EcolSciences, Inc.
Environmental Management & Regulatory Compliance

ENVIRONMENTAL IMPACT STATEMENT
FOR
PROPOSED AFFORDABLE AGE-RESTRICTED HOUSING DEVELOPMENT
BLOCK 27, LOT 2
TOWNSHIP OF HARDING
MORRIS COUNTY, NEW JERSEY

Prepared for:

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I. EXECUTIVE SUMMARY

Hurstmont Urban Renewal Entity, LLC of Haskell, New Jersey is proposing an age-restricted residential development that includes affordable housing set-aside within a 19.6± acre site known as Block 27, Lot 2 in the Township of Harding, Morris County, New Jersey. The site was formerly occupied by the Hurstmont estate in the central portion of the site that was recently partially demolished. The driveway, old foundations and stone walls remain. The remainder of the site is undeveloped and characterized as early successional fields and successional upland forest. The site is bordered to the east and northwest by single-family residences interspersed with mixed forest patches and shrubland. North of the site is an expansive area of forested open space associated with the 1,200-acre Jockey Hollow National Historic Park. Immediately to the west of the subject property is the Glen Alpin Estate, a historic property jointly owned by the Township of Harding and the Harding Land Trust. Route 202 borders the site's southern boundary.

The project consists of the construction of a senior living facility containing 210 units that will include a mix of independent living units, assisted living units and memory care units. In addition, the project includes the construction of 40 town houses for a total of 250 living units for the overall project. Two types of town houses are proposed including 28 carriage homes and 12 cottages. The senior living facility will include 151 underground parking spaces and 31 surface parking spaces, and the town houses will each include a two-car garage and two driveway parking spaces. The project will be accessed by one proposed driveway off Route 202.

The principal impacts of the proposed plan are those associated with a change in land use from undeveloped early successional fields and successional upland forest to an affordable, age-restricted housing development. Long-term impacts to the site include an increase in impervious surfaces and the loss of natural habitat. Temporary impacts will occur during the construction phase of the project and include soil loss, and increased noise and dust levels. All impacts will be minimized through appropriate mitigation procedures and best management practices.

This Environmental Impact Statement (EIS) has been prepared by EcolSciences, Inc. of Rockaway, New Jersey in accordance with the Township of Harding's Land Use and Development Ordinance Chapter 225 (Environmental Impact Statements) and is intended to support site plans prepared by Gladstone Design, Inc. of Gladstone, New Jersey (Gladstone Design) (2023). The following chapters provide a project description, an inventory of existing environmental conditions in and around the site, an assessment of potential impacts associated with the proposed development plan, a description of performance controls designed to mitigate adverse impacts, a discussion of alternatives, and a listing of required permits and approvals.

II. DESCRIPTION OF DEVELOPMENT PLAN

A. General Description

Hurstmont Urban Renewal Entity, LLC of Haskell, New Jersey is proposing an age-restricted residential development that includes affordable housing set-aside within a 19.6± acre site known as Block 27, Lot 2 in the Township of Harding, Morris County, New Jersey. The site was formerly occupied by a Hurstmont estate in the central portion of the site that was recently partially demolished. The driveway, old foundations and stone walls remain. The remainder of the site is undeveloped and characterized as early successional fields and successional upland forest. The site is bordered to the east and northwest by single-family residences interspersed with mixed forest patches and shrubland. North of the site is an expansive area of forested open space associated with the 1,200-acre Jockey Hollow National Historic Park. Immediately to the west of the subject property is the Glen Alpin Estate, a historic property jointly owned by the Township of Harding and the Harding Land Trust. Route 202 borders the site's southern boundary.

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B. Master Planning and Zoning

At the time the Township of Harding's Amended Housing Element and Fair Share Plan was adopted (December 17, 2018), the site (known as "Hurstmont") and the adjacent property at Block 34, Lot 1 (known as "Glen Alpin") were under investigation to determine whether they qualified for designation as "an area of redevelopment" (Township of Harding, 2018). On February 25, 2019, the Township Committee designated the site and adjacent Glen Alpin property as an area in need of redevelopment (HGA, 2023). The Township Committee adopted the Glen Alpin/Hurstmont Redevelopment Plan (herein referred to as the "Redevelopment Plan") on June 24, 2019, and amended and adopted the Redevelopment Plan on September 30, 2019 (Township of Harding, 2020). The Redevelopment Plan was again amended January 17, 2023 and adopted February 14, 2023, which further refined the standards in the previously adopted Redevelopment Plan, although the core of the Redevelopment Plan principles and goals remained essentially unchanged (HGA, 2023).

The Redevelopment Plan calls for the site to be redeveloped into an age-restricted community with affordable housing set-aside. More specifically, the Redevelopment Plan calls for a variety of living arrangements for seniors, including townhouses/stacked townhouses, multi-family independent living, and assisted living/dementia care (HGA, 2023). In addition, the proposed redevelopment is to provide a portion of the Township's affordable housing obligation in accordance with the Court-approved settlement agreement between the Township and the Fair Share Housing Center (HGA, 2023). The development, as proposed, meets these planned principles of the Redevelopment Plan.

The Redevelopment Plan calls for the site to be redeveloped with the standards set forth in the Redevelopment Plan, which supersedes the provisions of the Township of Harding's Land Use and Development Regulations (Chapter 225), unless specifically referenced in the Redevelopment Plan The Redevelopment Plan proposed to reclassify the site as a Senior Living District to permit the site's redevelopment into a senior living facility that provides for a diversity of residential opportunities (HGA, 2023). Therefore, no variances or waivers are proposed for the project. The project is seeking a de minimis exception from the parking requirements for assisting living/dementia care/independent living units from the Residential Site Improvement Standards (RSIS) found at N.J.A.C. 5:21, which was determined to be acceptable in the Redevelopment Plan (HGA, 2023). The site is not subject to any dedication, easement, right-of-way, covenant, condition, restriction, lien or encumbrance that would prohibit or interfere materially with the use of the site for the development of affordable, age-restricted housing, according to the Township of Harding's Amended Housing Element and Fair Share Plan (Township of Harding, 2018).

According to the New Jersey State Development and Redevelopment Plan (SDRP), the site is within the Environmentally Sensitive Planning Area (PA5) for environmentally sensitive planning areas, parks, and natural areas (New Jersey State Planning Commission, 2001). The proposed development meets seven of the eight goals outlined in the SDRP, including:

1) Revitalize the State's cities and towns.

   The intended redevelopment of the former Hurstmont estate will bring a productive use to a site that has been left to decay for more than two decades and with the partial demolition, has turned into a hazard and an eyesore for the community (HGA, 2023).

2) Conserve the State's natural resources and systems.
   The Redevelopment Plan intends to minimize environmental disturbance by providing for tree conservation areas and building with respect to all environmental features on the site (HGA, 2023).

3) Promote beneficial economic growth, development, and renewal for all residents of New Jersey.

The redevelopment of the site will bring jobs and housing options to the residents of Harding Township and New Jersey (HGA, 2023).

4) Protect the environment, prevent and clean up pollution.

The easements, setbacks, and conservation areas within this Redevelopment Plan will continue to protect the environment surrounding the site, including the Morristown National Historical Park (HGA, 2023).

6) Provide adequate housing at a reasonable cost.

Construction of affordable, age-restricted housing helps to fulfill the Township's affordable housing obligations while also providing housing options for seniors of all income groups (HGA, 2023).

7) Preserve and enhance areas with historic, cultural, scenic, open space, and recreational value.

The proposed pedestrian trails will enhance the open space and recreational opportunities for the residents of the proposed development, Harding Township, and New Jersey (HGA, 2023).

8) Ensure sound and integrated planning and implementation statewide.

The site is located directly on Route 202 (Mt. Kemble Avenue) and is near entrances to I-287. The Redevelopment Plan calls for the redevelopment of an underutilized and dilapidated property. Redevelopment of the site is consistent with good planning principles and integrated land use planning and implementation (HGA, 2023).

C. Sanitary Sewage

Wastewater for the project will be directed to an on-site wastewater treatment system comprised of proposed underground tanks and a sewer treatment building in the southern portion of the site. It is estimated that the proposed development will generate 35,590 gallons per day (gpd) of wastewater (Gladstone Design, 2023). On September 2, 2022, the New Jersey Department of

Environmental Protection (NJDEP) adopted an amendment to the Northeast Water Quality Management (WQM) Plan. This amendment, identified as "Hurstmont-Glen Alpin" (Program Interest No. 435442, Active No. AMD190009) establishes a new discharge to groundwater sewer service area that covers the majority of the site. A copy of the NJDEP adoption letter dated September 2, 2022 is provided in Attachment B.

D. Potable Water Supply

Potable water for the proposed development will be obtained from Southeast Morris County Municipal Utilities Authority (SMCMUA) by a connection to an existing line located along Route 202. The estimated average demand for potable water for the proposed development is 38,660 gpd (Gladstone Design, 2023).

E. Stormwater Management Facilities

Stormwater from the developed portions of the site will be collected by a proposed stormwater management system. This system will consist of a series of inlets, manholes and subsurface piping that will convey stormwater to two large scale bioretention basins and six small scale bioretention basins in the southern and central portions of the site. The stormwater management system has been designed to be in compliance with the requirements of the NJDEP's Stormwater Management Rules (N.J.A.C. 7:8) for runoff quantity standards, water quality standards, groundwater recharge standards, and soil erosion and sediment control. For specific details regarding the proposed stormwater management system, refer to the Stormwater Management Report prepared for the project by Gladstone Design dated May 26, 2023.

F. Utilities Plan

All other utilities (electricity, gas, cable television, telephone, etc.) will be provided through connections to the existing lines located along Route 202. The proposed utility connections will be located underground.

G. Solid Waste Plan

Solid waste generated by the proposed development will be collected and transported to an approved landfill for disposal. The Township of Harding, in conjunction with the Morris County District Solid Waste Management Plan, has developed a mandatory recycling program that requires the recycling of the following materials: aluminum cans, glass bottles and jars, plastic bottles (coded 1 and 2), steel (tin) cans, newspaper, corrugated cardboard, mixed paper, leaves, grass clippings, brush, natural wood waste, oil-contaminated soil, used motor oil, lead-acid batteries, hazardous dry cell batteries, metal appliances, and whole tires (Township of Harding, 2022).

H. Traffic

Detailed discussions of existing traffic conditions in the vicinity of the site have been prepared by Dolan & Dean Consulting Engineers, LLC of Somerville, New Jersey, as part of a Traffic Impact Assessment (dated May 1, 2023, revised May 26, 2023) and will be submitted under separate cover.

III. INVENTORY OF EXISTING ENVIRONMENTAL CONDITIONS

A thorough inventory of environmental conditions is a fundamental prerequisite to an understanding of a land tract's ecological and cultural history, current condition, and suitability for alternative future uses. The inventory of existing environmental conditions in this chapter is divided into systematic and logical subsections that treat each aspect of the site and vicinity in detail, and collectively define the constraints to future land use.

A. Geology

The portions of New Jersey that have similar sequences of rock types, geological structures, and geological history have been characterized as Physiographic Provinces - major areas of the state that have experienced specific geological histories and that have similar characteristics at present. From northwest to southeast across the State, the major physiographic provinces are: Appalachian Ridge and Valley, Highlands, Piedmont, and Coastal Plain. Each of these physiographic provinces has regional subdivisions, and each is also a continuation of larger regions in the northeastern United States (Widmer, 1964; Robichaud and Buell, 1973).

The Township of Harding falls withing the Mendham quadrangle. It is primarily in the New Jersey Highland Physiographic Province, except for the southeastern portion that is in the Piedmont Physiographic Province. The Ramapo fault provides a structural and physiographic boundary between these two provinces. The Highlands consist of a series of flat-topped ridges, separated by narrow deep valleys. The mountains are composed of hard, crystalline, resistant Precambrian igneous and metamorphic rocks and valleys are underlain by easily eroded shale and limestone (Volkert, 2019). Surficial deposits in the quadrangle include glacial, stream, hillslope, wetland, and man-made sediment and weathered-rock material. Glacial sediments were laid down during three glaciations: the late Wisconsian glaciation (about 25,000 years ago), an intermediate glaciation of pre-Wisconsian age (most likely the late Illinoian glaciation, about 150,000 years ago), and an older glaciation of pre-Illinoian age (possibly as old as 2.5 million years ago) (Stanford, 2012).

Two surface geologic deposits are mapped on the site, Weathered Gneiss in the north half of the site, and Gneiss Colluvium in the south half of the site. Weathered Gneiss consists of brown, yellowish brown, red, and white silty clayey sand to sandy clayey silt with gneiss fragments. This formation can be as much as 100 feet thick. Gneiss Colluvium consists of yellow, yellowish brown, and reddish yellow silty sand to sandy silt with gneiss fragments. This formation can be as much as 70 feet thick (NJDEP, Last Updated March 21, 2023). Below the surficial deposits, two bedrock geologic formations are mapped on the site, Hornblende Granite in the north half of the site and Quartz-Oligoclase Gneiss in the south half of the site. The Hornblende Granite formation consists of

medium-to-coarse grained granite and the Quartz-Oligoclase Gneiss formation consists of medium-to-course grained gneiss (NJDEP, Last Updated March 21, 2023).

B. Topography

The topography of a site or area is a description of the variation in elevation of the land surface with horizontal distance; topography is generally described by contour maps where points of equal elevation are connected by smooth contours. The surficial topography of a site or area reflects the underlying geology as altered by geomorphological processes; the surficial topography, in turn, directly influences the drainage patterns, watercourses, soils, and biological communities evolving on the particular site.

The site is very gently sloping to very strongly sloping with elevations ranging from approximately 538 feet in the northern portion of the site to 373 feet in the southern corner of the site. The steeper slopes are present in the northern half of the site and along Route 202. There are slopes on site that exceed 25 percent.

C. Soils

Soils are formed through the interaction of a variety of physical, chemical, and biological factors that include climate, parent material, topography, biological activities, and time. The degree to which any or all of these factors affect the local soil characteristics is quite variable, generally leading to the formation of a mosaic of soil types in any particular locality. The United States Department of Agriculture (USDA) has, through the Natural Resources Conservation Service (NRCS), mapped soils in detail; for New Jersey, the results of these soil surveys are issued for each county.

According to the USDA NRCS Web Soil Survey (USDA NRCS, 2019) (Figure 3), six soil units across four soil series occur on the site: Califon loam, 3 to 8 percent slopes (CakB); Cokesbury gravelly loam, 0 to 3 percent slopes (CobA); Parker gravelly sandy loam, 3 to 15 percent slopes (PaoC); Parker-Gladstone complex, 0 to 15 percent slopes, extremely stony (PauCc); Parker-Gladstone complex, 15 to 25 percent slopes, extremely stony (PauDc); and Parker-Rock outcrop complex, 25 to 45 percent slopes (PawE). Table 1 lists the soil characteristics, limitations, and suitabilities. A brief description of each soil series per the SCS is provided as follows:

> Califon Series – The Califon series consists of very deep, moderately well or somewhat poorly drained soils formed either from old till, or on driftless landscapes in the Northern Piedmont in colluvium from granitic gneiss on upland flats or concave slope positions. This particular soil unit (CakB) is very gently to gently sloping with

Table 1:
Soil Characteristics, Limitations, and Suitabilities

Parameter	Califon loam (CakB)	Cokesbury gravelly loam (CobA)	Parker gravelly sandy loam (PaoC)	Parker-Gladstone complex (PauCc)	Parker-Gladstone complex (PauDc)	Parker-Rock outcrop complex (PawE)
Texture	Loam	Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
Slope (%)	3 – 8	0 – 3	3 – 15	0 – 15	15 – 25	25 – 45
Depth to Bedrock (ft.)*	>6.5	>6.5	>6.5	>6.5	>6.5	>6.5
Depth to Seasonal High Water Table (in.)	6 - 30	0 - 12	>80	>80	>80	>80
Capacity of Most Limiting Layer to Transmit Water (Ksat) (in/hr)	0.06 – 0.20	0.06 – 0.20	2.00 – 6.00	2.00 – 6.00	2.00 – 6.00	2.00 – 6.00
Available Water Capacity (cm. water/cm. soil)*	0.13	0.13	0.09	0.09	0.09	0.09
pH*	5.6	5.6	5.0	5.0	5.0	5.0
Erosion Hazard (K Factor)*	0.37	0.43	0.20	0.20	0.20	0.20
Limitations for Dwellings with Basements	Very limited (depth to saturated zone)	Very limited (depth to saturated zone)	Somewhat limited (slope)	Somewhat limited (slope)	Very limited (slope, depth to saturated zone)	Very limited (slope)
Limitations for Local Roads and Streets	Very limited (depth to thick cemented pan, depth to thin cemented pan, depth to saturated zone, frost action, dusty)	Very limited (depth to thick cemented pan, depth to saturated zone, depth to thin cemented pan, frost action, dusty)	Somewhat limited (frost action, slope, dusty)	Somewhat limited (frost action, slope, dusty)	Very limited (slope, frost action, dusty)	Very limited (slope, frost action, dusty)

*weighted average of all soil layers
Source: USDA NRCS, 2019

slopes ranging from 3 to 8 percent. The depth to the seasonal high-water table is about 6 to 30 inches. The depth to the bedrock is greater than 6.5 feet. The Califon series is not listed as a hydric soil group by the Soil Conservation Service (SCS) as a hydric soil (Tiner, 1985).

Cokesbury Series – The Cokesbury series consists of deep or very deep, poorly drained soils formed either from old till, or on driftless landscapes of the Northern Piedmont in colluvium from granitic gneiss on upland depressions, headslopes or concave footslope and toeslope positions. This particular soil unit (CobA) is level to very gently sloping with slopes ranging from 0 to 3 percent. The depth to the seasonal high water table is about 0 to 12 inches. The depth to bedrock is greater than 6.5 feet. The Cokesbury series is listed as a Group 1 hydric soil group by the SCS. Group 1 soils nearly always display consistent hydric conditions (Tiner, 1985).

Parker Series – The Parker series consists of very deep, somewhat excessively drained soils that formed in residuum derived from granitic gneiss bedrock. It occurs on gently sloping to very steep slopes of ridges and hills. These particular soil units (PaoC, PauCc, PauDc, PawE) are very gently sloping to steeply sloped with slopes ranging from 3 to 45 percent. The depth to the seasonal high water table is greater than 80 inches. The depth to bedrock is greater than 6.5 feet. The Parker series is not listed as a hydric soil group by the SCS as a hydric soil (Tiner, 1985).

Gladstone Series – The Gladstone series consists of very deep, well drained soils formed in residuum and colluvium from granitic gneiss. It occurs on upland divides and rolling foothills. These particular soil units (PauCc, PauDd) are level to strongly sloped with slopes ranging from 0 to 25 percent. The depth to the seasonal high water table is greater than 80 inches. The depth to bedrock is greater than 6.5 feet. The Gladstone series is not listed as a hydric soil group by the SCS as a hydric soil (Tiner, 1985).

Geo-Technology Associates, Inc. of Somerset, New Jersey (October 2022) executed 32 test pits and 4 test borings in August 2022 within the site. The 32 test pits were completed to depths ranging from 5 to 15 feet below grade, and the 4 test borings were completed to depths ranging from 18.5 to 40 feet below grade. In general, an approximately 1- to 12-inch-thick layer of topsoil was encountered at the ground surface in 34 of the 36 explorations, averaging about 7 inches. Fill material was encountered in 9 of the explorations. The topsoil and fill were underlain by medium dense to very dense silty sands with gravel and silty gravels with sand. Cobbles and boulders were frequently encountered within the excavated soils. Below the surficial soils, decomposed gneiss bedrock was encountered in 34 of the 36 explorations at depths ranging from about 1 to 12.5 feet below the ground surface (Geo-Technology Associates, Inc., October 2022).

D. Ground Water Quantity and Quality

Ground water is all water within the soil and subsurface strata that is not at the surface of the land. It includes water that is within the earth that supplies wells and springs. Ground water resources are often functionally linked to overlying land areas and surface water bodies; ground water is often recharged through "outcrop" areas at the land surface and ground water discharges ("seeps") may contribute to base flows of streams and rivers.

The ground water yields of any particular geological formation are a function of the porosity and permeability of the material comprising the formation (consolidated rock or unconsolidated deposits). Porosity describes the water-containing spaces between individual mineral grains, while permeability is the ease or difficulty with which water is transmitted through interconnecting spaces in the formation. Formations lacking open spaces between the mineral grains have both low porosity and low permeability. Weathering and cracking of the parent bedrock can induce secondary porosity in the formation; water can accumulate and move through these fractures in the primary rock formation.

The site is underlain by the igneous and metamorphic rocks aquifer system (NJDEP, Last Updated March 21, 2023). The igneous and metamorphic rocks aquifer system consists of gneiss, granite, schist, and marble. Fractures in marble are locally enlarged by chemical weathering. Calcium-bicarbonate type waters dominate (G.C. Herman et al., 1998).

The NJDEP, NJGS, Bureau of Water Resources (BWR) in conjunction with Mark A. French prepared a GIS layer of "Aquifer Recharge Potential." The aquifer recharge potential was not calculated in areas of wetlands and open waters, or areas of hydric soils (NJDEP, NJGS, BWR, Mark French, 2005). The majority of the site is mapped as Rank A Ground Water Recharge Rank (20 to 23 inches per year) and Rank D Water-Table Aquifer Rank (25 to 100 gallons per minute). The southern portion of the site is mapped as Rank B Ground Water Recharge Rank (15 to 19 inches per year) and Rank D Water-Table Aquifer Rank. Rank A is highest rank and Rank E is the lowest rank (NJDEP, NJGS, BWR, Mark French, 2005).

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E. Surface Water Quantity and Quality

Surface waters include lakes, rivers, ponds, and streams - water bodies at the surface of the land. These waters serve as valuable habitats for aquatic organisms; collect, store and distribute water from rainfall; and serve as important aesthetic and recreational features.

Overland runoff is generally to the south towards Route 202 where inlets drain to a nearby Primrose Brook tributary and Primrose Brook. The unnamed tributary to Primrose Brook flows north to south approximately 0.10 miles from the site's southeastern boundary. Primrose Brook flows north to south approximately 0.13 miles from the site's western boundary. Primrose Brook and its unnamed tributary have been classified by the NJDEP as Freshwater 2, Trout Production, Category 1 (FW2-TPC1) waters (NJDEP, 2020).

By definition, FW2 waters are suitable for public potable water supply after required treatment. This classification requires that waters be acceptable for primary contact recreation, industrial and agricultural use, and maintenance and migration of the established biota. The Trout Production (TP) suffix indicates that the waters possess the properties suitable for the maintenance of trout species, i.e., high dissolved oxygen levels, relatively low summer temperatures, and low pollutant loadings. The Category 1 (C1) suffix indicates that the waters possess exceptional ecological significance, exceptional recreational significance, exceptional water supply significance and/or exceptional fisheries resources(s) that require protection from measurable changes in water quality (NJDEP, 2020).

The NJDEP (May 12, 2022) published a "Final 2018/2020 New Jersey Integrated Water Quality Assessment Report" (Integrated Report), which is intended to provide an effective tool for maintaining high quality waters and improving the quality of waters that do not attain their designated uses. The Integrated Report describes attainment of the designated uses specified in New Jersey's Surface Water Quality Standards (N.J.A.C. 7:9B), which include: aquatic life (general), aquatic life (trout), recreation, public water supply, fish consumption, and shellfish consumption (NJDEP, May 12, 2022). The Integrated Report includes management strategies, including Total Maximum Daily Loads (TMDLs), under development to achieve surface water quality standards and attain the designated uses of the waters (NJDEP, May 12, 2022). TMDLs represent the assimilative or carrying capacity of the receiving water taking into consideration point and nonpoint sources of pollution, natural background, and surface water withdrawals (NJDEP, May 12, 2022).

The NJDEP assesses each applicable designated use for all of the State's 958 subwatersheds (assessment units), to determine whether each subwatershed is "fully supporting" the use, "not supporting" the use, or if insufficient information is available to assess the use. A subwatershed is

"fully supporting" a designated use only if data for the minimum suite of parameters are available and there are no exceedances of the applicable criteria for each parameter in the suite. If data are available for only some of the minimum suite of parameters, the use is not assessed due to insufficient information. If any one parameter associated with a designated use exceeds the applicable criteria, then the subwatershed is "not supporting" for the designated use.

The site is within the Primrose Brook assessment unit (NJDEP, May 12, 2022). This assessment unit had "insufficient data" for Fish Consumption and was "not supporting" for Aquatic Life (General), Aquatic Life (Trout), Water Supply, and Primary Recreation. Specifically, this assessment unit was in "non-attainment" of dissolved oxygen, pH, and turbidity for Aquatic Life (General); in "non-attainment" of dissolved oxygen, temperature, pH, and turbidity for Aquatic Life (Trout); in "non-attainment" of arsenic for Water Supply; and in "non-attainment" of *Escherichia coli* (E. coli) for Primary Recreation (NJDEP, May 12, 2022).

F. Vegetation

Vegetation is the plant life or the total plant cover that is found in a specific area, whether indigenous or introduced by humans. The Highlands Physiographic Province of New Jersey contains a diverse mixture of major terrestrial plant habitats, including freshwater marshes, bogs, swamps and floodplains, upland valleys and slopes, upland ridges, and rock outcrops (Collins and Anderson, 1994). This habitat diversity results in a mosaic of plant communities occurring in small areas, a situation rather different from the more homogeneous habitat conditions and plant communities found in more southern portions of the State.

The Natural Heritage Program (NHP) of the NJDEP Office of Natural Lands Management identifies the state's most significant natural areas through a comprehensive inventory of rare plant and animal species and representative ecological communities (NHP, 2022). Through this program, Natural Heritage Priority Sites were identified which include critically important areas to conserve New Jersey's biological diversity, with particular emphasis on rare plant species and ecological communities. Based on review of NJ-GeoWeb, there are no Natural Heritage Priority Sites on or in the vicinity of the site. The nearest Natural Heritage Priority Site, Mount Freedom, is located approximately 5.18 miles north of the site (NJDEP, Last Updated March 21, 2023).

In addition to Natural Heritage Priority Sites, the NHP Database includes Natural Heritage Grid Maps, which provide a general portrayal of the geographic location of rare plant species and rare ecological communities for New Jersey, without providing sensitive detailed location information. Each grid that is mapped is classified into one of three categories: 'S', which indicates the location of the rare plant and/or ecological community is precisely known within the grid; 'M', which indicates

the location of the rare plant and/or ecological community is only known to within 1.5 miles; or 'BOTH', which indicates the grid includes locations of rare plants and/or ecological communities that are precisely known and less precise occurrences are found (NJDEP, Last Updated March 21, 2023). Based on review of NJ-GeoWeb, the site is not located within or adjacent to a Natural Heritage Grid Map. The nearest Natural Heritage Grid Map is located approximately 1.85 miles south of the site (NJDEP, Last Updated August 4, 2021).

EcolSciences performed a site visit in March 2023 to document vegetation communities on the site. Based upon species composition, soils, and apparent hydrology noted during EcolSciences' field investigations, two vegetative communities were identified within the site: early successional field and successional upland forest. Each community is briefly described below.

Early Successional Field – This community is found within the southern portion of the site and includes areas formerly maintained as lawn around the previously developed portions of the site. Canopy vegetation is absent within this community. The woody understory consists of Japanese wineberry (*Rubus phoenicolasius*) and multiflora rose (*Rosa multiflora*). Herbaceous vegetation is dominated by Kentucky bluegrass (*Poa pratensis*), broom sedge (*Andropogon virginicus*), common mugwort (*Artemisia vulgaris*) and Japanese stilt grass (*Microstegium vimineum*).

Successional Upland Forest – This community is found within the northern portion of the site. Canopy vegetation is dominated by American beech (*Fagus grandifolia*), tuliptree (*Liriodendron tulipifera*), sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), and Norway spruce (*Picea abies*). The woody understory consists of Japanese wineberry, arrowwood viburnum (*Viburnum dentatum*), and Japanese honeysuckle (*Lonicera japonica*). Herbaceous vegetation consists of Japanese stilt grass, garlic mustard (*Alliaria petiolata*), periwinkle (*Vinca minor*), and Japanese knotweed (*Reynoutria japonica*).

G. Wildlife

The utility of an area as wildlife habitat depends on many factors. All wildlife species require food, water, cover, and space. The relative abundance or lack of these resources in relation to each species' particular requirements will, in part, determine the species composition and distribution of a particular area. In addition, the types of vegetative communities present, the size, shape, and complexity of the habitat(s), and the surrounding land uses will further interact to determine the success of various wildlife species at the location being considered. Some wildlife species have demonstrated great adaptability and tolerance to the human presence; others are less able to tolerate such activities and are displaced to more suitable habitats, if such are available and accessible.

Starting in July 2002, the NHP of the NJDEP Office of Natural Lands Management adopted use of the Landscape Project to supplement threatened and endangered species data requests. The Landscape Project was developed by the NJDEP, Division of Fish & Wildlife, Endangered & Nongame Species Program (ENSP). It is a wildlife habitat-mapping program that is used to identify and map critical habitats for endangered, threatened, and special concern species. This approach takes documented records of threatened and endangered wildlife and, based on a species-specific model or "occurrence area", maps areas of suitable habitat contiguous to the record as critical wildlife habitat. Each critical habitat patch appears as a shaded color from light to dark (5 Ranks) indicating its relative priority ranking. Rank 1 is the lowest priority ranking, while Rank 5 is the highest priority ranking. Rank 1 meets the minimum area requirement, but no data exists for the presence of priority species (New Jersey Division of Fish and Wildlife, 2017). This is the NJDEP's lowest priority ranking and is defined as areas meeting the minimum size requirements but with no documented sightings of threatened or endangered species. Rank 2 contains records for priority species, which are species of special concern. Ranks 3, 4, and 5 indicate that the identified land cover type has been identified as providing habitat for State threatened (Rank 3), State endangered (Rank 4), or Federally threatened or endangered (Rank 5) species.

The Landscape Project (Version 3.3) has mapped portions of the site within Rank 5 habitats. These Rank 5 habitats include documented sightings of the Federally-listed Indiana bat (*Myotis sodalis*) and northern myotis (also known as Northern long-eared bat) (*Myotis septentrionalis*), and State-threatened wood turtle (*Glyptemys insculpta*) (Figure 4). The on-site Rank 5 habitats also include documented occurrences of the following State-special concern species: Canada warbler (*Wilsonia canadensis*), hooded warbler (*Wilsonia citrina*), veery (*Catharus fuscescens*), cooper's hawk (*Accipiter cooperii*), wood thrush (*Hylocichla mustelina*), eastern box turtle (*Terrapene carolina carolina*), and tiger spiketail (*Cordulegaster erronea*).

Although the State-endangered bobcat (*Lynx rufus*) is not mapped on-site by the Landscape Project (Version 3.3), pursuant to an April 8, 2021 Teams meeting with biologists from NJDEP Office of Natural Resource Protection, it was brought to the applicants' attention that the northern portion of the site is mapped by Connecting Habitat Across New Jersey (CHANJ) as part of a much larger, off-site core/corridor habitat for bobcats. The bulk of this corridor is located within the adjacent Jockey Hollow National Historic Park (Figure 5).

EcolSciences' biologists conducted an on-site habitat evaluation and preliminary impact assessment for the Federally-listed Indiana bat and northern long-eared bat and the State-listed bobcat and wood turtle in June 2020. The Habitat Impact Assessment (HIA) is provided in Appendix B of this EIS. EcolSciences also performed a field investigation in March 2023 to record general wildlife

species observed on the site. During EcolSciences' 2023 field investigation, the following species were observed by sight, call, tracks, or by other signs: white-tailed deer, raccoon, red fox, skunk, song sparrow, eastern phoebe, turkey vulture, American robin, northern cardinal, eastern bluebird, Carolina wren, wild turkey, and red-winged blackbird.

H. Wetlands

Wetlands are lands where water saturation is the dominant factor determining the nature of soil development and the types of plants and animal communities living in the soil and on its surface. Wetlands are transitional areas between terrestrial and aquatic systems, and are unique biological habitats of socioeconomic value. Wetlands moderate extremes in water flow, aid in the natural purification of water, and may be areas of groundwater recharge. According to regulations promulgated by the United States Army Corps of Engineers (COE) and the United States Environmental Protection Agency (EPA) (33 CFR Section 323.2 and 40 CFR Section 230.2, respectively) and pursuant to the New Jersey Freshwater Wetlands Protection Act (1987), wetlands are those areas that are inundated or saturated with surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

No wetlands, streams or waterbodies were observed or identified on or adjacent to the site during EcolSciences' field investigations. An application for an Absence Letter of Interpretation (LOI) was submitted to the NJDEP on April 6, 2023 to verify that no wetlands, State open waters or transition areas are located on the site (File No. 1413-13-0007.1).

I. Aquatic Biota

Aquatic biota comprise various macroinvertebrates including insects (largely immature forms), worms, mollusks (snails, clams), and crustaceans (scuds, shrimp, crayfish etc.) generally found within freshwater and estuarine environments. Macroinvertebrate species play an integral role in the aquatic food web and their presence and relative abundance is governed by environmental conditions and by the pollution tolerance of the respective species. The overall community thus is holistically reflective of conditions in its environment and can be used as an indicator of the water or habitat quality of a waterbody (NJDEP, December 2012). The NJDEP conducts biological monitoring studies of the state's waterbodies and ranks water quality for these sites using the Rapid Bioassessment Protocol method devised by the Environmental Protection Agency (EPA). The Ambient Biomonitoring Network (AMNET) is one of the major ongoing monitoring programs (NJDEP, December 2012).

As discussed in Section III.H. above, no surface waters that could support aquatic biota are present on-site. In the vicinity of the site, the nearest AMNET station (AN0215A) is located along Primrose Brook approximately 0.65 miles upstream from its nearest location to the site (approximately 0.13 miles from the site's western boundary) (NJDEP, Last Updated March 21, 2023). During the latest round of sampling (sixth round), this station was found to have an excellent High Gradient Macroinvertebrate Index (HGMI) with optimal habitat analysis (NJDEP, Last Updated March 21, 2023).

The HGMI is used for high gradient streams and the result of this index is considered reflective of the water and/or habitat quality of the monitoring site. An excellent HGMI result indicates that the monitoring site has minimal changes in structure of biological community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes to biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability (NJDEP, December 2012). The four categories of the habitat analysis include optimal, suboptimal, marginal, and poor. A variety of habitat parameters are considered when scoring the monitoring site's habitat analysis including epifaunal substrate/available cover, embeddedness, velocity/depth regimes, sediment deposition, channel flow status, channel alteration, frequency of riffles (or bends), bank stability, bank vegetation protection, and riparian vegetative zone width (NJDEP, December 2012).

The NJDEP does not provide a monitoring station for "Fish Index of Biotic Integrity" anywhere within the site's subwatershed (NJDEP, Last Updated March 21, 2023). As discussed in Section III.E. of this EIS, overland runoff is generally to the south towards Route 202 where inlets drain to a nearby Primrose Brook tributary and Primrose Brook. Primrose Brook and its unnamed tributary have been classified by the NJDEP as Freshwater 2, Trout Production, Category 1 (FW2-TPC1) waters. The Trout Production (TP) suffix indicates that the waters possess the properties suitable for the maintenance of trout species, i.e., high dissolved oxygen levels, relatively low summer temperatures, and low pollutant loadings (NJDEP, 2020).

J. Floodways and Floodplains

The area inundated by the floodwaters of a river or stream is termed the floodplain. Within the floodplain can be found several subdivisions: the channel, where normal, non-floodplain flow is confined; the floodway, or terrestrial areas on the margins of the channel that show permanent terracing effects of repeated flooding; and the flood fringe, or areas landward of the floodway that may be inundated during more severe (and less frequent) storms. Taken together, these areas constitute the flood hazard area around a river or stream.

Overland runoff is generally to the south towards Route 202 where inlets drain to a nearby Primrose Brook tributary and Primrose Brook. The unnamed tributary to Primrose Brook flows north to south approximately 0.10 miles from the site's southeastern boundary. Primrose Brook flows north to south approximately 0.13 miles from the site's western boundary. According to FEMA mapping (Community Panel No. 3403440003D, effective December 6, 2001), the site is mapped within areas of minimal flood hazard (Zone X).

In addition to regulating activities within floodways and floodplains, the Flood Hazard Area (FHA) Control Act Rules (N.J.A.C. 7:13 et seq.) also protects a riparian zone adjacent to all regulated waters. The riparian zones are 50, 150 or 300 feet in width along each side of regulated surface waters throughout the State. The riparian zone width depends on the environmental resources being protected, with the most protective 300-ft riparian zone applicable to waters designated as Category 1 (C1) and certain upstream tributaries. Waters supporting trout, or habitats of threatened or endangered species critically dependent on regulated waters for survival receive a 150-ft riparian zone. Regulated waters not identified above would have a 50-foot riparian zone.

There are no FHA regulated waters on or within 300 feet of the site.

K. Air Quality

The Federal and State environmental regulatory agencies have established permissible concentrations, termed the National Ambient Air Quality Standards (NAAQS), for six principal pollutants including carbon monoxide, lead, nitrogen dioxide, ozone, particle pollution, and sulfur dioxide. These standards have been shown to reduce to an acceptable level the risk of health effects to vulnerable human populations, primarily the young, the elderly, and those with respiratory ailments. Primary standards define air quality levels intended to protect the public health including "sensitive" populations such as asthmatics, children, and the elderly. The secondary standards define levels of air quality intended to protect the public welfare including protection against decreased visibility and damage to animals, crops, vegetation, and buildings (EPA, 2023).

The NJDEP annual air quality reports summarize the air quality monitoring data for that particular year in New Jersey. The State of New Jersey has been monitoring air quality since 1965. The most recent NJDEP Air Quality Summary Report available is for the year 2021. Based on the 2021 annual air quality report, the entire state of New Jersey is in non-attainment for the ozone NAAQS. New Jersey's northern non-attainment area is classified as "moderate" for the 0.08 parts per million (ppm) and 0.07 ppm 8-hour ozone standards and "serious" for the 0.075 ppm 8-hour ozone standard (NJDEP, September 2022). A "serious" area has a design value of 0.093 up to but not including 0.105 ppm (EPA, 2022).

There were two exceedances of the fine particle ($PM_{2.5}$) level 24-hour NAAQS (35 µg/m^3) at two sites in New Jersey (NJDEP, September 2022). These exceedances are attributable to a wildfire in western U.S. and Canada that caused an exceedance event in the northeast U.S. (NJDEP, September 2022). New Jersey was in attainment in 2021 for the remaining four principal pollutants including nitrogen dioxide, sulfur dioxide, carbon monoxide, and lead (NJDEP, September 2022).

The Air Quality Index (AQI) is a national air quality rating system based on the NAAQS. An index value of 100 is equal to the primary, or health-based, NAAQS for each pollutant. This allows for a comparison of each of the pollutants used in the AQI. These pollutants are ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide. In 2021, there were 14 days where the AQI reached the "Unhealthy for Sensitive Groups" ("USG") threshold in New Jersey. Twelve (12) days were due to ozone and two days were due to fine particles ($PM_{2.5}$) (NJDEP, September 2022). Only one station for one day in New Jersey had a AQI that reached "Unhealthy" ("U"). The Monmouth University station reached the U threshold due to ozone for one day (NJDEP, September 2022). The USG threshold means that members of sensitive groups may experience health effects and that the general public is not likely to be affected. The U threshold means that everyone may begin to experience health effects and that members of sensitive groups may experience more serious health effects (NJDEP, September 2022). The nearest air monitoring station, the Chester air monitoring station, is located approximately 8.02 miles northwest of the site. This station reported no AQI exceedances in 2021 for the following measured AQI parameters: ozone, particulate matter, nitrogen dioxide, and sulfur dioxide (NJDEP, September 2022).

The NJDEP annual air quality reports also provide information on longer-term trends in the state, providing summary data for all monitoring locations from 1965 to the latest year reported. Examination of those data indicates that New Jersey has shown a somewhat erratic downward trend in the ozone standard and is getting close to meeting the ozone NAAQS. There has been a steady decline in overall particulate matter $(PM)_{2.5}$, which is now in compliance with the NAAQS. A sharp increase and subsequent decrease in sulfur dioxide concentrations in New Jersey occurred in 2013 as a result of a coal-burning facility across the Delaware River in Pennsylvania. The facility has since ceased operations under a court agreement, and sulfur dioxide levels in New Jersey have returned to meeting the NAAQS for sulfur dioxide. The State of New Jersey has long been in compliance with the NAAQS for the remaining three principal pollutants including nitrogen dioxide, carbon monoxide, and lead (NJDEP, September 2022).

These positive trends in air quality have been occurring despite significant population increases in the central and southern regions of the state, and the concomitant increase in vehicular traffic associated with population growth. These countervailing trends appear to be the result of more

effective emissions controls on vehicle exhausts and on industrial emissions, the net result of which is a decline in overall air loadings since air monitoring began in 1965 as summarized in the NJDEP report for 2021.

L. Sound Characteristics and Levels

Sound is conducted through air as a series of pressure waves having kinetic energy. The kinetic energy of these sound waves can be quantified in decibels - scalar units that are geometrically related to the energy of the sound at the receptor. A doubling in the sound energy will yield an increase of 6 dB. The decibel (dBA) scale ranges from 0 for the threshold of perception of sound to approximately 130 dBA for the threshold of pain at the ear; a quiet residential street may have noises in the 55 to 60 dBA range, while heavy street traffic generates noises in the 85 to 95 dBA range (EPA, 1976). The "A" suffix means that the sound energy characteristics have been weighted to emphasize the upper audible frequency ranges (A-weighting).

The site is located in a rural area primarily surrounded by sparse residential development. All that remains of the Hurstmont estate that previously occupied the site is the driveway, old foundations and stone walls. The remainder of the site is undeveloped and characterized as early successional fields and successional upland forest. Route 202 borders the site's southern boundary, with Interstate 287 approximately 230 feet to the southeast. During peak hours, traffic along Route 202 and Interstate 287 could be expected to generate sound levels of 55-70 dBA at points approximately 150 to 200 feet from the roadways (EPA, 1976). When road traffic is minimal, sound levels are likely to be typical of a normal suburban residential area, in the range of 53-57 dBA (EPA, 1976).

M. Land Use

The development of a site is in many cases a major alteration of the features of a property. The extent to which such change in land use is significant depends in part on the existing land use(s) on the site and in surrounding areas, and on the zoning constraints selected for the land by the governing municipality.

The site was formerly occupied by the Hurstmont estate in the central portion of the site. The estate was partially demolished, and the driveway, old foundations and stone walls remain. The remainder of the site is undeveloped and characterized as early successional fields and successional upland forest. The site is bordered to the east and northwest by single-family residences interspersed with mixed forest patches and shrubland. North of the site is an expansive area of forested open space associated with the 1,200-acre Jockey Hollow National Historic Park. Immediately to the west of the subject property is the Glen Alpin Estate, a historic property jointly owned by the Township of Harding and the Harding Land Trust. Route 202 borders the site's southern boundary.

N. Aesthetics

The aesthetic quality of a particular area is a general representation of how the area is perceived by humans. Literally, it is how the sensory information provided by an area is interpreted. Pleasing visual, auditory, and olfactory stimuli will combine to provide a perception of high aesthetic appeal. Offensive sights, sounds or odors will yield the opposite impression. Aesthetics, of course, vary from observer to observer; generally, though, rural and natural landscapes offer higher aesthetic appeal than do urban, highly modified landscapes.

The site could be considered aesthetically pleasing to persons passing by along Route 202 or on adjacent properties due to the remains of the Hurstmont estate, and undeveloped early successional fields and successional upland forest that characterizes the site.

O. Historic and Cultural Resources

Historic and cultural resources are man-made or man-modified features of the environment, including objects, structures, site and districts deemed to be of cultural significance. Such resources may be pre-historic or historic in age and are often worthy of preservation to provide present and future generations with a sense of the peoples who once lived and worked in a particular locality.

The New Jersey and National Registers of Historic Places (NJDEP, 1995, last updated December 20, 2022) lists the Tempe Wick Road/Washington Corners Historic District as a listed historic district that encompasses the site. Based on a review of the GIS layers "NJDEP Historic Districts, Properties, and Site Grid Map of New Jersey" (NJDEP, NHR, HPO, 2023), this site is a listed property, known as Hurstmont, within the Tempe Wick Road/Washington Corners Historic District (Figure 6). The site was developed with a 17,000 square foot, single-family home, along with a one-story structure called the "playhouse" near Mt. Kemble Avenue and a two-story barn-like structure known as the "carriage home" in the rear of the site (HGA, 2023). In 2011, the owner received demolition permits from the Township of Harding to demolish the structures on site, but the demolition was not completed. As part of the Redevelopment Plan, the carriage home and mansion remain partially demolished (HGA, 2023).

P. Demography

The demographic characteristics of a municipality define the characteristics of the human population living in this municipality - the population size, rate and direction of change in size, age structure, etc. These characteristics provide a perspective for assessing the degree to which a proposed development will affect the municipality.

According to the 2020 census, the Township of Harding had a population of 3,871 people, and an estimated population of 3,877 as of July 1, 2021 (State of New Jersey Department of Labor and Workforce Development, 2022). This translates into a 0.2% percent change in population, which is similar to the 0.3% percent change in population of Morris County (State of New Jersey Department of Labor and Workforce Development, 2022).

IV. ASSESSMENT OF ENVIRONMENTAL IMPACT

This chapter addresses the potential impacts to the environmental resources of the site and surrounding areas that could result from the proposed development. Potential impacts are first discussed generally, then according to the specific topics set forth in the preceding chapter that inventoried environmental characteristics of the site. The incorporation of mitigation measures during construction and operational phases of the proposed project are cited here in the context of the potential impacts; reference is made again to these mitigating measures in the following chapter.

In general, the principal environmental impacts associated with the construction phase of such a project result from disturbances to soils and vegetation. In the absence of appropriate control measures, clearing of vegetated tracts of land for construction and access to construction sites could reduce the productivity of the soil and create unsightly conditions and fugitive dust. Precipitation falling on disturbed areas could tend to erode fine soil particles and, in the absence of appropriate controls, increase loadings to areas receiving stormwater runoff. As will be detailed below, these potential adverse effects will be minimized by adherence to the Soil Erosion and Sediment Control Plan, to be approved by the Township of Harding.

The principal environmental impact associated with the proposed project would be the change in land use and the direct and indirect influences on the surrounding natural communities associated with the use of the site as an affordable, age-restricted housing development. Construction of the development will convert approximately 16.6± acres of undeveloped land characterized as early successional field and successional upland forest to an affordable, age-restricted housing development.

Potential impacts on specific natural or human resources are discussed in the following sections.

A. Geology

Potential impacts to the project site's geological integrity are typically related to the location and extent of bedrock disturbance resulting from the construction phase. The construction of the project will occur in primarily unconsolidated sediments. Thus, no significant impacts to the site's geological integrity are anticipated from the construction of the proposed development.

B. Topography

Potential impacts to the topography of the site are related to the extent of excavation and/or filling required to achieve the desired topography for construction of the affordable, age-restricted

housing development. The topography within the area of proposed development is very gently sloping to very strongly sloping. As indicated on the grading plan, some modifications to the existing topography are proposed. Cutting and grading will be required at the proposed access driveway, buildings, parking areas, and stormwater management system. Throughout the site, soil erosion and sediment control measures will minimize soil loss and erosion wherever grading is proposed.

Chapter 225 Article XVIII Steep Slopes of the Township of Harding Land Use and Development Ordinance is not applicable per the Redevelopment Plan (HGA, 2023).

C. Soils

In the absence of appropriate control measures, construction activities may result in both short-term and long-term impacts related to soil loss. Removal of topsoil and organic layers could reduce the productivity of the soils, remove ground cover vegetation, and create unsightly conditions. During construction, the potential for soil disturbance will be limited to the area surrounding the proposed buildings, driveways, parking areas, and stormwater management system. During the entire construction period, soil loss and associated adverse impacts will be minimized by strict adherence to the measures specified in the Soil Erosion and Sediment Control Plan, to be approved by the Township of Harding.

These soil erosion measures include the use of a stabilized construction entrance, installation of inlet filters, installation of tree protection fences where necessary, and installation of silt fences and sediment berm along the east side of the site. Immediately following rough grading, all disturbed soils will be protected from erosion and soil loss by temporary seeding and mulching. Permanent vegetation will be established as soon as possible after final grading, as specified in the site plans. In areas where grading is necessary, rapid stabilization of all disturbed soil areas will minimize adverse effects related to soil loss or erosion. For a complete description of the soil erosion and sediment control measures, please refer to the site plans prepared by Gladstone Design (2023).

D. Ground Water Quantity and Quality

Construction of the proposed development is not expected to have an adverse impact on the ground water resources of the site and surrounding area. No ground water withdrawal is proposed within the site, and no private wells will be used to supply potable water for the project. Potable water for the proposed development will be provided by SMCMUA. The daily water demand from the development will be approximately 38,660 gpd (Gladstone Design, 2023). There will be no need to treat or manage the water from a regulatory or public health perspective.

Wastewater generated by the development, estimated to be 35,590 gpd, will be directed to an on-site wastewater treatment system comprised of proposed tanks and a sewer treatment building in the southern portion of the site (Gladstone Design, 2023). On September 2, 2022, the NJDEP adopted an amendment identified as "Hurstmont-Glen Alpin" (Program Interest No. 435442, Active No. AMD190009), which established a new discharge to groundwater sewer service area that covers the majority of the site, including all sewage-generating structures. The proposed on-site wastewater treatment system will be regulated under a New Jersey Pollutant Discharge Elimination System (NJPDES) permit. A copy of the NJDEP adoption letter dated September 2, 2022 is provided in Attachment B.

There will be an increase in impervious surfaces as a result of the proposed development. The stormwater management system has been designed to be in compliance with the requirements of the NJDEP's Stormwater Management Rules (N.J.A.C. 7:8) for ground water recharge. The proposed stormwater management system is designed such that 100 percent of the average annual pre-construction groundwater recharge volume for the site is infiltrated post-construction. For further details, please refer to the Stormwater Management Report prepared by Gladstone Design dated May 26, 2023.

E. Surface Water Quantity and Quality

The construction of the proposed affordable, age-restricted housing development is expected to have a minimal impact to the surface water resources in the vicinity of the site. Potential short-term impacts to surface water quality are generally associated with soil loss, erosion, and sedimentation during construction activities. As previously described in Section C (Soils) of this chapter, soil disturbance will be largely confined to areas surrounding the proposed buildings, driveways, parking areas, and stormwater management system. Any adverse impacts will be minimized by the installation and maintenance of proven soil erosion and sediment control measures presented in the plans. These measures will retain disturbed soil sediment within the areas of construction and will mitigate the potential for sediment being transported to the off-site Primrose Brook and Primrose Brook tributary.

Stormwater from the developed portions of the site will be collected by a proposed stormwater management system. This system will consist of a series of inlets, manholes and subsurface piping that will convey stormwater to two large scale bioretention basins and six small scale bioretention basins in the southern and central portions of the site. The stormwater management system has been designed to be in compliance with the requirements of the NJDEP's Stormwater Management Rules (N.J.A.C. 7:8) for runoff quantity standards, water quality standards, groundwater recharge standards, and soil erosion and sediment control. For specific details regarding the proposed stormwater

management system, refer to the Stormwater Management Report prepared for the project by Gladstone Design dated May 26, 2023.

F. Vegetation

Construction will require removal of existing vegetation from the site, affecting approximately 16.6± acres of undeveloped land characterized as early successional field and successional upland forest. A landscaping plan will be implemented to enhance the aesthetic features of the development. The landscaping plan includes trees, shrubs and groundcovers. For specific details regarding the proposed landscaping, refer to the Landscape and Lighting Plan prepared by Bosenberg Landscape Architecture of Far Hills, New Jersey (2023).

A 50-foot tree conservation area is required along all site boundary lines, with the exception that the rear boundary line abutting the Morristown National Historic Park and the southwest boundary line in which a trail connection is proposed, shall have a 25-foot wide tree conservation area. Within this conservation area, no tree measuring six inches or greater in diameter at a point 4 ½ feet above the ground shall be cut down or removed (HGA, 2023). Tree removal is required for the project as shown on the site plans prepared by Gladstone Design (2023). However, the requirements of Chapter 225 Article XXI Tree Conservation of the Township of Harding Land Use and Development Ordinance is not applicable per the Redevelopment Plan (HGA, 2023).

G. Wildlife

Noise, heavy equipment, and human activity during the construction phase of the project will cause most mobile wildlife species to move from the site into adjacent undeveloped areas. The project will disturb approximately 16.6± acres of the 19.6±-acre site consisting of undeveloped land characterized as early successional field and successional upland forest. This area will be developed with an affordable, age-restricted housing development. A landscaping plan will be implemented to maintain aesthetics and provide soil stabilization throughout the site. The landscaping plan includes a mixture of trees, shrubs and groundcovers. These landscaped areas will offer habitat to species tolerant of human disturbance. The proposed project will keep approximately 3 acres of undeveloped early successional field and successional upland forest, which will continue to offer wildlife habitat.

EcolSciences biologists conducted an on-site habitat evaluation and preliminary impact assessment for the Federally-listed Indiana bat and Northern long-eared bat and the State-listed wood turtle as documented on-site by NJDEP's Landscape Project (Version 3.3). This field evaluation also included assessing the site for suitable habitat for the State-listed bobcat as requested by biologists from NJDEP Office of Natural Resource Protection during an April 8, 2021 Teams meeting. This June 2020 habitat evaluation and preliminary impact assessment concluded the following:

- Bat habitat occurs on-site. As directed by the U.S. Fish and Wildlife Service (USFWS), a summer acoustic survey for Indiana and northern long-eared bats documented the probable absence of these Federally-listed bat species in the proposed development area on-site. The diminished impact to potential, but not currently occupied bat habitat, will not have a significant impact to the local environment or population.

- The site does not include any critical habitat for wood turtle due to the absence of wetlands or streams on or adjacent to the site.

- The mapped corridor for bobcat is largely focused on the off-site habitats associated with Jockey Hollow Park. No on-site habitat was identified to support bobcat usage of the site.

Based on the results of the above habitat evaluation and preliminary impact assessment, no impacts to threatened or endangered wildlife species are anticipated. For a complete description of the habitat evaluation, please refer to the HIA provided in Attachment B.

H. Wetlands

No disturbances are proposed to wetlands, State open waters or transition areas as regulated by the NJDEP. As discussed in Section III.H of this EIS, an application for Absence LOI was submitted to the NJDEP on April 6, 2023 to verify that no wetlands, State open waters or transition areas are on the site (File No. 1413-13-0007.1).

I. Aquatic Biota

Soil erosion and sediment controls will be in place during construction to prevent siltation and sedimentation from reaching the off-site Primrose Brook and Primrose Brook tributary.

As mentioned in Section E of this chapter (Surface Water Quantity and Quality), stormwater from the developed portions of the site will be collected by a series of inlets, manholes and subsurface piping that will convey stormwater to two large scale bioretention basins and six small scale bioretention basins in the southern and central portions of the site. This system has been designed to detain stormwater such that sediment and associated pollutants will be removed from the stormwater and will not be released to the any off-site surface water features. This system is also designed to release stormwater at a controlled rate.

J. Floodways and Floodplains

No disturbances are proposed to floodways, floodplains, or riparian zones.

K. Air Quality

Short-term air quality impacts during construction are related to production of fugitive dust and generation of emissions from exhausts of construction vehicles. Mitigating measures, including dust control practices and the use on construction equipment of efficient air pollution control devices meeting applicable State/Federal specifications, will minimize adverse effects on local air quality.

Long-term air quality impacts will be related primarily to vehicle exhaust emissions, primarily carbon monoxide (CO), hydrocarbons, and nitrogen oxides (NO_x). However, the magnitude of the environmental effects attributable to the vehicle traffic associated with the proposed project should not affect regional air quality.

L. Sound Characteristics and Levels

Short-term generation of noise levels elevated over existing ambient levels will be generated during the construction of the proposed development. Sound levels generated during the construction phase can be expected in the range of 72 to 94 dBA at a distance of 50 feet from construction equipment (EPA, 1976). The construction equipment included in this range consists of backhoes, concrete mixers, pavers, and trucks. To minimize adverse impacts to ambient noise levels during the construction period, construction equipment will only be operated during construction periods permitted by local law.

During the operational phase of the project, the principal sources of sound will be vehicular traffic. It is expected that the principal sources of noise in the area will continue to be traffic along Route 202 and Interstate 287. The project will comply with the Township's requirements related to noise.

M. Land Use

The proposed development will result in the conversion of undeveloped land characterized as early successional field and successional upland forest into an affordable, age-restricted housing development. The project as designed is in conformance with the Senior Living District as outlined in the Redevelopment Plan, which supersedes the provisions of the Township of Harding's Land Use and Development Regulations (Chapter 225) (HGA, 2023). The Redevelopment Plan includes the development of pedestrian trails for access between the subject site, the adjacent Glen Alpin site, and the 1,200-acre Jockey Hollow National Historic Park to the north of the site (HGA, 2023).

N. Aesthetics

The portion of the site proposed for development is currently undeveloped land characterized as early successional field and successional upland forest. A landscaping plan will be implemented to enhance the aesthetic features of the development. The landscaping plan includes a mixture of trees, shrubs and groundcovers.

