



TOWN OF NEEDHAM



RIDGE HILL | NIKE SITE PROPERTY ASSESSMENT STUDY 2018

Submitted to: CONSERVATION COMMISSION

Weston & Sampson™

Acknowledgements

Under the direction of the Conservation Commission, this effort was led by Weston & Sampson Design Studio. Town staff and Needham resident volunteers contributed to the development of the Ridge Hill/Nike Property Assessment Study by providing valuable support materials, guidance, and input.

We gratefully acknowledge the Town Manager staff, Conservation Department staff, and in particular:

Kate Fitzpatrick, Town Manager
Janet Bernardo, Chair, Conservation Commission
Daniel P. Matthews, Chair, Board of Selectmen

Sincerely,

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October 2018



Photo: Weston & Sampson, 2018

Table of Contents

1. INTRODUCTION AND EXECUTIVE SUMMARY

- A. Statement of Purpose
- B. Planning Process
- C. Background and History

2. STUDY OF EXISTING CONDITIONS, SITE ASSESSMENT, AND PREFERRED SITES

- A. Existing Conditions Summary
- B. Site Assessment and Preferred Sites Summary
- C. Utilities Summary
- D. Figures
 - Figure 1. Zoning Map | Overview
 - Figure 2. Zoning Map | Southwest Quadrant Enlargement
 - Figure 3. Existing Conditions | Overview
 - Figure 4. Existing Conditions | Streams and Wetlands
 - Figure 5. Existing Conditions | Overlay Districts
 - Figure 6. Existing Conditions | Priority Habitat
 - Figure 7. Existing Conditions | Easements
 - Figure 8. Existing Conditions | Trails
 - Figure 9. Existing Conditions | Slopes 15%-25%
 - Figure 10. Existing Conditions | Slopes 8%-15%
 - Figure 11. Existing Conditions | Treeline
 - Figure 12. Existing Conditions | Utilities
 - Figure 13. Existing Conditions | Soils Map
 - Figure 14. Site Assessment | Not Usable
 - Figure 15. Site Assessment | Not Recommended
 - Figure 16. Site Assessment | Remaining Land
 - Figure 17. Site Assessment | Elimination 1-Size & Configuration
 - Figure 18. Site Assessment | Elimination 2-Access & Constraints
 - Figure 19. Preferred Sites | Sites 1-5
 - Figure 20. Preferred Sites | Site 1 Enlargement
 - Figure 21. Preferred Sites | Site 2 Enlargement
 - Figure 22. Preferred Sites | Site 3 Enlargement
 - Figure 23. Preferred Sites | Site 4 Enlargement
 - Figure 24. Preferred Sites | Site 5 Enlargement

3. STUDY OF POTENTIAL SITE USES PER TOWN ZONING

- A. Potential Site Uses Summary
- B. Buildout Options Summary
- C. Zoning Summary Chart
- D. Figures

- Figure 25. Buildout Options | Generic Buildout
- Figure 26. Buildout Options | Option A | Greenhouse Operation
- Figure 27. Buildout Options | Option B | Place of Assembly
- Figure 28. Buildout Options | Option C | Community Recreation Center
- Figure 29. Buildout Options | Option D | Elderly/Hospice Care
- Figure 30. Buildout Options | Option E | Department of Public Works

4. STUDY OF CIRCULATION AND CONNECTIVITY OPTIONS

- A. Circulation and Connectivity Options Summary
- B. Figures

- Figure 31. Existing Site Uses | Connectivity Existing Conditions
- Figure 32. Existing Site Uses | Connectivity Option 1
- Figure 33. Existing Site Uses | Connectivity Option 2
- Figure 34. Existing Site Uses | Connectivity Option 3

1

Introduction and Executive Summary

A. STATEMENT OF PURPOSE

In the fall of 2017, Weston & Sampson was retained by the Town of Needham to complete an assessment of a 223-acre portion of the Ridge Hill Reservation including the Nike Property. The purpose of this assessment was to evaluate this property for potential areas of future development, and then have the resulting assessment report serve as a guide to the Town when considering current and future uses of this open space resource.

Of these 223 acres, 202 are under the control of the Conservation Commission. The remaining 21 acres are controlled by the Selectmen; 3 of those acres are referred to as the “old estate” and 18 acres are the Nike Property.

More specifically, Weston & Sampson was asked to look at potential reuse of the Selectmen-controlled 3-acre old estate area, as well as look at a possible exchange with another 3-acre parcel located anywhere within this portion of the Reservation. An important goal was to ensure that the 3-acre parcel, wherever located, be advantageously considered in conjunction with the 18-acre Nike so that, together, these two Selectmen properties could be optimized for more active use, while being sensitive to the passive use of the Reservation in general.

The scope of work undertaken by Weston & Sampson included:

- Thorough review of the many relevant existing studies, plans, and related documents available.
- On-the-ground field reconnaissance to visually identify and discuss basic reuse opportunities and constraints.
- Development of new maps from readily available sources that document existing conditions, environmental constraints analysis (wildlife habitat/cover type, wetlands, vernal pools, rare species, other unique resources, etc.), buffer zones, and other pertinent site features and characteristics. Mapping also identified land use and zoning considerations.

- Identification of existing utility infrastructure systems available to the study area (electricity, gas, sewer, water, and drainage) and discussion of opportunities for upgrading certain systems to support potential re-use options.
- Identification of options for types and sizes of structures and facilities that could potentially be constructed within the study area.
- Exploration of roadway and parking options to support existing conditions or any potential build-out, with an emphasis on creating environmentally sensitive and sensible connections.

B. PLANNING PROCESS

Over several months, Weston & Sampson developed new maps representing existing conditions, environmental constraints, and site analysis. Throughout the process, Weston & Sampson representatives frequently toured the property during different seasons, at different times of day, and on different days of the week. The existing conditions of all active and passive recreation use, current limitations, safety concerns, and maintenance issues were observed and assessed at a high planning level. Existing conditions assessments are included within this document in the form of maps and brief narrative summaries.

This written report represents the culmination of the assessment process, and contains narrative and graphic depictions of the findings. It includes the materials and information presented in draft form to the Board of Selectmen and Conservation Commission on September 24, 2018 and September 28, 2018.

It is important to note that this assessment was general in nature, and intended to be the first of many steps, including public process, yet to occur.

C. BACKGROUND AND HISTORY

Ridge Hill Reservation includes a total of 352 acres of open space land, 223 of which are the study area located north of Charles River Street. Owned by the Town of Needham, most of it is controlled by the Conservation Commission; 21 acres are controlled by the Board of Selectmen.

The Reservation is made up of multiple properties that were formerly private. Ridge Hill Reservation looked very different 120 years ago when William Emerson Baker, a wealthy owner of a sewing machine company, purchased 800 acres in the southwest corner of Needham and built his summer estate. Following his death, the land was sold and later subdivided into residential house lots.

Along the eastern portion of the Reservation is the former Nike Missile Site. Following World War II, Nike-Ajax missiles with radar-guidance systems were located on the property that falls

within the Ridge Hill Reservation boundary. In 1960, a TV transmission tower was installed close by, rendering the radar readings inaccurate; the Site was transferred to the National Guard and then closed in 1963. Now controlled by the Selectmen, the property has been utilized as a community garden and dog park more recently.

2

Study of Existing Conditions, Site Assessment, and Preferred Sites

A. EXISTING CONDITIONS SUMMARY

Located in the southwestern corner of Needham, Ridge Hill Reservation is approximately 352 acres of open space. Owned by the Town, most of it is controlled by the Conservation Commission. The Reservation starts at the Charles River and extends to the north, across Charles River Street, to the Needham-Wellesley town line.

This assessment involved the 223-acre parcel north of Charles River Street, and included the 18-acre former Nike Missile Site and 3-acre area where the old estate remains. These two parcels (totaling 21 acres) are controlled by the Board of Selectmen.

The purpose of this assessment was to evaluate the property for potential areas of future development/reuse. Specifically, Weston & Sampson was directed to look at the Selectmen-controlled 3-acre old estate area or a similarly sized area within the study property. An important goal was to ensure that the 3-acre parcel, wherever located, be advantageously considered in conjunction with the 18-acre Nike Property so that, together, these two Selectmen properties could be optimized for more active use, while being sensitive to the passive use of the Reservation in general. The assessment will serve as a guide when the Town further considers current and future uses of this open space resource. A brief explanation of Weston & Sampson's process and findings follows, and begins with gaining an understanding of the existing conditions.

The scope of work undertaken by Weston & Sampson included these tasks related to existing conditions:

- Thorough review of the many relevant existing studies, plans, and related documents available.
- Historical data provided by the Town of Needham.
- On-the-ground field reconnaissance conducted by representative from Weston & Sampson.

- Development of new maps from readily available sources (including GIS mapping) that document existing conditions, environmental constraints (wildlife habitat/cover type, wetlands, vernal pools, rare species, other unique resources, etc.), buffer zones, and other pertinent site features and characteristics. Mapping also identified land use and zoning considerations.
- Identification of existing utility infrastructure systems available to the study area (electricity, gas, sewer, water, and drainage).

The series of existing condition maps produced are summarized below and are included later in this Section. See C. Figures.

Zoning Maps Summary (Figures 1 & 2)

The study area (outlined in yellow) is in the less-densely populated south-west quadrant of Needham and falls under the SRA (Single Residence-A) use district. See Section 3 - Study of Potential Site Uses Per Town Zoning for detailed information.

Existing Conditions Maps Summary (Figures 3 – 13)

This series of existing conditions maps illustrates the context in which the 223-acre property sits, and highlights (in red) the 3-acre old estate and the 18-acre Nike boundary (also in red).

Of note:

- Streams & Wetlands (F-4)
 - Three important Wetland Buffer Zones are shown: 25 ft (no construction allowed within 25 feet); 50 ft (where wildlife habitat is provided, no construction is allowed within 50 feet); and 100 ft (no construction within 100 feet of a vernal pool).
- Overlay Districts (F-5)
 - Two overlay districts impact the site: Aquifer Protection and Flood Plain. There is a Wireless Communications Facilities Towers District abutting the north-east corner of the site.
- Priority Habitat (F-6)
 - The site is subject to regulatory review due to State-listed rare species of both plants and animals.
- Easements (F-7)
 - Easements exist for three things: a gas line, the Nike Site entry road, and an Army Corps Flood Storage area.

- Trails (F-8)
 - A web of existing pedestrian trails crosses the property.
- Slopes ranging from 15%-25% (F-9)
 - Severe slopes are highlighted.
- Slopes ranging from 8%-15% (F-10)
 - Moderate slopes are highlighted.
- Treeline (F-11)
 - Most of the site is wooded, with few open/disturbed areas.
- Utilities (F-12)
 - Utilities are limited to those connecting from Charles River Street north to the old estate and Charles River Street to the Nike Property. In each instance, utilities have been placed under or adjacent to the entrance roads to these two facilities. (in addition to Figure F-12, see Section 2.C for a Utilities Summary).
- Soils (F-13)
 - Three types of soils are identified on this site. Till/bedrock covers about half of the overall property, predominantly in the north-west. To the south-east, it is sand/gravel. The dividing line between these two main soils areas is approximately along the esker landform, in the area of the Esker Trail. Additionally, there is a smaller pocket of floodplain/alluvium to the north-west, between the adjacent Pleasant Landing and Beard Way neighborhoods.

B. SITE ASSESSMENT AND PREFERRED SITES SUMMARY

Following the existing conditions mapping that was described in Section 2.A above, further assessment of the property was necessary. Due to the large 223-acre size of the study area, Weston & Sampson looked for a reasonable way to identify and further evaluate only the more-desirable areas of the site. Though it was just one of many possible means to achieve this, Weston & Sampson chose to first eliminate less-desirable areas. Figures 14 through 18 illustrate this process and the criteria used.

Criteria used to eliminate some areas included:

- Wetlands & wetland buffer zones
- Easements
- Priority habitats

- Flood plain
- Steep slopes

Figure 16 Site Assessment – Remaining Land illustrates the areas remaining after this elimination process; they are identified as “more-desirable”. As a further step, Figures 16 through 19 describe additional elimination criteria that were added, including:

- Parcels smaller than 3 acres
- Narrow configuration
- Lack of reasonable access
- Moderate slopes

This culminated in the development of a Preferred Areas mapping, as shown on Figure 19; for ease of discussion, five sites were identified and numbered. The old estate was kept together as one 3-acre area and is identified as Site 1. The remaining land was shaped into Sites 2-4, using continuous land as the criteria.

These preferred sites total 62 acres and breakdown by site, as follows:

Site 1 3 acres
Site 2 33 acres
Site 3 17 acres
Site 4 3 acres
Site 5 6 acres

An enlarged image of each site is shown on a map and described in greater detail. See Figures 20 through 24.

Additional information includes site inventory data such as:

- Parcel size
- Areas of vegetation
- Areas of pavement
- Existing utilities.

Site opportunities and site constraints are noted and include criteria such as:

- Sun exposure
- Impacts on existing trails
- Access from Charles River Street

C. UTILITIES SUMMARY

Information was gathered by Weston & Sampson staff from a variety of sources including:

- Phone calls and discussions with W&S and utility representatives, as noted.
- Site photos taken by Weston & Sampson.
- Needham Senior Center Feasibility Study, III Site Analysis (NSCFS).
<http://www.needhamma.gov/DocumentCenter/Home/View/1272>

Water, Sewer, Drainage Summary

Known Data:

- 16" water main in Charles River St (source: NSCFS).
- Town sewer is available in Charles River St and Pheasant Landing Road (source: NSCFS).
- Existing Ridge Hill buildings are on septic/cesspools (source: NSCFS).

Assumptions:

- Assume there is also Town water in Pine St and Pheasant Landing Rd.
- Adequate water pressure and available flows are available (pressure test/hydrant flow testing would be needed to verify).
- The elevation/grade of the site is such that sewer and drainage can be conveyed by gravity out to Charles River Street, Pine Street, and/or Pheasant Landing Road at installation depths between 5 and 12 feet along the way.
- Water main will be installed at depths between 5 and 6-feet.
- The total length of pipe will be somewhere between 1,000 and 5,000 feet.
- Water main will be 8-inch diameter DI pipe.
- Gravity sewer will be 8-inch diameter PVC.
- Drainage will be 12-inch diameter RCP.
- Subsurface conditions will include some level of boulders but will not require blasting of bedrock.
- Groundwater levels will be able to be controlled with trench pumps and will not require special dewatering methods.
- Excavated soils will primarily be suitable for reuse as backfill in the completed trenches.
- Support of excavation will be through the use of a trench box without the need to sheet the excavation.
- Interference with existing underground utilities will be minimal.
- Surface restoration will include a combination of up to 5 inches of trench-width permanent pavement in roadway areas, and loaming and seeding in cross-country areas.
- The cost of gravity sewer will be similar to the cost of drainage (storm sewer).

Estimated Costs (using historical bidding information):

- Estimated costs are planning-level costs for installation/construction purposes.
- Costs do not include engineering, public safety (police details), or full street width paving.
- Water: \$200-\$250 per linear foot.
- Sewer & Drain: \$150 to \$200 per linear foot.

Gas (NStar) Summary

Known Data:

- Existing building commercial range fueled with propane (source: NSCFS).
- Gas is available in Charles River St (approx. 1,860 linear feet from house) (source: NSCFS).

Assumptions:

- Estimated LF cost: not provided.

Electric (NStar) Summary

Known Data:

- Ridge Hill site is supplied by 25kVA 13.8 kV-120 / 240 V single phase pad-mounted transformer.

Assumptions:

- Sites 1, 2, and 4 power would all be fed off a new 3 phase 13.8KV high voltage line from Charles River Street:
 - Depending on the proposed development of each site, either underground manholes would be strategically located along the route to feed off to transformers or, if overhead distribution is utilized, poles would be strategically located for the same purpose.
- Sites 3 and 5 power would be fed off a new 3 phase 13.8KV high voltage line from Charles River Street:
 - Depending on the proposed development of each site, either underground manholes would be strategically located along the route to feed off to transformers or, if overhead distribution is utilized, poles would be strategically located for the same purpose. This assumes that Site 5 can be accessed from Site 3 which is unclear based on the documentation currently in hand.
- Estimated costs for the above are as follows, given on a cost per foot for each option (very rough numbers):
 - underground high voltage power: \$32.00 per foot plus trenching.
 - overhead high voltage power: \$14.00 per foot.

Telecommunications Summary

Known Data:

- RCN added fiber optic lines in the 1990s underground along east side of drive near electrical conduit (source: NSCFs).

Assumptions:

- Sites 1, 2, and 4 telecommunications would follow the same strategy as the electric/power indicated above.
- Sites 3 and 5 telecommunications would follow the same strategy as the power indicated above.
- Estimated costs for the above are as follows given on a cost per foot for each option (very rough numbers):
 - underground telecommunication: \$18.00 per foot plus trenching.
 - overhead telecommunications: \$8.00 per foot.

D. FIGURES

Figures 1 through 24 follow.

RIDGE HILL / NIKE PROPERTY ASSESSMENT

Needham, Massachusetts | June 2018

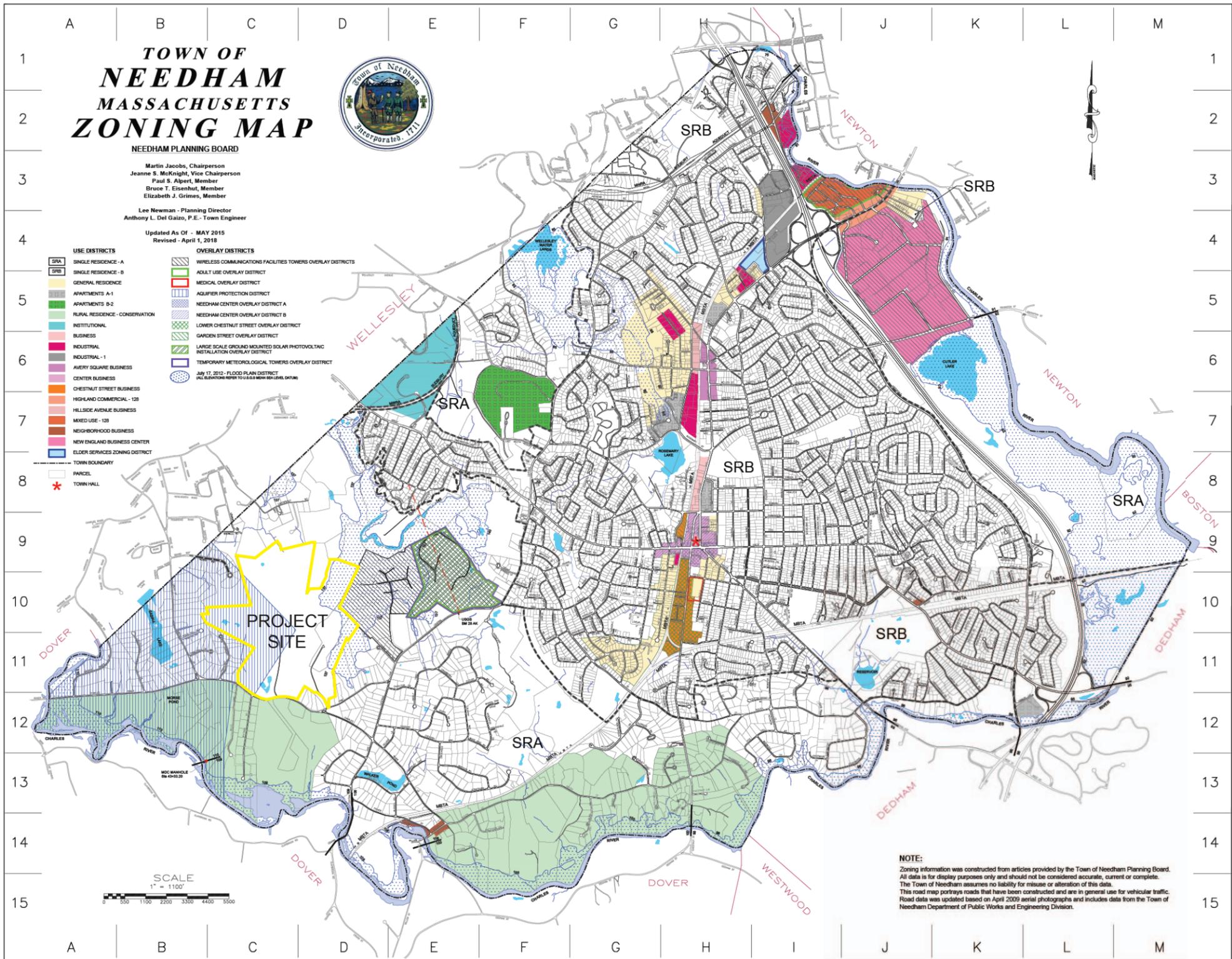


FIGURE 1 | ZONING MAP OVERVIEW



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Updated As Of - MAY 2015
Revised - April 1, 2018

4

5

6

7

8

9

10

11

12

13

USE DISTRICTS

- SRA SINGLE RESIDENCE - A
- SRB SINGLE RESIDENCE - B
- GENERAL RESIDENCE
- APARTMENTS A-1
- APARTMENTS B-2
- RURAL RESIDENCE - CONSERVATION
- INSTITUTIONAL
- BUSINESS
- INDUSTRIAL
- INDUSTRIAL - 1
- AVERY SQUARE BUSINESS
- CENTER BUSINESS
- CHESTNUT STREET BUSINESS
- HIGHLAND COMMERCIAL - 128
- HILLSIDE AVENUE BUSINESS
- MIXED USE - 128
- NEIGHBORHOOD BUSINESS
- NEW ENGLAND BUSINESS CENTER
- ELDER SERVICES ZONING DISTRICT

