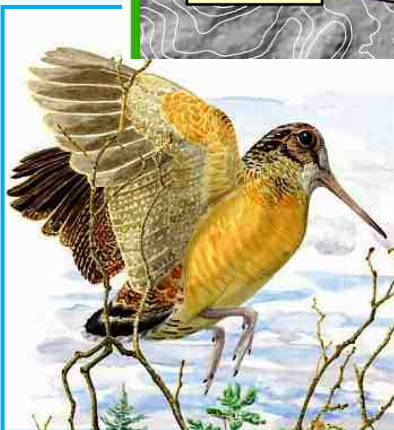
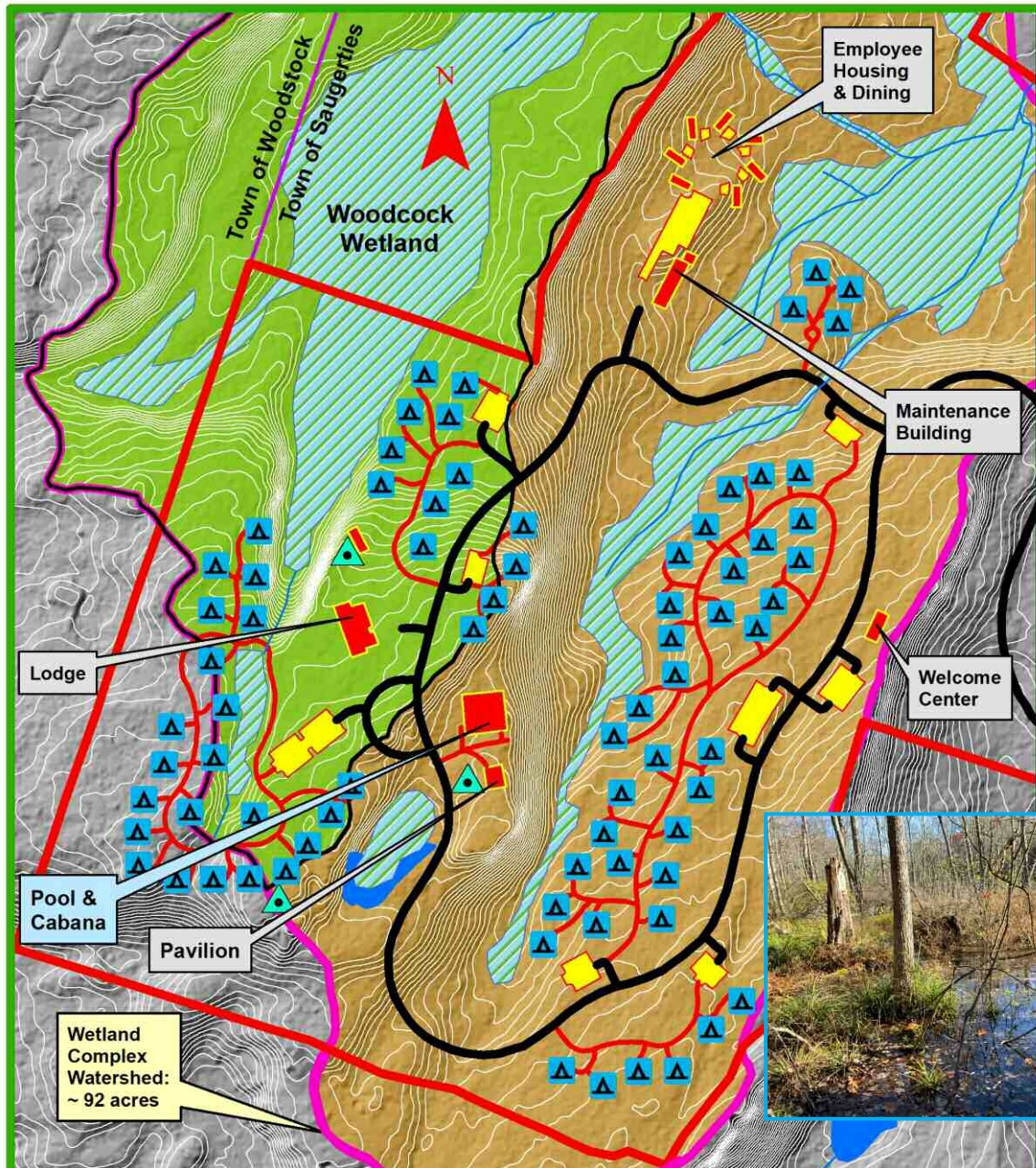


Proposed Terramor Glamping Project: Hydrologic and Land Use Based Justification for Issuance of a Positive SEQRA Declaration



Prepared For:
Citizens Against Terramor
December 5, 2022

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Proposed Terramor Glamping Project: Hydrologic and Land Use Based Justification for Issuance of a Positive SEQRA Declaration by Paul A. Rubin; Professional Geologist

Introduction

HydroQuest, an environmental consulting firm, has been retained by Citizens Against Terramor to review and evaluate potential environmental impacts of certain aspects of an upscale “glamping project” proposed in the Town of Saugerties, NY. Hydrologic and geologic features within and adjacent to the project area extend westward into the Town of Woodstock (i.e., Woodcock Wetland, wetland watershed, groundwater-bearing bedrock fractures). Project construction would result in adverse environmental impacts that require detailed analysis.

HydroQuest is a sole proprietorship company, of which I serve as principal. I have over 41 years of professional hydrologic, geologic and hydrogeologic experience. This work includes providing expert advice relative to environmental risks to aquifers, surface water resources, ecosystems, individuals, and communities. My expert reports, affidavits, papers, presentations, and testimony have been provided in projects throughout NY, PA, NJ, MD, FL, AL, GA, TX, SC, VA, and WV. They have been presented in court, at press conferences, as a panel member, and before the Legislature, Governor’s executive staff, and the NYS Assembly, as well as before a delegation from the People’s Republic of China. I am a licensed Professional Geologist in the state of New York. My curriculum vitae and assorted work products may be reviewed on my web page at: <http://hydroquest.com>.

As an independent geologic and hydrologic consultant, HydroQuest provides hydrologic, geologic and hydrogeologic consulting services to environmental groups, Towns, business associations, law firms, and individuals. HydroQuest assists groups in identifying issues and developing strategies designed to protect groundwater and surface water resources, community safety, and wildlife habitat. This work includes assessments of land use and community character. One recent example of a land use related work project was commissioned by the Town of Mamakating: ***Hydrogeologic Study of the Town of Mamakating, Sullivan County, New York*** (Rubin and Beinkafner, 2017).¹ The study served as the foundation for development of the Town’s

¹ Rubin, P.A. and Beinkafner, K.J., 2017, ***Hydrogeologic Study of the Town of Mamakating, Sullivan County, New York***. Report documents groundwater and surface water resources throughout the town. Analysis included extensive field work, watershed and sub-basin delineation using high resolution imagery and digital elevation data, and GIS-based map production. The report includes numerous land use

Comprehensive Plan. Other examples of my environmental work involved authoring a report commissioned by the Town of Saugerties Planning Board, that accented potential environmental consequences of modifying existing regulations designed to protect groundwater resources, and a companion report commissioned by Catskill Mountainkeeper (HydroQuest 2022a, 2022b).

Glamping and the Proposed Terramor Project

Glamping is advertised as a fusion of glamping and camping, where nature meets luxury amenities in a wooded setting. Glamping “tents” include real mattresses; full bathrooms with running water, showers, and toilets; electricity; and heat and, as such, are also referred to as luxury tent hotels or glamping tent hotels.

Forbes describes glamping as “a combination of glamorous and camping, ... *some of which have “tents” that outshine the Presidential suite at your local hotel. Most typically they are enormous canvas structures parked on permanent platforms with running water, and often the kind of bathroom you’d expect at 4 or 5-Star hotel. They are basically houses that happen to be made of canvas, and most have fine linens, porches, firepits and often rustic touches.*”



Photograph from Forbes of a luxury canvas glamping tent at the Terramor Outdoor Resort near Bar Harbor, Maine. Most tents there have full en suite bathrooms, Wi-Fi, fans, and heated blankets.

Terramor project construction would be within a Moderate-Density Residential (MDR) zoning district. In reviewing the proposed project, HydroQuest reviewed a series of maps provided to the public that detail a large-scale luxury campground referred to as the Terramor project. I have georeferenced and digitized major project components and have brought them into a Geographic Information System (GIS) database for use in constructing, interpreting, mapping, expanding, and

recommendations and formed the backbone of the Town’s development of a Comprehensive Plan. Commissioned by the Town of Mamakating; 36 pages plus 32 detailed GIS maps and figures.

graphically presenting project-related information both on and off the Terramor site. The proposed Terramor project would, if permitted, consist of several components including a 75-unit glamping campground; a 7,600 ft² lodge with lounge area, bar and restaurant; 1,100 ft² wellness center; welcome center; swimming pool with cabana, bathrooms; event lawn pavilion; gift shop; six grilling stations; employee housing (6 dorm units) and mess hall; general manager's house; a maintenance building with washing machines; activity lawns; two dog parks; water, sewer, and electrical infrastructure; multiple parking areas (166 spaces); roads; and a package wastewater treatment plant on 77.51 acres. Terramor references canvas glamping "tent" sizes of 510 ft² (referred to as Woody 35) and 615 ft² (referred to as Woody 45) inclusive of covered porch areas atop wood bases. Terramor's site plans depict the Woody 35 as having a bathroom with a shower stall, one bedroom, a screen porch, and an outside shower. The Woody 45 is depicted with a full bathroom with tub, two bedrooms, a screen porch, and an outside shower.

Luxetenten, like Terramor, sell glamping tents with the same names: Woody 35 and Woody 45. The products of Luxetenten.com (a producer of luxury tents) are shown on their website floorplans with model sizes of 538 ft² and 646 ft², respectively. While they bear the same name, the Luxetenten models have additional amenities. Depending on the model, Luxetenten's glamping tents have two or three bedrooms with mattresses, a full bathroom, a kitchen-dining area with a table and chairs, a living room area with comfortable furniture, furnished porches, and a boiler for heating. Perhaps it is just a coincidence that these glamping tents have the same names. If Terramor plans on using the Luxetenten glamping tents, the public should be apprised of this.

For size comparison, while variable, the average hotel room size in the United States is 300 ft² while 5-star hotel rooms in the US are generally expected to be over 400 ft² (SiteMinder). The average studio apartment size, while variable by location and other factors, was determined to be 514 ft² in 2022 (Home Stratosphere, 2022).

Two-person camping tents generally vary between 29 ft² and 33 ft² in size, while 6 person tents average 83 ft² in size. Thus, Terramor's Woody 35 and Woody 45 glamping "tents" are 15.5X and 18.6X larger than 2-person camping tents and 6.1X and 7.4X larger than 6-person camping tents, respectively. The Terramor glamping "tents" are larger than many 5-star hotel rooms, yet they share many of the amenities of their non-woody luxury hotel counterparts. Effectively, they are luxury hotel rooms situated in a forested setting. In no way do glamping tents resemble small portable tents pitched in public campgrounds. As discussed below, luxury glamping tents are not permitted within the Town of Saugerties Moderate-Density Residential District.

Town of Saugerties Zoning Law, Its Goals, Campgrounds, and Land Uses Permitted in Moderate-Density Residential Districts

Town of Saugerties Zoning Law does not permit private campgrounds in Moderate-Density Residential Districts. The Town of Saugerties' Zoning Law, Chapter 245, regulates the density of population and the location and use of buildings (§ 245-1). The Town clearly states several of the goals for their zoning law (§ 245-2), also referred to as their zoning code. These include:

- “A. To promote the use of land for its most appropriate, reasonable and beneficial purposes;*
- C. To conserve and enhance the value of land, farms, viewsheds, and buildings;*
- G. To promote efficiently spaced development which meets community needs, **protects natural**, agricultural, historic, and cultural **resources**, and preserves open space* (emphasis added);
- H. To **protect** and promote enjoyment of **the Town’s natural**, agricultural, historic, and cultural **resources*** (emphasis added);
- J. To assure privacy for residences;*
- K. To **protect** rivers, streams, creeks, **wetlands**, ponds, lakes, and other bodies of water* (emphasis added);”

The Terramor project is proposed within a Moderate-Density Residential District (MDR). *“**This district is intended to extend the benefit of rural environment ... and recreational uses compatible with a rural environment may also be permitted, subject to conditions which protect the residential character of this district.**”* (emphasis added; (§ 245-6). As discussed below and in the General Definitions section of the Town of Saugerties’ Zoning Law (§ 245-56), under the definition of Residence defines Residence as *“A building, or any part of a building, **which contains living and sleeping accommodations for permanent occupancy**”*. (emphasis added) Glamping tents are for transient occupancy, not permanent occupancy.

Regarding the Town’s zoning districts, Section 245-9 (Effect of establishment of districts) of the Town of Saugerties’ code states:

- “A. **No building shall be erected, moved, altered, rebuilt or enlarged nor shall any land or building be used, designed or arranged to be used for any purpose or in any manner except in conformity with all regulations, requirements and/or restrictions specified in this chapter for the district in which such building or land is located.*** (emphasis added)
- F. **Any uses not specifically permitted shall be deemed to be prohibited.**”* (emphasis added)

Section 245-10 (Schedule of District Use Regulations), Article IV (Use Regulations) of the Town of Saugerties’ zoning code, referred to as the Use Schedule, clearly states:

“No structure or land shall be used except as provided in the use schedule. Uses which are not permitted are prohibited, unless specifically stated elsewhere by this chapter.”