O. Historic and Cultural Resources

The proposed project is not expected to adversely impact any known cultural or historical resources. Although the site is located within a listed historic district, the Hurstmont estate was partially demolished per demolition permits received by the owner from the Township of Harding in 2011 (HGA, 2023).

P. Demography

The proposed affordable, age-restricted housing development will provide a variety of affordable housing options for the senior population that contributes to the Township's affordable housing obligation (HGA, 2023). The proposed project will contribute to temporary and permanent jobs in the Township, however, this increase in job availability is not anticipated to have a significant impact on the Township's population.

V. STEPS TO MINIMIZE ENVIRONMENTAL IMPACTS

A number of potential impacts associated with construction and operation of the proposed project were identified in Chapter IV. Environmental protective measures that can minimize or eliminate environmental impacts are summarized below. Some have already been included in the site plans; others will be implemented during the construction phases. Many of the measures identified below have already been discussed in the preceding chapter, in the context of the particular environmental features in which they are identified.

A. Soils and Surface Water Resources

- Existing topography will be maintained to the greatest extent possible in the site planning to minimize the amount of grading required.
- Stabilized construction entrance and exit will be installed at Route 202 to reduce tracking of sediment onto adjacent roadways during construction activities.
- Silt fences will be erected around and/or down slope of disturbed areas to prevent sediment from being transported off-site.
- Upon completion of final grading, all disturbed areas will receive a final seeding and mulching in accordance with the Soil Erosion and Sediment Control Plan.
- All side slopes shall be protected from erosion by top soiling, seeding, and mulching as soon as possible after final grading.
- All soil erosion and sediment control measures shall be kept in place until construction is complete and/or the disturbed area is stabilized.
- All work will be done in accordance with the Standards for Soil Erosion and Sediment Control in New Jersey.
- The stormwater management basins will be maintained free of debris and sediment that would interfere with the effective operation of these facilities.

B. Air Quality

- Construction vehicles that are to operate upon the public highways of the State of New Jersey will comply with the regulations as required by N.J.A.C. 7:27-14 and 15.
- Disposal of incinerable wastes by open burning will not be permitted.
- Exhaust systems and emission control devices on all construction machinery will be maintained in good operating condition.
- Vehicles transporting fill, dirt, or other materials will be covered with canvas or similar material.

C. Sound Levels

- To minimize noise generated by construction equipment, mufflers or similar noise abatement devices will be in good operating condition on all construction machinery.
- Silencers, shields, or enclosures will be used around all stationary noise-generating equipment.
- Operation of machinery will be limited to work periods permitted by local law.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The major irreversible and irretrievable commitment of resources will be the conversion of 16.6± acres of undeveloped land characterized as early successional field and successional upland forest to an affordable, age-restricted housing development, consistent with the Redevelopment Plan. A discussion of a no-action alternative is provided in Section VIII of this EIS.

VII. UNAVOIDABLE IMPACTS

The applicant and its engineers have proposed and planned a project that will be compatible with the surrounding land uses in the Township of Harding. No project can be built and operated without generating some degree of adverse impact on some aspect of the natural or man-made environment. As discussed in the preceding chapter, impacts have been minimized to the extent possible by sound design decisions in the planning stages of the project. Moreover, compliance with State permit conditions for regulated activities and the Redevelopment Plan will protect the site's natural resources in the project vicinity. This chapter identifies the probable adverse environmental impacts of the proposed project. The unavoidable environmental impacts resulting from construction and operation of the proposed project are anticipated to be:

- Developing the currently undeveloped portions of the site characterized as early successional field and successional upland forest to an affordable, age-restricted housing development, and the associated loss of wildlife habitat.

- Increases in impervious surfaces.

- Increases in loadings of common constituents in stormwater runoff.

In general, the principal short-term environmental impacts associated with the construction phase of such a project result from temporary disturbances to soils and from the clearing of vegetation. In the absence of appropriate control measures, clearing of vegetated tracts of land for construction and access to construction sites could reduce the productivity of the soil and create unsightly conditions and fugitive dust. Precipitation falling on disturbed areas could tend to erode fine soil particles and, in the absence of appropriate controls, increase loadings to areas receiving stormwater runoff. These potential adverse effects will be managed by adherence to the Soil Erosion and Sediment Control Plan, as approved by the Township of Harding.

The principal long-term impact associated with the project is the commitment of natural resources resulting from the change in land use. The construction of the project will convert approximately 16.6± acres of undeveloped land characterized as early successional field and successional upland forest to an affordable, age-restricted housing development consistent with the Redevelopment Plan. The mitigating measures described in the preceding chapters will serve to minimize the potential impacts to natural resources in the site and surrounding area.

The long-term benefits of the project are related to improving the economy of the Township of Harding through the provision of new jobs and increased tax revenues to support public services.

VIII. PROJECT ALTERNATIVES

A. No-Build Alternative

The no-build alternative assumes no redevelopment of the site, which would then remain in its present condition. This alternative does not satisfy the intended purpose for the site under Redevelopment Plan as adopted by the Township Committee on February 14, 2023 (HGA, 2023). The site is privately owned, and subject to applicable laws and regulations, and can be developed. The No-Project alternative would result in a loss in tax revenues and infrastructure improvements to the Township of Harding. Therefore, this alternative was rejected because it does not allow reasonable use of the site and does not contribute to temporary and permanent jobs in the Township of Harding.

B. Alternative Uses

The project as designed is consistent with the proposed Senior Living District as outlined in the Redevelopment Plan, which supersedes the provisions of the Township of Harding's Land Use and Development Regulations (Chapter 225) (HGA, 2023). For details, please refer to the site plans as prepared by Gladstone Design (2023).

The proposed project aligns with the Redevelopment Plan discussed in Section II.B. of this EIS to redevelop the site formerly occupied by the Hurstmont estate with an affordable, age-restricted housing development, and will provide temporary and permanent jobs for Township residents. Various concepts were evaluated; the culmination of those evaluations is the proposed development, which is consistent with the Redevelopment Plan.

IX. LIST OF LICENSES, PERMITS AND OTHER APPROVALS

The following constitutes a list of licenses, permits and approvals required for the proposed project:

Table 2:

List of Licenses, Permits, or Other Approvals Needed

Granting Authority	License, Permit, or Approval	Status
Township of Harding	Preliminary & Final Major Site Plan and Minor Subdivision Approval Soil Erosion and Sediment Control Plan Certification	Subject of this application Submitted concurrently with Site Plan application
Morris County Planning Board	Preliminary & Final Major Site Plan and Minor Subdivision Approval	Submitted concurrently with Site Plan application
NJDEP Division of Land Resource Protection	Absence Letter of Interpretation	Submitted 4/6/2023 (File No. 1413-13-0007.1)
NJDEP Division of Watershed Protection & Restoration	Amendment to the Sewer Service Area of the Northeast Water Quality Management (WQM) Plan	Issued 9/2/2022 (Program Interest No. 435442 Activity No. AMD190009)
NJDEP Division of Water Quality	National Pollutant Discharge Elimination System (NJPDES) Discharge to Groundwater Permit NPDES General Permit 5G3 No. NJG0088323 Stormwater Discharge Associated with Construction Activity Treatment Works Approval	To be submitted To be submitted To be submitted
New Jersey Department of Transportation (NJDOT)	Subdivision Approval Minor Access Permits	To be submitted To be submitted
NJDEP Bureau of Safe Drinking Water	Water Main Extension Permit	To be submitted

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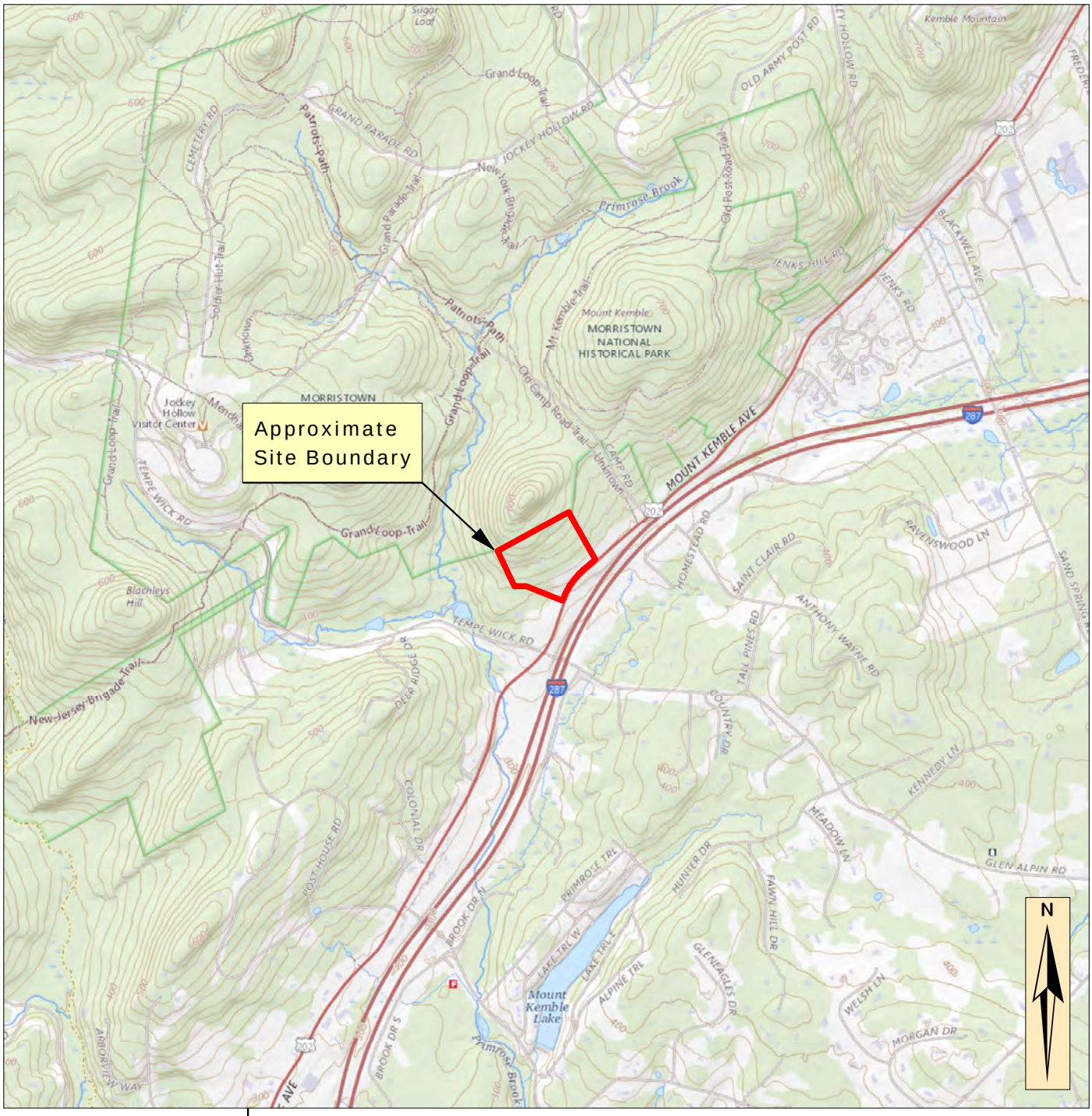
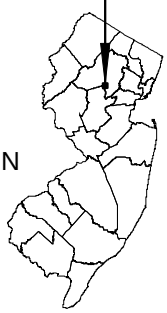
ATTACHMENT A

Figures



0 2,000 4,000
Feet

SITE
LOCATION



State Plane Coordinates (New Jersey NAD 83)
484,904' E; 701,006' N

FIGURE 1: USGS SITE LOCATION

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 3/27/2023

Scale 1:24,000

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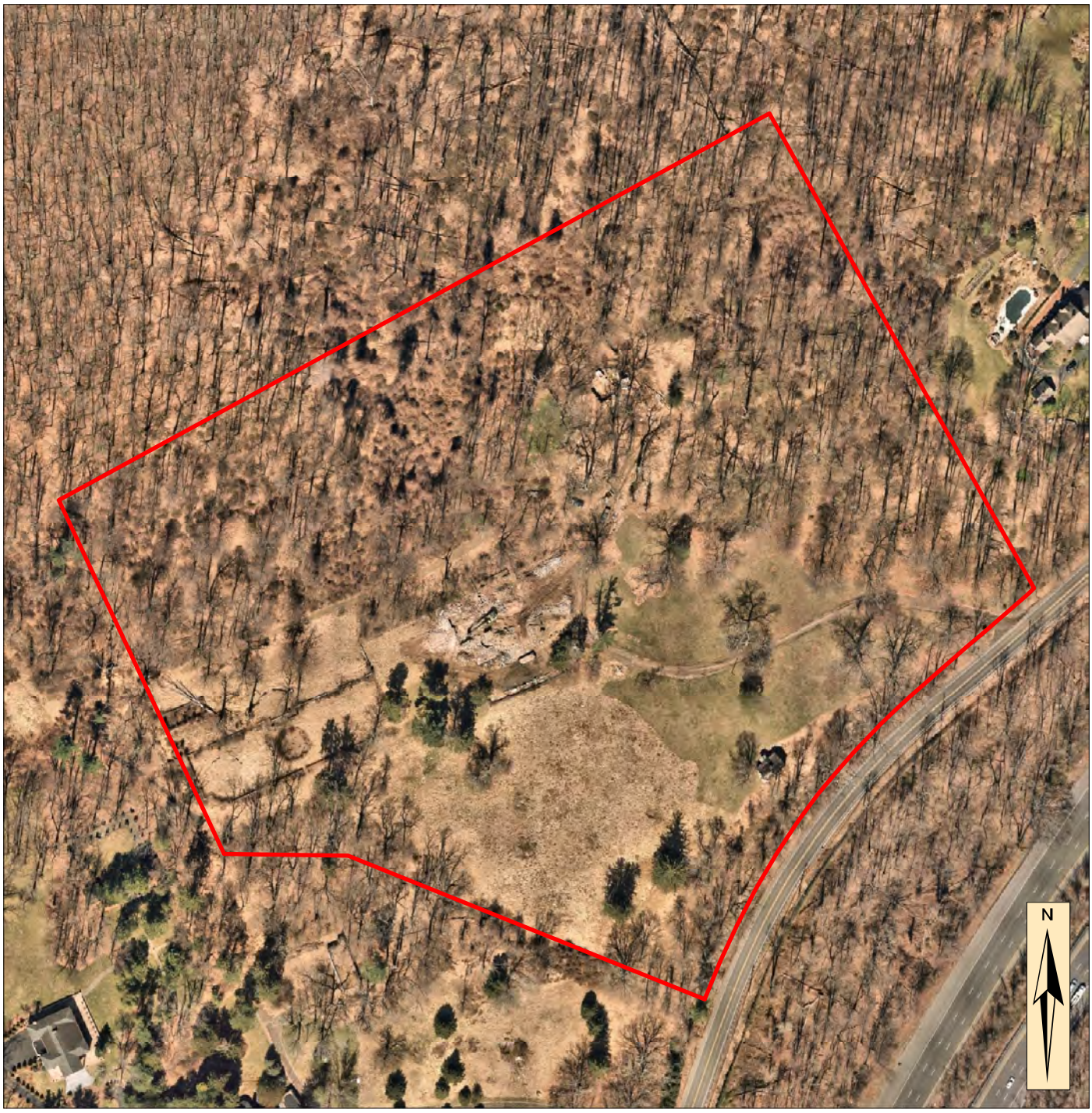

Legend

Approximate Site Boundary

0 200 400 Feet

FIGURE 2: 2022 AERIAL IMAGERY

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Source: Nearmap US Inc. MapBrowser. 2022.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 3/27/2023

Scale 1:2,400

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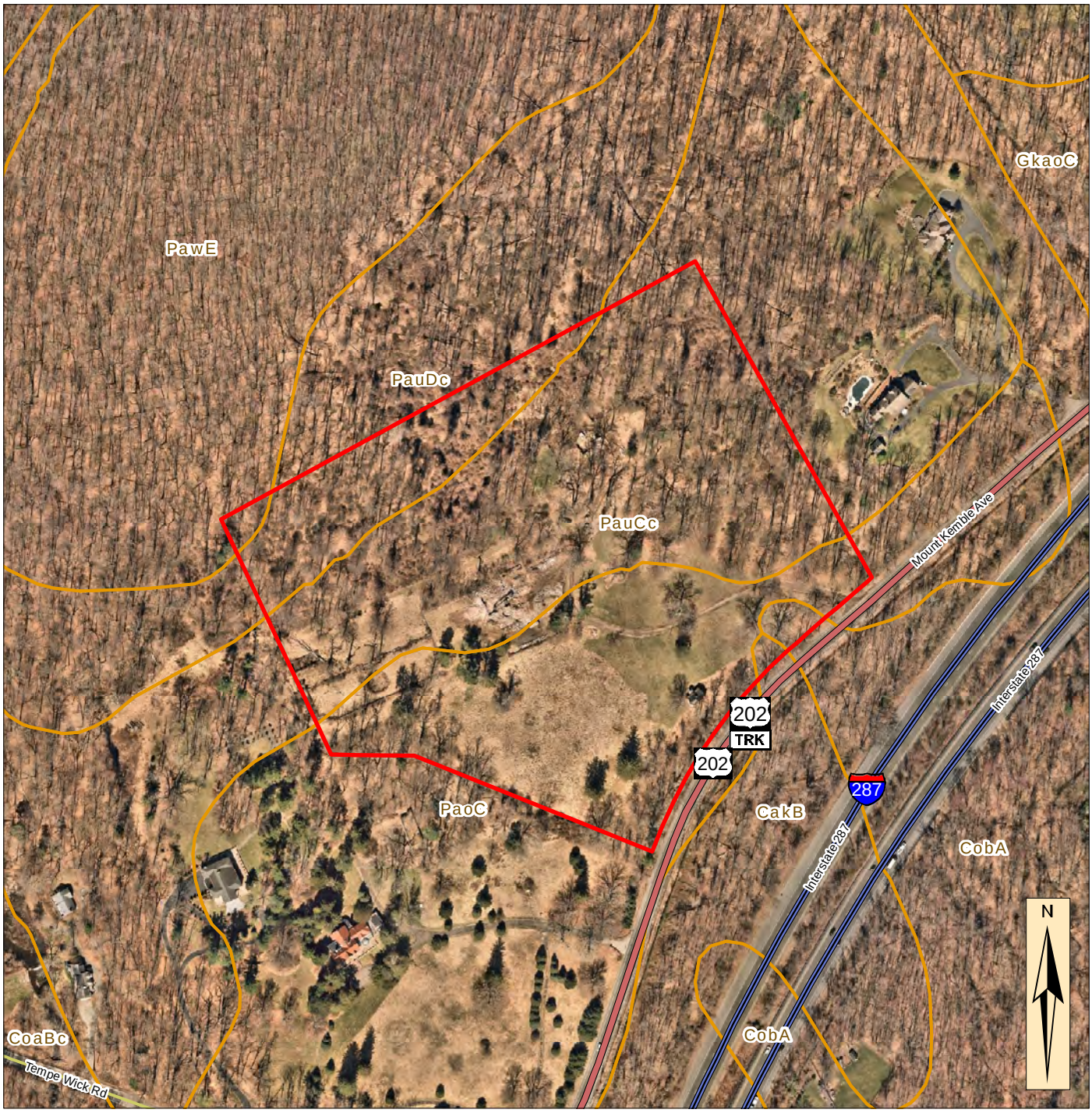

Legend

Approximate Site Boundary

Soil Unit Boundary

0 300 600 Feet

SYMBOL	NAME
CakB	Califon loam, 3 to 8 percent slopes
CobA	Cokesbury gravelly loam, 0 to 3 percent slopes
PaoC	Parker gravelly sandy loam, 3 to 15 percent slopes
PauCc	Parker-Gladstone complex, 0 to 15 percent slopes, extremely stony
PauDc	Parker-Gladstone complex, 15 to 25 percent slopes, extremely stony
PawE	Parker-Rock outcrop complex, 25 to 45 percent slopes

FIGURE 3: SSURGO SOILS MAP

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Sources:
USDA, NRCS. 2014. SSURGO Database for Morris County, NJ.
Source: Nearmap US Inc. MapBrowser. 2022.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 3/27/2023

Scale 1:3,600

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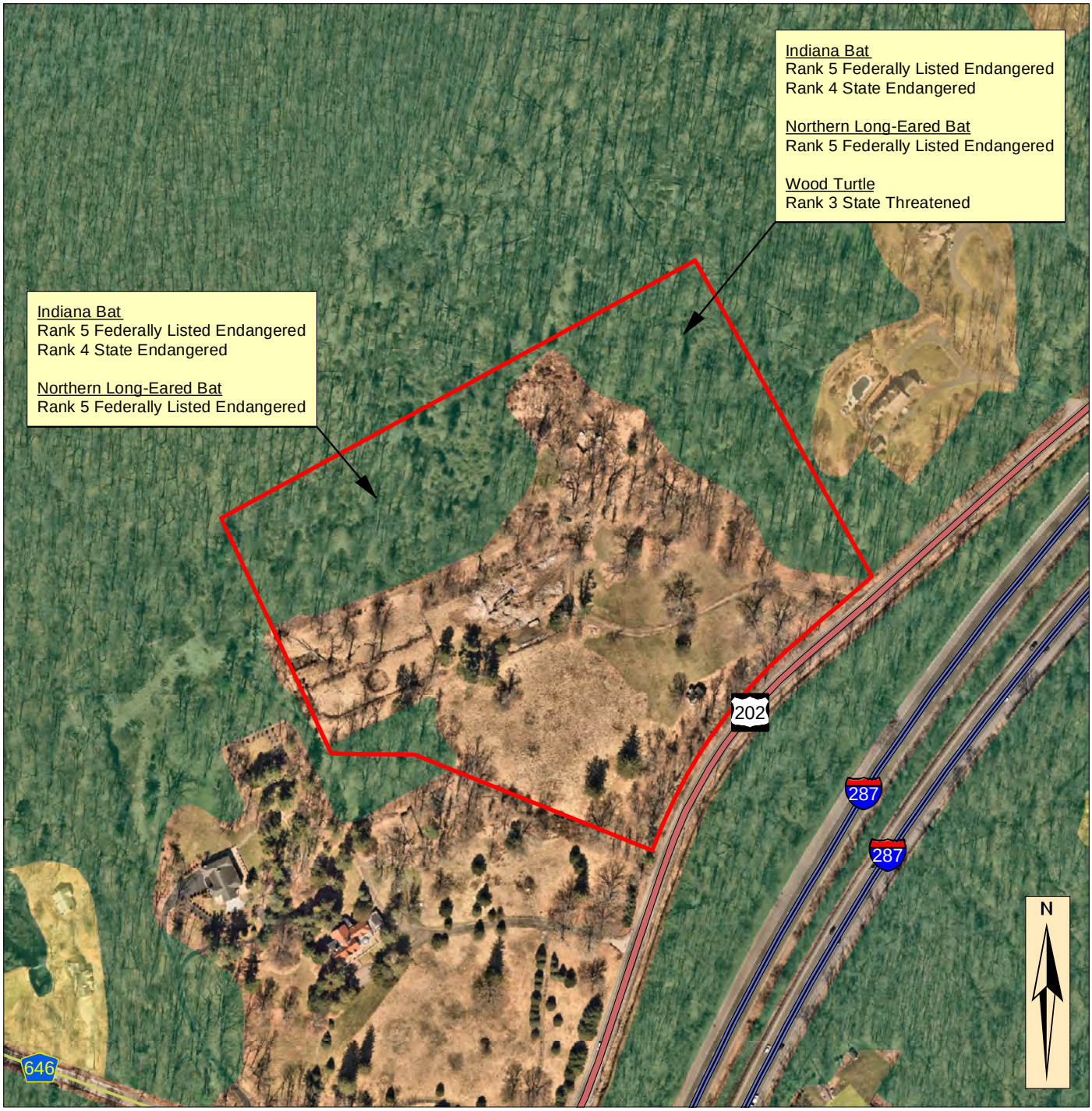

Legend

- Approximate Site Boundary
- Rank 1 - Habitat specific requirements
- Rank 2 - Special Concern
- Rank 3 - State Threatened
- Rank 4 - State Endangered
- Rank 5 - Federal Listed

0 300 600 Feet

LANDSCAPE PROJECT MAP

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Sources:
NJDEP, DFW, ENSP. 2017. New Jersey's Landscape Project (Version 3.3).
Nearmap US Inc. MapBrowser. 2022.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 3/27/2023

Scale 1:3,600

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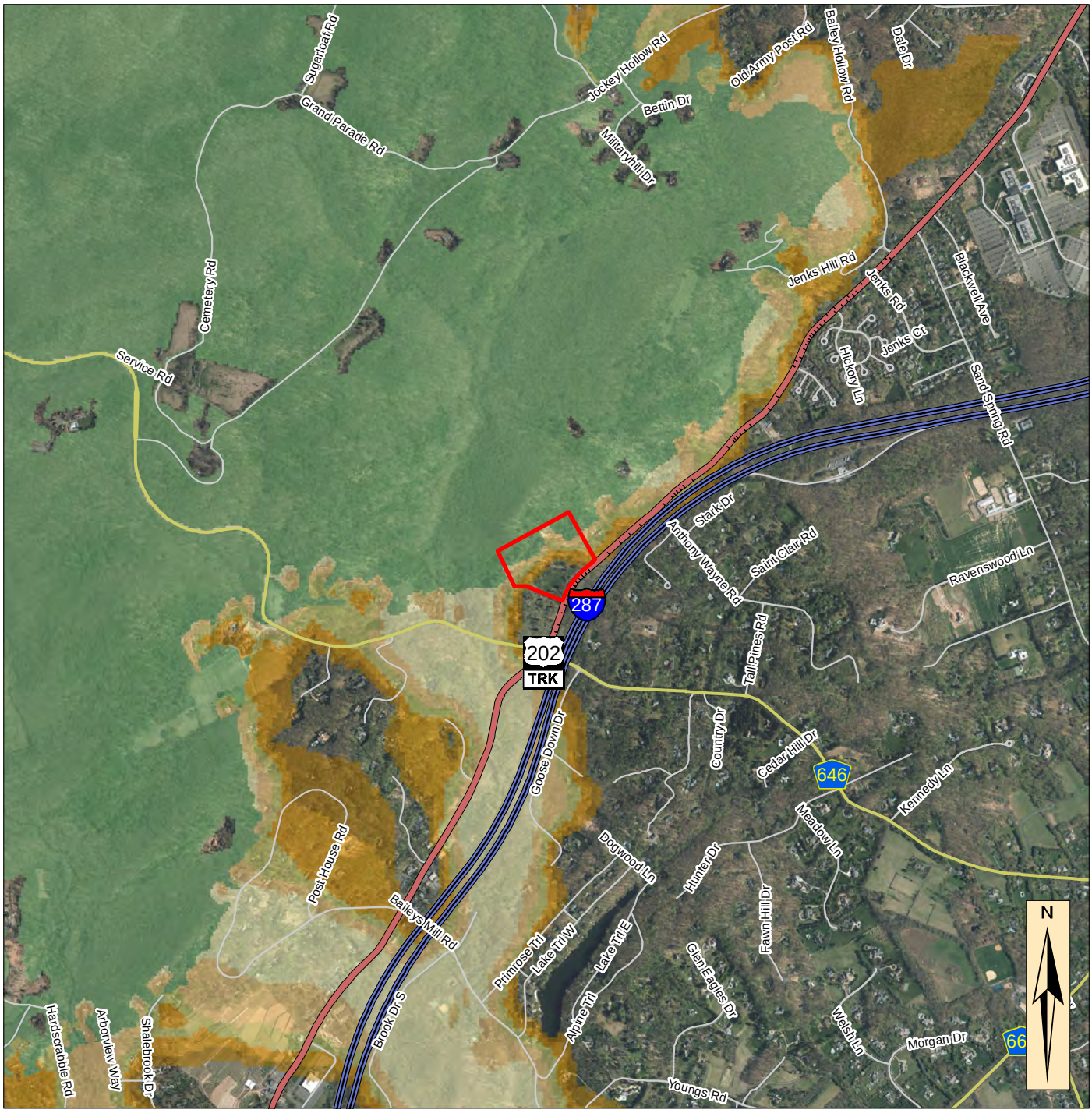

Legend

- Approximate Site Boundary
- Core
- Corridor, 1 (Easier Movement)
- Corridor, 2
- Corridor, 3
- Corridor, 4
- Corridor, 5 (More Difficult Movement)

0 2,000 4,000 Feet

FIGURE 5: WILDLIFE CORRIDORS

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Source: NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 3/27/2023

Scale 1:24,000

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Legend

- Approximate Site Boundary
- Historic Property Features
- Historic Properties
- Historic Districts
- Archaeological Site Grid

0 300 600 Feet

FIGURE 6: HISTORIC RESOURCES

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Sources:
NJDEP, NHR, HPO. 2022. NJDEP Historic Property Features, Properties, Districts, and Site Grid Map of NJ.
Nearmap US Inc. MapBrowser. 2022.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 3/27/2023

Scale 1:3,600

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ATTACHMENT B

Pertinent Correspondence

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATERSHED PROTECTION & RESTORATION
Bureau of NJPDES Stormwater Permitting & Water Quality Management
P.O. Box 420, 501 East State Street
Mail Code 501-02A
Trenton, New Jersey 08625-0420
Tel. (609) 633-7021 • Fax (609) 984-6505
https://www.nj.gov/dep/wqmp

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

SHAWN M. LATOURETTE
Commissioner

Adam Stern
Executive Vice President
Natural Systems Utilities
170 Township Line Road, Suite C
Hillsborough, New Jersey 08844

Email only
September 2, 2022

Re: **Hurstmont-Glen Alpin**
Block 27, Lot 2 and Block 34, Lot 1, Harding Township, Morris County
Amendment to the Northeast Water Quality Management (WQM) Plan
Program Interest No.: 435442, Activity No.: AMD190009
Adoption Letter

Dear Mr. Stern:

The New Jersey Department of Environmental Protection (Department) received the above-referenced application for an amendment to the Northeast WQM Plan on November 18, 2019. The Department processed the amendment application in accordance with the New Jersey Water Quality Planning Act (N.J.S.A 58:11A-1 et seq.) and the Water Quality Management Planning Rules (N.J.A.C. 7:15). This amendment establishes a new discharge to groundwater sewer service area of 17.6 acres to provide for a proposed 250-unit residential development and a 360-person banquet hall on portions of Block 27, Lot 2 and Block 34, Lot 1, Harding Township, Morris County. The Department published the preliminary notice of the proposed amendment in the New Jersey Register on December 6, 2021, at 53 N.J.R. 2091(a).

I am pleased to inform you that this amendment has been formally adopted as of the date of this letter. No comments were received during the comment period. It is anticipated that the Department will publish the attached final notice of the adoption in an upcoming edition of the New Jersey Register. Please note that sewer service is not guaranteed by adoption of this amendment since the amendment represents only one part of the permit process and other issues may need to be addressed. Inclusion in the sewer service area resulting from adoption of this amendment does not eliminate the need to obtain all necessary permits, approvals or certifications required by any Federal, State, county or municipal review agency with jurisdiction over this project/activity.

Please include the program interest and activity numbers provided above on all written correspondence to the Department regarding this amendment. If you have any questions about this amendment, please contact Scott Sullivan at (609) 633-7021 or Scott.Sullivan@dep.nj.gov.

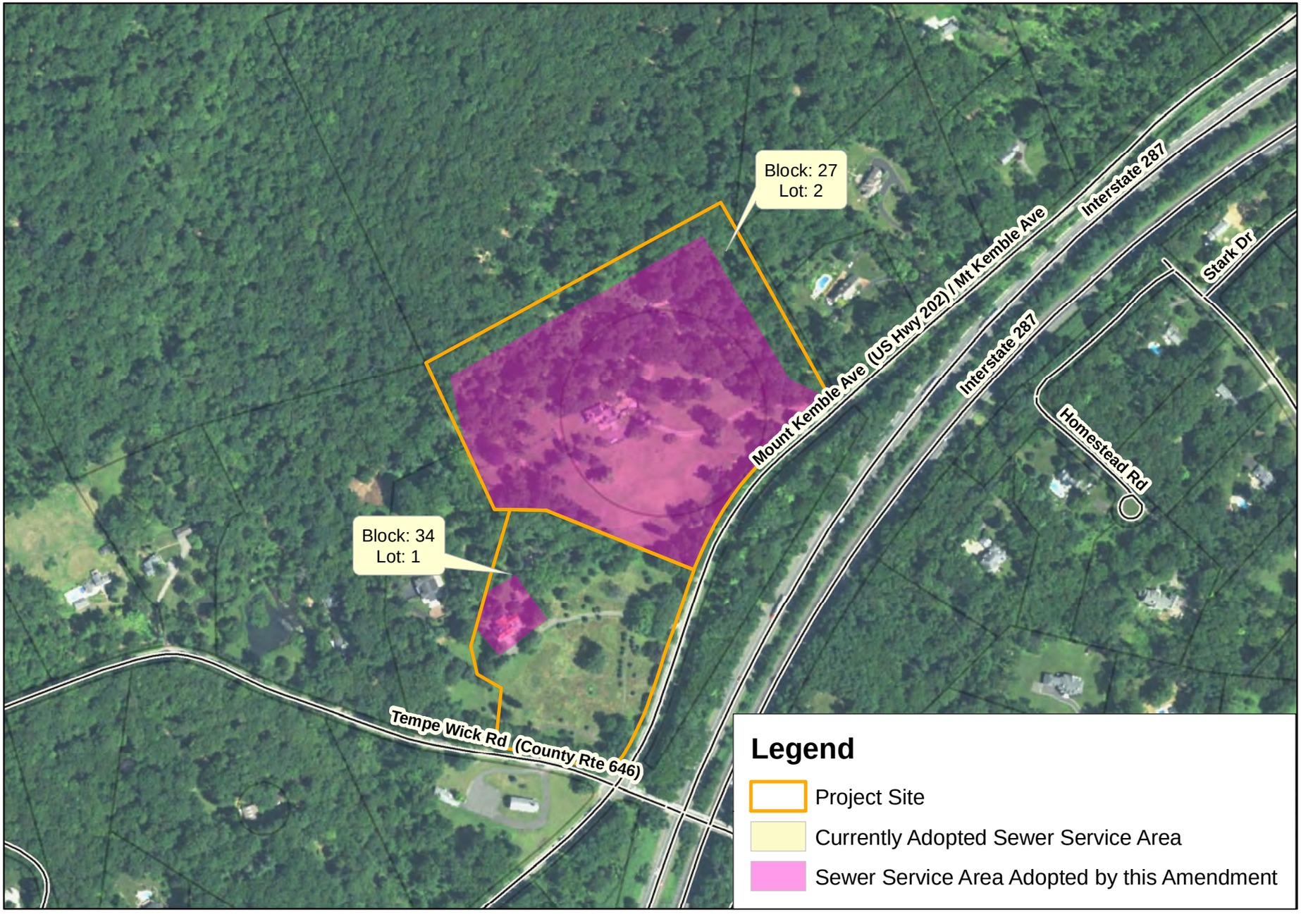
Sincerely,

Madhu Guru, PE, Assistant Director
Bureau of NJPDES Stormwater Permitting and Water Quality Management
Division of Watershed Protection and Restoration

Enclosures: Adoption Notice
Adoption Map

c: Peter Monaghan, Applicant, Hurstmont Estate Acquisition, LLC
Michael Nestico, Property Owner, Harding Holding PM, LLC
Lisa Sharp, Municipal Clerk, Harding Township
Virginia Michelin, Principal Environmental Planner, Morris County Office of Planning and Preservation
Ben Spinelli, Executive Director, New Jersey Highlands Council
Raj Shah, Environmental Engineer 4, NJDEP, Division of Water Quality (DWQ), Bureau of Environmental Engineering and Permitting (BEEP)
Kathleen Burkhard, Section Chief, NJDEP, DWQ, BEEP
Brian Sage, Environmental Specialist 3, NJDEP, DWQ, Bureau of Ground Water, Residuals and Permit Administration

Hurstmont-Glen Alpin, Harding Township, Morris County, PI# 435442, AMD 190009



PUBLIC NOTICE

ENVIRONMENTAL PROTECTION

WATERSHED AND LAND MANAGEMENT

DIVISION OF WATERSHED PROTECTION AND RESTORATION

Adopted Amendment to the Northeast Water Quality Management Plan

Public Notice

Take notice that **on September 2, 2022,** pursuant to the provisions of the New Jersey Water Quality Planning Act, N.J.S.A. 58:11-1 et seq., and the Water Quality Management Planning rules, N.J.A.C. 7:15, the New Jersey Department of Environmental Protection (Department) adopted an amendment to the Northeast Water Quality Management (WQM) Plan. This amendment, identified as "Hurstmont-Glen Alpin" (Program Interest No.435442, Activity No. AMD190009, establishes a new discharge to groundwater (DGW) sewer service area (SSA) of 17.6 acres on portions of Block 27, Lot 2 and Block 34, Lot 1, Harding Township, Morris County to serve a proposed 250-unit residential housing development consisting of 75 1-bedroom units, 50 2-bedroom units, 40 2-bedroom age-restricted units, and 85 1-bedroom assisted living units to be located on Block 27, Lot 2. In addition, an existing structure located on Block 34, Lot 1 is to be renovated into a banquet hall designed for 360 people. Wastewater from both the proposed residential development and the banquet hall would be served by a proposed on-site DGW wastewater treatment system, which will be regulated under a New Jersey Pollutant Discharge Elimination System (NJPDES) permit. As calculated in accordance

with N.J.A.C. 7:14A-23.3, the project would generate a projected wastewater flow of 45,000 gallons per day (gpd).

Preliminary notice of this amendment was published in the New Jersey Register on June 6, 2022, at 54 N.J.R. 1099(a). No comments were received during the comment period. This notice represents the Department's determination that the amendment complies with the applicable regulatory criteria at N.J.A.C. 7:15, as described below.

In accordance with N.J.A.C. 7:15-3.5(g)6, the Department instructed the applicant to request written statements of consent from Harding Township, the Morris County Board of County Commissioners, and the New Jersey Highlands Council. On June 20, 2022, Harding Township passed Resolution TC 22-137, consenting to the amendment. In an email dated June 2, 2022, Morris County stated that they took no position on the amendment. The New Jersey Highlands Council did not pass a resolution as the amendment was not subject to Highlands review.

In accordance with N.J.A.C. 7:15-3.3(b), site specific amendments are limited to alterations of the eligible SSA needed to address a specific project or activity. N.J.A.C. 7:15-3.5(j)2 requires that site specific amendments proposing to add 100 or more acres or generating 20,000 gpd or more of wastewater flow shall include a proposed modification to the wastewater treatment capacity analysis prepared in accordance with N.J.A.C. 7:15-4.5(b) to include the proposed project or activity. The proposed project involves less than 100 acres but will generate more than 20,000 gpd of wastewater. However, since the wastewater is to

be treated by a proposed new on-site wastewater treatment facility specifically for this project, a wastewater treatment capacity analysis is not required.

The proposed project is located within the Highlands Region, as defined in the Highlands Water Protection and Planning Act, N.J.S.A. 13:20-7.a. As delineated in the Highlands Regional Master Plan (RMP), the proposed project property is located within the Protection Zone of the Highlands planning area. Harding Township has not opted to conform with the Highlands RMP. However, in accordance with Executive Order 114 (2008), the Highlands Council reviewed the amendment for consistency with the Net Water Availability (NWA) provisions of the RMP and issued a letter dated March 24, 2020, stating that, based on recent Net Water Availability calculations, the project site is located in a HUC14 subwatershed which is not in a deficit, and therefore, the project is not subject to Highlands Council's review.

Pursuant to N.J.A.C. 7:15-4.4(d), the following are not eligible for delineation as SSA, except as otherwise provided at N.J.A.C. 7:15-4.4(i), (j), (k) and (l): ESAs identified under N.J.A.C. 7:15-4.4(e) as any contiguous area of 25 acres or larger consisting of any of the following, alone or in combination: endangered or threatened wildlife species habitat, Natural Heritage Priority Sites, riparian zones of Category One (C1) waters and their tributaries, or wetlands; coastal planning areas identified at N.J.A.C. 7:15-4.4(f); and ESAs subject to 201 Facilities Plan grant conditions pursuant to N.J.A.C. 7:15-4.4(g). The Department conducted an evaluation of the project site using a GIS shapefile provided by the applicant compared to the Department's GIS data layers available at http://www.nj.gov/dep/gis/listall.html and/or other

information as noted below, to determine the presence of any such areas in accordance with N.J.A.C. 7:15-4.4(e), (f) and (g) and made the following findings:

- The Department determined that the new SSA contains areas mapped as endangered or threatened wildlife species habitat for Wood Turtle (Rank 3) and Northern Myotis and Indiana Bat (Rank 5) on the Department's Landscape Maps of Habitat for Endangered, Threatened or other Priority Wildlife based on the "Landscape Project Data" Version 3.3 GIS data layers in accordance with N.J.A.C. 7:15-4.4(e)1. However, based on review of the Habitat Suitability Determination/Habitat Impact Assessment (HSD/HIA) prepared and submitted pursuant to N.J.A.C. 7:15-4.6 and 4.7, the Department determined that, in accordance with N.J.A.C. 7:15-4.4(j)2, the mapped habitat for Wood Turtle is not suitable as the species is not documented in the nearby Primrose Brook and no wetland or water features or associated buffers occur on-site. It was determined that the project would impact 4.54 acres of potential Northern Myotis and Indiana Bat habitat. An acoustic survey was conducted during the active foraging and maternity season and did not identify either bat species on the project site, indicating that no maternity roost for either species was present on the project site. Additionally, the project site is adjacent to over 1,000 acres of protected open space offering similar habitat and critical habitats for the species, such as wetlands, waters, and riparian forests that are no present on the project site. In accordance with N.J.A.C. 7:15-4.4(k)2, the Department concurred with the HSD/HIA find that, for the habitat that could not be avoided by the project, the impacts would be insignificant or discountable on the maintenance of local breeding, resting, or feeding of both the Northern Myotis and Indiana Bat.

- The Department determined that the new SSA does not contain any areas mapped as Natural Heritage Priority Sites based on the "Natural Heritage Priority Sites" GIS data layer in accordance with N.J.A.C. 7:15-4.4(e)2.
- The Department determined that the new SSA does not contain any C1 waters or 300-foot riparian zones along any C1 waters or upstream tributaries within the same HUC14 watershed of any C1 waters based on the "Surface Water Quality Standards" GIS data layer in accordance with N.J.A.C. 7:13-4.1(c)1 and 7:15-4.4(e)3.
- The Department determined that the new SSA does not contain wetlands based on the "Wetlands 2012" GIS data layer I accordance with N.J.A.C. 7:15-4.4(e)4.
- The Department determined that the new SSA does not contain any Coastal Fringe Planning Areas, Coastal Rural Planning Areas, or Coastal Environmentally Sensitive Planning Areas mapped on the CAFRA Planning Map based on the "CAFRA Layers" GIS layer in accordance with 7:15-4.4(f).
- The Department determined that there are no 201 Facilities Plan grant conditions applicable to the project based on the U.S. Environmental Protection Agency (USEPA) list of New Jersey Grantees with ESA Grant Conditions at https://www.epa.gov/npdes-permits/environmentally-sensitive-area-esa-grant-condition-waiver-program-region-2 in accordance with N.J.A.C in accordance with N.J.A.C. 7:15-4.4(g).

Pursuant to N.J.A.C. 7:15-4.4(h)1 and 2, the Department considered the land uses allowed in adopted zoning ordinances, future land uses shown in municipal and county master plans, and other local land use objectives. The proposed project is consistent with land uses allowed by local zoning and the county and local master plans. On February 25, 2019,

Harding Township adopted Resolution 17-073 designating the project site as a non-condemnation Area in Need of Development. In a December 6, 2021, email to the Department, Harding Township confirmed that the project was consistent with the zoning and master plan. The Morris County Office of Planning and Preservation indicated to the Department that it took no position on the project.

Sewer service is not guaranteed should this amendment be adopted as it represents only one part of the permit process and other issues may need to be addressed. Inclusion in the SSA as a result of the approval of this amendment does not eliminate the need to obtain all necessary permits, approvals, or certifications required by any Federal, State, county, or municipal review agency with jurisdiction over this project/activity.

09/02/2022

Date

Bureau of NJPDES Stormwater Permitting and Water Quality Management
Division of Watershed Protection and Restoration
NJ Department of Environmental Protection

HABITAT IMPACT ASSESSMENT
HURSTMONT ESTATE
BLOCK 27, LOT 2
TOWNSHIP OF HARDING
MORRIS COUNTY, NEW JERSEY

Prepared for:

Hurstmont Estate Acquisition, LLC
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May 11, 202

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I. EXECUTIVE SUMMARY

This report analyzes a requested Site-Specific amendment to the Morris County Wastewater Management Plan to support the redevelopment of a currently developed residential site which will satisfy a portion of Harding Township affordable housing obligations.

The applicant, Hurstmont Estate Acquisition, LLC, is proposing to redevelop Block 27, Lot 2 located at 679 Mt. Kemble Avenue (Rte. 202), in the Township of Harding, Morris County, New Jersey (Appendix A – Figure 1) with an affordable housing project, which would require approximately 5.1 acres of tree clearing. The 19.78 – acre site consists of 7.74 - acres of forested area. The remainder of the site is field/former lawn and landscaped areas associated with the former Hurstmont Estate. The project will impact 5.11 – acres of forested habitat mapped as potential bat habitat.

The site is currently occupied by vacant dwellings and outbuildings associated with the former Hurstmont Estate. The property is primarily characterized by upland grassland fields, (former maintained lawns) and landscaped areas. The northern portion of the site consists of upland forest. The site includes no wetlands, streams, or open water. The site is located south of the approximately 1,200-acre Jockey Hollow National Historic Park and north of Route 202.

The proposed Hurstmont Estates residential development will be composed of approximately 250 townhomes, independent living apartments, and assisted-living units with a proposed estimated wastewater generation of 37,800 gpd. Because there is no existing public sewer nearby, the wastewater from the proposed development will be treated by an on-site tertiary treatment facility with discharge to groundwater and a new sewer service area is proposed. The Hurstmont Estate property comprises 19.78- acres of a total of 29- acres of the Township of Harding's Glen Alpin/Hurstmont Redevelopment Area. No new sewer generating facilities are proposed on the existing Glen Alpin Historic Site. Water supply for the development is expected to be provided by the Southeast Morris County Municipal Utilities Authority. An amendment to the Northeast Water Quality Management Plan to designate the Hurstmont/Glen Alpin Sewer Service Area has been submitted to the NJ Department of Environmental Protection (Application File No: 998407).

The amendment is needed to allow certain portions of the site which are identified by the New Jersey Department of Environmental Protection ("NJDEP') as potential habitat for the federally endangered Indiana bat (*Myotis sodalis*), federally threatened northern long-eared bat (*Myotis septentrionalis*) (also known as northern Myotis), State endangered bobcat (Lynx rufus),

and State threatened wood turtle (*Glyptemys insculpta*) to be included in the Sewer Service Area (SSA). Following consultation with the United States Fish and Wildlife Service (USFWS), a Summer Presence/Absence Acoustic Survey for Indiana and Northern long-eared bats was conducted in June 2020. No Indiana or Northern long-eared bats were identified. However, acknowledging the presence of potential habitat for these two species, the applicant is also proposing to abide by a time of year tree clearing restriction between April 1 and September 30.

Although bobcat is not mapped on-site by the New Jersey Landscape Project, pursuant to an April 8, 2021 Teams meeting with biologists from NJDEP Division of Natural Resource Protection, it was brought to the applicants' attention that the northern portion of the site is mapped by Connecting Habitat Across New Jersey (CHANJ) as part of a much larger, off-site core/corridor habitat for bobcats. The bulk of this corridor is located within the adjacent Jockey Hollow National Historic Park (Figure 2).

It was determined by EcolSciences, as part of the field investigation that the site is not critical wood turtle habitat since it does not include streams, wetlands, or riparian corridors. As discussed with NJDEP Natural Resource Protection biologists, during the April 12th meeting, it was agreed that no critical habitat for this species occurs on-site and development of the site will not have an impact on local wood turtle populations. Therefore, this HIA will not address this species.

As this report demonstrates, the impact to potential Indiana and northern long-eared bat and bobcat habitat is insignificant and discernable and will not result in negative impacts to local populations.

II. INTRODUCTION

The Hurstmont Estate Acquisition, LLC, of Ambler, Pennsylvania, is proposing to redevelop Block 27, Lot 2 located in the Township of Harding, Morris County, New Jersey, with an affordable housing project, which would require approximately 5.1 acres of tree clearing. The 19.87±-acre site is currently occupied by vacant dwellings and outbuildings associated with the former Hurstmont Estate. The property is primarily characterized by upland grassland fields, (former maintained lawns) and landscaped areas. The northern portion of the site consists of upland forest. The site includes no wetlands, streams, or open water features. The site is located south of Jockey Hollow National Historic Park and north of Route 202 (Figure 3) .

The site is bordered to the east and north-west by single-family residence interspersed with mixed forest patches and shrubland. North of the site is an expansive area of forested open space associated with the 1,200-acre Jockey Hollow National Historic Park. Immediately to the west of the subject property is the Glen Alpin Estate, a historic property jointly owned by the Township of Harding and the Harding Land Trust.

The project sit is part of the Township of Harding Glen Alpin/Hurstmont Redevelopment Plan (adopted on September 30, 2019, Appendix B) Development proposed on the Hurstmont Estate property will be composed of approximately 250 townhomes, independent living apartments, and assisted-living units (Figure 4). As part of a Court approved Settlement agreement with the Housing Element and Fair Share Plan, no less than 40 units must be affordable. The Hurstmont Estate property comprising 19.78- acres of the total redevelopment area of 29.44 acres.

As part of the Glen Alpin/Hurstmont Redevelopment Plan, the following environmental concerns were considered:

- That there would be no impacts to Primrose Brook, a Category 1 (C1) watercourse and important watercourse that flows from Jockey Hollow and located in excess of 300 feet from the proposed redevelopment area.
- That the Plan will preserve existing mature trees wherever possible.
- That the Plan will encourage additional tree planting.
- That the Plan will maintain the rural character of the area.
- That the Plan will develop pedestrian trails between the two redevelopment properties and the Morristown Historic Park.
- That the Plan will preserve the environmental quality of the adjacent Morristown Historic Park and downstream Great Swamp National Wildlife Refuge.

- That the Plan will protect natural resources through stringent land use and development regulations.
- That the Plan comply with Township's exterior lighting "dark sky" ordinance, to minimize light pollution.
- That the plan provide a 50-foot tree conservation area required to remain along all perimeter property lines.
- That the Plan proposes all new plantings shall consist of native species. Invasive species are prohibited from plantings.

The Glen Alpin/Hurstmont Redevelopment Plan requires that the entire Glen Alpin property remains preserved. This keeps the project in compliance with the Morris County Master Plan that stresses projects that preserve open space and access to historic sites. The proposed trail system also supports the Morris County Master Plan objectives. The Glen Alpin/Hurstmont Redevelopment Plan is also in accordance with the New Jersey State Development and Redevelopment Plan (SDRP). Although Harding Township is located in Planning Area 5 (PA5) for environmentally sensitive planning areas, parks, and natural areas, the project meets seven (7) of the eight (8) goals and policies of SDRP, including:

1) Redevelopment of a blighted area;
2) Minimization of environmental disturbances through tree conservation and respecting environmental setting of the site;
3) Encourage economic growth by preserving Glen Alpin and providing housing on Hurstmont;
4) Protect the adjacent Morristown National Historic Park with easements, setbacks, and conservation areas;
5) Provide affordable and age-restricted housing, as well as local senior housing.
6) Protect and preserve the Glen Alpin mansion and provide walking trails and open space to local and State residents;
7) Take an underutilized and historic property near adequate infrastructure (Route 287 and 202) and create re-use for the properties.

Currently, none of the Redevelopment Area is located within a Sewer Service Area. In order to address returning the entire proposed development area into the Sewer Service Area, the applicant must address the impacts of the proposed development on environmentally sensitive areas. Environmentally sensitive areas include areas mapped as endangered or threatened wildlife species habitat on the Department's most currently available New Jersey Landscape Project Maps, Natural Heritage Priority Sites, wetlands and riparian zones. The development area does not

include any Natural Heritage Priority Sites, wetlands, or riparian corridors. The NJDEP issued a Freshwater Wetlands (FWW) Letter of Interpretation (LOI) Absence Verification, that expired in 2018 (File No. 18413-13-0007.1 FWW 130001), verifying the absence of regulated wetlands and state open waters. EcolSciences, Inc. conducted a wetland investigation in July of 2018 re-verifying the absence of all regulated wetland and water features.

The NJDEP Landscape Project Version 3.3, the latest currently available, is a wildlife habitat mapping program that is used to identify and map critical wildlife habitats for endangered, threatened, and special concern species. The maps are based on land use classification and rare species locations. Each mapped area appears as a different shaded color (5 Ranks) indicating its relative priority ranking. Rank 1 is the lowest priority ranking, while Rank 5 is the highest priority ranking. Rank 1 is defined as areas meeting the minimum size requirements but with no documented sightings of threatened or endangered species. Rank 2 contains records for priority species, which are species of special concern. Ranks 3, 4, and 5 indicate that the identified land cover type has been identified as providing habitat for State threatened (Rank 3), State endangered (Rank 4), or Federally threatened or endangered (Rank 5) species (NJDEP DFW ENSP, 2017).

The Landscape Project (Version 3.3) has mapped portions of the site within Rank 5 habitats. These Rank 5 habitats include documented sightings of Federally-listed Indiana bat and northern myotis (also known as Northern long-eared bat), and State-threatened wood turtle (Figure 5).

Wood turtle is a wetland-dependent species. Although wood turtles can travel quite a distance from their hibernacula streams, streams and wetlands are their core habitats. Wood turtles require streams for hibernating, breeding, and riparian zones for nesting. EcolSciences conducted a site inspection and determined that no wetlands, transition areas, State open waters, or riparian zones are located on or within 300-feet of the development area. The closest stream is Primrose Brook mapped in excessive of 700- feet from the site. As such, the site does not provide critical breeding, resting, or foraging habitat for wood turtles and should not be considered critical habitat for this species.

The Indiana bat sightings originates from active season, breeding, maternity, and roost sightings and the northern myotis sighting originates from an active season sighting. Most of these sightings are from surveys conducted prior to the devastation of northeastern *Myotis* species by White Nose Syndrome and are likely no longer active sights. The United States Fish and Wildlife Services (USFWS) lists the Township of Harding as a hibernation colony for both Indiana bat and Northern myotis. According to the USFWS project screening chart, if a proposed project will result in at least one acre of tree clearing in Morris County, the USFWS recommends that they

review the project. EcolSciences contacted the USFWS and conducted a Summer Acoustic Survey in 2020. No Indiana or Northern long-eared bats were identified, and the USFWS concurred with these findings (Appendix B).

The identification by the CHANJ Project of a large Core/Corridor habitat for bobcat associated largely with the 1,200-acre Jockey Hollow National Historic Park focuses on large areas of contiguous forest and scattered successional field habitat that may provide habitat for an species with a very large homerange, such as a bobcat.

EcolSciences, Inc. prepared this Habitat Impact Assessment (HIA) to support an application to New Jersey Department of Environmental Protection (NJDEP) for a Site-Specific Sewer Service Area (SSA) Amendment in accordance with the Water Quality Management Planning Rules set forth at N.J.A.C. 7:15-1.1. The amendment application proposes to add the entire Hurstmont site, none of which is presently within the SSA (Figure 6). Of the 19.78- acres to be added to the SSA, a total of 4.54- acres are mapped as environmentally sensitive for threatened or endangered bat species.

EcolSciences biologists also conducted an on-site habitat evaluation and preliminary impact assessment, concluding the following:

- Bat habitat occurs on-site. As directed by the USFWS, a summer acoustic survey for Indiana and northern long-eared bats documented the probable absence of these Federally listed bat species, in the project area. The diminished impact to potential, but not currently occupied bat habitat, will not have a significant impact to the local environment or population.

- The mapped corridor for bobcat is largely focused on the off-site habitats associated with Jockey Hollow Park. No on-sit habitat was identified to support bobcat usage of the site.

- The site does not include any critical habitat for wood turtle in the absence of wetlands or streams on or adjacent to the site.

As required by Section 7:15-4.7 of the Water Quality Management Planning Rules, the following sections of this document provide habitat requirements for Indiana bat, northern long-eared bat, and bobcat; an inventory of various natural and man-made features that characterize the

site and surrounding area; other natural features critical to the species of concern; and the results of the habitat impact assessment.

