreader's location and construction plan for the contractor. Once the stone bermed level lip spreaders are constructed and stabilized, the inspecting engineer will notify the department in writing within 14 days to state that the level lips have been completed. Accompanying the engineer's notification must be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, the items inspected on each visit, and include any testing data or sieve analysis data of the berm media.

FLOODING STANDARDS

The applicant has provided a Hydro-cad model that shows the project's impact on the weighted curve number of each watershed and the subsequent impact to peak flows for these watersheds for the 2,10, and 25 year, 24 hour storm. The evidence shows that the weighted curve number for each sub watershed changes little. In addition the model does not take into consideration that flow on the proposed site is dispersed through natural buffers in sheet flow for 86% of the new roads. This lengthens the time of concentration for all of the watersheds while reducing the peak flow at the property boundary. For this project the model indicates that the project meets the flooding standard requirement of maintaining the preconstruction peak flows for the 2, 10, and 25 year, 24 hour storm at the property boundary.

Approval recommended for this section.

E-mail From: Richard Bard
Mon 5/9/2011 10:08 AM
To: Don Murphy, LURC Project Planner
CC: Steve Timpano, IF&W

RE: Applicant Response to IF&W Review Comments - T16MD Bull Hill Wind Project DP#4886

Don,

MDIFW offers the following comments on First Wind's response to our earlier comments about the Blue Sky East Wind Project. We are still working on some vernal pool issues, but I believe this completes our comments on all other issues at this time.

Draft Post-Construction Monitoring Plan

First Wind challenged the recommended mortality search schedule proposed by Tom Hodgman, primarily on the grounds that they prefer to finalize the plan after permits are issued and before construction begins. While we agree with the concepts of adaptive management, MDIFW would prefer to have an acceptable plan in place before any permits are issued, with the understanding that modifications can be made as new information becomes available.

Exhibit G of the response states that "First Wind intends to conduct continuous monitoring from April 15 to October 30," but the table that follows leaves gaps in May and September, two time periods that MDIFW considers critical to understanding the impacts on birds and bats. MDIFW stands by our recommendation for weekly mortality searches at all turbines on the following schedule: April 15 – June 7 and July 7 to October 15. This schedule provides the same number of weeks of coverage as First Wind's proposed schedule, but makes more biological sense by covering all of the periods of likely high bird and bat activity.

Operation Control Measures (Curtailment)

First Wind proposes to monitor bat mortality for one to two years before deciding whether curtailment (i.e. increased cut-in speed) is warranted for Blue Sky East. In Exhibit G the developer cited the low numbers of bats detected in pre-construction radar studies compared with similar projects in Maine, and concludes that there is not adequate cause to take pro-active measures to prevent bat mortality.

Stantec acknowledges that bat acoustic studies provide overall bat species composition and bat activity data, but to date, a statistical relationship between pre-construction acoustic bat activity data and post-construction mortality has not been quantified.

Estimates of post-construction mortality for bats provide estimates of mortality that are likely lower than actual mortality. Because of the uncertainty in detection rates due to inherent problems with searcher efficiency and carcass persistence, bat mortality estimates have potentially significant error. Therefore drawing conclusions regarding impact of mortality is difficult, if not inappropriate. Given these uncertainties as well as our concern for declining populations of *Myotis* species, MDIFW prefers to apply the

best available methods accepted by the scientific community. Arnett et al. (2010) showed that a turbine cut-in speed of 5 meters per second significantly reduced bat mortality. Studies cited in MDIFW's comments dated March 10, 2011 show that increased cut-in speed reduces bat mortality on nights with low wind velocity.

Additionally, White-nose Syndrome (WNS) has caused precipitous declines in bat populations in the Northeast over the past several years. Bats in the genus *Myotis* have been particularly hard hit, prompting the US Fish and Wildlife Service (USFWS) to determine that listing northern long-eared bats (*Myotis septentrionalis*) and eastern small-footed bats (*Myotis leibii*) under the Endangered Species Act is warranted. The USFWS is also considering an emergency listing of little brown bats (*Myotis lucifugus*) to the Endangered Species list. Models predict that the little brown bat may face extinction by 2026 if current trends continue (Frisk et al. 2010). *Myotis* calls represent up to 50% of the calls identified in First Wind's 2009 Acoustic Bat Survey. Wind power projects throughout Maine have recorded bat sequences at acoustic detectors from April 20th through October 15th. The curtailment measures MDIFW are recommending will help minimize impact of the project to bat species.