OVERLAY DISTRICTS

- WIRELESS COMMUNICATIONS FACILITIES TOWERS OVERLAY DISTRICTS
- ADULT USE OVERLAY DISTRICT
- MEDICAL OVERLAY DISTRICT
- AQUIFER PROTECTION DISTRICT
- NEEDHAM CENTER OVERLAY DISTRICT A
- NEEDHAM CENTER OVERLAY DISTRICT B
- LOWER CHESTNUT STREET OVERLAY DISTRICT
- GARDEN STREET OVERLAY DISTRICT
- LARGE SCALE GROUND MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION OVERLAY DISTRICT
- TEMPORARY METEOROLOGICAL TOWERS OVERLAY DISTRICT
- July 17, 2012 - FLOOD PLAIN DISTRICT
(ALL ELEVATIONS REFER TO U.S.G.S MEAN SEA LEVEL DATUM)

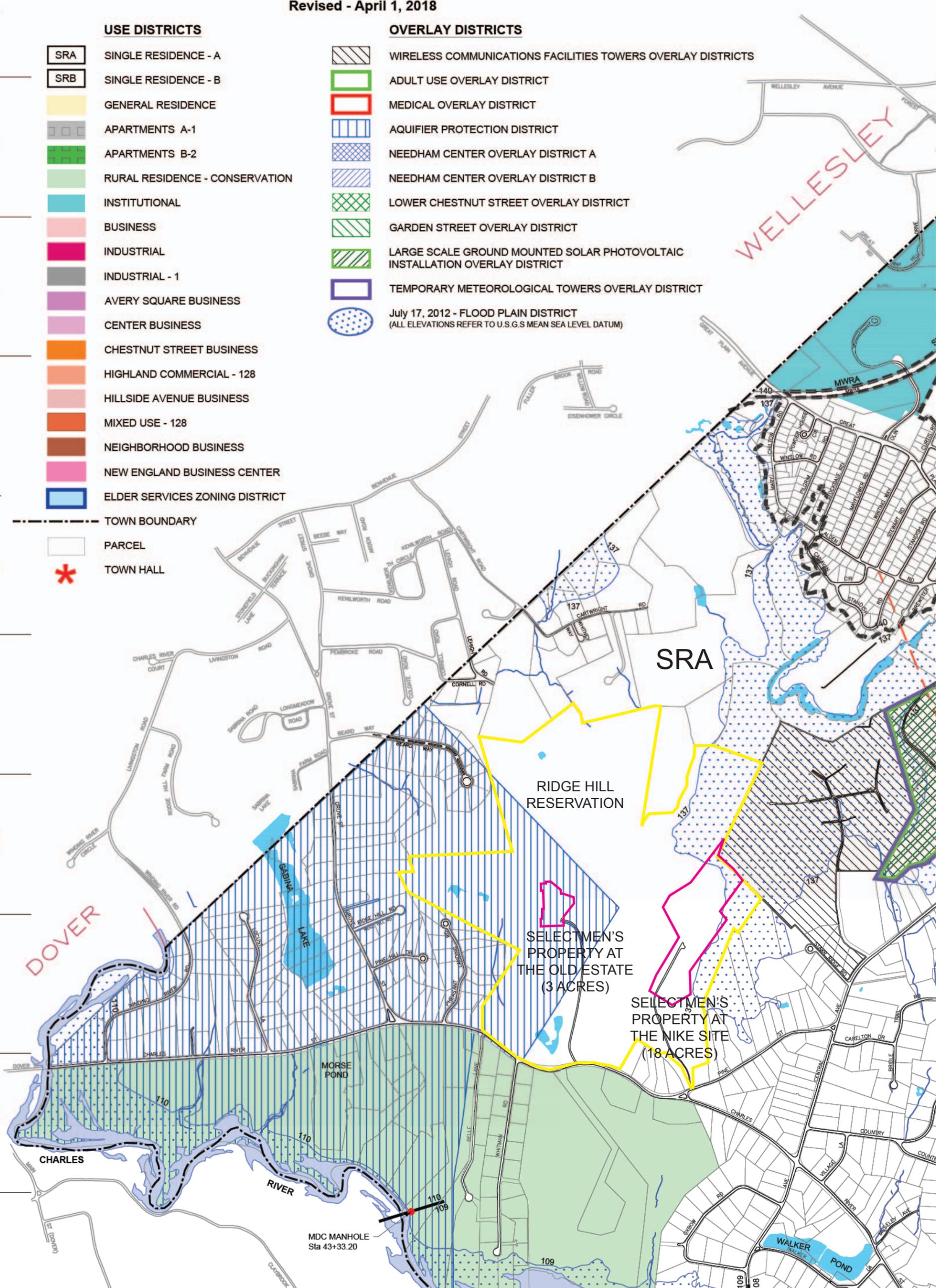


FIGURE 2 | ZONING MAP
SOUTHWEST QUADRANT ENLARGEMENT



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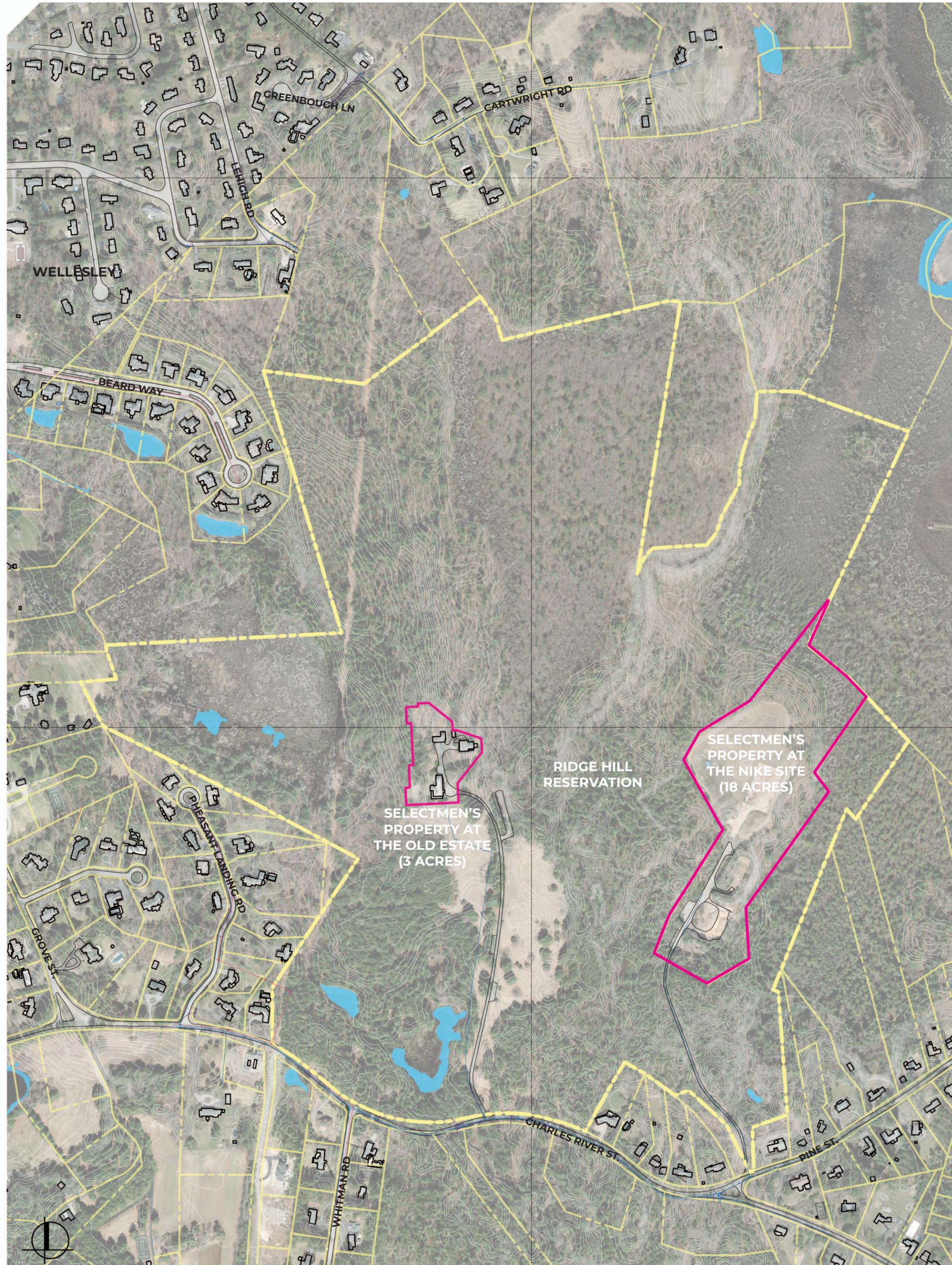


FIGURE 3 | EXISTING CONDITIONS
OVERVIEW



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LEGEND

- wetland
- pond
- 25' wetland buffer zone
- 50' wetland buffer zone
- 100' wetland buffer zone
- stream
- vernal pool

WETLAND BUFFER ZONES

25' WETLAND BUFFER ZONE:
NO CONSTRUCTION WITHIN 25 FEET OF THE LIMIT OF BANK OR VEGETATED WETLAND MAY BE PERMITTED.

50' WETLAND BUFFER ZONE:
WHERE THE BUFFER ZONE PROVIDES WILDLIFE HABITAT, NO ALTERATION OF VEGETATION OR CONSTRUCTION WITHIN 50 FEET OF THE LIMIT OF VEGETATED WETLAND OR BANK IS PERMITTED.

100' WETLAND BUFFER ZONE:
NO CONSTRUCTION MAY BE PERMITTED WITHIN 100 FEET OF A VERNAL POOL.

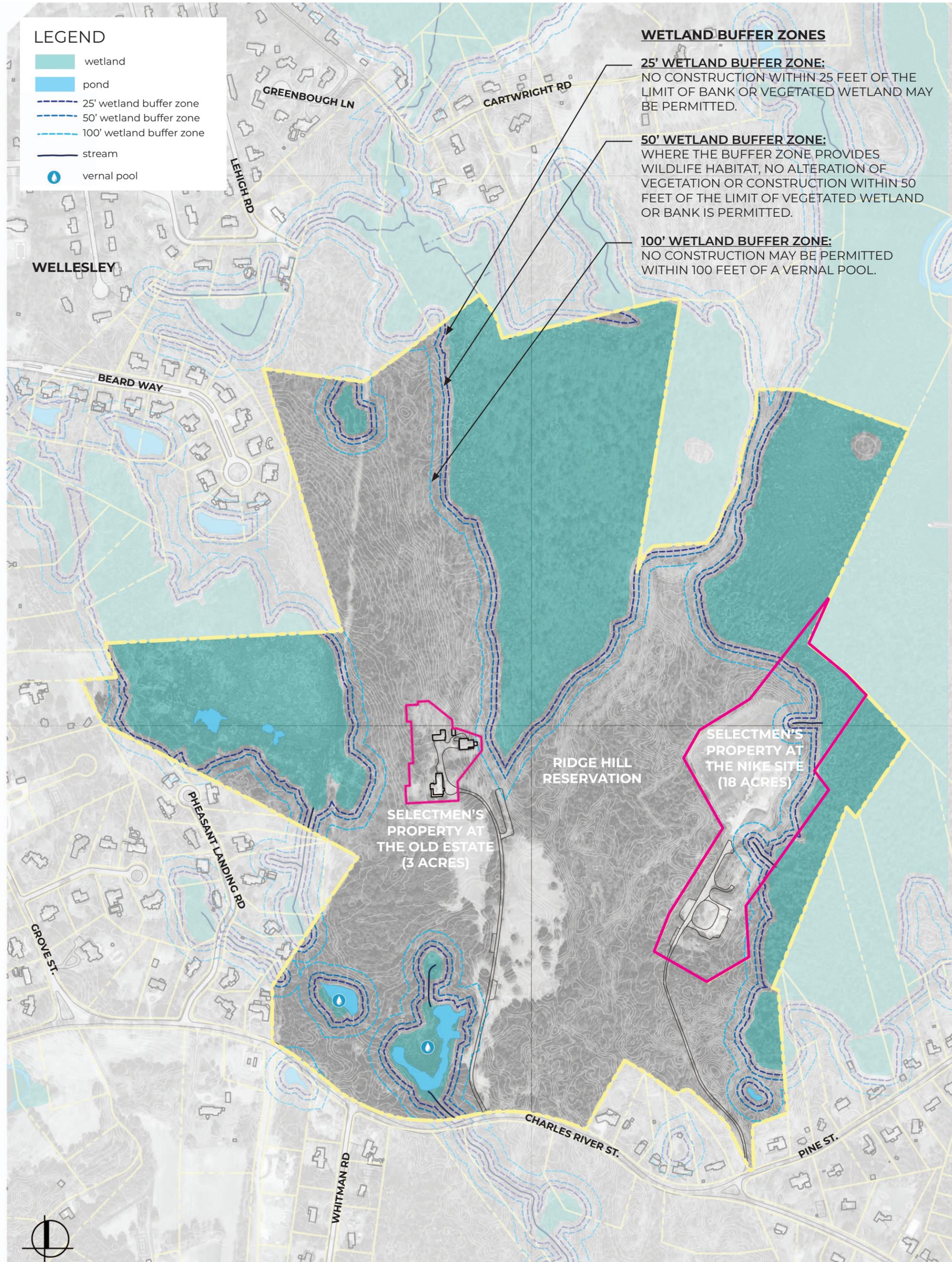


FIGURE 4 | EXISTING CONDITIONS
STREAMS & WETLANDS



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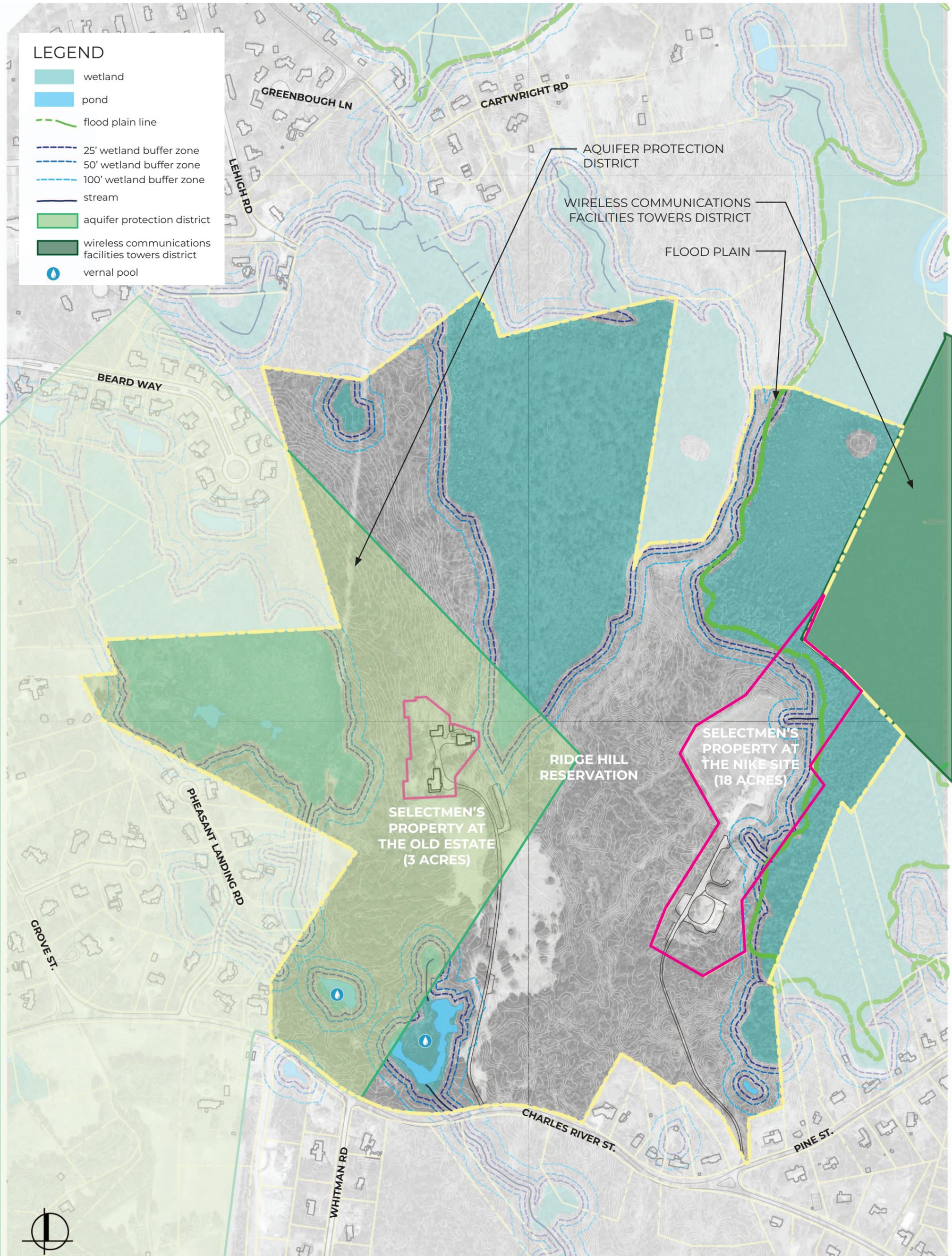


FIGURE 5 | EXISTING CONDITIONS
OVERLAY DISTRICTS



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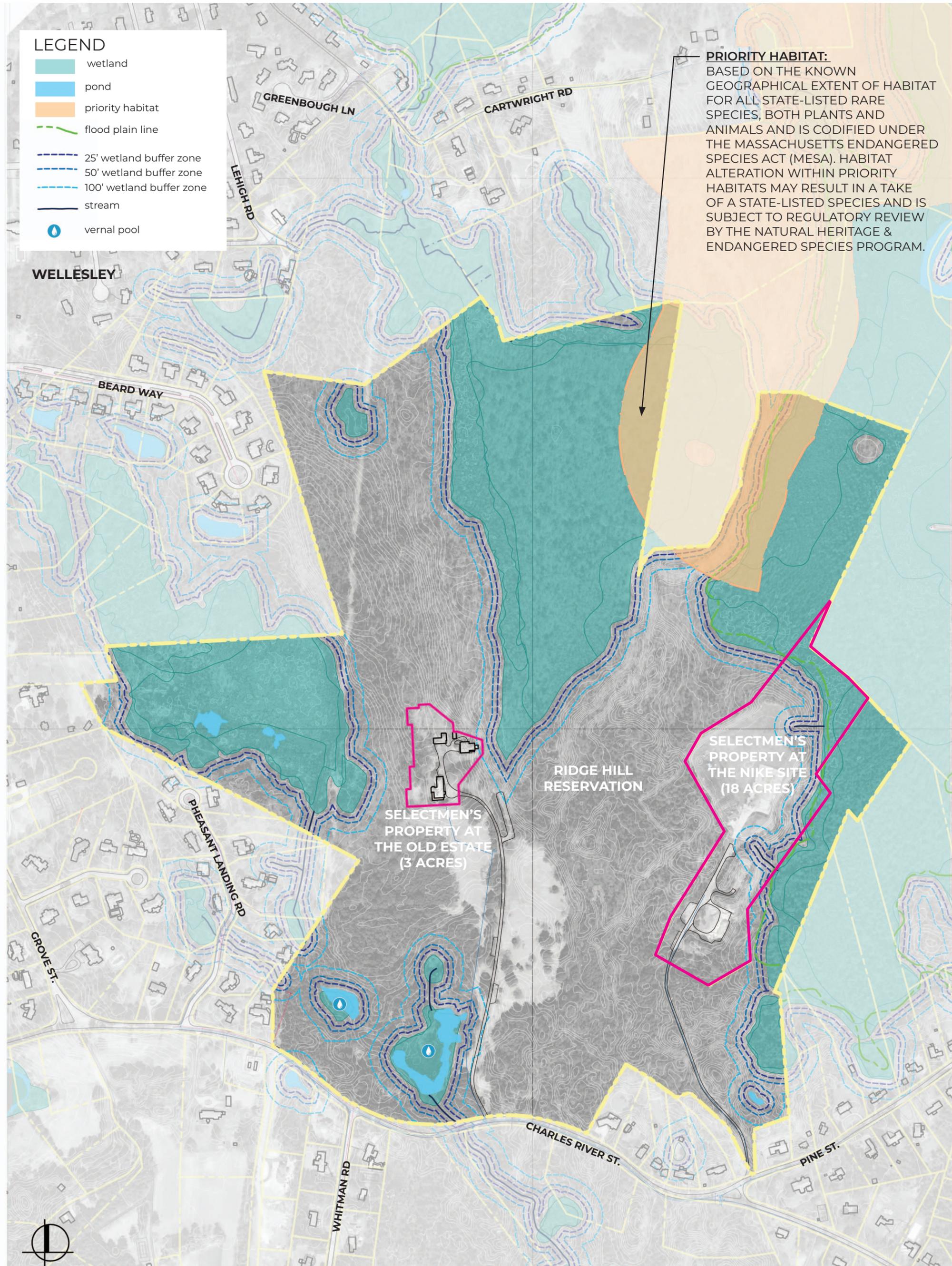