As discussed in the following sections and in accordance with the requirements of 7:15-4.7(a), for sites that have been excluded from a Sewer Service Area due to mapped threatened or endangered species habitat, this Habitat Impact Assessment also provides a finding that the project will *result in insignificant or discountable effects on the maintenance of local breeding, resting, and feeding of the endangered or threatened wildlife species* as discussed in Subsections 7:15-4.7(e) 1.ii. As discussed in the following section, the project will have an insignificant impact on Indiana and northern long-eared bat because neither species was identified on-site during an acoustic survey conducted during the active season. Therefore, impacts to these species must be determined incapable of being detected, measured, or evaluated. As outlined in the Rules *If the impacts will likely be negative but the consequences are so minute that a person could not measure or detect such responses, then the department will find that there are insignificant impacts*. If the species is not present, impacts cannot be assessed. In terms of the bobcat corridor, the property is on the fringe of a much larger area of core and corridor habitat currently protected in open space. The on-site habitat is not critical for bobcats due to its absence of cover, ledges, dense vegetation, water source and likely prey base. Therefore, discountable impacts*, impacts that are extremely unlikely to occur* to the local population is expected since the species is unlikely to use the habitat when more suitable habitat is available.

III. SPECIES HABITAT REQUIREMENTS

A. Indiana Bat

The Indiana bat is known to occur in Sussex, Passaic, Morris, Union, Essex, Somerset, and Hunterdon Counties. The species' geographic range (where bats may occur) also includes Warren and parts of Bergen, Middlesex, and Mercer Counties. The Township of Harding is located within Morris County and has been identified by USFWS as having or being in the vicinity of an Indiana bat maternity colony (USFWS, revised April 8, 2020).

The USFWS defines suitable Indiana bat summer habitat as consisting of a wide variety of forested/wooded habitats where they roost, forage and travel. Habitat may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields, and pastures. This includes forested woodlots containing potential roosts (i.e., live trees and/or snags) that have exfoliating bark, cracks, crevices, and/or hollows. Potential roost trees for Indiana bats are generally greater than 5-inch Diameter at Breast Height (DBH). Linear features such as fencerows, riparian forest, and other wooded corridors may also be considered habitat. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of similar forested/wooded habitat. Indiana bats are more likely to use forest edges for foraging and are strongly associated with wetlands, floodplains, and riparian corridors.

Within potential summer habitat areas, the USFWS New Jersey Field Office has provided *Forest Management Recommendations for Indiana Bats Summer Breeding Range*. These recommendations include maintaining 60% canopy closure in forested stands, retaining snags wherever possible, maintaining shagbark hickory or other high value trees (large trees with shaggy bark, crevices, or hollows), not harvesting timber within 300 feet of a streambank, and not removing trees when Indiana bats may be present, generally between April 1 and September 30. Tree clearing restrictions extend to November 15, if a site is located within potential hibernacula habitat.

Maternity colonies generally occur in riparian and floodplain forests under the loose bark of dead or dying trees. They also have been found under the loose bark of live trees and in the cavities of dead trees. In recent years, Indiana bats have also been documented to use buildings. Factors influencing the stability of a particular tree as a roost site include the tree's solar exposure, location in relation to other trees, and the tree's spatial relationship to water sources and foraging areas. Studies have shown that Indiana bats show a strong site fidelity to summer colony areas

(NJDEP, 2013). Adult males usually roost in trees near maternity roosts, but some males remain near the hibernaculum and have been found in caves and mines during the summer ((USFWS, last revised April 11, 2019).

Indiana bats hibernate in limestone caves and open, abandoned mine shafts. The hibernacula caves are typically medium sized with large, shallow passageways and suitability is determined by the configuration so as to trap cold air and provide stable low temperatures that allow bats to maintain low metabolic rates and conserve fat resources throughout the winter (NJDEP, 2013).

B. Northern Long-Eared Bat

The northern long-eared bat is found throughout New Jersey. Similar to Indiana bat, northern long-eared bat summer habitat also consists of a wide variety of forested/wooded habitats where they roost, forage, and travel. This species is generally considered more of a forest interior species, hunting within the body of the forest and spending less time in adjacent and interspersed non-forested habitats. Preferred roosting includes trees and snags that have exfoliating bark, cracks, crevices, and/or hollows. However, northern long-eared bats have been found to use roost trees as small as 3-inch DBH. Linear features such as fencerows, riparian forest, and other wooded corridors may also be considered habitat, especially if they connect blocks of unfragmented forest habitat.

The northern long-eared bat is comparable to the Indiana bat in terms of summer roost selection but appears to be more opportunistic. Northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Maternity colonies generally consist of 30 to 60 females and young. Males and non-reproductive females are solitary in the summer and may roost in cooler places such as caves and mines. In recent years roosting northern long-eared bats have also been observed in man-made structures, such as buildings, barns, sheds, cabins, under eaves of buildings, and in bat houses (USFWS, last updated April 11, 2019).

In reviewing the addition of the northern long-eared bat as a species affecting wetland resource value, the NJDEP reviewed Landscape Project mapping for the northern long-eared bat which indicated that 45,629 acres of wetland habitat occur within the species' overall mapped habitats, approximately 99% of which are wooded wetlands. In addition, existing records show 22 out of 55 (40%) roost trees occurred in wetland areas and 51 out of 212 (24%) positive identifications come from wetland habitats. Many of the roost tree species used by northern long-eared bats are species which occur in wetlands or wetland buffers in New Jersey. Northern long-eared bats lack site fidelity and tend to switch roosts and maternity colony sites many times during

a single active season (Carter & Feldhamer 2005, USFWS 2014, Foster & Kurta 1999, Caceres & Barclay 2000, Lacki & Schwierjohann 2007) emphasize the importance of protecting contiguous forest to protect roosting and breeding northern long-eared bats (Larry Torok, personal communication, November 14, 1919).

C. Bobcat

The bobcat's range extends throughout North America and northern New Jersey. Hunting, development, and deforestation in New Jersey over the last century have reduced the numbers in New Jersey leading to the species being listed as State-endangered.

The bobcat is found in a variety of habitats including forests, areas of mixed forest and agriculture primarily in rural areas. Bobcats use rough, broken habitat that has a mix of early and late successional stages. They prefer dense understory cover for resting and protection from weather and predators. Northern New Jersey habitats typically consist of large contiguous areas of forest and fragmented forests interspersed with agricultural areas or early succession vegetation. Bobcats often use areas with rock outcrops, caves, and ledges that provide shelter and cover for hunting, resting and rearing young. Where rocky areas are not available, swamps, bogs, conifer stands, and rhododendron and mountain laurel thickets provide good cover and excellent hunting grounds (Beans and Niles, 2003).

Bobcat home range and habitat selection are influenced by prey availability. They prey on small mammals, ground nesting birds, turkey and deer. Their territories are variable and have been recorded from 0.5 kilometers^2 (0.2 miles^2) to greater than 208 kilometers^2 (80 miles^2). In northern New Jersey, home range of two males has been documented at 18 kilometers^2 (7 miles^2) (Beans and Niles, 2003). Male home ranges are generally larger than female. In New Jersey, an average potential habitat home range buffer of 2.8 kilometers is applied around a documented bobcat sighting.

IV. PARCEL DESCRIPTION

An application for a Habitat Impact Assessment requires a description of natural and man-made features that characterize the site and surrounding area. The following sections describe the local geology, soils, hydrologic features, natural and man-made disturbance, and ecological communities.

A. Geology

The portions of New Jersey that have similar sequences of rock types, geological structures, and geological history have been characterized as Physiographic Provinces - major areas of the State that have experienced specific geological histories and that have similar characteristics at present. From northeast to southwest across the State, the major physiographic provinces are: Appalachian Ridge and Valley, Highlands, Piedmont, and Coastal Plain. Each of these physiographic provinces has regional subdivisions, and each is also a continuation of larger regions in the northeastern United States (Widmer, 1964; Robichaud and Buell, 1973).

The Township of Harding falls withing the Mendham quadrangle. It is primarily in the New Jersey Highland Physiographic Province, except for the south-eastern part that is in the Piedmont Physiographic Province. The Ramapo fault provides a structural and physiographic boundary between the two provinces. The Highlands consist of a series of flat-topped ridges, separated by narrow deep valleys. The mountains are composed of hard, crystalline, resistant Precambrian igneous and metamorphic rocks and valleys are underlain by easily eroded shale and limestone (Volkert, 2019). Surficial deposits in the quadrangle include glacial, stream, hillslope, wetland, and man-made sediment and weathered-rock material. Glacial sediments were laid down during three glaciations: the late Wisconsian glaciation (about 25,000 years ago), an intermediate glaciation of pre-Wisconsian age (most likely the late Illinoian glaciation, about 150,000 years ago), and an older glaciation of pre-Illinoian age (possibly as old as 2.5 million years ago) (Stanford, 2021).

Bedrock geology (Figure 7) deep beneath the Site consists of two formations, Homblende Granite (Ybh) and Quartz-Oligoclase Gneiss (Ylo). A brief description of each per USGS is provided as follows:

> Homblende Granite (Ybh) – Medium to coarse grained, pink to buff, gneissoid to indistinctly foliated granite and sparse granite gneiss composed principally of microcline microperthite, quartz, oligoclase, and hornblende. Contains small bodies of pegmatite and amphibolite.

Quartz-Oligoclase Gneiss (Ylo) – Medium to coarse grained, white to light-greenish gray, well layered gneiss composed of quartz, oligoclase, and sparse hornblende, chlorite, and altered clinopyroxene. Locally contains amphibolite layers.

The surficial geology (Figure 8) of the Site consists of two mapped units, Gneiss Colluvium (Qcg) and Weathered Gneiss (Qwg). Descriptions are as follows:

Gneiss Colluvium (Qcg) – Yellowish-brown, reddish-yellow, brown sandy silt, silty sand, sandy clayey silt with some to many subangular gneiss pebbles and cobbles, in places underlain by, or interbedded with, thinly layered reddish yellow to pinkish-white clayey sand and sandy clay with few angular pebbled and cobbles. Long dimensions of clast typically are aligned parallel to the hillslope. Upper blocky colluvium is derived from downslope movement of fractured, weathered bedrock; lower layered colluvium is derived from downslope movement of saprolite. Within the limit of pre-Wisconsian glaciation, colluvium includes few to some erratic pebbles and cobbles of purple conglomerate, gray to white quartzite, and gray sandstone and mudstone from erosion of Flanders Till. Elsewhere, colluvium may include rare (<0.1%) conglomerate, quartzite, and chert erratics from erosion of pre-Illinoian till. Colluvium on moderate-to-gentle slopes cobble-to-boulder lags formed by seepage erosion of weathered gneiss, alternating with, or overlain by, clayey-silty material. As much as 50 feet thick.

Weathered Gneiss (Qwg)– Yellowish-brown, yellow, very pale brown, reddish-yellow, silty sand, silty clayey sand to sandy clayey silt, locally micaceous, with few to many subangular pebbles and cobbles of gneiss. Includes mixed clast and matrix sediment, granular decomposed rock, fractured rick rubble, and saprolite that preserves original rock structure. Clasts vary from unweathered to fully decomposed. On gentle to moderate slopes, well records indicate that clast and matrix sediment (described by drillers as "overburden", "hardpan", "sandy hardpan", and "clay hardpan"), which is fractured rock mixed with sandy clayey saprolitic material by colluviation, cryoturbation, and bioturbation, is generally between 5 and 30 feet thick and commonly overlies or grades downward to saprolite (described by drillers as "rotten rock", "sandstone", "rotten granite", and "soft granite") that may be as much as 100 feet thick over unweathered rock. On steep slopes, fractured rock rubble, generally less than 20 feet thick, overlies unweather bedrock. Total thickness of weathered material is as much as 150 feet but is generally less than 50feet. The uppermost, clast and matrix material may contain traces of quartzite, chert, and

gray sandstone and mudstone erratic pebbles and cobbles, especially within the pre-Wisconsin glacial limit.

B. Soils

According to the Morris County Soil Survey (SSURGO, 1996) as prepared by the United States Department of Agriculture Soil Conservation Service and Natural Resource Conservation Service (Figure 9), six soil profiles occur on the site: Califon loam, 3 to 8 percent slopes (CakB); Cokesbury gravelly loam, 0 to 3 percent slopes (CobA); Parker gravelly sandy loam, 3 to 15 percent slopes (PaoC); Parker-Gladstone complex, 0 to 15 percent slopes, extremely stony (PauCc); Parker-Gladstone complex, 15 to 25 percent slopes, extremely stony (PauDc); and Parker-Rock outcrop complex, 25 to 45 percent slopes (PawE). A brief description of each soil and its respective series per the SCS is provided as follows:

Califon Series - Deep, nearly level to strongly sloping, moderately well drained and somewhat poorly drained soils. Califon soils are mostly in small narrow waterways or elongated seepage areas at the base of slopes in the granitic gneiss uplands, but also occur in nearly level areas and depressions on the top of ridges, particularly Schooley's Mountain. Undisturbed areas of these soils are wet during winter and early spring and in depressions or nearly level areas water remains ponded after heavy rains. Water is perched at a depth of 0.5 to 4.0 feet for only a brief period late in winter and early in spring and on slopes moves laterally as seepage. The depth to bedrock is greater than 6 feet.

Califon loam, 3 to 8 percent slopes (CakB)- This soil is in small narrow waterways or elongated areas at the base of steeper slopes adjacent to large areas of well drained soils. Included with this soil in mapping are small areas of well-drained Annadale and Edneyville soils are the Califon friable subsoil variant. Also included are areas of Califon gravelly loam and very stony loam. Because this soil is gently sloping, the hazard of erosion is moderate. Diversions, subsurface interceptor drains, and spot drains help to improve drainage. In addition, crop rotation strip cropping, and diversions help to control erosion. Drainage is a limitation for community development. Lateral seepage of water and a perched water table limit septic fields and building foundations. Early establishment of good cover on lawns and play areas provides adequate protection against erosion.

Cokesbury Series – This series consists of deep, nearly level to gently sloping, poorly drained soils. These soils are in waterways, depressions and elongated areas that

extend along the bases of steeper slopes and elongated areas in the granitic highlands in the southwestern part of the county. They have a moderately developed fragipan and are generally cobbly and stony. Permeability is slow in the fragipan, and available water capacity is moderate. Locally, the water table is perched at or near the surface for long periods during winter, spring and after heavy rains. In addition, areas of these soils receive extensive runoff and seepage water from surrounding soils that occupy higher positions. Cokesbury soils have been classified as hydric by the National Technical Committee for Hydric Soils and as New Jersey Group 1 hydric soils by the USFWS and SCS. Group 1 hydric soils nearly always display consistent hydric conditions (Tiner, 1985). The depth to bedrock is greater than 6 feet.

Cokesbury gravelly loam, 0 to 3 percent slopes (CobA)- This soil has the profile described as representative of the series. Included in mapping are some areas of extremely stony Cokesbury and Califon soils. Where this soil is adjacent to Washington or Bartley soils, it is likely that fractured limestone bedrock rather than granitic gneiss bedrock is at a depth of more than 10 feet. Properties that affect use of these soils are poor drainage, coarse fragments, and content of stones. In its natural condition, this soil is used for woodland. If adequately drained, it is suited to cultivated crop. Surface drainage and interceptor drains help to improve drainage. Removal of stones is needed in some small, isolated areas. For community development, this soil has limitations caused by periods of saturation and the presence of coarse fragments. Because of its low position in the landscape and the presence of a high perched water table, this soil is well suited to ponds.

Parker Series- Deep, gently sloping to very steep, excessively drained soils that contain a large amount of angular granitic stones, cobbles and gravel. The more gently sloping soils are on irregularly shaped ridgetops, and the steep soils are on elongated areas on the sides of ridges. Parker soils have a seasonal high-water table at a depth greater than 10 feet. Permeability is moderately rapid and available water capacity is low. The depth to bedrock is between 4 and 10 feet.

Parker gravelly sandy loam, 3 to 15 percent slopes (PaoC)- This soil has a profile similar to the one described as representative of the series, but it contains fewer stones. Depth to bedrock is 6 to 10 feet or more. Included with this soil in mapping are small areas of Edneyville, Annandale, and Califon soils; the Califon friable subsoil variant; and very stony and steeper parker soils.

Parker-Gladstone complex (PauCc & PauDC)- Complexes consist of two or more dissimilar components that occur in a regularly repeating pattern, in this case Parker and Gladstone. Parker soils are derived of residuum weathered from granite and gneiss. Gladstone parent material may also consist of loamy residuum weather from granite and gneiss and/or loamy colluvium derived from granite and gneiss. This soil consists of gravelly sandy loam to very gravelly sandy loam and can range from gently sloping to steeply sloped. Run off class is medium to high. Depth to bedrock 6 feet or more.

Parker-Rock outcrop complex, 25 to 45 percent slopes (PawE)- Deep, gently sloping to very steep, excessively drained soils that contain a large amount of angular granitic stones, cobbles, and gravel. This complex is 65 to 90 percent Parker soils and 10 to 35 percent rock outcrop. The Parker soils are extremely stony. Permeability is moderately rapid and available water capacity is low because of the high content of coarse fragments. Depth to the seasonal high-water table is too variable to estimate.

C. Hydrologic Features

The site is located within the Passaic River Upper (above Pine Brook bridge) watershed of the Passaic River Drainage Basin. Primrose Brook is located east of the site and a tributary to Primrose Brook is located to the southwest of the site across Route 202 and Interstate 287 (Figure 10). The NJDEP has classified Primrose Brook and its tributaries as Freshwater, Trout Production, Category One (FW2-TP C1).

According to NJ-Geoweb (NJDEP, 2012), multiple ponds are mapped within 0.25-mile radius of the site along Primrose Brook and its tributaries. One of these ponds is located southeast of the site, while two additional ponds are located across route 202 and interstate 287. No wetlands, streams, or water bodies were observed or identified on or adjacent to the site during EcolSciences' field investigations.

D. Natural or Man-Made Disturbance

Based upon a review of historical aerial photographs, the property has remained relatively unchanged since 1931. The main residence was built on site between 1903 - 1906 and the surrounding area cleared likely around the same time. The main residence and associated buildings are still present on the property. The residence has been uninhabited for some time and some of the buildings have been partially demolished or gutted.

Land use/land cover mapping from 2015 (Figure 11) illustrates that most of the site is classified as urban, consisting of residential, rural, single unit. The remaining site consist of forested, deciduous forest (10-50% crown closure), and deciduous forest (>50% crown closure).

E. Ecological Communities

Based upon species composition, soils, and apparent hydrology noted during the field investigation, three vegetative communities were identified outside of currently impervious areas within the site: maintained landscaped areas, upland field, and upland forest. Each community is briefly described below:

Maintained Landscaped Areas - The maintained lawn is found around the developed portions of the site. Planted larger trees include upland species such as Norway spruce, blue spruce, eastern hemlock, arborvitae, Japanese cedar, American beech, black oak, and Japanese maple.

Upland Field – The upland fields are located primarily in the southern portion of the site. Vegetation is characterized by upland species such as clasping leaved dogbane, horse nettle, English plantain, grasses, Queen Anne's lace, bull thistle, timothy, orchard grass, redtop, and crown vetch.

Upland forest – The upland woodlands are generally located in the northern portion of the site. Vegetation is characterized by upland species such as American beech, black locust, tulip poplar, mockernut hickory, black birch, black walnut, tree-of-heaven, wineberry, wisteria, Japanese barberry, fox grape, Japanese stilt grass, and periwinkle.

V. HABITAT EVALUATION AND IMPACT ASSESSMENT

A. Indiana Bat and Northern long-eared Bat

The USFWS identified the Township of Harding as having or being near potential maternity colonies for Indiana bat and northern long-ear bat (USFWS, revised April 8, 2020). In addition, the New Jersey Landscape Project (a request has also been submitted to New Jersey Natural Heritage Program) identified habitat for the Federally endangered Indiana bat and Federally-threatened northern long-eared bat on site. Both species were mapped by Landscape Project in portions of the site that appeared wooded on aerial photographs. A total of 7.74- acres of mapped habitat occurs on-site. Of this total, 4.54- acres will be disturbed in this request to be added to the Sewer Service Area. EcolSciences conducted habitat evaluations in the spring of 2020 and confirmed potential habitat for both species. See Appendix C for annotated photographs of habitat conditions.

Based on consultation with the USFWS (September through November 2019), the site is located within proximity of several active season sightings of Indiana bat. In addition, the adjacent Jockey Hollow National Park has documented sightings of northern-long eared bat. Based on this information the USFWS requested that an Indiana/ northern long-eared bat acoustic survey be conducted.

In June 2020 EcolSciences conducted an Indiana bat presence/ absence acoustic survey in accordance with *Range-Wide Indiana Bat Survey Guidelines* (last updated March 2020) and a study plan submitted to USFWS in February 2020. Two acoustic monitors were stationed on the site in two locations for four nights, equating to 8 detector nights (survey protocol requires a minimum 8 detector nights per 123 acres). Acoustic Monitor Location 1 was deployed from May 24th thru and retrieved on May 28th. Due to malfunction of the microphone, Acoustic Monitor Location 2 was deployed from June 1st and retrieved on June 5th. Survey locations were selected based on preferred summer habitat, potential flight corridors, and other important features such as proximity to water, and roosting habitats. Acoustic Monitor Location 1 is located along the western boundary of the property at the edge of a former lawn area. Acoustic Monitor Location 2 is located in the central portion of the property, near the partially demolished estate house, and proximate to landscaping including mature ornamental trees, and upland hardwood forest.

During the survey period big brown bats (*Eptesicus fuscus*), eastern red bats (*Lasiurus borealis*), hoary bats (*Lasiurus cinereus*), silver haired bats (*Lasionycteris noctivagans*), and tri-colored bat (*Perimyotis subflavus)* were identified as significant (likely to occur) on site by the

USFWS approved software, Kaleidoscope, confirmed the probable absence of Indiana bat and northern long-eared bat on the property. The acoustic call survey results were submitted and USFWS concurrence obtained (Appendix B).

The New Jersey Landscape Project mapping identifies the northern portion of the site as forested and potential Indiana and northern long-eared bat habitat, approximately 7.74 acres. The remainder of the site is characterized as successional lawn, ornamental plantings, and developed areas including the former Hurstmont Estate buildings and access drive. Redevelopment of the site will result in the removal of 5.11 - acres of mapped forested habitat and a total land disturbance of 16.2 acres (Figure 6).

The upland forest portions slated for development within the proposed Sewer Service Area is characterized by a diverse community of tulip poplar, pignut hickory, red maple, northern red oak, white pine, black locust, black walnut, and American beech. Several snags and declining trees were identified in area exhibiting exfoliating bark and cavities. This community mix was also typical of the adjacent Jockey Hollow National Historic Park.

Based on review of the site plans, the project will impact 4.54- acres of potential Indiana and northern long-eared bat forested roosting habitat within the lands proposed to be added to the Sewer Service Area (Figure 6). However, this minor encroachment into the fringe of the mapped bat habitat will not encroach into the considerable areas of protected open space surrounding the property (Figure 12). The NJDEP determined the site is potential habitat as supported by Landscape Project mapping of the site for Indiana and northern long-eared bat, although neither species was encountered during an acoustic survey conducted during the active foraging and maternity season/foraging, when bat encounters are most likely to occur. The absence of Indiana and northern long-eared bat during the survey is a strong indicator that a maternity roost for either species does not occur on or in proximity to the site. Therefore, the most likely bat impacts would be to transient male populations and solitary bats passing through the site. Due to the absence of Indiana and northern long-eared bat during the acoustic survey, as well as the site's adjacency to over a thousand acres of protected open space lands offering similar habitat, the impacts to the local population will be insignificant. Additionally, both species are strongly associated with critical habitats such as wetlands, waters, and riparian forests for drinking and foraging. None of these features exist within the area of disturbance or project site. Because neither species was identified on-site during an acoustic survey conducted on-site during the active season, they must be determined incapable of being detected, measured, or evaluated. Therefore, as outlined in the Water Quality Management Plan Rules, *impacts will likely be negative, but the consequences are so minute that a person could not measure or detect such responses, then the department will find that there are insignificant impacts.*

B. Bobcat

The New Jersey Landscape Project did not identify habitat for the State endangered bobcat (Figure 5). However, the northern half of the site falls within the outer boundaries of mapped core and corridor habitat for bobcat. The Core habitat indicates that the critical habitat necessary to support bobcat, including food, water, and cover are located within the area. Corridor habitat means areas where animals with large home ranges, such as the bobcat, can move safety between areas. No surveys were conducted for bobcat on the site. As described above, the site does not offer critical habitat for bobcat. The site has no surface water surfaces. Cover within the site is limited to the forested portions of the property, but even these areas do not exhibit, the dense undergrowth and often rocky terraces from which bobcats stealthily hunt., Human habitation is largely avoided by bobcats. The early successional fields (former lawn areas) may provide potential prey species but exposure to road noise and adjacent homes would lead bobcats to avoid these areas for areas of greater cover. These types of preferred habitat are exhibited in the large Core habitat mapped largely north of the site. With access to these alternative protected open spaces habitats that include stream corridors, ponds, wetlands, and closed canopy forest, it is anticipated that even a transient bobcat that may move through the site, would likely avoid the subject property and utilized the larger undisturbed open space located to the north. Therefore, discountable impacts*, impacts that are extremely unlikely to occur* to the local population is expected since the species is unlikely to use the on-site habitat when better habitat is available immediately adjacent to the site.

VI. SUMMARY AND CONCLUSION

As discussed above, although portions of this site have been excluded from a Sewer Service Area due to mapped threatened or endangered species habitat, this Habitat Impact Assessment supports a finding that the project will *result in insignificant or discountable effects on the maintenance of local breeding, resting, and feeding of the endangered or threatened wildlife species* as discussed in Subsections 7:15-4.7(e) 1.ii.

As previously discussed with NJDEP Department of Environmental Protection biologists, the site does not provide habitat for the State threatened wood turtle in the absence of on-site stream corridors, riparian zones, or wetlands. Nor are these features identified adjacent to the project site. Therefore, no impacts to this species are anticipated.

A summer acoustic survey confirmed the absence of Indiana and northern long-eared bat during the survey period. Since the survey period occurred during the active season and identified no Indian or northern long-eared bat calls, this also confirmed the absence of any critical maternity colonies using the site. Although it is possible a transient Indiana or northern long-eared bat may fly across the site, the applicant has already committed to not conducting tree removal during the active season, April 1 through September 30. As such a determination of insignificant impacts has been made because any impacts are so *minute that a person could not measure or detect such responses.*

No surveys were conducted for bobcats, since they were not identified by the New Jersey Landscape Project, as required by Section 7:15-4.4(e)1. of the Water Quality Management Plan Rules. However, as requested by NJDEP, the applicant reviewed the CHANJ maps that identifies a very small portion of a bobcat corridor within the northern half of the property. However, the property is on the fringe of a much larger area of core and corridor habitat currently protected in open space. The on-site habitat is not critical for bobcats due to its absence of cover, ledges, dense vegetation, water source and likely prey base. As such a determination of discountable impacts*, impacts that are extremely unlikely to occur* to the local population is expected since the species is unlikely to use the on-site habitat when more appropriate habitat is located just off-site.

In conclusion, as required by Rules this Habitat Impact Assessment has determined that the proposed project will not adversely impact an area critical to the survival of a local population of endangered or threatened wildlife species and can be replaced into a sewer service area.

VII. REFERENCES

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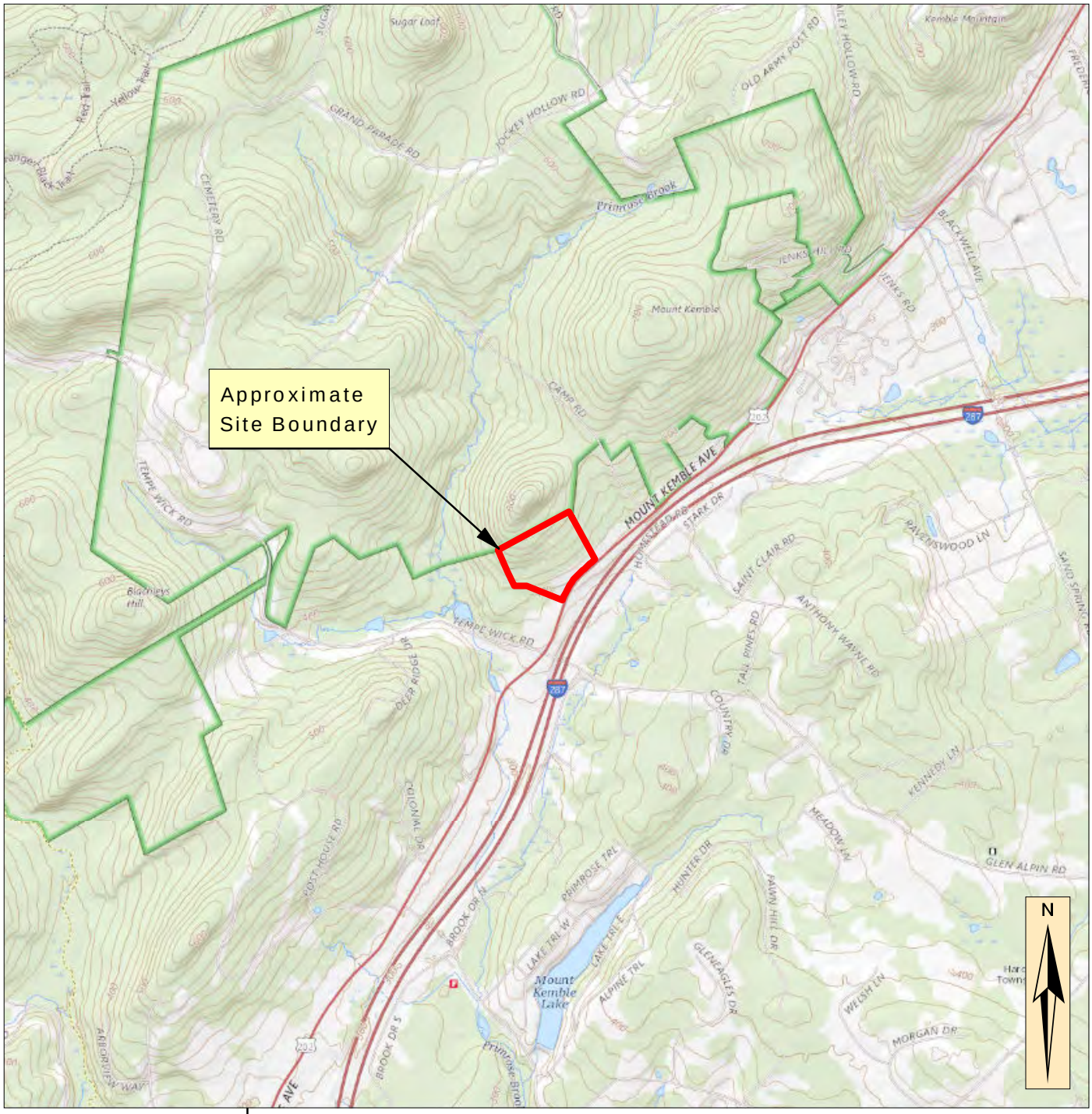
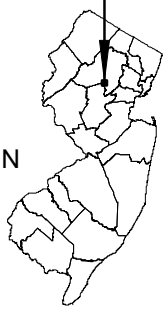
APPENDIX A

Figures



0 2,000 4,000 Feet

SITE LOCATION



State Plane Coordinates (New Jersey NAD 83)
484,904' E; 701,006' N

FIGURE 1: USGS SITE LOCATION

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 2/23/2021

Scale 1:24,000

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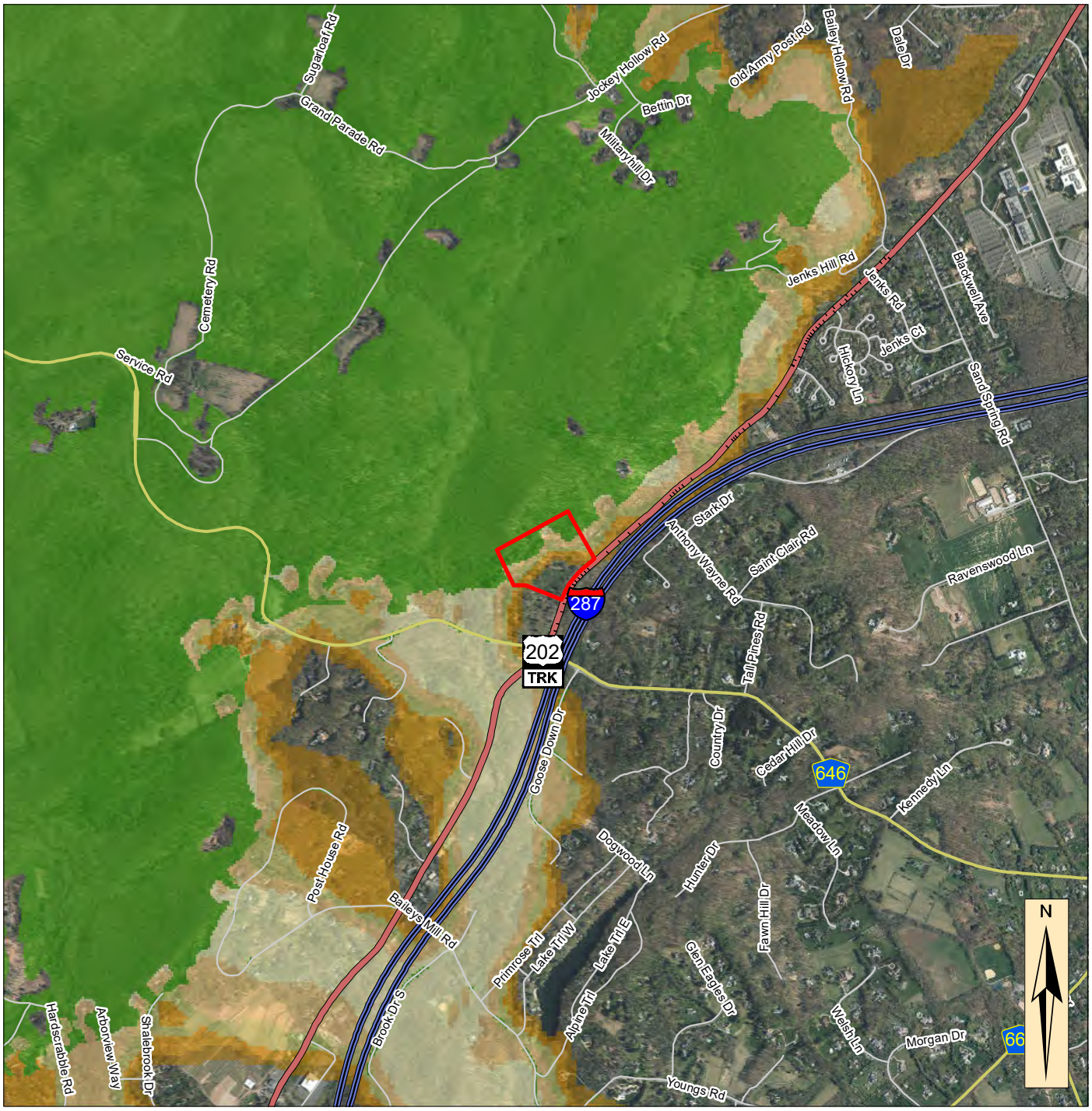

Approximate Site Boundary

0 2,000 4,000 Feet

NJDEP-CHANJ Wildlife Corridor

- Core
- Corridor, 1, Easier movement
- Corridor, 2
- Corridor, 3
- Corridor, 4
- Corridor, 5, More difficult movement

FIGURE 2: WILDLIFE CORRIDOR

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Source: NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 4/22/2021

Scale 1:24,000

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Approximate Site Boundary

Roads

- Limited Access Highway
- Interstate
- US Highway
- State Highway
- County Route
- Local roads

0 400 800
Feet

FIGURE 3: 2015 AERIAL IMAGERY

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Source: NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 6/14/2020

Scale 1:4,800

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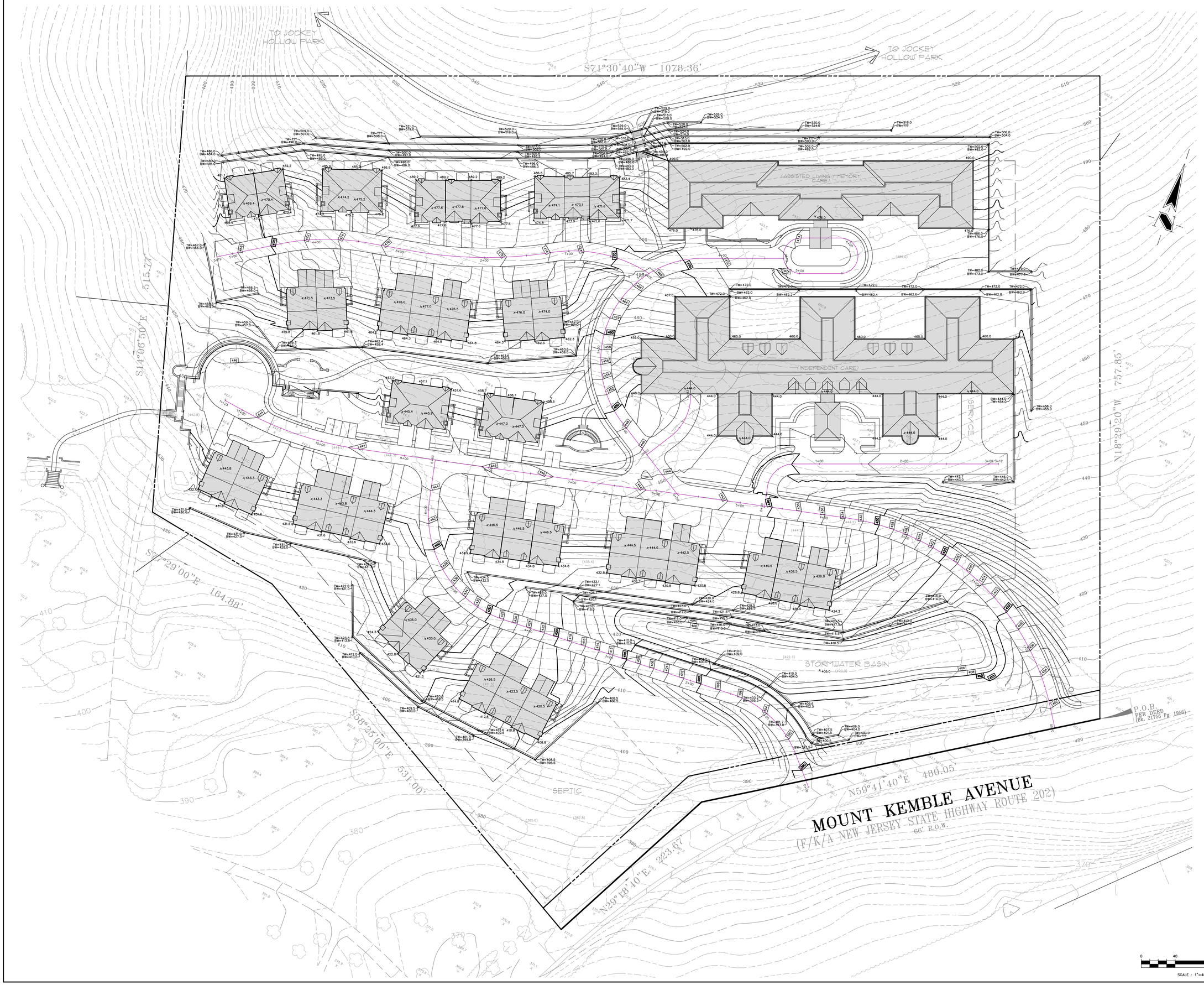

REVISIONS		
NO.	DATE	DESCRIPTION

GDI

www.gladstonedesign.com

GLADSTONE DESIGN, Inc.

Consulting Engineers
Land Surveyors
Landscape Architects
Land Planners

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NJ Certificate of Authorization
No. 24GA28034400

Ronald A. Kennedy, P.E., P.P., CME, LEED AP
Kurt T. Hanie, P.L.S.
Robert C. Morris
Robert C. Moschello, P.E.

PROGRESS PRINT
DATE: 09/11/19 9:59 AM

RONALD A. KENNEDY, P.E.
NJ PROFESSIONAL ENGINEER
LICENSE No. 24GE03345300

PROJECT

HURSTMONT ESTATE

LOT 2 BLOCK 27

HARDING TOWNSHIP
MORRIS COUNTY
NEW JERSEY

SHEET TITLE

FIGURE 4:
CONCEPT PLAN

DATE	JULY 29, 2019
SCALE 1" = 40'	JOB NO. 1047-01
DRAWN BLR	SHEET NO. 1 OF 1
CHKD. RCM2	

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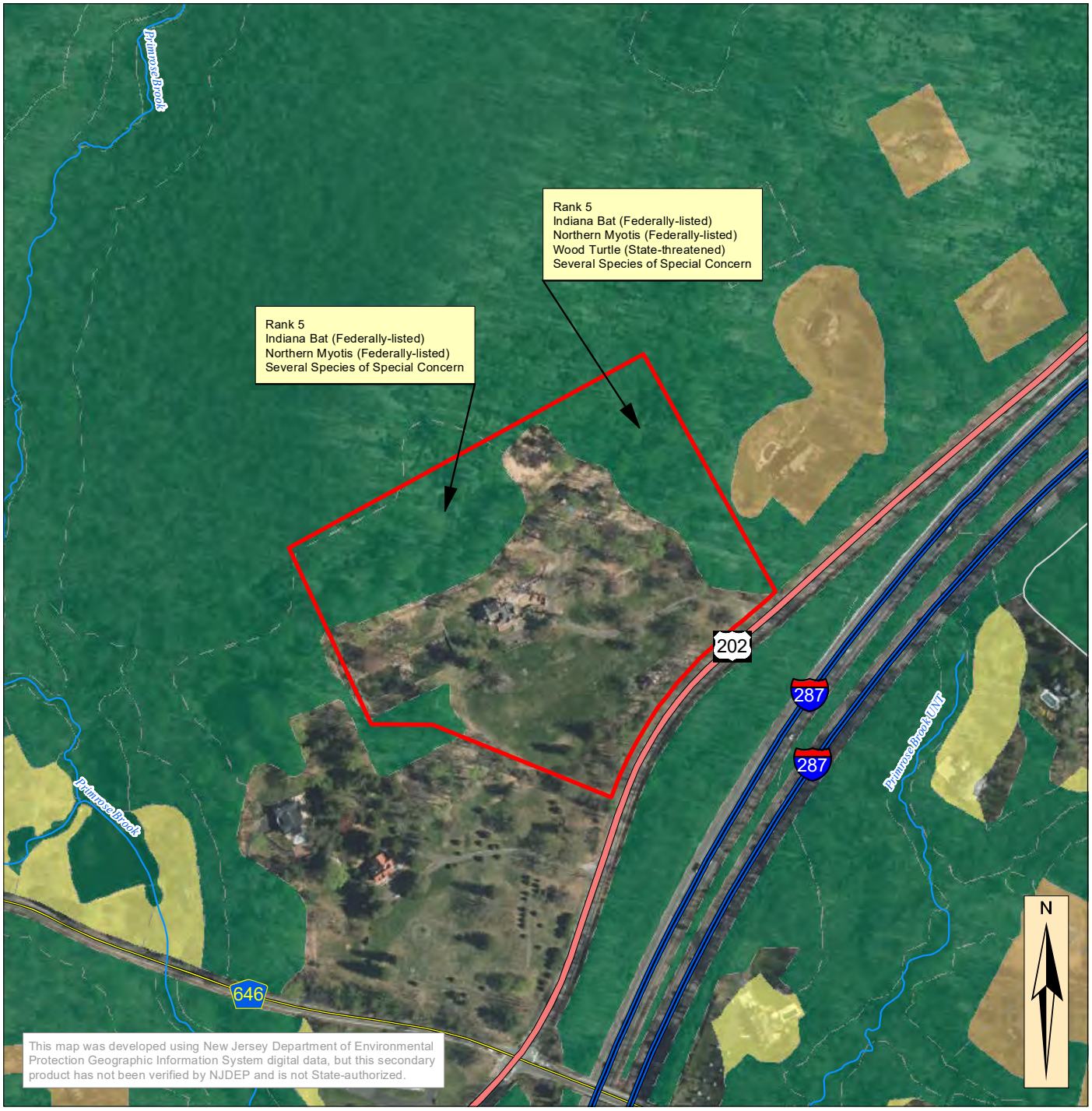

Approximate site boundary

Streams

Vernal Pools

VERNAL POOL STATUS

- Vernal pool location
- Potential vernal pool location

Species-Based Habitat - Skylands

RANK

- Rank 1 - Habitat specific requirements
- Rank 2 - Special Concern
- Rank 3 - State Threatened
- Rank 4 - State Endangered
- Rank 5 - Federal Listed

FIGURE 5: LANDSCAPE PROJECT

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Sources:
NJDEP, DFW, ENSP. 2017. New Jersey's Landscape Project (Version 3.3).
NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 2/23/2021

Scale 1:4,800

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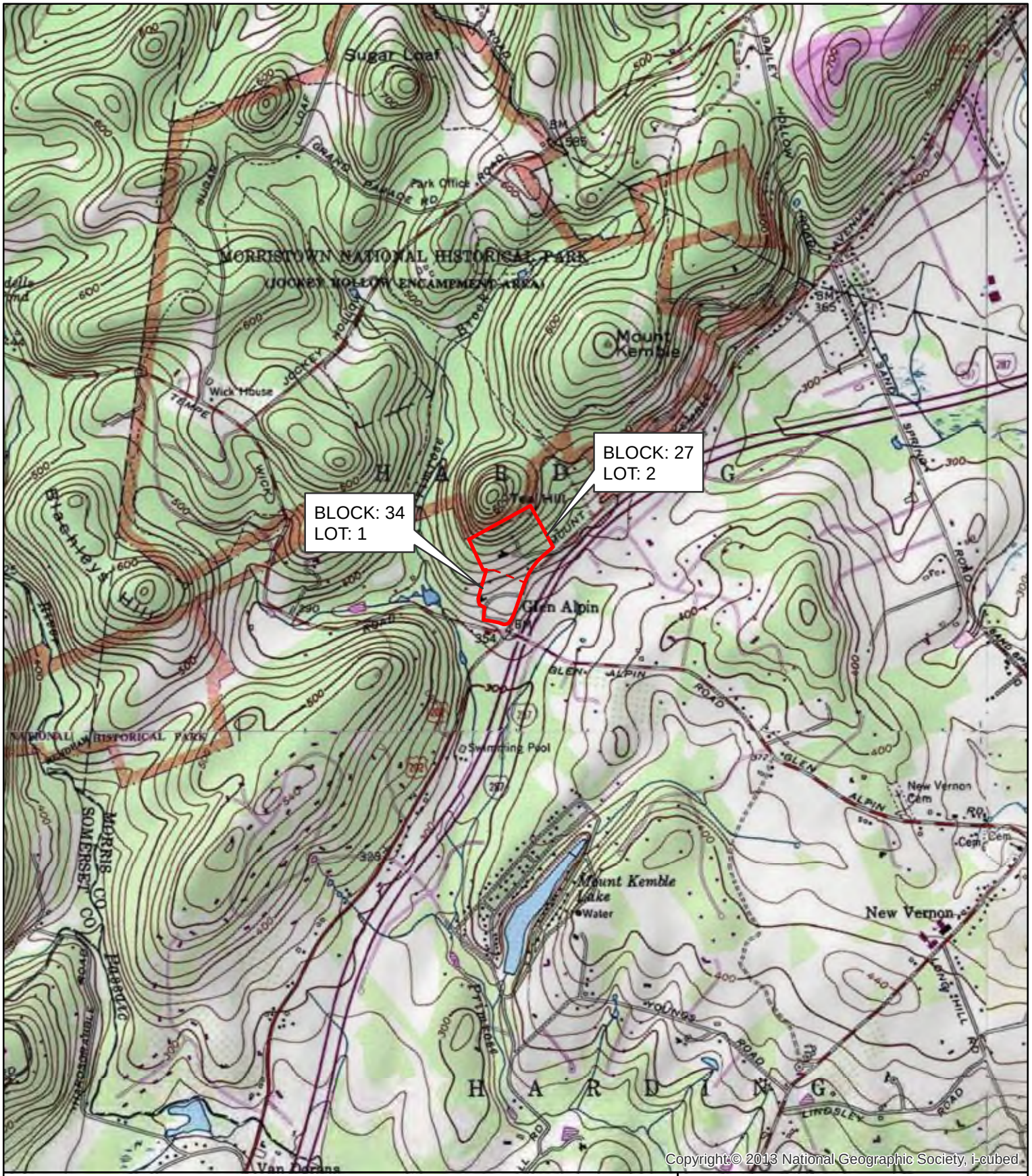


FIGURE 6: PROPOSED SEWER SERVICE AREA
BLOCK 27 LOT 2 & BLOCK 34, LOT 1
HURSTMONT/GLEN ALPIN ESTATES
HARDING TOWNSHIP, MORRIS COUNTY, NEW JERSEY

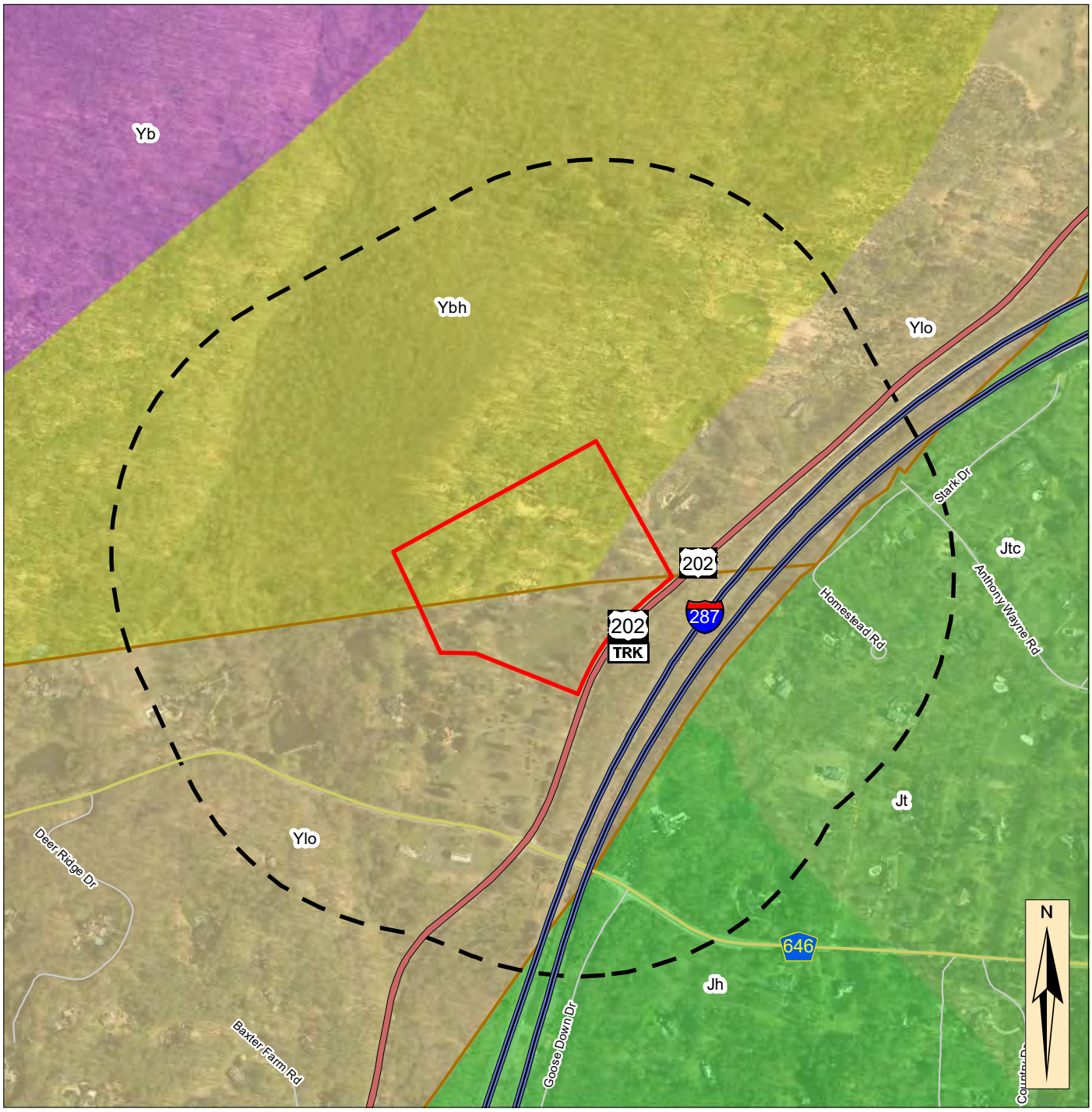
Legend

Proposed Sewer Service

0 1,000 2,000 4,000 Feet

NATURAL SYSTEMS UTILITIES
A BETTER WAY
170 TOWNSHIP LINE ROAD
HILLSBOROUGH, NJ 08844
(908)359-5501 (T)
(908-359-8286 (F)

Date: 11/7/2019	Designed By: JW	Scale:1 " = 2,000 '
Drawn By: JW	Checked By: JR	



Approximate Site Boundary
0.25 mile Site Buffer
Dikes
Folds
Fault

Bedrock Geology (Abbreviation, Name)

- Yb, Biotite-Quartz-Feldspar Gneiss
- Jh, Hook Mt. Basalt
- Ybh, Hornblende Granite
- Ylo, Quartz-Oligoclase Gneiss
- Jt, Towaco Formation
- Jtc, Towaco Formation Conglomerate and Sandstone facies

FIGURE 7: BEDROCK GEOLOGY

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Sources:
NJGS. 1999. Bedrock Geology for New Jersey 1:100,000 Scale.
NJDEP/NJGS. 2006. Bedrock Outcrops of New Jersey.
NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 2/23/21

Scale 1:8,400

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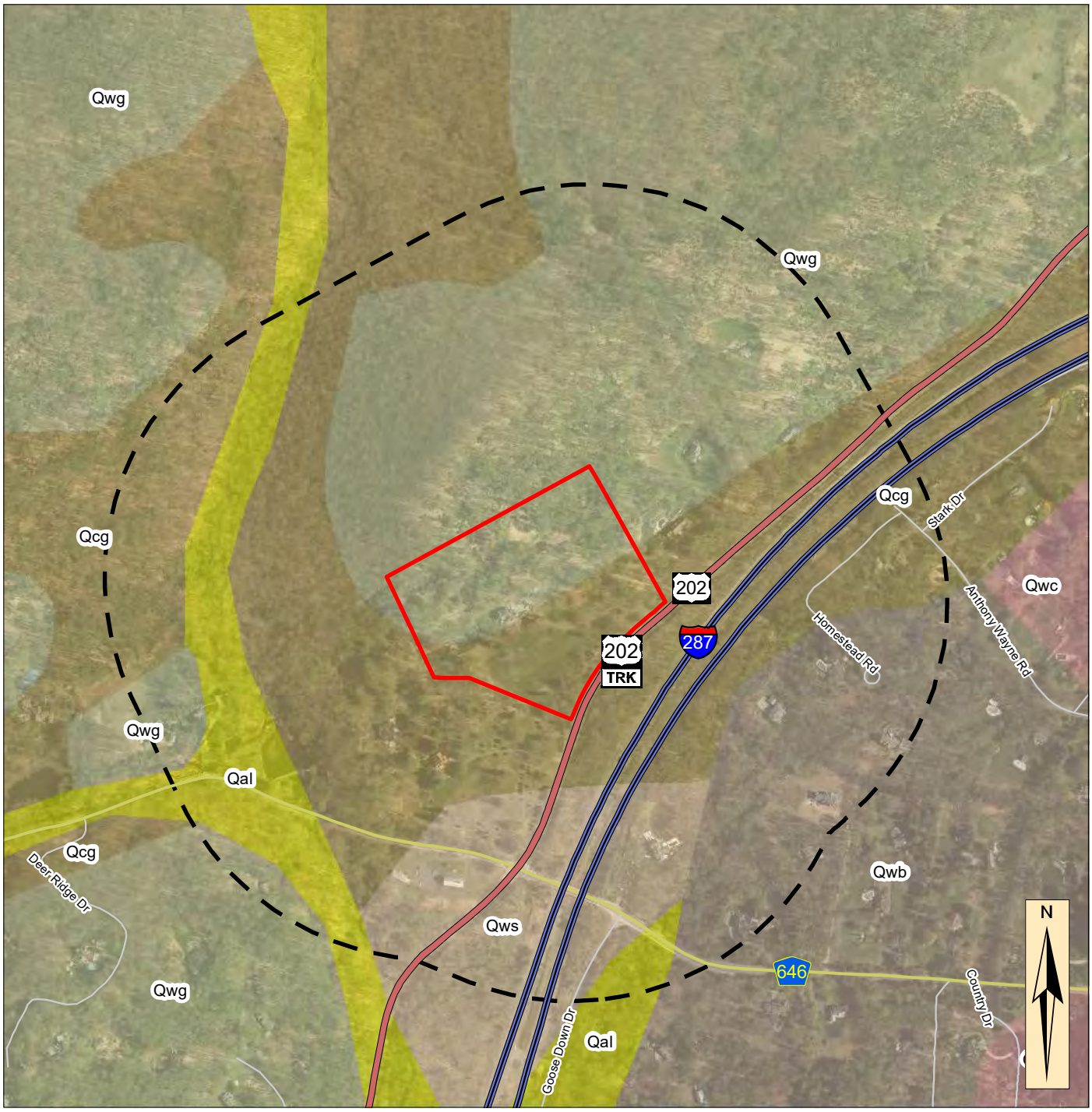

Approximate Site Boundary

0.25 mile Site Buffer

0 1,000 2,000 Feet

Surface Geology (Abbreviation, Name)

- Qal, Alluvium
- Qcg, Gneiss Colluvium
- Qwb, Weathered Basalt
- Qwc, Weathered Conglomerate
- Qwg, Weathered Gneiss
- Qws, Weathered Shale, Mudstone, and Sandstone

FIGURE 8: SURFACE GEOLOGY

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Sources:
NJDEP, NJGS. 2006. Surficial Geology of New Jersey.
NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 2/23/21

Scale 1:8,400

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Approximate site boundary

Soil boundary

SYMBOL	NAME
CakB	Califon loam, 3 to 8 percent slopes
CobA	Cokesbury gravelly loam, 0 to 3 percent slopes
PaoC	Parker gravelly sandy loam, 3 to 15 percent slopes
PauCc	Parker-Gladstone complex, 0 to 15 percent slopes, extremely stony
PauDc	Parker-Gladstone complex, 15 to 25 percent slopes, extremely stony
PawE	Parker-Rock outcrop complex, 25 to 45 percent slopes

FIGURE 9: SSURGO SOILS MAP

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Sources:
USDA, NRCS. 2014. SSURGO Database for Morris County, NJ.
Source: NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 2/23/21

Scale 1:4,800

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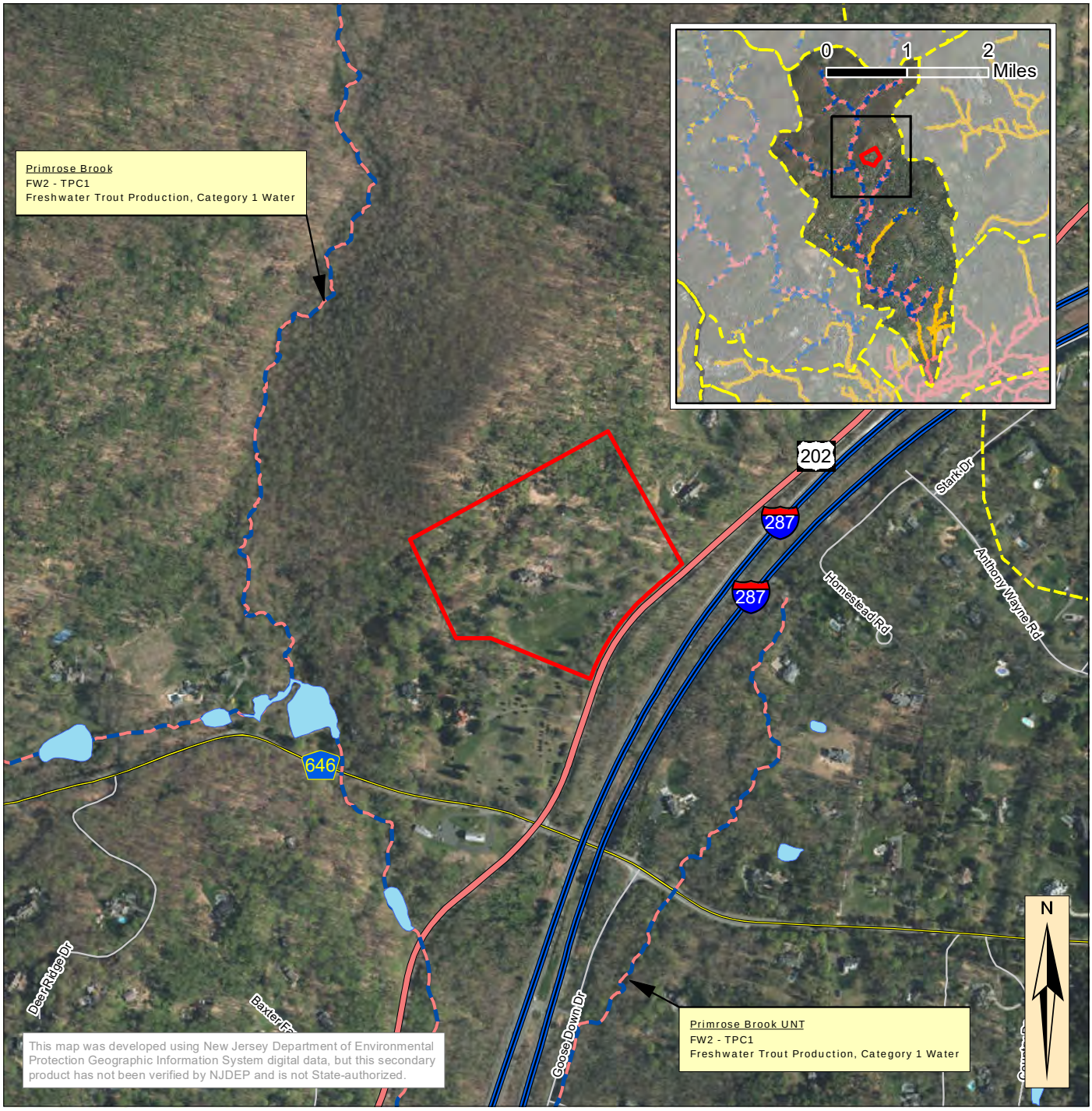

Approximate Site Boundary

HUC 14 Drainage Area Boundary

Lakes, bays, etc.