Based on peer-reviewed analyses of the efficacy of operational curtailment and the imminent threat of WNS, MDIFW believes that pro-active avoidance of preventable bat mortality is warranted immediately, rather than one to two years of mortality study

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*APPLICANT RESPONSE (ITALICS) TO IFW VERNAL POOL EMAIL COMMENTS
OF MAY 12, 2011
MAY 16, 2011*

From: Bard, Richard
Sent: Thursday, May 12, 2011 12:48 PM
To: Murphy, Donald
Cc: Timpano, Steve
Subject: FW: Applicant Response to IF&W Review Comments - T16MD Bull Hill Wind Project DP#4886

Don,

Here are MDIFW's comments on vernal pool studies and potential impacts. I apologize for the late submission of these comments; however, we still have not received all of the information we need to fully assess the potential impacts to vernal pools from this project. For example, on March 8, I requested a breakdown of pre- and post-construction impacts to the vernal pool buffers on all potentially Significant vernal pools. On April 22, I repeated that request. On May 4, we received a table that was incomplete. Our Reptile, Amphibian and Invertebrate (RAI) Group has been in direct contact with Stantec to try to get final answers to this and several other questions that remain outstanding, as detailed below in Section I. Section II and III contain our comments and recommendations based on the information we have been provided to date. Some of these concerns will likely be assuaged when the missing information in Section I is delivered. We remain willing to work with the applicant to ensure that the potential impacts to vernal pools are understood, and avoided or minimized to the greatest extent possible.

RESPONSE:

As noted in the March 18 response to IFW's inquiry regarding vernal pools, no calculation of pre and post construction impacts was done because there is no new clearing in the Significant Vernal Pool (SVP) buffers. Since there is no new clearing, it seemed unnecessary to undertake such a calculation. Nonetheless, because IFW requested the calculation, it was completed for the significant vernal pools known at the time, and provided to IFW. Since that time, IFW has made additional comments and requested additional data of a type not previously requested or submitted, i.e., forms for potential vernal pools and forms for man-made pools. As explained below, that information is included herewith.

I. Additional Information Needed to Complete Our Review:

- 1) Submit completed State of Maine Vernal Pool Assessment Forms (including habitat photos) for:
 - a. all unnatural pools meeting egg mass criteria (03MG-M, 20MG-M, 17/39CF-M, 05BE-M, 11BE-M)
 - b. all natural pools identified as Potential Vernal Pools (01DK-N, 03DK-N, 04DK-N, 01BB-N)

RESPONSE:

Maine, by statute and both DEP and IFW rule, regulates only natural vernal pools, so forms are not typically completed for all man-made pools. Nevertheless, forms have been completed for the pools noted in 1(a) above, and are included with this submission.

Forms are also not prepared for potential vernal pools (PVPs) because they are only a possible vernal pool location that is identified out of season, but are treated for planning purposes as if they are SVPs. There is no biological data for these locations, which may be no more than a depression

with stained leaves indicating seasonal saturation. The locations of the four PVPs noted in 1(b) above were recently visited just prior to receiving these comments from IFW. The PVP labeled 01BB-N had no egg masses, standing water, or other indicators, and no form was prepared. The PVPs labeled 02DK-N and 04DK-N had egg masses and forms are attached. The pool labeled 01DK-N is the pool noted in the Stantec communication of March 18 that was assumed to be significant, and resulted in the road being redesigned. This pool met actual significance levels; a vernal pool form is attached.

2) Clarify project activities within 250' of all pools identified as SVP or PVP:

- a. Confirm that all roads depicted within a SVP (Significant Vernal Pool) or PVP (Potential Vernal Pool) habitat (250' zone) are existing roads, and that no new roads are proposed. (There is no legend for symbology provided on the Delineated Natural Resource Maps to allow MDIFW to make this determination with certainty.) Note that upland habitat zones were not depicted on the maps for PVPs 01bb, 03dk, and 04dk.

RESPONSE:

All project roads within an SVP habitat are existing roads. There are no longer any PVP's present within the project area.

- b. Confirm that there will be no additional upgrading or clearing to improve or widen existing roads, road shoulders, deforested verge areas, or transmission corridors within a SVP or PVP habitat (see above comment in "a")

RESPONSE:

There will be no additional clearing to improve the roads or transmission corridors in SVP depressions or their surrounding critical habitat. Regular road maintenance within the existing cleared foot print will be done, as it is now.

3) Vernal Pool Impact Analysis:

- a. Confirm that existing and proposed percent clearing/impacts were calculated by including all permanent, non-forested project footprints (e.g., clearings, roads, including cleared shoulders/verges). The footprint of all existing forestry roads (including verges) that will be used to access and maintain the industrial wind facility should be included in the calculation of percent post-construction impacts.

RESPONSE:

As noted previously, there is no additional clearing or impact in SVP depressions or their surrounding critical habitats. Percent impact was calculated using the cleared area, whether road surface, verge or shoulder.

- b. Include an impact analysis for all PVPs identified in the project area (01dk, 03dk, 04dk, 01bb)

RESPONSE:

01DK-N has zero impact pre-construction, and zero impact post-construction.

03 DK-N exhibited no amphibian breeding activity and is therefore not a functioning vernal pool.

04 DK-N is outside the project area and more than 1,000 feet from the nearest project clearing. No impact calculations are provided.