The Schedule of District Use Regulations provides a table that lists *“Publicly operated campgrounds and recreation areas”* under *“Public open space”* as a permitted land use in the MDR zoning district. The proposed project is not planned in a public open space. The same Use Schedule table lists hotels, motels, and camps as either not being permitted or requiring a special use permit. Section I. of § 245-11 (Standards for certain uses requiring special use permits) states:

*“Lodges (maximum 50 units), **camps** and recreational vehicle parks. In reviewing special use permit applications for lodges (maximum 50 units), camps and recreational vehicle parks, the Planning Board shall consider the following:*

- (2) Adequacy of parcel size so as not to induce overcrowding,*
- (3) The extent to which noise or light interferes with the use and enjoyment of surrounding properties and appropriate hours of operation to limit such impacts.”*

Section 245-34 (Special use permit review), under section A. (Intent) states:

“(2) The primary purpose of special use permit review is to ensure compatibility with the surrounding neighborhood and to ensure the long-term benefit of the use to the Town.” (emphasis added)

Section 245-34 D (Special use permit standards), states:

“(2) (o): Character and appearance. The character and appearance of the proposed use, buildings, structures, outdoor signs, and lighting shall be in general harmony with the character and appearance of the surrounding neighborhood and of the Town of Saugerties and shall not adversely affect the general welfare of the inhabitants of the Town.” (emphasis added)

“(2) (s) Nuisances. The proposed use shall not be more objectionable to nearby property owners or occupants by reason of noise, fumes, vibration or lighting than would be the operations of a permitted use.”

“(2) (w) Compatibility of the proposed use with the principles of the district, the purposes set forth in this chapter, and the goals of the Comprehensive Plan.”

“(4) Noncomplying uses deemed prohibited. Any use that is unable to meet the performance standards required in this section, as determined by the Planning Board, shall be deemed a prohibited use and a special use permit shall be denied by said Board.” (emphasis added)

The General Definitions section of the Town of Saugerties” Zoning Law (§ 245-56), under the definition of Residence defines Residence as ***“A building, or any part of a building, which contains living and sleeping accommodations for permanent occupancy”***. (emphasis added) The definition continues and specifically states that “residence” **shall not include**:

“A. Transient accommodations, such as hotels, motels and campgrounds;”
(emphasis added)

As stated in the Town of Saugerties Zoning Law ((§ 245-6 Zoning districts), section B Moderate-Density Residential District and within the General Definitions section of the Town of Saugerties Zoning Law (§ 245-56), campgrounds are defined as being transient accommodations, NOT permanent residences which protect the residential character of the district. Furthermore, section 245-57 (Land Use Table definitions), Services Division includes hotels and other lodging places, including camping facilities (e.g., recreational hotels, camps, campgrounds, campsites for transients). Clearly, Town of Saugerties Zoning Law recognizes campgrounds and campsites for transients as being non-permanent accommodations versus MDR residences for permanent

occupancy. **Thus, private campgrounds and luxury tent hotels (i.e., luxury glamping tents) are not permitted land uses in Moderate-Density Residential Districts.**

Based on this assessment of the Town of Saugerties Zoning Law and glamping tent configuration and transient occupancy, all review of the proposed Terramor project should now cease because private campgrounds are not permitted land uses in Moderate-Density Residential Districts. However, if the Town of Saugerties Planning Board determines to consider the non-residential application, HydroQuest provides technical input below on behalf of Citizens Against Terramor.

SEQRA Context

For all practical purposes, the project's required infrastructure, number of living units, and water, electric, fire, and sewer demands are like those required for major resort complexes. Thus, in my professional opinion, the proposed Terramor project should be reviewed in the context of a major development. Similarly, the environmental issues attendant to such developments must be comprehensively evaluated relative to potential adverse environmental impacts and given the necessary "hard look" required under the State Environmental Quality Review Act (SEQRA).

As the Town of Saugerties Planning Board is aware, NYSDEC's Full Environmental Assessment Form (FEAF); Part 2 – Identification of Potential Project Impacts is to be completed by lead agencies to help them inventory all potential resources that could be affected by a proposed project or action. This inventory allows the reviewing agency to properly evaluate the significance of environmental impacts to ascertain whether a negative or positive SEQRA environmental declaration is needed to ensure that the environmental resources of the town are protected. This report provides my professional opinion and technical evaluation of a number of the issues raised on Part 2 of the FEAF. I have included extensive graphic presentation material developed to visually facilitate understanding of the issues raised. HydroQuest has also provided the broad hydrologic and land use perspective needed to place the 77.51-acre project parcel within the landscape and community as a whole. This report is provided in the context of rigorous scientific assessment contemplated in the spirit of SEQRA. The issues brought forth provide important evidence that support a positive declaration of environmental impact under SEQRA and a comprehensive evaluation, complete with full public scoping and review, within the framework of a Draft Environmental Impact Statement. For the Planning Board's convenience, these issues are addressed in a report format patterned after that of the FEAF Part 2 form.

Full Environmental Assessment Form - Part 2 Issues

18. Consistency with Community Character

The proposed project is inconsistent with the existing community character.
(See Part 1. C.2, C.3, D.2, E.3)

☐ NO ☒ YES

Except for the large “*tent-like*” outer roof and wall material, luxury beds, floors, furnishings, bathrooms, electricity, and amenities would make each of the proposed 75 individual “*tents*” analogous to resort cabins or boutique hotel rooms, albeit located amidst trees. This permanent housing unit setup is very different from old-style campgrounds where tents are pitched on bare ground campsites and are readily removed, leaving little environmental footprint.

Like luxury boutique hotels with bathrooms, running water, sewer, and electricity, these “glamping” accommodations would be attractive and available to a mobile population from May 1 through the end of October (six months of the year). Thus, each project site would be occupied as are homes in the surrounding area.

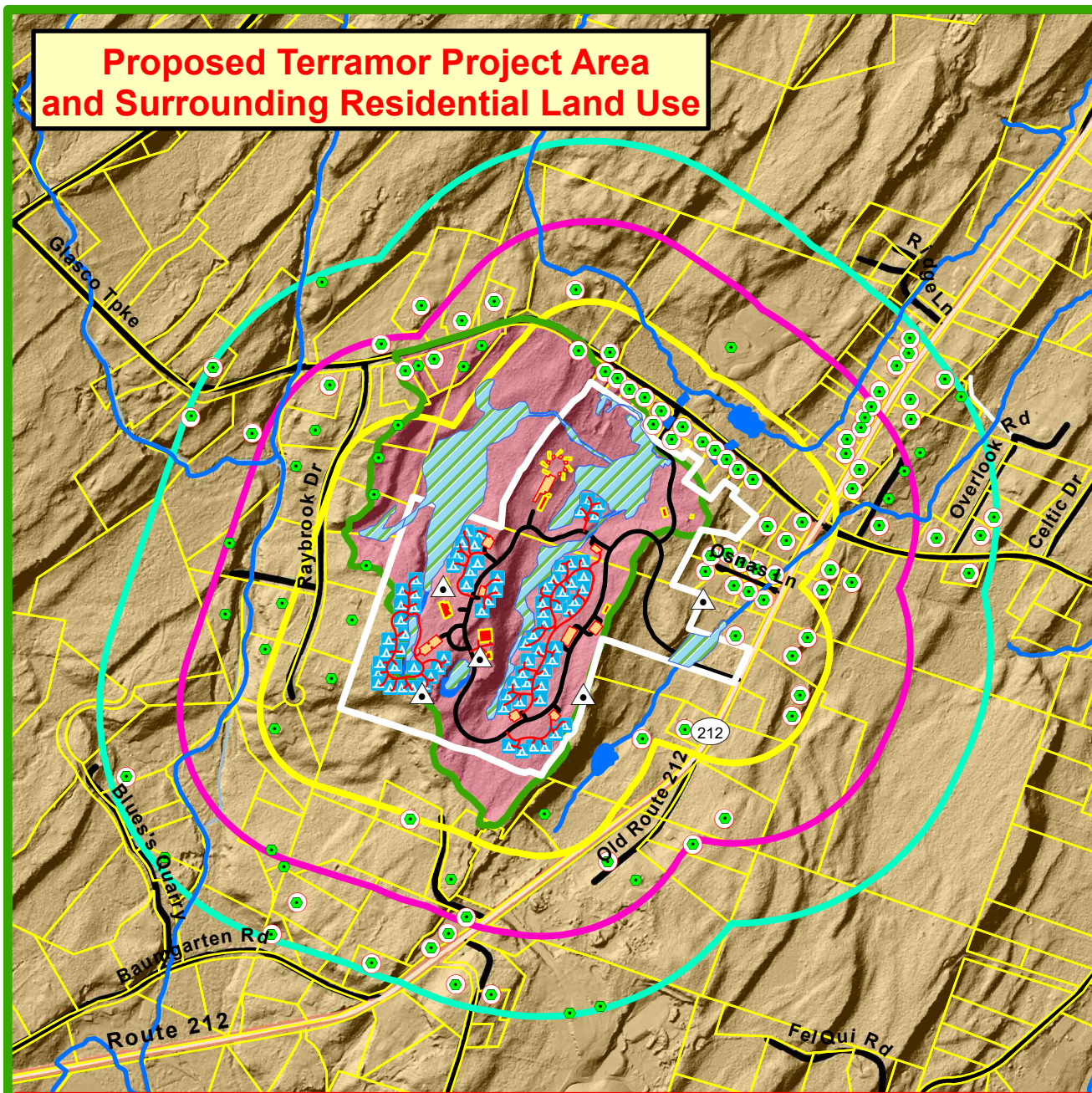
The proposed project is inconsistent with the existing community character. Analysis of historic aerial imagery for the years 1986, 1993, 1994, other mid-1990s imagery, 2001, 2004, 2009, 2013, 2016, and 2021 documents a well-established rural residential community extending for more than 1,500 feet outward from the Terramor property boundary. **Figures 1** (Proposed Terramor Project Area and Surrounding Residential Land Use), **2 and 3** (Proposed Terramor Project Area: Contrast Between a High-Density Boutique Glamping Campground Within a Wetland Complex Watershed and a Well-Established Residential Neighborhood) document offsite houses and large buildings (mostly residences) present in both 1986 and 2021 (35+ years). This well-established rural residential neighborhood is centered around a natural forested wetland complex that is discussed further below.

Assessment of high resolution 2021 imagery shows the number of houses and large buildings extending outward (aka offsite) from the Terramor property boundary. Most of these buildings are residences:

- Within 500 feet: 42
- Within 1,000 feet: 79
- Within 1,500 feet: 110

Reference to Figures 1, 2, and 3 document the low housing density currently present within an area extending 1,500-feet outward from the Terramor property boundary. This area, inclusive of the Terramor property encompasses 523 acres. The 110 houses and large buildings within this area equate to 1 house/large building per 4.75 acres. Beyond the 1,500-foot outward distance line, residential density is even more sparse. Housing/large building density within the 195-acre 500-foot distance polygon, closer to the proposed project area, currently equates to 4.64 acres per house on average.

Proposed Terramor Project Area and Surrounding Residential Land Use



- ~ Terramor Project Boundary
- 1986 Offsite Houses & Large Buildings
- 2021 Offsite Houses & Large Buildings
- Tax Parcels (Borders Approx.)
- 500-Foot Outward From Project Area (~ 42 Buildings)
- 1000-Foot Outward From Project Area (~ 79 Buildings)



1500-Foot Outward From Project Area ~ 110 Buildings)

Wetlands

Wetland Watershed

75 Permanent Glamping "Tent" Sites

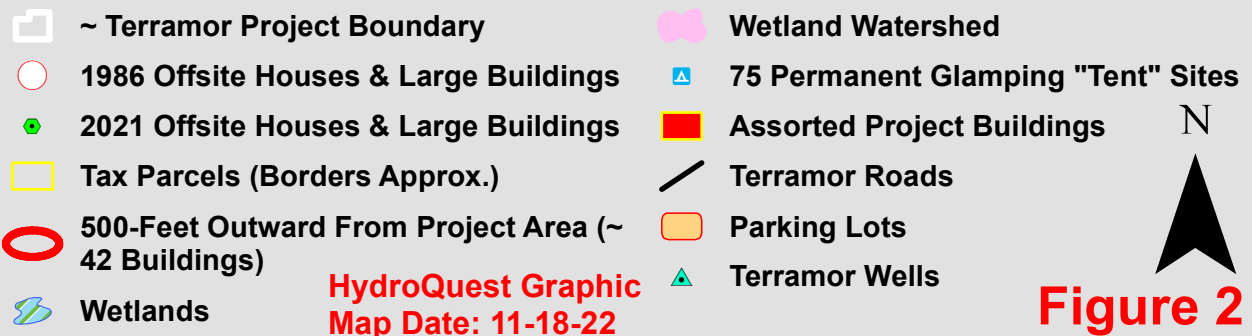
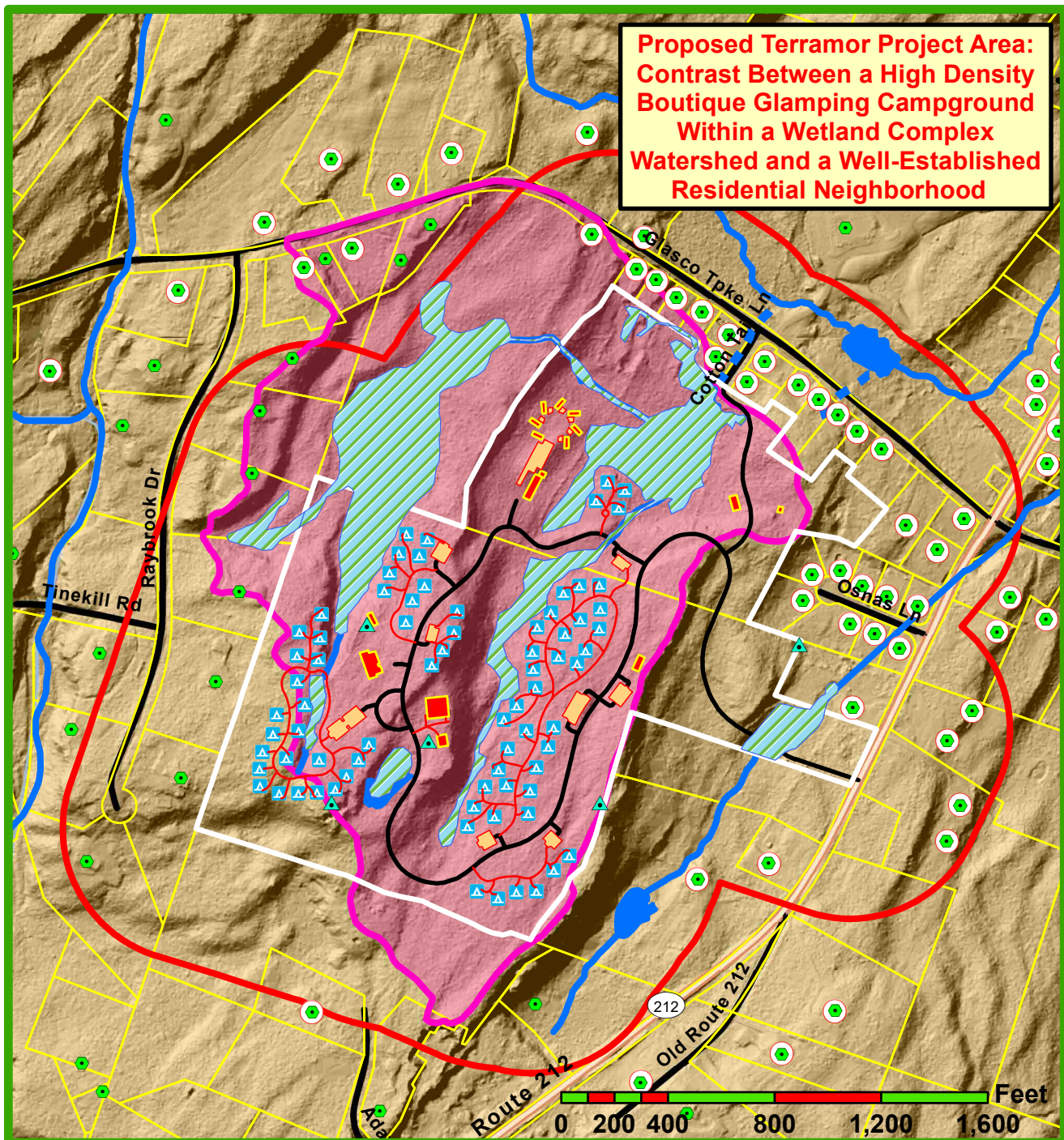
Assorted Project Buildings