C1 - Category 1 Water

C2 - Category 2 Water

ON - Outstanding National Resource Water

Trout maintenance waters

Trout production waters

FIGURE 10: HYDROLOGIC FEATURES

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Sources:
NJDEP, WMS, BFBM, 2007. NJDEP Surface Water Quality Standards of NJ (Version 201012).
NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 2/23/2021

Scale 1:8,600

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ON-SITE LAND USE/ LAND COVER		
LABEL	SYMBOL	DESCRIPTION
1140	URBAN	RESIDENTIAL, RURAL, SINGLE UNIT
4110	FOREST	DECIDUOUS FOREST (10-50% CROWN CLOSURE)
4120	FOREST	DECIDUOUS FOREST (>50% CROWN CLOSURE)

FIGURE 11: 2015 LAND USE/ LAND COVER

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

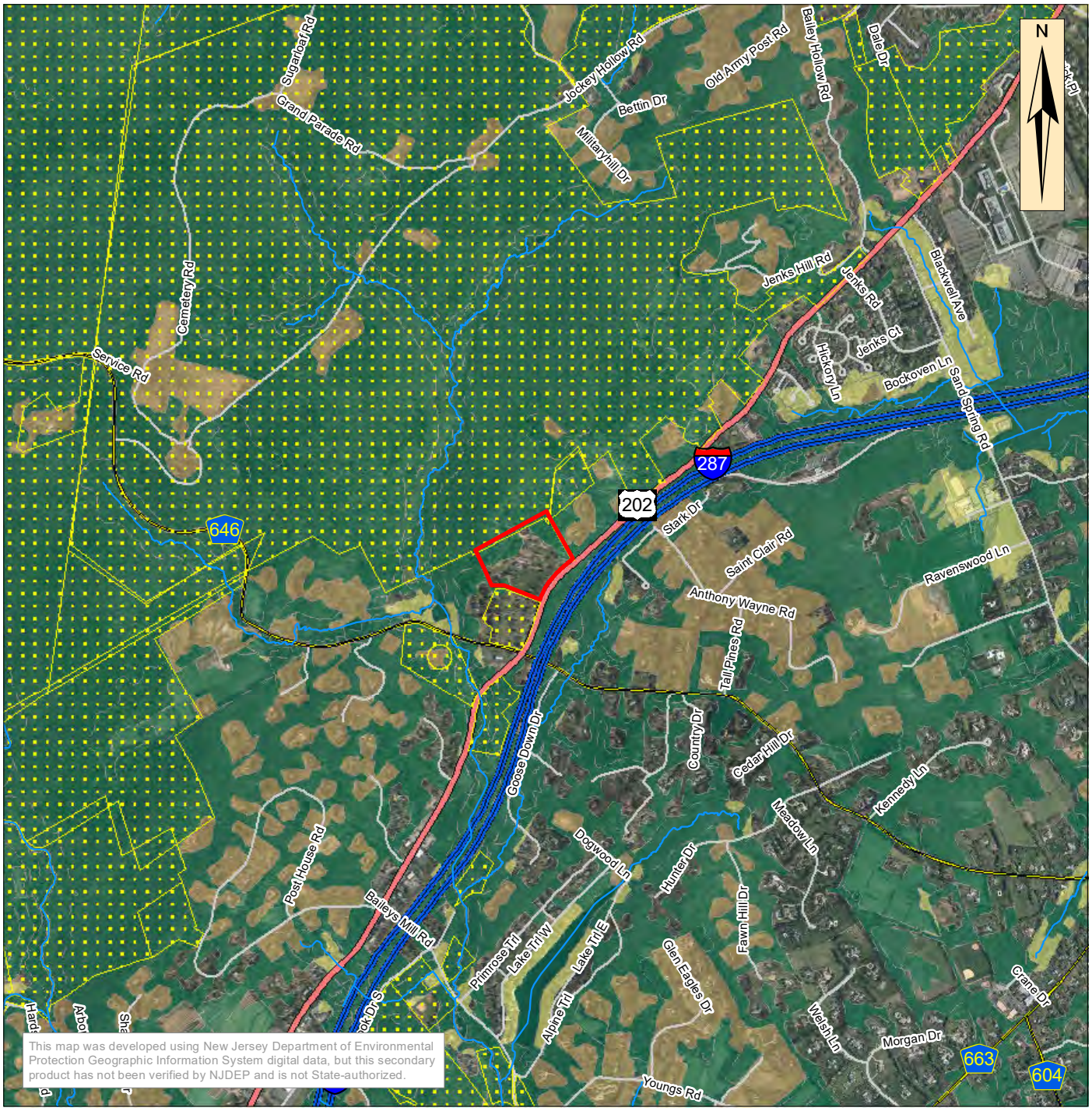
Sources:
NJDEP, OIRM, BGIA. 2015. Land Use/Land Cover 2015 Update, Edition 2015.
State of NJ, OIT, OGIS. 2008. NJ 2007 - 08 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 2/23/2021

Scale 1:6,000

F:\Jobs18\EN18-041 Endeavor-Harding-Hurstmont-Glen Alpin\GIS\HIA_Figures\LULC2015.mxd



Approximate Site Boundary

Open Space

Streams

0 2,000 4,000 6,000 Feet

Species-Based Habitat

RANK

- Rank 1 - Habitat specific requirements
- Rank 2 - Special Concern
- Rank 3 - State Threatened
- Rank 4 - State Endangered
- Rank 5 - Federal Listed

FIGURE 12: SITE LOCATION RELATIVE TO THE MAPPED BAT HABITAT AND OPEN SPACE IN THE SITE VICINITY

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Sources:
NJDEP, DFW, ENSP. 2017. New Jersey's Landscape Project (Version 3.3).
NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 2/23/2021

Scale 1:24,000

F:\Jobs18\EN18-041 Endeavor-Harding-Hurstmont-Glen Alpin\GIS\HIA_Figures\OpenSpace_BatHabitat.mxd

APPENDIX B

Pertinent Correspondence

Glen Alpin/ Hurstmont Redevelopment Plan
Amended Housing Element and Fair Share Plan
Summer Indiana Bat Acoustic Survey Results
USFWS Summer Indiana Bat Acoustic Survey Concurrence

EcolSciences, Inc.

Environmental Management & Regulatory Compliance

GLEN ALPIN/HURSTMONT
REDEVELOPMENT PLAN






Township of Harding

Adopted June 24, 2019

Amended and Adopted September 30, 2019

Prepared by:

H|G|A

Heyer, Gruel & Associates

Community Planning Consultants

236 Broad Street

Red Bank, NJ 07701

732-741-2900

The original of this report was signed and
sealed in accordance with N.J.S.A. 45:14A-12.

Susan S. Gruel, P.P. #1955

M. McKinley Mertz, AICP, P.P. #6368 LEED Green Associate

ACKNOWLEDGMENTS

Township Committee

Christopher Yates, Mayor
Timothy Jones, Deputy Mayor
Nanette DiTosto
Devanshu Modi
Nicolas Platt

Redevelopment Steering Committee

George Boyan, Resident
Gwenn Claytor, Resident
Richard Clew, Resident
Thomas dePoortere, Resident
Karen Hefner, Resident
Timothy Jones, Township Committee
Julia Somers, Resident
Tracey Walters, Resident
Lawrence Weppler, Resident
Chistopher Yates, Mayor

Robert Falzarano, Township Administrator
Robert Goldsmith, Special Council
John Hague, Special Council
Susan S. Gruel, Township Planner

Township Planning Board

Peter Saulnier, Chair
Richard Clew, Vice Chair
Devanshu Modi
Timothy Jones
Thomas dePoortere
David Dietz
Robert J. Edgar
Alf Newlin
David Chipperson
Nik Bjorkedal
Gwenn Claytor

Special Thanks To

Mary Prendergast and the Harding
Township Historical Society
and the
Glen Alpin Conservancy

Heyer, Gruel & Associates

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CONTENTS

INTRODUCTION

The Township of Harding's Glen Alpin/Hurstmont Redevelopment Area, herein referred to as the "Area" or "Redevelopment Area," is 29.44 acres in size and consists of Block 34 Lot 1 (685 Mt. Kemble Avenue (Route 202) – Glen Alpin) and Block 27 Lot 2 (679 Mt. Kemble Avenue – Hurstmont). The Area is located on the west side of Route 202, on the northwest corner of the Tempe Wick Road – Route 202 intersection. The Area is bordered by residential properties to the north and west, as well as Morristown National Historical Park to the northwest.

On November 19, 2018, the Township Committee adopted Resolution 18-196 to direct the Harding Township Planning Board to investigate the two properties to determine if the area qualifies as a non-condemnation "area in need of redevelopment" per the statutory criteria of the Local Redevelopment and Housing Law (LRHL) N.J.S.A. 40A:12A, et seq. An investigation report, entitled "685 Mt. Kemble Avenue ("Glen Alpin") 679 Mt. Kemble Avenue ("Hurstmont") Area in Need of Redevelopment Investigation Report" (the "Study") and dated February 1, 2019, was prepared. On February 19, 2019, the Township Planning Board adopted a resolution recommending the properties be designated as a non-condemnation area in need of redevelopment. The Township Committee took action at its February 25, 2019 meeting, designating the Area as in need of redevelopment through resolution 17-073.

The Redevelopment Area is also a component of the Court-approved settlement agreement between the Township and Fair Share Housing Center (FSHC). The settlement agreement was approved by the Court at a November 2, 2018 Fairness Hearing. The Area is also part of the Township's Housing Element and Fair Share Plan (HEFSP), adopted by the Planning Board on December 17, 2018. At a Compliance Hearing on March 1, 2019, the Court declared the land use regulations and affirmative measures within the HEFSP will satisfy the Township's constitutional obligation to provide its fair share of the region's affordable housing under the Mount Laurel doctrine.

At the March 1, 2019 Compliance Hearing, the Township was issued a Conditional Declaratory Judgment of Compliance and Repose (JOR), with one of the conditions being the adoption of a Redevelopment Plan for the Glen Alpin/Hurstmont Redevelopment Area. The Court-approved settlement agreement determined that development within the Redevelopment Area shall produce no less than 40 affordable housing units. The adopted HEFSP concluded that the Area is appropriate for an age-restricted community, consisting of up to 250 units with the mandatory set-aside of 40 units. This Plan implements the provisions of the HEFSP, the Court-approved settlement agreement, and one of the conditions of the Conditional JOR.

Subsequent to the Compliance hearing, a Redevelopment Plan was prepared and adopted by the Township Committee on June 24, 2019 after significant public input. The Township Committee also designated Hurstmont Estate Acquisition, LLC as the redeveloper of Block 27 Lot 2 (the Hurstmont site).

This Amended Redevelopment Plan refines the standards in the previously adopted Redevelopment Plan, although the core of the Plan principles and Plan goals remain essentially unchanged and consistent with the HEFSP and the settlement agreement with FSHC.

Hurstmont Mansion, 1907
From the June 1907 issue of American Homes and Gardens

2015 Aerial

HGA
Heyer, Gruel & Associates
May 2019

STATUTORY CRITERIA

The Redevelopment Plan is a formal planning document for the Redevelopment Area. According to the Local Redevelopment and Housing Law (NJSA 40A:12A-7), the Redevelopment Plan shall include an outline for the planning, development, redevelopment or rehabilitation of the project area sufficient to indicate:

1. Its relationship to definite local objectives as to appropriate land uses, density of population and improved traffic and public transportation, public utilities, recreational and community facilities and other public improvements;
2. Proposed land uses and building requirements in the project area;
3. Adequate provision for the temporary and permanent relocation as necessary of residents in the project area including an estimate of the extent to which decent, safe and sanitary dwelling units affordable to displaced residents will be available to them in the existing local housing market;
4. An identification of any property within the redevelopment area proposed to be acquired in accordance with the redevelopment plan;
5. Any significant relationship of the redevelopment plan to:
   a. The master plans of contiguous municipalities;
   b. The master plan of the County in which the municipality is located; and
   c. The State Development and Redevelopment Plan adopted pursuant to the "State Planning Act" PL 1985, C398 (C52:18A-196 et al.).
6. As of the date of the adoption of the resolution finding the area to be in need of redevelopment, an inventory of all housing units affordable to low and moderate income households, as defined pursuant to section 4 of P.L. 1985 c.222 (C.52:27D-304), that are to be removed as a result of implementation of the redevelopment plan, whether as a result of subsidies or market conditions listed by affordability level, number of bedrooms, and tenure.
7. A plan for the provision, through new construction or substantial rehabilitation of one comparable, affordable replacement housing unit for each affordable housing unit that has been occupied at any time within the last 18 months, that is subject to affordability controls and that is identified as to be removed as a result of implementation of the redevelopment plan.

Glen Alpin Mansion, 1942

Photo courtesy of the Harding Township Historical Society

PLANNING CONTEXT

Area Location

The Township of Harding is a community of approximately 3,887 residents,[1] comprising 20.4 square miles of land in the southeastern portion of Morris County. The Township is bordered by Long Hill Township to the south, Chatham Township to the east, Morris Township to the north, Mendham Township to the west, and Bernardsville Borough and Bernards Township to the southwest.

The predominant land use in the Township is single-family residential and farmland, as well as some commercial clusters along Route 202 and in the Historic Village Business District. There are two publicly owned parks in Harding that make up a significant amount of preserved land: Morristown National Historical Park in the northwest and the Great Swamp National Wildlife Refuge in the southeastern portions of the Township. I-287 and Route 202 run north-south through the western portion of the Township, but no interchanges or access points to I-287 are within Harding's municipal boundary.

The Redevelopment Area is located in the northwestern portion of the Township, immediately southwest of the Morristown National Historical Park and at the intersection of Route 202 (Mt. Kemble Avenue) and Tempe Wick Road. Surrounding the Area are single-family residences as well as the Morristown Seventh-Day Adventist Church. The Redevelopment Area is comprised of Block 34 Lot 1, known as the "Glen Alpin property," and Block 27 Lot 2, known as the "Hurstmont property." Together the two properties make up 29.44 acres of land, with the Glen Alpin property comprising 9.57 acres and the Hurstmont property comprising 19.87 acres. The Glen Alpin property is a historic site with an existing historic structure that is jointly owned by the Township of Harding and the Harding Land Trust, a nonprofit organization dedicated to preserving natural areas and farmland within the Township.

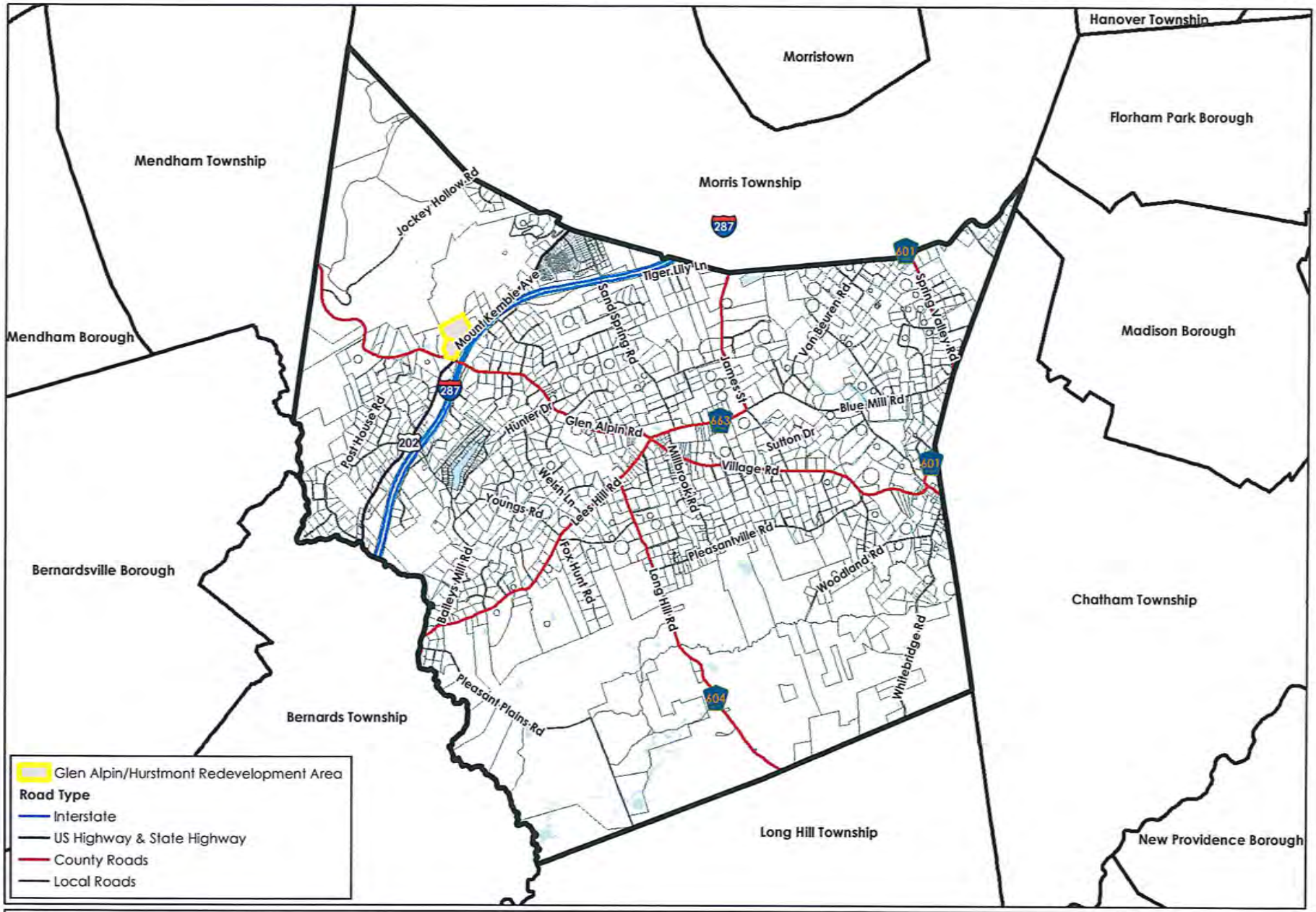
Primrose Brook is a waterway located west of the Redevelopment Area that flows into the Great Swamp National Wildlife Refuge and Passaic River. Three tributaries make up Primrose Brook, the second of which originates in the Morristown National Historical Park's Jockey Hollow and is classified by the NJDEP as a Category 1 Trout Production Stream. It is considered the most protected and pristine waterway in the Primrose Brook subwatershed by the Great Swamp Watershed Association. The Redevelopment Area is outside of the 300-foot buffer required by the DEP for Category 1 waterways.[2]

Historic Map of Redevelopment Area and its Surroudings

Photo courtesy of the Harding Township Historical Society

Indicates current Redevelopment Area boundaries

1. 2013-2017 American Community Survey 5-Year Estimates
2. "Primrose Brook," Great Swamp Watershed Association https://www.greatswamp.org/streams/primrose-brook/



Regional Context

HGA
HEYER, GRUEL & ASSOCIATES
May 2019

Area Description

The Hurstmont property, Block 27 Lot 2, is within the RR Rural Residential Zone, which permits single-family residential as well as farming. The Glen Alpin property, Block 34 Lot 1, is within the PB Public Land Zone, which permits administrative buildings and installations, libraries, historical buildings, cultural or community centers, public schools, parks, playfields, playgrounds, conservation purposes, recreational uses, educational facilities, garages to house municipal equipment, and any other public uses, buildings, and structures. The Area is surrounded by other properties in the RR and PB zones. The B-2 Business Zone is located south of the Area along Mt. Kemble Avenue.

The Glen Alpin property is developed with a 14,000 square foot, three floor, single-family home set back approximately 500 feet from Mt. Kemble Avenue (Route 202) and 370 feet from Tempe Wick Road. There is a small burial ground south of the dwelling, and to the north is a six-bay, single story, cement block garage. The property has two driveway entrances onto Mt. Kemble Avenue. The first entrance being at the intersection of Mt. Kemble Avenue and Tempe Wick Road, and the second being approximately 500 feet north of the intersection. Since its acquisition, the Township has invested a significant amount to renovate the principal dwelling in an effort to preserve its functionality and historic character, but the structure still shows signs of deterioration.

Glen Alpin Mansion, January 2019

The Hurstmont property is developed with a 17,000 square foot, single-family home, along with a one-story structure called the "playhouse" near Mt. Kemble Avenue and a two-story barn-like structure known as the "carriage home" in the rear of the property. In 2011, the current owner received demolition permits from the Township to demolish structures on the property, but the demolition was not completed. As of this Plan, the carriage home and mansion remain partially demolished. The Hurstmont property has one access driveway onto Mt. Kemble Avenue.

The primary environmental constraint on the Area is the presence of steep slopes, located predominantly on the Hurstmont property. The Glen Alpin property slopes moderately upwards from the southeast corner to the northwest corner abutting the Hurstmont property. The entire Redevelopment Area is located outside the sewer service area.

Given their historical and cultural significance, both properties are included in the Tempe Wick Road/Washington Corners Historic District. The Tempe Wick Road/Washington Corners Historic District was placed on the New Jersey Register of Historical Places on June 26, 2000 and on the National Register of Historic Places on August 24, 2000. Block 34 Lot 1 (Glen Alpin) is a "key contributing" property and Block 27 Lot 2 (Hurstmont) is a "contributing" property to the Tempe Wick Road/Washington Corners Historic District.

Harding Township is making application to the NJ State House Commission for a diversion/disposal of its ownership of the Glen Alpin property. The Township submitted its "Pre-Application" in early May 2019, which will be reviewed by the Historic Sites Council staff. In 2019 the Township received a ruling of no encroachment from the Historic Sites Council. As Glen Alpin is a registered historic site and there have been grants obtained from the NJ Historic Trust as well as the Morris County Historic Preservation Trust Fund Review Board, there are approvals necessary from historic preservation agencies. The NJ Historic Sites Council is reviewing the Township's request for its impact on the historic resources found on the property. The Township has proposed to permanently protect all historic features of the home (interior and exterior) and the grounds of Glen Alpin and anticipates a finding of "no encroachment" shortly. Morris County must also approve the diversion and that process is following in lock step with the State House Commission process.

The State House Commission process should be concluded in 2020, at which time the Township can transfer ownership of the property with associated historic easements and protections.

History and Character of the Area

The estates on both properties are very much emblematic of the Township's history. The building of estates with large dwellings began in the later part of the 19th century as wealthy families looked to buy large tracts of land adjacent to transportation improvements linking rural areas to Newark and New York City. The area that would become Harding Township in 1922, following a land dispute with Passaic Township, was one area with these large swaths of land. When families began buying up these tracts, the land was subject to the New Vernon Neighborhood Restrictive Agreement, which served as a form of zoning to restrict development to low density residential development in order to preserve the rural character of the community.

Both properties represent a tie to Harding's past as both properties came about from a land purchase in 1751 made by Peter Kemble, a member of New Jersey's governing council in the mid-1750s. Known as Mount Kemble, the purchase included a large tract of land, today bounded by U.S. Route 202 (Mt. Kemble Avenue) and Tempe Wick Road and extending toward Morristown.

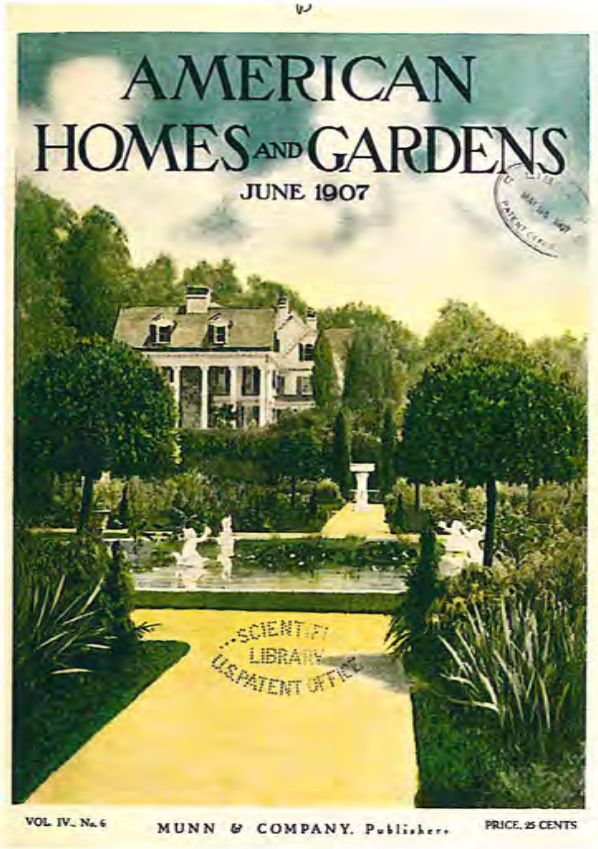
The current dwelling on the Glen Alpin property was originally built by the Hoyt family in the late 1840s. It received its current name when it was bought by David Hunter McAlpin in 1885. The dwelling underwent a number of renovations and additions in the following years as the property was transferred through several owners until 2004 when the Township and Harding Land Trust acquired the property for $1,400,000 to be used as open space (Harding owns 85.71% and Harding Land

Glen Alpin Mansion, 1940s

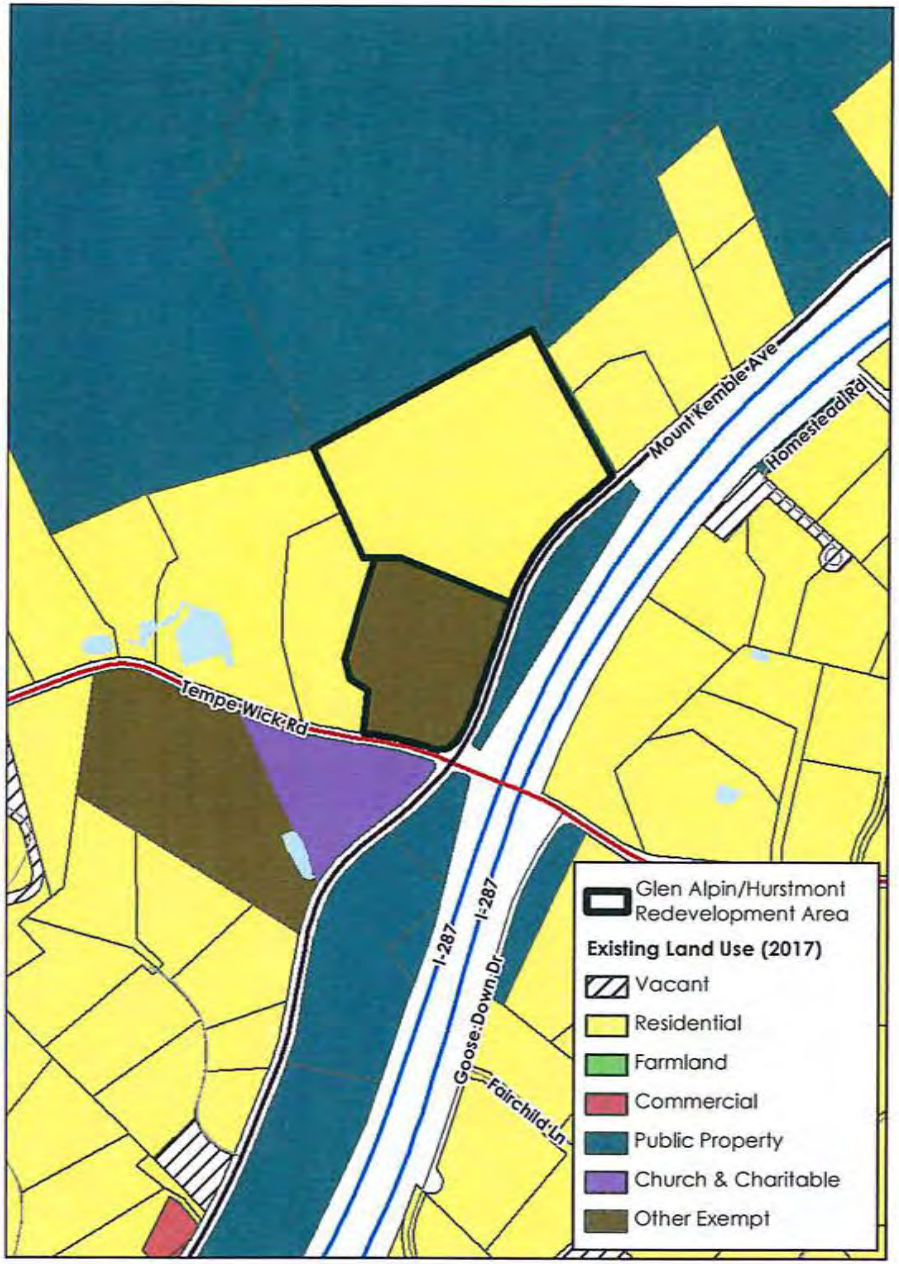
Photo courtesy of the Harding Township Historical Society

Trust owns 14.29% of the property). Funds to purchase the property came from Harding's Open Space Trust (HOST), the Harding Land Trust, the Morris County Open Space Farmland Preservation Fund, the Morris County Park Commission, and New Jersey State Green Acres.

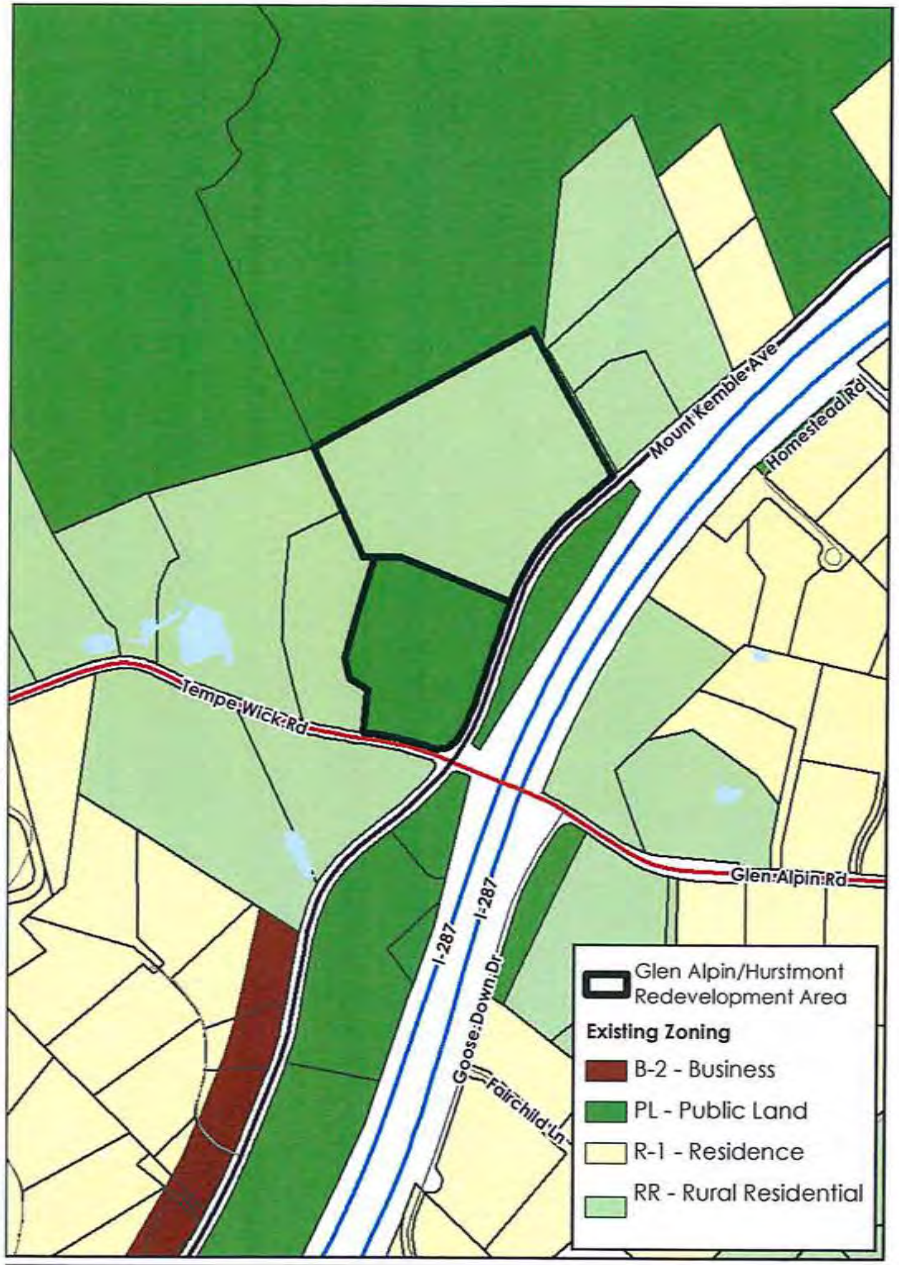
The original house on the Hurstmont property was constructed in 1886 for David McAlpin's daughter, Adelaide, and her husband, James Pyle. Adelaide and James decided to redesign their home to better reflect their social status. With the help of architect Stanford White, of the McKim, Mead, and White architecture firm, the home was redesigned to have 30 rooms and was decorated with antique crown molding, plaster designed ceilings, marble hearths, elaborate tapestries, and Moravian Tile. The new home was featured in the June 1907 edition of American Homes and Gardens. A featured component of the estate was the formal gardens and terraces that were cut into the hillside. A large, rectangular pool was a focal point of the gardens. The property changed ownership throughout the 20th century until the current owner, Harding Holdings LLC, purchased the property in 2011.



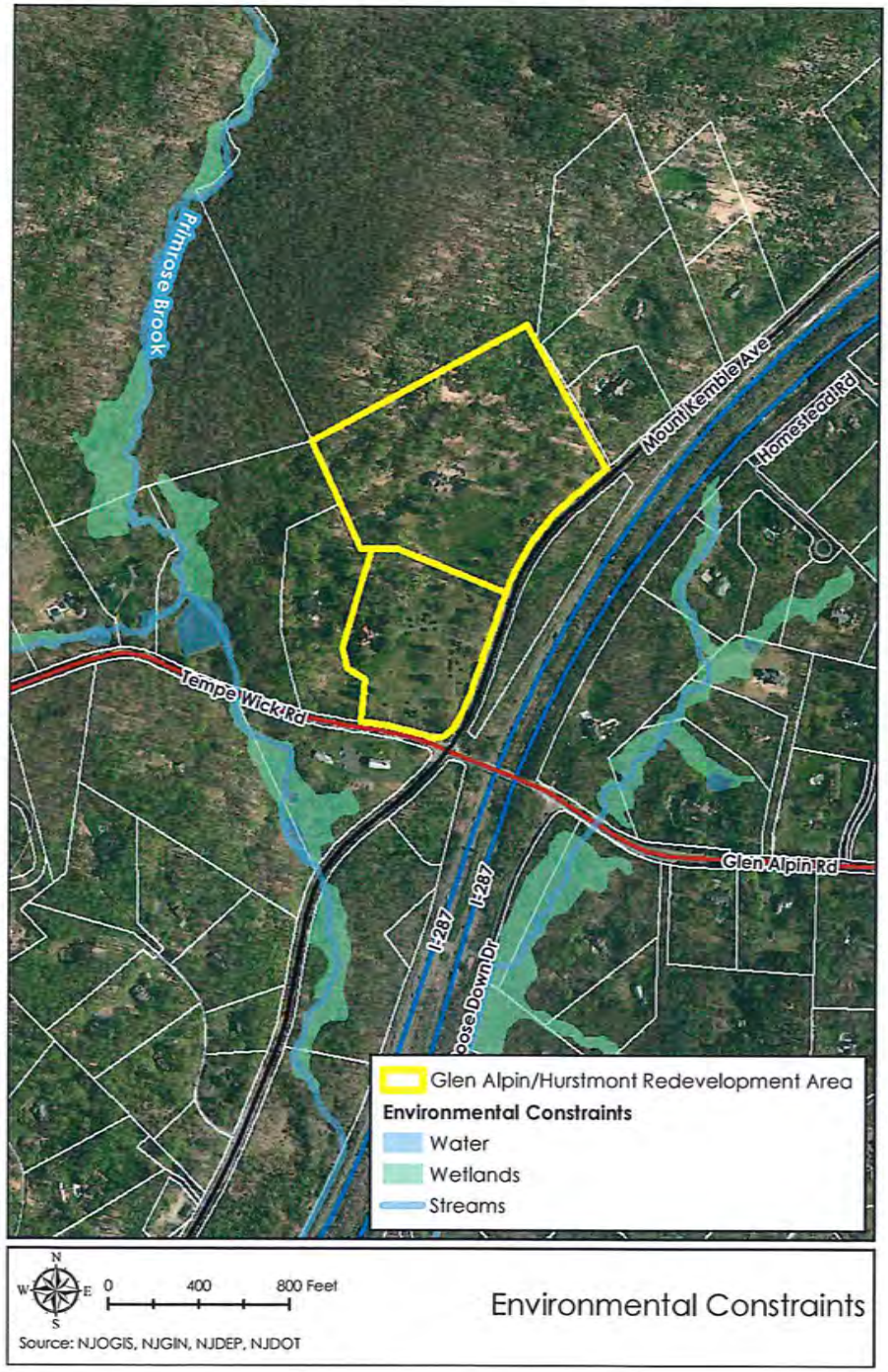
1907 Cover of American Homes and Gardens, Featuring the Hurstmont Estate



Existing Land Use



Existing Zoning



PUBLIC PARTICIPATION

Public participation is a key component of the redevelopment process. The public engagement process allows community members to voice concerns and address issues to ensure that the Redevelopment Plan reflects the goals and long-term vision of the community. A public meeting was held on April 23, 2019, at which time Township residents voiced their comments and opinions regarding the redevelopment of the Hurstmont and Glen Alpin properties. Concerns raised by the residents included preserving the historic Glen Alpin mansion, mitigating the impact of all new development on the environment and streetscape, and ensuring that new development conforms with the architectural design and character of the community.

A Steering Committee was formed and tasked with the responsibility to assist in the preparation of the standards and guidelines that comprise this Redevelopment Plan. The Steering Committee is composed of Township Committee members as well as Township residents.

A public meeting and a meeting of the Steering Committee was held on September 4, 2019, followed by a second public meeting at the Township Committee meeting on September 9, 2019. The purpose of these public meetings was to allow the public to review the changes from the adopted June 2019 Redevelopment Plan and to once again voice any comments and opinions they may have regarding the amendments to the Plan.

PLAN PURPOSE

The purpose of this Plan is to redevelop the Hurstmont property into an age-restricted community with an affordable housing set-aside. In addition, a significant component of this Plan is to preserve the historic Glen Alpin site and restore it as a community asset.

PLAN PRINCIPLES

Senior Living Housing

- Supply a variety of living arrangements for seniors, including townhomes, multi-family independent living, and assisted living/dementia care.
- Supplement living options with dining facilities and medical services, including fitness, occupational, and cognitive therapy.
- Provide a portion of the Township's affordable housing obligation in accordance with the Court-approved settlement agreement between the Township and the Fair Share Housing Center.
- Redevelop the site with a facility that considers the location of steep slopes and preserves the existing environmental features on the site to the extent feasible.

Circulation

- Maintain the existing access point to the Hurstmont property and construct a second access roadway from Route 202.
- Evaluate the need for transportation infrastructure investments on surrounding roadways, traffic signals, and signage to offset the impacts of the new development on existing conditions.
- Design an on-site circulation plan to ensure efficient movement of vehicles within the development and reduce congestion from turning vehicles on Mt. Kemble Avenue.
- Minimize the impact of the development on traffic at the intersection of Mt. Kemble Avenue and Tempe Wick Road.

Site and Architectural Design

- Provide for internal movement of pedestrians through sidewalks and paths.
- Promote pedestrian safety through well-designed crossings and sidewalks within the Redevelopment Area.
- Ensure the general preservation of mature trees throughout the property and within the

Main Entrance of the Hurstmont Mansion, 1907
From the June 1907 Issue of American Homes and Gardens

proposed conservation easement to help screen the development from the view of the public roads to the extent feasible.

- Utilize stormwater management best practices.
- Maintain a minimal amount of impervious surface on the site in order to manage stormwater runoff into local surface water bodies pursuant to the Township's stormwater management ordinance (Part 4 of Chapter 225).
- Establish architectural design standards that respects the historic features of the Hurstmont estate.

Open Space Environmental Protection

- To the extent feasible, preserve the existing mature trees on the site to create a more aesthetically pleasing community, to provide screening from adjacent uses, and to absorb runoff.
- Encourage the planting of additional trees (hardwood and evergreen) and vegetation along Mt. Kemble Avenue as well as throughout the entire Area.
- Maintain the rural character of the Township through large areas of on-site open space, including mature tree growth (of both hardwood and evergreen).
- Implement pedestrian trails and paths that connect the Glen Alpin and Hurstmont properties, as well as connect the two properties with the Morristown National Historical Park.
- Preserve the environmental quality of the Morristown National Historical Park and the Great Swamp National Wildlife Refuge.
- Protect natural resources through stringent land use and development regulations.

Cultural Heritage

- Encourage the restoration and adaptive reuse of the Glen Alpin site for its historical and cultural significance.
- Encourage sensitivity to cultural heritage and historical resources on the Hurstmont property with the acknowledgment that the existing structures on the Hurstmont property will be razed in connection with the redevelopment of the property.

Glen Alpin Gardens, 1940s

Photo courtesy of the Harding Township Historical Society

Community Character

- Create an aesthetically pleasing community that is compatible with the architectural and community character of the Township.
- Maintain the residential character of Harding by use of traditional building materials. See the Architectural Standards section of this Plan for more details.

PLAN GOALS

- Provide a variety of affordable housing options for the senior population that contribute to the Township's Third Round Affordable Housing Obligation.
- Improve the utilization of the land, which can be redeveloped into uses beneficial for the community while taking into consideration the historical significance of the properties.
- Preserve and enhance the historical character of the Township.
- Maintain the rural pattern of development in the Township.
- Facilitate redevelopment that addresses and protects the environmental constraints and characteristics, particularly as they relate to stormwater runoff, of the individual site as well as the Township as a whole.
- Minimize the impact of the proposed development on the natural environment.
- Encourage the pursuit of LEED or similar certification.
- Mitigate the impact of any additional traffic generated by the new development.
- Preserve and restore the historic Glen Alpin mansion.
- Provide a public walking trail that connects the Redevelopment Area to the Morristown National Historical Park.

Hurstmont Mansion, 1907
From the June 1907 Issue of American Homes and Gardens

RELATIONSHIP OF PLAN TO TOWNSHIP LAND DEVELOPMENT REGULATIONS

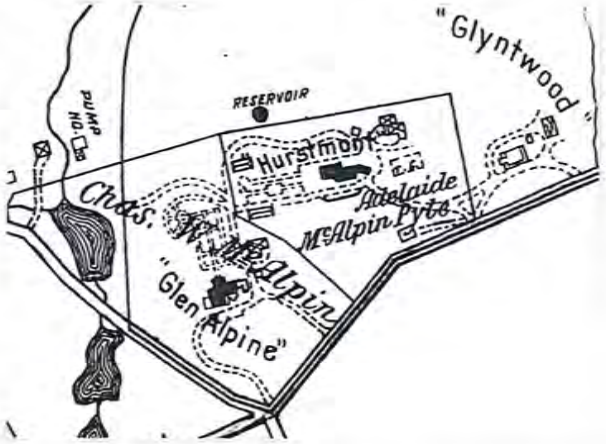
The Redevelopment Area shall be redeveloped with the standards detailed in this Plan. The Plan supersedes the provisions of the Township Land Use and Development Regulations (Chapter 225) for the Redevelopment Area unless specifically referenced. Other Township regulations affecting development that are in conflict are superseded by this Plan. All development shall require site plan approval and shall comply with Chapter 225 Article XVI Design Standards for Site Plans, unless superseded by this Plan and subject to the following paragraphs regarding deviations and exceptions/waivers.

No deviations may be granted which will result in permitting a use that is not a permitted use within this Redevelopment Plan. Any deviation from standards of this Plan that results in a "d" variance pursuant to N.J.S.A. 40:55D-70d shall be addressed as an amendment to the Plan rather than via variance relief through the Township's Zoning Board of Adjustment. An application requesting a deviation from the requirements of this Redevelopment Plan shall provide public notice of such application in accordance with the public notice requirement set forth in N.J.S.A. 40:55D-12a.&b. All development must be approved by the Planning Board and shall be submitted through the normal site plan and subdivision procedures as identified by N.J.S.A. 40:55D, et seq.

Any deviations from bulk standards shall require "c" variance relief. The Planning Board shall have the power to grant relief to the same extent as the Board may grant relief from bulk and dimensional requirements pursuant to N.J.S.A. 40:55D-70.c. See the Review Process section at the end of this Plan for additional information regarding the application review process.

The Planning Board may grant exceptions or waivers from design standards for site plan or subdivision approval as may be reasonable and within the general purpose and intent of the provisions for site plan review and/or subdivision approval within the Plan. The Board may grant exceptions or waivers if it is determined that the literal enforcement of one or more provisions of the Plan is impracticable or would exact undue hardship because of peculiar conditions pertaining to the site. No deviations may be granted under the terms of this section unless such deviations can be granted without resulting in substantial detriment to the public good and will not substantially impair the intent and purpose of the Redevelopment Plan and Master Plan (N.J.S.A. 40:55D-51).

Final adoption of this Redevelopment Plan by the Township Committee shall be considered an amendment to the Township of Harding Land Use and Development Regulations Ordinance and Zoning Map. Any and all amendments to this Plan shall be authorized and adopted by the Harding



1910 Map of the Redevelopment Area

Photo courtesy of the Harding Township Historical Society

Township Committee. In addition, any potential future reuse of underground parking shall require a Plan amendment. Unless otherwise defined in the Plan, terms used in this Plan shall have the same meaning as defined in the Township's Land Use and Development Regulations Ordinance.

LAND USE PLAN

This Plan includes the following two land use Districts:

- Senior Living District
- Glen Alpin Cultural Center District

The evaluation of any proposal submitted under this Redevelopment Plan shall be based upon the sections of this Plan entitled "Relationship of Plan to Township Standards" as well as "District Standards" and "Design Standards."

Definitions

Assisted Living Residence: A facility licensed by the Department of Health and operated pursuant to N.J.A.C. 8:36-16.1 et seq. to provide apartment-style housing, dining and assisted living services when needed. Apartment units offer, at a minimum, one unfurnished room, a private bathroom, a kitchenette, and a lockable door on the unit entrance, intended for, and solely occupied by, persons 62 years of age or older, unless permitted by Medicaid.

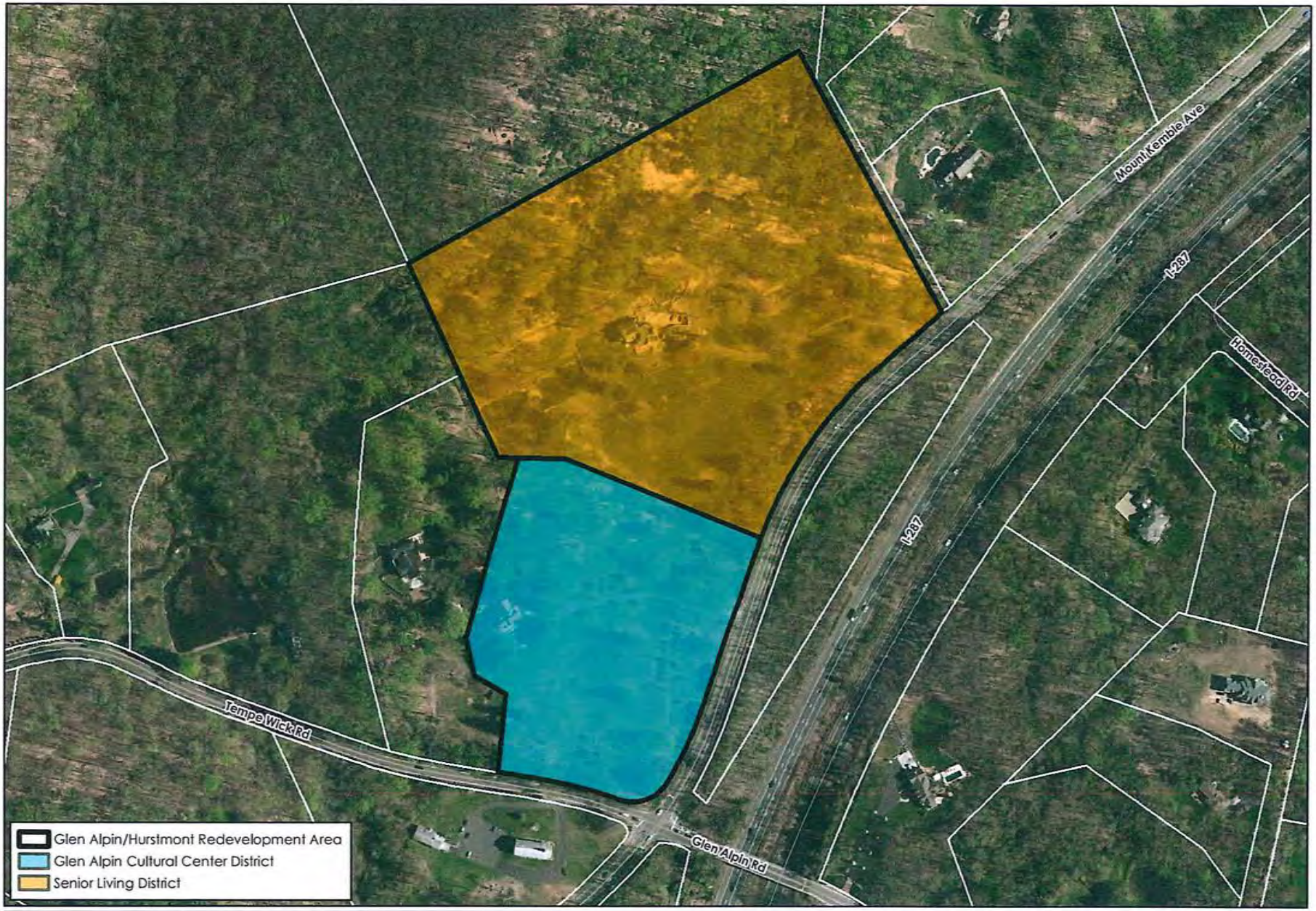
Independent Living Unit (ILU): One (1) or more rooms occupied by persons who are sixty-two (62) years of age or older with private bath and kitchen facilities comprising an independent, self-contained dwelling unit within multi-family structures.

Dementia Care Home: Pursuant to N.J.A.C. 8:37-1.1 et. seq. and the Dementia Care Home Act, a Dementia Care Home is a facility which (1) provides services to residents with special needs, including but not limited to, persons with Alzheimer's disease and related disorders or other forms of dementia; (2) is subject to the licensure authority of the Department of Health as a health care facility pursuant to P.L. 1971, c.136 (C.26:2H-1 et seq.); and (3) meets the requirements of section 19 of P.L.2015, C.125 (C:26:2H-150). There shall be no age restriction on the dementia care home provided that the residents are over the age of nineteen (19) and have a medical diagnosis of Alzheimer's disease or related disorders or others forms of dementia.

Townhouse: A contiguous building or buildings, including one of two or more contiguous dwelling units in the same structure, each separated by plane vertical walls and having direct access to the outside and the road without use of a common hall, passageway or land and so laid out that

Hurstmont Swimming Pool, 1939

Photo courtesy of the Harding Township Historical Society



Proposed Land Use Districts

HGA
HEYER, GRUEL & ASSOCIATES
September 2019

each is susceptible to sale as an individual house and lot. A townhouse shall be occupied by persons who are fifty-five (55) sixty-two (62) years of age or older and others pursuant to the Federal Housing for Older Persons Act (42 U.S.C. 3607(b)(2)(C)). No permanent (60 or more cumulative days over the course of a year) resident shall be nineteen (19) years or younger.

Unit: One (1) or more rooms, designed, occupied, or intended for occupancy as separate living quarters, with cooking (excluding dementia care homes), sleeping, and sanitary facilities provided within the unit for the exclusive use of a household. An individual living quarter within the dementia care home is a single unit.