01BB-N was not a vernal pool, so no calculations are provided.

4) Boundary Buffer Surveys:

Without additional information from the applicant, MDIFW is unable to complete its review of potential project impacts to vernal pools or other wildlife resources. As currently defined, the project boundary does not sufficiently buffer the outside edge of existing or proposed development impacts to ensure that all resources of concern within 250' of a project activity are considered in the review.

RESPONSE:

All areas within 250 feet of any project clearing were surveyed subsequently to receiving this comment verbally from IFW. Three man-made vernal pools and one natural pool were identified (see attached figures 1, 3, and 4). None met the level of significance. The vernal pool form for the natural pool is attached.

II. Applicant Language Characterizing Overall Project Impacts to Amphibian and Reptile Habitat:

1) The applicant understates the value of the project area for vernal pool wildlife and does not accurately portray post-construction impacts to SVPs. Specifically:

- a. Exhibit 13A, page 5, Section 4.1, next to last paragraph: the applicant states that blue-spotted and spotted salamanders are less likely to occur in the project area and thus be impacted by construction, yet spotted salamander egg masses were present in 44 of the 54 pools listed in Table C-3, and one pool with high numbers of blue-spotted salamander egg masses was also identified.

RESPONSE:

This response is based on initial observations of the project area. While noted as less likely to occur, they do occur within the project area as should be expected. The intent of the observation was not to suggest a lack of species presence. Avoidance and minimization has resulted in no direct impact to any SVP depression or the surrounding critical habitat.

- b. Exhibit 13A, page 7, Section 4.4, last sentence: the applicant states “no vernal pools ..are impacted by this project”. A minimum of 55 vernal pools were identified within the project area. These include at least 7 SVPs and 4 PVPs, of which several have some project impacts occurring within the 250' upland habitat zone. The percent proposed impact for each SVP/PVP was not calculated to take into account the change in land-use from strictly forestry (generally a temporary land-use and exempt from MDIFW vernal pool regulatory concerns) to development (long-term wind power infrastructure construction and maintenance) use of project area facility roads.

RESPONSE:

The roads where power from the project will be placed are not temporary forest roads. They are permanent haul roads, used for forestry and recreation since at least 1957. Although the roads will be used for an additional purpose, there is not a change in use that will result in any environmental impact, and therefore we do not believe that there is any policy, regulatory or environmental basis for assigning impacts that have been in place for many years to an applicant who uses those existing roads. Indeed, doing so runs counter to the long-standing policy of encouraging (indeed sometimes requiring) applicants to utilize existing roads and other infrastructure to minimize the overall project footprint.

- c. Exhibit 13A, page 8, Section 5.1, “Reptiles and Amphibians”: the applicant states there is “minimal breeding habitat available for amphibians in the project area”....”therefore, disturbances incurred from project construction are not expected to result in undue or adverse impacts to local populations.” See above comment in “b”.

III. Specific Comments and Recommendations for Minimizing and Compensating Potential Impacts:

1. All roads and forest clearing within a SVP or PVP habitat should be kept to the minimum extent possible. A road shoulder maintenance plan should be developed with the goal of maintaining dominant canopy trees in close proximity to road segments bisecting SVP and PVP habitat thus increasing road permeability to amphibian migrations.

RESPONSE:

We agree and, as previously stated, there is no new road construction or forest clearing within SVP depressions or their surrounding critical habitat.

2. MDIFW recommends that any existing roads bisecting SVP or PVP habitat (e.g., 11MG, 12MG, 9MG, 8MG on Map 3; SVP34CF on Map 4) that are not integral to the proposed wind facility infrastructure, and will no longer serve a forest management need, be closed/discontinued and allowed to revegetate to mature forest. If the current condition of these roads is not conducive to natural revegetation (e.g., wide cleared path, hard-packed surface, etc), the applicant should advance succession by softening/degrading the road surface and replanting with locally native tree species on 8ft x 8ft spacing. These plantings should be monitored for survival (ensuring a 75% survival rate of seedlings over a 5 year period) in order to facilitate recovery of a forested critical terrestrial life zone.

RESPONSE:

There are no impacts proposed to any SVP depression, their surrounding critical habitat, or wetland impact associated with this project. The existing roads are forestry roads under the control of the landowner. In a zero impact project, there is no legal basis to require mitigation and, as noted above, IFW’s recommendation creates a disincentive to minimize a project footprint through use of using existing roads.

3. SVP 34CF: Post-project percent impact (39%) exceeds the 25% non-forested threshold for protecting significant vernal pools within the 250’ upland habitat zone. If the additional 14% impact can not be avoided or further minimized, MDIFW recommends project compensation for Significant Wildlife Habitat impacts.