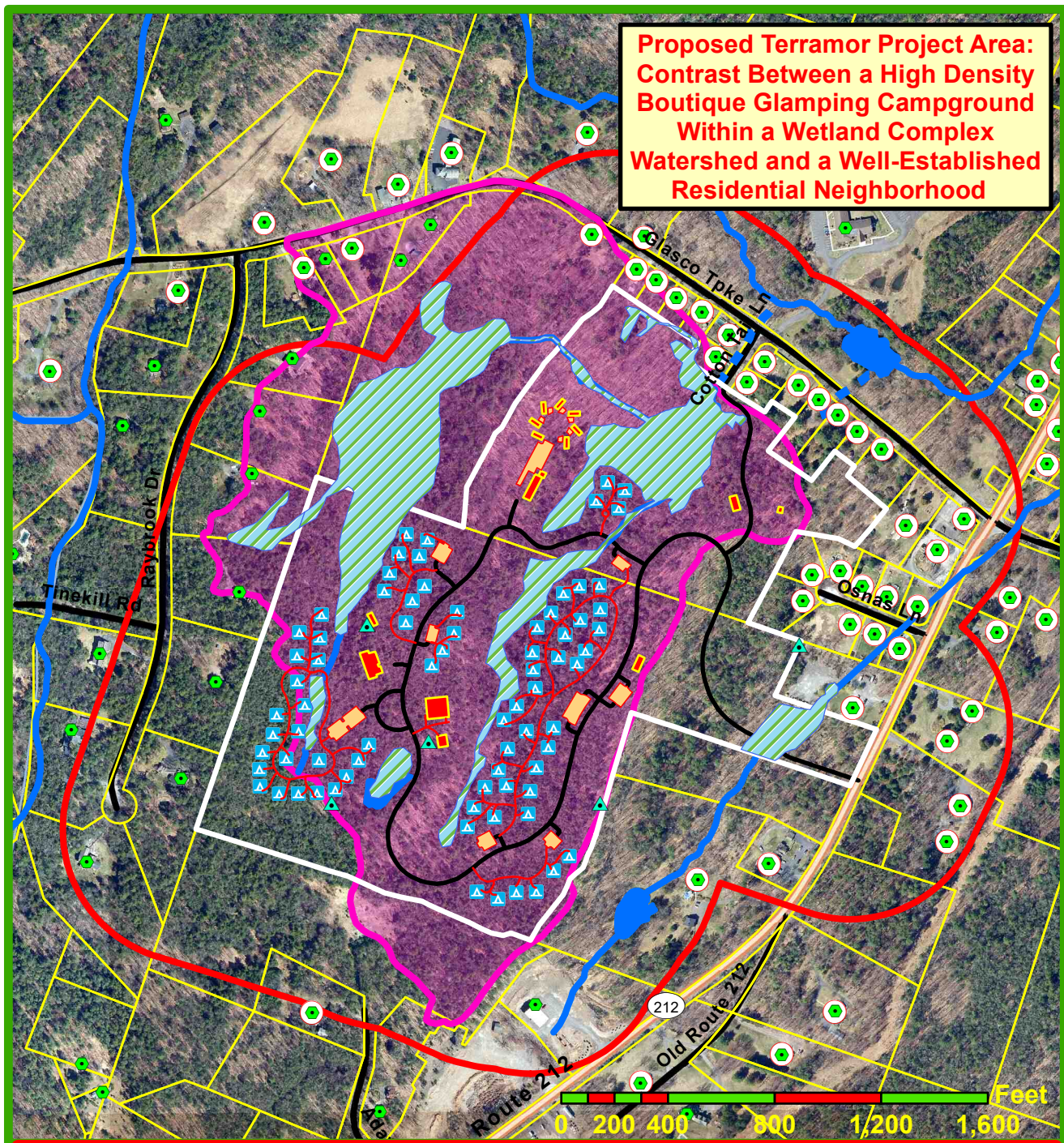
Terramor Wells

**HydroQuest Graphic
Map Date: 11-18-22**

Figure 1

Feet
0 375 750 1,500 2,250 3,000





- | | |
|--|------------------------------------|
| ~ Terramor Project Boundary | Wetland Watershed |
| 1986 Offsite Houses & Large Buildings | 75 Permanent Glamping "Tent" Sites |
| 2021 Offsite Houses & Large Buildings | Assorted Project Buildings |
| Tax Parcels (Borders Approx.) | Terramor Roads |
| 500-Foot Outward From Project Area (~42 Buildings) | Parking Lots |
| Wetlands | Terramor Wells |
- HydroQuest Graphic
Map Date: 11-18-22**
- N

Figure 3

In contrast to this, proposed glamping project housing (75 large “tents” and 6 dorm units without the General Manager’s house) would be constructed within an area of approximately 34 acres that includes significant wetland areas. Within this 34-acre area, housing density would equate to 1 housing unit per 0.42-acres, which would be an 11-fold increase in average housing density versus that currently present within both the project area and the 500-foot area surrounding the project site.

Overall, if the 82 proposed Terramor project housing units were developed, this would effectively triple the number of housing units (i.e., residences) currently within 500 feet of the project site border and double the number of housing units currently within 1,000 feet of the project site border. Doubling and tripling the living density is not consistent with, and is in sharp contrast to, the rural residential community character, land use pattern, and building type that has been maintained over the last 35 plus years.

When considering the proposed action’s consistency with Community Character, the Planning Board should consider the following NYS DEC guidance:

NYSDEC provides guidance relative to assessing community character:

“Community character is defined by all the man-made and natural features of the area. It includes the visual character of a town, village, or city, and its visual landscape; but also includes the buildings and structures and their uses, the natural environment, activities, town services, and local policies that are in place. These combine to create a sense of character that defines the area. Changes to the type and intensity of land use, housing, public services, aesthetic quality, and to the balance between residential and commercial uses can all change community character.”

Part 2 of the FEAF, Question 18, asks if the proposed project is NOT consistent with community character. As discussed above and illustrated on Figures 1, 2, and 3, the existing rural community character is of a well-established low density rural residential neighborhood centrally located around a natural forested wetland complex. This complex is discussed and illustrated in a report section below. As discussed above, residential density of a campground land use and its intensity associated with the proposed Terramor glamping project sharply contrast with the present land use. If the project were to be developed, it would place a commercial real estate land use directly within an existing Moderate-Density Residential District.

Sub-questions e. and f. of Question 18 of FEAF Part 2 seek to have lead agencies inventory all potential resources that could be affected by a proposed project, including potential inconsistency with the predominant architectural scale, character, and intensity of uses in the neighborhood or community, as well as with the character of the existing natural landscape. As discussed above, glamping tents within a rural community and natural forested wetland complex landscape are in sharp contrast to land use which currently exists. Alteration and development within the forested headwater wetland watershed the project lies within may jeopardize and irreparably harm wetland

ecology, biota, natural communities and wildlife, hydrologic fluxes, and water quality. These are potentially large impacts.

Key map-based conclusions that support issuance of a positive SEQRA declaration that are evident from the Community Character discussion here and on Figures 1, 2, and 3 include:

- Proposed action is NOT consistent with existing community character;
- Proposed project is of a larger scale than currently exists in the area;
- Proposed building types are not consistent with surrounding land use;
- Project introduces land use components that are different from, and is in sharp contrast to, the current surrounding land use pattern;
- Proposed action is inconsistent with the character of the existing natural landscape;
- Project would comprise a significant change in type and intensity of land use;
- Project housing density is not consistent with surrounding land use; and
- Documentation of existing community character through time (i.e., comparison of current conditions to those that would exist after project implementation) shows that project approval would result in tripling of the living density within 500 feet of the project border.

The proposed project is NOT consistent with the existing community character. The comparison provided above of current land use conditions to those that would exist after project implementation demonstrate that the action is inconsistent with the existing community character. Evaluation of this item justifies a positive declaration of significant environmental impact under SEQRA.

17. Consistency with Community Plans

The proposed action is not consistent with adopted land use plans.
(See Part 1. C.1., C.2. and C.3.)

☐ NO ☒ YES

The proposed Terramor project, as discussed above in the Consistency with Community Character section of this report documented that the proposed action is not consistent with the Town of Saugerties Zoning Law that does not permit private campgrounds in Moderate-Density Residential Districts. Sub-question 17a asks if the proposed action's land use components may be different from, or in sharp contrast to, current surrounding land use pattern(s). As discussed above, it is. Thus, a moderate to large impact may occur if the project were to be developed. Similarly, sub-question 17c asks if the proposed action is inconsistent with local land use plans or zoning regulations. As discussed above, it is inconsistent.

Relative to the proposed Terramor project, sub-question 17h "Other" is filled in here to pose the following question: **The proposed action may result in the devaluation of adjacent residential properties.**

The answer to this question is very important and it is YES. Private campgrounds, especially commercial real estate glamping campgrounds, do not comply with the permanent moderate-

density residential land use contemplated in the Town of Saugerties Zoning Law. Many property owners who own land abutting the proposed project are concerned that their land values will drop, along with their quality of life. This is borne out by the recent failed \$350,000 sale of a 14.6-acre property that directly abuts the southern Terramor property (**Figure 4**). The Adams Road real estate sale was nearing completion when the buyer learned of and investigated the Terramor project and then backed out of the real estate transaction.

Reference to Figures 4 and 5 show that 19 planned glamping tent sites lie within 400 feet of Terramor's southern property line, 4 planned glamping tent sites lie within 200 feet of Terramor's southern property line, 2 planned glamping tent sites lie within 125 feet of Terramor's southern property line. Vehicular campground traffic would also be driving within about 75-feet of this same property line along the project loop road. Similarly, other Terramor project glamping tents and employee dorm buildings are planned close to or within 100 feet of the Terramor property border (see the teal-colored 100-Foot Inside Line on Figure 4). In the northern portion of the Terramor property, employee housing is planned within about 80 feet of Refregier's Woodcock Wetland property. These buildings, their physical placements, and related noise, smoke, and odors are not consistent with Moderate-Density Residential District land use. Planned project development has already resulted in substantial property devaluation and, as such, presents a large impact.

3. Impacts on Surface Water

The proposed action may affect one or more wetlands or other surface water bodies (e.g., streams, rivers, ponds or lakes). (See Part 1. D.2, E.2.h) ☐ NO ☒ YES

Terramor Wetland Complex Geology and Setting

Evaluation of Terramor site plan maps and HydroQuest's offsite wetland mapping reveals that the proposed Terramor glamping project, if developed, would be centered around significant portions of a previously unrecognized, expansive, and hydrologically interconnected wetland complex. This complex is portrayed on Figures 6 and 7 and others. Figure 7 portrays the extensive overdevelopment that would occur if the project were to be developed.

The wetland complex is situated in an unusual physical setting, one that currently protects and maintains hydrologically isolated ecosystems and species habitats. Reference to **Figure 8** shows that the wetland complex area (gray 92-acre watershed area) and a green 80-acre area immediately to the west are elevated above much of the surrounding topography. Note that blue drainageways and streams surround the cork stopper-shaped gray and green-shaded upland area. Steep hillslopes flank much of this wetland complex area, essentially leaving a small inclined, miniature, plateau-like area raised above the surrounding landscape. This "*island*" formed as a result of erosion and sculpting by both streams and glaciers. The watershed area of the wetland complex comprises more than fifty percent of the 172-acre erosional island top.