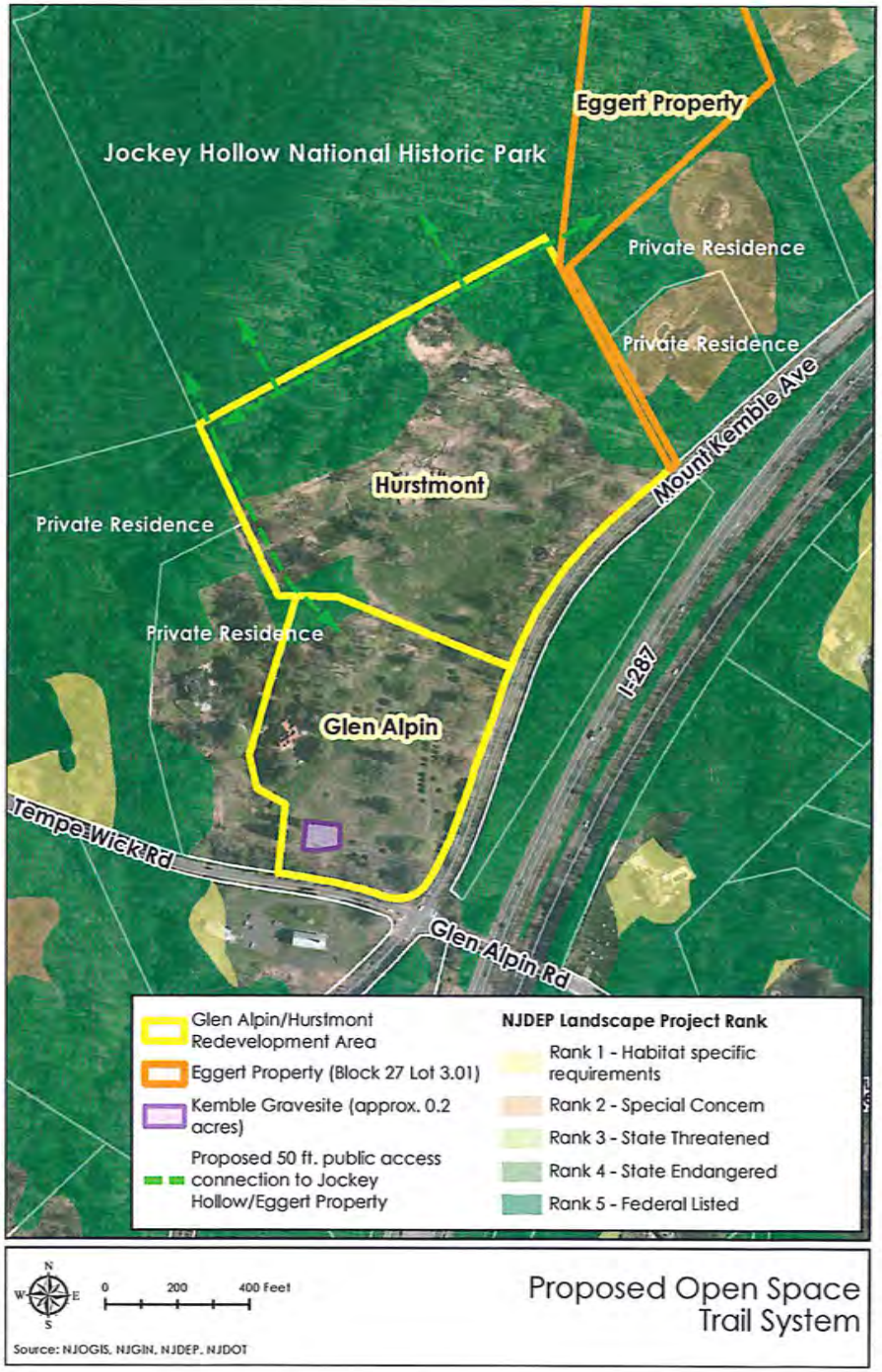
Standards Applicable to All Districts

Walking Trails

- A walking trail shall be constructed throughout the Area, connecting the Glen Alpin Cultural Center District and Senior Living District with the Jockey Hollow section of the Morristown National Historical Park (see opposite map).
- The walking trail shall also connect to Block 27 Lot 3.01, commonly referred to as the "Eggert property," via the rear portion of the Senior Living District. The Eggert property is a Township-owned parcel located directly north of the Redevelopment Area and is preserved as open space.
- Public parking shall be permitted on the Glen Alpin property for users of the trail connecting to Jockey Hollow Morristown National Historical Park.

Circulation

- Applications for development shall provide a traffic study evaluating the impact of new development, particularly on the Mt. Kemble Avenue/Tempe Wick Road intersection and identify strategies to mitigate the traffic effects of the new development.
- All private roads and driveways must have adequate width and turning radii to accommodate emergency services vehicles including fire trucks and ambulances.



- The streets providing access to the townhouses shall not exceed 22 feet in width. The street providing primary access to the ILU and assisted living/dementia care home buildings may be 24 feet wide.
- Mountable curbs shall be provided where feasible.
- To the extent feasible, street ends shall be designed as hammerheads rather than cul-de-sacs.
- Site circulation improvements shall include provisions for sidewalks or similar pedestrian pathways. Protections for pedestrians shall be provided at crosswalks and sidewalks.
- Sidewalks shall begin at the residential units closest to Route 202 and continue north into the site. Sidewalks shall not continue all the way to Route 202.
- Surface parking is encouraged to utilize reinforced porous products to reduce impervious coverage.
- All roads shall be built to Township standards or RSIS standards as applicable.

Lighting

- Applications for development shall demonstrate compliance with the Township's Exterior Lighting "Dark Sky" ordinance (Chapter 233) and the Lighting ordinance (Chapter 225 Section 85). The developer shall submit a Lighting Plan that meets the requirements set forth in Section 225-85 of the Township Land use and Development Regulations.
- Applications for development shall take all necessary steps to ensure minimal light pollution. Proposed lighting shall be evaluated during site plan review to ensure minimal adverse effects on neighbors and the night sky.
- Site lighting shall be provided on bollards rather than using pole mounted fixtures. To satisfy minimum illumination requirements of applicable Township and State codes and regulations that cannot be satisfied by use of bollards, elevated fixtures may be utilized.
- Bollards should use smart light technology, including motion sensor light fixtures.
- All light fixtures shall utilize LED bulbs and shall be shielded to prevent glare or hotspots from any direction.
- Up lighting or outward facing building-mounted light fixtures are not permitted.

Glen Alpin Conservatory, January 2019

- Illumination levels for all interior streets, driveways, and sidewalks/pedestrian pathways shall conform to the standards set forth in Section 225-85 of the Harding Township Land Use and Development Regulations.
- Color temperatures for light bulbs shall be 2700K (Degrees Kelvin).
- Light fixtures shall not exceed 600 lumens or such elevated levels as are necessary to satisfy minimum illumination requirements of applicable Township and State codes and regulations.

Environmental Protection

- Applications for development shall demonstrate compliance with the Township's Site Plan Design and Environmental Protection ordinance (Ordinance Section 225-78) and the Environmental Impact Statement ordinance (Chapter 225 Article XII) of the Township Code. An Environmental Impact Statement shall be provided at time of site plan application.

Subsurface Wastewater Treatment and Disposal Systems

- An on-site subsurface wastewater treatment and disposal system ("system") may be provided within the front yard of the Senior Living District to service both Districts. Development of the on-site system shall be subject to the appropriate approvals from the DEP and shall be exempt from the Township's Sewers and Water ordinance (Chapter 422).

State Requirements

- All development shall conform to all applicable State requirements, unless the State grants any waivers or exceptions.

Existing Mature Trees at the Rear of the CCRC District, January 2019

Senior Living District

The purpose of the Senior Living District is to permit the redevelopment of the Hurstmont property into a senior living facility that provides a diversity of residential opportunities. Residential housing types will include townhomes, multi-family independent living units (ILUs), and assisted living and dementia care homes. An affordable housing set-aside is required. This District shall be designed and developed on a coordinated basis. Development of this District shall take into account the rural character of the development immediately surrounding the District as well as the Township as a whole.

Permitted Principal Uses

- Townhomes
  - Townhomes shall have a maximum of four units per building
- Multi-Family Independent Living Units (ILU's)
- Assisted Living and Dementia Care Homes
- Telecommunication antennas and associated equipment subject to the standards detailed in the Additional Standards subsection of the District.

Permitted Accessory Uses

- Fitness and wellness center to be used by residents and guests of residents only
- Movie theater to be used by residents and guests of residents only
- Library to be used by residents and guests of residents only
- Retail to be used by residents and guests of residents only
- Office spaces
- Dining facilities
- Parking
- Signage
- Roof-mounted solar panels
- Subsurface Wastewater Treatment and Disposal System, including a related structure, (eave shall not be greater than 15 feet in height). The size of the structure shall be designed in accordance with applicable DEP regulations and based on the effluent requirements specified in the final discharge permit. The architectural/exterior treatment of the structure will resemble that of the townhomes and shall abide by the material standards found within

Hurstmont's Formal Gardens, 1907
From the June 1907 Issue of American Homes and Gardens

this Plan. Odor control systems and noise attenuating enclosures will also be added. The facility shall have below grade treatment tanks and all related equipment shall also be below grade. The structure shall be set back a minimum of 100 feet from any District line. The system will be used to service both the Senior Living District and Glen Alpin Cultural Center District, including any potential future improvements at the Glen Alpin site/building.

- Uses that are customarily incidental to the principal use

Bulk Standards

Minimum Tract Area:

- 19 acres. The proposed townhouse area, which is approximately 11 acres in size, may be subdivided for purposes of financing, operations, and ownership, leaving an 8-acre parcel for the assisted living/dementia care and independent living unit uses. With respect to any subdivision, internal setbacks and coverage standards shall not apply. In the case of any subdivision, easements including but not limited to, cross access easements shall be required.

Impervious Coverage:

- Maximum building coverage shall not exceed 25% within the District.
- Maximum impervious coverage shall not exceed 40% within the District.
- Any land conveyed to the Township or Park Commission shall be included for purposes of calculating coverage.

Number of Units:

- The total number of units, inclusive of market rate and affordable units, shall not exceed 250 to be broken down as follows:
  - No more than 40 townhouse units shall be constructed
  - No more than 85 assisted living/dementia care units shall be constructed
  - No more than 125 independent living units shall be constructed. However, the number of independent living units may be increased if there is a corresponding decrease in the number of townhouse units.
- Of the total number of units, 40 shall be affordable units. In no event shall the District produce The affordable units shall consist of the number of units attributable to assisted living units pursuant to NJSA 26:2H-12.16 and NJAC 8:33H-1.7, with the remainder of the affordable units located within the independent living building.

Glen Alpin Mansion, 2009

Photo courtesy of the Harding Township Historical Society

Setbacks

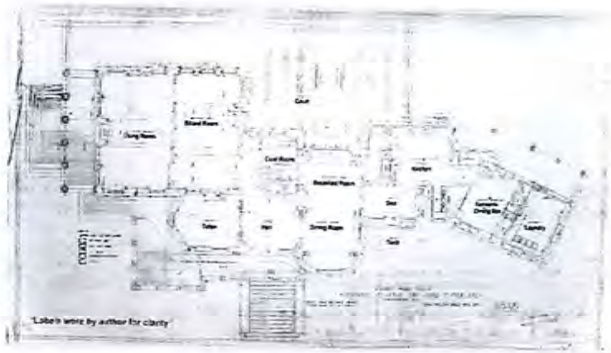
- With the exception of the setbacks found in the three following charts, all new structures and any recreational facilities shall be set back at least 100 feet from any District line.
- Any land conveyed to the Township shall be included for purposes of calculating setbacks.
- The components of the subsurface wastewater treatment and disposal system ("system") may be located within the setbacks. The above-ground structure associated with the system shall be setback 100 feet from any District line.

Townhouses:

Minimum setback from Mt. Kemble Ave.	150 feet
Minimum setback from adjacent structures	30 feet
Minimum setback from internal roadways	25 feet
Maximum building height**	2.5 habitable stories / Front elevation (pursuant to the Township's definition of "front elevation"): 45 feet
Maximum unit footprint	Uphill building: 1,760 SF Downhill Building: 2,200 SF
Minimum setback from southwest property line	50 feet

Multi-family Independent Living Units (ILU's):

Minimum setback from Mt. Kemble Ave.	300 feet
Minimum setback from rear property line*	100 feet
Minimum setback from adjacent structures	30 feet
Maximum building height**	4 habitable residential stories over parking, lobby, and service areas/ 65 feet total. Service areas include accessory uses as defined in this Plan.



Hurstmont Mansion First Floor Plan

Photo courtesy of the Harding Township Historical Society

Assisted Living/Dementia Care Homes

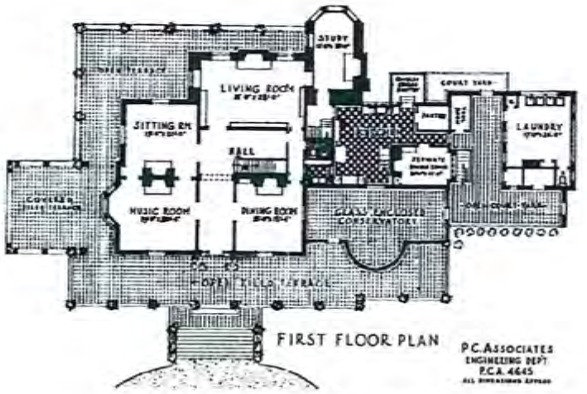
Minimum setback from Mt. Kemble Ave.	500 feet
Minimum setback from rear property line*	100 feet
Minimum setback from adjacent structures	30 feet
Maximum building height **	4 habitable residential stories over parking, lobby and related dining facilities and services areas / 55 feet total. Service areas include accessory uses as defined in this Plan.

*Rear property line = property line abutting Morristown National Historical Park

** Calculation of height shall be as defined by the Township's Land Use Development Ordinance. The assisted living/ dementia care and independent living buildings are exempt from the front elevation height limitation as set forth in the Township's Land Development Ordinance.

Parking Requirements

- ILUs: 1 space per unit
  - Guest parking for the ILUs may be provided at a maximum ration of 1 space per three (3) units but is not required.
- Assisted living/dementia care: 0.5 spaces per unit (RSIS)
- All parking associated with the independent living units and the assisted living/dementia care home, including employee parking, shall be located under the ground surface. However, a maximum of 10% of the total parking may be surface parking earmarked for visitors and/or as handicapped spaces.
- Each townhouse unit shall have a two-car attached garage.
- Street parking is not permitted anywhere within the District.
- With the exception of the above parking standards, RSIS shall apply.



Glen Alpin Mansion First Floor Plan

Photo courtesy of the Harding Township Historical Society

Additional Standards:

Emergency Services

- The redeveloper shall provide their own ambulance and emergency services, which may be contracted out so as to not put a significant burden on the existing all-volunteer Township services.

Outdoor Amenities

- The extent and placement of outdoor amenities, such as pools, shall be evaluated at site plan approval to minimize any impact on adjacent residential properties. Specific considerations shall be given to lighting and noise. Tennis courts shall not be lighted.

Garages for Townhouses

- To the extent feasible, garages shall be visually screened from public streets.

Tree Conservation

- A 50-foot tree conservation area is required along all perimeter property lines, with the following exceptions: 1) driveways that service the development, and 2) the rear property line abutting the Morristown National Historic Park and the southwest property line in which a trail connection is proposed, shall have a 25-foot wide tree conservation area. The trail may pass through the tree conservation area, and the components of the subsurface wastewater treatment and disposal system may extend beyond the boundary of the tree conservation area. Within this conservation area, no tree measuring six inches or greater in diameter at a point 4 ½ feet above the ground shall be cut down or removed.
- Exceptions to the above shall be in conformance with Ordinance Section 225-111.B(2) of the Township Code.
- Should an application for development propose any tree removal within the tree conservation area, a permit shall be obtained pursuant to Ordinance Section 225-111 of the Township Code. 'C' variance relief is not required.

Other

- A master property association will be created to cover the entire Senior Living District, which may be extended to the Glen Alpin Cultural Center District at such time as septic service is extended. The Association will implement the Emergency Services provision, as previously discussed.

Hurstmont Mansion, 1986

Photo courtesy of the Harding Township Historical Society

- An internal interconnection between the Districts may be maintained. There shall be no gates restricting access to the development nor shall any gates be located internally to the site.
- Medical and other support services typically provided in a skilled nursing home shall be provided as an option for residences. If necessary, provisions for transportation shall be provided.
- Chapter 225 Article XVIII Steep Slopes is not applicable. However, concerns relating to erosion in association with steep slopes will need to be addressed during the site plan application process.
- A minor subdivision shall be required, and is authorized by this Plan, in order to subdivide the townhouse development from the ILU and assisted living/dementia care development.
    - Article XV Design Standards for Subdivisions shall not apply.
    - The District still needs to be developed in an integrated manner, fully satisfying the affordable housing obligation and the required development phasing (see Provision for New Affordable Housing Units at the end of this Plan).
- Retaining walls built in relation to the detention basin shall be a maximum of 8 feet in height and shall include landscaping to screen the wall from view. Long, monotonous expanses of retaining walls shall be avoided to the maximum extent feasible. Landscaping shall used to help to break up long expanses of wall.
- The building comprising the independent living units may be connected to the assisted living/dementia care building through one or more passageways to be used as service connectors for employees, staff, and pedestrians. One of such passageways may extend above ground to grade. This at-grade passageway shall not to exceed 30 feet in width between interior walls or 20 feet in height to the peak of the roof and shall be included in the lot and building coverage calculations. The at-grade passageway shall have an architectural style that is complimentary with the assisted living/dementia care and the independent living buildings. The above ground corridor shall be treated as a free-standing building.

Hurstmont's Formal Gardens, 1930s

Photo courtesy of the Harding Township Historical Society

Telecommunication Standards

- Installation of a wireless telecommunications antenna or antenna array shall be permitted on the rooftop or flush against the exterior of the assisted living/dementia care building. Monopoles and/or towers are not permitted.
- Wireless telecommunications antennas/antenna arrays are subject to the following standards:
  - Application requirements shall be pursuant to §225-175.B.
  - Applications to construct wireless telecommunication facilities are not subject to a report and approval by the Township Department of Health.
  - All equipment associated with the wireless telecommunications facility, including equipment shelters, shall be located internally within the building.
  - Wireless telecommunication facilities are required to be structurally sound and not create any hazards to the general public.
  - Wireless telecommunication facilities shall be designed, located, and screened to blend with and into the surrounding architecture and designed so as to eliminate, to the maximum extent practical, adverse visual impacts through the use of color, camouflaging, architectural treatment, and other means.
  - Antennas must be spaced and positioned in such a way as to not interfere with buildings' architecture and design features.
  - All wiring and/or cable tray devise must be positioned in such a way that is not visible to the public.
  - Wireless telecommunication facilities that are not in use for wireless telecommunication purposes for six consecutive months shall be removed by the facility owner or the contractually responsible party at its expense. Removal shall occur within 90 days of the end of such six-month period. Upon removal, the site shall be cleaned and restored.

Glen Alpin's Formal Gardens, 1935

Photo courtesy of the Harding Township Historical Society

Glen Alpin Cultural Center District

The purpose of this District is to restore and preserve a historic asset for its historic and cultural significance. The Township agreement with the New Jersey Department of Environmental Protection as part of the diversion/disposal process, as well as the easements placed on the property, will control the standards for the site.

Permitted Principal Uses

- Cultural center
- Offices
- Leasable event space that allows for off-site food and drink to be brought in for on-site consumption during a private function
- A single-family residence within the existing mansion
- Restaurant, where food and drink are prepared, served, and consumed on-site
- Group Home

Permitted Accessory Uses

- Subsurface Wastewater Treatment and Disposal System, only for use within the Redevelopment Area
- Uses that are customarily incidental to the principal use

Bulk Standards

Minimum Tract Area: 9 acres, less so much acreage as may be transferred to the Morris County Park Commission.

Remaining Bulk Standards: The agreements and easements with the DEP, County, and other relevant parties shall control the bulk standards for the District.

Parking Requirements

- Office Space: 1 space per 250 gross square feet
- Leasable Event Space/Restaurant: 1 space for every 3 seats; Where no permanent, individual seats are provided, 1 space for each 100 square feet of seating area or primary assembly area shall be provided
- Residential: RSIS
- Trail Head Parking: 4 spaces

Additional Standards

Easements

- All easements with the DEP, County, and other relevant parties shall remain in effect subject to the terms of each easement.

Early Photo of the Glen Alpin Mansion, Prior to the Construction of the Conservatory

Photo courtesy of the Harding Township Historical Society

Design Standards for the Senior Living District

Architecture

- New development shall be architecturally consistent with the architecture of the Hurstmont mansion.
- New development shall be designed to utilize the natural topography of the site.
- New development shall be undertaken in ways that will preserve and respect the historic character of the Redevelopment Area, the Township, and the surrounding area. Historic character is defined by existing or formerly existing structures that participated significantly in aspects of the local historic story.
- Respect in design shall be expressed at the level of basic structural forms, rather than in superficial architectural detail.
- Decorative details like shutters, pilasters, and elaborate shingle siding patterns shall be used sparingly and in support of massing statements, not as an afterthought. The architectural design of the townhomes, independent living building, and the assisted living/dementia care building shall be compatible in terms of building materials and architectural techniques utilized.
- All buildings shall be designed with materials that reflect the historical and rural character of the community. Appropriate materials include:
  - Brick
  - Wood
  - Cast architectural concrete
  - Azek Trim
  - Simulated fiberglass roofing
  - Clapboard siding
  - Field stone/granite/other native stone
  - Durable manufactured product is permitted for retaining wall surfacing only, pursuant to approval of the Redevelopment Entity. Examples that are not acceptable will be referenced in redevelopment agreement.
- Pudding stone, EIFS, and stucco shall not be utilized anywhere on site.

Hurstmont Mansion, January 2019

- Imitative veneers, such as vinyl siding or Garden State Brickface, shall not be used anywhere on site.
- No manufactured products such as cultured stone can be used as a veneer on any building.
- For the townhomes, architectural design features such as pitched roofs, dormers, window shutters, stoops, and entrance overhangs shall be utilized to reflect the look of older carriage homes.
- For the multi-family ILUs and assisted living/dementia care units, architectural features such as mullioned windows and gabled roofs shall be used.
- Building massing shall be broken up through the use of multiple gables, varying roof heights, dormers, materials, and architectural articulation.
- Hipped and gable roofs shall be utilized for all new structures.
- All roofs must have eaves, which shall be continuous and measure a minimum of 2'-0" from the building face.
- Primary front-to-back roofs may have a minimum pitch of 6:12. All other roofs shall have a minimum pitch of 8:12.
- Roofs and building orientation should be designed to accommodate solar panels whenever possible.
- Garage doors on townhomes shall be constructed of a solid material and be aesthetically pleasing.
- Retaining walls shall be terraced, with no single wall taller than 10 feet and with at least 6 feet horizontally separating each wall. Areas between retaining walls shall be landscaped.
- Any at-grade passageway that connects the assisted living/dementia care building with the independent living building shall abide by the design standards herein and shall have an architectural style that is complimentary with the assisted living/dementia care and the independent living buildings.
- To the extent feasible, existing historic features such as stone walls shall be salvaged and utilized in the development.
- Construction materials used in landscaping shall conform to the design standards found herein.
- The following page provides examples of appropriate architectural styles:

Hand Drawn 1915 Map of Redevelopment Area, prepared by F.S. Tainter, Engineer

Photo courtesy of the Harding Township Historical Society







Open Space and Landscaping/Buffering

- Maximum effort should be made to preserve and incorporate into the landscaping plan all existing trees and vegetation within the Redevelopment Area.
- For all new plantings, native species shall be utilized to the extent feasible. Native plants species can be found on the Native Plant Society of New Jersey webpage, among other similar sources.
- Invasive species are prohibited for all new plantings. A list of invasive and non-invasive alternatives can be found in a report entitled "Plant Invaders of Mid-Atlantic Natural Areas," published by the U.S. Fish and Wildlife Service.
- Landscaping shall include a combination of hardwood and other deciduous trees in addition to evergreens. Evergreens shall be utilized for screening purposes.
- Landscaping shall include canopy, understory, shrub, and ground layers.
- Street trees shall be planted along all interior roadways, and shall be planted on average 40 feet apart.
- At the time of planting, a minimum of 50% of all internal trees must be at least 3 inches in caliper measured 4.5 feet above ground for deciduous trees and a minimum of 6 feet in height for evergreens. The trees in the Route 202 buffer and street trees along entrance driveways shall be at least 4-5 inches in caliper for deciduous trees and 6 feet in height for evergreen trees. All trees must adhere to the American Standards for Nursery Stock.
- Outdoor gardens are encouraged within the Senior Living District and shall be planted with non-invasive flowers, shrubs, and tree species. To the maximum extent feasible, historic garden elements shall be restored and reused. The responsibility of managing the gardens is delegated to the redeveloper.

Glen Alpin Mansion, January 2019

Stormwater Management

- All development shall comply with Chapter 225, Part 4 "Stormwater Management" of the Township Land Use and Development regulations.
- Site design within the Redevelopment Area shall adhere to the New Jersey Stormwater Management Best Management Practices Manual, which can be accessed at: https://www.njstormwater.org/bmp_manual2.htm. Should there be discrepancies between the New Jersey Stormwater Management Best Management Practices and the Township's Stormwater Management ordinance, the stricter standard shall govern.

- To the extent feasible, development within the Area should employ green infrastructure and stormwater management best practices including, but not limited to, the following:
  - Rain gardens/bioswales - A shallow, sloped, and landscaped retention area designed to capture and convey stormwater runoff. These facilities assist with stormwater filtration and groundwater recharge while also serving as aesthetically pleasing landscapes and habitats for local wildlife.
  - Rain barrels – Containers that capture stormwater runoff from the roof of a structure and store it for later use, such as on lawns, gardens, or indoor plants. Reduces the amount of water taken from the municipal system that is used for aesthetic landscaping maintenance.
  - Green roofs – The roof of a structure which is completely or partially covered with vegetation. Green roof vegetation typically includes a growing medium planted on top of a waterproofing membrane. In addition to assisting with retaining stormwater, green roofs also provide insulation for the building and could potentially be used as a rooftop garden area forresidents.
  - Permeable pavement – A porous surface that captures stormwater runoff, and stores it in an underground cistern to be infiltrated and absorbed back into the soil. Can be used for pedestrian pathways as well as driveways to assist with stormwater runoff and groundwater recharge.

West Wing of Hurstmont Mansion, January 2019

Signage

- One (1) double-faced freestanding monument sign (a sign in which the entire bottom is in contact with the ground) shall be permitted at the main entrance from Mt. Kemble Avenue. The sign shall not exceed 16 square feet per side. The sign may be externally lit by shielded downlighting.
- Sign setback shall be subject to Planning Board review and approval, based on final driveway design.
- Directional and wayfinding signs are permitted on all internal roadways. All wayfinding signage shall be consistent in design, style, and color.
- Unless otherwise stated here, all signs shall comply with Article XXIII Signs of the Harding Township Land Use and Development regulations.
- A street sign identifying the name of the secondary access road may be paced at the intersection of the secondary access road with Mount Kemble Avenue.

Sustainability

- Roof-mounted solar arrays are encouraged to be utilized to fully or partially offset the Redevelopment Area's energy demand. If implemented, solar panels shall not be visible from the side or front of the building or from Mt. Kemble Avenue.
- Sustainable building and design measures are encouraged throughout the site. Such measures include but are not limited to use of geothermal energy; use of passive solar, ventilation and shading design; use of low VOC interior paints and finishes; use of low VOC adhesives and sealants; operable windows where appropriate; installation of ENERGY STAR appliances; pursue ENERGY STAR certification; pursue LEED certification; utilize LEED standards, even without the pursuit of certification; utilize high-performance glazing; install lighting fixtures that utilize LED bulbs; utilize Integrated Pest Management (IPM); install high-efficiency toilets.

Fencing

- No chain link, barbed wire, or electrical fences shall be permitted within the Redevelopment Area.

Refuse Storage, Collection, and Disposal

- All new development shall address solid waste storage and disposition by following the standards set forth in Section 225-87 of the Harding Township Land Use and Development Regulations.
- To the extent feasible, refuse generated by the multi-family ILU's and assisted living/ dementia care shall be stored in an enclosed structure within the confines of the building. Should refuse storage be needed externally to the building, it shall be within an enclosed structure constructed of solid material and designed in such a way as to prevent wildlife from accessing the contents.

Utilities

- All utilities servicing the Senior Living District shall be installed underground.
- Building-mounted utility meters shall be placed in enclosures, rooms, alcoves, or otherwise incorporated into the design of the building and screened from public view.
- Ground-level utilities shall be screened on at least three (3) sides by non-deciduous landscaping that will conceal the structures throughout the year, without impeding access to the unit for the utility company.

Front Yard of Hurstmont Property with the Glen Alpin Property in the Background, January 2019

- Emergency generators are required for all multi-family structures and for buildings consisting of assisted living/dementia care. Use of generators shall be for emergency use only.
- Emergency generators shall be planned for as part of the site plan application for development and shall be incorporated into building and site design. For each townhouse, an appropriately sized generator pad, of a design to be approved by the Board Engineer, shall be indicated on the site plan. In the event that future residents elect to install a generator, it shall be placed in the location shown on the approved site plan.
- Generators shall not be visible from Mr. Kemble Avenue or neighboring properties. The provisions for ground-level utility screening described above shall apply to generator installations.
- To the extent feasible, generators should be fueled by battery backup storage devices, charged by solar panels with a natural gas backup.

Glen Alpin Mansion, 1949

Photo courtesy of the Harding Township Historical Society

Hurstmont's Formal Gardens, 1907

From the June 1907 Issue of American Homes and Gardens

RELATION TO OTHER PLANS

Township Master Plan

Harding Township's Master Plan was originally adopted in 1984. Components of the Master Plan have subsequently been amended several times. The following goals, objectives, and policies in the Land Use Element are relevant to the Area and the formulation of this Redevelopment Plan:

Land Use Element (2017)

- Preserve the Township's historic heritage – The standards in this Plan enforce the historic significance of both the original Glen Alpin mansion and the Hurstmont estate. While the Hurstmont structure cannot be saved due to its deteriorating state, the Glen Alpin structure will be maintained. The architectural standards of this Redevelopment Plan encourage new structures to respect the historic architecture and cultural significance of the sites.
- Commitment to provide affordable housing – This Redevelopment Plan provides for the creation of 40 affordable, age-restricted units.
- Critical areas and areas with special natural resources – The development of the Area will be driven by the landscape. The standards of this Plan require mature tree preservation and consideration of open space. There are additionally no freshwater wetland or floor hazard areas within the Area.
- Open space preservation – The entire Glen Alpin property will be preserved, including the large front yard area where no development is permitted. Additionally, the Plan incorporates a public trail that will begin at Glen Alpin and cross the perimeter of the Senior Living District, finally connecting to the Morristown National Historical Park.

Historic Preservation Element (2005)

- The historic character and integrity of Harding's historic buildings should be preserved – The historic Glen Alpin mansion will be preserved and maintained through the provisions of this Plan as well as through easements established with the County and NJDEP.

Open Space Preservation Plan (2008)

- Preserve open space areas that contribute to the preservation of water resources, scenic vistas, streetscapes or landscapes, and/or that contain historic features or qualities of importance to the traditional rural historic character of the Township – The open front yard of the Glen Alpin property will be maintained in perpetuity, pursuant to the easement with the NJDEP. Additionally, the historic cemetery that is located within Glen Alpin's front yard area will be preserved and maintained. The preservation of this front yard area also preserves the streetscape of this section of Mt. Kemble Avenue and Tempe Wick Road. This Plan also requires setbacks and tree conservation areas within the Senior Living District along Mt. Kemble Avenue, also preserving the streetscape.

Housing Element and Fair Share Plan (2018)

- The 2018 Housing Element and Fair Share Plan (HEFSP) envisions the Redevelopment Area as a CCRC with an affordable set-aside of 40 affordable units. The Redevelopment Plan provides for both age-restricted residential units as well as the affordable set-aside.

Adjacent Municipalities

The Redevelopment Area is located in the northwest portion of the Township and does not border or impact any of the adjacent municipalities.

Morris County Master Plan

The Morris County Master Plan was last adopted in April 1975. Elements have since been added to the Master Plan and amended. The following goals, objectives, and policies in the Land Use Element are relevant to the Area and the formulation of this Redevelopment Plan:

Circulation Element (2018)

- Support bicycle and pedestrian network improvements – The Redevelopment Plan provides standards for a pedestrian trail connecting the Glen Alpin Cultural Center District and the Senior Living District with the Jockey Hollow section of the Morristown National Historical Park. Additionally, pedestrian connections within the Area are encouraged through required sidewalk networks.

- Improve access to tourist destinations, such as historical, cultural, and recreation sites – The Glen Alpin Cultural Center District will become more available to the public through the realization of the Redevelopment Plan. The proposed trail connecting the Districts with the National Historical Park will also improve tourist access to the sites and recreation areas of the Park.

- Support local efforts to construct and expand trails on or connecting to public parkland – As previously stated, this Plan provides for a connecting trail through the Area and into the Morristown National Historical Park.

New Jersey State Development and Redevelopment Plan

The New Jersey State Development and Redevelopment Plan (SDRP) was adopted on March 1, 2001. This plan compared the planning policies at various government levels with the purposes of establishing consistency among local, county, and State planning practices. The SDRP allocates land into five (5) different categories called planning areas. Harding Township is located almost entirely within Planning Area 5 (PA5), the Environmentally Sensitive Planning Area, and the Parks and Natural Areas, which encompasses preserved natural areas. According to the SDRP, the Environmentally Sensitive Area includes large contiguous land areas with valuable ecosystems, geological features, and wildlife habitats. The SDRP is unique in that its policy recommendations are not binding, but instead guide state-level development and redevelopment policy in addition to local and regional planning efforts. The SDRP includes eight statewide goals and several policies which are intended to implement the goals. The goals outlined in the SDRP are as follows:

1. Revitalize the State's cities and towns.
2. Conserve the State's natural resources and systems.
3. Promote beneficial economic growth, development, and renewal for all residents of New Jersey.
4. Protect the environment, prevent and clean up pollution.
5. Provide adequate public facilities and services at a reasonable cost.
6. Provide adequate housing at a reasonable cost.
7. Preserve and enhance areas with historic, cultural, scenic, open space, and recreational value.
8. Ensure sound and integrated planning and implementation statewide.

This Plan meets stated goals 1, 2, 3, 4, 6, 7, and 8

1. The intended redevelopment of the former Hurstmont estate will bring a productive use to a site that has been left to decay for more than two decades and with the partial demolition, has turned into a hazard and an eyesore for the community.
2. The Plan intends to minimize environmental disturbance by providing for tree conservation areas and building with respect to

all environmental features on the site.

3. This Plan seeks to encourage economic growth by allowing the preserved Glen Alpin mansion to become a productive use that supports the community. The redevelopment of the former Hurstmont estate will bring jobs and housing options to the residents of Harding Township and New Jersey.
4. The easements, setbacks, and conservation areas within this Plan will continue to protect the environment surrounding the Area, including the Morristown National Historical Park.
6. Construction of affordable, age-restricted housing helps to fulfill the Township's affordable housing obligations while also providing housing options for seniors of all income groups.
7. The historic Glen Alpin mansion will be maintained and preserved. Additionally, the proposed walking trail will enhance the open space and recreational opportunities for the residents of the Area, Harding Township, and New Jersey.
8. The Redevelopment Area is located directly on Route 202 (Mt. Kemble Avenue) and is near entrances to I-287. The Plan calls for the preservation and adaptive reuse of a previously unused historical building, turning it into a productive property once again, as well as the redevelopment of an underutilized and dilapidated property. Redevelopment of the Area is consistent with good planning principles and integrated land use planning and implementation.

State Strategic Plan

The Final Draft of the New Jersey State Strategic Plan for Development and Redevelopment, which has yet to be adopted by the State Planning Commission, was intended to be an update to the State Development and Redevelopment Plan. The four goals guiding the State Strategic Plan are the following:

1. Targeted economic growth: Enhance opportunities to attract and grow industries of statewide, regional, and international importance.
2. Effective regional planning: Guide and inform regional planning to enable each region of the State to experience appropriate growth, preservation and protection based on its assets and desires.
3. Preservation, protection, and enhancement of critical state resources: Ensure that strategies for growth include preservation, protection, and enhancement of our State's critical natural, agricultural, scenic, recreation, and historic resources, recognizing their role in economic growth and the quality of life for New Jersey residents.
4. Tactical alignment of government: Prioritize effective resource allocation, coordination, cooperation, and communication among entities that play a role in meeting the Plan's mission.

The State Strategic Plan also outlines several "Garden State Values" which reflect the principles set forth in this Plan, including prioritizing redevelopment and infill development, creating high-quality and livable spaces, and protecting and restoring heritage lands.

ADMINISTRATION AND PROCEDURAL REQUIREMENTS

Redevelopment Entity

The Township Committee shall serve as the Redevelopment Entity to implement this Redevelopment Plan.

Duration of Redevelopment Plan

This Redevelopment Plan shall be in full force and effect for a period of thirty (30) years from the date of approval of this Plan by the Township Committee.

Review Process

The review process for all redevelopment projects shall consist of the following steps:

- Negotiation of Redevelopment Agreement – A Redevelopment Agreement is required. The Harding Township Committee shall be responsible to negotiate the terms and conditions of any redevelopment agreement by which specific entities are authorized to undertake redevelopment activities in accordance with the Plan. As part of such negotiations, the Harding Township Committee shall review the conceptual projects plans submitted by the proposed redeveloper and shall be authorized to include within the redevelopment agreement descriptions of such projects in sufficient detail to govern that which the redeveloper is authorized to construct, including exceptions from design standards.

  The Redevelopment Agreement to be entered into between the Township and the Redeveloper will have attached to it as exhibits a concept plan that includes the site layout and a cross section plan of the site, prepared by Minno and Wasko, dated 7-30-19, detailing the grading and showing the relationship of the buildings to the grading/site.

- Harding Township Committee Review of Proposed Development Plans - Prior to submission of formal development review by the Township Planning Board (including any subsequent and future site plan amendments), the Redeveloper shall submit detailed plans to the Harding Township Committee for its review. Harding Township Committee's approval of such submission shall be based on whether the plans are consistent with the Redevelopment Plan and redeveloper agreement (including the attached concept plan and site cross section plan prepared by Minno and Wasko, dated 7-30-19), as well as any other comments the Harding Township Committee may have.

  If the Harding Township Committee determines that the plans are not consistent, the Harding Township Committee shall advise the Redeveloper of the issues that give rise to such inconsistency. The Redeveloper shall then revise the plans and resubmit them as many times as necessary to receive approval from the Harding Township Committee. The Harding Township Committee shall issue a report to the Planning Board providing its consistency evaluation and any recommendations relating to the proposed site plan. Such report can include recommendations and comments relating to consistency with relevant Township ordinances including but not limited to the standards found in Article XVI Design Standards for Site Plans where applicable. It should be noted the Harding Township Committee does not have the authority to grant relief from 'c' variances or grant waivers from the design standards of the Redevelopment Plan.

- Planning Board Review of Development Plans - After approval of the proposed plans by the Harding Township Committee, the Redeveloper shall submit the plans to the Planning Board for its review pursuant to its normal site plan and subdivision powers. The Planning Board shall take the Harding Township Committee's comments and recommendations into account in their review process.

  The redeveloper is not required to present the plans to the Harding Township Historic Preservation Commission.

Redeveloper Process

1. Applicants for designation as redeveloper shall submit the following materials to the Township Committee for review and approval:
   a. Documentation evidencing financial responsibility and capability with respect to the proposed development.
   b. Fiscal impact analysis addressing the effect of the proposed project on municipal services and tax base.
   c. Estimated time schedule for start and completion of development.
   d. Conceptual plans and elevations sufficient in scope to demonstrate the design, architectural concepts, parking, traffic circulation, landscaping, and active and/or passive recreation space.
2. The redeveloper shall be obligated to carry out the specified improvements in accordance with this Redevelopment Plan.
3. The redeveloper, its successors or assigns shall devote land within the Redevelopment Area to the uses specified in this Redevelopment Plan.
4. As previously noted, The Township Committee has designated Hurstmont Estate Acquisition, LLC as the redeveloper for the Senior Living District.

Amending the Redevelopment Plan

Upon compliance with the requirements of applicable law, the Township of Harding may amend, revise, or modify this Redevelopment Plan, as changing circumstances may make such changes appropriate.

Property Acquisition

The Area has been designated as a non-condemnation redevelopment area. No property acquisition through the use of eminent domain is authorized or anticipated as part of this Plan.

Relocation

Eminent domain is not authorized as part of this Plan and any transfer of property and subsequent relocation requirements are purely voluntary so no plan for relocation assistance in necessary.

Affordable Housing Units

There are no existing affordable housing units in the Area. Consequently, there are no affordable housing units identified for removal as part of the implementation of this Redevelopment Plan.

Provisions of New Affordable Housing Units

Redevelopment Plans are permitted to require the provision of affordable housing units per the Local Redevelopment and Housing Law (N.J.S.A 40A:12A-7.b).

In conformance with the Township's settlement agreement with FSHC and their Conditional JOR, 40 affordable units shall be produced as a result of development of this Area.

All affordable units shall comply with the Uniform Housing Affordability Controls (UHAC), N.J.A.C. 5:80-26.1 et. seq. or any successor legislation, with the exception that in lieu of 10% of affordable units in rental projects being required to be affordable households earning at or below 35% of the regional median household income, 13% of affordable units in such projects is required to be affordable to households earning at or below 30% of the regional median household income, consistent with and as required by the Fair Housing Act.

The affordable units shall be constructed pursuant to the phasing schedule found in Part 5 Article XLI of Chapter 225 (adopted by Township Ordinance 04-19) and N.J.A.C. 5:93-5.6(d). The townhouse units shall not be aggregated with the remainder of the market units for purposes of the phasing schedule. When 20 of the townhouse units receive their Certificate of Occupancy, all of the affordable units within the independent living building shall also have been issued their Certificate of Occupancy. At

the issuance of Certificates of Occupancy for 30 of the townhomes, all of the affordable units within the assisted living facility shall have also been issued.

Affordable units shall be affirmatively marketed in a manner consistent with UHAC and shall comply with UHAC bedroom distributions. Deed Restrictions shall be filed to ensure that the affordability controls remain in place for at least 30 years, pursuant to UHAC regulations (N.J.A.C. 5:80-26.1 et seq.).

Glen Alpin Mansion Front Entrance, 1942

Photos courtesy of the Harding Township Historical Society

Walls that Surrounded the Gardens of Hurstmont, January 2019

AMENDED
HOUSING ELEMENT AND
FAIR SHARE PLAN

Township of Harding

Morris County, New Jersey

December 2018

Adopted by the Planning Board December 17, 2018

Prepared By:

Heyer, Gruel & Associates
Community Planning Consultants
236 Broad Street, Red Bank, NJ 07701
(732) 741-2900

FAIR SHARE OBLIGATION SUMMARY

The settlement between the Township of Harding and the FSHC assigns a Present Need obligation of 0 units, a Prior Round obligation of 83 units, and a Prospective Need obligation of 176 units.

The Township has fully addressed its entire obligation through the following mechanisms:

- Existing Credits
    - The Farm (100% affordable) (24 units)
- Rezoning of the Mt. Kemble site for inclusionary zoning (16 units)
- Universal Institute group home (5 units)
- Proposed Cerebral Palsy of New Jersey (CPNJ) group home (4 units)
- Proposed two (2) new units at The Farm
- Durational Adjustment due to lack of infrastructure
    - Proposed Overlay along the southern section of the Route 202 corridor (Mt. Kemble Avenue) with a Mandatory Affordable Set-Aside (73 units)
- Proposed CCRC Development (40 age-restricted units)
- Amendment to the Township's Accessory Apartments Ordinance (10 units)
- RCA Credit from the Prior Round (43 units)
- Rental Bonus Credits (42 credits between the Prior and Third Round)

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

June 25, 2020

Ms. Alicia Protus
U.S. Fish and Wildlife Service
New Jersey Field Office
4 East Jimmie Leeds Road
Galloway, New Jersey 08205

Via email Protus, Alicia <Alicia_Protus@fws.gov> and US Mail

Re: Summer Indiana Bat Acoustic Survey Results
Hurstmont Redevelopment Area
Block 27, Lot 2
Township of Harding, Morris County, New Jersey

Dear Ms. Protus:

In accordance with EcolSciences' January 13, 2020 Study Plan, a presence/absence summer bat acoustic survey was conducted on the above referenced property to determine the presence/probable absence of the federally endangered Indiana bat (*Myotis sodalis*) and federally threatened northern long-eared bat (*Myotis septentrionalis*) (also known as northern Myotis). The acoustic survey was conducted on the evenings of May 24th through 27th, 2020 and June 1st through 4th, 2020 on the above referenced site (Attachment A, Figure 1).

The applicant, Endeavor Property Group, is proposing to redevelop the site with an affordable housing project, which would require approximately 6.5 acres of tree clearing. The 19.87±-acre site is currently occupied by vacant dwellings and outbuildings associated with the former Hurstmont Estate. The property is characterized by upland hardwood forest, upland grassland fields (former maintained lawns) (Attachment A, Figure 2). It is located south of the approximately 1,200-acre Jockey Hollow National Historic Park. No wetlands or watercourse occur on-site.

Based on United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) review, this site falls within the known range of the Indiana bat and the northern long-eared bat. Based on consultation with the USFWS (September through November 2019), the site is located within proximity of several sightings of Indiana bat. In addition, the adjacent Jockey Hollow National Park has documented sightings of northern-long eared bat. The Township of Harding is also listed as a municipality with hibernating colonies of both Indiana and northern long-eared bats (USFWS, last revised April 8, 2020). Field investigations conducted by EcolSciences identified multiple snags and declining trees that provide potential habitat for Indiana and northern-long eared bats.

During consultation, the USFWS advised that an acoustic survey performed in accordance with the *Range-Wide Indiana Bat Survey Guidelines* (last updated March 2020) (Guidelines) would act as a coarse screening to assess whether the property is in a colony's core roosting/foraging area. If Indiana bats are detected on the acoustics, one night of emergence survey should be completed to determine whether a tree is a roost or not.

Two acoustic monitor survey locations were selected within the property re-development area (Attachment A, Figure 3). Survey locations were selected based on preferred summer habitat, potential flight corridors, and other important features such as, forest openings, and roosting habitat. The survey locations are within 656 feet (200 meters) of each other due to the small size of the property, proposed development area, and forested habitat located within the project site.

The acoustic survey was conducted utilizing Wildlife Acoustics omni-directional microphones (SMM-U1) connected to SM4BAT FS Song Meters with GPS connection. Prior to deployment of the monitors, the SD cards were formatted, and microphones calibrated. Each monitor was programed to the specifications listed below (Table 1). These are the default selections recommended by the monitor developer (Wildlife Acoustics). The omnidirectional microphones were elevated above the surrounding landscape 3.6 meters (12 feet) on extendable poles, oriented horizontal, and at least 10 feet away in any direction from vegetation or other obstructions. Photos of the acoustic set-up and surrounding area were taken to document the orientation, detection zone, and relative position of the microphone. A GPS was temporarily to each detector to accurately record location coordinates for each acoustic monitor location.

Table 1: The settings of the SM4BAT FS acoustic monitors during the acoustic surveys.

Settings	**SM4BAT FS Stationary Monitors**
Time	Sunset to Sunrise
Format	WAV
Frequency Max	128 kilohertz (kHz)
Frequency Min	16 kHz
Trigger Level	12 decibels (dB)
Trigger Window	3.0 seconds
Minimum Duration	1.5 milliseconds

The microphone at Acoustic Monitor Location 1 was placed facing southeast at the edge of a lawn area along the western boundary of the property. A scrub/shrub community abuts the lawn to the north. Forested habitat is present from the west to the northeast and retired gardens from the east to southwest. There are trees present in this area, including Dead/declining trees (snags), containing potential bat roost habitat including cavities, fissures, and exfoliating bark. These trees had been previously identified by EcolSciences and submitted to USFWS as potential maternity colony habitat (September 9, 2019 and November 22, 2019). Photos of the acoustic

set-up and surrounding area were taken to document the orientation, detection zone, and relative position of the microphone (Attachment B, Photos 1 – 5).

The microphone at Acoustic Monitor Location 2 was placed facing southeast in a lawn area in the vicinity of snags with exfoliating bark and several trees with cavities. Photos of the acoustic set-up and surrounding area were taken to document the orientation, detection zone, and relative position of the microphone (Attachment B, Photos 6 - 10).

The weather during the duration of the survey met the requirements set forth by the March 2020 Guidelines. Temperatures did not fall below 50°F (10°C) during the duration of the survey. Precipitation, including rain and/or fog, did not exceed 30 minutes or continue intermittently during the first 5 hours of the survey period; and wind speeds were not greater than 9 miles/hour (4 meters/second) for 30 minutes or more during the first 5 hours of the survey period. Weather conditions were documented and are presented in the attached Hardware and Software: Presence/ Absence Acoustic Survey Datasheets, as reported by Weather Underground: Historic Weather for Harding, new Jersey (Attachment C). A copy of the National Oceanic and Atmospheric Administration (NOAA) weather report from Morristown Municipal Airport, Morristown, New Jersey, which is the closest weather station is provided in Attachment D.

As required by the Study Plan protocol, each monitor was deployed for four nights. Acoustic Monitor Location 1 was deployed from May 24th thru and retrieved on May 28th. Due to malfunction of the microphone, Acoustic Monitor Location 2 was deployed from June 1st thru and retrieved on June 5th. The recordings were processed by acoustic monitor location by night using USFWS approved program, Kaleidoscope Pro V5.1.0 (Kaleidoscope), sensitivity setting of "0" (zero). All original recordings and log files produced by the detectors were exported and will be saved for a period of 7 years.

The results of each monitor location are as follows:

Acoustic Monitor Location 1:

Acoustic Monitor Location 1 is located along the western boundary of the property at the edge of a former lawn area. A shrub/shrub community dominated by multiflora rose, Allegheny blackberry, grape vine, and wisteria abuts the lawn to the north. Upland hardwood forest habitat is contiguous to the lawn area from the west to northeast that is dominated by tulip poplar, red maple, northern red oak, white pine, and American beech. Scattered ornamental trees and shrubs also characterize the former lawn. Ornamental trees, shrubs, and retired gardens are also present in this area. This area also has a potential flight corridor west of the microphone where a mowed lawn corridor bisects the forested area. Several snags with exfoliating bark and cavities, as well as several mature trees (e.g. copper beech and American beech) with cavities were identified in this portion of the site (Attachment B, photos 11 through 16). Refer to the attached Acoustic Survey Field Habitat Form datasheet for Acoustic Monitor Location 1 (Attachment C).

The SM4BAT FS was deployed along the edge of a maintained lawn area that abuts a scrub\shrub community located along the forest edge community (Attachment A, Figure 3). The

microphone was placed facing southeast toward snags and mature ornamental trees, as well as the forest edge (Attachment B, Photos 1-5).

Over the four-night survey, Kaleidoscope identified 820 bat calls to eight species consisting of big brown bat (*Eptesicus fuscus)* (EPFU), eastern red bat (*Lasiurus borealis*) (LABO), hoary bat (*Lasiurus cinereus*) (LACI), silver-haired bat (*Lasionycteris noctivagans*) (LANO), little brown bat (*Myotis lucifugus*) (MYLU), Northern long-eared bat (*Myotis septentrionalis*) (MYSE), Indiana bat (*Myotis sodalis*), and tri-colored bat (*Perimyotis subflavus*) (PSEU). Of the eight species identified, Kaleidoscope assigned significant maximum likelihood estimation (MLE) values to five species per night: EPFU, LABO, LACI, LANO, and PESU (Attachment E, Table 1). A representative call files of all identified species can be found in Attachment E, spectrograms 1 – 5.

Nightly analysis did not identify the likely presence of any *Myotis* species on-site. However, Kaleidoscope reported MYSE presence to be likely (with a significant MLE) when analysis was done for the overall four-day survey period. Although the Guidelines only requires qualitative analysis when Indiana bat presence is determine to be likely on a given night, due to the habitat present on the property and the sites proximity to Indiana and northern long-eared bat sightings qualitative analysis of all of the calls including no ID calls was performed.

A single call was identified as MYSE throughout the survey period. Qualitative analysis of this call found that it is comprised of two pulses. With only two pulses present in a call sequence there is not enough information to determine if the call is search phase verses approach phase or the overall pattern of the call (e.g. consistent characteristic frequency (Fc) or variable Fc overtime). The pulses of this call also lack harmonics. When harmonics are not recorded the pulses have not fully rendered. This means the lower and/or upper portions of a given pulse may not have been recorded, which may lead to misidentification by software. As such, this recording lacks the needed information to determine presence of MYSE.

In addition, typical MYSE calls have a 43± kHz Fc (but can be as low as 32 kHz and as high as 53 kHz) with a bandwidth of 90 kHz or greater, a 120 kHz maximum frequency (Fmax) (typically reach 100 kHz), as well as pronounced “toes”. “Toes” are a low intensity sharp downward trend at the end of the call, which may not render in a poor-quality call. The pulses in this call had a Fc between 38 and 41 kHz with a 74 kHz Fmax, a bandwidth between 33 and 36 kHz, and no pronounced toe. The pulses of a MYSE calls are also nearly vertical with almost no inflection sometimes making the Fc and toe difficult to determine. The pulses in this call also lack the characteristic steep slope of the MYSE call. As such, this call could not confirm the presence of MYSE. A spectrogram of this call has been included in Attachment E, spectrogram 6.

PESU, a species with a Fc in the range of *Myotis* species, was also identified to likely be present at this location. PSEU has a Fc typically between 41 and 44 kHz but can be as low as 36 kHz and as high as 47 kHz. As such, this species Fc is similar to that of the high frequency *Myotis* species. However, PESU calls lack toes and are bilinear, not steeply sloped curvilinear calls of *Myotis* species. PESU calls have two distinct parts to them: a very steep mostly vertical

frequency modulation (FM) and a very shallow quasi-constant (QFC) to constant frequency (CF) bottom portion that often turns upwards. The upper portion of the call is shorter than the lower portion and may be altogether absent, especially in long open-air calls. Based on a review of the identified PESU calls, the characteristics were correctly identified, and this species was identified on-site. A representative call file of PESU can be found in Attachment E, spectrogram 5.

Qualitative analysis of all the remaining call files including "no ID" and "Noise" files was performed. During this process EPFU, LANO, LABO, and LACI were also confirmed to occur at this location. No Myotis calls were identified.

As a result of the qualitative analysis, it was determined that redevelopment activities are not likely to adversely affect Indiana or northern long-eared bats.

Acoustic Monitor Location 2:

Acoustic Monitor Location 2 is located in the central portion of the property, near the partially demolished estate house, and proximate to landscaping including mature ornamental trees, and upland hardwood forest. Forested habitat is present west, north, and southeast ranging from 100 to greater than 150 feet away from the microphone. The forested habitat is dominated by tulip poplar, pignut hickory, northern red oak, black locust, and black walnut. Ornamental\landscape trees and shrubs are present in this area including white pine and northern red oak, wisteria, and deutzia. Several snags and declining trees identified in this survey area include exfoliating bark and cavities In addition, several mature trees with dead branches with exfoliating bark, previously identified by EcolSciences as potential maternity trees, occur within this survey area (Attachment B, photos 17 – 25). The location was selected because it provides potential foraging habitat for bats that may be roosting nearby trees. Refer to the attached Acoustic Survey Field Habitat Form datasheet for Acoustic Monitor Location 2 (Attachment C) for site specific characteristics.

The SM4BAT FS was placed in an open lawn area in the vicinity of trees containing potential habitat (Attachment A, Figure 3). The microphone was placed facing southeast toward potential foraging habitat (Attachment B, Photos 6 – 10).

Over the four-night survey 1075 bat calls were identified belonging to six species consisting of EPFU, LABO, LACI, LANO, MYLU, and PSEU. Of the six species identified, Kaleidoscope assigned significant MLE values to five species: EPFU, LABO, LACI, LANO, and PESU (Attachment E, Table 2). In the absence of significant MYSO or MYSE calls, qualitative analysis of the calls was not required. However, a cursory review of the calls, confirmed the presence of all five of these species at this location. Representative call files of all identified species can be found in Attachment E, spectrograms 8 – 11.

Conclusion:

Analysis by the approved USFWS software, Kaleidoscope, confirmed the probable absence of Indiana bat on the property. Therefore, the proposed site development is not likely to adversely affect Indiana bats. Although, a single northern long-eared bat call was identified but not determined to be significant by night, a qualitative analysis of all recorded calls including "NOID" and "Noise" files, no *Myotis* species confirmed the absence of Indiana bat and northern log-eared bat within the study area.

Due to the absence of identifying Indiana or northern long-eared bat, emergence surveys of the potential roost trees will not be required. The applicant would like to move forward with the redevelopment process for the site. If you have any questions or need any additional information regarding this survey including, but not limited to, call files and detector logfiles, please do not hesitate to contact Victoria Schaller or myself.

Very truly yours

EcolSciences, Inc.