RESPONSE:

The 39% impact to the 250-foot upland habitat zone is an existing impact and is not an impact associated with the project. As noted above, the applicant’s use of the existing road does not involve any new clearing or disturbance and, importantly, does not result in a loss of functions or values of the resource. Therefore, we do not believe there is a regulatory, policy or environmental basis for requesting mitigation for the pre-existing impacts. Moreover, doing so would create a perverse incentive for applicants to construct new roads with attendant clearing and other potential habitat impacts, instead of using existing roads.

Bull Hill SVP Impacts
195600500
4/28/2011

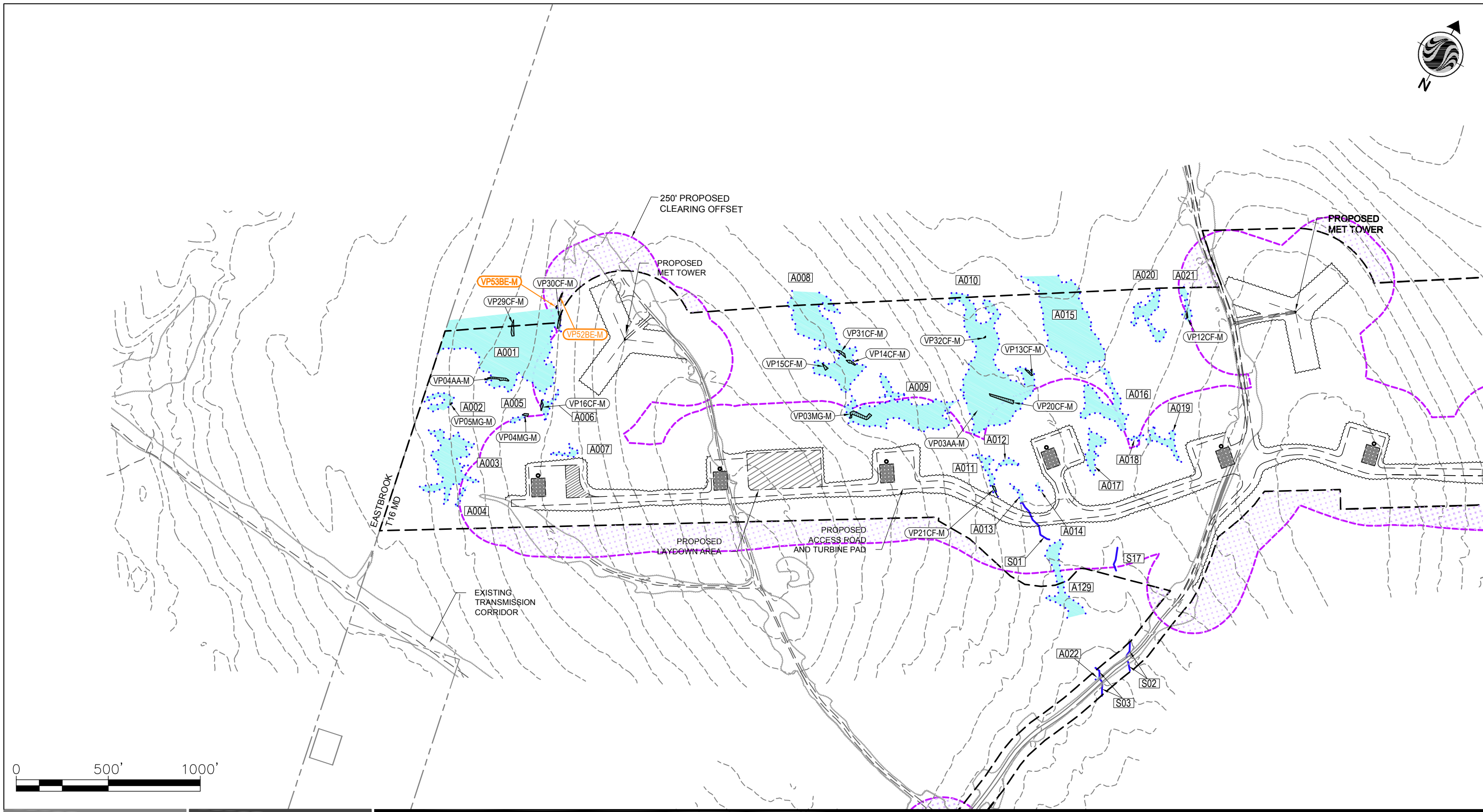
Note: 6 of the 7 habitat buffers overlap. Calculated impacts for each pool individually. Therefore double dippi

Vernal Pool Habitat Buffer Impacts (250')

Type	PoolID	Habitat (sqft)	Eclearing (sqft)	Pclearing (sqft)	25% of Habitat
SVP	02be	229,130.91	27,382.15	-	57,282.73
SVP	35cf	318,464.73	74,860.89	-	79,616.18
SVP	34cf	275,202.53	106,904.23	-	68,800.63
SVP	09mg	282,782.69	18,302.26	-	70,695.67
SVP	11mg	266,536.20	39,238.99	-	66,634.05
SVP	12mg	280,525.08	12,217.64	-	70,131.27
SVP	08mg	255,525.12	13,614.95	-	63,881.28

ng does occur.