Terramor Wetland Complex and Potential Property Devaluation

Figure 4

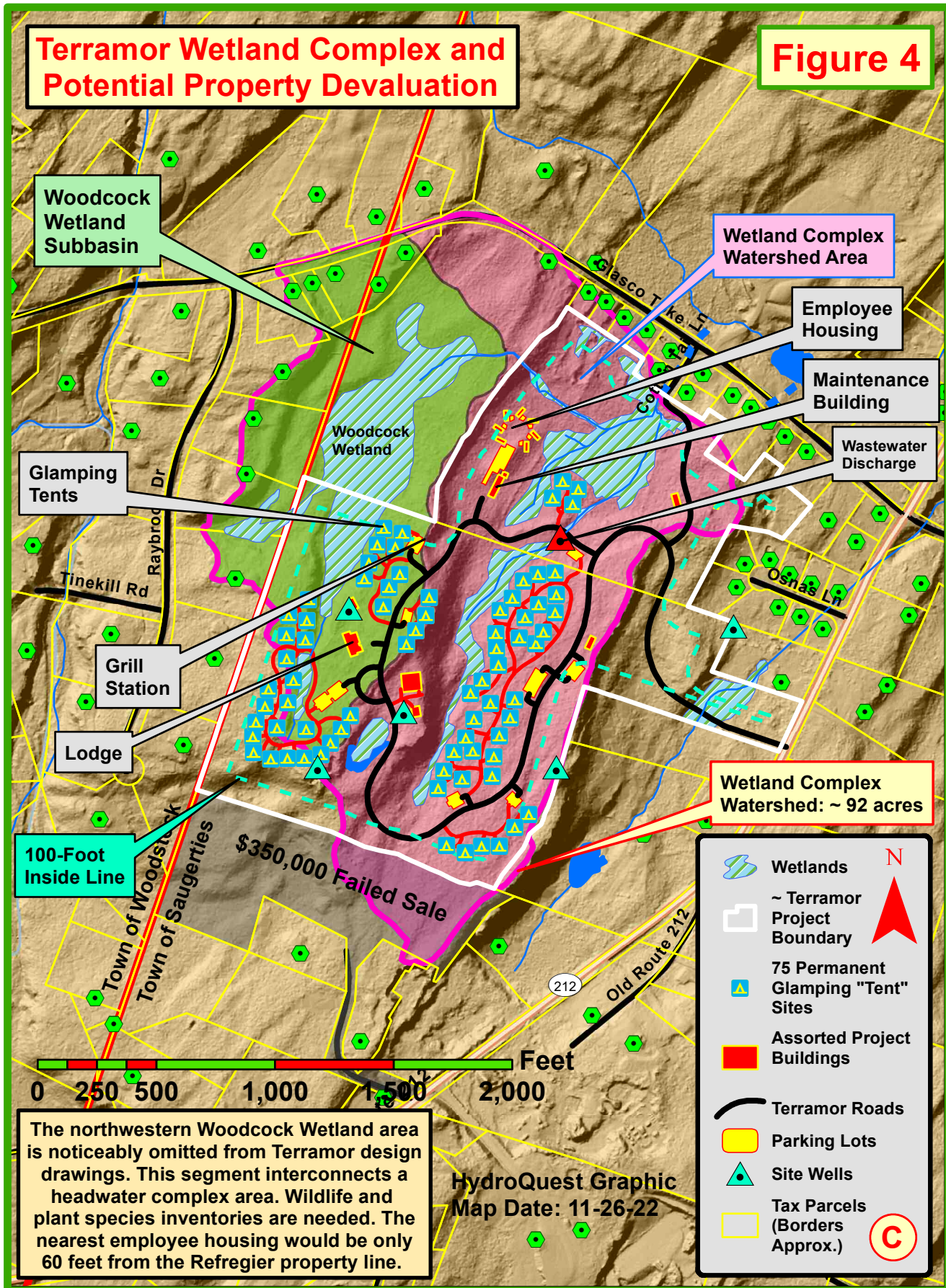
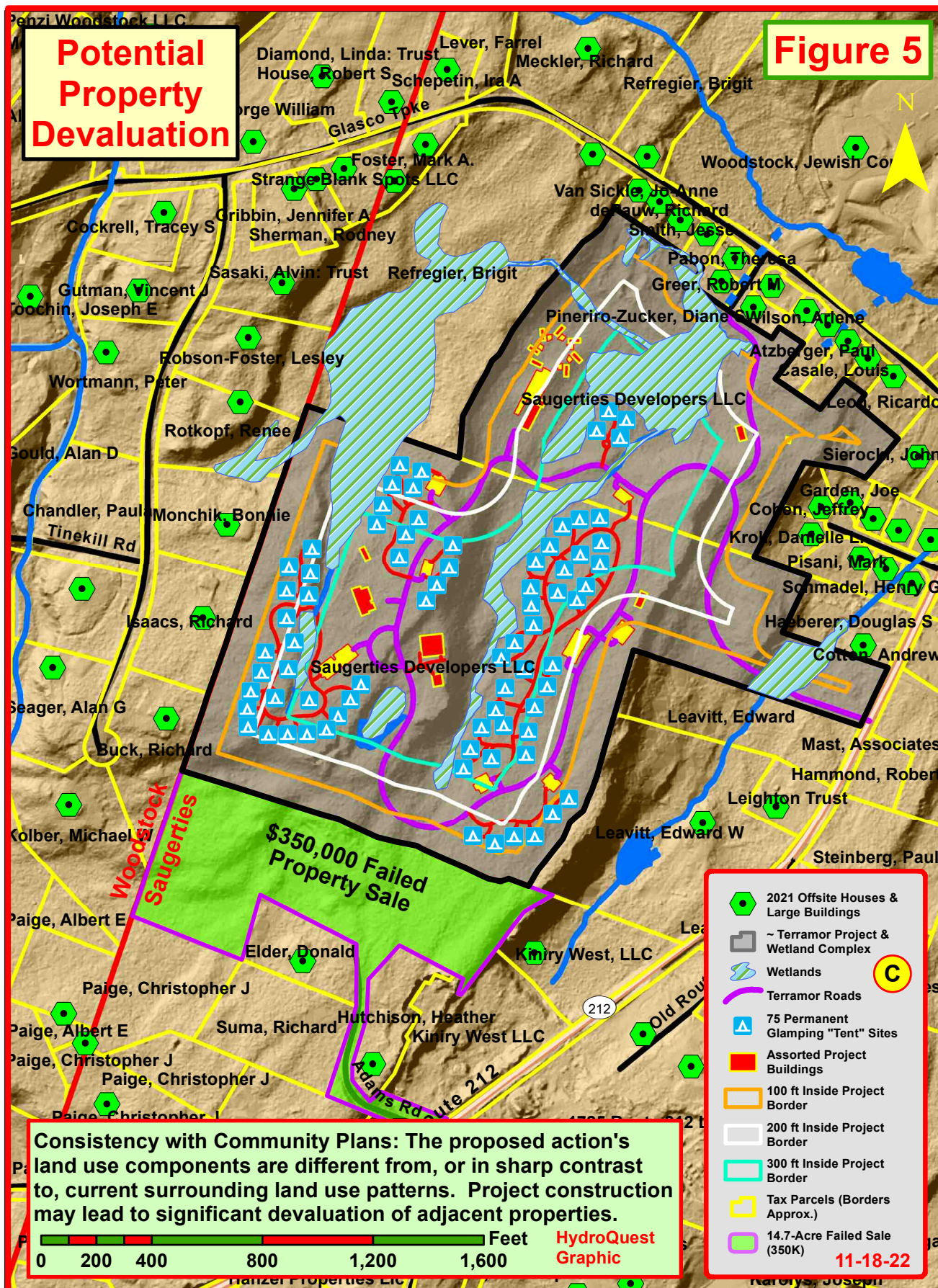


Figure 5



Terramor Wetland Complex

Approx. Wetland Acreages
 A: 1.8 acres
 B: 0.3 acres
 C: 0.4 acres
 D: 6.3 acres
 E: 5.5 acres
Total: 14.3 acres

Figure 6

Woodcock Wetland:
 ~ 7.3-Acres; Basin
 Size: ~ 34-Acres

Wetland Complex
 Watershed Area

Unsurveyed
 Wetland
 Segment

Wastewater
 Discharge

Wetland Complex
 Watershed: ~ 92 acres

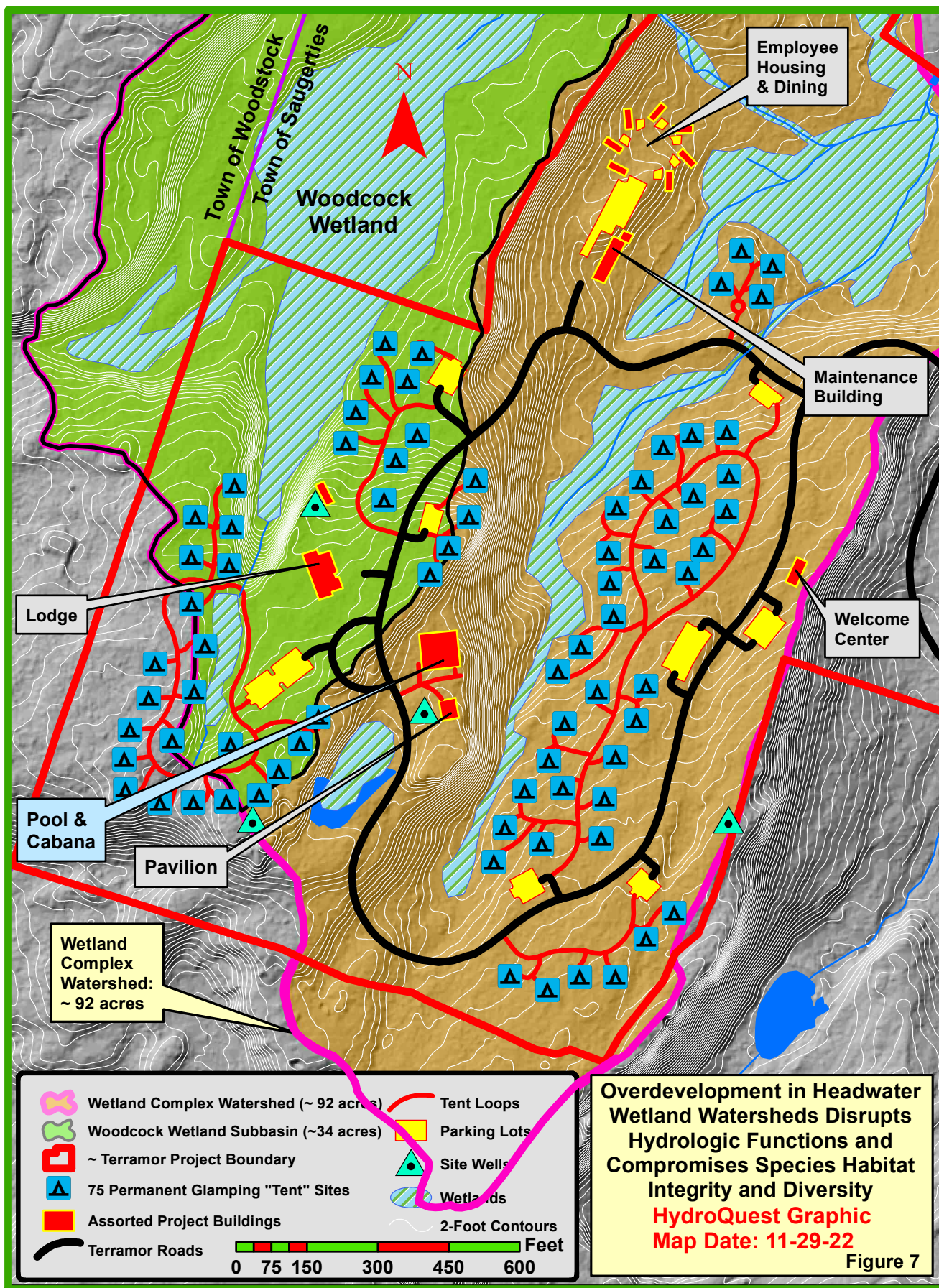
0 250 500 1,000 1,500 2,000 Feet

Wetland Viability Requires Continued
 Input of Natural Hydrologic Fluxes to
 Maintain Species Diversity and Health.
 Newly Enacted Wetland Reforms will
 Increase Protections of Wetlands and
 Terrestrial and Aquatic Wildlife Habitats.

HydroQuest Graphic
 Map Date: 12-02-22

-  Wetlands
-  ~ Terramor Project Boundary
-  75 Permanent Glamping "Tent" Sites
-  Assorted Project Buildings
-  Terramor Roads
-  Parking Lots
-  Site Wells
-  Tax Parcels (Borders Approx.)

C



HydroQuest Graphic - Map Date: 12-03-22

Figure 8

**Wetland Complex Watershed
Atop an Erosional Island**

Eastern Island
Wetland
Complex
Watershed:
~ 92-Acres

Western Island
Top Area:
~ 80-Acres

Stream Bounded &
Steep-Sided
Minature Plateau
Area: ~ 172-Acres

- Eastern Island
Top & Wetland
Complex
Watershed
- Western Island
Top
- Streams &
Ponds
- Wetlands
- ~ Terramor
Project
Boundary
- Planned
Terramor Roads

The wetland complex and its watershed are physically separated from the surrounding terrain, leaving a uniquely isolated wildlife habitat atop a glacially sculpted landscape. This erosional island is analogous to an inclined minature plateau. The naturally protected wetland complex comprises more than fifty percent of the erosional island top.



0 375 750 1,500 2,250 3,000 Feet

Soils in and around these island wetlands provide valuable insight into the characteristics that combine to make their protected settings and geologic history one well-suited for habitat development specific to the presence of unusual species. The geology present provides additional factors that likely contribute to an unusual physical setting where threatened, endangered, or species of special concern may thrive. An excellent example of this is accented relative to Woodcock Wetland that is portrayed on Figure 7 and other figures. The basin of this wetland was gouged by south-southwesterly advancing glacial ice, carving its invert into underlying sandstones and shales. As the last glacier retreated and melted back, it left behind sediments that contribute to its unusual setting as well as massive boulders (Figure 10 bottom). As observable on **Figure 9** and its key (**Figure 10**), much of Woodcock Wetland flourishes on a substrate of Canandaigua silt and clay loam (Cc) and Oquaga-Arnot (ORC) silt loam soils formed in glacial till compacted by glacier ice over bedrock. The Canandaigua loam sediments were deposited in a small pro-glacial lake atop glacial till and are bounded to the north by a low, arcuate, sediment knoll mapped as Tunkannock gravelly loam. Thus, Woodcock Wetland species thrive on soils deposited in a small pro-glacial lake in the waning stages of the last glaciation. The lack of any major anthropogenic development proximal to the wetland provides pristine habitat that the state of New York and others seek to protect. The proposed action may adversely affect these wetlands.