Laura Newgard
Vice President

LN/vs
enclosure

cc: Mr. Peter H. Monaghan
Ms. Karin Tekel

ATTACHMENT A

Figure 1: USGS Site Location
Figure 2: 2015 Aerial Imagery
Figure 3: Approximate Acoustic Monitor Locations

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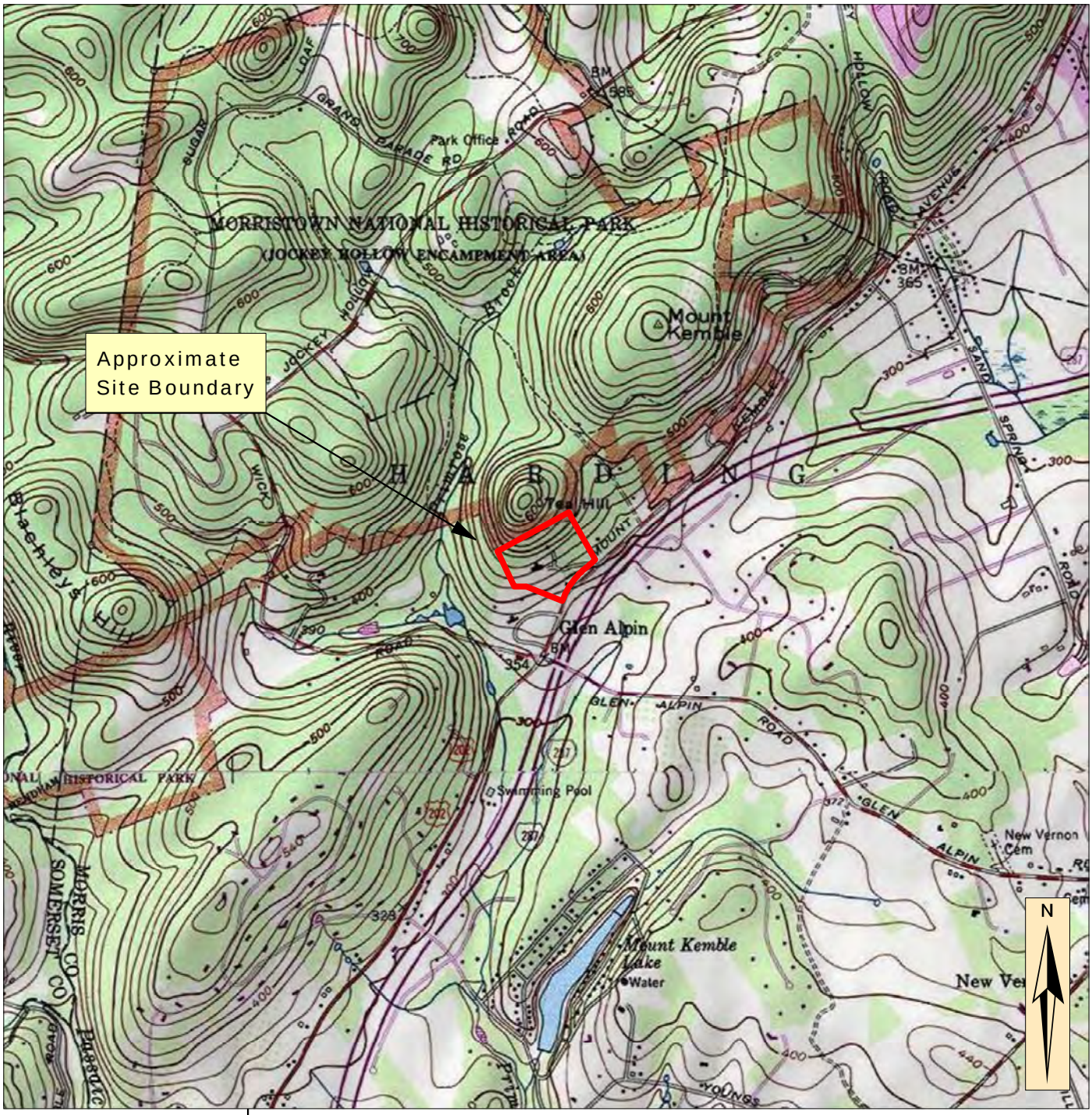
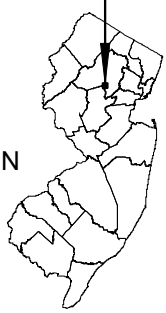


0 2,000 4,000 Feet

SITE LOCATION



State Plane Coordinates (New Jersey NAD 83)
484,904' E; 701,006' N

FIGURE 1: USGS SITE LOCATION

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

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Date: 6/12/2020

Scale 1:24,000

F:\Jobs18\EN18-041 Endeavor-Harding-Hurstmont-Glen Alpin\GIS\Figure1USGS_NJ.mxd

Legend

Approximate Site Boundary

0 400 800
Feet

FIGURE 2: 2015 AERIAL IMAGERY

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Source: NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

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Date: 6/14/2020

Scale 1:4,800

F:\Jobs18\EN18-041 Endeavor-Harding-Hurstmont-Glen Alpin\GIS\Figure2Aerial_NJ.mxd

Legend

Approximate Site Boundary

Approximate Acoustic Monitor Location

0 200 400 Feet

FIGURE 3: APPROXIMATE ACOUSTIC MONITOR LOCATIONS

Block 27, Lot 2
Township of Harding
Morris County, New Jersey

Source: NJOIT, OGIS. 2016. NJ 2015 High Resolution Orthophotography.

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Date: 6/14/2020

Scale 1:2,400

F:\Jobs18\EN18-041 Endeavor-Harding-Hurstmont-Glen Alpin\GIS\Figure3AcousticLocationsl_NJ.mxd

ATTACHMENT B

Acoustic Set-up and Site Photographs

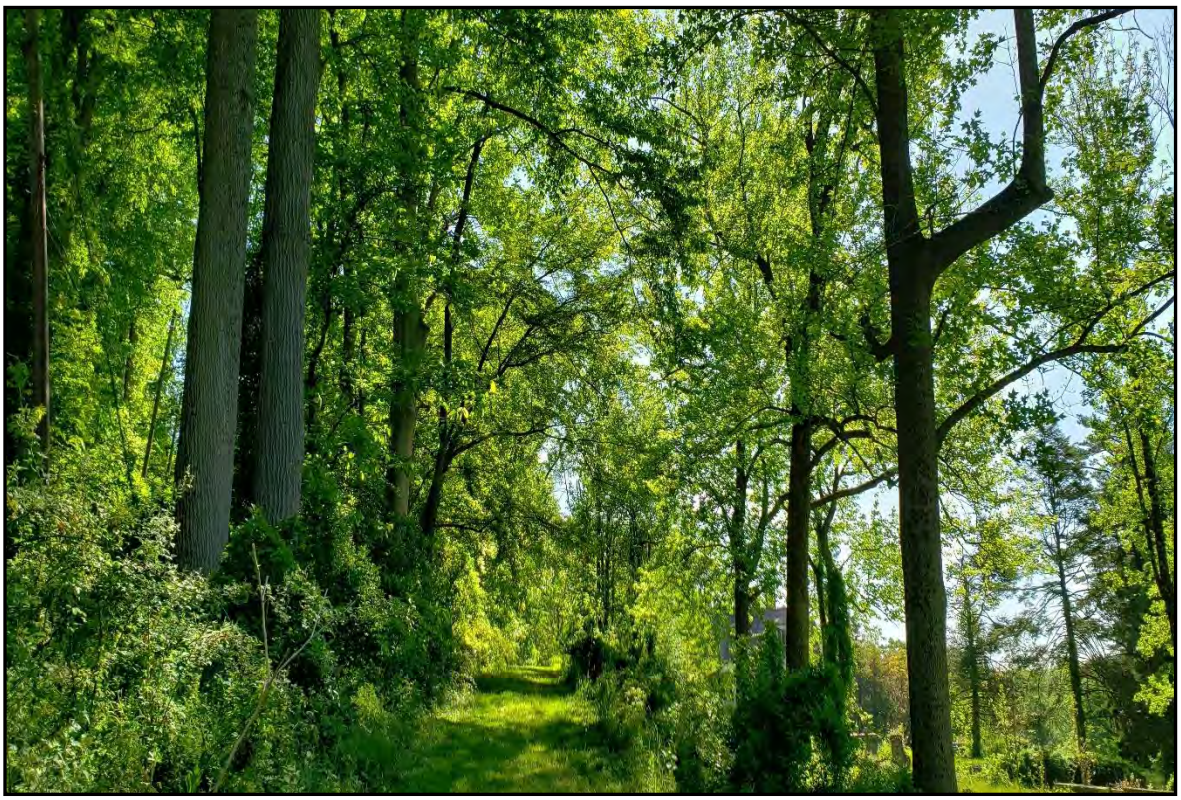
1

May 23, 2020 - Photograph of acoustic microphone deployed at Site 1 at the Hurstmont Redevelopment Area site, Harding, Morris County, NJ. The microphone was oriented facing south at the edge of a lawn area that abuts scrub/shrub habitat in the northwestern corner of the site. Forested habitat is present from the west to the northeast and retired gardens from the east to southwest. Snags and large trees with cavities and a potential flight corridor is also present in this area.

2

May 24, 2020 - Photograph facing north at Site 1 showing the forest and ash snags.

3



May 24, 2020 - Photograph facing north at Site 1 showing the forest and a potential flight corridor to the east.

4

May 24, 2020 - Photograph facing south at Site 1 showing retired gardens and a scarlet beech with a cavity approximately 50 feet above the ground.

5

May 25, 2020 - Photograph facing east at Site 1 showing the forested habitat.

6

June 1, 2020 - Photograph of acoustic microphone deployed at Site 2 at the Hurstmont Redevelopment Area, Harding, Morris County, NJ. The microphone was placed in a lawn area in the vicinity of snags with exfoliating bark and several trees with cavities. The microphone oriented south facing open lawn.

7

June 1, 2019- Photograph facing north at Site 2 showing the forest edge to the north and a red oak tree with a dead limb and ash snags.

8

June 1, 2019- Photograph facing east at Site 2 showing a small snag, ornamental trees, and forest edge.

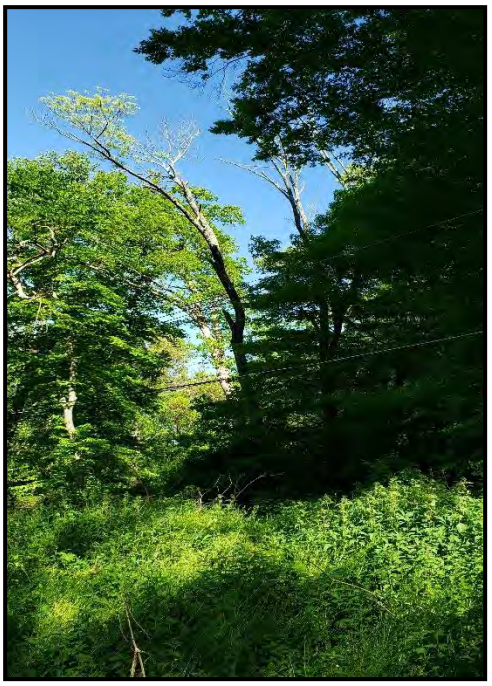
9

June 1, 2020- Photograph facing south at Site 2 showing lawn and landscaping, as well as a declining pine and abandoned out building.

10

June 3, 2019- Photograph facing west at Site 2 showing a declining double trunk white pine and the partially demolished home onsite.

11



Photograph of ash snags with exfoliating bark north of Site 1.

12

Photograph of a declining white pine west of Site 1.

13

Photograph of a scarlet beech with a dead limb and cavity approximately 50 feet above the ground south of Site 1.

14

Photograph of a snag north of site 1 with some exfoliating bark.

15

Photograph of a pine snag with cavities, broken branches, and exfoliating bark southeast of Site 1.

16

Photograph of an American beech with a cavity north of Site 1.

17

Photograph of a small snag with exfoliating bark and red oak with dead limbs east of Site 2.

18

Photograph of a declining double trunk white pine west of Site 2. One trunk is dead with cavities and exfoliating bark.

19

Photograph of a declining white pine with broken branches and exfoliating bark south of Site 2.

20

Photograph of a snag along the forest tree line east of Site 2.

21

Photograph of a snag to the northeast of Site 2 along the forest tree line.

22

Photograph of a tree with a broken main trunk with cavities and exfoliating bark south of Site 2.

23

Photograph of ash snags covered in vines north of Site 2. The snags have exfoliating.

24

Photograph of a snag in the northeastern corner of the property, northeast of Site 2.

25

Photograph of a northern red oak north of Site 2 with dead limbs.

ATTACHMENT C

Hardware and Software: Presence/Absence Acoustic Survey Datasheet
Acoustic Monitor Location 1 and 2 Acoustic Survey Field Habitat Forms

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

Acoustic Survey Field Habitat Form

Project Name: Endeavor Hardwood Date: 5-24-2020

Job Description: Indiana bat acoustic survey Site No. 1

Observer(s): Newgard / Vschaller

Site Description

Open Habitat in the Vicinity of Survey Area: Yes / No **Wetland Present: Yes / No**

Open Habitat Type: ornamental plantings, field, lawn % Cover 50

Dominant vegetation: Ash, "copper" beech, tulip poplar, grasses, wisteria,

Scrub/Shrub Habitat within the Vicinity of the Survey Area: Yes / No **Wetland Present: Yes / No**

Scrub/Shrub Habitat: N/A % Cover

Dominant vegetation:

Forest within the Vicinity of the Survey Area: Yes / No **Wetland Present: Yes / No**

Forest Habitat Type: Deciduous hardwood % Cover 50

Closure of forest (rough estimate):

Canopy:	1-10%	11-20%	21-40%	41-60%	61-80%	81-100%
Subcanopy:	1-10%	11-20%	21-40%	41-60%	61-80%	81-100%
Understory:	1-10%	11-20%	21-40%	41-60%	61-80%	81-100%

Forest Composition:

Canopy: Dominant Species: American beech, tulip poplar, dead white ash, sugar maple

Subcanopy: Dominant Species: American beech/tulip poplar

Understory: Dominant Species: multiflora rose, winterberry wisteria,

Suitable Roost trees/Snags**

Description: ± 5 good snags

→ good maternity habitat, large trees w/ cavities & fissures)

**Standing dead trees with exfoliating bark, cracks, or hollows. Snags without these characteristics are not considered suitable.

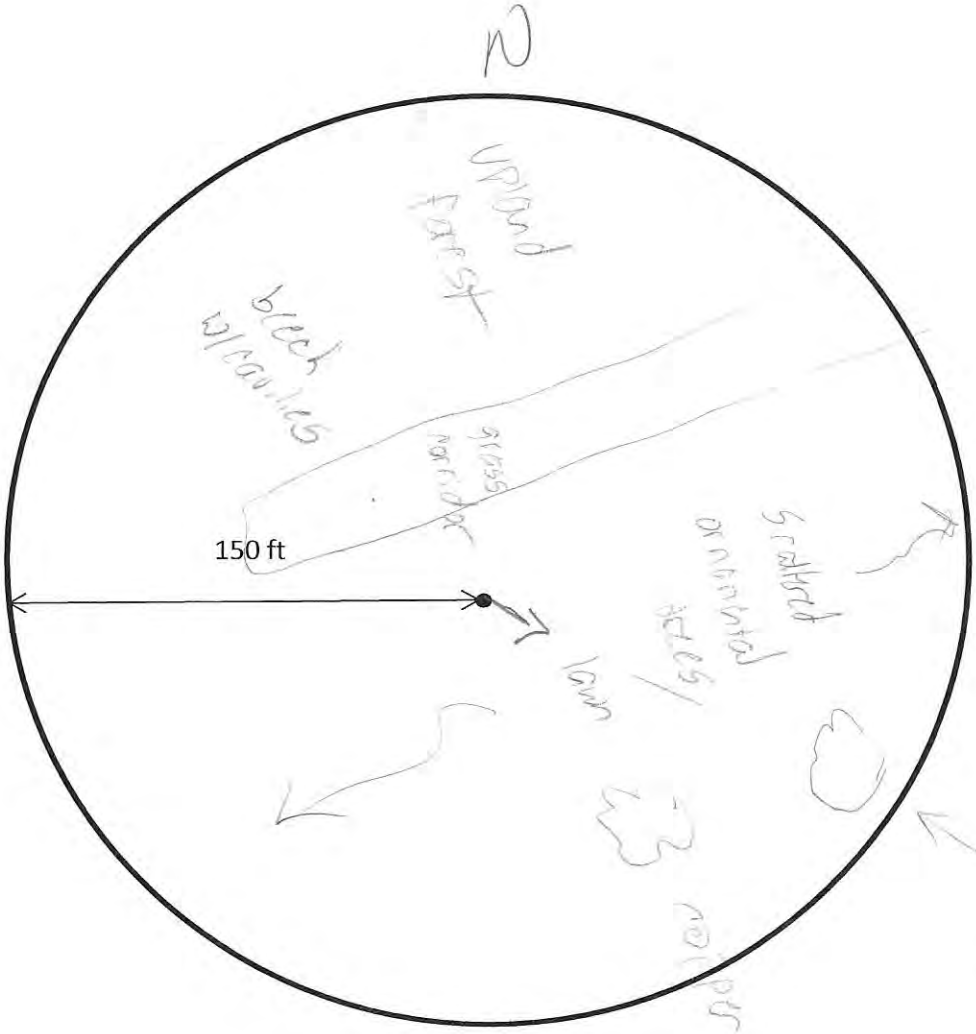
Suitable Habitat for Indiana Bat: **Yes / No**

Comments large ornamental trees with exfoliating barks, fissures, large snags, edge foraging

This site is located along the edge of previous teaneck gardens with landscaping including mature deciduous and coniferous trees. The retired gardens are now largely comprise of grassfields.

Sketch habitat types within 150ft of detector. Include or describe presence of unique landforms potially used by bats (rock piles, cliffs, right-of-ways, ect.)

Site No. 1



Acoustic Survey Field Habitat Form

Project Name: Endeavor-Harding Date: June 1, 2022
Job Description: Acoustic Survey Site No. 2
Observer(s): V. Shaller

Site Description

Open Habitat in the Vicinity of Survey Area: (Yes) / No **Wetland Present: Yes / (No)**

Open Habitat Type: Open Field / maintained lawn and landscaping % Cover 80

Dominant vegetation: grass species, white and red clover, English plantain, wood sorrel, wisteria, red oak, white pine, tulip poplar

Scrub/Shrub Habitat within the Vicinity of the Survey Area: Yes / (No) **Wetland Present: Yes / No**

Scrub/Shrub Habitat: N/A % Cover

Dominant vegetation:

Forest within the Vicinity of the Survey Area: Yes / No **Wetland Present: Yes / No**

Forest Habitat Type: Deciduous Upland Forest % Cover 20

Closure of forest (rough estimate):

Canopy:	1-10%	11-20%	21-40%	41-60%	61-80%	(81-100%)
Subcanopy:	1-10%	11-20%	21-40%	41-60%	(61-80%)	81-100%
Understory:	1-10%	11-20%	21-40%	(41-60%)	61-80%	81-100%

Forest Composition:

Canopy: Dominant Species: Red oak, Tulip poplar, Pignut hickory, Black birch

Subcanopy: Dominant Species: Tree-of-heaven, Black walnut, Black locust, Sweetgum, Japanese maple

Understory: Dominant Species: Black locust, wisteria, A. blackberry, deutzia

Suitable Roost trees/Snags**

Description: There are several dead snags present as well as a pine snag with exfoliating bark and cavities. There are also several large trees present with dead limbs with exfoliating bark and/or cavities.

**Standing dead trees with exfoliating bark, cracks, or hollows. Snags without these characteristics are not considered suitable.

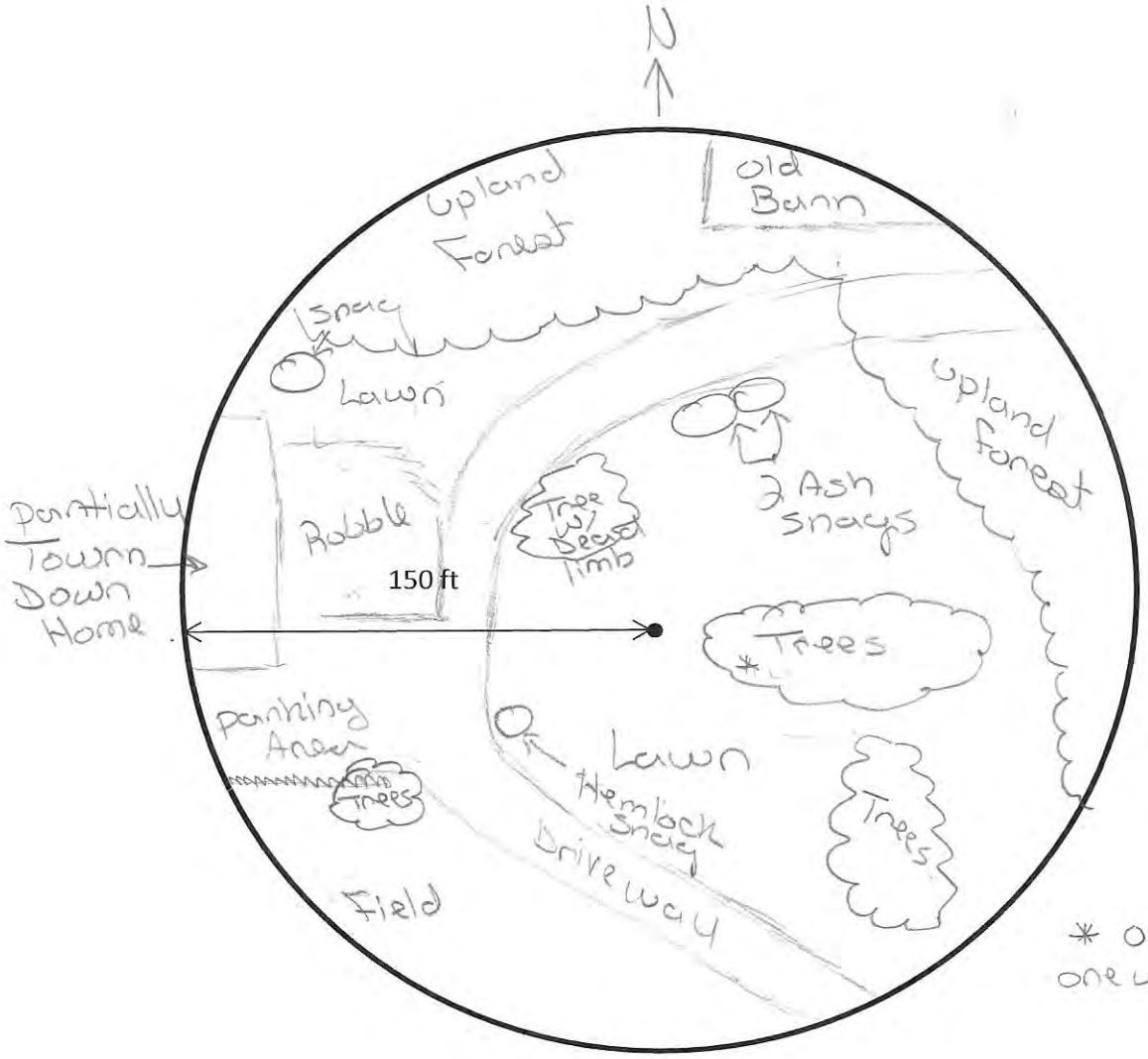
Suitable Habitat for Indiana Bat: (Yes) / No

Comments

This site is located in a maintained lawn with landscaping, including mature deciduous and coniferous trees.

Sketch habitat types within 150ft of detector. Include or describe presence of unique landforms potially used by bats (rock piles, cliffs, right-of-ways, ect.)

Site No. 2



Hardware and Software: Presence / Absence Acoustic Survey

Project Name: Endeavor-Harding Date: May 24, 2020

Personnel: V Schaller, L Weichgrod Municipality/County: Harding Twp / Morris

Acoustic Device Settings

Recording Settings: (Full Spectrum) Zero Cross Sensitivity: 0 Program: Kalidoscope 5.1.0 Trigger: 8dB

N/A – For Zero Cross- Data Divisions: 4 8 Calibration: (Yes) / No Record Time: Sunset Sunrise

For Full Spectrum- Time Expansion Factor: (1) 8 10 16 20 Elapse Time: ∅

Monitor Settings:	Location 1	Location 2	Location 3	Location 4
Unit#/Mic#:	3/3			
Monitoring Type:	(Passive) / Active	Passive / Active	Passive / Active	Passive / Active
Weather Proofing:	Yes / (No)	Yes / No	Yes / No	Yes / No
Unit Model:	SM4BAT FS/SMM-U1			
Orientation:	South			
Mic azimuth:	0, Omnidirectional			
Mic Height (ft):	12			
Location (X):	-74.52798			
(Y):	40.75142			
Photo Documentation:				
Taken By:	V Schaller			
Site Photo #:	2-5			
Set-Up Photo #:	1			
Other Photo #:	11-16			
Habitat:				
Distance to nearest Vegetation (ft):	>10 Feet in any direction at microphone height. Shrubs present north of setup			
Habitat Type Surveyed:	Lawn/Landscaping and Forest			
Adjacent habitat type:	Deciduous Forest			

Weather/ Environmental Variables

Night	Date	Recorder Start Time	Recorder End Time	Sun Set	Sun Rise	Daily High Temp. (°F)	Daily Low Temp. (°F)	Daily High Wind (mph)	Daily Average Wind (mph)	Moon Phase	Nightly Cloud Coverage	Date of Last Rain Event
1	5/24/2020	20:20	5:35	20:21	5:35	67	53	15	9.7	Waxing Gibbous	Cloudy	5/24/2020*
2	5/25/2020	20:21	5:34	20:22	5:34	73	56	10	5.8	Waxing Gibbous	Fair	5/24/2020
3	5/26/2020	20:21	5:34	20:22	5:34	76	58	10	3.5	Waxing Gibbous	Partially Cloudy	5/24/2020
4	5/27/2020	20:22	5:33	20:23	5:33	77	59	10	4.2	Waxing Gibbous	Mostly Cloudy	5/24/2020

* Rain between 1:00 and 3:00 am, prior to setting up equipment

Hardware and Software: Presence / Absence Acoustic Survey

Project Name: Endeavor - Harding Date: June 1, 2020

Personnel: V. Schaller Municipality/County: Harding Township, Morris County

Acoustic Device Settings

Recording Settings: (Full Spectrum) Zero Cross Sensitivity: 0 Program: Kalidoscope 5.1.0 Trigger: 8dB

For Zero Cross- Data Divisions: N/A 4 8 Calibration: (Yes) / No Record Time: Sunset/Sunrise

For Full Spectrum- Time Expansion Factor: (1) 8 10 16 20 Elapse Time: (2)

Monitor Settings:	Location 1	Location 2	Location 3	Location 4
Unit#/Mic#:		4/1		
Monitoring Type:	Passive / Active	(Passive) / Active	Passive / Active	Passive / Active
Weather Proofing:	Yes / No	Yes / (No)	Yes / No	Yes / No
Unit Model:		SM4BAT FS/SMM-U1		
Orientation:		South		
Mic azimuth:		90°		
Mic Height (ft):		0, Omnidirectional		
Location (X):		-74.52565		
(Y):		40.75781		
Photo Documentation:				
Taken By:		V. Schaller		
Site Photo #:		7-10		
Set-Up Photo #:		6		
Other Photo #:		17-25		
Habitat:				
Distance to nearest Vegetation (ft):		>10 feet in any direction		
Habitat Type Surveyed:		Lawn/Landscaping and forest		
Adjacent habitat type:		Deciduous forest		

Weather/ Environmental Variables

Night	Date	Recorder Start Time	Recorder End Time	Sun Set	Sun Rise	Daily High Temp. (°F)	Daily Low Temp. (°F)	Daily High Wind (mph)	Daily Average Wind (mph)	Moon Phase	Nightly Cloud Coverage	Date of Last Rain Event
1	6/1/2020	20:26	5:31	20:27	5:31	74	51	16	10.5	Waxing Gibbous	Cloudy	5/30/2020
2	6/2/2020	20:27	5:30	20:28	5:30	74	54	14	9.0	Waxing Gibbous	Cloudy	5/30/2020
3	6/3/2020	20:27	5:30	20:28	5:30	81	60	31*	8.5	Waxing Gibbous	Cloudy	6/3/2020*
4	6/4/2020	20:28	5:29	20:29	5:29	87	65	14	6.0	Waxing Gibbous	Cloudy	6/3/2020

* Thunderstorms passed through the area in the afternoon and early evening.

ATTACHMENT D

NOAA Morristown Municipal Airport Weather Report

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Local Climatological Data
Daily Summary
May 2020

Generated on 06/22/2020

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 187 ft. Lat: 40.8000° N Lon: -74.4167° W
Station: **MORRISTOWN, NJ US WBAN: 72409754738 (KMMU)**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH / Direction = Degrees			
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type	TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01										0455	1855	RA DZ BR										
03										0453	1857	RA DZ										
08										0447	1902	RA DZ BR										
15										0440	1909	RA DZ										
16										0439	1910	RA DZ										
21										0435	1914	FG BR										
22										0434	1915	BR										
23										0433	1916	RA DZ FG BR										
25										0432	1918	BR										
26										0431	1919	FG BR										
27										0431	1920	FG BR										
28										0430	1920	RA FG BR										
29										0429	1921	RA										
30										0429	1922	RA										
										Monthly Averages | Totals												
				Departure from Normal (1981-2010)																		

Degree Days					Number of days with...								
	Monthly		Season-to-date		Temperature				Precipitation		Snow	Weather	
	Total	Departure	Total	Departure	Max		Min						
Heating					>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
Cooling													

Date of 5-sec to 3-sec wind equipment change	Sea Level Pressure			Greatest...		
		Date	Time	24-Hr...		Snow Depth
N/A	Maximum			Precip	Snowfall	
	Minimum					
				Date		

Station Augmentation

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 187 ft. Lat: 40.8000° N Lon: -74.4167° W

Station: **MORRISTOWN, NJ US WBAN: 72409754738 (KMMU)**

Local Climatological Data
Hourly Observations
May 2020

Generated on 06/22/2020

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Date	Time (LST)	Station Type	Sky Conditions	Visibility	Weather Type (see documentation)	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Hum %	Wind Speed (MPH)	Wind Dir (Deg)	Wind Gusts (MPH)	Station Press (inHg)	Press. Tend	Net 3-Hr Change (inHg)	Sea Level Press. (inHg)	Report Type	Precip Total (in)	Altimeter Setting (inHg)
					AU | AW | MW	(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
23	0015	7	OVC:08 3	2.50	BR:1 ||	64	17.8	64	17.8	64	17.8	100	0	000		29.81				FM-15		30.01
23	0035	7	OVC:08 3	3.00	BR:1 ||	64	17.8	64	17.8	64	17.8	100	0	000		29.80				FM-15		30.00
23	0055	7	OVC:08 3	2.50	BR:1 ||	64	17.8	64	17.8	64	17.8	100	3	020		29.79				FM-15		29.99
23	0115	7	OVC:08 3	3.00	BR:1 ||	64	17.8	64	17.8	64	17.8	100	3	030		29.78				FM-15		29.98
23	0135	7	OVC:08 3	2.50	BR:1 ||	64	17.8	64	17.8	64	17.8	100	0	000		29.78				FM-15		29.98
23	0155	7	OVC:08 3	3.00	BR:1 ||	63	17.2	63	17.2	63	17.2	100	0	000		29.78				FM-15		29.98
23	0215	7	OVC:08 3	3.00	BR:1 ||	63	17.2	63	17.2	63	17.2	100	0	000		29.78				FM-15		29.98
23	0235	7	OVC:08 3	2.50	BR:1 ||	63	17.2	63	17.2	63	17.2	100	0	000		29.77				FM-15		29.97
23	0255	7	OVC:08 3	2.50	BR:1 ||	63	17.2	63	17.2	63	17.2	100	0	000		29.77				FM-15		29.97
23	0315	7	OVC:08 3	2.50	BR:1 ||	63	17.2	63	17.2	63	17.2	100	0	000		29.76				FM-15		29.96
23	0335	7	OVC:08 3	2.00	BR:1 ||	63	17.2	63	17.2	63	17.2	100	0	000		29.75				FM-15		29.95
23	0355	7	OVC:08 3	0.75	BR:1 ||	63	17.2	63	17.2	63	17.2	100	0	000		29.75				FM-15		29.95
23	0415	7	OVC:08 3	0.50	FG:2 |FG |	63	17.2	63	17.2	63	17.2	100	0	000		29.76				FM-15		29.96
23	0435	7	OVC:08 3	0.25	FG:2 |FG |	64	17.8	64	17.8	64	17.8	100	0	000		29.76				FM-15		29.96
23	0455	7	OVC:08 3	0.75	BR:1 ||	64	17.8	64	17.8	64	17.8	100	0	000		29.77				FM-15		29.97
23	0515	7	OVC:08 3	0.25	FG:2 |FG |	64	17.8	64	17.8	64	17.8	100	0	000		29.76				FM-15		29.96
23	0535	7	OVC:08 3	0.50	FG:2 |FG |	64	17.8	64	17.8	64	17.8	100	5	020		29.76				FM-15		29.96
23	0655	7	OVC:08 3	1.25	-RA:02 BR:1 |RA |RA	66	18.9	66	18.9	66	18.9	100	6	080		29.77				FM-15		29.97
23	0745	7	OVC:08 3	1.50	-RA:02 BR:1 |RA |RA	66	18.9	66	18.9	66	18.9	100	5	060		29.79				FM-15		29.99
23	0845	7	OVC:08 6	1.50	-RA:02 BR:1 |RA |RA	66	18.9	66	18.9	66	18.9	100	0	000		29.79				FM-15		29.99
23	0945	7	OVC:08 6	1.50	DZ:01 BR:1 |DZ |DZ DZ	66	18.9	66	18.9	66	18.9	100	0	000		29.79				FM-15		29.99
23	1045	7	OVC:08 4	1.50	DZ:01 BR:1 |DZ |DZ DZ	66	18.9	66	18.9	66	18.9	100	6	040		29.79				FM-15		29.99
23	1145	7	BKN:07 4 OVC:08 11	6.00	DZ:01 BR:1 |DZ |DZ DZ	68	20.0	68	20.0	68	20.0	100	0	000		29.80				FM-15		30.00
23	1245	7	BKN:07 8 OVC:08 12	10.00		70	21.1	70	21.1	70	21.1	100	5	060		29.79				FM-15		29.99
23	1345	7	BKN:07 8 OVC:08 28	10.00	-RA:02 |RA |RA	68	20.0	68	20.0	68	20.0	100	8	050		29.80				FM-15		30.00
23	2135	7	OVC:08 31	10.00		57	13.9	51	10.6	46	7.8	67	5	010		29.96				FM-15		30.16
23	2155	7	OVC:08 31	10.00		57	13.9	51	10.6	46	7.8	67	3	040		29.96				FM-15		30.16
23	2215	7	BKN:07 27 OVC:08 31	10.00		57	13.9	51	10.6	46	7.8	67	0	000		29.96				FM-15		30.16
23	2235	7	OVC:08 27	10.00		57	13.9	52	11.1	48	8.9	72	0	000		29.97				FM-15		30.17
23	2255	7	BKN:07 27 OVC:08 33	10.00		57	13.9	52	11.1	48	8.9	72	0	000		29.97				FM-15		30.17
23	2315	7	OVC:08 30	10.00		57	13.9	51	10.6	46	7.8	67	3	030		29.98				FM-15		30.18
23	2335	7	OVC:08 28	10.00		57	13.9	51	10.6	46	7.8	67	3	030		29.98				FM-15		30.18
23	2355	7	OVC:08 28	10.00		57	13.9	51	10.6	46	7.8	67	3	040		29.98				FM-15		30.18
24	0015	7	OVC:08 28	10.00		57	13.9	51	10.6	46	7.8	67	5	030		29.99				FM-15		30.19
24	0035	7	OVC:08 26	10.00		57	13.9	50	10.0	43	6.1	59	5	060		29.99				FM-15		30.19
24	0055	7	OVC:08 26	10.00		55	12.8	50	10.0	45	7.2	67	6	060		29.98				FM-15		30.18
24	0115	7	OVC:08 26	10.00		55	12.8	50	10.0	45	7.2	67	3	030		29.98				FM-15		30.18
24	0135	7	OVC:08 26	10.00		55	12.8	50	10.0	45	7.2	67	5	010		29.99				FM-15		30.19
24	0155	7	OVC:08 26	10.00		55	12.8	49	9.4	43	6.1	63	7	010		30.00				FM-15		30.20
24	0215	7	OVC:08 26	10.00		55	12.8	48	8.9	41	5.0	59	7	030		30.00				FM-15		30.20
24	0235	7	OVC:08 24	10.00		55	12.8	48	8.9	41	5.0	59	10	040		30.00				FM-15		30.20
24	0255	7	OVC:08 24	10.00		55	12.8	48	8.9	41	5.0	59	8	040		30.00				FM-15		30.20
24	0315	7	OVC:08 22	10.00		55	12.8	47	8.3	39	3.9	55	6	030		30.00				FM-15		30.20

24	0335	7	OVC:08 22	10.00		54	12.2	48	8.9	41	5.0	63	7	030		30.00				FM-15		30.20
24	0355	7	OVC:08 22	10.00		54	12.2	48	8.9	41	5.0	63	9	010		30.01				FM-15		30.21
24	0415	7	OVC:08 24	10.00		54	12.2	47	8.3	39	3.9	58	8	010		30.01				FM-15		30.21
24	0435	7	OVC:08 26	10.00		54	12.2	47	8.3	39	3.9	58	11	020		30.02				FM-15		30.22
24	0455	7	OVC:08 26	10.00		54	12.2	47	8.3	39	3.9	58	8	030		30.02				FM-15		30.22
24	0515	7	OVC:08 26	10.00		54	12.2	47	8.3	39	3.9	58	7	030		30.03				FM-15		30.23
24	0535	7	OVC:08 26	10.00		54	12.2	46	7.8	37	2.8	54	9	040	16	30.03				FM-15		30.23
24	0655	7	SCT:04 120	10.00		55	12.8	49	9.4	43	6.1	63	10	070	16	30.06				FM-15		30.26
24	0755	7	SCT:04 120	10.00		57	13.9	51	10.6	45	7.2	63	10	080		30.08				FM-15		30.28
24	0850	7	*	10.00		57	13.9	52	11.1	48	8.9	72	10	070	16	30.08				FM-15		30.28
24	0950	7	SCT:04 20 SCT:04 120	10.00		59	15.0	54	12.2	50	10.0	72	7	030	*	30.08				FM-15		30.28
24	1045	7	BKN:07 22	10.00		61	16.1	56	13.3	52	11.1	72	8	080		30.08				FM-15		30.28
24	1145	6	BKN:07 28	10.00		64	17.8	59	15.0	55	12.8	73	5	090		30.07				FM-15		30.27
24	1245	7	BKN:07 30	10.00		68	20.0	60	15.6	55	12.8	64	13	150		30.05				FM-15		30.25
24	1345	7	BKN:07 28	10.00		66	18.9	60	15.6	55	12.8	68	7	110	*	30.05				FM-15		30.25
24	2135	7	CLR:00	10.00		55	12.8	53	11.7	52	11.1	88	0	000		30.04				FM-15		30.24
24	2155	7	SCT:04 11	10.00		54	12.2	54	12.2	54	12.2	100	0	000		30.04				FM-15		30.24
24	2215	7	BKN:07 11	10.00		54	12.2	54	12.2	54	12.2	100	0	000		30.04				FM-15		30.24
24	2235	7	SCT:04 11 SCT:04 27	10.00		54	12.2	54	12.2	54	12.2	100	0	000		30.04				FM-15		30.24
24	2255	7	SCT:04 19 SCT:04 27	7.00		54	12.2	54	12.2	54	12.2	100	0	000		30.04				FM-15		30.24
24	2315	7	SCT:04 19	7.00		52	11.1	52	11.1	52	11.1	100	0	000		30.04				FM-15		30.24
24	2335	7	BKN:07 19	10.00		52	11.1	52	11.1	52	11.1	100	0	000		30.04				FM-15		30.24
24	2355	7	SCT:04 11 OVC:08 19	10.00		54	12.2	54	12.2	54	12.2	100	0	000		30.03				FM-15		30.23
25	0015	7	OVC:08 19	10.00		54	12.2	54	12.2	54	12.2	100	0	000		30.03				FM-15		30.23
25	0035	7	OVC:08 19	10.00		54	12.2	54	12.2	54	12.2	100	0	000		30.02				FM-15		30.22
25	0055	6	OVC:08 19	10.00		55	12.8	55	12.8	55	12.8	100	0	000		30.01				FM-15		30.21
25	0115	7	OVC:08 19	10.00		55	12.8	55	12.8	55	12.8	100	0	000		30.01				FM-15		30.21
25	0135	7	SCT:04 19 OVC:08 27	10.00		55	12.8	55	12.8	55	12.8	100	0	000		30.01				FM-15		30.21
25	0155	7	OVC:08 25	10.00		55	12.8	55	12.8	55	12.8	100	3	040		30.01				FM-15		30.21
25	0215	7	OVC:08 23	10.00		55	12.8	55	12.8	55	12.8	100	3	360		30.01				FM-15		30.21
25	0235	7	OVC:08 21	10.00		55	12.8	55	12.8	55	12.8	100	0	000		30.01				FM-15		30.21
25	0255	7	OVC:08 19	10.00		55	12.8	55	12.8	55	12.8	100	0	000		30.01				FM-15		30.21
25	0315	7	OVC:08 17	10.00		55	12.8	55	12.8	55	12.8	100	0	000		30.01				FM-15		30.21
25	0335	7	OVC:08 15	10.00		55	12.8	55	12.8	55	12.8	100	3	040		30.01				FM-15		30.21
25	0355	7	OVC:08 13	10.00		55	12.8	55	12.8	55	12.8	100	3	020		30.01				FM-15		30.21
25	0415	7	OVC:08 11	10.00		55	12.8	55	12.8	55	12.8	100	0	000		30.01				FM-15		30.21
25	0435	7	OVC:08 7	5.00	BR:1 ||	55	12.8	55	12.8	55	12.8	100	3	020		30.01				FM-15		30.21
25	0455	7	OVC:08 7	4.00	BR:1 ||	55	12.8	55	12.8	55	12.8	100	0	000		30.01				FM-15		30.21
25	0515	7	OVC:08 7	2.50	BR:1 ||	55	12.8	55	12.8	55	12.8	100	3	340		30.03				FM-15		30.23
25	0535	7	OVC:08 7	4.00	BR:1 ||	55	12.8	55	12.8	55	12.8	100	3	010		30.03				FM-15		30.23
25	0655	4		10.00		59	15.0			59	15.0	100	6	050						FM-15		30.25
25	0656	7	BKN:07 7 OVC:08 15	5.00	BR:1 ||	59	15.0	59	15.0	59	15.0	100	6	050		30.05				FM-15		30.25
25	0745	7	BKN:07 7 OVC:08 9	10.00		59	15.0	59	15.0	59	15.0	100	9	060		30.04				FM-15		30.24
25	0845	7	OVC:08 9	10.00		61	16.1	60	15.6	59	15.0	94	9	070		30.03				FM-15		30.23
25	0945	7	OVC:08 11	10.00		61	16.1	60	15.6	59	15.0	94	0	000		30.04				FM-15		30.24
25	1045	7	OVC:08 13	10.00		63	17.2	61	16.1	59	15.0	88	0	000		30.05				FM-15		30.25
25	1145	7	OVC:08 15	10.00		66	18.9	62	16.7	59	15.0	78	5	140		30.04				FM-15		30.24
25	1245	7	BKN:07 21	10.00		70	21.1	65	18.3	61	16.1	73	0	000		30.04				FM-15		30.24
25	1345	7	SCT:04 23	10.00		72	22.2	66	18.9	63	17.2	73	0	000		30.01				FM-15		30.21
25	2135	7	CLR:00	10.00		61	16.1	60	15.6	59	15.0	94	0	000		30.00				FM-15		30.20
25	2155	7	CLR:00	10.00		59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20

25	2215	7	CLR:00	10.00		59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
25	2235	7	BKN:07 10	10.00		59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
25	2255	7	OVC:08 8	7.00		59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
25	2315	7	OVC:08 8	7.00		59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
25	2335	7	OVC:08 6	10.00		59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
25	2355	7	OVC:08 6	10.00		59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
26	0015	7	OVC:08 4	7.00		59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
26	0035	7	OVC:08 4	4.00	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
26	0055	7	OVC:08 2	2.50	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
26	0115	7	OVC:08 2	2.50	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
26	0135	7	OVC:08 2	3.00	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
26	0155	7	OVC:08 2	5.00	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
26	0215	7	OVC:08 2	4.00	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
26	0235	7	OVC:08 2	4.00	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
26	0255	7	OVC:08 2	0.50	FG:2 |FG |	59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
26	0315	7	OVC:08 2	1.50	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		29.99				FM-15		30.19
26	0335	7	OVC:08 2	1.25	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
26	0355	7	OVC:08 2	1.25	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.00				FM-15		30.20
26	0415	7	OVC:08 2	1.75	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
26	0435	7	OVC:08 2	1.00	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
26	0455	7	OVC:08 2	0.75	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
26	0515	7	OVC:08 2	0.25	FG:2 |FG |	59	15.0	59	15.0	59	15.0	100	0	000		30.02				FM-15		30.22
26	0535	7	OVC:08 2	0.25	FG:2 |FG |	59	15.0	59	15.0	59	15.0	100	0	000		30.02				FM-15		30.22
26	0645	7	OVC:08 2	0.75		61	16.1	60	15.6	59	15.0	94	0	000		30.03				FM-15		30.23
26	0745	7	OVC:08 2	2.00		63	17.2	63	17.2	63	17.2	100	0	000		30.04				FM-15		30.24
26	0845	7	OVC:08 9	7.00		64	17.8	64	17.8	64	17.8	100	0	000		30.04				FM-15		30.24
26	0945	7	SCT:04 15 BKN:07 70	10.00		70	21.1	67	19.4	66	18.9	88	5	210		30.03				FM-15		30.23
26	1045	7	SCT:04 20	10.00		73	22.8	69	20.6	66	18.9	78	0	000		30.02				FM-15		30.22
26	1155	7	*	10.00		77	25.0	69	20.6	64	17.8	65	7	230		30.01				FM-15		30.21
26	1255	7	*	10.00		79	26.1	69	20.6	64	17.8	61	7	150		29.99				FM-15		30.19
26	1345	7	*	10.00		81	27.2	71	21.7	66	18.9	62	3	210		29.98				FM-15		30.18
26	2135	7	CLR:00	10.00		63	17.2	63	17.2	63	17.2	100	0	000		30.00				FM-15		30.20
26	2155	7	CLR:00	10.00		61	16.1	61	16.1	61	16.1	100	0	000		29.99				FM-15		30.19
26	2215	7	CLR:00	10.00		61	16.1	61	16.1	61	16.1	100	0	000		30.00				FM-15		30.20
26	2235	7	CLR:00	10.00		63	17.2	62	16.7	61	16.1	94	0	000		30.00				FM-15		30.20
26	2255	7	CLR:00	10.00		63	17.2	62	16.7	61	16.1	94	0	000		30.01				FM-15		30.21
26	2315	7	CLR:00	10.00		63	17.2	62	16.7	61	16.1	94	0	000		30.01				FM-15		30.21
26	2335	7	CLR:00	10.00		61	16.1	61	16.1	61	16.1	100	0	000		30.01				FM-15		30.21
26	2355	7	CLR:00	10.00		61	16.1	61	16.1	61	16.1	100	0	000		30.01				FM-15		30.21
27	0010	7	CLR:00	10.00		59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
27	0035	7	CLR:00	10.00		59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
27	0055	7	CLR:00	10.00		57	13.9	57	13.9	57	13.9	100	0	000		30.01				FM-15		30.21
27	0115	7	CLR:00	7.00		57	13.9	57	13.9	57	13.9	100	0	000		30.01				FM-15		30.21
27	0135	7	CLR:00	10.00		57	13.9	57	13.9	57	13.9	100	0	000		30.01				FM-15		30.21
27	0155	7	SCT:04 7	10.00		57	13.9	57	13.9	57	13.9	100	0	000		30.01				FM-15		30.21
27	0215	7	OVC:08 7	10.00		57	13.9	57	13.9	57	13.9	100	0	000		30.01				FM-15		30.21
27	0235	7	OVC:08 5	10.00		59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
27	0255	7	OVC:08 3	7.00		59	15.0	59	15.0	59	15.0	100	0	000		30.02				FM-15		30.22
27	0315	7	OVC:08 3	3.00	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
27	0335	7	OVC:08 3	2.50	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
27	0355	7	OVC:08 3	0.50	FG:2 |FG |	59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
27	0415	7	OVC:08 3	0.50	FG:2 |FG |	59	15.0	59	15.0	59	15.0	100	0	000		30.02				FM-15		30.22
27	0435	7	OVC:08 3	0.50	FG:2 |FG |	59	15.0	59	15.0	59	15.0	100	0	000		30.02				FM-15		30.22
27	0455	7	OVC:08 3	0.50	FG:2 |FG |	59	15.0	59	15.0	59	15.0	100	0	000		30.03				FM-15		30.23
27	0515	7	OVC:08 3	0.25	FG:2 |FG |	59	15.0	59	15.0	59	15.0	100	0	000		30.03				FM-15		30.23
27	0535	7	OVC:08 3	0.25	FG:2 |FG |	59	15.0	59	15.0	59	15.0	100	0	000		30.04				FM-15		30.24

27	0645	4		10.00		63	17.2			63	17.2	100	0	000						FM-15		30.25
27	0654	7	OVC:08 3	1.25		63	17.2	63	17.2	63	17.2	100	0	000		30.05				FM-15		30.25
27	0745	7	OVC:08 3	2.00		63	17.2	63	17.2	63	17.2	100	0	000		30.06				FM-15		30.26
27	0845	7	OVC:08 9	10.00		66	18.9	66	18.9	66	18.9	100	0	000		30.05				FM-15		30.25
27	0945	7	BKN:07 9	10.00		70	21.1	67	19.4	66	18.9	88	0	000		30.05				FM-15		30.25
27	1000	7	BKN:07 16	10.00		70	21.1	67	19.4	66	18.9	88	3	330		30.05				FM-15		30.25
27	1045	7	BKN:07 20	10.00		75	23.9	70	21.1	68	20.0	78	3	240		30.04				FM-15		30.24
27	1145	7	OVC:08 27	10.00		77	25.0	70	21.1	66	18.9	69	3	200		30.02				FM-15		30.22
27	1245	7	SCT:04 32 SCT:04 37	10.00		77	25.0	70	21.1	66	18.9	69	5	210		30.01				FM-15		30.21
27	1345	7	SCT:04 34 OVC:08 44	10.00		79	26.1	71	21.7	66	18.9	65	5	260		29.99				FM-15		30.19
27	2135	7	BKN:07 50	10.00		64	17.8	64	17.8	64	17.8	100	0	000		30.01				FM-15		30.21
27	2150	7	SCT:04 50	10.00		64	17.8	63	17.2	63	17.2	94	0	000		30.01				FM-15		30.21
27	2215	7	SCT:04 10 SCT:04 55	10.00		64	17.8	63	17.2	63	17.2	94	0	000		30.01				FM-15		30.21
27	2235	7	SCT:04 9 SCT:04 55	10.00		63	17.2	63	17.2	63	17.2	100	0	000		30.02				FM-15		30.22
27	2255	7	CLR:00	10.00		63	17.2	63	17.2	63	17.2	100	0	000		30.02				FM-15		30.22
27	2315	7	CLR:00	10.00		63	17.2	63	17.2	63	17.2	100	0	000		30.02				FM-15		30.22
27	2335	7	CLR:00	10.00		61	16.1	61	16.1	61	16.1	100	0	000		30.02				FM-15		30.22
27	2355	7	CLR:00	7.00		61	16.1	61	16.1	61	16.1	100	0	000		30.01				FM-15		30.21
28	0015	7	CLR:00	10.00		61	16.1	61	16.1	61	16.1	100	0	000		30.02				FM-15		30.22
28	0035	7	BKN:07 23	5.00	BR:1 ||	59	15.0	59	15.0	59	15.0	100	0	000		30.01				FM-15		30.21
28	0055	7	OVC:08 23	10.00		61	16.1	61	16.1	61	16.1	100	0	000		30.01				FM-15		30.21
28	0115	7	BKN:07 11 OVC:08 23	10.00		63	17.2	63	17.2	63	17.2	100	0	000		30.01				FM-15		30.21
28	0135	7	OVC:08 9	10.00		63	17.2	63	17.2	63	17.2	100	0	000		30.01				FM-15		30.21
28	0155	7	OVC:08 9	10.00		63	17.2	63	17.2	63	17.2	100	0	000		30.00				FM-15		30.20
28	0215	7	OVC:08 7	10.00		63	17.2	63	17.2	63	17.2	100	0	000		30.00				FM-15		30.20
28	0235	7	OVC:08 7	10.00		63	17.2	63	17.2	63	17.2	100	0	000		30.00				FM-15		30.20
28	0255	7	OVC:08 7	10.00		63	17.2	63	17.2	63	17.2	100	0	000		29.99				FM-15		30.19
28	0315	7	OVC:08 5	10.00		64	17.8	64	17.8	64	17.8	100	0	000		29.99				FM-15		30.19
28	0335	7	OVC:08 3	5.00	BR:1 ||	64	17.8	64	17.8	64	17.8	100	0	000		29.99				FM-15		30.19
28	0355	7	OVC:08 3	2.50	BR:1 ||	64	17.8	64	17.8	64	17.8	100	0	000		29.99				FM-15		30.19
28	0415	7	OVC:08 3	1.75	BR:1 ||	64	17.8	64	17.8	64	17.8	100	0	000		29.99				FM-15		30.19
28	0435	7	OVC:08 3	1.00	RA:02 |RA |RA	64	17.8	64	17.8	64	17.8	100	0	000		29.99				FM-15		30.19
28	0455	7	OVC:08 3	1.75	BR:1 ||	64	17.8	64	17.8	64	17.8	100	0	000		29.99				FM-15		30.19
28	0515	7	OVC:08 3	2.00	BR:1 ||	64	17.8	64	17.8	64	17.8	100	0	000		30.00				FM-15		30.20
28	0535	7	OVC:08 3	0.75	BR:1 ||	64	17.8	64	17.8	64	17.8	100	0	000		30.00				FM-15		30.20
28	0658	7	OVC:08 3	0.50	FG:2 |FG |FG	68	20.0	68	20.0	68	20.0	100	3	110		30.00				FM-15		30.20
28	0715	7	OVC:08 3	1.50	BR:1 ||	68	20.0	68	20.0	68	20.0	100	0	000		30.01				FM-15		30.21
28	0716	7	OVC:08 3	1.50	BR:1 ||	68	20.0	68	20.0	68	20.0	100	0	000		30.01				FM-15		30.21
28	0745	7	OVC:08 3	2.00	BR:1 ||	68	20.0	68	20.0	68	20.0	100	0	000		30.01				FM-15		30.21
28	0845	7	OVC:08 7	4.00	BR:1 ||	70	21.1	70	21.1	70	21.1	100	5	140		29.99				FM-15		30.19
28	0950	7	BKN:07 14 OVC:08 23	7.00		75	23.9	73	22.8	72	22.2	89	6	190		29.97				FM-15		30.17
28	1050	7	BKN:07 20 OVC:08 29	7.00		75	23.9	73	22.8	72	22.2	89	8	190		29.96				FM-15		30.16
28	1145	7	BKN:07 22 BKN:07 26 OVC:08 35	8.00		77	25.0	74	23.3	72	22.2	83	10	170	16	29.94				FM-15		30.14
28	1245	7	BKN:07 13 OVC:08 34	2.50		75	23.9	74	23.3	73	22.8	94	7	170	*	29.93				FM-15		30.13
28	1258	7	BKN:07 8 OVC:08 13	2.50	-RA:02 BR:1 |RA |RA	75	23.9	74	23.3	73	22.8	94	10	190		29.93				FM-15		30.13
28	1345	7	BKN:07 11 OVC:08 26	7.00		75	23.9	74	23.3	73	22.8	94	13	180	18	29.91				FM-15		30.11
28	2135	7	OVC:08 11	10.00		72	22.2	71	21.7	70	21.1	94	3	150		29.86				FM-15		30.06