Exceeds Threshold (Y/N)	Final % Impact	%Existing Clearing	% Proposed Clearing	-
N		12	12	-
N		24	24	-
Y		39	39	-
N		6	6	-
N		15	15	-
N		4	4	-
N		5	5	-



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Legend

	Stream identified by Stantec
	Project/Delineation limits
	Wetland identified by Stantec
	Vernal pool identified by Stantec
	Significant vernal pool identified by Stantec

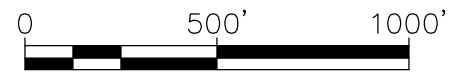
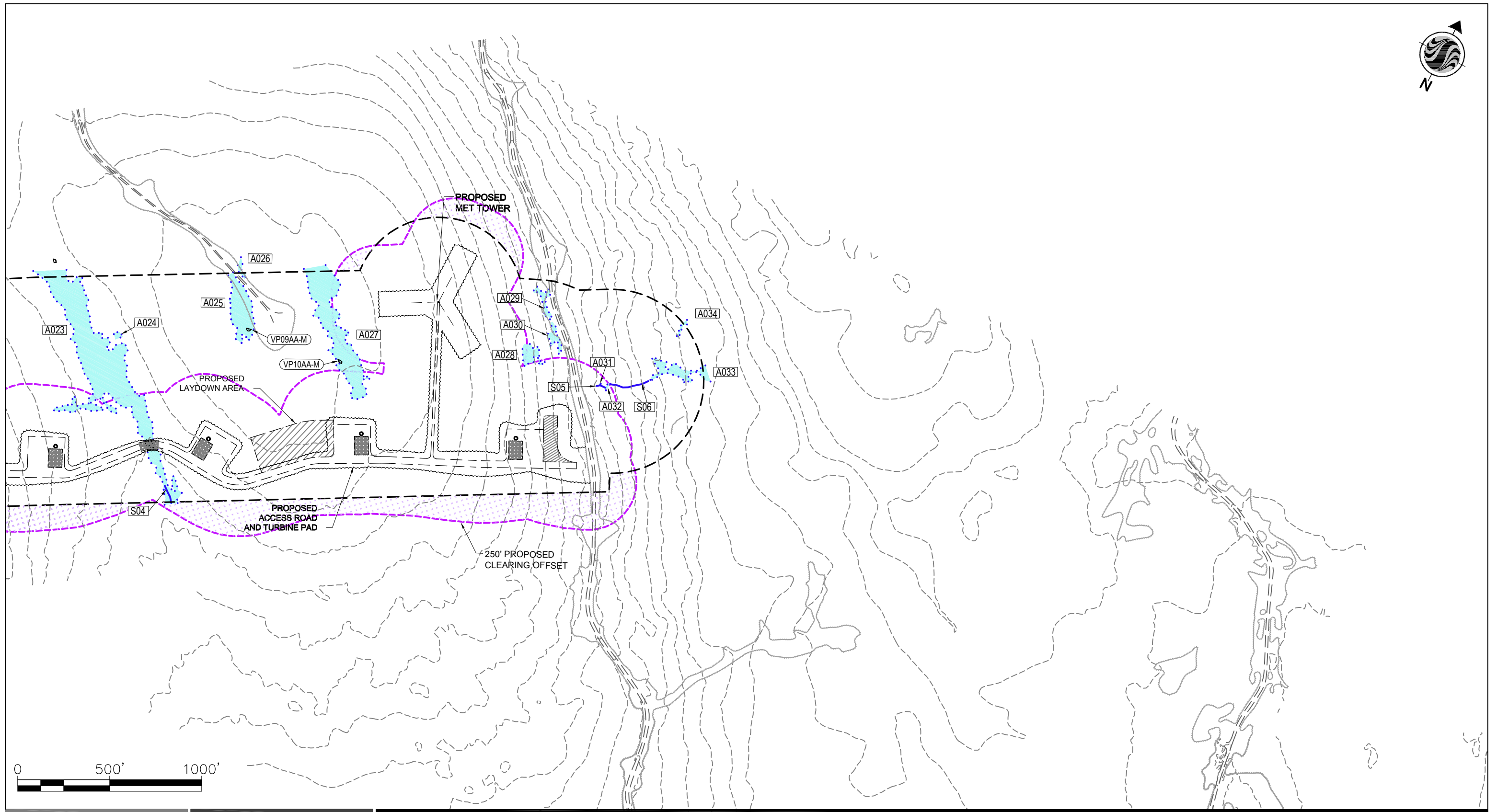
A001	Resource identification
VP01MA-N	Natural vernal pool identification
VP02MA-M	Man-made vernal pool identification
SVP01DD-N	Significant vernal pool identification
PVP01BB-N	Potential vernal pool identification

Notes

1. Wetland boundaries delineated in accordance with USACE 1987 Wetland Delineation Manual or subsequent versions. Vernal pools surveyed in accordance with Maine Association of Wetland Scientists 2010 Interim Vernal Pool Survey Protocol, April 2010.
2. Wetland and vernal pool boundaries were located utilizing a Trimble PRO Series Receiver. Expected accuracy of GPS data is within 1 to 2 meters of actual position.
3. Basemap features comprised of photogrammetry obtained from James W. Sewell Company.
4. Civil Design provided by James W. Sewell Company dated 11/15/2010.