FIGURE 6 | EXISTING CONDITIONS
 PRIORITY HABITAT



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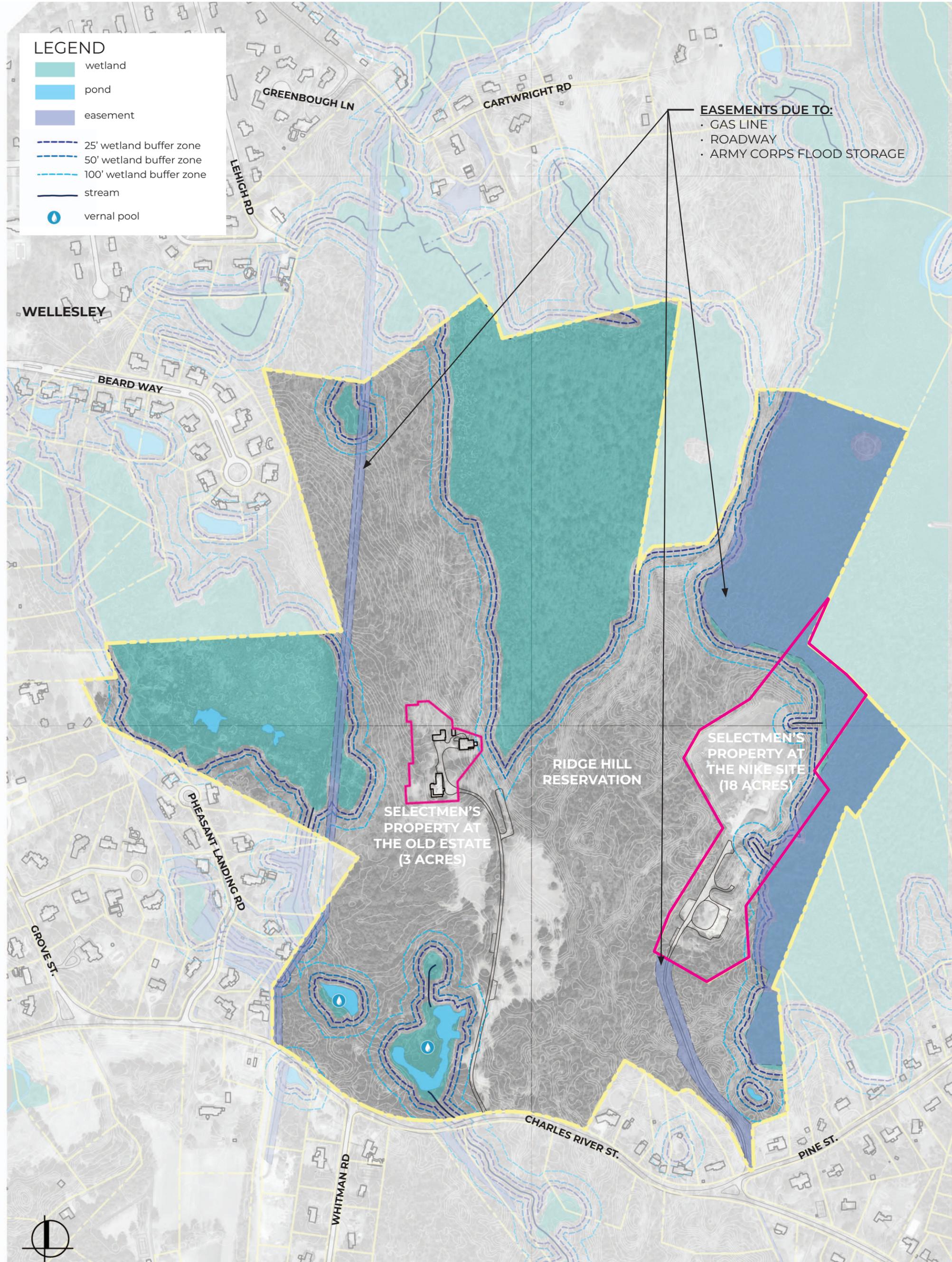


FIGURE 7 | EXISTING CONDITIONS
EASEMENTS



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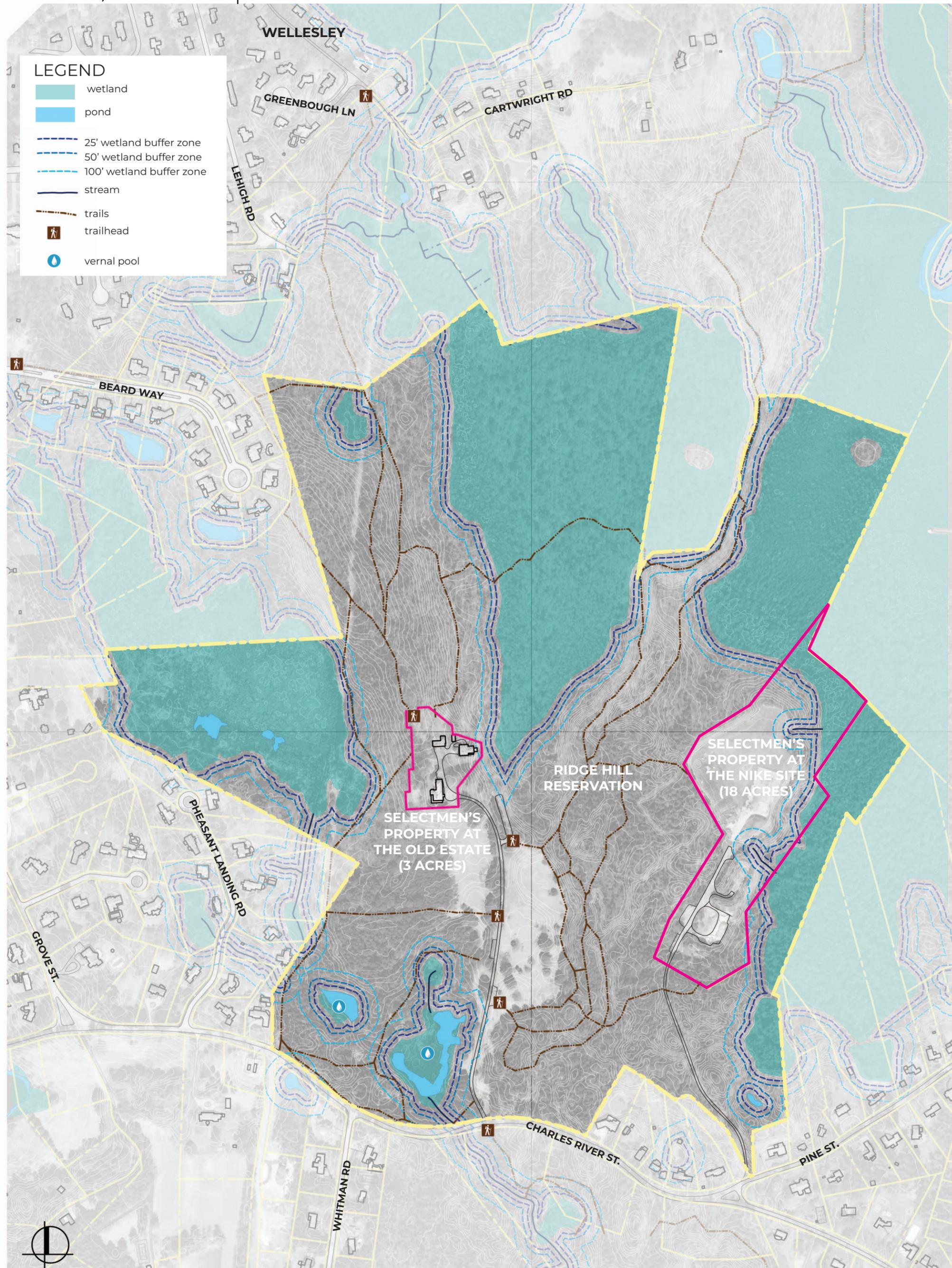


FIGURE 8 | EXISTING CONDITIONS
TRAILS



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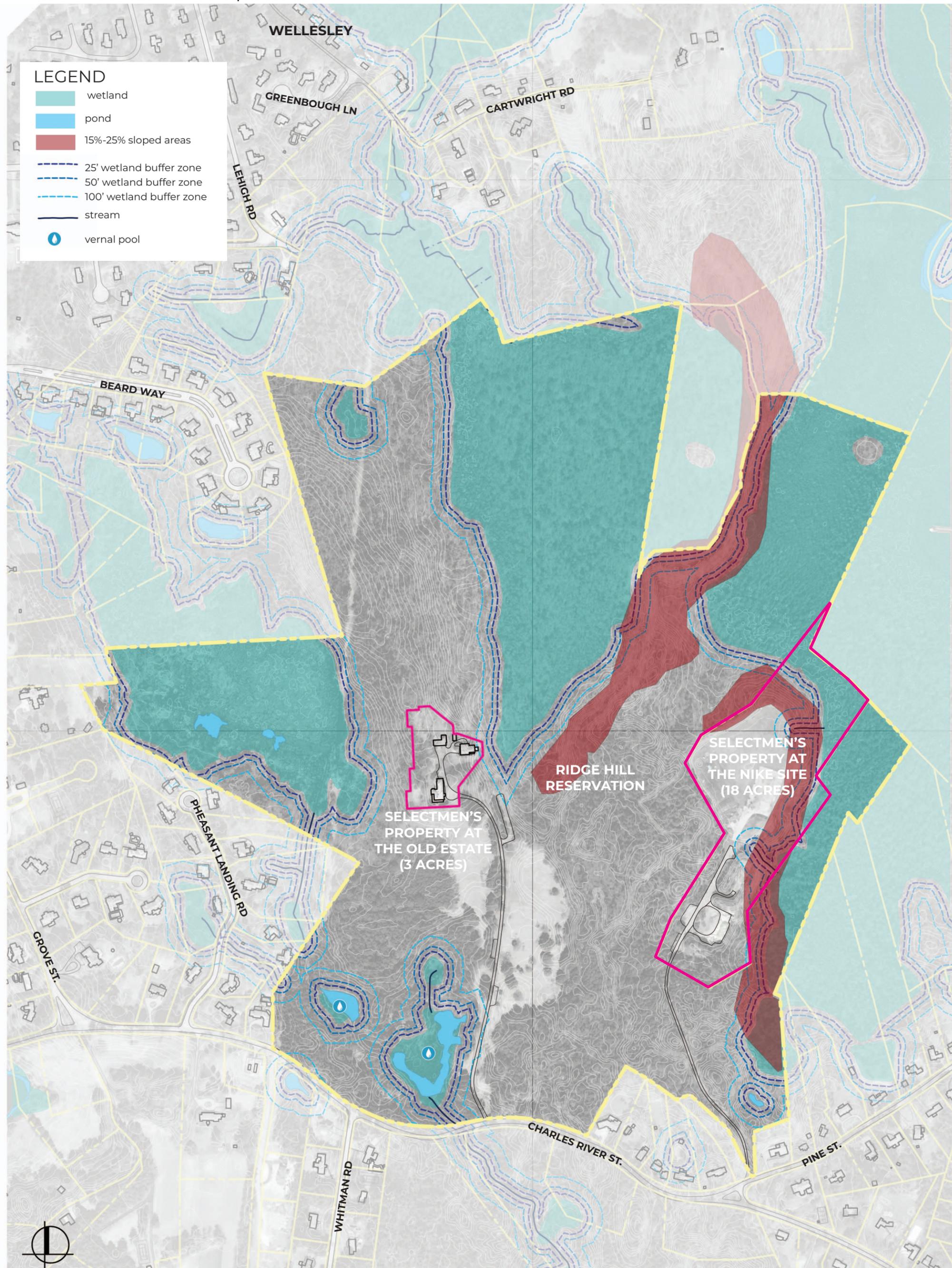


FIGURE 9 | EXISTING CONDITIONS
SLOPES: 15%-25%



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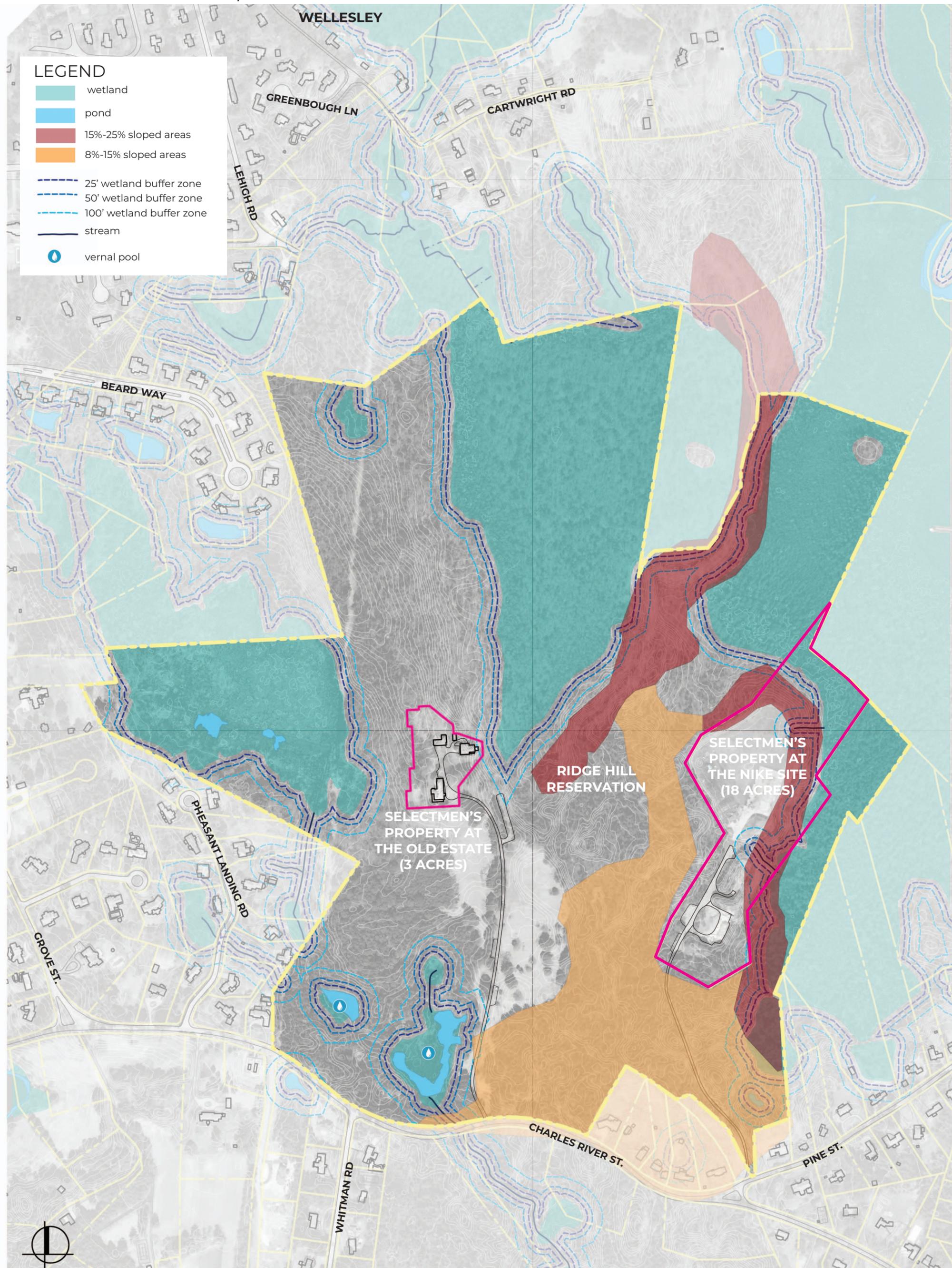


FIGURE 10 | EXISTING CONDITIONS
SLOPES: 8%-15%



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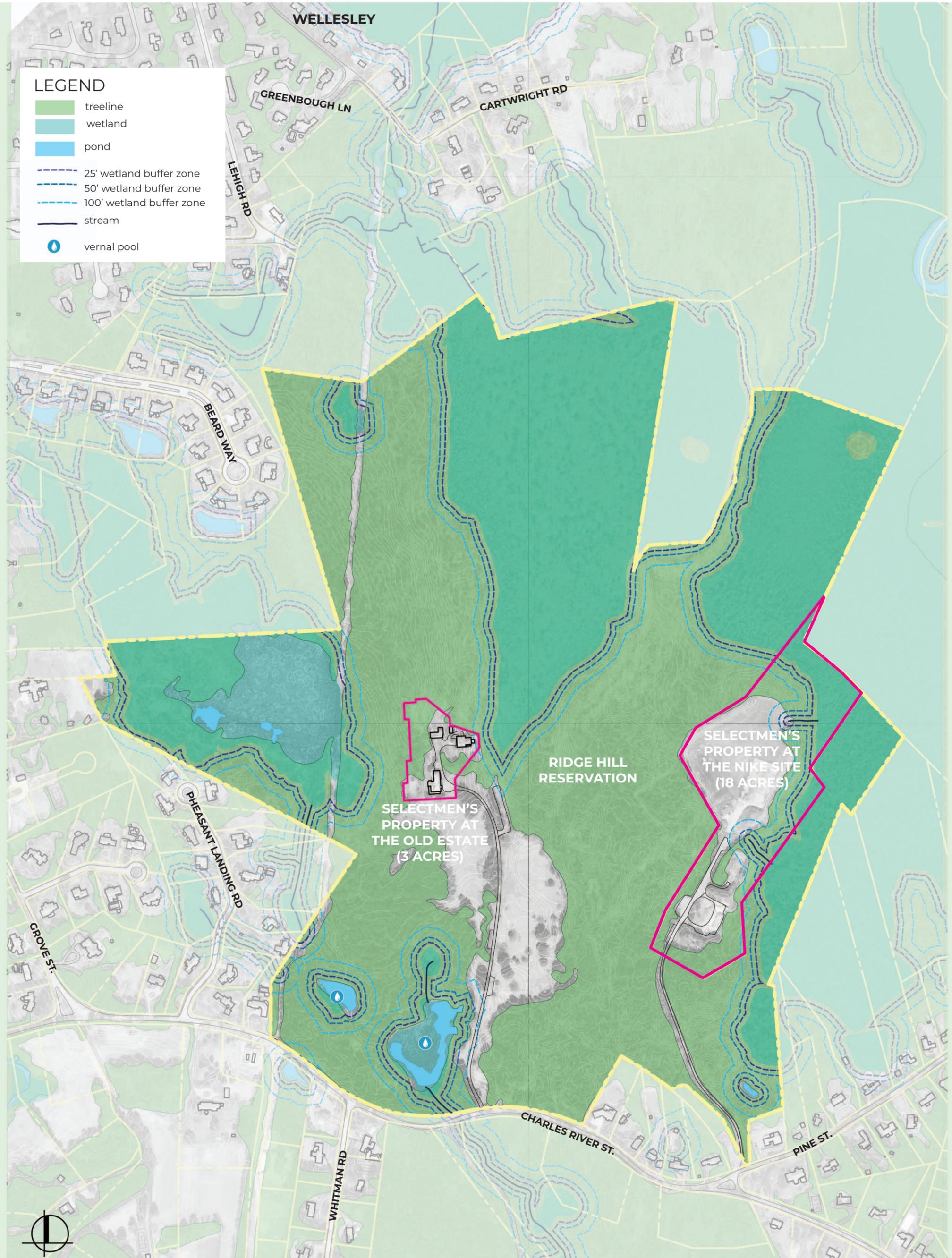