28	2155	7	BKN:07 11 OVC:08 14	10.00		72	22.2	71	21.7	70	21.1	94	6	160		29.85				FM-15		30.05
28	2215	7	OVC:08 11	10.00		72	22.2	71	21.7	70	21.1	94	5	170		29.85				FM-15		30.05
28	2235	7	OVC:08 9	10.00		72	22.2	71	21.7	70	21.1	94	6	170		29.85				FM-15		30.05
28	2255	7	OVC:08 9	10.00		72	22.2	71	21.7	70	21.1	94	6	190		29.86				FM-15		30.06
28	2315	7	OVC:08 11	10.00		72	22.2	71	21.7	70	21.1	94	3	170		29.86				FM-15		30.06
28	2335	7	BKN:07 13 OVC:08 25	10.00		72	22.2	71	21.7	70	21.1	94	0	000		29.85				FM-15		30.05
28	2355	7	SCT:04 15 OVC:08 25	10.00	-RA:02 |RA |RA	72	22.2	71	21.7	70	21.1	94	0	000		29.85				FM-15		30.05
29	0015	7	BKN:07 13 OVC:08 25	7.00	-RA:02 |RA |RA	72	22.2	71	21.7	70	21.1	94	3	150		29.85				FM-15	0.01	30.05
29	0035	7	SCT:04 11 BKN:07 25 OVC:08 33	10.00		72	22.2	71	21.7	70	21.1	94	3	150		29.84				FM-15	0.01	30.04
29	0055	7	BKN:07 11 BKN:07 23 OVC:08 33	10.00		70	21.1	70	21.1	70	21.1	100	0	000		29.84				FM-15		30.04
29	0115	7	OVC:08 9	10.00		70	21.1	70	21.1	70	21.1	100	3	160		29.84				FM-15		30.04
29	0135	7	OVC:08 9	10.00		70	21.1	70	21.1	70	21.1	100	5	180		29.84				FM-15		30.04
29	0155	7	OVC:08 9	10.00		70	21.1	70	21.1	70	21.1	100	7	160		29.84				FM-15		30.04
29	0215	7	OVC:08 7	10.00		70	21.1	70	21.1	70	21.1	100	6	180		29.84				FM-15		30.04
29	0235	7	OVC:08 7	10.00		70	21.1	70	21.1	70	21.1	100	5	170		29.84				FM-15		30.04
29	0255	7	OVC:08 7	10.00		70	21.1	70	21.1	70	21.1	100	5	180		29.84				FM-15		30.04
29	0315	7	OVC:08 7	10.00		70	21.1	70	21.1	70	21.1	100	3	180		29.83				FM-15		30.03
29	0335	7	OVC:08 7	10.00		70	21.1	70	21.1	70	21.1	100	6	180		29.83				FM-15		30.03
29	0355	7	OVC:08 7	7.00		70	21.1	70	21.1	70	21.1	100	5	160		29.83				FM-15		30.03
29	0415	7	OVC:08 7	7.00		70	21.1	70	21.1	70	21.1	100	5	170		29.83				FM-15		30.03
29	0435	7	OVC:08 7	10.00		70	21.1	70	21.1	70	21.1	100	3	190		29.83				FM-15		30.03
29	0455	7	OVC:08 7	10.00		72	22.2	71	21.7	70	21.1	94	3	190		29.84				FM-15		30.04
29	0515	7	OVC:08 7	10.00		72	22.2	71	21.7	70	21.1	94	5	190		29.84				FM-15		30.04
29	0535	7	OVC:08 9	10.00		72	22.2	71	21.7	70	21.1	94	5	190		29.84				FM-15		30.04
29	0700	4		8.00		73	22.8			73	22.8	100	8	220						FM-15		30.05
29	0745	7	OVC:08 9	8.00		73	22.8	73	22.8	73	22.8	100	7	220		29.85				FM-15		30.05
29	0845	7	OVC:08 9	8.00		75	23.9	74	23.3	73	22.8	94	8	210		29.84				FM-15		30.04
29	0945	7	BKN:07 12 OVC:08 18	6.00		75	23.9	75	23.9	75	23.9	100	7	210		29.82				FM-15		30.02
29	1045	7	OVC:08 16	10.00		79	26.1	75	23.9	73	22.8	84	8	210		29.80				FM-15		30.00
29	1145	7	BKN:07 21 OVC:08 40	10.00		81	27.2	75	23.9	73	22.8	79	13	220		29.78				FM-15		29.98
29	1245	7	BKN:07 23 OVC:08 42	10.00	-RA:02 |RA |RA	79	26.1	75	23.9	73	22.8	84	13	250		29.77				FM-15		29.97
29	1345	7	SCT:04 29 SCT:04 36 BKN:07 60	10.00		82	27.8	76	24.4	73	22.8	74	14	210	22	29.73				FM-15		29.93
29	2135	7	CLR:00	10.00		68	20.0	68	20.0	68	20.0	100	0	000		29.68				FM-15		29.88
29	2155	7	CLR:00	10.00		66	18.9	66	18.9	66	18.9	100	0	000		29.68				FM-15		29.88
29	2215	7	CLR:00	10.00		66	18.9	66	18.9	66	18.9	100	0	000		29.68				FM-15		29.88
29	2235	7	SCT:04 27	7.00		66	18.9	66	18.9	66	18.9	100	0	000		29.68				FM-15		29.88
29	2255	7	BKN:07 23 BKN:07 32	10.00		66	18.9	66	18.9	66	18.9	100	0	000		29.68				FM-15		29.88
29	2315	7	BKN:07 22 BKN:07 30 OVC:08 120	10.00		68	20.0	68	20.0	68	20.0	100	0	000		29.68				FM-15		29.88
29	2335	7	BKN:07 16 BKN:07 21 OVC:08 120	10.00		68	20.0	68	20.0	68	20.0	100	0	000		29.67				FM-15		29.87
29	2355	7	OVC:08 14	10.00		68	20.0	68	20.0	68	20.0	100	0	000		29.67				FM-15		29.87
30	0015	7	BKN:07 12 BKN:07 30 OVC:08 41	10.00	RA:02 |RA |RA	68	20.0	68	20.0	68	20.0	100	7	290		29.69				FM-15	0.01	29.89

30	0035	7	SCT:04 28 BKN:07 55 OVC:08 85	10.00	RA:02 |RA |RA	68	20.0	68	20.0	68	20.0	100	0	000		29.68				FM-15	0.05	29.88
30	0055	7	SCT:04 55 SCT:04 70 BKN:07 100	10.00		68	20.0	68	20.0	68	20.0	100	0	000		29.67				FM-15		29.87
30	0115	7	BKN:07 110	7.00		66	18.9	66	18.9	66	18.9	100	0	000		29.67				FM-15		29.87
30	0135	7	SCT:04 85 SCT:04 110	10.00		66	18.9	66	18.9	66	18.9	100	0	000		29.67				FM-15		29.87
30	0155	7	BKN:07 75 BKN:07 90	10.00		66	18.9	66	18.9	66	18.9	100	3	240		29.67				FM-15		29.87
30	0215	7	SCT:04 75 OVC:08 90	10.00	-RA:02 |RA |RA	66	18.9	66	18.9	66	18.9	100	5	230		29.67				FM-15	0.01	29.87
30	0235	7	SCT:04 75 BKN:07 90 OVC:08 110	10.00		66	18.9	66	18.9	66	18.9	100	0	000		29.67				FM-15	0.01	29.87
30	0255	7	SCT:04 75 SCT:04 90 BKN:07 120	10.00		66	18.9	66	18.9	66	18.9	100	0	000		29.67				FM-15		29.87
30	0315	7	SCT:04 120	10.00		66	18.9	66	18.9	66	18.9	100	3	220		29.67				FM-15		29.87
30	0335	7	CLR:00	10.00		66	18.9	66	18.9	66	18.9	100	0	000		29.66				FM-15		29.86
30	0355	7	CLR:00	10.00		66	18.9	66	18.9	66	18.9	100	0	000		29.67				FM-15		29.87
30	0415	7	CLR:00	10.00		64	17.8	64	17.8	64	17.8	100	0	000		29.67				FM-15		29.87
30	0435	7	CLR:00	10.00		64	17.8	64	17.8	64	17.8	100	0	000		29.67				FM-15		29.87
30	0455	7	CLR:00	7.00		64	17.8	63	17.2	63	17.2	94	0	000		29.68				FM-15		29.88
30	0515	7	CLR:00	10.00		64	17.8	61	16.1	59	15.0	83	0	000		29.69				FM-15		29.89
30	0535	7	CLR:00	10.00									3	190		29.69				FM-15		29.89
30	0700	4		10.00		70	21.1			66	18.9	88	6	320						FM-15		29.92
30	0745	4		10.00		70	21.1			64	17.8	83	6	330						FM-15		29.93
30	0746	7	SCT:04 34 SCT:04 40	10.00		70	21.1	66	18.9	64	17.8	83	6	330		29.73				FM-15		29.93
30	0846	7	SCT:04 31 BKN:07 38	10.00		70	21.1	63	17.2	59	15.0	69	9	340	17	29.74				FM-15		29.94
30	0946	7	SCT:04 37 SCT:04 120	10.00		72	22.2	64	17.8	59	15.0	65	9	320	*	29.73				FM-15		29.93
30	1045	7	SCT:04 41 SCT:04 250	10.00		73	22.8	63	17.2	57	13.9	57	8	350	*	29.72				FM-15		29.92
30	1145	7	FEW:02 250	10.00		73	22.8	62	16.7	55	12.8	53	8	340	*	29.70				FM-15		29.90
30	1245	7	FEW:02 250	10.00		79	26.1	65	18.3	55	12.8	45	8	300		29.69				FM-15		29.89
30	1345	7	FEW:02 250	10.00		81	27.2	65	18.3	55	12.8	42	8	310	16	29.68				FM-15		29.88
30	1500	7	SCT:04 70	10.00		81	27.2	64	17.8	52	11.1	37	14	310	20	29.67				FM-15		29.87
30	2135	7	CLR:00	10.00		68	20.0	59	15.0	52	11.1	56	9	280	17	29.73				FM-15		29.93
30	2155	7	CLR:00	10.00		70	21.1	59	15.0	50	10.0	50	7	310		29.73				FM-15		29.93
30	2215	7	CLR:00	10.00		68	20.0	58	14.4	50	10.0	53	5	330		29.73				FM-15		29.93
30	2235	7	CLR:00	10.00		68	20.0	58	14.4	50	10.0	53	7	320		29.74				FM-15		29.94
30	2255	7	CLR:00	10.00		66	18.9	57	13.9	50	10.0	56	8	320		29.74				FM-15		29.94
30	2315	7	CLR:00	10.00		66	18.9	57	13.9	50	10.0	56	7	320		29.75				FM-15		29.95
30	2335	7	CLR:00	10.00		66	18.9	57	13.9	50	10.0	56	7	310		29.75				FM-15		29.95
30	2355	7	CLR:00	10.00		64	17.8	56	13.3	50	10.0	60	8	330		29.75				FM-15		29.95
31	0015	7	CLR:00	10.00		64	17.8	55	12.8	48	8.9	56	6	330		29.75				FM-15		29.95
31	0035	7	CLR:00	10.00		64	17.8	55	12.8	48	8.9	56	11	310	21	29.76				FM-15		29.96
31	0055	7	CLR:00	10.00		63	17.2	54	12.2	46	7.8	56	10	VRB	21	29.76				FM-15		29.96
31	0115	7	CLR:00	10.00		63	17.2	54	12.2	45	7.2	52	14	310	23	29.77				FM-15		29.97
31	0135	7	CLR:00	10.00		61	16.1	51	10.6	41	5.0	48	9	340	21	29.78				FM-15		29.98
31	0155	7	CLR:00	10.00		61	16.1	49	9.4	36	2.2	39	15	330	25	29.78				FM-15		29.98
31	0215	7	CLR:00	10.00		59	15.0	48	8.9	37	2.8	45	10	330	20	29.79				FM-15		29.99
31	0235	7	CLR:00	10.00		57	13.9	48	8.9	39	3.9	51	15	VRB	20	29.79				FM-15		29.99
31	0255	7	CLR:00	10.00		57	13.9	48	8.9	39	3.9	51	9	320		29.80				FM-15		30.00
31	0315	7	CLR:00	10.00		57	13.9	48	8.9	39	3.9	51	7	350		29.80				FM-15		30.00
31	0335	7	CLR:00	10.00		55	12.8	47	8.3	39	3.9	55	6	310		29.81				FM-15		30.01

31	0355	7	CLR:00	10.00		55	12.8	47	8.3	39	3.9	55	8	310		29.82				FM-15		30.02
31	0415	7	CLR:00	10.00		55	12.8	47	8.3	39	3.9	55	8	320		29.83				FM-15		30.03
31	0435	7	CLR:00	10.00		55	12.8	47	8.3	37	2.8	51	7	310		29.84				FM-15		30.04
31	0455	7	CLR:00	10.00		55	12.8	47	8.3	37	2.8	51	11	320		29.84				FM-15		30.04
31	0515	7	CLR:00	10.00		55	12.8	47	8.3	37	2.8	51	8	320		29.85				FM-15		30.05
31	0535	7	CLR:00	10.00		55	12.8	47	8.3	37	2.8	51	8	VRB		29.86				FM-15		30.06
31	0658	7	*	10.00		57	13.9	50	10.0	43	6.1	59	10	360	17	29.89				FM-15		30.09
31	0745	7	FEW:02 30	10.00		61	16.1	52	11.1	43	6.1	52	10	360	18	29.90				FM-15		30.10
31	0845	7	FEW:02 45	10.00		61	16.1	51	10.6	41	5.0	48	13	020	23	29.90				FM-15		30.10
31	0945	7	FEW:02 45	10.00		63	17.2	53	11.7	43	6.1	49	13	310	20	29.90				FM-15		30.10
31	1045	7	FEW:02 45	10.00		64	17.8	52	11.1	41	5.0	43	6	310	20	29.89				FM-15		30.09
31	1150	7	FEW:02 50	10.00		66	18.9	52	11.1	39	3.9	37	13	360	20	29.88				FM-15		30.08
31	1250	7	FEW:02 50	10.00		68	20.0	53	11.7	39	3.9	35	11	350	21	29.87				FM-15		30.07
31	1350	7	FEW:02 50	10.00		68	20.0	53	11.7	39	3.9	35	9	350	24	29.87				FM-15		30.07
31	2135	7	CLR:00	10.00									7	330		29.98				FM-15		30.18
31	2155	7	CLR:00	10.00		55	12.8	45	7.2	32	0.0	41	6	350		29.99				FM-15		30.19
31	2215	7	CLR:00	10.00		55	12.8	45	7.2	32	0.0	41	6	350		29.99				FM-15		30.19
31	2235	7	CLR:00	10.00		54	12.2	44	6.7	32	0.0	44	6	340		30.00				FM-15		30.20
31	2255	7	CLR:00	10.00		52	11.1	44	6.7	34	1.1	50	5	020		30.00				FM-15		30.20
31	2315	7	CLR:00	10.00		52	11.1	44	6.7	34	1.1	50	0	000		30.00				FM-15		30.20
31	2335	7	CLR:00	10.00		52	11.1	40	4.4	23	-5.0	32	0	000		30.00				FM-15		30.20
31	2355	7	CLR:00	10.00		52	11.1	41	5.0	25	-3.9	35	0	000		30.00				FM-15		30.20

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 187 ft. Lat: 40.8000° N Lon: -74.4167° W
Station: **MORRISTOWN, NJ US WBAN: 72409754738 (KMMU)**

Local Climatological Data
Hourly Precipitation
May 2020

Generated on 06/22/2020

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Date	For Hour (LST) Ending at																							Date
	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	NOON	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	MID	
01	M	M	M	0.01	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	01
02	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	02
03	M	M	M	0.01	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	03
04	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	04
05	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	05
06	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	06
07	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	07
08	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	08
09	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	09
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	10
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	11
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	12
13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	13
14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	14
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	15
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	16
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	17
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	18
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	19
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	20
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	21
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	22
23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	23
24	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	24
25	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	25
26	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	26
27	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	27
28	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	28
29	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	29
30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	30
31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	31

Maximum Short Duration Precipitation

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (inches)												
Ending Date Time (yyyy-mm-dd hh:mi)												

Hourly, daily, and monthly totals on the Daily Summary page and the Hourly Precipitation Table are shown as reported by the instrumentation at the site. However, NWS does not edit hourly values for its ASOS sites, but may edit the daily and monthly totals for selected sites which will be reflected on the Daily Summary page.

T = Trace
s = Suspect
* = Erroneous
blank = No precipitation observed
M = Missing

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 187 ft. Lat: 40.8000° N Lon: -74.4167° W
Station: **MORRISTOWN, NJ US WBAN: 72409754738 (KMMU)**

Local Climatological Data
Daily Summary
June 2020

Generated on 06/22/2020

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH / Direction = Degrees			
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type	TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
02										0428	1924	TS										
03										0427	1925	TS RA FG BR HZ										
04										0427	1926	TS RA FG BR HZ										
05										0427	1926	RA BR HZ										
06										0426	1927	RA DZ FG BR										
10										0426	1929	RA HZ										
11										0426	1929	RA DZ BR										
12										0426	1930	FG BR										
15										0426	1931	BR										
16										0426	1931	FG BR										
17										0426	1932	FG BR										
18										0426	1932	BR										
19										0426	1932	RA FG BR										
20										0426	1933	FG BR										
21										0426	1933	FG BR										
										Monthly Averages | Totals												
				Departure from Normal (1981-2010)																		

Degree Days

	Monthly		Season-to-date	
	Total	Departure	Total	Departure
Heating				
Cooling				

Number of days with...

	Temperature				Precipitation		Snow	Weather	
	Max		Min						
	>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
Heating									
Cooling									

Date of 5-sec to 3-sec wind equipment change	Sea Level Pressure			Greatest...		
		Date	Time	24-Hr...		Snow Depth
N/A	Maximum			Precip	Snowfall	
	Minimum					
				Date		

Station Augmentation

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Current Location: Elev: 187 ft. Lat: 40.8000° N Lon: -74.4167° W

Station: **MORRISTOWN, NJ US WBAN: 72409754738 (KMMU)**

Local Climatological Data
Hourly Observations
June 2020

Generated on 06/22/2020

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Date	Time (LST)	Station Type	Sky Conditions	Visibility	Weather Type (see documentation)	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Hum %	Wind Speed (MPH)	Wind Dir (Deg)	Wind Gusts (MPH)	Station Press (inHg)	Press. Tend	Net 3-Hr Change (inHg)	Sea Level Press. (inHg)	Report Type	Precip Total (in)	Altimeter Setting (inHg)
					AU | AW | MW	(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01	0015	7	CLR:00	10.00		48	8.9	38	3.3	21	-6.1	34	0	000		30.00				FM-15		30.20
01	0035	7	CLR:00	10.00		46	7.8	38	3.3	25	-3.9	43	0	000		30.00				FM-15		30.20
01	0055	7	CLR:00	10.00		45	7.2	41	5.0	37	2.8	76	0	000		30.00				FM-15		30.20
01	0115	7	CLR:00	10.00		45	7.2						0	000		30.01				FM-15		30.21
01	0135	7	CLR:00	10.00		45	7.2	40	4.4	32	0.0	61	0	000		30.01				FM-15		30.21
01	0155	7	CLR:00	10.00		43	6.1						0	000		30.01				FM-15		30.21
01	0215	7	CLR:00	10.00		43	6.1	40	4.4	36	2.2	76	0	000		30.01				FM-15		30.21
01	0235	7	CLR:00	10.00		43	6.1	41	5.0	39	3.9	87	0	000		30.00				FM-15		30.20
01	0255	7	CLR:00	10.00		41	5.0	40	4.4	39	3.9	93	0	000		30.01				FM-15		30.21
01	0315	7	CLR:00	10.00		43	6.1	41	5.0	39	3.9	87	0	000		30.01				FM-15		30.21
01	0335	7	CLR:00	10.00		41	5.0	34	1.1	23	-5.0	49	0	000		30.01				FM-15		30.21
01	0355	7	CLR:00	10.00		41	5.0	37	2.8	32	0.0	70	0	000		30.02				FM-15		30.22
01	0415	7	CLR:00	10.00		41	5.0	33	0.6	19	-7.2	42	3	260		30.03				FM-15		30.23
01	0435	7	CLR:00	10.00		41	5.0	33	0.6	18	-7.8	39	3	300		30.03				FM-15		30.23
01	0455	7	CLR:00	10.00		45	7.2	39	3.9	30	-1.1	57	3	290		30.04				FM-15		30.24
01	0515	7	CLR:00	10.00		48	8.9						3	290		30.05				FM-15		30.25
01	0535	7	CLR:00	10.00		50	10.0						0	000		30.06				FM-15		30.26
01	0658	7	SCT:04 250	10.00		54	12.2	47	8.3	39	3.9	58	5	020		30.07				FM-15		30.27
01	0745	7	SCT:04 250	10.00		57	13.9	48	8.9	39	3.9	51	0	000		30.08				FM-15		30.28
01	0845	7	SCT:04 250	10.00		61	16.1	51	10.6	41	5.0	48	9	290		30.06				FM-15		30.26
01	0945	7	SCT:04 60	10.00		63	17.2	51	10.6	39	3.9	42	8	350	16	30.04				FM-15		30.24
01	1050	7	BKN:07 65	10.00		63	17.2	52	11.1	41	5.0	45	6	340		30.01				FM-15		30.21
01	1145	7	BKN:07 70	10.00		63	17.2	52	11.1	41	5.0	45	6	340		29.98				FM-15		30.18
01	1245	7	BKN:07 70 BKN:07 85 BKN:07 100	10.00		64	17.8	52	11.1	41	5.0	43	9	310		29.96				FM-15		30.16
01	1345	7	BKN:07 95	10.00		68	20.0	53	11.7	39	3.9	35	13	300	23	29.93				FM-15		30.13
01	2135	7	BKN:07 100 BKN:07 120	10.00		54	12.2	49	9.4	45	7.2	72	0	000		29.91				FM-15		30.11
01	2155	7	OVC:08 100	10.00		54	12.2	51	10.6	48	8.9	82	0	000		29.91				FM-15		30.11
01	2215	7	BKN:07 100 BKN:07 110	10.00		52	11.1	49	9.4	46	7.8	82	0	000		29.91				FM-15		30.11
01	2235	7	SCT:04 100 SCT:04 110	10.00		50	10.0	48	8.9	46	7.8	88	0	000		29.90				FM-15		30.10
01	2255	7	CLR:00	10.00		50	10.0	48	8.9	46	7.8	88	0	000		29.90				FM-15		30.10
01	2315	7	CLR:00	10.00		50	10.0	48	8.9	46	7.8	88	0	000		29.90				FM-15		30.10
01	2335	7	CLR:00	10.00		48	8.9	47	8.3	46	7.8	94	0	000		29.89				FM-15		30.09
01	2355	7	CLR:00	10.00		46	7.8	46	7.8	46	7.8	100	0	000		29.89				FM-15		30.09
02	0015	7	CLR:00	10.00		46	7.8	46	7.8	45	7.2	93	0	000		29.89				FM-15		30.09
02	0035	7	CLR:00	10.00		46	7.8	46	7.8	45	7.2	93	0	000		29.89				FM-15		30.09
02	0055	7	CLR:00	10.00		46	7.8	46	7.8	46	7.8	100	0	000		29.88				FM-15		30.08
02	0115	7	CLR:00	10.00		45	7.2	45	7.2	45	7.2	100	0	000		29.88				FM-15		30.08
02	0135	7	CLR:00	10.00		45	7.2	45	7.2	45	7.2	100	0	000		29.88				FM-15		30.08
02	0155	7	CLR:00	10.00		45	7.2	44	6.7	43	6.1	93	0	000		29.88				FM-15		30.08
02	0215	7	CLR:00	10.00		45	7.2	45	7.2	45	7.2	100	0	000		29.87				FM-15		30.07
02	0235	7	CLR:00	10.00		45	7.2	45	7.2	45	7.2	100	0	000		29.88				FM-15		30.08
02	0255	7	CLR:00	10.00		45	7.2	45	7.2	45	7.2	100	0	000		29.87				FM-15		30.07
02	0315	7	CLR:00	10.00		45	7.2	41	5.0	36	2.2	71	0	000		29.87				FM-15		30.07

02	0335	7	CLR:00	10.00		45	7.2	41	5.0	36	2.2	71	0	000		29.87				FM-15		30.07
02	0355	7	CLR:00	10.00		45	7.2	41	5.0	37	2.8	76	0	000		29.88				FM-15		30.08
02	0415	7	CLR:00	10.00		46	7.8	45	7.2	43	6.1	87	0	000		29.88				FM-15		30.08
02	0435	7	CLR:00	10.00		46	7.8	46	7.8	46	7.8	100	0	000		29.87				FM-15		30.07
02	0455	7	CLR:00	10.00		48	8.9						0	000		29.88				FM-15		30.08
02	0515	7	CLR:00	10.00		48	8.9	41	5.0	32	0.0	54	0	000		29.88				FM-15		30.08
02	0535	7	CLR:00	10.00		48	8.9						0	000		29.87				FM-15		30.07
02	0659	7	BKN:07 95	10.00		55	12.8	54	12.2	54	12.2	94	0	000		29.87				FM-15		30.07
02	0756	7	SCT:04 120	10.00		63	17.2	57	13.9	52	11.1	68	0	000		29.86				FM-15		30.06
02	0850	7	BKN:07 120	10.00		64	17.8	57	13.9	52	11.1	64	6	220		29.86				FM-15		30.06
02	0945	7	BKN:07 120	10.00		64	17.8	57	13.9	52	11.1	64	7	250		29.83				FM-15		30.03
02	1050	7	BKN:07 120	10.00		70	21.1	60	15.6	52	11.1	53	7	250		29.82				FM-15		30.02
02	1145	7	OVC:08 90	10.00		70	21.1	57	13.9	46	7.8	43	13	300		29.80				FM-15		30.00
02	1245	7	OVC:08 90	10.00		72	22.2	58	14.4	46	7.8	41	11	250		29.77				FM-15		29.97
02	1353	7	OVC:08 80	10.00		72	22.2	59	15.0	48	8.9	44	6	270		29.74				FM-15		29.94
02	2135	7	SCT:04 70	10.00									3	160		29.64				FM-15		29.84
02	2155	7	SCT:04 85	10.00									0	000		29.64				FM-15		29.84
02	2215	7	SCT:04 85	10.00									0	000		29.63				FM-15		29.83
02	2235	7	SCT:04 85	10.00									0	000		29.62				FM-15		29.82
02	2255	7	SCT:04 55 SCT:04 75 BKN:07 85	10.00									0	000		29.61				FM-15		29.81
02	2315	7	SCT:04 55 BKN:07 65 BKN:07 85	10.00	VCTS:7 ||								0	000		29.60				FM-15		29.80
02	2335	6	SCT:04 48 BKN:07 95 OVC:08 120	7.00	* * |* |*								5	200		29.59				FM-15	0.03	29.79
02	2355	7	SCT:04 50 SCT:04 95 BKN:07 120	10.00									0	000		29.58				FM-15		29.78
03	0015	7	BKN:07 50 OVC:08 110	10.00	-RA:02 |RA |RA								0	000		29.59				FM-15		29.79
03	0035	7	BKN:07 50 OVC:08 70	10.00									0	000		29.58				FM-15		29.78
03	0055	7	OVC:08 60	10.00	-RA:02 |RA |RA								5	170		29.55				FM-15		29.75
03	0115	6	OVC:08 60	10.00	* * |* |*								3	170		29.53				FM-15		29.73
03	0135	6	OVC:08 60	5.00	* * |* |*								0	000		29.52				FM-15	0.08	29.72
03	0155	7	SCT:04 25 SCT:04 43 OVC:08 60	2.00V	TS:7 -RA:02 |RA TS TS |RA								5	360		29.54				FM-15	0.01	29.74
03	0215	7	SCT:04 17 SCT:04 28 OVC:08 60	2.00V	TS:7 +RA:02 |RA TS TS |RA								0	000		29.53				FM-15	0.08	29.73
03	0235	7	SCT:04 15 SCT:04 34 OVC:08 60	2.00V	VCTS:7 RA:02 |RA TS |RA								0	000		29.52				FM-15	0.18	29.72
03	0255	7	OVC:08 60	7.00	TS:7 -RA:02 |RA TS TS |RA								0	000		29.53				FM-15		29.73
03	0315	7	SCT:04 3 OVC:08 60	7.00	VCTS:7 ||								0	000		29.54				FM-15	0.01	29.74
03	0335	7	SCT:04 60	4.00	HZ:7 |FU |HZ								3	190		29.52				FM-15	0.01	29.72
03	0355	7	SCT:04 75	4.00	HZ:7 |FU |HZ								0	000		29.51				FM-15		29.71
03	0415	7	SCT:04 75	5.00	HZ:7 |FU |HZ								3	170		29.50				FM-15		29.70
03	0435	7	CLR:00	5.00	HZ:7 |FU |HZ								3	180		29.50				FM-15		29.70
03	0455	7	CLR:00	5.00	HZ:7 |FU |HZ								0	000		29.49				FM-15		29.69
03	0515	7	CLR:00	4.00	HZ:7 |FU |HZ								0	000		29.49				FM-15		29.69
03	0535	7	CLR:00	7.00									0	000		29.49				FM-15		29.69
03	0652	7	SCT:04 60	10.00		64	17.8	63	17.2	63	17.2	94	6	240		29.49				FM-15		29.69
03	0749	7	*	10.00		68	20.0	65	18.3	63	17.2	83	8	220		29.47				FM-15		29.67
03	0849	7	BKN:07 250	10.00		70	21.1	67	19.4	66	18.9	88	5	180		29.45				FM-15		29.65

03	0950	7	BKN:07 250	10.00		77	25.0	71	21.7	68	20.0	74	7	260		29.44				FM-15		29.64
03	1045	7	BKN:07 100	10.00		75	23.9	70	21.1	68	20.0	78	8	250		29.44				FM-15		29.64
03	1145	7	BKN:07 100	10.00		77	25.0	71	21.7	68	20.0	74	9	260		29.46				FM-15		29.66
03	1250	7	BKN:07 100	10.00		70	21.1	70	21.1	70	21.1	100	3	030		29.41				FM-15		29.61
03	1345	7	BKN:07 100	10.00		73	22.8	71	21.7	70	21.1	89	18	280	22	29.44				FM-15		29.64
03	1445	4		10.00		77	25.0			68	20.0	74	11	280	17					FM-15		29.63
03	1446	7	FEW:02 100	10.00		77	25.0	71	21.7	68	20.0	74	11	280	17	29.43				FM-15		29.63
03	2135	7	BKN:07 2	0.50	FG:2 |FG |								0	000		29.52				FM-15		29.72
03	2155	7	BKN:07 2 BKN:07 47	0.75	BR:1 ||								0	000		29.52				FM-15		29.72
03	2215	7	SCT:04 2	1.25	BR:1 ||								0	000		29.52				FM-15		29.72
03	2235	7	SCT:04 2 BKN:07 60	0.75	BR:1 ||								0	000		29.53				FM-15		29.73
03	2255	7	OVC:08 2	0.25	FG:2 |FG |								0	000		29.54				FM-15		29.74
03	2315	7	OVC:08 2	0.25	FG:2 |FG |								0	000		29.54				FM-15		29.74
03	2335	7	OVC:08 2	0.25	FG:2 |FG |								0	000		29.54				FM-15		29.74
03	2355	7	OVC:08 2	0.25	FG:2 |FG |								0	000		29.55				FM-15		29.75
04	0015	7	OVC:08 2	0.25	FG:2 |FG |								0	000		29.55				FM-15		29.75
04	0035	7	OVC:08 2	0.50	FG:2 |FG |								0	000		29.56				FM-15		29.76
04	0055	7	OVC:08 2	0.50	FG:2 |FG |								0	000		29.56				FM-15		29.76
04	0115	7	OVC:08 2	0.50	FG:2 |FG |								0	000		29.56				FM-15		29.76
04	0135	7	OVC:08 2	0.25	FG:2 |FG |								0	000		29.57				FM-15		29.77
04	0155	7	OVC:08 2	0.25	FG:2 |FG |								0	000		29.56				FM-15		29.76
04	0215	7	OVC:08 2	1.00	BR:1 ||								0	000		29.57				FM-15		29.77
04	0235	7	SCT:04 2	2.50V	BR:1 ||								0	000		29.57				FM-15		29.77
04	0255	7	OVC:08 2	0.75	BR:1 ||								0	000		29.57				FM-15		29.77
04	0315	7	OVC:08 2	0.50	FG:2 |FG |								0	000		29.58				FM-15		29.78
04	0335	7	OVC:08 2	0.50	FG:2 |FG |								0	000		29.59				FM-15		29.79
04	0355	7	BKN:07 2	2.50	BR:1 ||								0	000		29.59				FM-15		29.79
04	0415	7	OVC:08 2	0.75	BR:1 ||								0	000		29.61				FM-15	0.01	29.81
04	0435	7	OVC:08 2	1.25	BR:1 ||								0	000		29.61				FM-15	0.01	29.81
04	0455	7	OVC:08 2	0.50	FG:2 |FG |								0	000		29.62				FM-15		29.82
04	0515	7	BKN:07 2	5.00	HZ:7 |FU |HZ								0	000		29.63				FM-15		29.83
04	0535	7	SCT:04 2	3.00	BR:1 ||								0	000		29.63				FM-15		29.83
04	0649	7	*	10.00		68	20.0	68	20.0	68	20.0	100	0	000		29.66				FM-15		29.86
04	0749	7	SCT:04 250	10.00		75	23.9	73	22.8	72	22.2	89	0	000		29.67				FM-15		29.87
04	0850	6	SCT:04 250	10.00		79	26.1	70	21.1	66	18.9	65	3	260		29.69				FM-15		29.89
04	0945	6	SCT:04 250	10.00		81	27.2	71	21.7	66	18.9	62	7	260	18	29.69				FM-15		29.89
04	1055	7	SCT:04 250	10.00		81	27.2	67	19.4	59	15.0	48	8	280		29.70				FM-15		29.90
04	1150	7	SCT:04 250	10.00		81	27.2	69	20.6	63	17.2	54	7	260		29.70				FM-15		29.90
04	1250	7	SCT:04 250	10.00		82	27.8	70	21.1	63	17.2	51	11	190		29.68				FM-15		29.88
04	1355	7	SCT:04 250	10.00		84	28.9	68	20.0	59	15.0	43	9	240		29.68				FM-15		29.88
04	2135	7	CLR:00	10.00									0	000		29.70				FM-15		29.90
04	2155	7	SCT:04 120	10.00	-RA:02 |RA |RA								3	060		29.69				FM-15		29.89
04	2215	7	SCT:04 80 SCT:04 110	10.00	VCTS:7 ||								0	000		29.70				FM-15		29.90
04	2235	7	BKN:07 80 BKN:07 110	10.00	-RA:02 |RA |RA								6	290		29.70				FM-15		29.90
04	2255	7	BKN:07 65 BKN:07 70 OVC:08 90	10.00	-RA:02 |RA |RA								7	290		29.71				FM-15		29.91
04	2315	7	SCT:04 26 BKN:07 55 OVC:08 70	4.00	VCTS:7 RA:02 |RA TS |RA								10	270		29.72				FM-15	0.16	29.92
04	2335	7	BKN:07 55 OVC:08 70	5.00	RA:02 |RA |RA								3	250		29.73				FM-15	0.21	29.93
04	2355	7	SCT:04 50 BKN:07 65 OVC:08 110	5.00	RA:02 |RA |RA								0	000		29.70				FM-15	0.01	29.90

05	0015	7	SCT:04 70 SCT:04 90 BKN:07 120	7.00	-RA:02 |RA |RA								0	000		29.70				FM-15	0.02	29.90
05	0035	7	OVC:08 120	5.00	HZ:7 |FU |HZ								0	000		29.69				FM-15	0.02	29.89
05	0055	7	OVC:08 110	10.00									0	000		29.69				FM-15		29.89
05	0115	7	SCT:04 4 OVC:08 120	10.00									5	220		29.69				FM-15		29.89
05	0135	7	BKN:07 6 BKN:07 90 BKN:07 120	10.00									3	210		29.69				FM-15		29.89
05	0155	7	SCT:04 7 SCT:04 17 BKN:07 90	7.00	-RA:02 |RA |RA								3	220		29.69				FM-15		29.89
05	0215	7	SCT:04 8 BKN:07 100 OVC:08 120	10.00	-RA:02 |RA |RA								0	000		29.70				FM-15	0.01	29.90
05	0235	7	SCT:04 8 BKN:07 70 OVC:08 110	10.00									0	000		29.70				FM-15	0.01	29.90
05	0255	7	BKN:07 8 BKN:07 70 OVC:08 85	7.00	-RA:02 |RA |RA								0	000		29.70				FM-15		29.90
05	0315	7	BKN:07 10 BKN:07 13 OVC:08 19	10.00									0	000		29.69				FM-15		29.89
05	0335	7	SCT:04 8 BKN:07 13 OVC:08 110	10.00									0	000		29.68				FM-15		29.88
05	0355	7	SCT:04 10 SCT:04 18 BKN:07 110	4.00	HZ:7 |FU |HZ								0	000		29.67				FM-15		29.87
05	0415	7	BKN:07 14 BKN:07 120	4.00	HZ:7 |FU |HZ								0	000		29.65				FM-15		29.85
05	0435	7	BKN:07 14 OVC:08 120	3.00	BR:1 ||								0	000		29.65				FM-15		29.85
05	0455	7	SCT:04 12 SCT:04 120	4.00	HZ:7 |FU |HZ								0	000		29.65				FM-15		29.85
05	0515	7	BKN:07 120	4.00	HZ:7 |FU |HZ								5	090		29.64				FM-15		29.84
05	0535	7	BKN:07 12 BKN:07 17 OVC:08 110	5.00	-RA:02 |RA |RA								3	200		29.69				FM-15		29.89
05	0655	7	SCT:04 8 OVC:08 17	10.00		72	22.2	72	22.2	72	22.2	100	7	230		29.72				FM-15		29.92
05	0755	7	OVC:08 10	7.00		72	22.2	72	22.2	72	22.2	100	5	270		29.73				FM-15		29.93
05	0845	7	OVC:08 10	7.00		73	22.8	73	22.8	73	22.8	100	6	230		29.72				FM-15		29.92
05	0946	7	BKN:07 12 OVC:08 19	10.00		73	22.8	72	22.2	72	22.2	94	7	220		29.72				FM-15		29.92
05	1051	7	BKN:07 16 OVC:08 23	10.00		77	25.0	74	23.3	72	22.2	83	8	230		29.73				FM-15		29.93
05	1145	7	BKN:07 16 OVC:08 23	10.00		77	25.0	74	23.3	73	22.8	89	9	230		29.73				FM-15		29.93
05	1245	4		10.00		77	25.0			72	22.2	83	7	230						FM-15		29.91
05	1250	7	BKN:07 16 OVC:08 80	10.00	RA:02 |RA |RA RA	77	25.0	74	23.3	72	22.2	83	7	230		29.71				FM-15		29.91
05	1345	7	BKN:07 12 OVC:08 80	6.00	RA:02 |RA |RA RA	77	25.0	74	23.3	72	22.2	83	5	300		29.70				FM-15		29.90
05	2135	7	SCT:04 6 SCT:04 21 BKN:07 120	5.00	-RA:02 |RA |RA	72	22.2	69	20.6	68	20.0	88	0	000		29.67				FM-15		29.87
05	2155	7	SCT:04 30 SCT:04 65 BKN:07 110	7.00	-RA:02 |RA |RA	72	22.2	69	20.6	68	20.0	88	0	000		29.67				FM-15		29.87
05	2215	7	SCT:04 8 OVC:08 30	5.00	RA:02 |RA |RA	72	22.2	69	20.6	68	20.0	88	0	000		29.67				FM-15	0.01	29.87

05	2235	7	BKN:07 8 BKN:07 30 OVC:08 100	2.50	* * |* |*	72	22.2	69	20.6	68	20.0	88	0	000		29.67				FM-15	0.08	29.87
05	2255	7	SCT:04 6 SCT:04 27 BKN:07 110	5.00	-RA:02 |RA |RA	72	22.2	69	20.6	68	20.0	88	0	000		29.66				FM-15		29.86
05	2315	7	SCT:04 120	3.00	-RA:02 |RA |RA	72	22.2	69	20.6	68	20.0	88	0	000		29.65				FM-15	0.01	29.85
05	2335	7	SCT:04 7 SCT:04 70 BKN:07 120	5.00	RA:02 |RA |RA	72	22.2	69	20.6	68	20.0	88	0	000		29.65				FM-15	0.01	29.85
05	2355	7	OVC:08 7	7.00	-RA:02 |RA |RA	72	22.2	69	20.6	68	20.0	88	0	000		29.65				FM-15		29.85

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Local Climatological Data
Hourly Precipitation
June 2020

Generated on 06/22/2020

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 187 ft. Lat: 40.8000° N Lon: -74.4167° W
Station: **MORRISTOWN, NJ US WBAN: 72409754738 (KMMU)**

Date	For Hour (LST) Ending at																							Date
	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	NOON	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	MID	
01	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	01
02	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	02
03	M	0.01	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	03
04	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	0.01	04
05	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	05
06	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	06
07	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	07
08	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	08
09	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	09
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	10
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	11
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	12
13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	13
14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	14
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	15
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	16
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	17
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	18
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	19
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	20
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	21

Maximum Short Duration Precipitation

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (inches)												
Ending Date Time (yyyy-mm-dd hh:mi)												

Hourly, daily, and monthly totals on the Daily Summary page and the Hourly Precipitation Table are shown as reported by the instrumentation at the site. However, NWS does not edit hourly values for its ASOS sites, but may edit the daily and monthly totals for selected sites which will be reflected on the Daily Summary page.

T = Trace
s = Suspect
* = Erroneous
blank = No precipitation observed
M = Missing

ATTACHMENT E

Acoustic Results Tables
Acoustic File Spectrogram Screen Shots

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

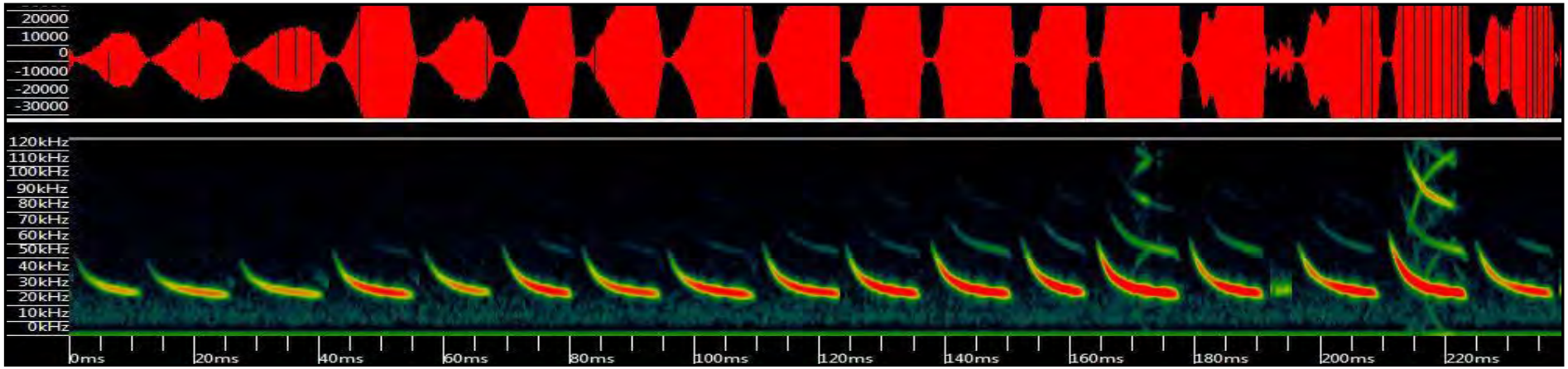
Table 1: Output results for Site 1 from Kaleidoscope V 5.1.0 for recordings collected with the Wildlife Acoustics SM4BAT FS at the Hurstmont Redevelopment Site in the Township of Harding, Morris County New Jersey. Significant maximum-likelihood estimator (MLE) of <0.05, are highlighted in green, while non-significant MLE values are highlighted in gray. Above each MLE value is the number of call files identified as each species.

Software	Adjusted Date		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	MYSO	PESU	NOID	Empty/ Noise
Kaleidoscope	24-May-20	# of Call Files	48	74	0	27	0	9	0	0	18	45	6
		MLE Value	0	0	1	1.00E-07	1	1	1	1	0		
	25-May-20	# of Call Files	74	44	12	21	0	5	0	1	8	54	11
		MLE Value	0	0	0.004305	0.048622	1	1	1	0.582613	0.000757		
	26-May-20	# of Call Files	112	79	14	49	0	4	0	0	8	55	14
		MLE Value	0	0	0.048683	0	1	1	1	1	0.016017		
	27-May-20	# of Call Files	105	46	18	32	0	6	1	1	4	49	9
		MLE Value	0	0	0.000125	0.002961	1	0.999892	0.088094	0.664987	0.214484		

Table 2: Output results for Site 2 from Kaleidoscope V 5.1.0 for recordings collected with the Wildlife Acoustics SM4BAT FS at the Hurstmont Redevelopment Site in the Township of Harding, Morris County New Jersey. Significant maximum-likelihood estimator (MLE) of <0.05, are highlighted in green, while non-significant MLE values are highlighted in gray. Above each MLE value is the number of call files identified as each species.

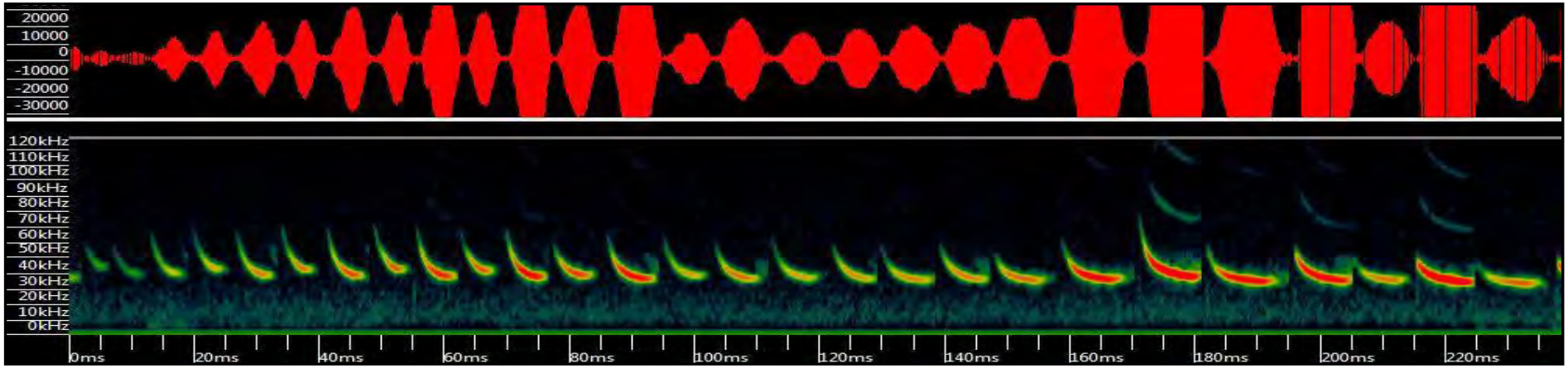
Software	Adjusted Date		EPFU	LABO	LACI	LANO	MYLE	MYLU	MYSE	MYSO	PESU	NOID	Empty/ Noise
Kaleidoscope	1-Jun-20	# of Call Files	72	26	8	15	0	0	0	0	3	20	4
		MLE Value	0	0	0.106149	0.381953	1	1	1	1	0.147769		
	2-Jun-20	# of Call Files	53	26	21	18	0	2	0	0	5	16	5
		MLE Value	0	0	0.163760	1	1	1	1	1	0.007886		
	3-Jun-20	# of Call Files	133	43	236	94	0	2	0	0	6	88	14
		MLE Value	0	0	0	0.012806	1	1	1	1	0.011386		
	4-Jun-20	# of Call Files	113	42	64	89	0	2	0	0	2	46	11
		MLE Value	0	0	0	0	1	1	1	1	0.811536		

1



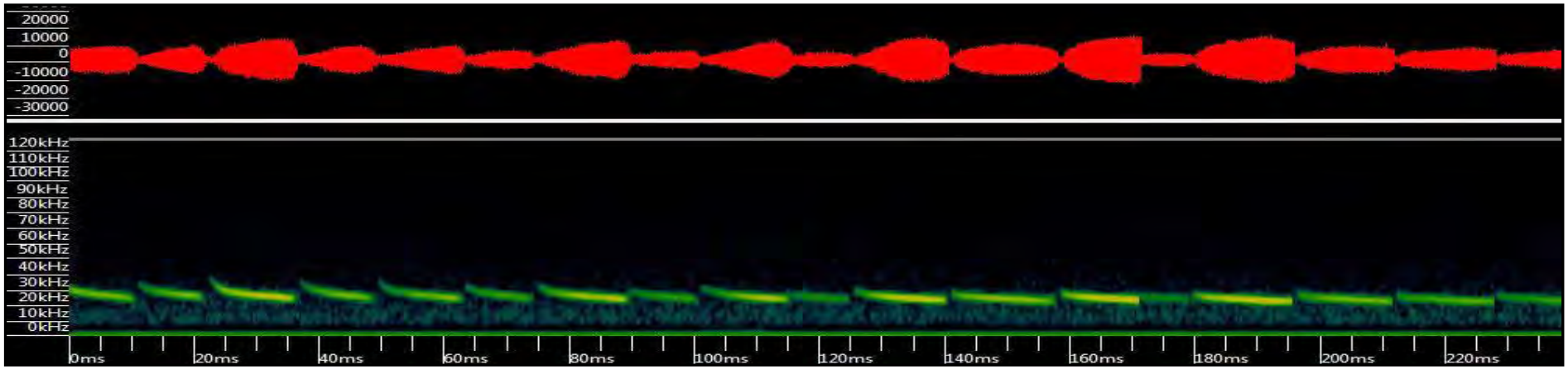
Representative spectrogram in compressed view of EPFU (*Eptesicus fuscus)* collected on site 1 at Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on May 26, 2020 using Wildlife Acoustic SM4BAT-FS.

2



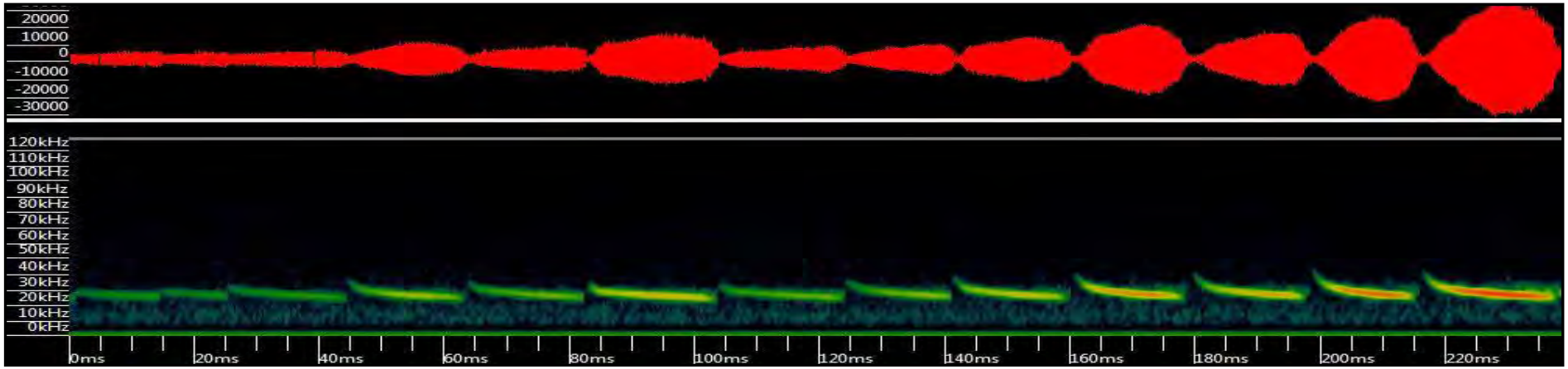
Representative spectrogram in compressed view of LABO (*Lasiurus borealis)* collected on site 1 at Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on May 24, 2020 using Wildlife Acoustic SM4BAT-FS.

3



Representative spectrogram in compressed view of LACI (*Lasiurus cinereus*) collected on site 1 at Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on May 25, 2020 using Wildlife Acoustic SM4BAT-FS.

4



Representative spectrogram in compressed view of LANO (*Lasionycteris noctivagans*) collected on site 1 at Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on May 27, 2020 using Wildlife Acoustic SM4BAT-FS.

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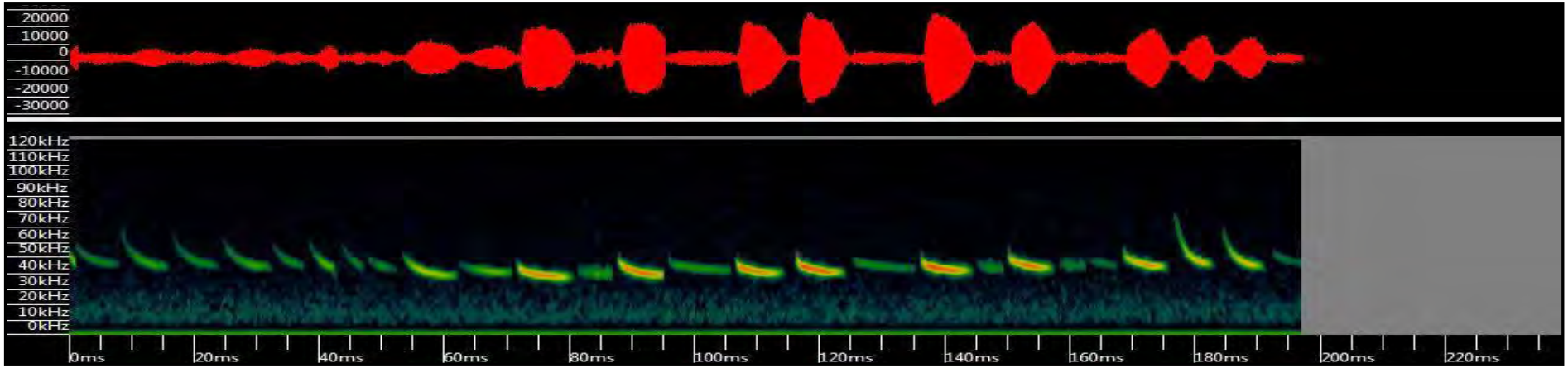
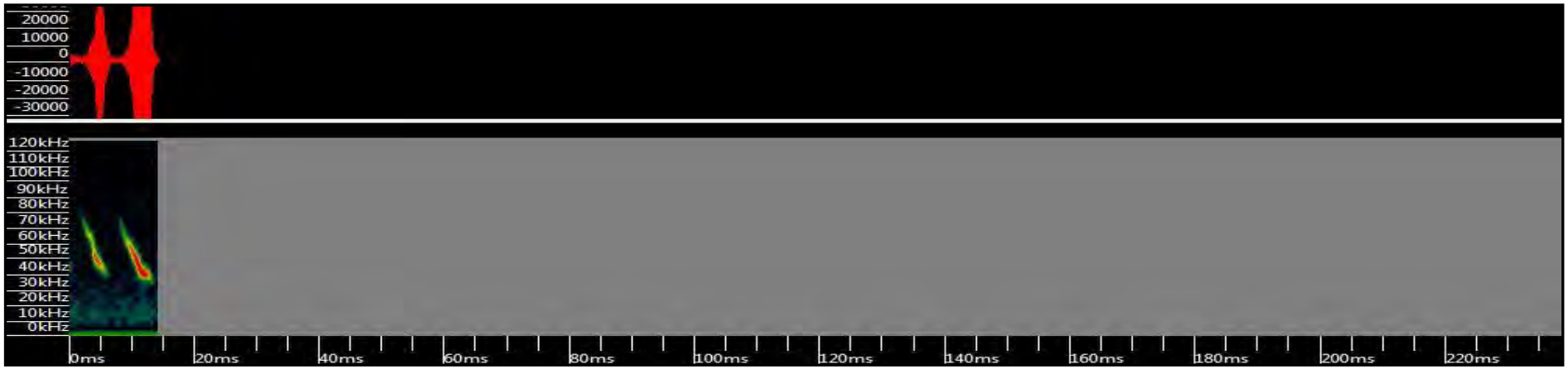
5



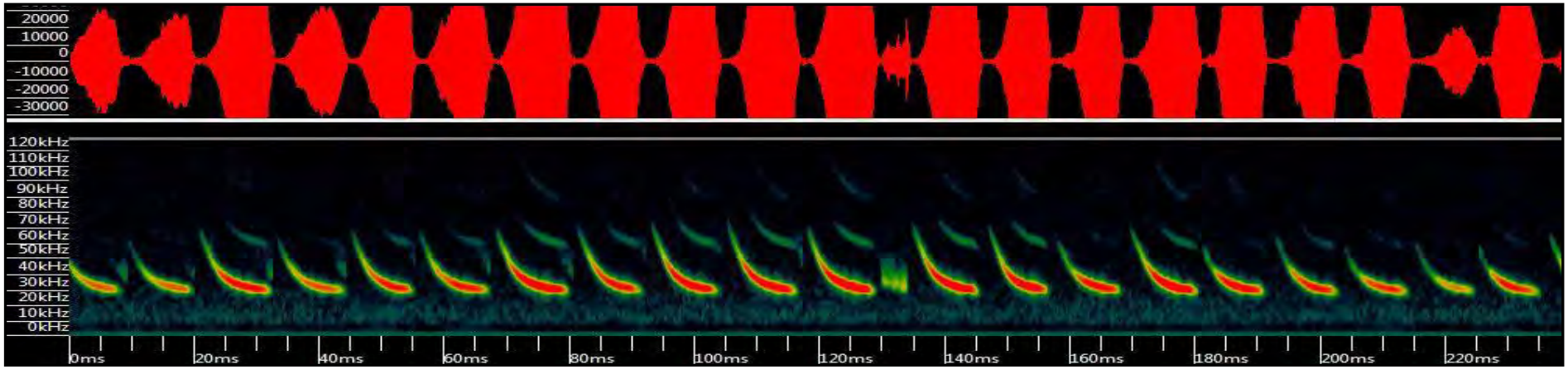
Representative spectrogram in compressed view of PESU (*Perimyotis subflavus*) collected on site 1 at Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on May 24, 2020 using Wildlife Acoustic SM4BAT-FS.