Client/Project
Blue Sky East Wind, LLC
 Bull Hill
 Eastbrook and T16MD, Maine
 Figure No.
1
 Title
Delineated Natural Resource Map
 December 2010
 rev. May 9, 2011

195600500



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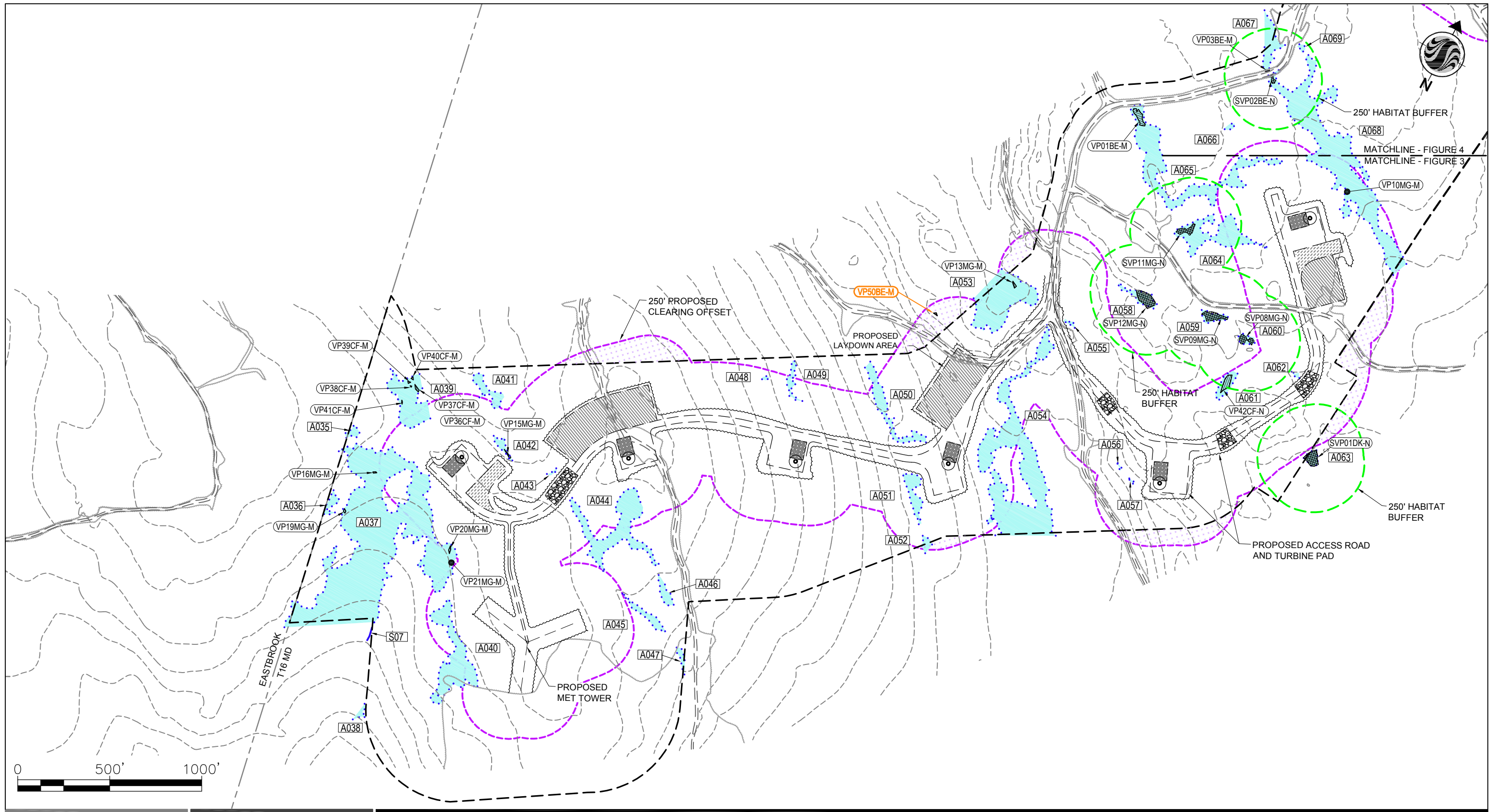
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Blue Sky East Wind, LLC
 Bull Hill
 Eastbrook and T16MD, Maine
 Figure No.
2
 Title
Delineated Natural Resource Map
 December 2010
 rev. May 9, 2011

