

December 10, 2015

**Jason Hodgkins**

**Assistant Project Manager/GIS Coordinator**

Commonwealth of Massachusetts

Division of Capital Asset Management & Maintenance (DCAMM)

Office of Real Estate Management

One Ashburton Place, 14th Floor

Boston, Massachusetts 02108

**RE: Camp Curtis Guild, Telecommunications Tower Siting Analysis  
Lynnfield, Reading, North Reading, and Wakefield MA  
Findings Report**

Dear Mr. Hodgkins,

BSC Group, Inc. (BSC) is pleased to submit this Findings Report for the Camp Curtis Guild Telecommunications Tower Siting Analysis (Siting Analysis) in Lynnfield, Reading, North Reading, and Wakefield MA. A brief summary of our findings is included below, and supporting graphics are attached.

The first step in our Siting Analysis was to conduct a desktop review of the entire Camp Curtis Guild property. Publically available data/information reviewed includes the following:

- Massachusetts Geographic Information Systems (MassGIS)
- Available topographic and aerial mapping
- Materials provided by DCAMM
- Local wetland bylaws
- Local zoning bylaws

Potential constraints associated with the human and natural environments were evaluated and displayed (if present) on two separate maps: Natural Environmental Constraints Map and Human Environmental Constraints Map (see Figures 1 and 2 attached). The constraints reviewed during each of these mapping exercises are identified below.

- **Natural Environmental Constraints Map**
  - MassDEP Wetlands
  - USGS Hydrography, MADEP Hydrologic Connections
  - NHESP Certified and Potential Vernal Pools
  - NHESP Priority and Estimated Habitats
  - USFWS Rare and Endangered Species<sup>1</sup>

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<sup>1</sup> The presence of USFWS Rare and Endangered Species was evaluated using the USFWS Information Planning and Conservation planning tool (iPaC). Since the one wildlife species identified on site is mapped throughout the state, this constraint was not utilized as part of our siting/alternatives analysis.



- FEMA 100 year Flood Zones (2013)
- Public Water Supplies
- Surface Water Protection Areas
- Zone II Wellhead Protection Zones
- Interim Wellhead Protection Zones
- Surface Water Protection Zones
- Outstanding Resource Waters
- Areas of Critical Environmental Concern
- MassDEP 21E Sites
- MassDEP AUL Sites
- Wetland buffers

- **Human Environmental Constraints Map**

- Existing infrastructure (e.g. Camp Curtis National Guard Base)
- MHC's Inventory of the Historic and Archaeological Assets of the Commonwealth (MACRIS)
- Local zoning setbacks or no-build areas for Lynnfield<sup>2</sup>, Reading<sup>3</sup>, and North Reading<sup>4</sup>
- Kinder Morgan Pipeline/Meter Station setbacks<sup>5</sup>
- New England Power Company Transmission line setbacks<sup>6</sup>
- FAA/MAC thresholds/setbacks (airports)<sup>7</sup>

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<sup>2</sup> Lynnfield recently designated the Camp Curtis Guild property as part of the Municipal District and stipulated that land in the Municipal District be included in the Wireless Communications Overlay District (WCOD). Wireless Communications structures are permitted in the WCOD by special permit from the Zoning Board of Appeals. The setback requirements are 1,000 feet from the nearest residential structure and the height shall not exceed 120 feet. The setback to property lines shall be equal to or greater than the height of the structure.

<sup>3</sup> The Reading Zoning Bylaw only permits wireless facilities in the S-40 residential district if it is within a state highway right-of-way (ROW). The Camp Curtis Guild property is not within a state highway ROW. Therefore, the portions of the site in Reading would not allow a wireless service facility.

<sup>4</sup> North Reading allows Wireless Service facilities in all districts by special permit from the Community Planning Commission (Planning Board). Height is restricted to 10 feet above the maximum permitted height in the zoning district it is located. The maximum allowed height in the Residence A district (which encompasses the Camp Curtis Guild) is 35 feet. The bylaw references a maximum height of 130 feet, in areas established as wireless facility overlay districts, however there is no record of any such areas established by the Town. The required setback is equal to the "fall zone" or the height of the structure, or 45 feet if the maximum structure height is applied. Since DCAMM identified the need for a 100-150 foot monopole, BSC has proceeded with the assumption that a 45-foot tower would not be appropriate. Therefore, the entire Town of North Reading was identified as "constrained" for the purposes of this analysis.