Recently, the state of New York has passed legislature designed to further protect and preserve freshwater wetlands from overdevelopment (see Figure 7). While some of this legislation has not yet gone into effect, it underscores the state's intent to increase wetland protection. As such, it would be prudent to consider the tenets of this legislation relative to Terramor project development within the watershed of this wetland complex. Key aspects of this legislative reform follow:

The reforms included in the SFY 2022-23 Budget will:

- Eliminate the jurisdictional nature of the existing state freshwater wetlands maps in 2025 and allow the Department to protect wetlands that are 12.4 acres or greater in size or of “unusual importance”.
- Lower the threshold for mandatory permitting for freshwater wetlands from 12.4 to 7.4 acres in 2028.
- Include criteria for permitting smaller wetlands of ‘unusual importance’, such as wetlands that attenuate significant flooding, filter drinking water, provide habitat for rare species, or are located in an urban area, among other criteria.
- Add in language creating a rebuttable presumption that freshwater wetlands are subject to regulation and permitting until proven otherwise.
- Increase fees and fines unchanged since the 1980’s.
- Remove prohibitive red tape and agency costs related to wetlands protection.
- Provide funding for wetlands management and local mapping of freshwater wetlands through the Climate Smart Communities Program in the NYS Environmental Protection Fund.
- Direct the Department to create educational resources on the process for identifying freshwater wetlands to inform landowners and local governments.

Soils Beneath and Adjacent to Woodcock Wetland

Figure 9

HydroQuest Graphic
Map Date: 12-03-22

ORC

0 75 150 300 450 600 Feet

N



ORD

TkB

Woodcock
Wetland

AcB

Cc

End Locations
of Terramor
Wetland
Delineations

ARF

TkC

At

2

3

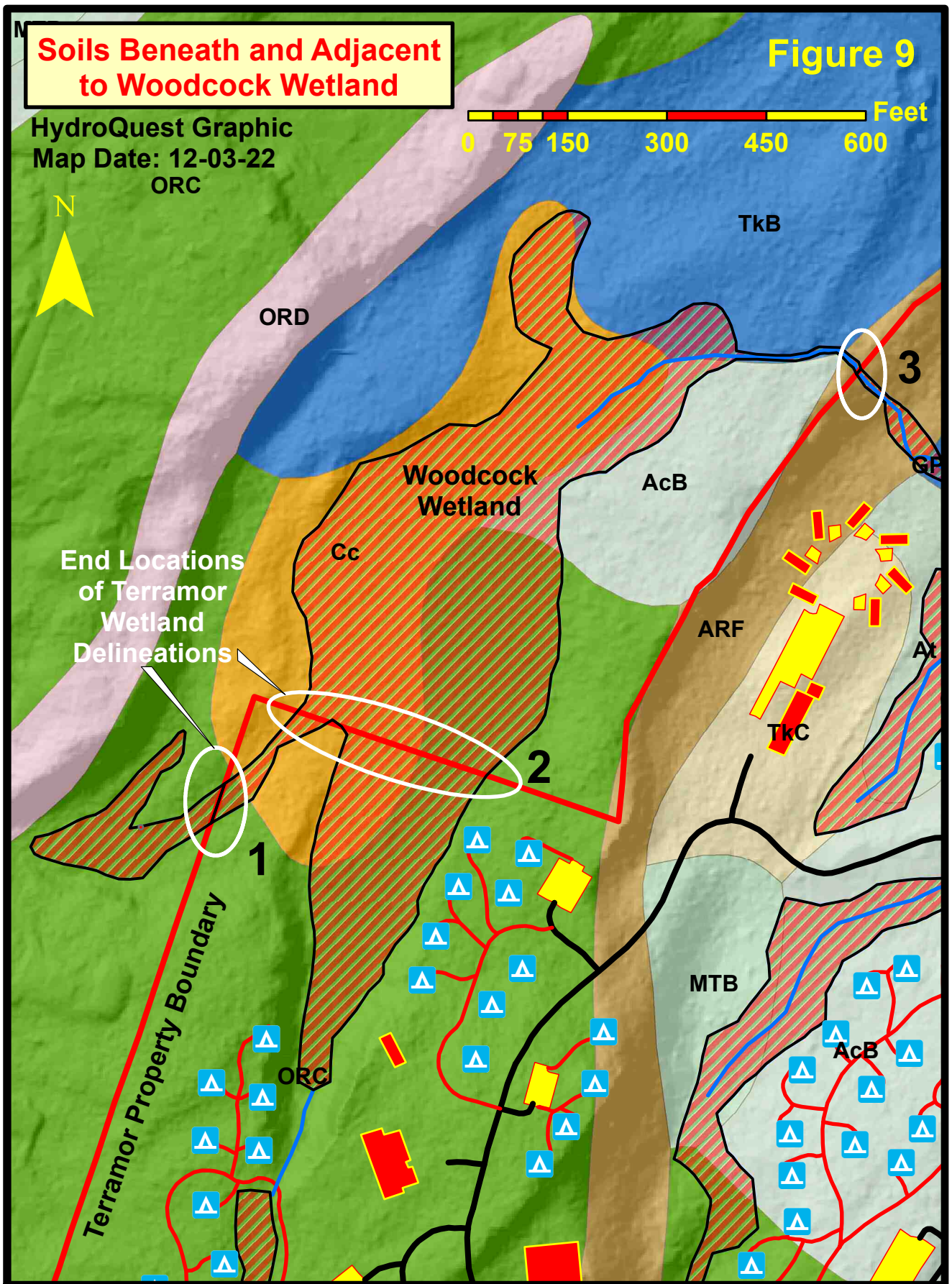
Terramor Property Boundary

1

MTB

AcB

ORC



Soils Beneath and Adjacent to Woodcock Wetland*

Key:

- Cc: Canandaigua silt and clay loam formed in a lacustrine (lake) deposit of silt, very fine sand, and clay; moderate to slow permeability; poorly and very poorly drained; surface layer is a gray mottled silty clay loam; mottling continues downward into substratum; free water on surface in late fall, winter, spring, and after rainy periods; good for wetland wildlife; wetland stratum bounded by low bedrock uplands on three sides; possible small relict proglacial lake; may provide a unique species habitat.
- TkB: Tunkannock gravelly loam; Soil formed in gravel & sand of glacial outwash; deep substratum of stratified gravel and sand; well to excessively well drained; highly permeable; gravel source.
- ORC: Oquaga-Arnot-Rock outcrop complex, sloping (slope bases, breaks and terraces); Silt loam soils formed in glacial till with small bedrock outcrop areas; shallow depth to bedrock; moderate permeability; well and excessively drained; free water for brief periods in spring and after very heavy rains; wildlife habitat.
- AcB: Arnot channery silt loam; somewhat excessively and moderately well drained soil formed in glacial till; shallow depth to bedrock; free water briefly in spring and after heavy rains; moderate permeability.
- ORD: Oquaga-Arnot-Rock outcrop complex, moderately steep slopes (15-25%); Silt loam soils formed in glacial till with small bedrock outcrop areas; shallow depth to bedrock; substratum is a very gravelly loam; moderate permeability; well and excessively drained; free water for brief periods in spring and after very heavy rains; wildlife habitat.
- ARF: Arnot-Oquaga-Rock outcrop complex, very steep slopes (35-70%); bedrock outcrops; moderate and shallow depth to bedrock; bouldery soils formed in glacial till on hillslopes; excessively and moderately well drained; moderate permeability; brief free water in spring and after heavy rain; woodland and wildlife habitat.

*: United States Department of Agriculture & Soil Conservation Service, 1979, Soil Survey of Ulster County, New York, 287 p.



Very large boulders deposited on Oquaga-Arnot (ORC) and Arnot channery silt loam (AcB) soils as glacial ice melted. These and other large boulders are present on a low bedrock ridge situated immediately east of Woodcock Wetland.

Figure 10

- Require the Department to consult with the federal government, colleges and universities, environmental organizations, and other entities to increase the accuracy of the freshwater wetland maps - which will be maintained as an online informational resource.

Project Area Wetland Complex

Reference to Terramor's set of site maps and documents show that they failed to document and acknowledge this wetland complex, its interconnectivity, and its headwater setting within an areally limited watershed area. Their wetland delineation and pink wetland flagging end at and slightly beyond their property boundary. **This is unfortunate because major development projects should be reviewed within a broad landscape and community setting, not in isolation where potentially significant adverse environmental impacts are not addressed.**

The most striking examples of Terramor's failure to provide a complete environmental assessment of the wetland complex are found in their July 1, 2022 Site Plan Application map set, especially on maps labeled "Sheet 1 of 5", "Sheet 4 of 5", "L-1.0", "L-1.1", "L-2.0", "L-3.0", "L-3.4", "L-4.0", "L-4.4", "L-5.4", and "L-7.3." **These Terramor maps artificially truncate the large wetland situated close to their northern property border** between points A and E that are depicted on HydroQuest **Figure 6**.

This wetland extends northward onto the property of Brigit Refregier, labeled on Figure 5. Figure 6 shows this wetland and associated acreages inclusive of labeled points A and E. Woodcock Wetland segments A and E total 7.3 acres in areal extent (see acreage table on Figure 6). This acreage value does not include the unsurveyed wetland segment located west of the border between the towns of Woodstock and Saugerties (Figure 6). While delineation of that segment is required, its approximate areal extent is surmised from a combination of high-resolution imagery and 2-foot elevational contour data. Figure 7 that depicts planned Terramor overdevelopment within the wetland complex watershed shows a second small segment of Woodcock Wetland that extends westward into the Town of Woodstock (west of the red north arrow).

HydroQuest mapped the Refregier portion of this wetland on November 4, 2022. Delineation was based on field evaluation of a combination of factors including standing water, hydric soils, hydrophytic vegetation, wetland hydrology, and topography using expertise in hydrology, geology, and geomorphology. Boundary point locations were recorded on a Global Positioning System receiver, brought into a GIS database, and plotted on GIS maps. A crude plot of this Freshwater Forested/Shrub Wetland is found on the NYSDEC Environmental Resource Mapper.

Construction of wetland complex and other HydroQuest GIS maps required that all major Terramor project components be georeferenced and digitized so that they could be depicted within context of the broader project area. In order to place the proposed project's location and features within a usable map base, versus solely as stand-alone project specific maps with no geographic context, it was necessary to provide all project features with exacting geographic spatial coordinates.

This newly mapped portion of the wetland complex is herein referred to, named, and labeled on HydroQuest maps as “*Woodcock Wetland.*” This name is appropriate because American woodcocks were sighted on three occasions while delineating the wetland (Figure 11). A Wildlife in Wetlands brochure authored by NYSDEC, NY Forest Owners Association, and Cornell University identifies the American woodcock as a species of greatest conservation need (SGCN) in the 2015 N.Y.S. Wildlife Action Plan where it is listed on page 81. The brochure states: “*The impact of human development on wetlands is the most significant threat to wetland habitats and their associated wildlife.*”



Figure 11. Woodcock Painting
by Jean Gawalt

Clearly, the Woodcock Wetland provides an excellent habitat suitable for species survival. **Figures 12, 13, and 14** provide photographs of this wetland and surrounding area.

Interconnectivity of the Wetland Complex

Delineation and cartographic plotting of Woodcock Wetland documents its interconnectivity with other wetland segments that were delineated by Terramor consultants within their property border. Terramor’s wetland delineator stopped Woodcock Wetland delineation close to or at their northern property boundary located between the letters A and E on HydroQuest’s Terramor Wetland Complex map (Figure 6). This same location is highlighted by the white oval numbered 2 on Figure 9. At this location, the wetland is approximately 230-feet wide and clearly extends far to the north-northeast. As seen on Figure 6 (*Terramor Wetland Complex*), Woodcock Wetland is an important component of the headwater wetland complex that ultimately discharges beneath Glasco Turnpike in a culvert. As noted in a table on this map, all wetland areas within the 92-acre wetland complex watershed (bounded by a purple line) are interconnected through a combination of wetlands and, in a few instances, narrow wetland segments with streamflow over steep topography. This topography is illustrated on Figure 7 (*Overdevelopment in Headwater Wetland Watersheds*) where 2-foot elevational contours are close together. Together, these wetland segments total approximately 14.3 acres (see table on Figure 6). Terramor lists their onsite wetland acreage as 10.04 acres.

Careful review of Terramor’s wetland maps documents that their delineator(s) recognized that wetlands on Terramor property clearly extended beyond their property border onto private property. There are three locations where this is documented that were subsequently surveyed by Terramor’s surveyor. These areas are highlighted by numbered white ovals on Figure 9:

- Oval 1: Wetland survey locations G3, G2, G1, F2, and F1, depicted on Sheet 4 of 5 of Terramor’s Site Plan Application map set, show the wetland here extends southwestward

Woodcock Wetland Photographs

Figure 12



Wetland edge.

Wetland outflow to east.

Woodcock Wetland Vegetation



Figure 13

Uplands Adjacent to Woodcock Wetland



Transition between wetland (left) and upland (right) terrain along the western flank of the Woodcock Wetland subbasin.



Hydrologic divide along the eastern border of the Woodcock Wetland subbasin.



Western flank of Woodcock Wetland subbasin.



Glacially dropped boulders along the eastern flank of Woodcock Wetland.



Arcuate sediment mound bounding the northern terminus of Woodcock Wetland.

Figure 14

onto two Town of Woodstock parcels owned independently by Rotkoph and Monchik. This wetland segment should be delineated;

- Oval 2: Wetland survey locations E2 and E1 depicted on Sheet 4 of 5 of Terramor's Site Plan Application map set show that Woodcock Wetland extends northward onto the private land of Refregier (Sutton);
- Oval 3: Wetland survey locations H83, J2 and J1 depicted on Sheet 5 of 5 of Terramor's Site Plan Application map set (i.e., Ausfeld & Waldruff Land Surveyors LLP map titled *Boundary & Topographic Survey of the Lands of Saugerties Developers LLC*) extend westward onto the private land of Refregier (Sutton). Importantly, Terramor's wetland delineator flagged the narrow northwesterly projecting segment of the wetland area labeled "D" on the *Terramor Wetland Complex* map (Figure 6) partially onto the Refregier property.