FIGURE 11 | EXISTING CONDITIONS
TREELINE



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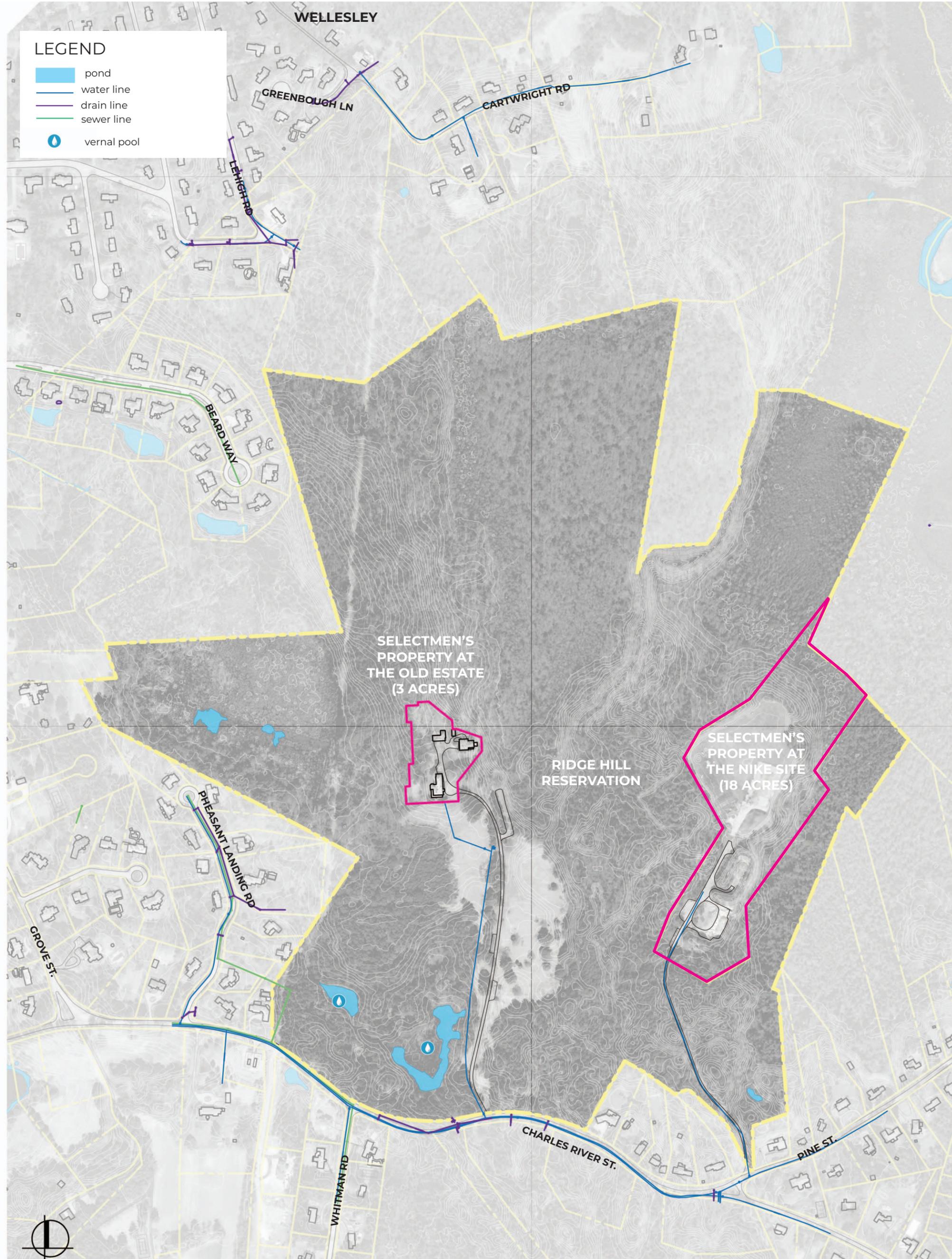


FIGURE 12 | EXISTING CONDITIONS
UTILITIES



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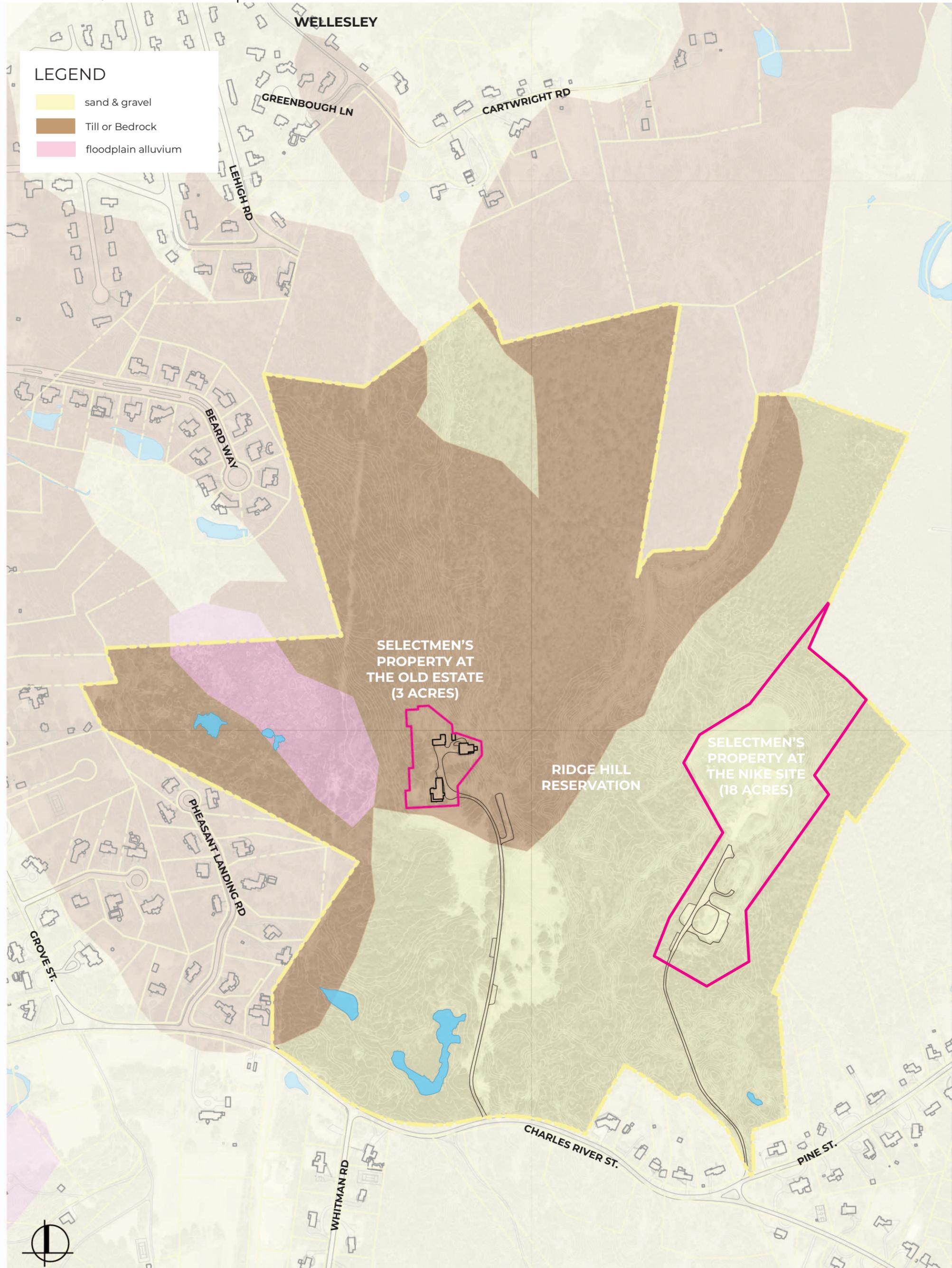


FIGURE 13 | EXISTING CONDITIONS
SOILS MAP



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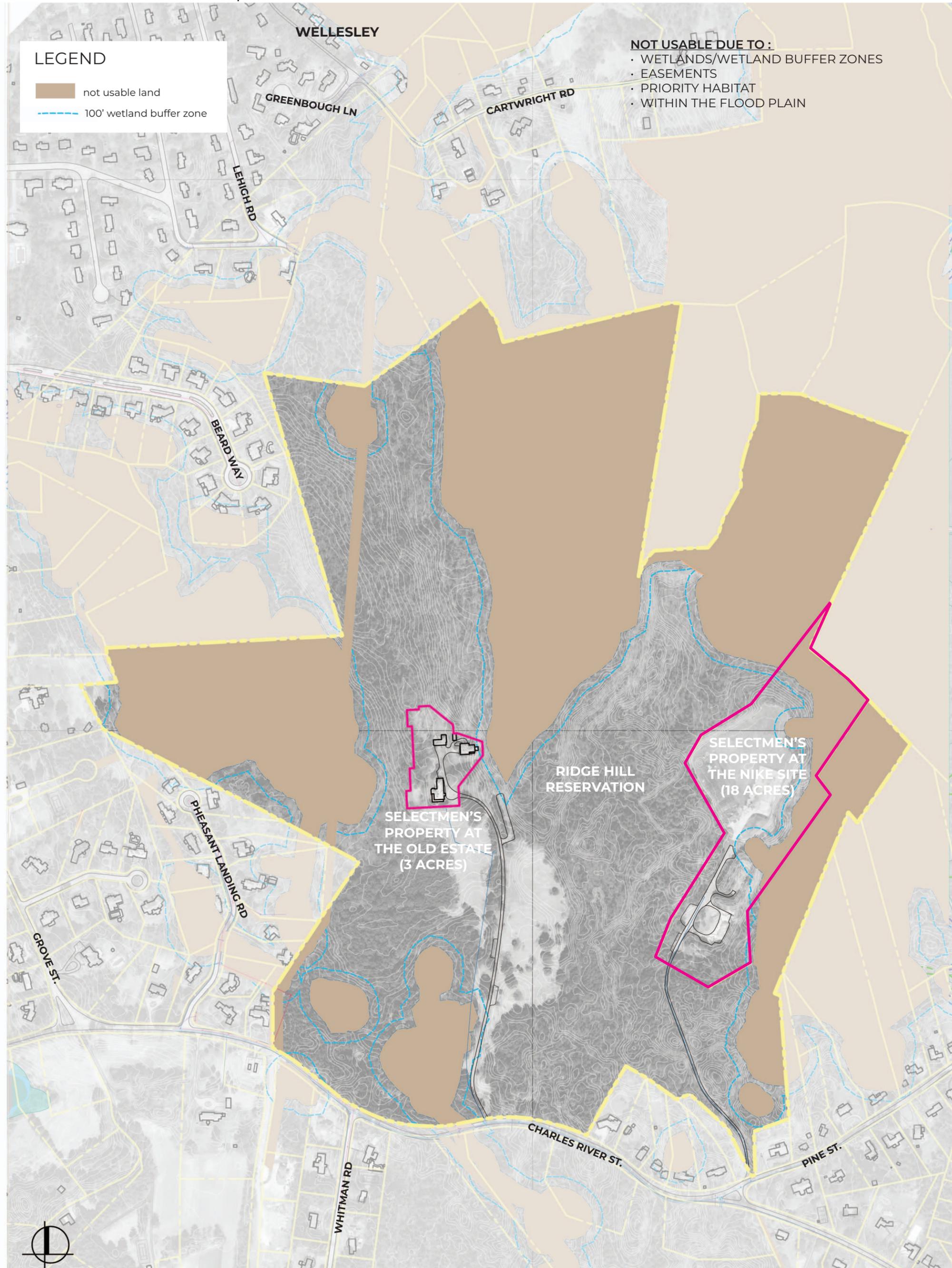


FIGURE 14 | SITE ASSESSMENT
NOT USABLE



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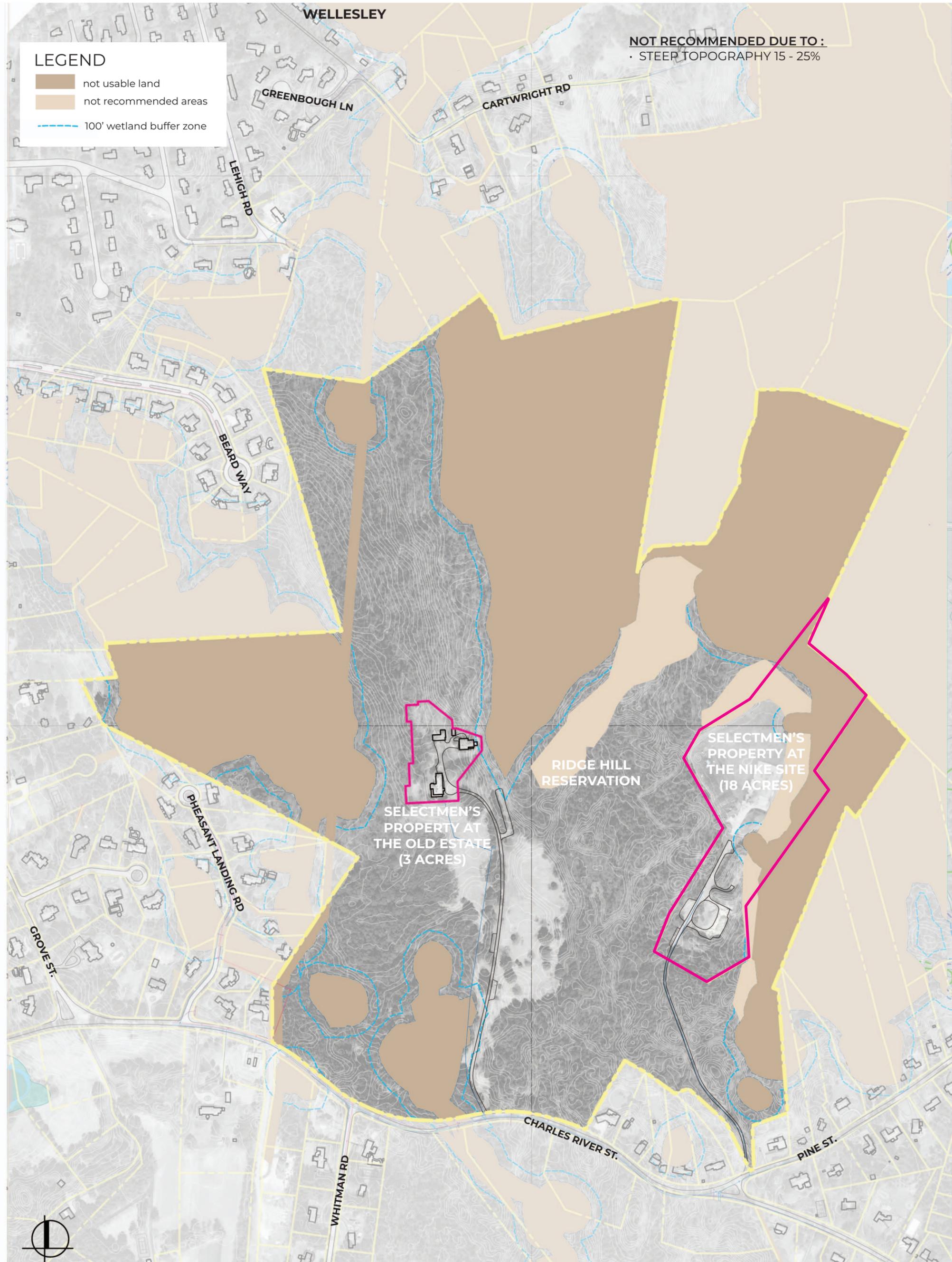


FIGURE 15 | SITE ASSESSMENT
NOT RECOMMENDED



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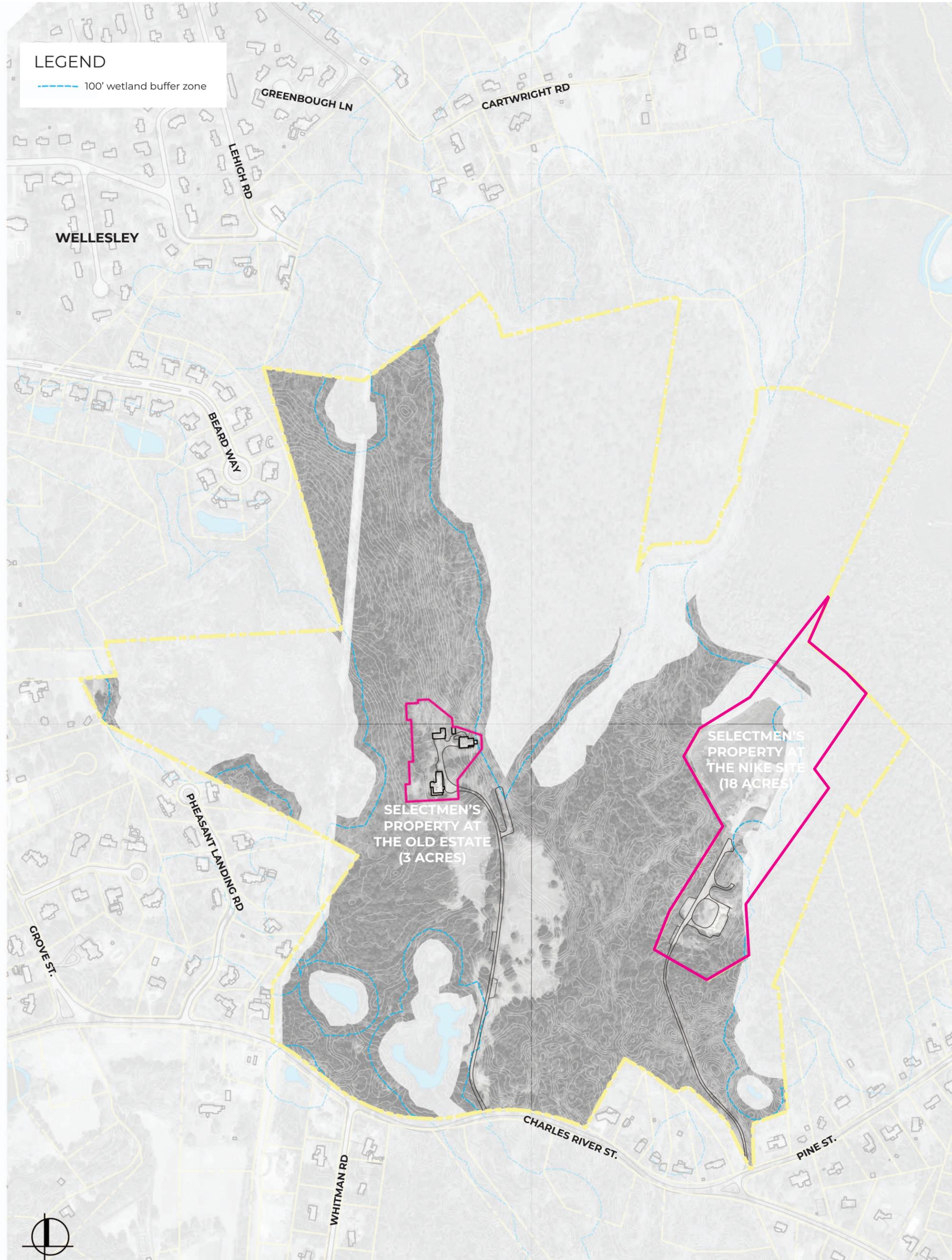


FIGURE 16 | SITE ASSESSMENT
REMAINING LAND



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LEGEND

-  eliminated area
-  100' wetland buffer zone

ELIMINATED DUE TO:

- SIZE OF PARCELS LESS THAN 3 ACRES
- CONFIGURATION IS TOO NARROW

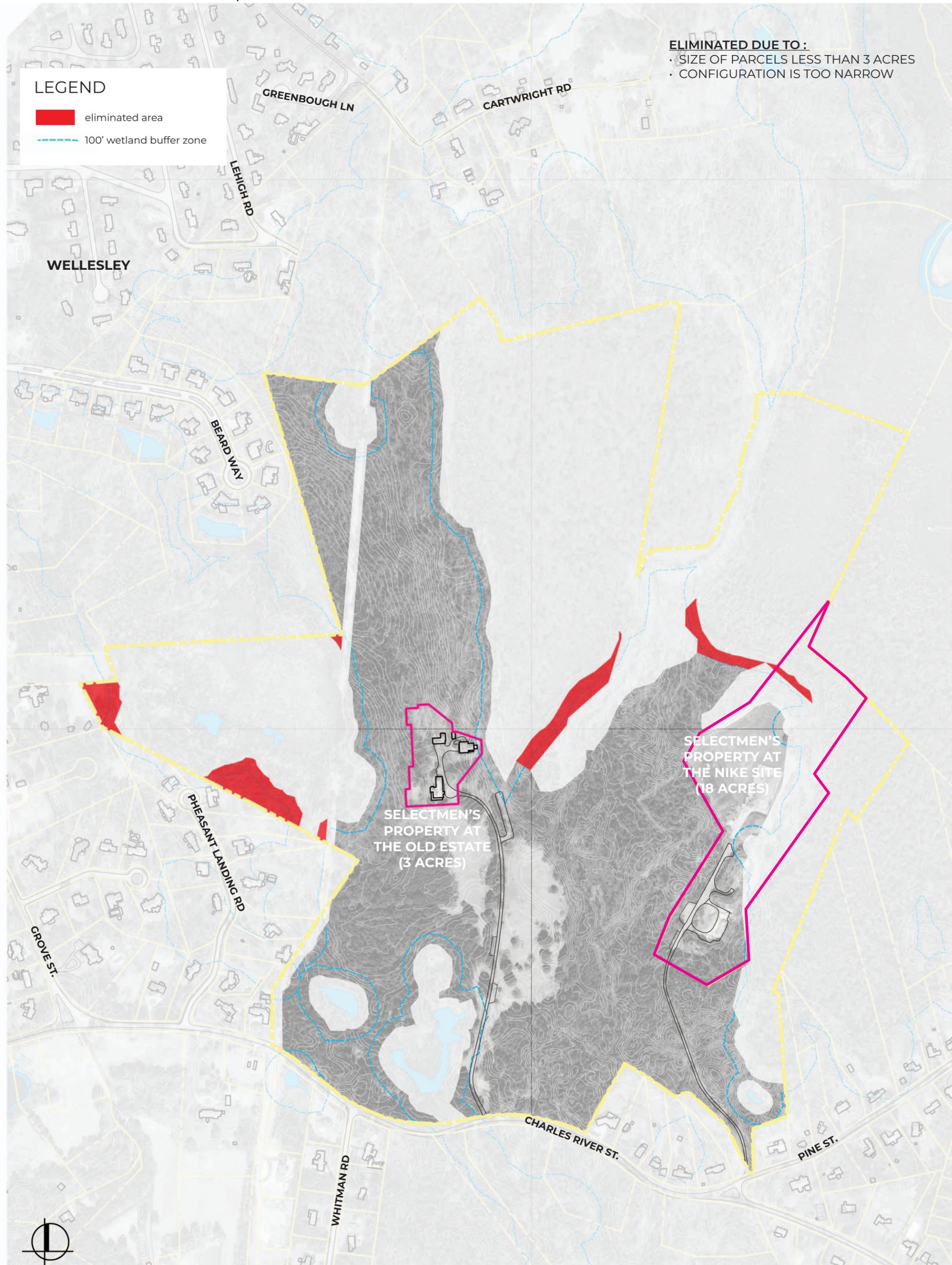


FIGURE 17 | SITE ASSESSMENT
ELIMINATION 1: SIZE & CONFIGURATION



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LEGEND

- eliminated area
- 100' wetland buffer zone

ELIMINATED DUE TO:

- LACK OF REASONABLE ACCESS TO THE PARCEL
- SURROUNDING CONSTRAINTS SUCH AS WETLANDS AND EASEMENTS

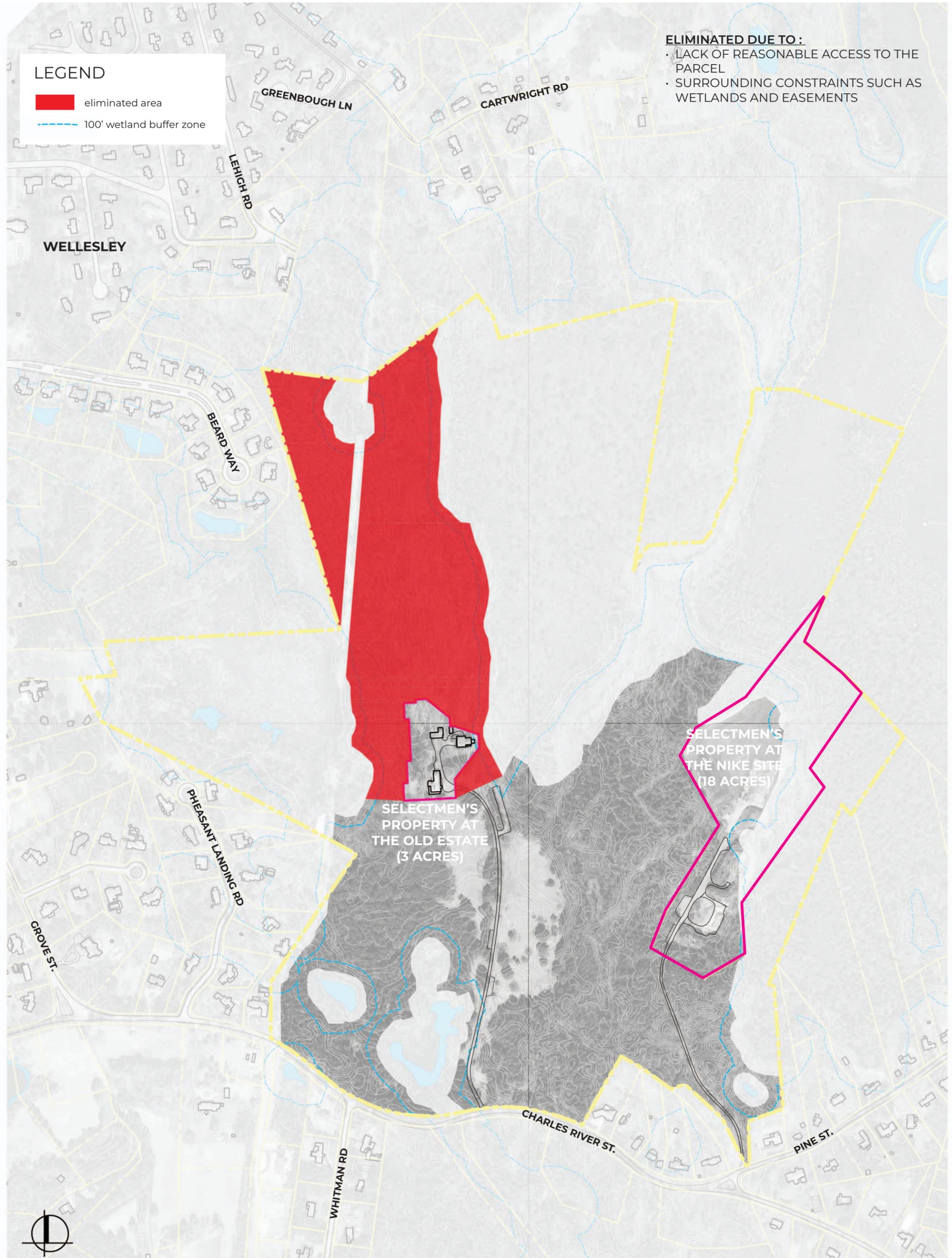


FIGURE 18 | SITE ASSESSMENT
ELIMINATION 2: ACCESS & CONSTRAINTS



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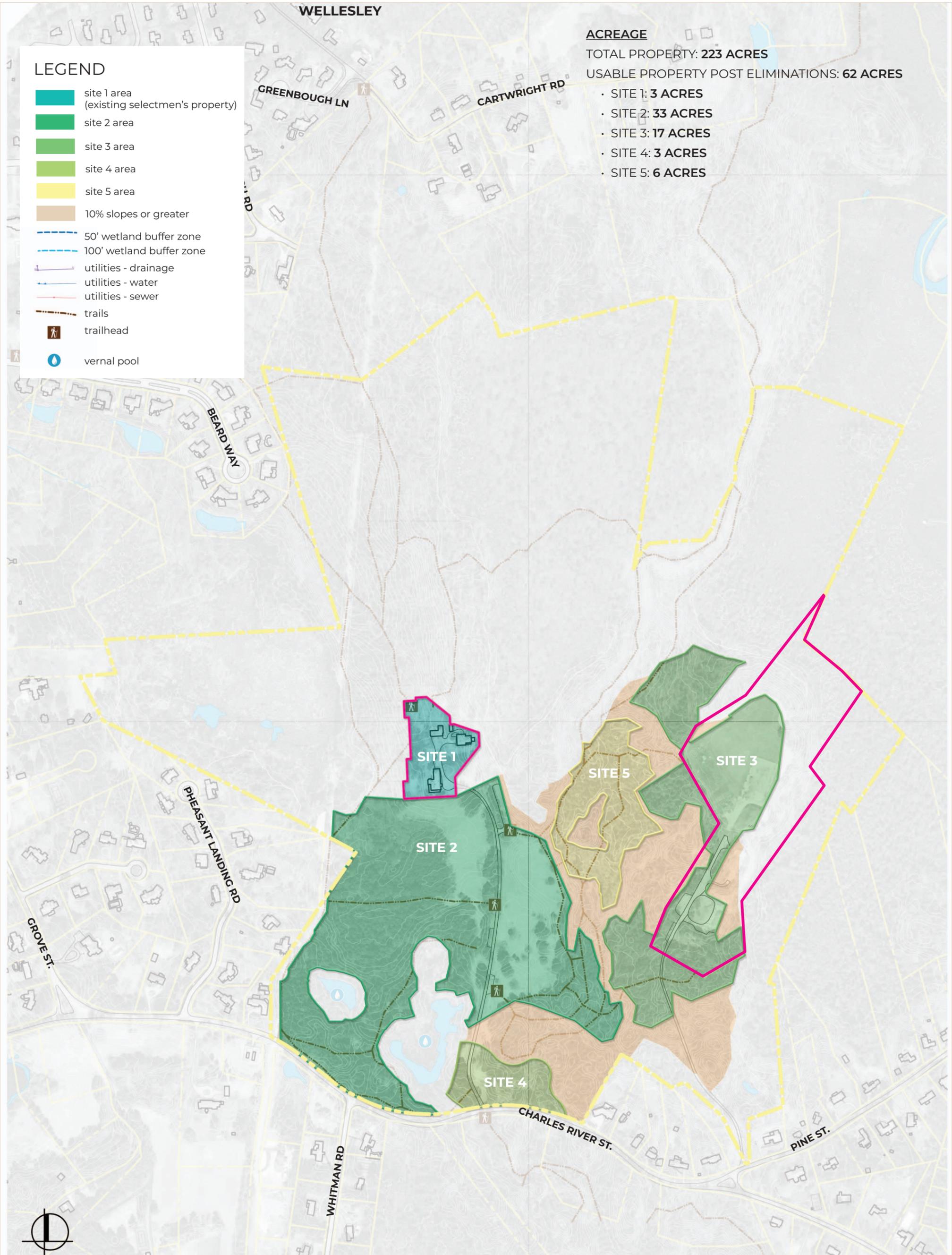
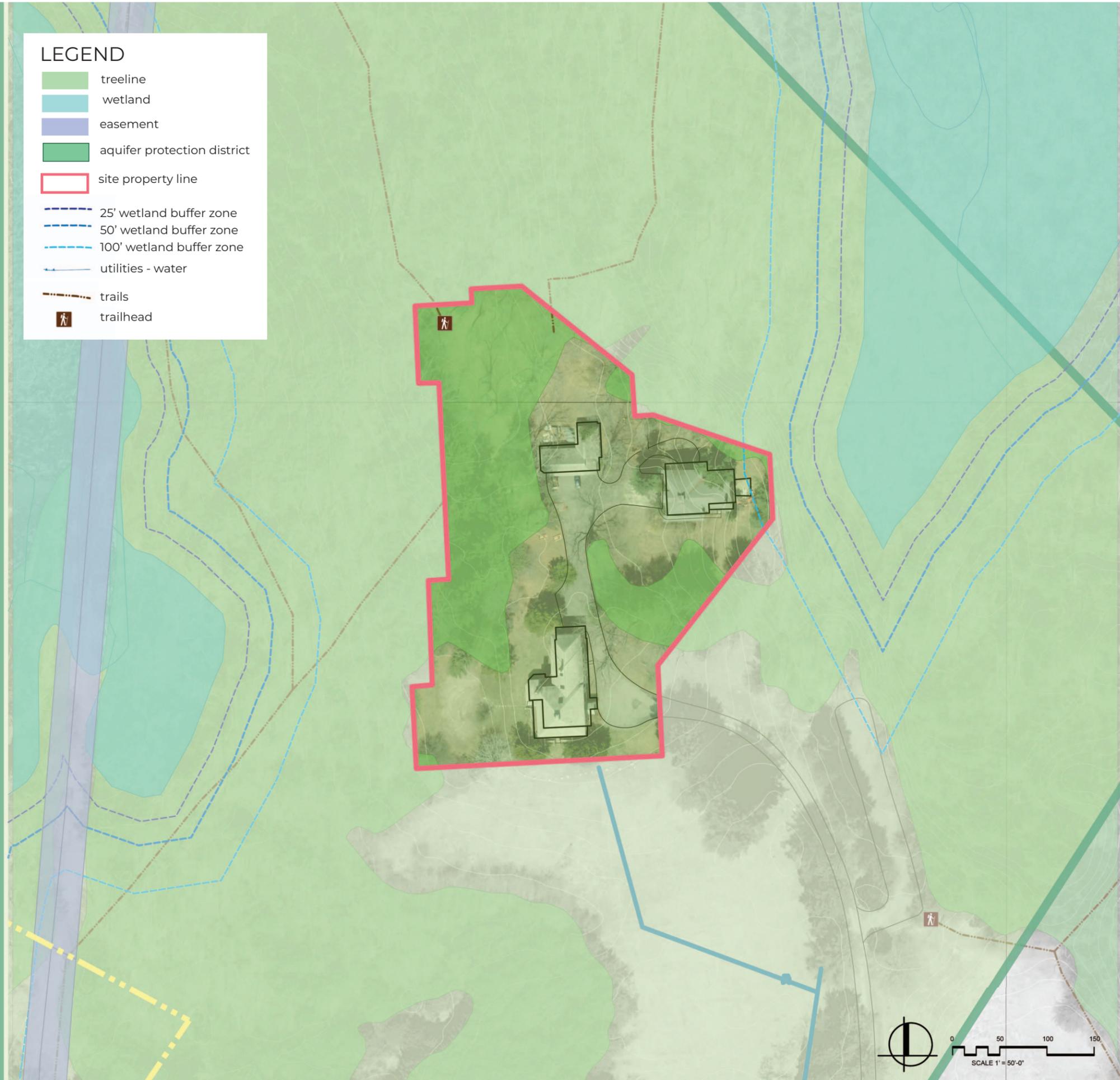


FIGURE 19 | PREFERRED SITES
SITES 1-5



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SITE INVENTORY

EXISTING SELECTMEN'S PROPERTY AT THE OLD ESTATE

AREA: **3 acres**

VEGETATED AREA: **1.2 acres**

PAVED AREA: **.3 acres**

BUILDINGS: **3 existing buildings (12,765 sf combined)**

EXPANSION AREA WITHIN 500' RADIUS: **yes**

UTILITIES: **see summary of utilities information**

SITE OPPORTUNITIES

- Already a disturbed site
- Possible reuse of some buildings
- On "high" ground; relatively flat area
- At "heart" of overall site; centrally located within Reservation
- Well screened from all directions
- Existing balance between disturbed and undisturbed areas
- Open/ good sun exposure
- Minimal impacts to existing trails
- Well screened from adjacent residential neighborhoods (Beard Way and Pheasant Landing in particular)
- Existing (limited) utilities
- Room for expansion

SITE CONSTRAINTS

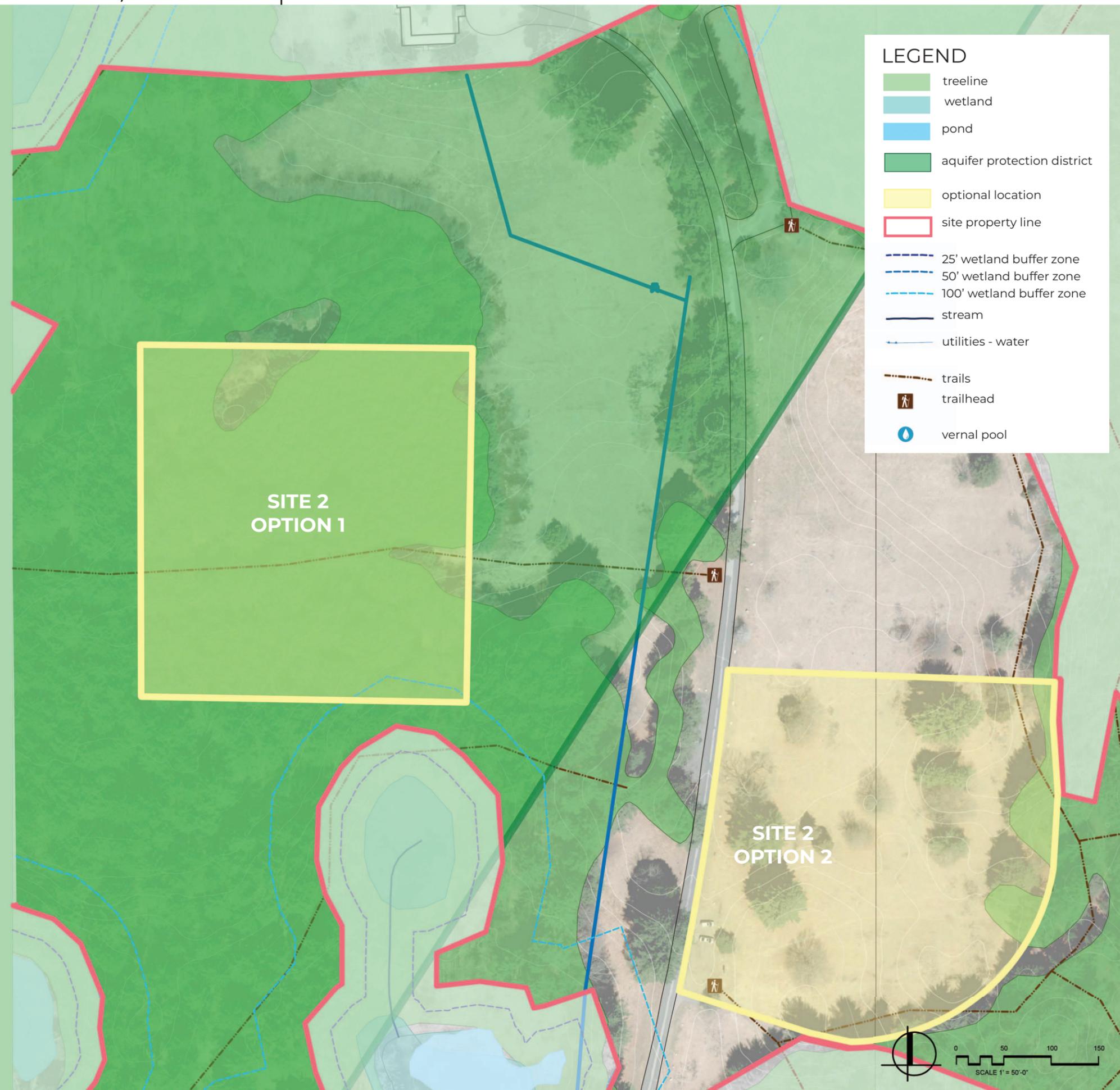
- Located deep into property; long access drive required (from Charles River Road)
- Additional utilities required
- Located between 2 wetland areas; within Aquifer Protection Overlay District
- Costs associated with demolishing existing building(s)

FIGURE 20 | PREFERRED SITES
SITE 1 ENLARGEMENT



RIDGE HILL / NIKE PROPERTY ASSESSMENT

Needham, Massachusetts | June 2018



SITE INVENTORY OPTION 1- TYPICAL WOODED

AREA: **3 acres of 33 acres total site 2**
 VEGETATED AREA: **2.8 acres**
 UTILITIES: **see summary of utilities information**

SITE OPPORTUNITIES (OPTIONS 1 & 2)

- Proximity to Charles River Road
- Accessible from existing entry drive
- Balance of wooded and open areas
- Relatively flat/ gently rolling area
- Good sun exposure in meadows
- West edge accessible from Pine Street
- Minimal impacts to most existing trails
- Diversity of Reservation landscape (east edge)
- Access to existing (limited) utilities
- Room for expansion

SITE INVENTORY OPTION 2- TYPICAL OPEN MEADOW

AREA: **3 acres of 33 acres total site 2**
 VEGETATED AREA: **0.17 acres**
 UTILITIES: **see summary of utilities information**

SITE CONSTRAINTS (OPTIONS 1 & 2)

- Proximity to Pheasant Landing neighborhood on west edge
- Adjacent to two wetland areas (south/southwest)
- Contains numerous existing trails; particular cluster in SE corner
- Highly visible along existing route from Charles River Road into main parking area
- Existing meadows valued for birding and open views
- Additional utilities required

FIGURE 21 | PREFERRED SITES
SITE 2 ENLARGEMENT



RIDGE HILL / NIKE PROPERTY ASSESSMENT

Needham, Massachusetts | June 2018

SITE INVENTORY

OPTION 1- TYPICAL DISTURBED

AREA: **3 acres of 17 acres total site 3**
 VEGETATED AREA: **0.01 acres**
 UTILITIES: **see summary of utilities information**

SITE INVENTORY

OPTION 2- TYPICAL WOODED

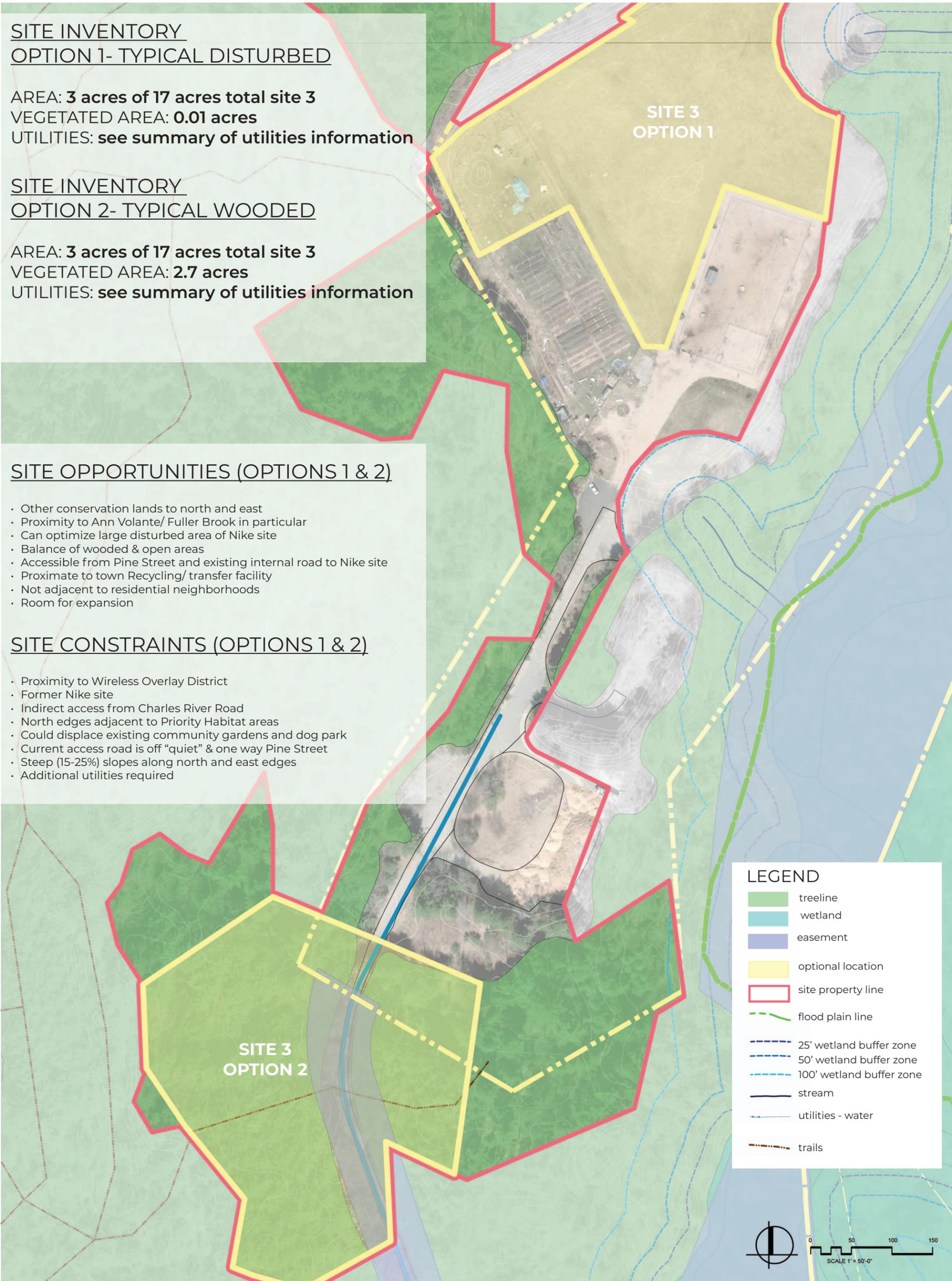
AREA: **3 acres of 17 acres total site 3**
 VEGETATED AREA: **2.7 acres**
 UTILITIES: **see summary of utilities information**