<sup>5</sup> Based on generic conversations with Kinder Morgan and previous project experience, no work should occur within 50 feet of the pipeline or associated facilities (meter station). Since the exact location of the pipeline is not known, the 50-foot buffer was developed based on MassGIS datalayers and aerial interpretation of the easement location. However, Kinder Morgan should be consulted before project details are finalized.

<sup>6</sup> Based on conversations with New England Power Company, the "fall zone" for any tower placed near their transmission line would need to be 1.5 times the structure height. For the purposes of this analysis, we assumed the maximum height of the structure to be 150 feet. Therefore, the setback (fall zone) associated with the Transmission was assumed to be 225 feet.

<sup>7</sup> Based on our desktop review, the closest airport is approximately 10 miles from the project site. Therefore, FAA/MAC thresholds/setbacks are not a concern for this analysis.



Since the ultimate goal of this analysis is to identify areas on site that are minimally constrained by either the human or natural environment, a custom datalayer was created by combining all constraints into one dataset and overlaying this information onto aerial imagery. This is referred to as the “Constrained Portions of the Project Site” on Figure 3 (attached). Based on the results of this mapping effort, two unconstrained portions of the site were identified in Lynnfield: Option A and Option B.

The next step to determine the Preferred Location for the installation of the proposed telecommunications tower was to conduct an Opportunities and Challenges (“Pros and Cons”) analysis for both Options A and B. Please refer to Table 1 for this detailed comparison.

**Table 1 – Summary of Opportunities and Constraints (“Pros and Cons”) Analysis**

Site	Opportunities	Challenges/Constraints
<b>Option A</b>	<ul style="list-style-type: none"><li>Existing shared access driveway from Lowell Street in Lynnfield.</li><li>No major overhead or subsurface utility ROW crossings required.</li><li>No adverse impact to the natural environment. <i>Note: a wetland complex is present to the east and west of the existing access driveway. If this road needs to be expanded or improved, wetlands may be impacted. See Obstacles/Constraints.</i></li><li>No adverse impact to the human environment.</li><li>Permissible under local zoning</li></ul>	<ul style="list-style-type: none"><li>At a minimum, an additional 500 linear feet of access road will need to be constructed.</li><li>Improvements may be required to the existing access road. If these improvements are necessary adjacent to the wetland, a Request for Determination of Applicability or Notice of Intent will need to be filed with the Lynnfield Conservation Commission. If expansion is required within the wetland, a Notice of Intent, MassDEP Section 401 Water Quality Certification, and U.S. Army Corps of Engineers (USACE) Section 404 approval would be required. Wetland mitigation and a Wildlife Habitat Evaluation may also be necessary.</li><li>A Special Permit will be required from the Zoning Board of Appeals.</li><li>Structure height is limited to 120 feet.</li><li>Coordination with Kinder Morgan will be required for shared use of the access driveway and any construction activities proximate to the existing meter station.</li><li>Upland tree clearing will be required for access and tower installation. If a federal permit is triggered (see above – USACE), coordination with the USFWS will be necessary due to the potential presence of the Northern Long-Eared Bat in Massachusetts.</li><li>Traffic management may be necessary on Lowell Street during construction.</li></ul>