6



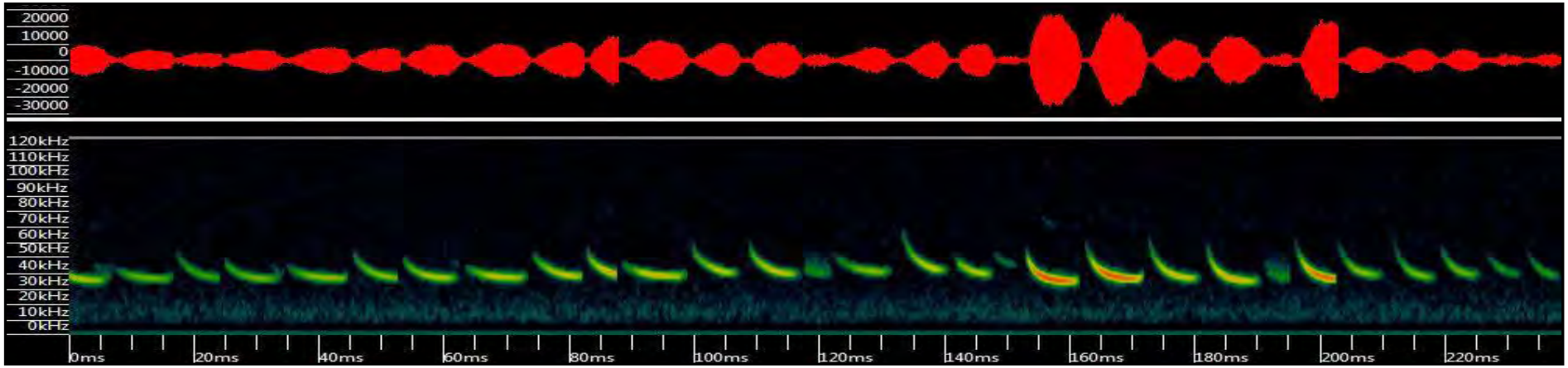
spectrogram in compressed view of the file identified as MYSE (*Myotis septentrionalus*) collected at site 1 at the Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on May 27, 2020 using Wildlife Acoustic SM4BAT-FS. This call is comprised of two low quality two pulses that lack harmonics with a bandwidth between 33 and 36 kHz. Typical MYSE pulses have a 90 kHz bandwidth. The pulses also have a varying characteristic frequencies (Fcs) (41 and 41 kHz, respectively) with a maximum frequency (Fmax) of 74 kHz. Typical MYSE calls have a 43± kHz Fc with 120 Fmax, typically reach 100 kHz with pronounced toes. The pulses in this recording lack a distinct pronounced toe. Overall, this call lacks the diagnostic tools needed to confirm presence of MYSE (e.g. greater than 2 pulses and harmonics) and the Fc and Fmax are low for MYSE calls. As such, this call could not confirm the presence of MYSE.

7



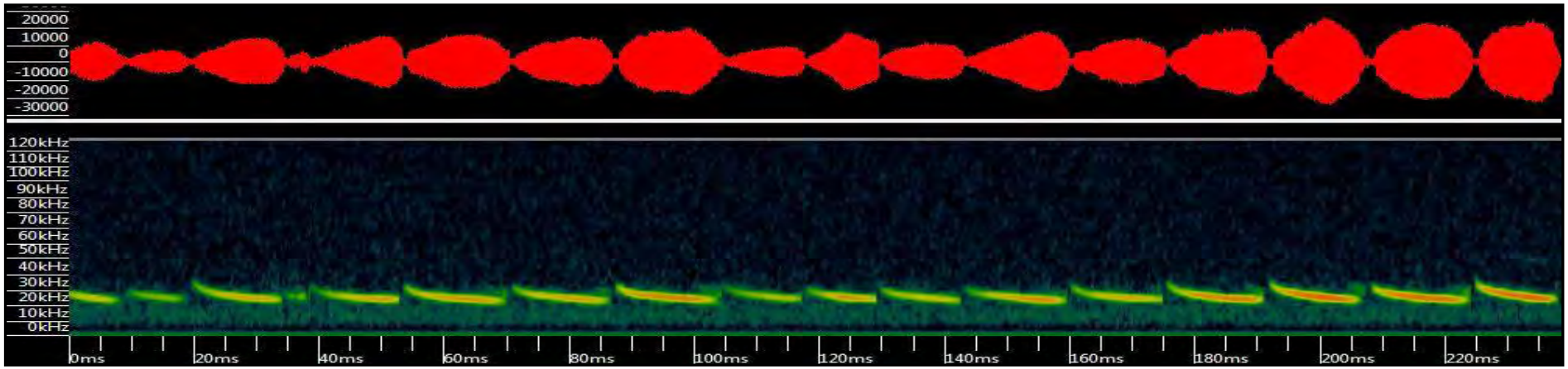
Representative spectrogram in compressed view of EPFU collected on site 2 at Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on June 3, 2020 using Wildlife Acoustic SM4BAT-FS

8



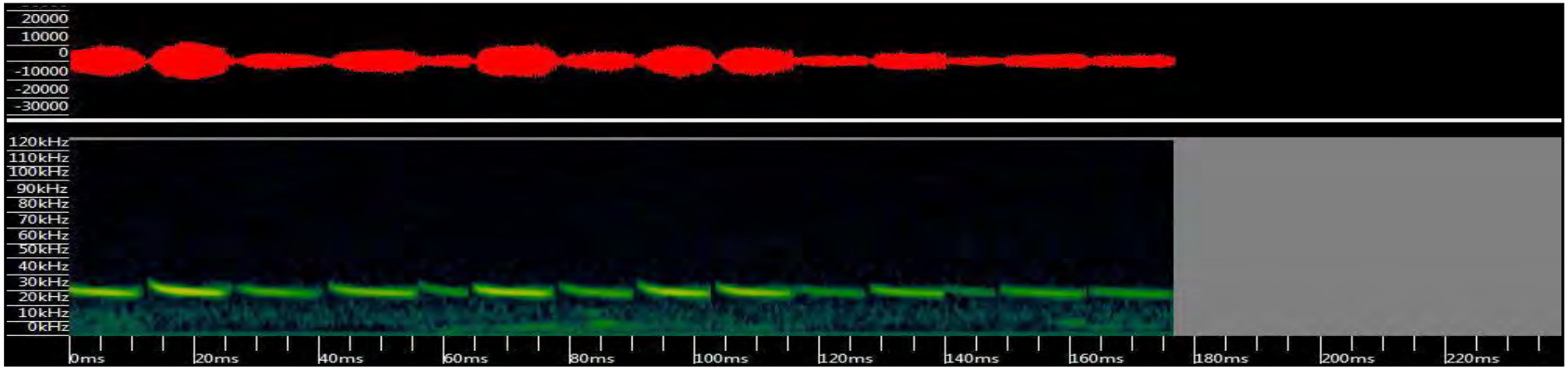
Representative spectrogram in compressed view of LABO collected on site 2 at Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on June 6, 2020 using Wildlife Acoustic SM4BAT-FS.

9



Representative spectrogram in compressed view of LACI collected on site 2 at Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on June 6, 2020 using Wildlife Acoustic SM4BAT-FS.

10



Representative spectrogram in compressed view of LANO collected on site 2 at Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on June 5, 2020 using Wildlife Acoustic SM4BAT-FS.

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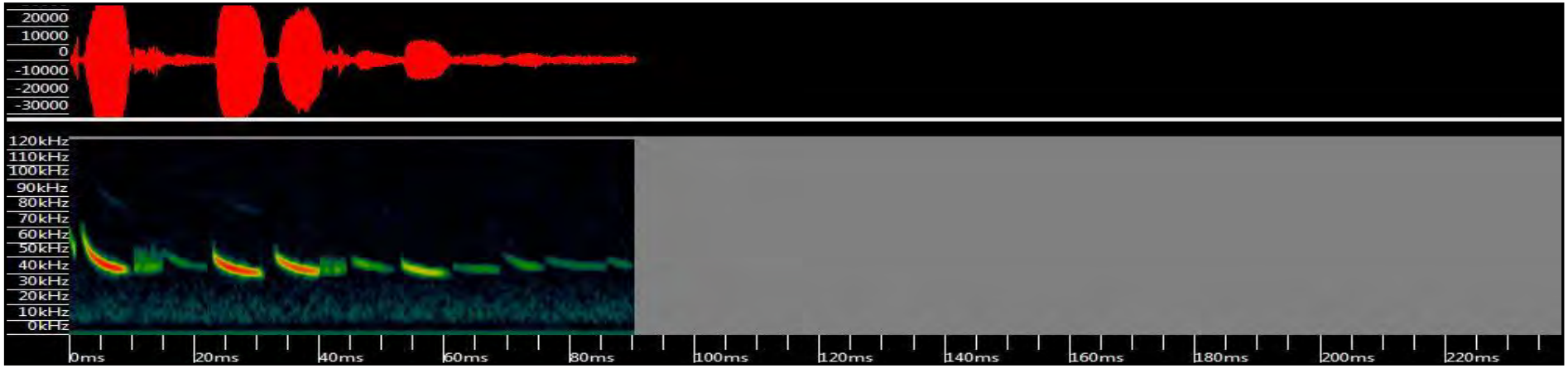
11



Representative spectrogram in compressed view of PESU collected on site 2 at Hurstmont Redevelopment Area, in the Township of Harding, Morris County, NJ on June 2, 2020 using Wildlife Acoustic SM4BAT-FS.

ATTACHMENT F

Qualifications of Preparers

EcolSciences, Inc.
Environmental Management & Regulatory Compliance

LAURA NEWGARD

EDUCATION:	*M.S., 1984 - Wildlife and Fisheries Sciences* *Texas A & M University* *B.S., 1982 - Forestry/Wildlife Management* *Purdue University*
AREAS OF EXPERTISE:	*Wildlife Ecology* *Wetlands and Terrestrial Ecology* *Rare Species Surveys and Construction Monitoring* *Environmental Impact Assessment and Mitigation Planning*
PROFESSIONAL CERTIFICATION:	*Certified Wildlife Biologist (CWB)* *Professional Wetland Scientist (PWS)* *Recognized Qualified Bog Turtle Surveyor; New York, Pennsylvania and New Jersey (USFWS) Phase 1, 2, and 3 (trapping)* *Recognized Qualified Indiana/Northern long-eared Bat Surveyor (USFWS)* *NJDEP qualified Venomous Snake Monitor (Tertiary)* *NJDEP qualified Wood Turtle Monitor* *Threatened and Endangered Species in New Jersey: Regulations, Identification and Assessment - Rutgers University* *BCI Bat Conservation and Management Workshop* *Interagency Coordination for Endangered Species (USFWS)* *Federal Manual for Identifying and Delineating Wetlands*
OTHER:	*Northeast Partnership in Reptile and Amphibian Conservation (NEPARC)* *Northeast Bat Working Group (NEBWG)* *Sparta Township Environmental Commission - Co-Chairman* *USFWS Adopt-a-Swamp Pink Population Volunteer* *NJDEP Bog Turtle Survey and Trapping Volunteer* *NJ Venomous Snake Response Team (NJDEP) Volunteer* *USFWS/NJDEP Bat Mist Net Survey Volunteer* *PA Chapter of the Nature Conservancy Bog Turtle Volunteer*

EXPERIENCE:

Ms. Newgard is a Certified Wildlife Biologist and Vice President with EcolSciences, Inc. Her expertise lies in the identification and evaluation of land for the presence/absence of rare wildlife and plant resources, including habitat assessments and species specific surveys; and providing guidance on the preservation and protection of these terrestrial, wetland, and aquatic ecosystem through environmental planning and construction monitoring.

Ms. Newgard's responsibilities include: wildlife and plant surveys; threatened and endangered species studies; delineating wetland systems based on the Federal "three-parameter" methodology; the preparation of wetland and habitat mitigation plans to compensate for unavoidable disturbances to natural systems; and preparation of environmental impact assessments. Ms. Newgard has conducted threatened and endangered species surveys at the request of the United State Environmental Protection Agency (USEPA), New Jersey Department of Environmental Protection (NJDEP), United States Fish and Wildlife Service (USFWS), National Park Service (NPS), New York State Department of Environmental Conservation (NYSDEC), and New York City Department of Environmental Protection (NYSDEP). In addition, Ms. Newgard has been involved with permit acquisition including Individual and Nationwide Permits from the Army Corp of Engineers and wetland permits from NJDEP and NYSDEC.

A summary of relevant project experience accumulated over the last several years includes:

- Design, manage, and conduct wildlife habitat studies and threatened and endangered species surveys for numerous wildlife species, including; bog turtle, Indiana bat, northern long-eared bat, grasshopper sparrow, short-ear owl, long-ear owl, wood turtle, long-tailed salamander, blue-spotted salamander, pine snake, pine barren's tree frog, southern gray tree frog, northern cricket frog, timber rattlesnakes, Northern copperhead, red-shouldered hawk, barred owl, Coopers hawk, goshawk, bobcat, and bald eagle. These studies provided comprehensive wildlife lists inhabiting a site, identified extent and potential habitat communities, and identified or confirmed the absence of rare species and their suitable habitat on 100s of sites throughout New York and New Jersey. Select studies include telemetry surveys for wood turtles and pine snakes; trapping for bog turtle and northern pine snake; vernal habitat surveys, migration studies, design, enhancement, restoration; and drift fences and pitfall traps for reptiles and amphibians.

Selected sites include:

- ***500-acre recreation amusement park development****:* Threatened and endangered species wildlife habitat assessment, Northern cricket frog survey, Phase 1 bog turtle surveys, Indiana and Northern long-eared bat acoustic surveys, USFWS Biologic Assessment (BA) Orange County, New York.
- ***Multiple Community Solar Projects****:* Threatened and endangered species habitat assessments and surveys, including wintering raptors, bog turtle Phase 1, Indiana and Northern long-eared bat acoustic surveys. Orange County, New York.
- ***250-mile utility alignment:*** Phase 1 and Phase 2 bog turtle surveys. York, Adams, and Franklin Counties, Pennsylvania.
- ***44-mile above-ground utility alignment:*** Phase 1 and Phase 2 bog turtle surveys, Wood turtle surveys, timber rattlesnake den, basking, and gestation surveys, vernal habitat surveys, Indiana bat mist net surveys, timber rattlesnake, northern copperhead, and wood turtle construction monitoring, vernal habitat restoration and creation plans. Morris and Sussex Counties, New Jersey.
- ***20-mile above ground utility alignment:*** Phase 1 and Phase 2 bog turtle surveys, Indiana bat mist summer mist net surveys, bog turtle habitat restoration, construction monitoring, radio telemetry surveys for bog turtle and Indiana/Northern long-eared bats, blue-spotted salamander surveys. Morris County, New Jersey.
- ***16 – mile and 8 – mile pipeline easements:*** Phase 1 and Phase 2 bog turtle surveys, wood turtle surveys, wood turtle hibernacula surveys, wood turtle, bog turtle, and timber rattlesnake construction monitoring. Sussex and Passaic Counties, New Jersey.
- ***2,000-acre mixed use development site:*** Timber rattlesnake and copperhead den surveys, Indiana bat mist net/acoustic surveys, vernal habitat surveys, marbled salamander pitfall trap migration surveys. Rockland and Orange Counties, New York.
- ***3,200-acre mixed use development site:*** Phase 1 and Phase 2 bog turtle surveys, small whorled Pogonia Surveys.
- **2006-2008**: Tobyhanna and Monroe Counties, Pennsylvania.
- **200-*acre redevelopment site*** (bog turtle Phase 1 surveys, timber rattlesnake habitat assessment/den emergent surveys, cricket frog survey)

- **2014:** Sterling Forest, New York.
- **6-mile and 8-mile pipeline project** (Indiana bat/Northern Long eared bat habitat assessment)
- **2014- 2015**: Somerset, Mercer, and Hunterdon Counties, New Jersey.

- Design, manage, and conduct vegetative inventories and threatened and endangered species surveys for several plant species, including; swamp pink, Kneiskern's beaked-rush, curly-grass fern, small whorled pogonia, spreading globeflower, little lady tresses, climbing fern, and serpentine aster. These studies also served to confirm the absence of these species and their suitable habitat on certain sites.

- Wetland delineation and impact assessment for numerous commercial and residential development projects throughout New Jersey, New York and Pennsylvania. Reports analyzed site conditions, classified wetlands and were prepared for submission to the appropriate agency.

- Preparation of wetland creation/mitigation reports for commercial and residential projects in which unavoidable disturbances will occur to existing wetland communities. Programs were designed to replace and enhance the system which was to be disturbed through careful site preparation, species composition and planting and monitoring.

- Involvement in Environmental Protection Agency Studies (USEPA), requiring field investigations, extensive literature searches and preparation of technical reports.

Victoria Schaller

EDUCATION:	*Bachelor of Science 2008 – Environmental Studies* *Minor2008 – Chemistry* *East Stroudsburg University; East Stroudsburg, Pennsylvania* *Masters of Science 2012 – Biology: Emphasis in Environmental Management* *East Stroudsburg University; East Stroudsburg, Pennsylvania*
AREAS OF EXPERTISE:	*Threatened and Endangered Species surveys* *Botanical Surveys* *U.S. Army Corp of Engineers Permitting* *New Jersey Department of Environmental Protection Permitting* *Mitigation and Restoration Monitoring*
PROFESSIONAL CERTIFICATIONS AND TRAININGS:	*Bat Acoustic Data Management Workshop – Bat Survey Solutions* *Wetland Delineation Program Certificate – Rutgers University* *Methodology for Delineating Wetlands Certificate – Rutgers University* *Vegetation Identification: Winter – Rutgers University* *40-Hour HAZWOPER course per OHSA 29CFR 1910.120*
PUBLICATION:	Schaller, V.S. (May 11, 2012). *The Effect of Temperature and PH in Relation to the Percent Coverage of the Invasive Common Reed (Phragmites Australis)*. Master's Thesis
CONFERENCES:	2016 North East Bat Working Group Conference, Baltimore, MD Discussions: Current bat research, techniques, and recommendations Regulatory amendments and compliance

EXPERIENCE:

Ms. Schaller is an Environmental Scientist at EcolSciences, Inc. with five years of experience in the field of environmental consulting. As an environmental consultant she has specialized in natural resources, including threatened and endangered species surveys, wetland sciences, vegetative surveying, restoration and mitigation site management, as well as State and Federal regulatory oversight/compliance.

Prior to entering the consulting industry, Ms. Schaller worked in academia and the non-profit sectors. During this time, she specialized in invasive plant species monitoring and management.

A summary of Ms. Schaller's relevant experience is discussed below:

Wildlife Surveys

Utility Right-of-Way, Multiple Locations in New Jersey (Newton, Essex County; Washington and Bridgewater, Morris County; Readington, Hunterdon County; and North Brunswick, Middlesex County)
Acoustic Bat Surveyor/Monitor

- These projects required emergence surveys of danger trees, which required removal. The emergence surveys were performed in consultation and in accordance with the protocols set forth by the US Fish and Wildlife Service.
- The surveys required habitat assessments for Indiana bat and/or northern long-eared bat at each site. This required inspection of the trees to be cleared. The inspections included the determination of species, condition of the tree, and the presence/absence of peeling bark, crevices, and cavities, or other features bats may utilize for roosting. Emergence surveys were then conducted for each tree or those determined to be a potential roost. This activity was performed in compliance with the US Fish and Wildlife protocol.
- During the emergence surveys acoustic data was also collected via Wildlife Acoustics, Inc. Song Meter SM3BAT, Song Meter SM4, and EM3+ acoustic monitors. The information gathered was then culled (reduce non-target species) and analyzed to determine, if possible, the bat species present utilizing Kaleidoscope Pro V3.1.4B and EchoClass Version 3.1 software.
- The species identified during acoustic analysis at multiple sites include included the big brown, eastern red bat, and hoary bat. Several sites also potentially had little brown and eastern small footed bat. One site adjacent to a stream containing several snags had a high probability of having Indiana bat and northern long-eared bat.

10 Acre Development Site, Hopatcong, Sussex County,
Acoustic Bat Monitor

- This project required the analysis of acoustic data collected form the site during emergence surveys that was captured via Wildlife Acoustics, Inc. Song Meter SM3BAT and EM3+ acoustic monitors. The information gathered was then culled (reduce non-target species) and analyzed to determine, if possible, the bat species present utilizing Kaleidoscope Pro V3.1.4B and EchoClass Version 3.1 software. The data analysis methods were in accordance with US Fish and Wildlife Service protocols.
- The species identified during acoustic analysis consisted of the hoary bat and silver-haired bat

East Stroudsburg University Presence/Absence Survey, Monroe and Pike Counties, PA, and Warren and Sussex Counties, NJ
Volunteer Bat Surveyor/Monitor

- The position required field surveys of bat species including capture of individuals and acoustic monitoring at various locations.
- Capture was performed via mist netting. Upon capture, individuals were identified by species, sex, and maturity (i.e. juvenile, mature reproductive, mature non-reproductive, and scrotal male). Upon capture, each individual was assessed for condition, measured and weighed. The following biometrics measurements were taken: length of the ear and tragus, calcar, keel of the tail membrane, rostrum, wing span, length from snout to tail, forearm and leg length, digit and tail length, as well as toe hair length. The condition of maturity was also determined based on reproductive condition (e.g. lactating, non-lactating, nipple condition, scrotal condition), as well as "finger" joint ossification, and uropatagium condition.

- Acoustic monitoring consisted of driving transects and overnight stationary monitoring that were analyzed with SonoBat software. The information gathered was then culled (reduce non-target species) and analyzed to determine, if possible, the bat species present.
- The species captured include the eastern red bat, hoary bat, big brown bat, little brown bat, and eastern small-footed bat. Other species identified during acoustic analysis included the Indiana bat.

Hibernia Mine Fall Swarming Monitoring Project, Mount Hope, Morris County
Volunteer Bat Surveyor/Monitor

- This project required the survey of fall hibernacula swarming activity occurring at the mouth of an abandon mine. The survey required the capture of individuals and acoustic monitoring.
- Capture was performed via harp trapping at the mouth of the mine. Similar biometrics were recorded to that of the above referenced measurements
- Acoustic monitoring consisted of a long term (two week period) stationary survey utilizing Wildlife Acoustic's SM3BAT. A Wildlife Acoustic EM3+ monitor was also used during harp trapping to provide real time recordings. The information gathered was then culled (reduce non-target species) and analyzed to determine, if possible, the bat species present utilizing the Wildlife Acoustic Kaleidoscope V3.1.4B software.
- The harp trap caught Indiana bats (17 individuals) in one monitoring period. Other species identified during acoustic analysis included the big brown, eastern red bat, hoary bat, and northern long-eared bat.

Longwood Lakes – Forest Disturbance Monitoring, Morris County, NJ
Volunteer Bat Monitor

- The project required the deployment of stationary survey equipment, the Wildlife Acoustic's SM3BAT. The information gathered was then culled (reduce non-target species) and analyzed to determine, if possible, the bat species present utilizing the Wildlife Acoustic Kaleidoscope software.
- The species identified during acoustic analysis included eastern red bat and Indiana bat (low probability).

Field Study Costa Rica, El Zota Field Station, Limon Province, Costa Rica
Field Research Biologist

- As part of this field study, the development of a method to survey the herpetological biodiversity within varying habitat types was required and implemented. The survey analyzed the changes that occurred in biodiversity between a stand of the non-native *Gmelina arborea* trees, lowland and upland secondary forest, as well as previously cleared land.
- The survey included plant surveys of the study areas to identify the tropical floral family/species present within each study site. Followed by the identification of tropical herpetofauna species observed within each study site.

Pilgrim Pipe Line – Avian Studies

- This project requires the ongoing study of rare and threatened and endangered species that may be present along the right-of-way corridor. This study required raptor surveys (sharp-shinned, red-shouldered hawk, northern goshawk, and barred owl. The surveys were performed via broadcasting taped conspecific vocalizations.

Plant Surveys:

Utility Upgrade Mitigation and Revegetation Monitoring Project, Sussex County
- This is a multi-phase project, requiring the monitoring of revegetated portions of the right-of-way, endangered plant species surveys, invasive plant species suppression, and mitigation compliance.
- The endangered species surveyed and monitored include the American mannagrass, climbing fern, and wood lily.

Plant Management Project: Tannersville Cranberry Bog Preserve
Volunteer: Field Assistant
- The project required the removal of various plant species within selected plot areas. The purpose of the program was to alter the existing plant community by removing shrubs and trees that had established within the bog area. The removal of these plants will allow for the reestablishment of once common plants species that are now rare due to succession. The rare native plant species include, yellow eyed grass, native orchids, and other rare species.

Habitat Assessment

Rockefeller – Habitat Suitability Determination, Morris County, NJ
- A Habitat Suitability Determinations (HSDs) was performed to determine if threatened and endangered species habitat was present on or within the vicinity of the project site, as required by the NJDEP Water Quality Management Planning. The species of concern on-site were Indiana bat and bald eagle. HSDs included the site assessment of State open waters, wetlands, habitat availability, site conditions, and other regulatory constraints. The assessment requires an environmental inventory of the site and surrounding area.

Randolph Township – Ecological Evaluation, Morris County, NJ
- An Ecological Evaluation (EE) was performed to determine if any environmentally sensitive natural resources (ESNRs) were present on or within the vicinity of an area of contamination, per the NJDEP Site Remediation Program (SRP) requirements. The EE included the assessment of State open waters, wetlands, threatened and endangered species (habitat), historical archeological resources, and other regulatory constraints. The assessment requires an environmental impacts that may have occurred from the contamination

Internship: Brodhead Watershed Association, Monroe County, PA
Field Research Assistant
- Field research technician performing riparian zone vegetative community surveys aimed at identifying the invasive plant species present along the Brodhead Creek and its related watershed. This position required field identification of native northeaster plant families/species and invasive plant species to document the invasion status (percent cover) of the invasive plant species present along the extent of the waterway and related watershed. The data gathered was then mapped via GIS software (ArcMap, ArcCatalog, and database.) to determine the areas with the greatest invasive coverage for future management purposes.

Evie Mcmenamin

From: Protus, Alicia S <alicia_protus@fws.gov>
Sent: Wednesday, October 21, 2020 12:58 PM
To: Victoria Schaller
Cc: Laura Newgard
Subject: Re: [EXTERNAL] Hurstmont Redevelopment Area/Endeavor Harding Site Bat Acoustic Results

Hi Victoria,

Based on the property's proximity to known Indiana bat roost trees and a northern long-eared bat maternity capture, the Service considers the property to still be within the home ranges of known Indiana bat and northern long-eared bat maternity colonies, however, it is unlikely occupied roost trees for either species currently exist on the property. No mist net survey or roost tree emergence surveys are required, however, a timing restriction on tree removal activities between April 1 and September 30 is recommended for this project to avoid impacts to the Indiana bat.

Sincerely,
Alicia Protus

Fish and Wildlife Biologist
(she / her)

U.S. Fish and Wildlife Service
New Jersey Field Office
4 E. Jimmie Leeds Road, Suite 4
Galloway, New Jersey 08205
p: (609) 382-5266
Phone number while teleworking: (631) 357-1136
e: Alicia_Protus@fws.gov

From: Victoria Schaller <VSchaller@ecolsciences.com>
Sent: Friday, October 16, 2020 8:09 AM
To: Protus, Alicia S <alicia_protus@fws.gov>
Cc: Laura Newgard <LNewgard@ecolsciences.com>
Subject: [EXTERNAL] Hurstmont Redevelopment Area/Endeavor Harding Site Bat Acoustic Results

Alicia,

Good morning, I would like to follow-up on the attached report for the Hurstmont Redevelopment Area/Endeavor Harding Site. Have you had the opportunity to review the results?

Sincerely,

Victoria Schaller
Environmental Scientist

EcolSciences, Inc.
75 Fleetwood Drive, Suite 250
Rockaway, New Jersey 07866
Phone: (973) 366-9500 Ext. 160
Fax: (973) 366-9593

APPENDIX C

Annotated Color Photographs of Site Conditions

EcolSciences, Inc.

Environmental Management & Regulatory Compliance

1

Photograph of Hurstmont Estate house.

2

Photograph of dilapidated barn on Hurstmont Estate property.

3

Photograph of old structure near Route 202.

4

Photograph of ___

5

Photograph of large field/lawn areas.

6

Photograph of landscaped areas.

7

Photograph of typical on-site successional forest.

8

Photograph of typical edge of successional forest.

9

Photograph of existing trail area between Hurstmont and Glen Alpin.

10

Photograph of field looking toward Glen Alpin Estate.

APPENDIX D

Qualifications of Preparers

EcolSciences, Inc.

Environmental Management & Regulatory Compliance

LAURA NEWGARD, PWS

EDUCATION:	*M.S., 1984 - Wildlife and Fisheries Sciences* *Texas A & M University* *B.S., 1982 - Forestry/Wildlife Management* *Purdue University*
AREAS OF EXPERTISE:	*Wildlife Ecology* *Wetlands and Terrestrial Ecology* *Rare Species Surveys and Construction Monitoring* *Environmental Impact Assessment and Mitigation Planning*
PROFESSIONAL CERTIFICATION:	*Certified Wildlife Biologist (CWB)* *Professional Wetland Scientist (PWS)* *Recognized Qualified Bog Turtle Surveyor; New York, Pennsylvania and New Jersey (USFWS) Phase 1, 2, and 3 (trapping)* *Recognized Qualified Indiana/Northern long-eared Bat Surveyor (USFWS)* *NJDEP qualified Venomous Snake Monitor (Tertiary)* *NJDEP qualified Wood Turtle Monitor* *Threatened and Endangered Species in New Jersey: Regulations, Identification and Assessment - Rutgers University* *BCI Bat Conservation and Management Workshop* *Interagency Coordination for Endangered Species (USFWS)* *Federal Manual for Identifying and Delineating Wetlands*
OTHER:	*Northeast Partnership in Reptile and Amphibian Conservation (NEPARC)* *Northeast Bat Working Group (NEBWG)* *Sparta Township Environmental Commission - Co-Chairman* *USFWS Adopt-a-Swamp Pink Population Volunteer* *NJDEP Bog Turtle Survey and Trapping Volunteer* *NJ Venomous Snake Response Team (NJDEP) Volunteer* *USFWS/NJDEP Bat Mist Net Survey Volunteer* *PA Chapter of the Nature Conservancy Bog Turtle Volunteer*

EXPERIENCE:

Ms. Newgard is a Certified Wildlife Biologist and Vice President with EcolSciences, Inc. Her expertise lies in the identification and evaluation of land for the presence/absence of rare wildlife and plant resources, including habitat assessments and species specific surveys; and providing guidance on the preservation and protection of these terrestrial, wetland, and aquatic ecosystem through environmental planning and construction monitoring.

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Selected sites include:

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- ***Multiple Community Solar Projects****:* Threatened and endangered species habitat assessments and surveys, including wintering raptors, bog turtle Phase 1, Indiana and Northern long-eared bat acoustic surveys. Orange County, New York.
- ***250-mile utility alignment:*** Phase 1 and Phase 2 bog turtle surveys. York, Adams, and Franklin Counties, Pennsylvania.
- ***44-mile above-ground utility alignment:*** Phase 1 and Phase 2 bog turtle surveys, Wood turtle surveys, timber rattlesnake den, basking, and gestation surveys, vernal habitat surveys, Indiana bat mist net surveys, timber rattlesnake, northern copperhead, and wood turtle construction monitoring, vernal habitat restoration and creation plans. Morris and Sussex Counties, New Jersey.
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- ***2,000-acre mixed use development site:*** Timber rattlesnake and copperhead den surveys, Indiana bat mist net/acoustic surveys, vernal habitat surveys, marbled salamander pitfall trap migration surveys. Rockland and Orange Counties, New York.
- ***3,200-acre mixed use development site:*** Phase 1 and Phase 2 bog turtle surveys, small whorled Pogonia Surveys.
- **2006-2008**: Tobyhanna and Monroe Counties, Pennsylvania.
- **200-*acre redevelopment site*** (bog turtle Phase 1 surveys, timber rattlesnake habitat assessment/den emergent surveys, cricket frog survey)

- **2014:** Sterling Forest, New York.
- **6-mile and 8-mile pipeline project** (Indiana bat/Northern Long eared bat habitat assessment)
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- Preparation of wetland creation/mitigation reports for commercial and residential projects in which unavoidable disturbances will occur to existing wetland communities. Programs were designed to replace and enhance the system which was to be disturbed through careful site preparation, species composition and planting and monitoring.

- Involvement in Environmental Protection Agency Studies (USEPA), requiring field investigations, extensive literature searches and preparation of technical reports.

EVIE MCMENAMIN

EDUCATION:

B.S. Wildlife Management, May 2011
State University of New York at Cobleskill, Cobleskill, New York

A.S. Liberal Arts Math and Science, September 2008
LaGuardia Community College, Long Island City, New York

AREAS OF EXPERTISE:

Wildlife Habitat Management and Restoration
Threatened and Endangered Species Surveys
Radio-telemetry Studies

CERTIFICATIONS:

Acoustic Data Management Course - Bat Survey Solutions
Bat Acoustics Training Course, with Introduction to Mist Netting - ERM
Qualified Bog Turtle Surveyor (NJ) – U.S. Fish & Wildlife Service
Approved Wood Turtle Surveyor - NJDEP
Tertiary Venomous Snake Monitor - NJDEP

EXPERIENCE:

Ms. McMenamin is an Environmental Scientist with EcolSciences, Inc. As an environmental consultant she has specialized in the field of natural resources including rare, threatened, and endangered species habitat management and surveying, construction monitoring, project permitting and general environmental compliance.

Prior to joining EcolSciences, Inc., Ms. McMenamin was an intern with the U.S. Fish and Wildlife Services and was a seasonal employee with the Suffolk County Parks Department. In addition to working with threatened and endangered flora and fauna, Ms. McMenamin obtained significant experience with habitat management and improvement. A summary of Ms. McMenamin's relevant experience includes:

Environmental Construction Monitoring & Management

- Environmental monitor for soil erosion sediment control and environmental permit compliance for overhead utility line construction projects and geotechnical investigations.
- Monitored for venomous snakes, wood turtle (*Glyptemys insculpta)*, bog turtle (*Glyptemys muhlenbergii*), and other rare reptiles and amphibians on overhead utility lines where maintenance activities such as vegetation maintenance, road repairs, culvert replacement, and tower repairs were being conducted in New Jersey.
- Monitored for *Helonias bullata* (Swamp Pink) a Federally threatened and NJ State-endangered species during vegetation maintenance on overhead utility lines.
- Wood Turtle monitor for underground gas utility line construction in New Jersey.
- Monitored the removal of trees during for roosting bats in townships with known occurrences of the Federally threatened and New Jersey State endangered Indiana Bat (*Myotis sodalis).*

Bat Studies

- Attended the Acoustic data management course provided by Bat Survey Solutions and Bat Acoustics Training Course, with Introduction to Mist Netting provided by ERM.

- Experience analyzing acoustic data with Sonobat and Kaleidoscope Pro software.
- Experience deploying long term acoustic equipment to determine the presence/ absence of rare bat species.
- Gained experience identifying and handling Indiana bat while volunteering at a known hibernaculum and capturing bats with the use of a hoop net.
- Attended the 2015 North East Bat Working Group Conference in Baltimore, Maryland.
- Participated in emergence surveys at Delaware National Water Gap Recreation Area and Great Swamp National Wildlife Refuge.
- Assessed the right-of-way of Williams Transco Pleasant Run and Skillman for potential bat roost sites and habitat.
- Used mist nest to catch bats and collect data on general health of all bats captured at Great Swamp National Wildlife Refuge.
- Attached transmitters to cave roosting bats to locate roost locations and monitor the effect of white nose syndrome on the population at Great Swamp National Wildlife Refuge.
- Collected data on all roost locations such as manmade or natural, tree species, height, and canopy cover at Great Swamp National Wildlife Refuge.
- Monitored and recorded temperature of abandoned bunkers for possible cave bat habitat at Patuxent Research Wildlife Refuge.

Vernal Habitats

- Conducted vernal habitat surveys in accordance with survey protocols developed by the New Jersey Department of Environmental Protection (NJDEP). Pertinent information was gathered on hydrology, vegetation, observed reptile and amphibian species, and weather conditions.

Avian Studies

- Participated in raptor surveys for Red-Shouldered Hawk, Northern Goshawk, Northern Harrier, Barred owl, and other species.
- Conducted weekly waterfowl and water bird surveys of water impoundments.
- Monitored mating pairs of Federally threatened Piping Plovers, and Roseate terns. Monitoring was also conducted for Lest terns, Common terns, Oyster catchers, and Ospreys.
- Located Federally- threatened Piping Plovers nest and assembled nest protection around completed clutches of nests.

Snake Studies

- Monitored known Timber Rattle snake (*Crotalus horridus*) dens for emerging individuals.
- Checked pine snake traps (*Pituophis melanoleucus*) set up along a drift fence as part of a pre-construction survey.
- Venomous snake spotter for PSE&G Susquehanna-Roseland Transmission construction project.

Salamander Studies

- Participated in field surveys for the State-threatened Long-tailed salamander (*Eurycea longicauda*) at Delaware National Water Gap Recreation Area.
- Conducted field surveys for the State-endangered, blue-spotted salamander (*Ambystoma laterale*) at Great Swamp National Wildlife Refuge.

- Blue-spotted salamander monitor for PSE&G vegetation, and other maintenance and upgrade projects

Frog and Toad Studies

- Participated in frog and toad call surveys.
- Collected metamorphosed frogs for federal research into rates of abnormalities.

Turtle Studies

- Assisted in Phase I and Phase II Surveys for Federally threatened and State-endangered bog turtle.
- Assisted in trapping and radio telemetry for bog turtle.
- Assisted in thread spooling gravid bog turtles and conducting nest searches.
- Assisted in a long-term wood turtle survey that involves radio telemetry of adults and hatchlings, hibernacula surveys, nesting surveys, and nest protection.
- Assisted in monitoring and management of an artificial wood turtle nesting mound

Rare Plant Studies

- Assisted in rare plant surveys for the Federally- threatened and NJ State- threated Swamp Pink.
- Assisted in surveys for rare plants including the Federally endangered and NY State-endangered *Agalinis acuta* (Sandplain Gerardia) and Federally threatened *Amaranthus pumilus* (Seabeach amaranth).

Additional Environmental Studies

- Analyzed Whitetail Deer population data collected through point intersect surveys and standard baited camera surveys. Utilized population equations to extract the buck to doe ratio, age structure, reproductive rate and success.
- Collected and analyzed data on hunter's harvest in regard to waterfowl species, age, and gender.
- Collected and analyzed data on hunter's harvest regarding whitetail gender, age, weight, and antler characteristics.

Wetland Delineations & Permitting

- Assisted in wetland and State-open-water delineations based on the Federal Manual, three-parameter approach, using vegetation, soils, and hydrology as indicators of wetland presence for various private properties in addition to utility projects.
- Prepared applications for NJDEP Freshwater Wetland Protection Act Letters of Interpretations, General Permits, Transition Area Waivers, and Flood Hazard Area Control Act Verifications.

Geographic Information Systems

- Evaluates potential environmental constraints using land use/land cover, wetlands, vernal habitat, riparian zones, flood hazard area information, and NJDEP Landscape Project mapping for major utility line projects and private development.

ATTACHMENT C

Qualifications of Preparers

EcolSciences, Inc.

Environmental Management & Regulatory Compliance

LAURA NEWGARD, PWS

EDUCATION:	*M.S., 1984 - Wildlife and Fisheries Sciences* *Texas A & M University* *B.S., 1982 - Forestry/Wildlife Management* *Purdue University*
AREAS OF EXPERTISE:	*Wildlife Ecology* *Wetlands and Terrestrial Ecology* *Rare Species Surveys and Construction Monitoring* *Environmental Impact Assessment and Mitigation Planning*
PROFESSIONAL CERTIFICATIONS:	*Certified Wildlife Biologist (CWB)* *Professional Wetland Scientist (PWS)* *Recognized Qualified Bog Turtle Surveyor; New York, Pennsylvania and New Jersey (USFWS) Phase 1, 2, and 3 (trapping)* *Recognized Qualified Indiana/Northern long-eared Bat Surveyor (USFWS)* *NJDEP qualified Venomous Snake Monitor (Tertiary)* *NJDEP qualified Wood Turtle Monitor* *Threatened and Endangered Species in New Jersey: Regulations, Identification and Assessment - Rutgers University* *BCI Bat Conservation and Management Workshop* *Interagency Coordination for Endangered Species (USFWS)* *Federal Manual for Identifying and Delineating Wetlands*
OTHER:	*Northeast Partnership in Reptile and Amphibian Conservation (NEPARC)* *Northeast Bat Working Group (NEBWG)* *USFWS Adopt-a-Swamp Pink Population Volunteer* *NJDEP Bog Turtle Survey and Trapping Volunteer* *NJ Venomous Snake Response Team (NJDEP) Volunteer* *USFWS/NJDEP Bat Mist Net Survey Volunteer* *PA Chapter of the Nature Conservancy Bog Turtle Volunteer*

EXPERIENCE:

Ms. Newgard is a Certified Wildlife Biologist and Vice President with EcolSciences, Inc. Her expertise lies in the identification and evaluation of land for the presence/absence of rare wildlife and plant resources, including habitat assessments and species-specific surveys; and providing guidance on the preservation and protection of these terrestrial, wetland, and aquatic ecosystem through environmental planning and construction monitoring.

Ms. Newgard's responsibilities include: wildlife and plant surveys; threatened and endangered species studies; delineating wetland systems based on the Federal "three-parameter" methodology; the preparation of wetland and habitat mitigation plans to compensate for unavoidable disturbances to natural systems; and preparation of environmental impact assessments. Ms. Newgard has conducted threatened and endangered species surveys at the request of the United State Environmental Protection Agency (USEPA), New Jersey Department of Environmental Protection (NJDEP), United States Fish and Wildlife Service (USFWS), National Park Service (NPS), New York State Department of Environmental Conservation (NYSDEC), and New York City Department of Environmental Protection (NYSDEP). In addition, Ms. Newgard has been involved with permit acquisition including Individual and Nationwide Permits from the Army Corp of Engineers and wetland permits from NJDEP and NYSDEC.

A summary of relevant project experience accumulated over the last several years includes:

- Design, manage, and conduct wildlife habitat studies and threatened and endangered species surveys for numerous wildlife species, including; bog turtle, Indiana bat, northern long-eared bat, grasshopper sparrow, short-ear owl, long-ear owl, wood turtle, long-tailed salamander, blue-spotted salamander, pine snake, pine barren's tree frog, southern gray tree frog, northern cricket frog, timber rattlesnakes, Northern copperhead, red-shouldered hawk, barred owl, Coopers hawk, goshawk, bobcat, and bald eagle. These studies provided comprehensive wildlife lists inhabiting a site, identified extent and potential habitat communities, and identified or confirmed the absence of rare species and their suitable habitat on 100s of sites throughout New York and New Jersey. Select studies include telemetry surveys for wood turtles and pine snakes; trapping for bog turtle and northern pine snake; vernal habitat surveys, migration studies, design, enhancement, restoration; and drift fences and pitfall traps for reptiles and amphibians.

Selected sites include:

- ***500-acre recreation amusement park development****:* Threatened and endangered species wildlife habitat assessment, Northern cricket frog survey, Phase 1 bog turtle surveys, Indiana and Northern long-eared bat acoustic surveys, USFWS Biologic Assessment (BA) Orange County, New York.
- ***Multiple Community Solar Projects****:* Threatened and endangered species habitat assessments and surveys, including wintering raptors, bog turtle Phase 1, Indiana and Northern long-eared bat acoustic surveys. Orange County, New York.
- ***250-mile utility alignment:*** Phase 1 and Phase 2 bog turtle surveys. York, Adams, and Franklin Counties, Pennsylvania.
- ***44-mile above-ground utility alignment:*** Phase 1 and Phase 2 bog turtle surveys, Wood turtle surveys, timber rattlesnake den, basking, and gestation surveys, vernal habitat surveys, Indiana bat mist net surveys, timber rattlesnake, northern copperhead, and wood turtle construction monitoring, vernal habitat restoration and creation plans. Morris and Sussex Counties, New Jersey.
- ***20-mile above ground utility alignment:*** Phase 1 and Phase 2 bog turtle surveys, Indiana bat mist summer mist net surveys, bog turtle habitat restoration, construction monitoring,

radio telemetry surveys for bog turtle and Indiana/Northern long-eared bats, blue-spotted salamander surveys. Morris County, New Jersey.

- ***16 – mile and 8 – mile pipeline easements:*** Phase 1 and Phase 2 bog turtle surveys, wood turtle surveys, wood turtle hibernacula surveys, wood turtle, bog turtle, and timber rattlesnake construction monitoring. Sussex and Passaic Counties, New Jersey.
- ***2,000-acre mixed use development site:*** Timber rattlesnake and copperhead den surveys, Indiana bat mist net/acoustic surveys, vernal habitat surveys, marbled salamander pitfall trap migration surveys. Rockland and Orange Counties, New York.
- ***3,200-acre mixed use development site:*** Phase 1 and Phase 2 bog turtle surveys, small whorled Pogonia Surveys. Tobyhanna and Monroe Counties, Pennsylvania.
- **200-*acre redevelopment site*** (bog turtle Phase 1 surveys, timber rattlesnake habitat assessment/den emergent surveys, cricket frog survey). Sterling Forest, New York.
- **6-mile and 8-mile pipeline project** (Indiana bat/Northern Long eared bat habitat assessment). Somerset, Mercer, and Hunterdon Counties, New Jersey.

- Design, manage, and conduct vegetative inventories and threatened and endangered species surveys for several plant species, including; swamp pink, Kneiskern's beaked-rush, curly-grass fern, small whorled pogonia, spreading globeflower, little lady tresses, climbing fern, and serpentine aster. These studies also served to confirm the absence of these species and their suitable habitat on certain sites.

- Wetland delineation and impact assessment for numerous commercial and residential development projects throughout New Jersey, New York and Pennsylvania. Reports analyzed site conditions, classified wetlands and were prepared for submission to the appropriate agency.

- Conduct, manage, and implement Habitat Suitability determination studies and develop Habitat Impact Assessments and/or Habitat Enhancement Plans.

- Preparation of wetland creation/mitigation reports for commercial and residential projects in which unavoidable disturbances will occur to existing wetland communities. Programs were designed to replace and enhance the system which was to be disturbed through careful site preparation, species composition and planting and monitoring.

- Involvement in Environmental Protection Agency Studies (USEPA), requiring field investigations, extensive literature searches and preparation of technical reports.

JENNIFER R. ROCHE, PWS

EDUCATION:

M.S., 2015 – Conservation Biology
SUNY College of Environmental Sciences and Forestry, Syracuse, N.Y.
Thesis: Ecological and Genetic Assessments of the Invasive Potential of Actinidia Arguta (Hardy Kiwi) in the Northeast United States

B.A., 2012 – Biological Science
Harpur College of Arts and Sciences,
Binghamton University, Binghamton, N.Y.

AREAS OF EXPERTISE:

Regulatory Assessments and Constraints Analysis
Wetland Delineations & Regulatory Review
Threatened & Endangered Species Surveys

PROFESSIONAL CERTIFICATIONS:

Professional Wetland Scientist (PWS) #3423 – Society of Wetland Scientists
Wetland Delineation Certificate – Rutgers University OCPE
OSHA 1910.120 40-hour HAZWOPER Training

PROFESSIONAL ASSOCIATIONS:

Member of the Society of Wetland Scientists

EXPERIENCE:

Ms. Roche is a Project Manager with EcolSciences, Inc. and has 8 years of environmental experience. She has professional experience in wetland and stream delineations; threatened & endangered species surveys; environmental permitting, planning, and monitoring; and constraints analyses with a focus on renewable energy, electric generation, and natural gas projects. Additional experience includes construction oversight to ensure compliance with permit conditions, preparation of permit applications and GIS mapping. Ms. Roche has extensive experience with power utility clients and has expertise in local and state regulations in NY and NJ as well as federal regulations as they apply to electric generation and transmission projects.

Prior to joining EcolSciences, Inc., Ms. Roche was the technical project manager and point of contact for a utility client at an engineering and environmental consulting firm where she was responsible for assisting in the growth of the Siting, Licensing, and Permitting program. As a technical project manager, Ms. Roche was responsible for the development of ecology-related project scopes, schedules, budgets, and overall project direction to ensure successful environmental compliance. A summary of Ms. Roche' relevant experience includes:

Wetland Delineations and Regulatory Compliance

- Conducted numerous wetland delineations based on the Federal Manual three-parameter approach using indicators of hydrophytic vegetation, hydric soils, and wetland hydrology.

- Preparation of Environmental Impact Statements, Letters of Interpretation, Transition Area Waivers, General / Individual Permits, CAFRA / Waterfront Development Permits, as various U.S. Army Corps permits for both development and utility projects throughout NJ.

- Preparation of Article VII and Article 10 applications for major utility projects, Freshwater Wetlands Permit (Article 24) and Protection of Waters Permit (Article 15) applications, and State Environmental Quality Review (SEQR) compliance for both development and utility projects throughout NY.

Threatened and Endangered Wildlife and Plant Species

- **Bat Studies:** Experience deploying long term acoustic equipment to determine the presence/absence of rare bat species, analyzing acoustic data with Kaleidoscope Pro software, and conducting emergence surveys.

- **Turtle Studies:** Assisted in Phase I and Phase II surveys for the Federally threatened and New Jersey State-endangered bog turtle (*Glyptemys muhlenbergii*). Assisted in radio telemetry for bog turtle.

- **Avian Studies:** Performs avian habitat evaluations and/or species presence/absence surveys for the New Jersey State-threatened barred owl (*Strix varia*) and the New Jersey State-endangered, red-shouldered hawk (*Buteo lineatus*) along utility rights-of-way. Avian surveys included performing call surveys, nest searches, and assessing suitability of habitat for nesting and/or foraging.

- **Vernal Habitats:** Conducted day and night surveys of vernal pools for an annual monitoring effort following installation of an underground gas line. Assessed for the presence of vernal-dependent species.

- **Rare Plant Studies:** Assisted in rare plant surveys for the Federally threatened and New Jersey State-threated swamp pink (*Helonias bullata*) along utility rights-of-way.

Construction/ROW Maintenance Monitoring

- Monitoring of construction and/or maintenance activities within environmentally sensitive areas along various overhead electric line ROWs to ensure compliance with permit conditions.

- Monitoring regulated activities within environmentally sensitive areas for the purposes of natural resources protection (wetlands, waters, and threatened and endangered species), soil and sediment erosion control, access road maintenance & repair, and ROW vegetation maintenance, including spraying, mowing, hand-cutting, and tree-cutting.

Geographic Information Systems

- Evaluates potential environmental constraints using land use/land cover, wetlands, vernal habitat, riparian zones, flood hazard area information, and NJDEP Landscape Project mapping for both development and utility projects.

ELIZABETH MULLER

EDUCATION: *B.S., 2019 – Ecology, Evolution, and Natural Resource Management*
School of Environmental and Biological Science
Rutgers University, New Brunswick, N.J.

AREAS OF EXPERTISE:
Wetland Delineations & Regulatory Review
Wetland and Riparian Zone Mitigation
Threatened & Endangered Species Surveys

PROFESSIONAL CERTIFICATIONS:
Wetland Delineation Certificate – Rutgers University OCPE
Geomatics Certificate (ArcGIS) – Rutgers University
Adult First Aid/CPR – American Red Cross
Qualified Small Whorled Pogonia Surveyor – USFWS-PAFO
40-hour HAZWOPER Training – OSHA
8-hour HAZWOPER Refresher Training – OSHA
Certified Arborist (NJ-1292A) & TRAQ Certified – ISA
Bats and Bridges Survey Techniques Training – USFWS-NJFO
Bat Emergence Surveys at Structures – USFWS-NJFO
Approved Wood Turtle Monitor – NJDEP

EXPERIENCE:

Ms. Muller has over 6 years of combined fulltime and part time experience delineating wetlands in accordance with the Federal Manual for Identifying and Delineating Wetlands (1989), the Corps of Engineers Wetlands Delineation Manual (1987), and the New Jersey Pinelands Commission Manual for Identifying and Delineating Pinelands Area Wetlands (1991). She has also conducted numerous preliminary wetland investigations, habitat assessments, tree surveys, wetland mitigation monitoring, and rare species surveys primarily throughout the State of New Jersey with some experience in New York, Pennsylvania, Delaware, Connecticut, and Virginia. She has conducted surveys for amphibians, insects, mammals, plants, reptiles, and vernal habitat, including federally listed species such as American chaffseed (*Schwalbea americana*), bog turtle (*Glyptemys muhlenbergii*), northeastern bulrush (*Scirpus ancistrochaetus*), and small whorled pogonia (*Isotria medeoloides*). She has assisted in the preparation of various approvals for all types of freshwater wetlands, flood hazard area, and coastal zone management permits (letters of interpretation, general permits, individual permits, permit extensions, permit modifications) in New Jersey. She has prepared NEPA Categorical Exclusions and environmental impact statements (EIS) on the municipal, county, and state level in New Jersey and New York. A summary of Ms. Mullers' relevant experience includes:

Wetland Delineations and Regulatory Compliance

- Conduct wetland delineations based on the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989), Corps of Engineers Wetlands Delineation Manual (1987), and Manual for Identifying and Delineating Pinelands Area Wetlands using indicators of hydrophytic vegetation, hydric soils, and wetland hydrology.
- Assist in the preparation of Environmental Impact Statements, Letters of Interpretation, General / Individual Permits, Waterfront Development, as various U.S. Army Corps permits for both development and utility projects.
- Prepare National Environmental Policy Act (NEPA) Categorical Exclusions.

Wetland and Riparian Zone Mitigation

- Assist in the preparation of wetland mitigation bank prospectus reports.
- Conduct yearly wetland mitigation monitoring and prepared wetland mitigation monitoring reports.
- Prepare an existing conditions natural resources report for use in determining appropriate mitigation measures for proposed activities onsite.

Bat Studies

- Attend the United States Fish and Wildlife Service (USFWS) New Jersey Field Office (NJFO) Bats and Bridges Survey Techniques Training and Bat Emergence Surveys at Structures training.
- Conduct site reconnaissance and preliminary bat assessments for bridge and culvert structures throughout New Jersey.
- Conduct bat emergence surveys at bridge structures and trees throughout New Jersey.

Vernal Habitats

- Conducted vernal habitat surveys in accordance with survey protocols developed by the New Jersey Department of Environmental Protection (NJDEP). Pertinent information was gathered on hydrology, vegetation, observed reptile and amphibian species, and weather conditions.

Avian Studies

- Conducted construction monitoring for nesting peregrine falcons, ospreys, piping plovers, red-knots, least terns, common terns, and American oystercatchers.
- Conducted callback surveys for red-shouldered hawks and barred owls.
- Conducted point-count surveys for woodland and grassland passerine species including grasshopper sparrow and bobolink.

Snake Studies

- Conduct visual assessments for venomous and non-venomous snakes.
- Conduct critical habitat assessments for early basking, gestation, and birthing sites for venomous snakes.
- Provide venomous snake response removal in northern New Jersey.
- Participate in studies to create and assess the use of basking habitat for venomous snakes using trail cameras and radio-telemetry studies for pine snakes and timber rattlesnakes.
- Participate in studies to capture, rehabilitate, and release venomous and non-venomous snakes affected by snake fungal disease (Ophidiomyces ophidiicola) to better understand the distribution of the disease.

Amphibian Studies

- Conduct amphibian crossing studies throughout northern New Jersey.

Turtle Studies

- Assist in Phase I and Phase II Surveys for Federally threatened and State-endangered bog turtle.
- Conduct vegetation plot monitoring in occupied bog turtle habitat.
- Conduct construction monitoring for State-endangered wood turtle.
- Conduct volunteer surveys for eastern box turtles as part of the Northeast Eastern Box Turtle Working Group.

Rare Plant Studies

- Technical identification of trees, shrubs, woody vines, and herbaceous species using dissecting microscopes and technical manuals including Gleason & Cronquist (1991) and Rhoads & Block (2007).
- Assisted in rare plant surveys for Federally and State listed species including American chaffseed (*Schwalbea americana*), northeastern bulrush (*Scirpus ancistrochaetus*), small whorled pogonia (*Isotria medeoloides*), and swamp pink (*Helonias bullata*).
- Conducted bi-weekly rare plant surveys for State listed species in New Jersey in accordance with the New Jersey Department of Environmental Protection, Office of Natural Lands Management "Recommended Rare Plant Species and Ecological Community Survey Protocols to Ensure Adequate Baseline Data Prior to Habitat Disturbance or Management."