SITE OPPORTUNITIES (OPTIONS 1 & 2)

- Other conservation lands to north and east
- Proximity to Ann Volante/ Fuller Brook in particular
- Can optimize large disturbed area of Nike site
- Balance of wooded & open areas
- Accessible from Pine Street and existing internal road to Nike site
- Proximate to town Recycling/ transfer facility
- Not adjacent to residential neighborhoods
- Room for expansion

SITE CONSTRAINTS (OPTIONS 1 & 2)

- Proximity to Wireless Overlay District
- Former Nike site
- Indirect access from Charles River Road
- North edges adjacent to Priority Habitat areas
- Could displace existing community gardens and dog park
- Current access road is off "quiet" & one way Pine Street
- Steep (15-25%) slopes along north and east edges
- Additional utilities required



LEGEND

- treeline
- wetland
- easement
- optional location
- site property line
- flood plain line
- 25' wetland buffer zone
- 50' wetland buffer zone
- 100' wetland buffer zone
- stream
- utilities - water
- trails

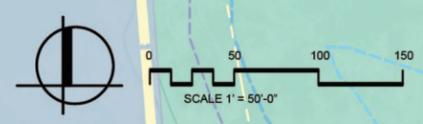
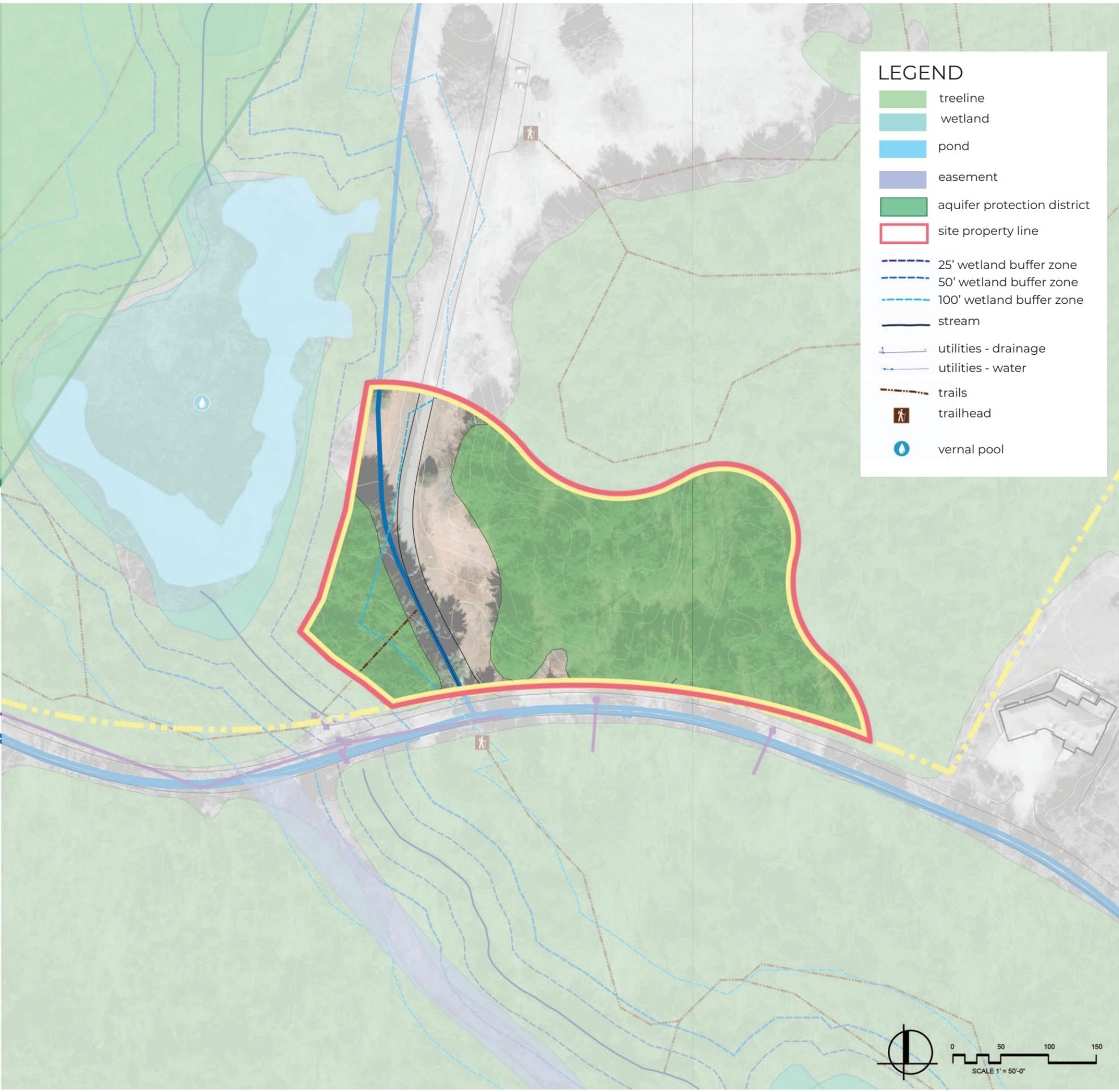


FIGURE 22 | PREFERRED SITES
 SITE 3 ENLARGEMENT



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Needham, Massachusetts | June 2018



SITE INVENTORY

AREA: **3 acres**
 VEGETATED AREA: **2.2 acres**
 UTILITIES: **see summary of utilities information**

SITE OPPORTUNITIES

- High visibility along Charles River Road
- Significant Charles River Road frontage
- On "high" ground
- Accessible from existing entry drive
- Could be accessed from existing Pine Street entrance
- Keeps remaining Reservation property contiguous
- Minimal impact to existing trails

SITE CONSTRAINTS

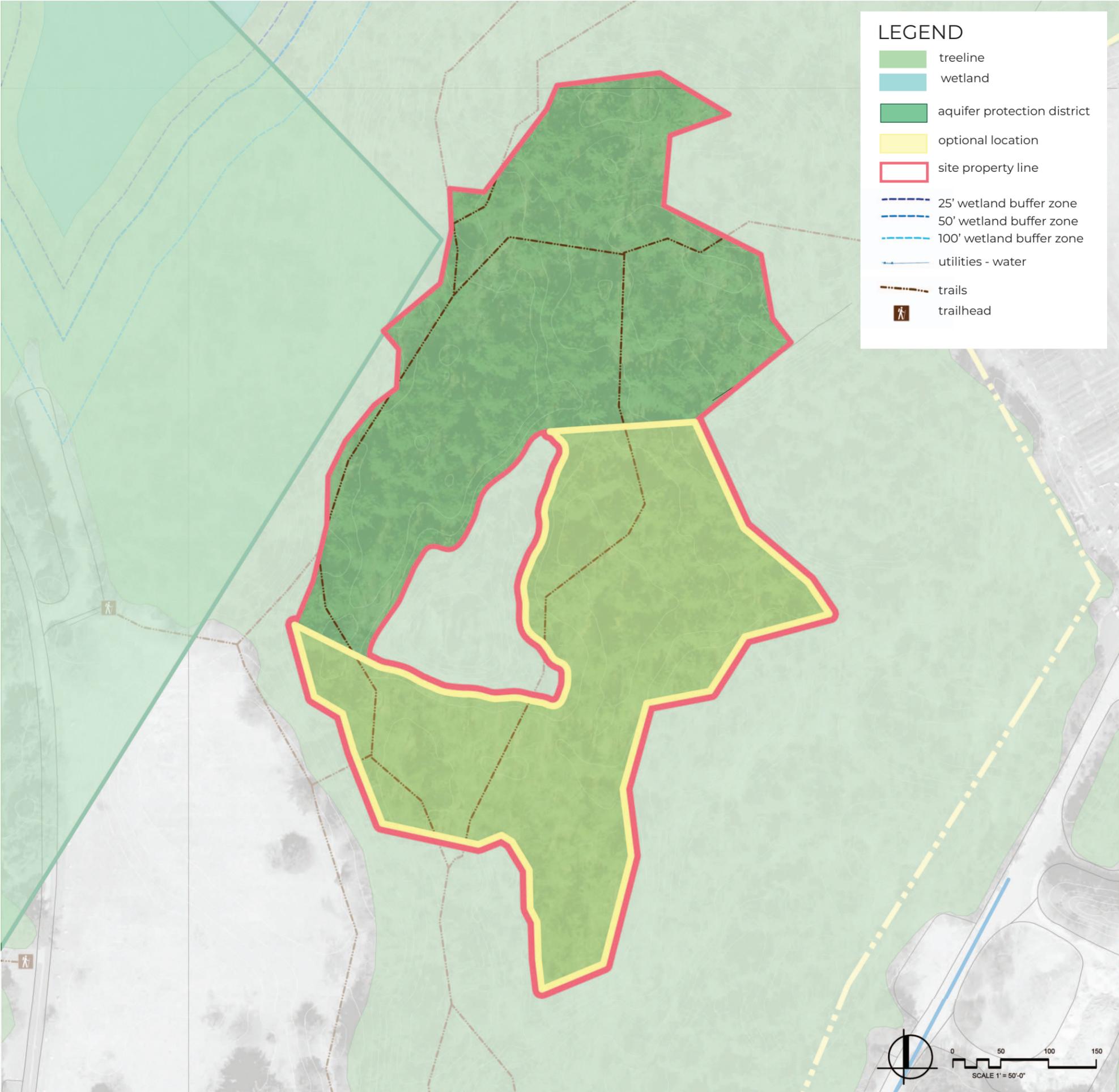
- High visibility along Charles River Road
- Adjacent to Charles River Road / Pine Street residential area
- Mostly wooded site
- Impacted by volume and noise of Charles River Road traffic
- No room for expansion within currently identified preferred area
- Additional utilities required

FIGURE 23 | PREFERRED SITES
 SITE 4 ENLARGEMENT



RIDGE HILL / NIKE PROPERTY ASSESSMENT

Needham, Massachusetts | June 2018



SITE INVENTORY

AREA: **3 acres of 6 acres total site 5**
 VEGETATED AREA: **3 acres**
 UTILITIES: **see summary of utilities information**

SITE OPPORTUNITIES

- Accessible from both existing Nike/ Pine Street and Reservation/ Charles River Road entry drives
- Centrally located within property
- Convenient to both Reservation parkland and disturbed / more active Nike site
- Topographically interesting
- Room for expansion

SITE CONSTRAINTS

- Wooded
- In middle of property
- Requires lengthy access road
- Isolated/ low visibility
- Requires additional utilities

FIGURE 24 | PREFERRED SITES
 SITE 5 ENLARGEMENT



3

Study of Potential Site Uses Per Town Zoning

A. POTENTIAL SITE USES SUMMARY

This assessment included review of the most current Needham Town Zoning By-Laws and Amendments. As previously described, the purpose of the assessment was to evaluate the property for potential areas of future development, and then have it serve as a guide in the future when the Town considers current and future uses of this open space resource. Although Weston & Sampson was asked to look at potential development/reuse of the Selectmen-controlled 3-acre old estate area in particular, as well as look at a possible exchange with another 3-acre parcel located anywhere within this part of the Reservation, the Town did not have a specific program in mind. An important goal was to ensure that the 3-acre parcel, wherever located, be advantageously considered in conjunction with the 18-acre Nike so that, together, these two Selectmen properties could be optimized for more active use, while being sensitive to the passive use of the Reservation in general.

The scope of work undertaken by Weston & Sampson for this next step in the assessment process included:

- Identification of options for types and sizes of structures and facilities that could potentially be constructed within the study area.

Without a particular use program to focus on, Weston & Sampson approached this task by considering all permissible uses described in the Town of Needham By-Laws. This property is zoned SRA (Single Residence – A) and a summary of the By-Laws is shown in Section 3.C Zoning Summary Chart. The full By-Laws can be found on the Town website. In this Report, five broad categories of potential use are outlined, and specific uses within each category are described.

In summary, they are:

1. Agriculture (for example: farmers market; greenhouses; Christmas sales)
2. Public / Semi Public / Institutional (for example: religious institution; municipal structure)
3. Residence (for example: single family residence; shared elderly; residential hospice)
4. Manufacturing (for example: multiple municipal buildings or uses)

5. Accessory (for example: occupation within home; use of room in home for business)

B. BUILDOUT OPTIONS SUMMARY

For each potential use, the By-Laws require certain criteria to be met with respect to building dimensions, parking, and landscaped space; some uses require a Special Permit. Because a range of uses are allowed, Weston & Sampson chose to study only a few select ones. Those considered were based on the level of demands each would place on the property; for the purposes of this study, we assumed that if the highest demand uses could be accommodated on the property then, in all likelihood, the lower-demand uses would fit as well. Of note, Weston & Sampson's selections were based on highest demand across all five categories, rather than choosing the one highest demand in each category, because the former ensured we studied the most demanding uses overall.

Taking all of this into consideration, Weston & Sampson selected these five high-demand uses:

- Option A – Greenhouse Operation (see Figure 26)
- Option B – Place of Assembly (see Figure 27)
- Option C – Community Recreation Center (see Figure 28)
- Option D – Elderly/Hospice Care (see Figure 29)
- Option E – Public Works Facility (see Figure 30)

First, a generic buildout option (Figure 25) was diagrammed to illustrate the maximum building, parking, and landscape areas allowed on a prototypical 3-acre site. A 3-acres plot was used as it is the size of the Selectmen's property (the old mansion site) being considered for re-use/development. Then, for each of the five options, a diagram was produced, also using a prototypical 3-acre site. The By-Laws criteria for each option (described earlier) was illustrated. The simplistic diagrams allowed for an "apples-to-apples" comparison of space requirements.

In summary, these were the findings:

- Highest demand for building space: Option E – Public Works Facility (Figure 30)
- Highest demand for parking space: Option E – Public Works Facility (Figure 30)
- Highest demand for landscape space: Option A – Greenhouse Operation (Figure 26)

Even though this exercise showed that each option had quite different building, parking, and landscape square footage requirements, it was determined that all five options could be accommodated on a 3-acre parcel, therefore making all permissible uses per the Zoning By-Laws ripe for consideration as possible program choices by the Town, if desirable.

C. ZONING SUMMARY CHART

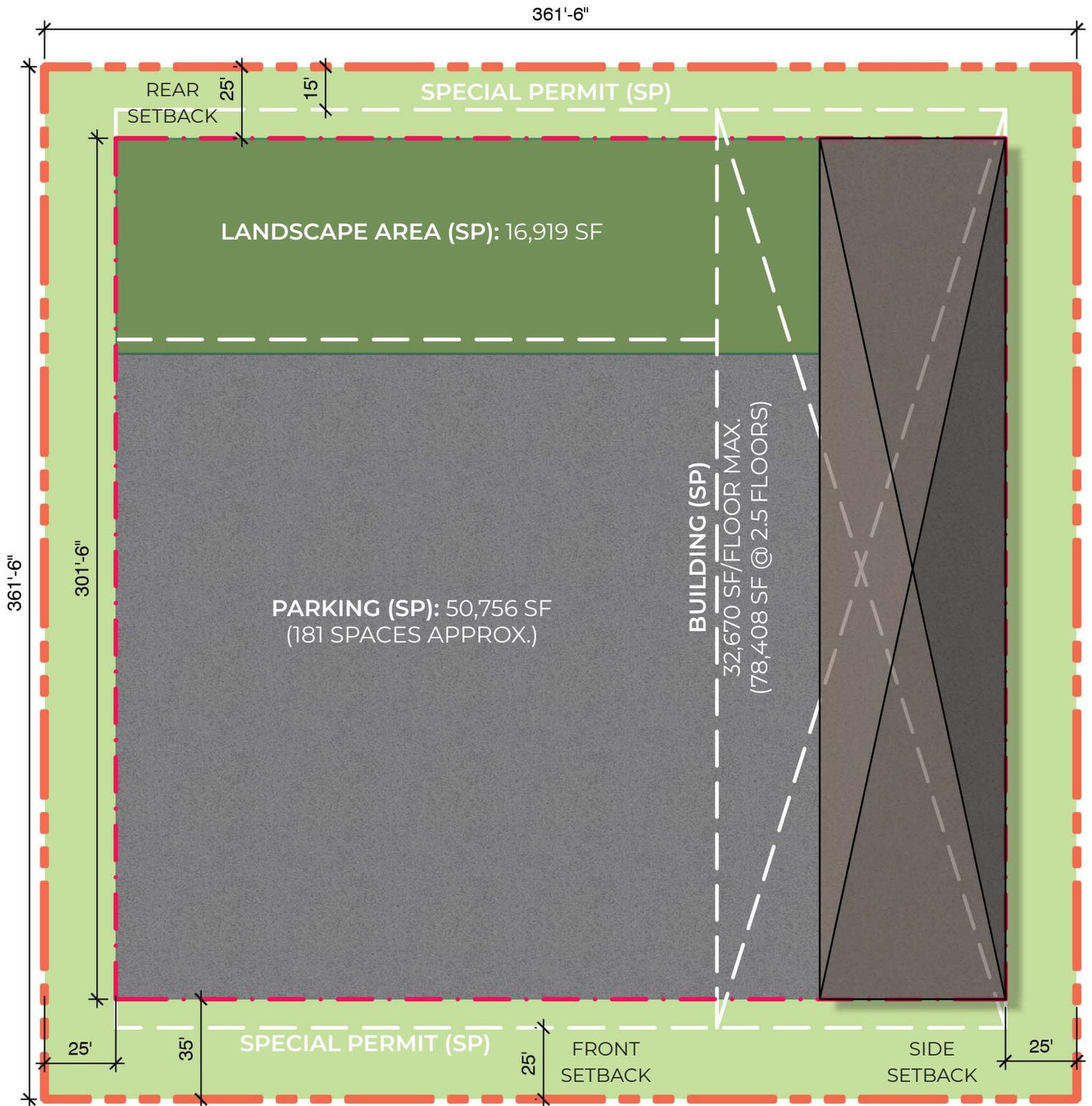
	Zone: SRA Single Family Residence Use	Special Permit Required	Areas 1-5	Specific Parking	Dimensional Regs (May 2017 Amendment)
	Agriculture			1 parking space per 300 SF gross area	Min Lot Area = 1 Acre (43,560 SF) Min Frontage = 150 ft. Min Lot Width = 120 ft. Front Setback = 35ft (SP 30ft) Side Setback = 25ft Rear Setback = 25ft (SP 15ft)
1.	Farmers Market	SP			
2.	Farm/ Greenhouse/ Nursery/ Truck Garden				
3.	Salesroom/ Stand for Agriculture/ Horticulture				
4.	Christmas Sales at above				
5.	Christmas Sales by Non-Profit & from Elsewhere *outdoor display on ex. parking (incl. required parking & loading)	SP			
	Public/ Semi Public/ Institutional				Max FAR = 0.30 (SP 0.60 municipal) Max % Lot Cov = 15% (SP 25% municipal) Max Stories = 2-1/2 Max Height = 35ft Overall Parking Space = 9'W x 18.5'L Aisle = 25'W (90°) Setback = 10' from front / street, 4' rear / sides, 5' from buildings on site Per 10+ parking spaces, add 10% landscaping Per 20+ parking spaces, add 25% landscaping Dimensional Regs (May 2017 Amendment)
1.	Religious Institution				
2.	School				
3.	Library/ Museum				
4.	Park/ Playground/ Municipal Structure		4 parking spaces per court <u>if</u> an indoor athletic facility; 1 parking space per 150 SF gross area <u>plus</u> 1 parking space per 3 employees		
5.	Public Passenger Station				
6.	Childcare		Higher of half enrollment or half expected enrollment		
7.	Private School				
8..	Convalescence/ Nursing		1 parking space per 2 beds <u>plus</u> 1 parking space per 2 employees		
9.	Cemetery				
10.	Private Club (Non-Business)				

	Use	Special Permit Required	Areas 1-5	Specific Parking	
	Residence				Min Lot Area = 1 Acre (43,560 SF)
					Min Frontage = 150 ft.
1.	Single Family				
2.	PRD	SP			Min Lot Width = 120 ft.
3.	RC	SP			
4.	Shared Elderly (Max. 6 Residents) (max. 50 structures in Town)	SP			Front Setback = 35ft (SP 30ft)
5	Residential Hospice			1 parking space per 2 beds <u>plus</u> 1 parking space per 2 employees	Side Setback = 25ft Rear Setback = 25ft (SP 15ft)
	Manufacturing				
1.	Multiple Municipal Buildings or Municipal Use On A Lot			1 parking space per 400 SF gross area or ½ employee total (larger of two)	Max FAR = 0.30 (SP 0.60 municipal) Max % Lot Cov = 15% (SP 25% municipal)
	Accessory				
1.	Use of Room(s) in Residence for Business				Max Stories = 2-1/2
2.	Occupation Within Home				
3.	Boarders (Max. 4)	SP			Max Height = 35ft
4.	Other: Garage/ Shed				Overall Parking Space = 9'W x 18.5'L Aisle = 25'W (90°) Setback = 10' from front / street, 4' rear / sides, 5' from buildings on site Per 10+ parking spaces, add 10% landscaping Per 20+ parking spaces, add 25% landscaping
	Note: Max FAR: Special Permit; 0.60 FAR; municipal bldg or structure on min 1 acre (Amendment 2 Oct 17) Max % Lot Coverage: Special Permit; 25% max lot coverage; municipal bldg or structure on min 1 acre (Amendment 2 Oct 17)				

D. FIGURES

Buildout Options A through E are shown on Figures 25 through 30, and follow.