**Table 1 – Summary of Opportunities and Constraints (“Pros and Cons”) Analysis**

Site	Opportunities	Challenges/Constraints
<b>Option B</b>	<ul style="list-style-type: none"><li>▪ The tower can be sited to avoid adverse impacts to the natural environment. <i>Note: access is constrained (see Obstacles/Constraints).</i></li><li>▪ The tower can be sited to avoid adverse impacts to the human environment. <i>Note: access is constrained (see Obstacles/Constraints).</i></li><li>▪ Permissible under local zoning.</li></ul>	<ul style="list-style-type: none"><li>▪ Existing upland access is available from the Camp Curtis National Guard Base only. For the purposes of this evaluation, it is assumed that construction and maintenance traffic in an active military base may not be permitted.</li><li>▪ Although the tower can be sited to avoid adverse impacts to the human and natural environment, access may impact existing base infrastructure and electric transmission line rights-of-way. Although alternative access paths appear to be available, they will require permanent wetland crossings and coordination with National Grid/Kinder Morgan for road crossings within their respective easements. If permanent wetland crossings are required, a Notice of Intent (Lynnfield Conservation Commission), MassDEP Section 401 Water Quality Certification, and U.S. Army Corps of Engineers (USACE) Section 404 approval would be required. Wetland mitigation and a Wildlife Habitat Evaluation may also be necessary.</li><li>▪ A Special Permit will be required from the Zoning Board of Appeals.</li><li>▪ Structure height is limited to 120 feet.</li><li>▪ Comparatively, more upland tree clearing will be required for access and tower installation. If a federal permit is triggered (see above – USACE), coordination with the USFWS will be necessary due to the potential presence of the Northern Long-Eared Bat in Massachusetts.</li><li>▪ Traffic management may be required during construction (pending access point).</li></ul>



## Results and Preferred Location

Based on the results of this analysis, Option A was identified as the Preferred Location. As shown in the summary provided in Table 1, Options A and B share some similar constraints. However, Option A was chosen as the Preferred Location due to the existing access road shown in Figure 4 (see attached). If this access road does not require improvement or expansion in wetland resource areas or buffer zones, no environmental permits are required. In addition, even if expansion (fill) is needed in wetland areas, the anticipated impacts would be less than those required to develop the new, longer access for Option B.

Furthermore, although access will be shared with Kinder Morgan, neither the road nor the proposed tower are anticipated to be located within an active natural gas pipeline or electric transmission corridor. Option B would require crossing New England Power Company's Transmission Right-of-Way and/or Kinder Morgan's Natural Gas Pipeline.

### *Visual Assessment*

Since the installation of this telecommunications tower will require tree clearing and the installation of a 100 to 120<sup>8</sup> foot monopole adjacent to residential areas, a high level visual assessment was conducted.

As part of this task, a preliminary topographic map analysis was performed over a study area of two miles from the Preferred Location. On the ground photographic analysis was then conducted over a study area of one mile, extending from the south near Juniper Road and Perkins Lane in Lynnfield, to Bachalder Road and Heritage Way in Reading.

Within the area identified as Option A, a test structure was modeled in the location where it was most likely to be visible to simulate worst case scenario. Although the proposed structure height is limited to 120 feet, a 200-foot tall tower was conservatively modeled for the visual assessment.

There are two sites where there is potential for the top of a 200-foot structure to be visible from the upper windows of adjacent residences. These views would likely be obscured and only visible during winter months when vegetation is defoliated. These locations include 22 Hickory Lane and 8 Crestwood Drive, with similar but more limited exposure at adjacent properties. However, it is important to note that a 120-foot structure would be practically invisible to adjacent residences at any time of year, even after tree clearing is performed for installation. Since there is essentially no change to demonstrate in the "before" and "after" photographs, simulations have not been included as part of this Siting Analysis.

In conclusion, the Preferred Location (Option A) is ideal for the installation of 100-130 foot telecommunications tower. Although access will need to be further evaluated and a Special Permit will be required from the Lynnfield Zoning Board of Appeals, impacts to the natural and human environments appear to be negligible.

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<sup>8</sup> Maximum height based on Lynnfield zoning restrictions.



If DCAMM has any questions or would like additional details about any of the tasks performed under this Siting Analysis, please do not hesitate to contact me with any questions. BSC would also be happy to meet with you, in person or via teleconference, to review these findings.

Very truly yours,

BSC Group, Inc.