Thus, Terramor's maps document the physical extension of the "D" labeled wetland (Terramor wetland H/I/J) extending up the steep slope here (shown on Overdevelopment map Figure 7 and on Figure 5) onto the Refregier property into the wetland outflow channel of Woodcock Wetland. This obvious wetland channel extends northwesterly into Woodcock Wetland. Terramor wetland delineation and subsequent survey of the areas depicted in Ovals 2 and 3 of Figure 9 document the interconnectivity of wetland segments labeled A, E, and D on Figure 6. Even if wetland segments B and C on the *Terramor Wetland Complex* Figure 6 map are omitted from the total acreage listed in the table, this leaves 13.6 acres of now mapped, interconnected, and documented wetland acreage. This exceeds the present 12.4-acre minimum acreage for New York State protected wetlands. However, because this wetland complex has not been officially recognized and vetted by NYSDEC as a mapped wetland, it is not afforded protection or subject to Environmental Conservation Law Article 24 Freshwater Wetlands regulations.

Whether NYSDEC would consider adding this now recognized and mapped 13.6⁺-acre wetland to current wetland listings is not known. Item 7, page 7, of Article 24 (§24-0301) appears to present a potential pathway to State wetland designation that should be reviewed and considered for future action and as part of the environmental review. At the very least, documentation and maps presented in this report provide justification for further study and species inventory to be completed as part of an EIS scoping document.

Terramor's failure to comprehensively acknowledge the full areal extent of Woodcock Wetland and its interconnection with other mapped site wetlands provides rationale for extended field investigation of wetland boundaries, inventory of animal and plant species present throughout all of Woodcock Wetland, and assessment of potential project-related hydrologic and biologic environmental impacts. As discussed above, newly upgraded wetland laws that will take effect in 2028 highlight the need to further protect wetlands like those in the wetland complex documented in this report by, in part, lowering the threshold for mandatory permitting for freshwater wetlands from 12.4 to 7.4 acres.

Wetlands of Unusual Local Importance

Woodcock Wetland and other “island” wetland complex wetlands may qualify as wetlands of “*unusual local importance*” as discussed in Article 24, Freshwater Wetlands, Title 23 of Article 71 of the Environmental Conservation Law in §24-0301, paragraph 1. This would require recognition of a few factors, perhaps including the wetland’s geologic substrate as discussed above, with specific emphasis on items b and c listed in subdivision seven of section 24-0105 of Article 24. These are:

- “7.(b) *wildlife habitat by providing breeding, nesting and feeding grounds and cover for many forms of wildlife, wildfowl and shorebirds, including migratory wildfowl and rare species such as the bald eagle and osprey;*
- 7.(c) *protection of subsurface water resources and provision for valuable watersheds and recharging ground water supplies;”*

Section 7 seeks to prevent any loss of freshwater wetlands that deprives the people of the state of some or all of the many and multiple benefits to be derived from wetlands, inclusive of those stated in 7.(b) and 7.(c) above. Documentation of American woodcock in Woodcock Wetland, discussed above, and of groundwater recharge discussed in a section below may support wetland classification as being of “*unusual local importance.*” If the Terramor application is advanced, the EIS should address this issue.

Risks to Wetland Water Quality and Species That Use Project Area Wetlands

Significant physical alteration of a major portion of the wetland 's watershed area stemming from multiple glamping tents, roadways, assorted buildings, utility lines, paving, and grading may adversely impact wetland water quality, the thriving ecosystem, and wetland species. Furthermore, placement of a package water treatment plant within the wetland complex (Figure 6) will result in wastewater additions to the wetland ecosystem. Even with treatment, this would pose a water quality risk and may degrade wetland habitat.

Project development has the potential to adversely impact water quality from wastewater effluent and stormwater discharge. The ability of the receiving wetland and downgradient stream to assimilate contaminants depends on several factors including contaminant concentrations and stream flow. If the treatment method does not remove 100 percent of the contaminants to be discharged, the chemical load may degrade the wetland and stream ecosystem

Because of the importance of project area wetlands, it is essential that the applicant provide a listing of all wastewater and stormwater chemicals, E. coli and fecal coliform and their maximum concentrations that will be discharged to site wetlands. This should be accompanied by low flow stream measurements and loading calculations. No hydrologic information has been provided by the applicant regarding the quantity of wetland water volume or streamflow required to assimilate their contaminant load.

The importance of assessing chemical loading and ecosystem harm cannot be over stated. The bioaccumulation and impact of some chemical parameters have the capacity to alter and degrade existing, healthy, ecosystems. High levels of nutrients, elevated Biochemical Oxygen Demand (BOD), NH₃ (ammonia; toxic to fish), total phosphorus, and fecal coliform can readily combine to make wetlands eutrophic. This can, in turn, encourage the overgrowth of weeds, algae, and cyanobacteria (blue-green algae). This may cause algal blooms, resulting in rapid growth in the population of algae. If algae numbers become unsustainable, eventually most of them die. The decomposition of the algae by bacteria uses up so much of oxygen in the water that many aquatic animals die. This is particularly true in wetlands or along stream reaches with little or no hydraulic gradient where limited re-oxygenation is likely to occur. Incomplete wastewater treatment or failures of the wastewater treatment system may result in adverse environmental impacts to aquatic species.

Less than 100 percent treated effluent can degrade project site wetlands, resulting in bioaccumulation of contaminants, reduction in species present, and eutrophication, especially during dry and drought periods. Key elements of the DEIS review process typically examine contaminant receptors, detailed species inventories, ecosystem assessments, baseline water chemistry, and flow throughout at least one annual cycle. Terramor should supply chemical loading calculations, baseline water chemistry data, and assessment of potential impact on site wetlands as part of the DEIS process.

A key difference relative to the glamping project is that all site units are concentrated in a small area with wastewater discharge to a single contaminant point source. **If permitted, all treated project wastewater would discharge into a federal wetland in the northern portion of the wetland complex (vs. private homeowner leach fields). Additionally, as designed, project wastewater would alter the naturally-existing hydrologic flow that contributes to the health and viability of this wetland. Together, these and other issues raise significant environmental concerns.** They must be fully characterized and evaluated prior to the project moving forward in order to avoid serious and perhaps unnecessary environmental impacts.

Chemical additions to wetlands, especially headwater wetlands with very small watersheds, can adversely impact aquatic ecosystems. This may, in turn, adversely impact animal species that rely on high quality water for ingestion and breeding. Furthermore, should wetland water be drained as a result of groundwater pumping, as discussed below, this may adversely impact assorted animal species. One such example is the threatened timber rattlesnake (*Crotalus horridus*). Comprehensive species inventory throughout all the wetland watershed may find that this area is frequented by rattlesnakes seeking water during dry spells. Two rattlesnake dens lie within two miles from the proposed project site.

Evaluation of these items justifies a positive declaration of significant environmental impact under SEQRA.

4.

Impact on groundwater

The proposed action may result in new or additional use of ground water, or may have the potential to introduce contaminants to ground water or an aquifer.

☐ NO ☒ YES

Groundwater pumping from Terramor's production wells, designed to meet project water demand, will impact homeowner water wells in both the Town of Saugerties and the Town of Woodstock. In addition, at least during dry periods, Terramor groundwater withdrawal may lower or potentially drain both onsite and offsite wetlands that together comprise the wetland complex mapped and discussed in this report.

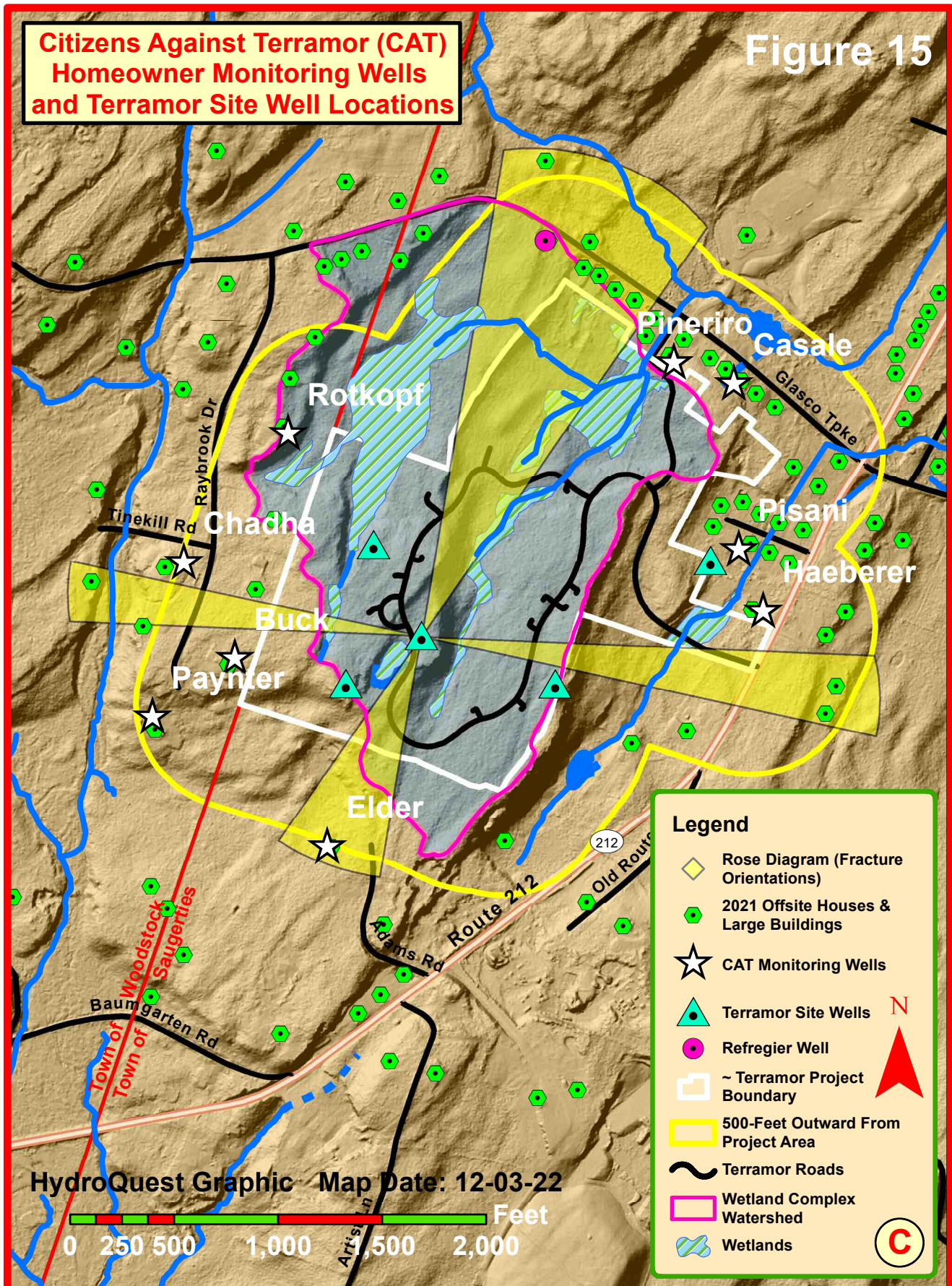
To satisfy Department of Health requirements supportive of a groundwater supply, Terramor must document that sufficient water is available meet project demand. From a hydrogeologic perspective, well testing must be conducted that records drawdown and recovery in both onsite wells and offsite wells. In physical settings where wetlands are present, it is also necessary to monitor their water levels during testing to assess potential adverse impacts to them, their ecosystems, and species. Citizens Against Terramor (CAT) became aware of Terramor's plans to limit well tests to 24-hours, which is not consistent with established regulations. In response, HydroQuest drafted a letter designed to ensure that 72-hour testing would be conducted, that wetland water levels would be monitored, that the frequency of water measurements would be sufficient to fully evaluate onsite and offsite hydrogeologic factors, and several other items (see Addendum A).

CAT were also concerned that Terramor would not monitor enough offsite homeowner wells to ascertain, or not, whether pumping of their groundwater production wells would impact homeowner water supplies. Despite a request provided to Terramor seeking a copy of their well testing protocols and information on which, where, and how many wells would be monitored during testing, Terramor elected to not share this critical information, opting instead to inform CATs that their report would be available after completion. Furthermore, Terramor elected to not monitor at least two wells where homeowners requested monitoring, one with known water quantity issues that HydroQuest specifically recommended for groundwater monitoring.

In response to Terramor not being forthcoming regarding important hydrogeologic information, CAT funded their own groundwater monitoring program that was spearheaded by Mid-Hudson Geosciences and HydroQuest. Monitoring well locations were selected based on a detailed fracture orientation analysis conducted in the local area. This is important because area wells are constructed in fractured sandstones and shales of the Hamilton Group. Groundwater flow occurs within fractures (aka joints) within sandstone and shales, primarily in vertical fractures. Measurement of many joints in nearby Bluestone Wild Forest by HydroQuest found that the prominent joint orientation in the area is approximately N22°E, but commonly ranges between N10°E and N35°E. A secondary joint orientation is also present at about 90 degrees to these orientations. Groundwater within these fractures is commonly present along both fracture sets that are often interconnected. The direction of these major fracture orientations in plotted as a mustard-yellow fan-shaped figure arbitrarily centered on one of Terramor's site wells. This plot is referred to as a Rose diagram (**Figure 15**). These same fracture orientations are present within bedrock

**Citizens Against Terramor (CAT)
Homeowner Monitoring Wells
and Terramor Site Well Locations**

Figure 15



throughout the local region. Groundwater flow primarily occurs through these fractures, often preferentially along the more prominent north-northwest to south-southeast orientation shown on Figure 15. Depending on the degree of bedrock fracturing present, groundwater availability to Terramor production wells was considered to potentially extend outward along numerous compass directions, although particularly along the primary north-northwest to south-southeasterly fracture orientation plotted on the Figure 15 Rose diagram.