195600500



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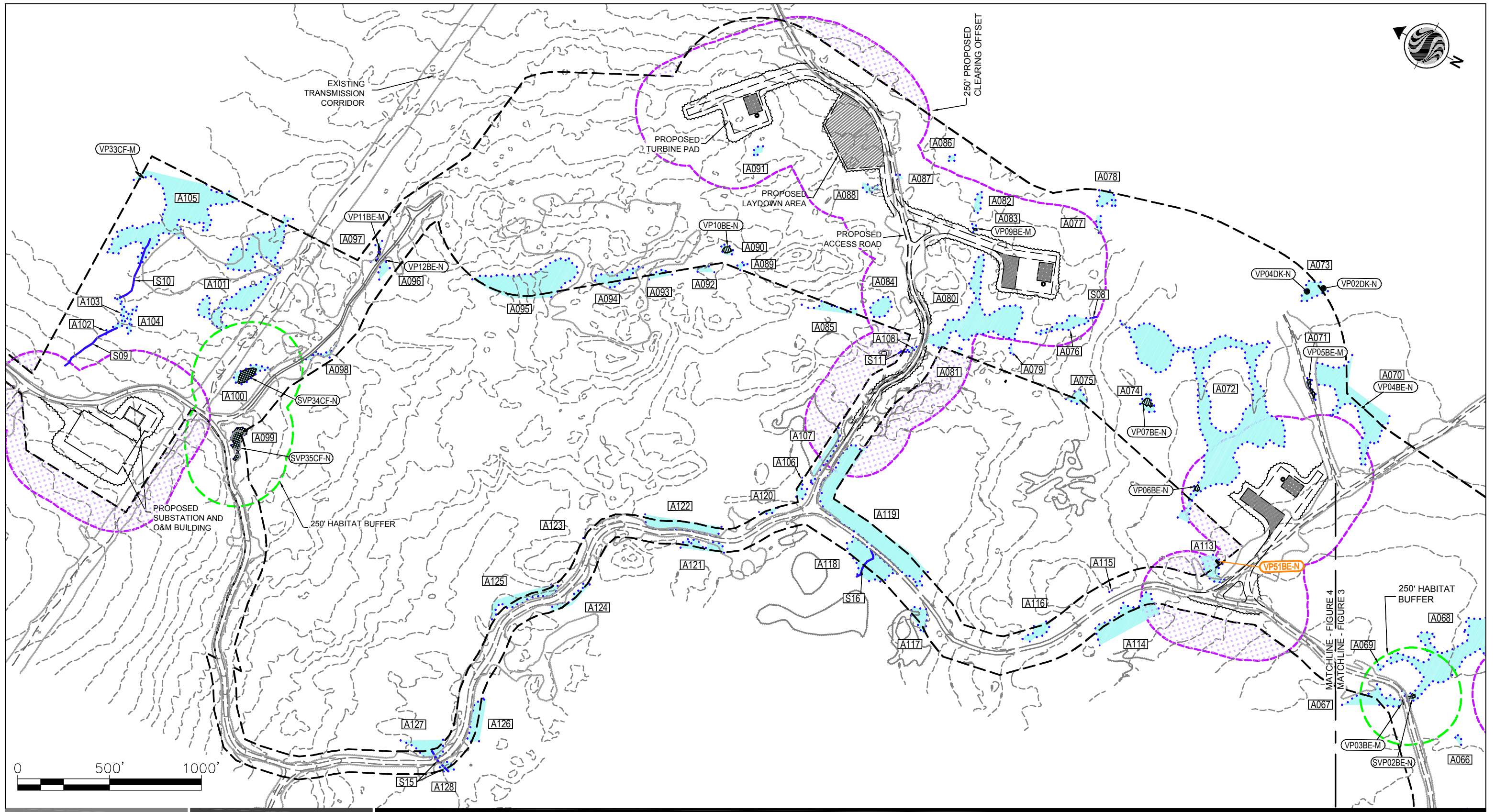
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 Bull Hill
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3
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Delineated Natural Resource Map
 December 2010
 rev. May 9, 2011

195600500



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Legend

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- Project/Delineation limits
- Wetland identified by Stantec
- Vernal pool identified by Stantec
- Significant vernal pool identified by Stantec

- [A001]** Resource identification
- [VP01MA-N]** Natural vernal pool identification
- [VP02MA-M]** Man-made vernal pool identification
- [SVP01DD-N]** Significant vernal pool identification
- [PVP01BB-N]** Potential vernal pool identification