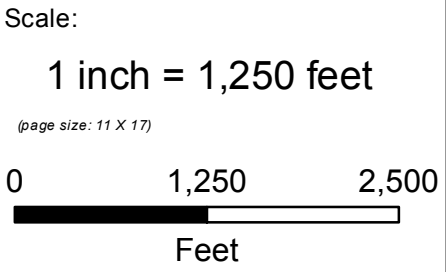
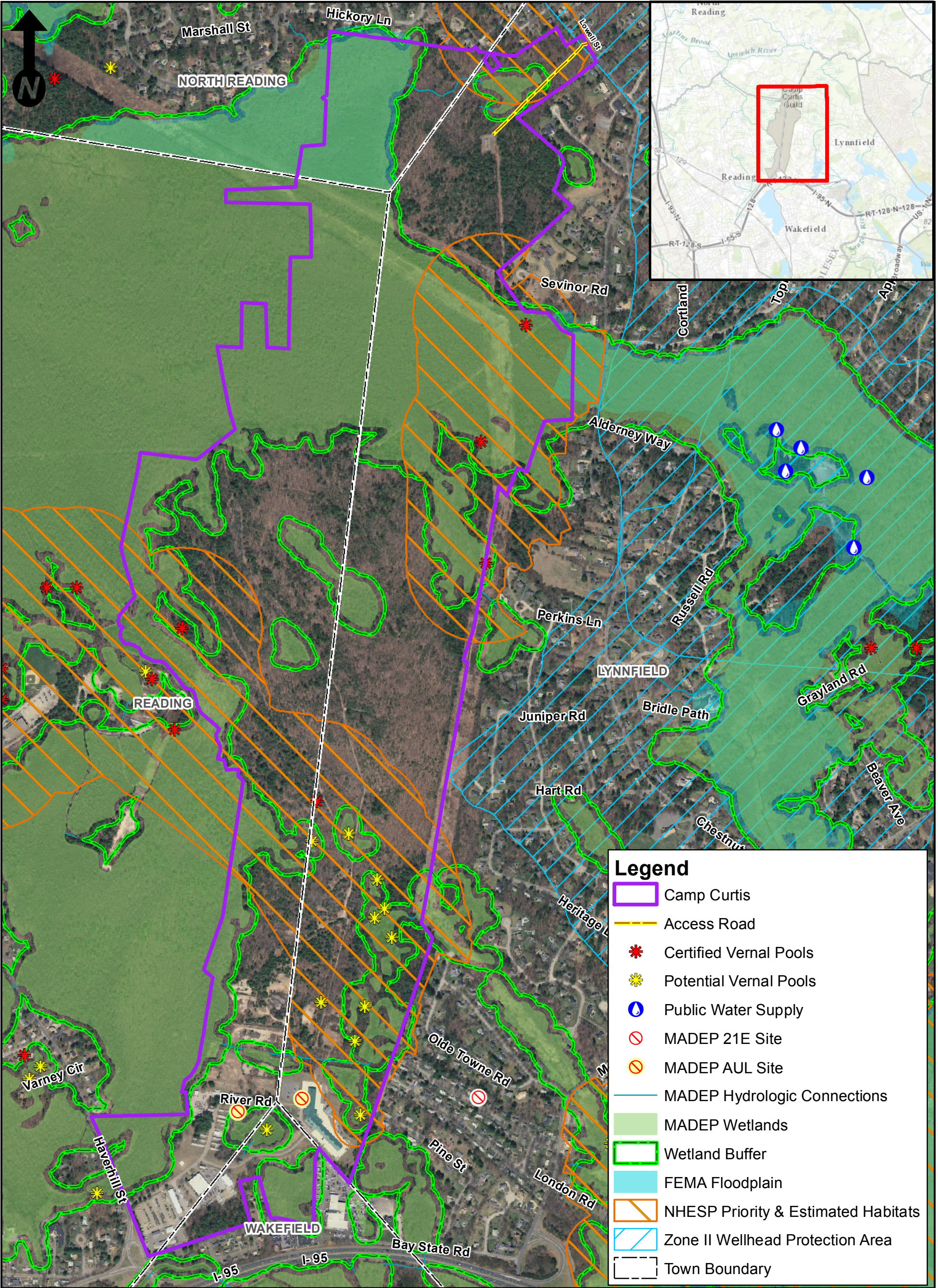
A handwritten signature in black ink, appearing to read 'Lee Curtis', with a long, sweeping horizontal line extending to the right.