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 Needham, Massachusetts | June 2018



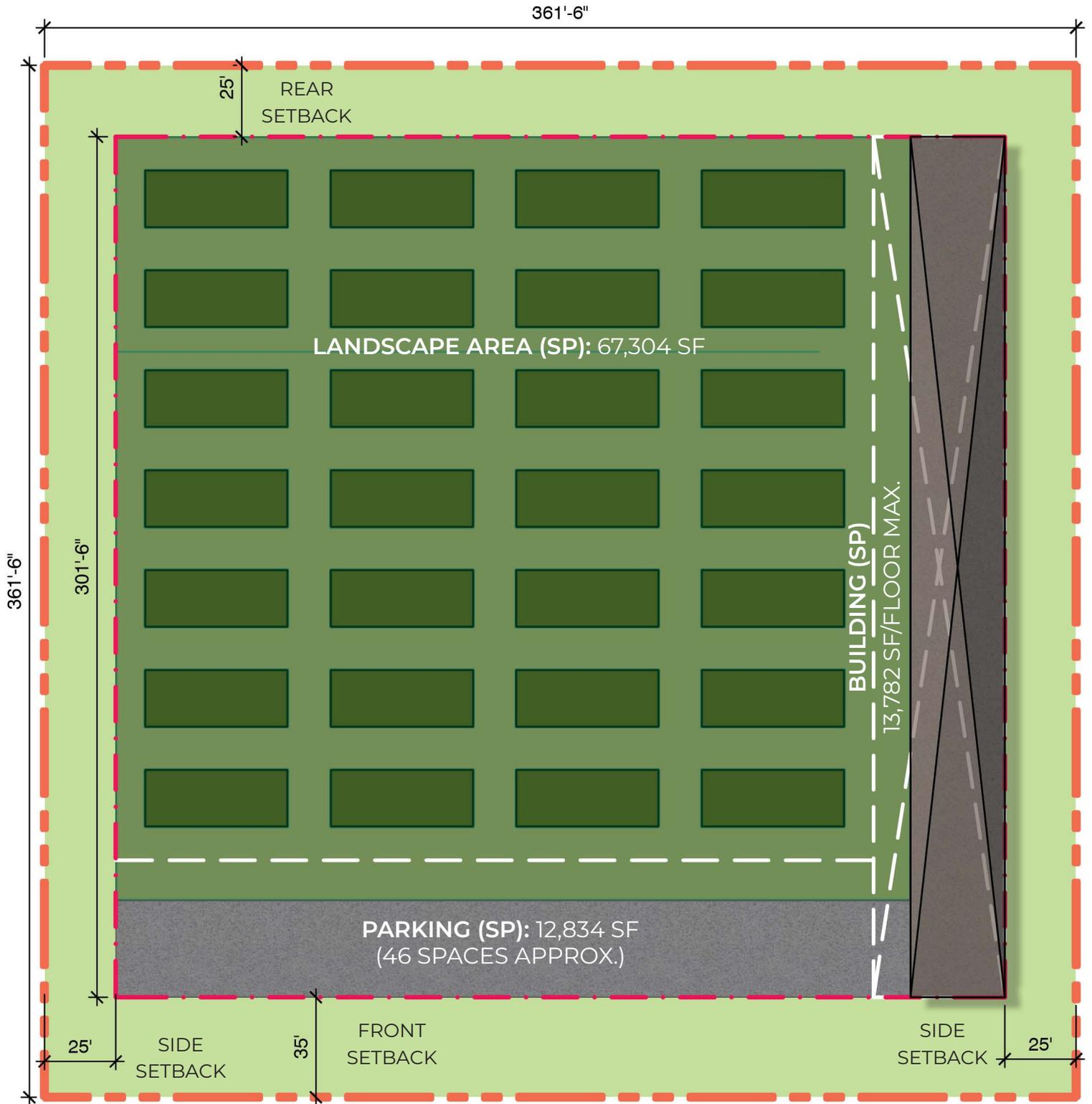
OVERALL SITE: 3 ACRES (130,680 SF)
BUILDING: 19,600 SF/ FLOOR MAX. (39,200 SF @ 2 FLOORS)
MAXIMUM PARKING: 55,739 SF (199 SPACES APPROX.)
LANDSCAPE AREA REQUIRED (25%): 18,580 SF

MAX. FAR: 39,204 SF
SP: 78,408 SF
MAX. % LOT COVERAGE: 19,600 SF
SP: 32,670 SF

FIGURE 25 | BUILDOUT OPTIONS
 GENERIC BUILDOUT



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 Needham, Massachusetts | June 2018



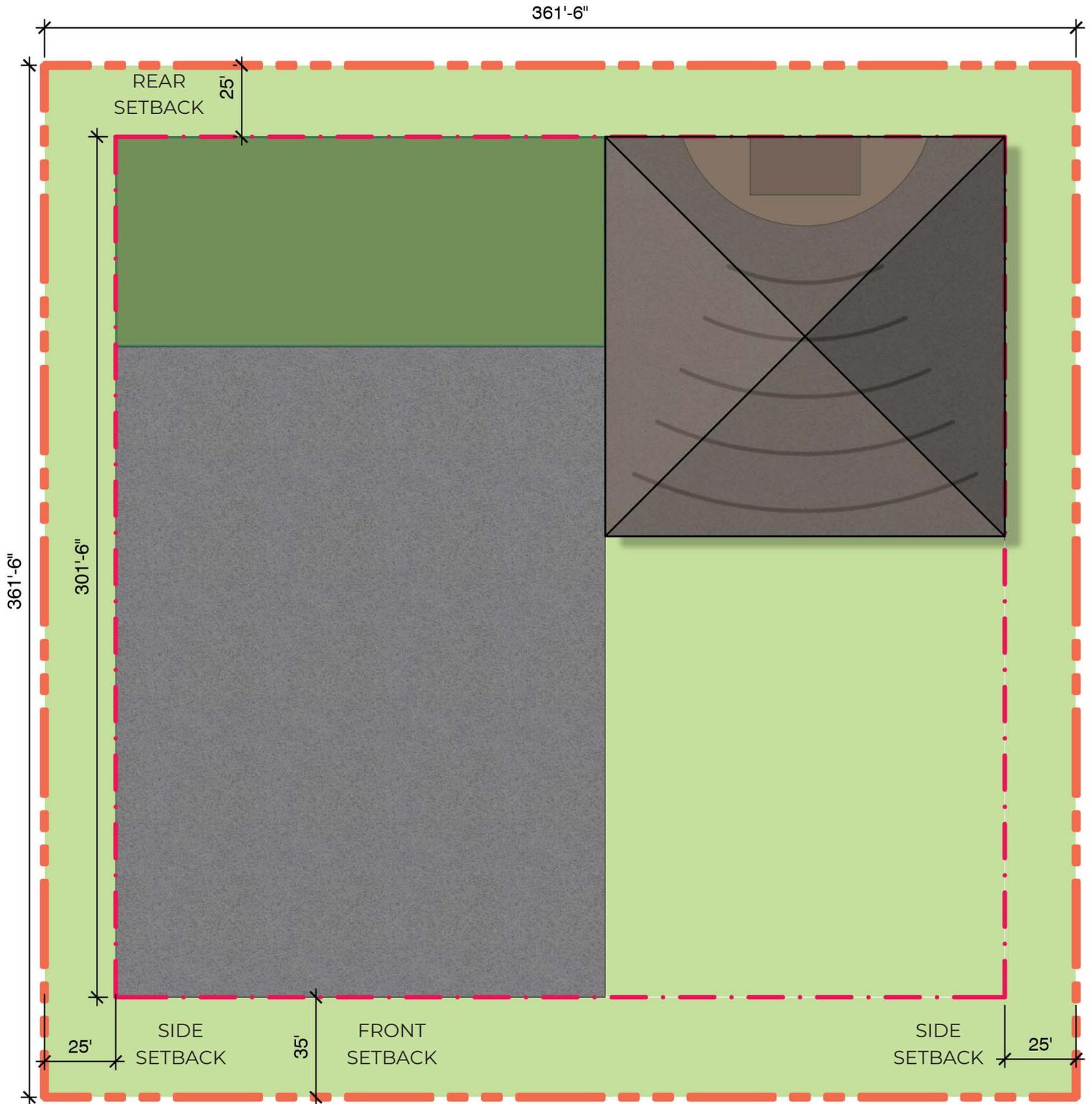
OVERALL SITE: 3 ACRES (130,680 SF)
BUILDING: 10,000SF/ FLOOR MIN.
PARKING: 9,207 SF (33 SPACES APPROX.)
 (1 SPACE PER 300 SF OF BUILDING)
LANDSCAPE AREA: 74,499 SF

MAX. FAR: 39,204 SF
MAX. % LOT COVERAGE: 19,600 SF



FIGURE 26 | BUILDOUT OPTIONS
 OPTION A | GREENHOUSE OPERATION

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 Needham, Massachusetts | June 2018



OVERALL SITE: 3 ACRES (130,680 SF)
BUILDING: 19,600SF/ FLOOR (APPROX. 1,500 SEATS)
PARKING: 39,200 SF (140 SPACES APPROX.)
 (1 SPACE PER 150 SF OF BUILDING + 1 SPACE PER 3 EMPLOYEES)
LANDSCAPE AREA: 35,117 SF (13,067 SF REQUIRED)

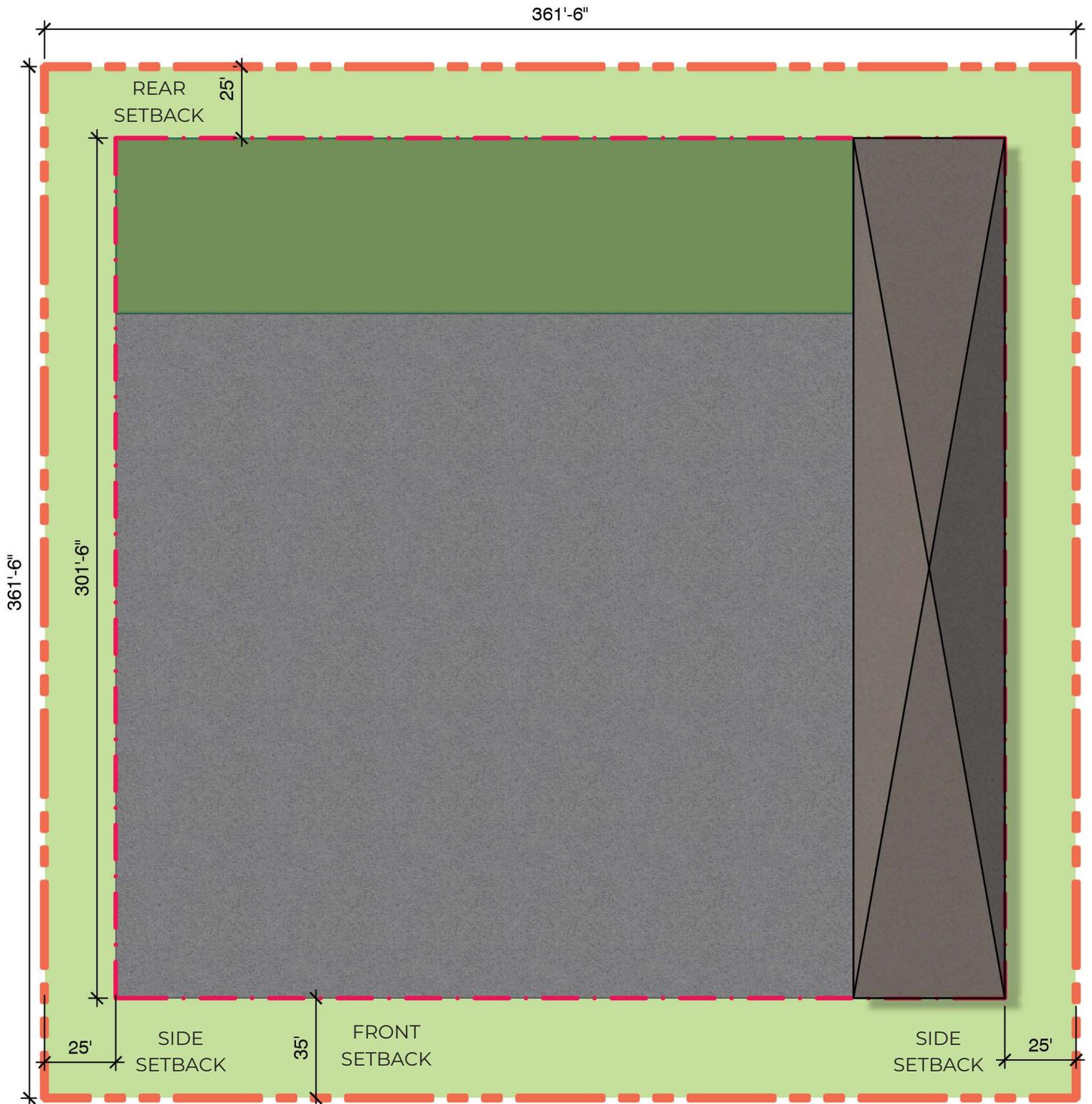
MAX. FAR: 39,204 SF
MAX. % LOT COVERAGE: 19,600 SF



FIGURE 27 | BUILDOUT OPTIONS
 OPTION B | PLACE OF ASSEMBLY

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Needham, Massachusetts | June 2018



OVERALL SITE: 3 ACRES (130,680 SF)
BUILDING: 15,900 SF/ FLOOR (31,800 @ 2 FLOORS)
PARKING: 62,160 SF (222 SPACES APPROX.)
 (1 SPACE PER 150 SF OF BUILDING + 1 SPACE PER 3 EMPLOYEES)
LANDSCAPE AREA: 15,540 SF

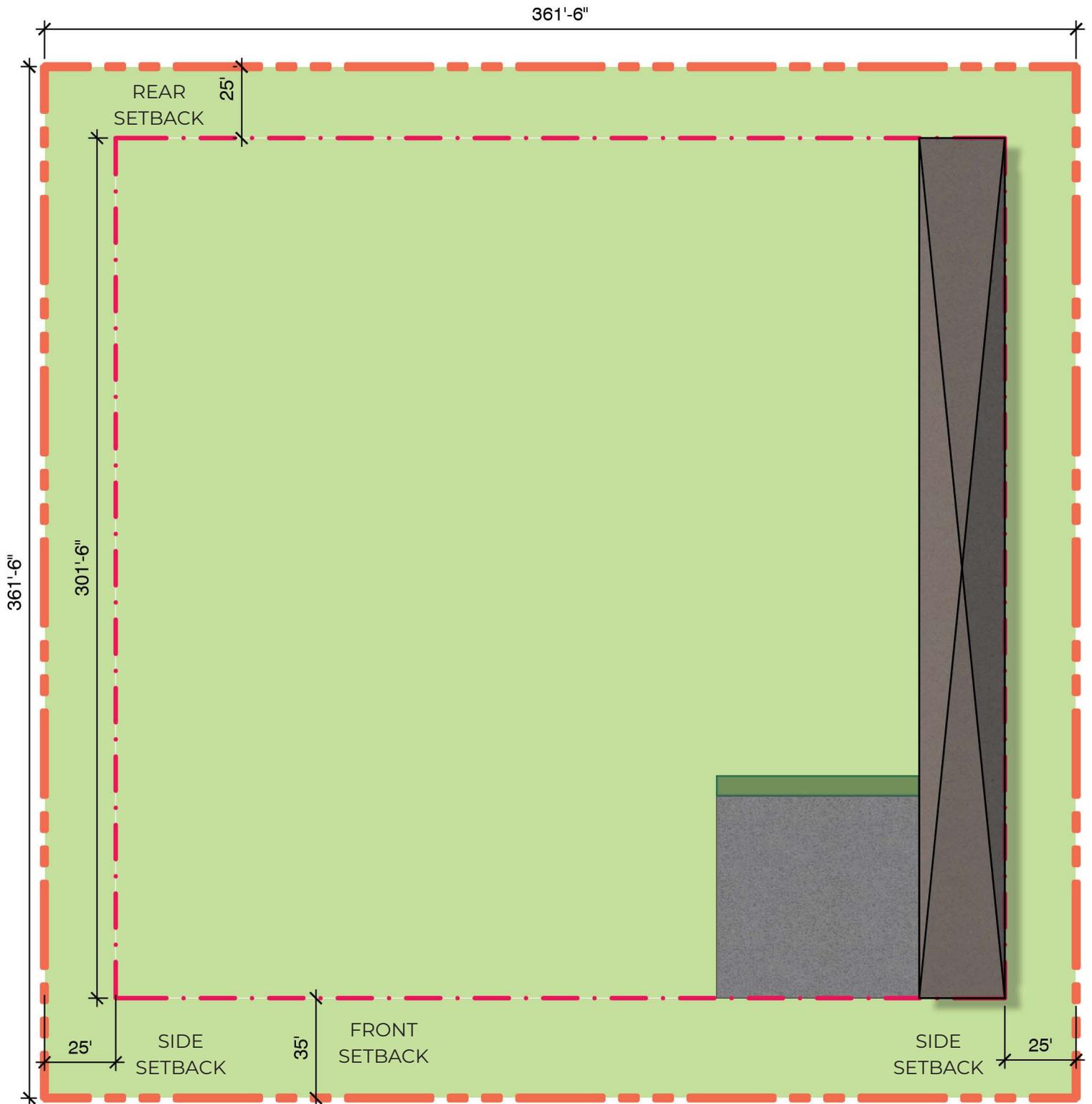
MAX. FAR: 39,204 SF
MAX. % LOT COVERAGE: 19,600 SF



FIGURE 28 | BUILDOUT OPTIONS
 OPTION C | COMMUNITY RECREATION CENTER

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Needham, Massachusetts | June 2018



OVERALL SITE: 3 ACRES (130,680 SF)
BUILDING: 9,000 SF/ FLOOR (18 RESIDENTS MAX.)
PARKING: 5,040 SF (18 SPACES APPROX.)
(1 SPACE PER RESIDENT)
LANDSCAPE AREA: 79,877 SF (10% REQUIRED)

MAX. FAR: 39,204 SF

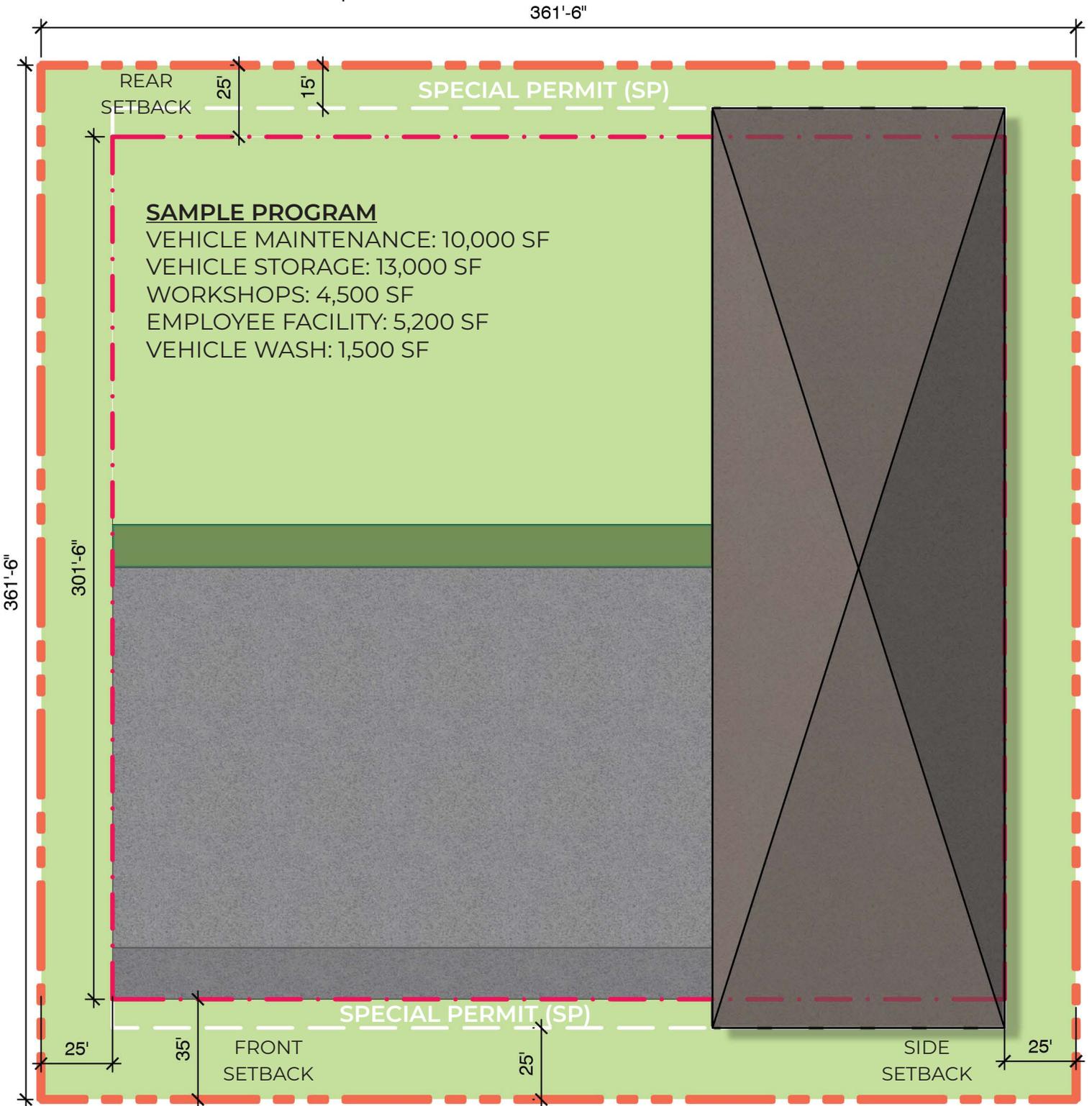
**MAX. % LOT
COVERAGE:** 19,600 SF

FIGURE 29 | BUILDOUT OPTIONS
OPTION D | ELDERLY/HOSPICE CARE



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Needham, Massachusetts | June 2018



OVERALL SITE: 3 ACRES (130,680 SF)
BUILDING: 32,670 SF/ FLOOR MAX.
PARKING: 3,640 (13 SPACES APPROX.) &
 27, 865 SF VEHICLE STORAGE/USE ON SITE
 (1 SPACE PER 150 SF OF BUILDING)
LANDSCAPE AREA (10%): 3,151 SF

MAX. FAR: 39,204 SF
SP: 78,408 SF
MAX. % LOT
COVERAGE: 19,600 SF
SP: 32,670 SF



FIGURE 30 | BUILDOUT OPTIONS
 OPTION E | DEPARTMENT OF PUBLIC WORKS

4

Study of Circulation and Connectivity Options

A. CIRCULATION AND CONNECTIVITY OPTIONS SUMMARY

As an independent though related exercise, Weston & Sampson was asked to consider the current pedestrian, vehicular, and emergency vehicle access to the two Selectmen-controlled properties: the existing old estate and the Nike site.