Notes

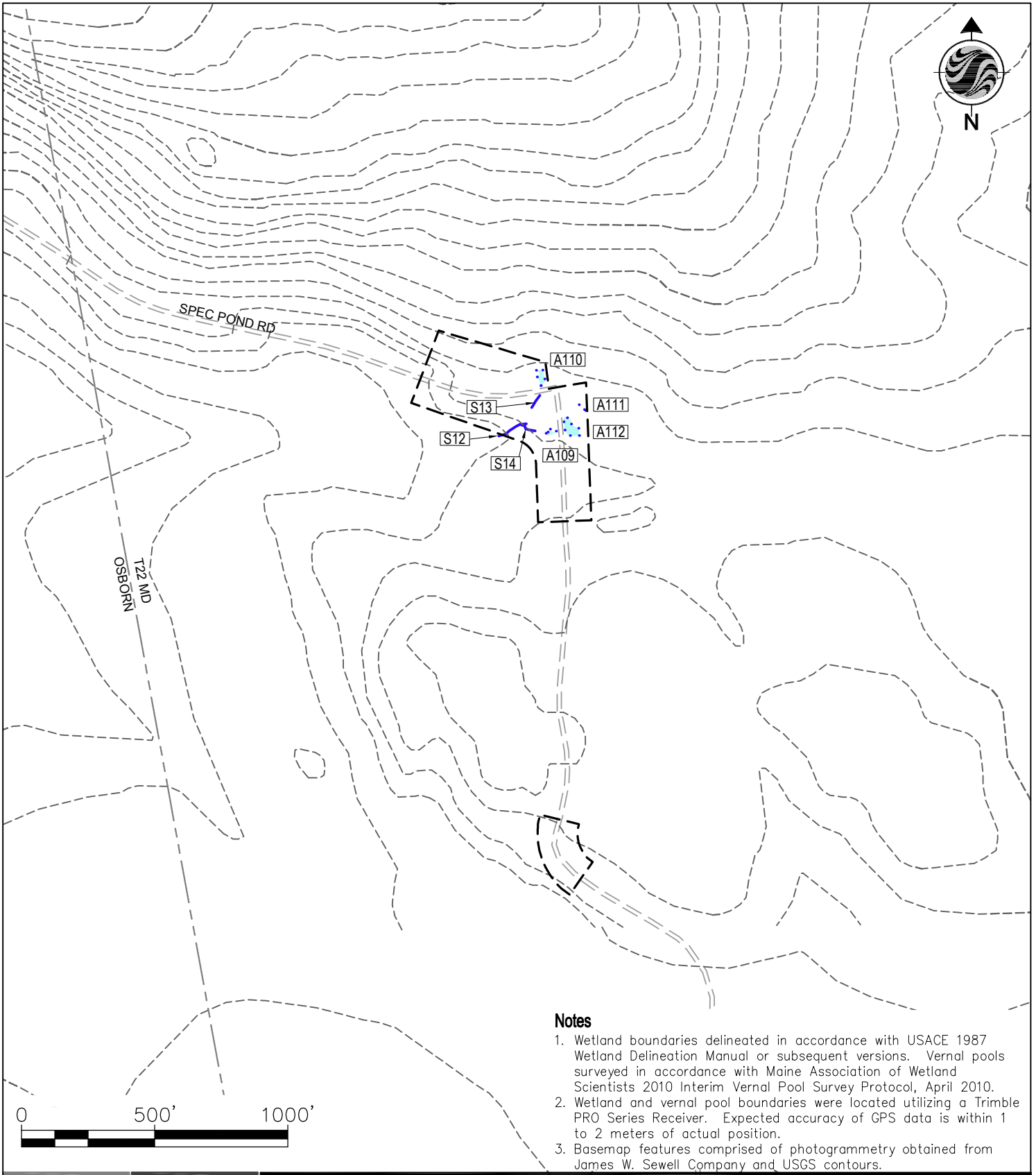
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Client/Project 195600500

Blue Sky East Wind, LLC
 Bull Hill
 Eastbrook and T16MD, Maine
 Figure No. 4

Title
Delineated Natural Resource Map

December 2010
 rev. May 9, 2011



Notes





1. Wetland boundaries delineated in accordance with USACE 1987 Wetland Delineation Manual or subsequent versions. Vernal pools surveyed in accordance with Maine Association of Wetland Scientists 2010 Interim Vernal Pool Survey Protocol, April 2010.
2. Wetland and vernal pool boundaries were located utilizing a Trimble PRO Series Receiver. Expected accuracy of GPS data is within 1 to 2 meters of actual position.
3. Basemap features comprised of photogrammetry obtained from James W. Sewell Company and USGS contours.



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Legend

-  Stream identified by Stantec
-  Project limits
-  Wetland identified by Stantec
-  Resource identification

Client/Project 195600500

Blue Sky East Wind, LLC

Bull Hill

Eastbrook and T16MD, Maine

Figure No.

5

Title

Delineated Natural Resource Map