Lee Curtis  
Manager of Ecological and GIS Services

**Attachments**  
Supporting Graphics

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**CAMP CURTIS GUILD**

**Figure 1**

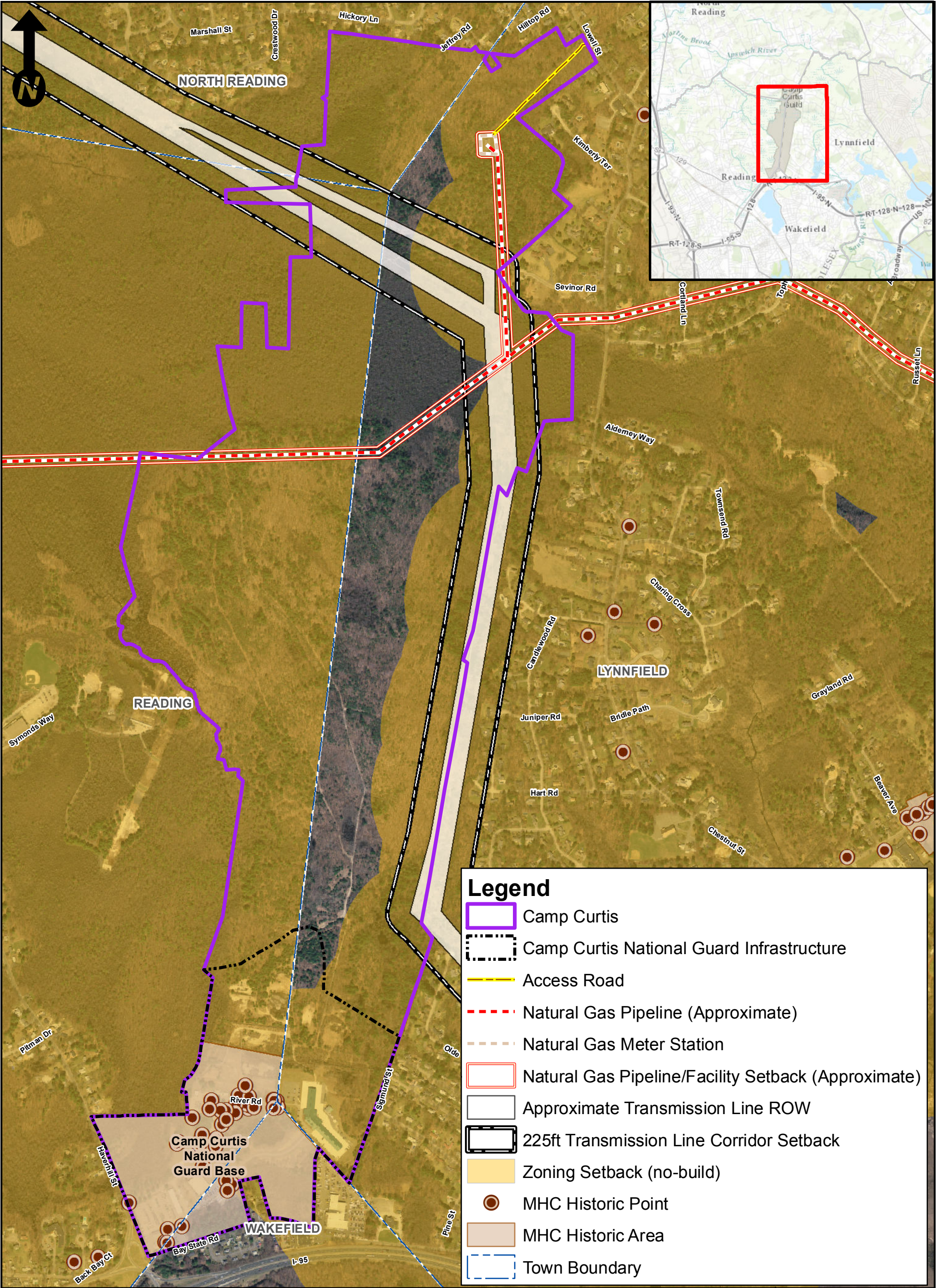
**Natural Environmental Resources Map**

North Reading, Reading, Lynnfield & Wakefield, MA

Source:  
-MassGIS: Basemap & Environmental Data  
-Aerial & Topo Imagery: ESRI, HERE, DeLorme, Intermap, increment P Corp., GEBCO, IGN, Kadaster NL, Ordnance Survey, ESRI Japan, METI, ESRI China (Hong Kong), swisstopo, MapmyIndia, OpenStreetMap contributors, & the GIS User Community







Scale:  
1 inch = 1,250 feet  
(page size: 11 X 17)