The task was to:

- Explore circulation connectivity options to support existing conditions or any potential build-out, with an emphasis on creating environmentally sensitive and sensible connections.

The desired connections include:

- A continued connection from Charles River Street to the old estate.
- A continued connection from Pine Street to the Nike Property.
- Consideration of a new connection from the old estate to the Nike site.

First, looking at existing conditions(Figure 31), Weston & Sampson confirmed that the entrance drive leading from Charles River Street north to the old estate is not sufficiently wide for its current use as a two-way access road. At approximately 15-foot wide, the road only accommodates two-way traffic by utilizing the cleared shoulder areas on either side of the paved surface. Similarly, at 12-foot wide, the entrance drive that connects Pine Street with the Nike Property is also undersized, and requires that unpaved shoulder areas be utilized to accommodate two-way vehicular traffic.

Figures 32, 33, and 34 illustrate three different and broad approaches that can be considered. There are numerous variations (not illustrated)of these approaches that could be consider in the future by the Town.

In summary, the three approaches can be summarized as follows:

- Figure 32 – Connectivity Option 1: Increase the width of the two existing entrance drives to

20-foot, two-way; and add a connecting road that could accommodate pedestrians, bicyclists (if desirable), and emergency vehicles across the south or/and across the north portion of the Reservation. As these two cross paths would be approximately 8-foot in width and not intended for regular vehicular use, both the old estate and the Nike site would require vehicular turn-around areas, as illustrate on Figure32. Of note, the locations of these north and south cross connectors were selected at this planning study level because they offer low-impact integration, based on the limited site analysis information used in this assessment process

- Figure 33 – Connectivity Option 2: Increase the two existing entrance drives to 20-foot, two-way widths. Add a vehicular turn-around area at both the old estate and the Nike site. Add one 20-foot wide two-way connecting road across the south portion of the site to accommodate pedestrians, bicyclists (if desirable), emergency vehicles, and regular vehicular traffic as indicated on Figure 33, or across the north portion of the site (not illustrated).
- Connectivity Option 3 on Figure 34 offers an example of how a one-way loop road could be accommodated. A clock-wise or counter clock-wise vehicular circulation pattern could be incorporated to connect the Nike site and the old estate, using Charles River Street and Pine Street as additional connecting links. In the example illustrated on Figure 34, a short two-way road with a vehicular turn-around is included up to the old estate house itself, as a way to minimize increased disturbance along the existing driveway, from the area just south of the existing Esker Trail trailhead/parking lot, up to the house.

B. FIGURES

Existing Site Uses – Connectivity Existing Conditions (Figure 31) and Options (Figures 32 through 34) follow.

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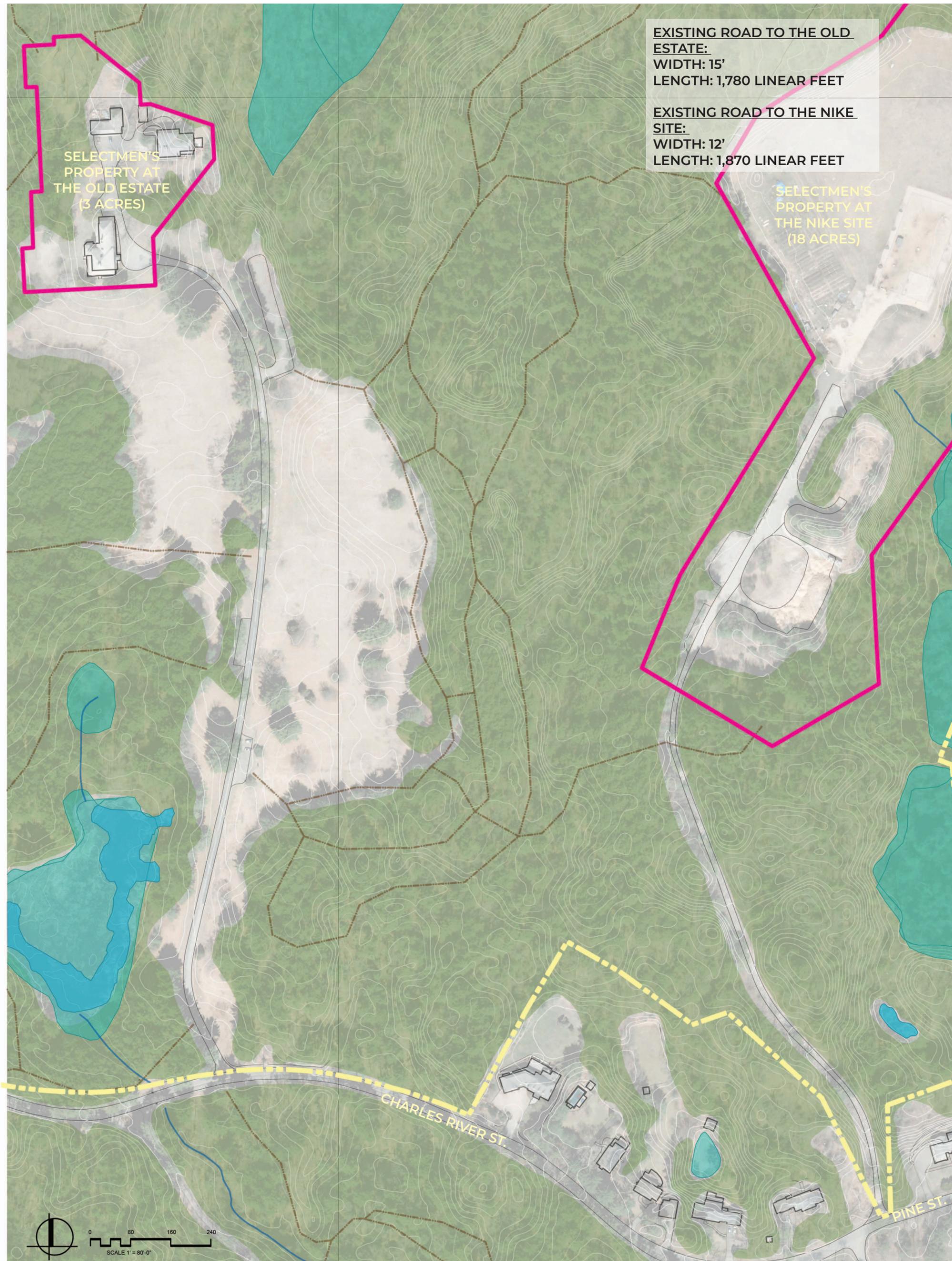


FIGURE 31 | EXISTING SITE USES
CONNECTIVITY EXISTING CONDITIONS



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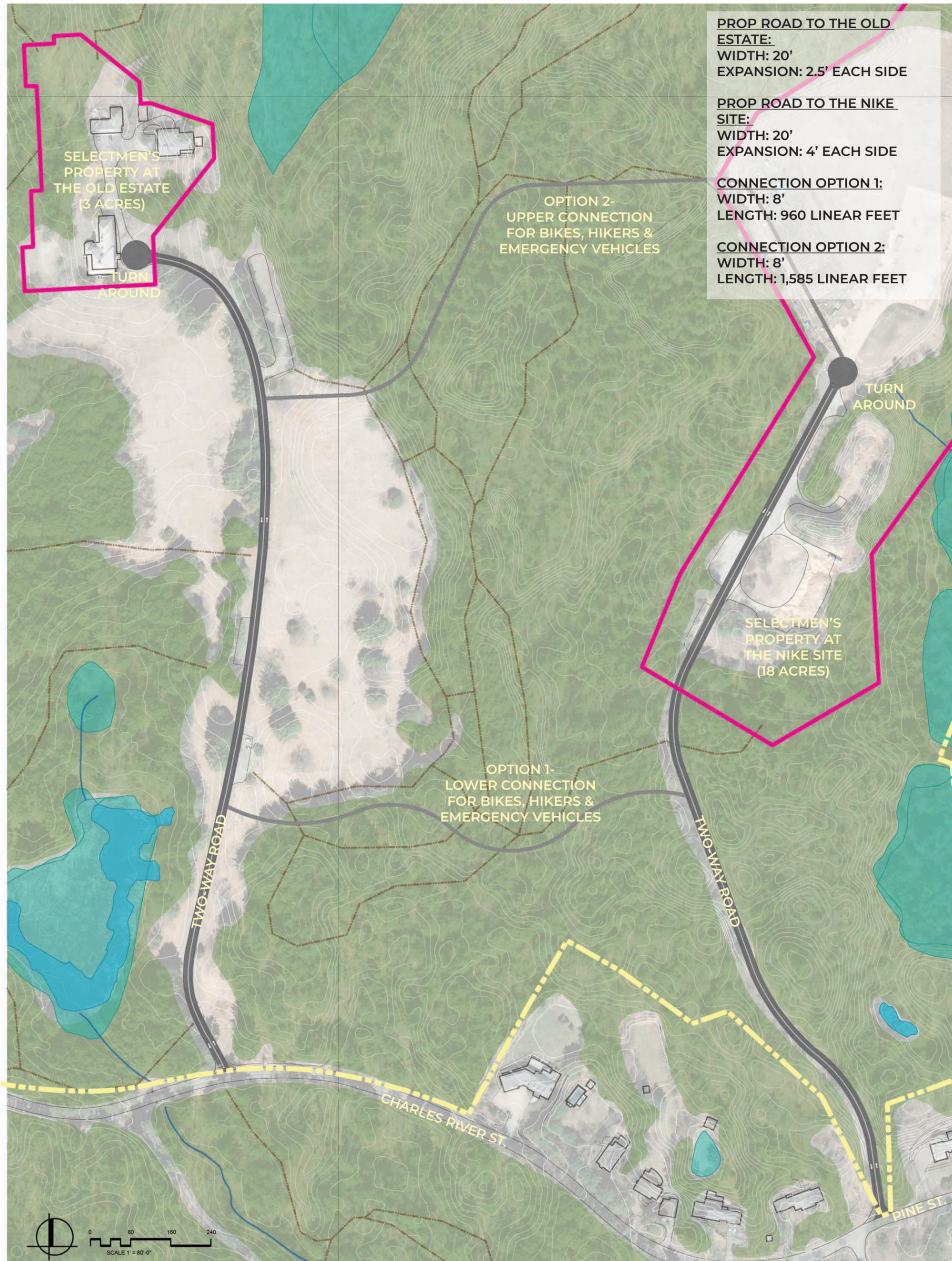


FIGURE 32 | EXISTING SITE USES
CONNECTIVITY OPTION 1



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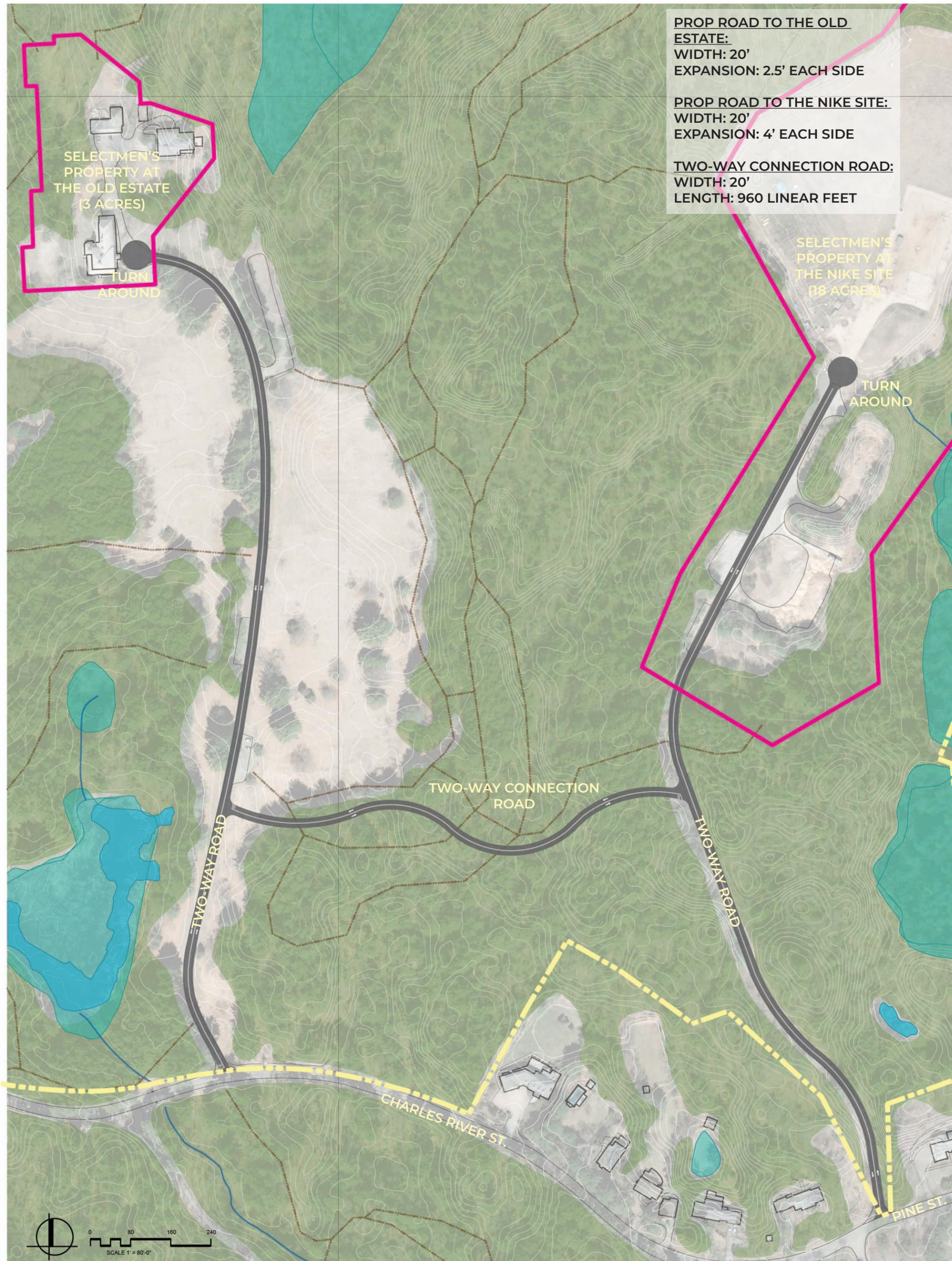


FIGURE 33 | EXISTING SITE USES
CONNECTIVITY OPTION 2



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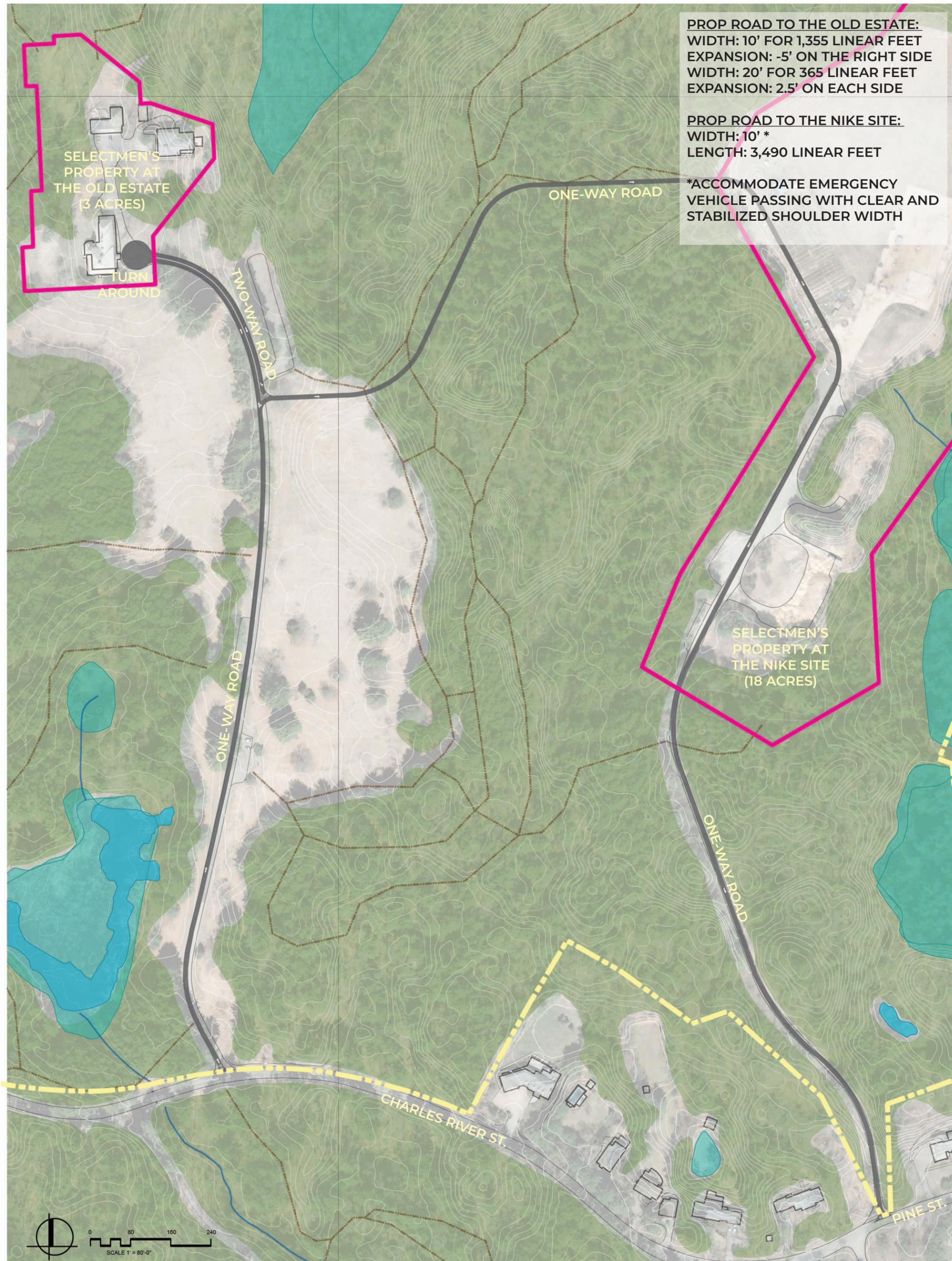


FIGURE 34 | EXISTING SITE USES
CONNECTIVITY OPTION 3