With these geologic factors in mind, and on short notice, permission to monitor nine homeowner wells was obtained. These white-starred wells with labeled homeowner names are depicted on Figure 15. Each of the wells were fitted with small, factory-calibrated, stainless-steel transducers (6 inches long and 1-inch in diameter; i.e., ONSET - HOBO U20 Series Water Level Logger - Figure 16) programmed to record water pressure above it. This is then equated to feet of water above the transducer. They were placed in wells on thin stainless-steel wires, sterilized, and dedicated to the wells being monitored. Contrary to assertions made by Terramor that their use is undesirable due to the possible introduction of bacteria, they are routinely used by hydrogeologists and other scientists worldwide. C.T. Male, for example, is familiar with transducers and has relied on data collected in them at 10-minute intervals during 72-hour water supply tests (2012). The recording interval was set to measure water pressure every five minutes. Rigorous hydrogeologic interpretation requires sufficient data collection during both aquifer drawdown (pumping) and recovery after pumps have been turned off.



Figure 16: Water Level Logger.

While we are uncertain as to the location and number of homeowner wells monitored by Terramor, we are aware of their infrequent water level measurements taken with a sonic meter in the Pisani, Pineriro, and Paynter wells.

Results of CAT Well Water Monitoring

Three of the nine homeowner wells monitored by CAT were impacted by all three of Terramor's production well tests, presumably conducted on three different wells, either individually or simultaneously. Until Terramor provides their aquifer test report, we will not be able to fully assess valuable hydrogeologic findings. However, water pressure data collected from the nine CAT monitoring wells, especially when coupled with other analyses presented in this report, support many important conclusions. These include:

- The nine homeowner wells monitored by CAT represent only a portion of homeowner wells that may be impacted if the Terramor glamping project is developed;
- The Pisani, Elder, and Chadha wells were impacted during all three of Terramor's production well testing of at least three wells;

- Over 50 percent of the available water column in the Pisani well was drawn down during Terramor's second production well testing (**Figure 17**). This plot is preliminary pending possible additional calibration, inclusive of barometric pressure correction. At the end of 72-hours of pumping, the water level in the well was still steadily declining, thereby indicating that aquifer equilibrium conditions were not achieved. Continued long-term pumping of Terramor production wells might dewater the Pisani and perhaps other non-monitored wells. Once Terramor stopped their test, this well took over 3 days to recover to its initial full capacity;
- The Pisani and Elder wells are in the Town of Saugerties. The Chadha well is in the Town of Woodstock (Figure 15);
- Thirty-three percent of the wells monitored by CAT were impacted by Terramor's production well testing. It is highly likely that other wells would also be impacted if the Terramor project is developed;
- Regardless of Terramor's production well pumping scenarios, impact to offsite homeowner wells situated east, west, and south of Terramor project property document substantial interconnectivity of bedrock fractures and groundwater flow paths;
- As illustrated on the Figure 15 Rose diagram, there is a strong likelihood that wells situated north and south of Terramor production wells will be impacted if the project is developed. The Refregier well is one example of a northern location where project groundwater pumping might impact homeowners' water supplies;
- Reference to the yellow blossom-shaped polygon on Figure 15 and the three homeowner wells that CAT found to be impacted by Terramor production well pumping shows that groundwater impacts may be anticipated for at least 500-feet outward from the Terramor property boundary. Prominent bedrock fractures commonly extend for far greater distances;
- An October 4, 2022 email from CT Male to UCDOH provides data that permits identification and location, using GIS technology, of the three Terramor wells that appear to be those pumped during their aquifer testing. Based on this assessment, the closest tested production well to the Elder well is some 1,100 feet distant, with the furthest being 2,300 feet away as the crow flies. The actual groundwater pathway is undoubtedly more tortuous and longer;
- Based on the well placement assessment above, the closest and furthest Terramor-tested production wells from the Chadha private well are 1,200 feet and 2,500 feet away,

**Pisani Well Response - 11 Osnas Lane
During Terramor's 2nd & 3rd Aquifer Tests**

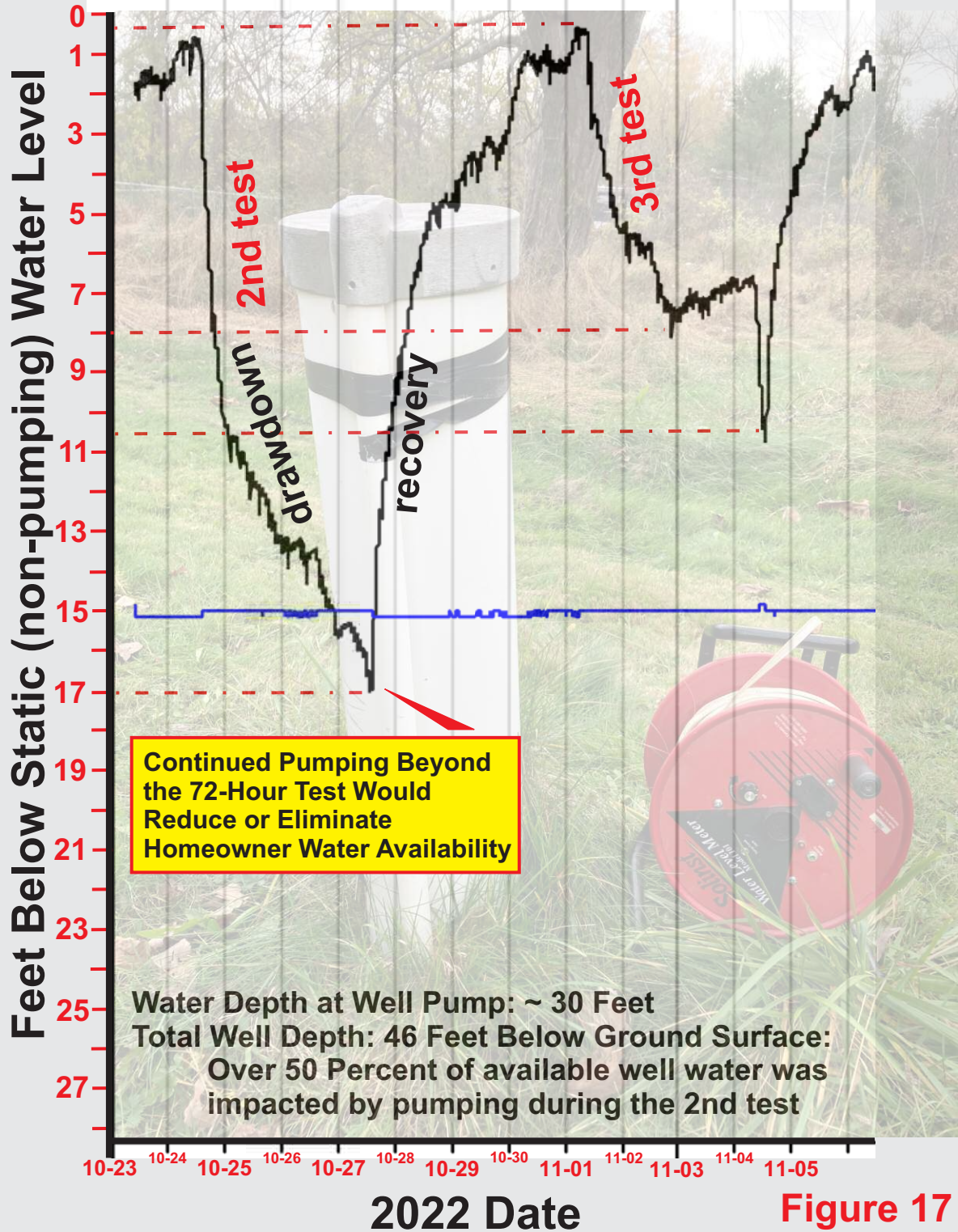


Figure 17

respectively. These great distances attest to the interconnectedness of the bedrock fractures that transmit groundwater;

- A number of Terramor's production wells are situated directly within or proximal to the watershed of the wetland complex;
- Pumping of Terramor production wells may induce downward infiltration that could potentially lower or drain standing water within wetland complex wetlands. This may, in turn, adversely impact species habitats and ecosystems. Alternately, and perhaps more likely, Terramor water pumping may lower nearby groundwater levels that contribute base flow to wetland complex wetlands. If Terramor did not monitor water levels in the wetland complex during their aquifer testing, as recommended by HydroQuest, the tests should be rerun during a dry summer or fall time period. Potential impact assessment should include a detailed plant and animal species inventory. This should be conducted throughout the entire wetland complex by an independent ecological firm;
- It is highly likely that the raised "*island*" upland area that is depicted on Figure 8 functions as the primary groundwater recharge area for many of the numerous homeowner wells present within 1,500 feet of the project (Figure 1). CAT's finding that 33 percent of all homeowner wells that were monitored during Terramor's production well tests were impacted provides hydrogeologic support for this. Extensive project development within this aquifer recharge area may adversely impact many homeowners;
- Additional hydrogeologic analysis, as well as assessment of projected project water demand, warrant assessment after Terramor discloses their aquifer testing data and report. After this information is made available and analyzed, interpretation will be presented in an upgrade to this report; and
- **The Town of Saugerties Planning Board does not have sufficient hydrogeologic information to advance the Terramor application.** Evaluation of impact on groundwater justifies a positive declaration of significant environmental impact under SEQRA.

Discussion

The proposed Terramor project is a major development project, not a typical campground. Its approval would change the character of the community. Historically, and today, land use planners and most people mentally visualize old-style campgrounds where tents are pitched on bare ground campsites and are readily removed, leaving little environmental footprint. The proposed development should more aptly be considered as a permanent housing project. Except for large "*tent-like*" outer roof and wall material, luxury queen and king-sized beds, floors, furnishings, bathrooms, electricity, and amenities make each of the proposed 75 individual "*tents*" analogous to resort cabins or boutique hotel rooms, albeit located amidst trees. These tents would be

supported by a massive infrastructure like that of resort projects that correctly follow the State Environmental Review Act (SEQRA) process. In short, these are the same components that SEQRA examines for resort projects, not pup tent campgrounds.

Examination of the community area extending radially outward for 1,500 feet from the proposed Terramor project documents a low-density rural area with about 110 residences. This reflects the serene, dispersed, nature of slow community growth over a century's time. Overall, if the 82 proposed Terramor project housing units were developed, this would effectively triple the number of housing units (i.e., residences) currently within 500 feet of the project site border and double the number of housing units currently within 1,000 feet of the project site border. Doubling and tripling the living density is not consistent with, and is in sharp contrast to, the rural residential community character, land use pattern, and building type that has been maintained over the last 35 plus years.

The inescapable conclusion that emerges from these assessments is the importance of reviewing major development projects, including the Terramor project, within a broad landscape and community setting, not in isolation where potentially significant adverse environmental impacts are not addressed. SEQRA is designed to fully, comprehensively, and in a single unified format evaluate all project aspects to ensure that no adverse environmental impacts will occur. The SEQRA process is designed to fully involve the public from project onset where the public provides input regarding issues of concern (scoping) through public review and comment. Decisions regarding SEQRA projects, including such things as design changes, special use permits, and waivers of any kind should be made after project applicants have developed the technical information needed to assess potential environmental impacts. SEQRA requires project applicants to take a "hard look" at all project components in a comprehensive manner, not based upon individualized, segmented, approvals.

While project development would, if approved, occur within the Town of Saugerties, aspects of the project would impact residents of the Town of Woodstock. As such, consideration should be given to having the Town of Woodstock being equally involved in project assessment. Factors to be considered include:

Justification Points for the Town of Woodstock to Become an Involved Agency

- Potential property devaluation of Woodstock properties along Raybrook Drive and Glasco Turnpike;
- Adverse impact on transportation (increased traffic and safety concerns);
- Adverse impact of noise, odor, and light for Raybrook Drive residents;
- Proposed action's land use components are different from, or in sharp contrast to, current surrounding land use patterns (Consistency with Community Plans);
- Proposed project is inconsistent with the existing community character;
- Groundwater impact to residential wells;

- Potential alteration of the hydrologic and biologic integrity of Woodcock Wetland; and
- Project construction within a vulnerable headwater wetland complex would fail to promote sound wetland, wildlife, habitat, and ecological protection within the region as advocated in the NYSFY 2022-23 budget and by NYSDEC.



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Proposed Terramor Glamping Project: Report Conclusions

Many technical topics are discussed in this report. Individually and collectively, they point to two important conclusions. These are:

- **The proposed Terramor glamping project does not fall within the Town of Saugerties Zoning Law definition of a Moderate-Density Residential District (MDR).** As such, the application should be rejected; and
- Should the Town of Saugerties determine to advance the Terramor project, it should be reviewed within both a local and regional context. Evaluation of issues presented in this report, among others, justifies a positive declaration of significant environmental impact under SEQRA, requiring preparation of a Draft Environmental Impact Statement.