0 1,250 2,500  
Feet

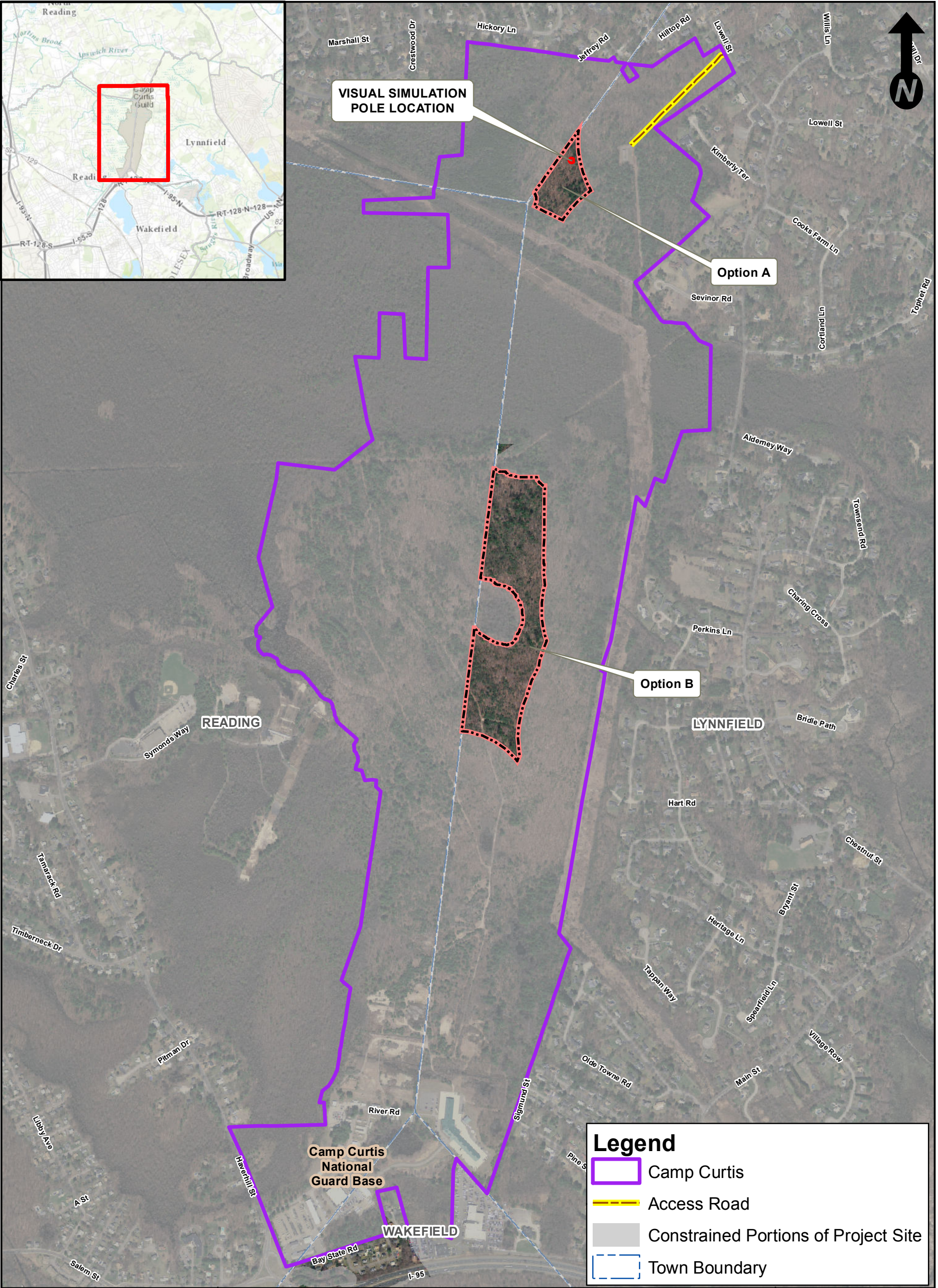
**CAMP CURTIS GUILD**

**Figure 2**  
**Human Environmental Resources Map**  
North Reading, Reading, Lynnfield & Wakefield, MA

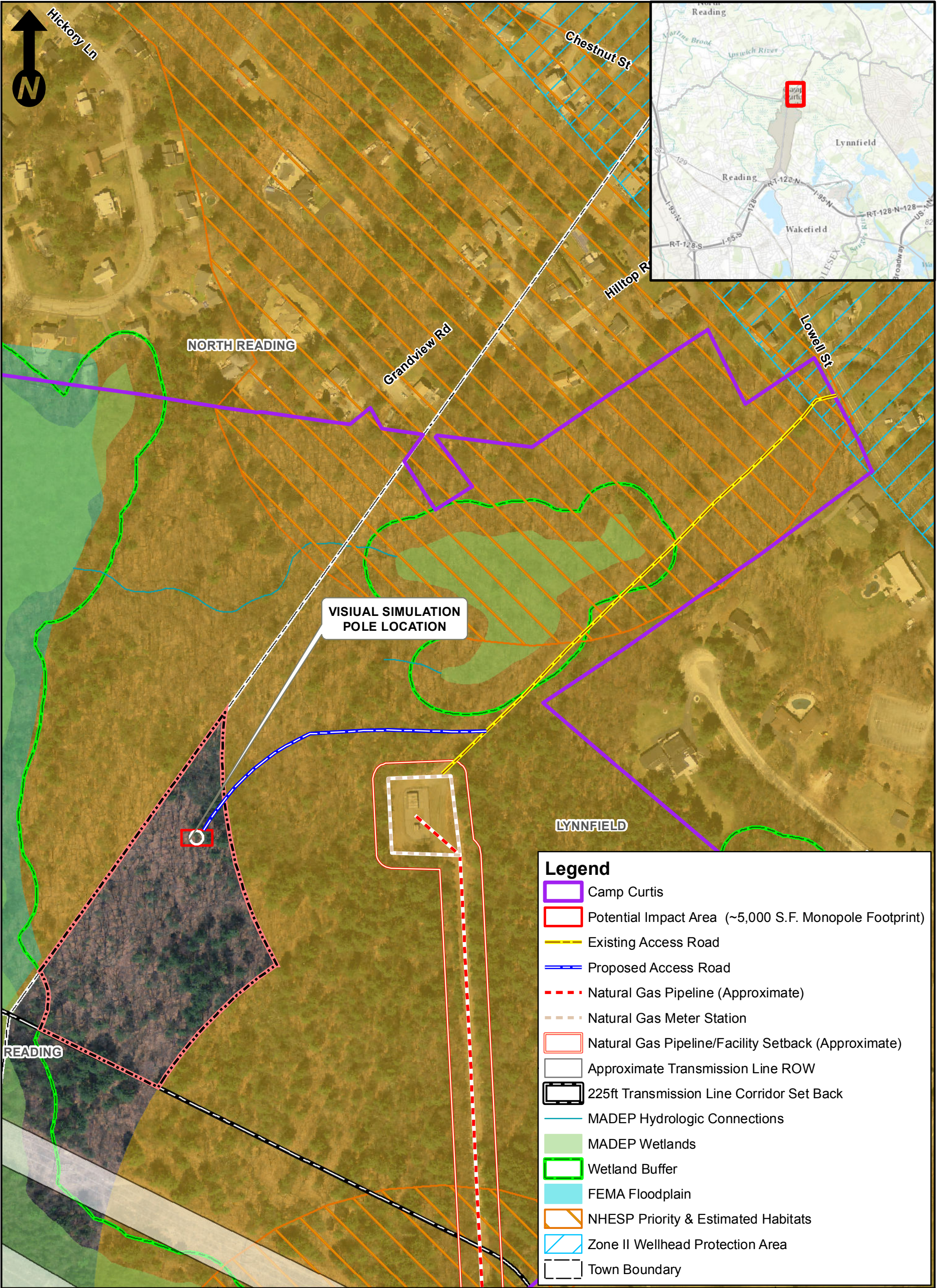
Source:  
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**CAMP CURTIS GUILD**

**Figure 4  
Preferred Location Map**

North Reading, Reading, Lynnfield & Wakefield, MA

Source:  
-MassGIS: Basemap & Environmental Data  
-Aerial & Topo Imagery: ESRI, HERE, DeLorme, Intermap, increment P Corp., GEBCO, IGN, Kadaster NL, Ordnance Survey, ESRI Japan, METI, ESRI China (Hong Kong), swisstopo, MapmyIndia, OpenStreetMap contributors, & the GIS User Community