If the application is advanced under SEQRA, many Part 2 FEIS issues will require detailed analysis. This report addresses several environmental issues. Findings include:

Glamping “Tents” are Equivalent to Luxury Hotel Rooms Not Portable Tents

- Private campgrounds and luxury glamping tents (i.e., luxury tent hotels) are not permitted land uses within the Town of Saugerties Moderate-Density Residential District;
- Terramor’s Woody 35 and Woody 45 glamping “tents” are 15.5X and 18.6X larger than 2-person camping tents and 6.1X and 7.4X larger than 6-person camping tents, respectively. The Terramor glamping “tents” are larger than many 5-star hotel rooms, yet they share many of the amenities of their non-woody luxury hotel counterparts. Effectively, they are luxury hotel rooms situated in a forested setting. In no way do glamping tents resemble small portable tents pitched in public campgrounds;

Consistency with Community Character

- The proposed project is inconsistent with the existing community character. A large well-established rural residential community surrounds the proposed project site. It extends for more than 1,500 feet outward from the Terramor property boundary. (Figures 1-3);

- The density of glamping tents would be vastly greater than the existing rural residential density. Current housing/large building density within the 195-acre residential area extending 500-feet outward from Terramor's property boundary equates to 4.64 acres per house on average. If the Terramor glamping project were to be developed, project housing density in the project area would equate to 1 housing unit per 0.42-acres, which would be an 11-fold increase in average housing density versus that currently present within both the project area and 500-foot area surrounding the project site;
- Overall, if the 82 proposed Terramor project housing units were developed, this would effectively triple the number of housing units (i.e., residences) currently within 500 feet of the project site border and double the number of housing units currently within 1,000 feet of the project site border. Doubling and tripling the living density is not consistent with, and is in sharp contrast to, the rural residential community character, land use pattern, and building type that has been maintained over the last 35 plus years;

Consistency with Community Plans

- Project construction would lead to devaluation of adjacent properties (Figures 4 and 5). Significant property devaluation has already occurred, even before potential project approval. Additional property and home devaluation would surely occur if the project is developed;
- Glamping "tents", project roads, and buildings would be in close proximity to wetlands and private property (Figures 4-7). For example, the nearest employee housing would be only 60 feet from the Refregier property line;
- Several aspects of the project may also adversely affect neighboring Town of Woodstock residents (i.e., property devaluation, degradation of wetland ecosystems, groundwater supply, quality of life). (Figures 7 and 15);

Impacts on Surface Water

- The proposed Terramor glamping project, if developed, would be centered around significant portions of a previously unrecognized, expansive, and hydrologically interconnected wetland complex (Figures 6-14). Reference to Terramor's set of site maps and documents show that they failed to document and acknowledge this wetland complex, its interconnectivity, and its headwater setting within an areally limited watershed area. Major development projects should be reviewed within a broad landscape and community setting, not in isolation where potentially significant adverse environmental impacts are not addressed;

- Terramor has failed to comprehensively acknowledge the full nature and extent of the wetland complex that is documented in this HydroQuest report, particularly with respect to offsite segments;
- The northwestern Woodcock Wetland area is noticeably omitted from Terramor design drawings. This segment interconnects a headwater wetland complex area. American woodcock are present in this wetland. NYSDEC and Cornell University have identified this species as one of greatest conservation need in the 2015 N.Y.S. Wildlife Action Plan. They state: *“The impact of human development on wetlands is the most significant threat to wetland habitats and their associated wildlife.”* Detailed wildlife and plant species inventories are needed;
- Planned wastewater discharge into a wetland complex wetland (Figure 4) may degrade water quality, ecosystems, and species habitats;



American woodcock

Impact on Groundwater

- Terramor has not been forthcoming relative to technical aspects of their well testing program, despite CAT's request for detailed information. It appears that Terramor only monitored a small number of offsite homeowner wells with infrequent measurements;
- The bedrock aquifer is comprised of a well-interconnected fracture set that extends for thousands of feet outward from Terramor's planned groundwater production wells. This is documented by CAT's monitoring of Terramor's aquifer tests. (Figures 15-17);
- Preliminary assessment of monitoring well data measured in homeowner wells indicates that well water levels continued to decline during Terramor aquifer testing, that stable groundwater conditions were not achieved during pumping, and that full aquifer recovery took many days. Detailed hydrologic analysis will be conducted by HydroQuest after Terramor makes their aquifer testing data, graphs, conclusions, and hydrogeology report available;
- Disruption of aquifer recharge in the proposed project area may adversely affect homeowner water supplies and wetland ecology; and
- Groundwater monitoring by CAT during Terramor's aquifer testing documented that one-third of the wells monitored were impacted by Terramor's pumping.



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Appendix A

Public Water Supply Development: Recommendation to Postpone Aquifer Testing and Review Terramor Well Testing Protocols

**October 4, 2022 HydroQuest Letter
to Ulster County Department of
Health and the Town of Saugerties
Planning Board and Provided to
Terramor Outdoor Resorts**



October 4, 2022

Carol Smith, MD, Commissioner
Ulster County Dept. of Health
239 Golden Hill Lane
Kingston, New York 12401

Ms. Becky Bertorelli, Planning Board Secretary
C. Howard Post, Chairperson and Planning Board Members
Town of Saugerties
4 High Street
Saugerties, New York 12477

RE: Public Water Supply Development: Recommendation to Postpone Aquifer Testing and Review Terramor Well Testing Protocols

Dr. Smith and Planning Board Members:

Terramor aquifer testing should be postponed until after the public, Ulster County Department of Health, and the Town of Saugerties Planning Board have had adequate time and opportunity to review project protocols and the issues raised in this letter. We seek your support in this matter.

I am a hydrogeologist, NYS licensed Professional Geologist, hydrologist, and cartographer with forty-one years of professional experience. This letter provides concerns and recommendations on behalf of Citizens Against Terramor Overdevelopment (CATO) regarding the proposed Terramor glamping project in the Town of Saugerties, New York. Rationale and justification are provided for postponing project well testing scheduled to begin tomorrow on October 5, 2022 at 8:00 am. The purpose of the proposed well testing, although not stated in information available to CATO, is to quantify the safe yield of wells as the foundation of a public water supply and to assess potential offsite impacts to surrounding homeowner wells.

Review of both Real Property License Agreements (former and revised) provided to Mark Pisani on October 3, 2022 accents a number of issues that, together, point out the need to postpone aquifer testing until they have been thoroughly reviewed and addressed. Failure to address these issues would likely result in substantive hydrogeologic concerns that might negate the veracity of testing protocols and testing methodology, question the duration of aquifer tests, expose the lack of sufficient offsite monitoring well data, and raise questions regarding hydrogeologic interpretation and conclusions. These issues include:

- Sonic water meters should NOT be used, unless they are used to provide a means to verify the accuracy of continuously monitored water level measurements collected before, during, and after well tests by continuously recording pressure transducers. Transducers may be programmed to record water levels at set, frequent, intervals (e.g., 10 minutes). Continuously recorded water level (pressure) data may then be professionally interpreted to determine such things as static groundwater level, homeowner water use, any impact

stemming from production well testing, and aquifer recovery follow pumping cessation. Sporadic, infrequent, water level measurements taken with sonic water level meters will be of limited value in assessing potential production well impact on homeowner wells. As written, the agreement provided to Mark Pisani, and presumably others, should not be signed because it implies that the method of monitoring homeowner well water levels would be sufficient to make informed decisions regarding offsite groundwater impact;

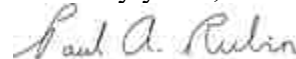
- Each aquifer test should be conducted for at least 72-hours, not only 24-hours. Testing of proposed site production wells should be conducted at constant rate discharges for at least 72 hours as required in NYSDOH Part 5, Subpart 5-1, Appendix 5D Public Water Systems, Table 2. Deviation from 72-hour testing is not advised due to the anisotropic character of the fractured bedrock aquifer, unknown depths and saturated aquifer thicknesses of homeowner wells, known well water quantity issues locally, and reported low well yields in the area. It is important to fully stress the aquifer during project water supply testing;
- Based on Kimberly Whites' 10-03-22 emails to Mark Pisani, two or three aquifer tests are scheduled to occur between October 5 and October 13, 2022. No information is provided regarding which wells will be tested either individually or simultaneously or at what constant rate discharges. Similarly, for example, the lack of disclosed testing protocol does not allow consideration of whether all four project site wells not being pumped will be monitored before, during, and after production well pumping. Empirical water level information recorded continuously in site monitoring wells is an important component of hydrogeologic interpretation in anisotropic aquifers. Lack of available test protocols makes it impossible to evaluate the adequacy of the proposed tests;
- A copy of the planned aquifer testing protocol should be provided to the public for review and comment prior to test initiation. The protocol should include a map that portrays site wells that will be tested and homeowner wells that will be monitored, as well as the rationale for selection of the number and locations of onsite and offsite wells. All particulars relating to project testing protocols, test duration, and onsite and offsite monitoring should be fully transparent to the surrounding community, not just to a select number of offsite homeowners;
- Reference to Exhibit A ("*a drawing identifying where the investigation will be undertaken within the Well Test Property*") on Mark Pisani's first Real Property License Agreement was omitted from a later revised agreement. Again, transparency of all aquifer testing particulars should be provided to the public for review and comment;
- Homeowners that were only recently provided with License Agreements should be given adequate time for both legal and hydrogeologic review before they sign the contracts provided to them. Mark Pisani, for example, was provided with a contract for signature only 1.6 days prior to the planned startup of aquifer testing;

- It is not clear if the surrounding community and/or individual homeowners were provided with sufficient information and notice regarding the near term planned aquifer tests;
- Homeowners that have experienced water quantity problems either during previous or current site well testing (e.g., step drawdown testing) or independently of testing should be included in offsite homeowner monitoring well selection. This requires investigation prior to drafting the aquifer test protocol;
- Based on emails to Mark Pisani, it appears that only four or five homeowner wells will be monitored during well testing. Reference to attached Figures 1 and 2 document the presence of a large number of homes within 1000-feet and 1500-feet outward from the project area. Additional homeowner wells should be monitored;
- A representative set of homeowner wells should be fitted with transducers to monitor water levels before, during, and after aquifer testing to obtain static, drawdown and recovery data (i.e., many homeowner wells should be selected for monitoring associated with Terramor aquifer testing). Many should lie within 1,000 feet of the project boundary (Figures 1 and 2) and should include wells encompassing all major compass directions;
- Include the Haeberer well among selected offsite homeowner wells. This well has known water quantity issues; and
- The Real Property License Agreement states “*the results of the investigation will be reported to the New York State Department of Health, the Town of Saugerties and **may be provided** to the Owner, if requested ...*” (Emphasis added). The wording should be changed to “*will be provided.*” All data, results, and hydrogeologic interpretation should be provided to those homeowners whose wells were monitored.

Terramor aquifer testing should be postponed until after the public, Ulster County Department of Health, and the Town of Saugerties Planning Board have had adequate time and the opportunity to review project protocols and the issues raised in this letter. We seek your support in this matter.

By way of this letter and in the spirit of transparency regarding testing particulars, Terramor project heads could determine to postpone aquifer testing until the issues raised here are fully addressed.

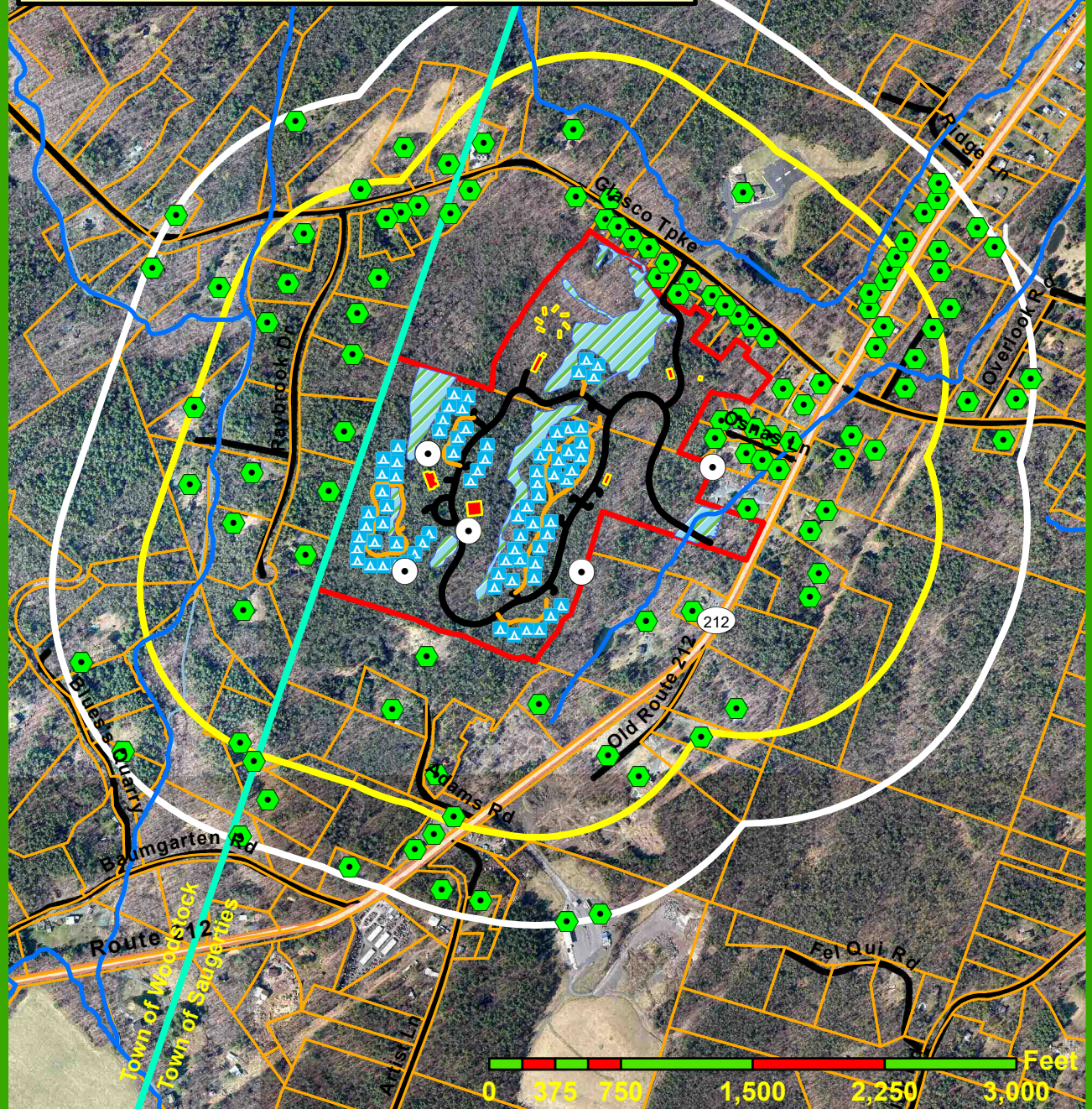
Sincerely yours,



Paul A. Rubin
Professional Geologist/Hydrogeologist

Cc: Daniel J. Tuczinski, Esq. (O’Connell & Aronowitz; Attorneys at Law)
Kimberly White (KOA); Project Manager, Terramor Outdoor Resorts

Proposed Terramor Project Area and Surrounding Residential Land Use



Legend

~ Terramor Project Boundary

Site Wells

Tent Sites

Assorted Project Buildings

Offsite Houses & Large Buildings

Terramor Roads

Wetlands

1000-Foot Outward From Project Area

1500-Foot Outward From Project Area

Tax Parcels (Borders Approx.)

Map Date: 9-21-22

HydroQuest Graphic

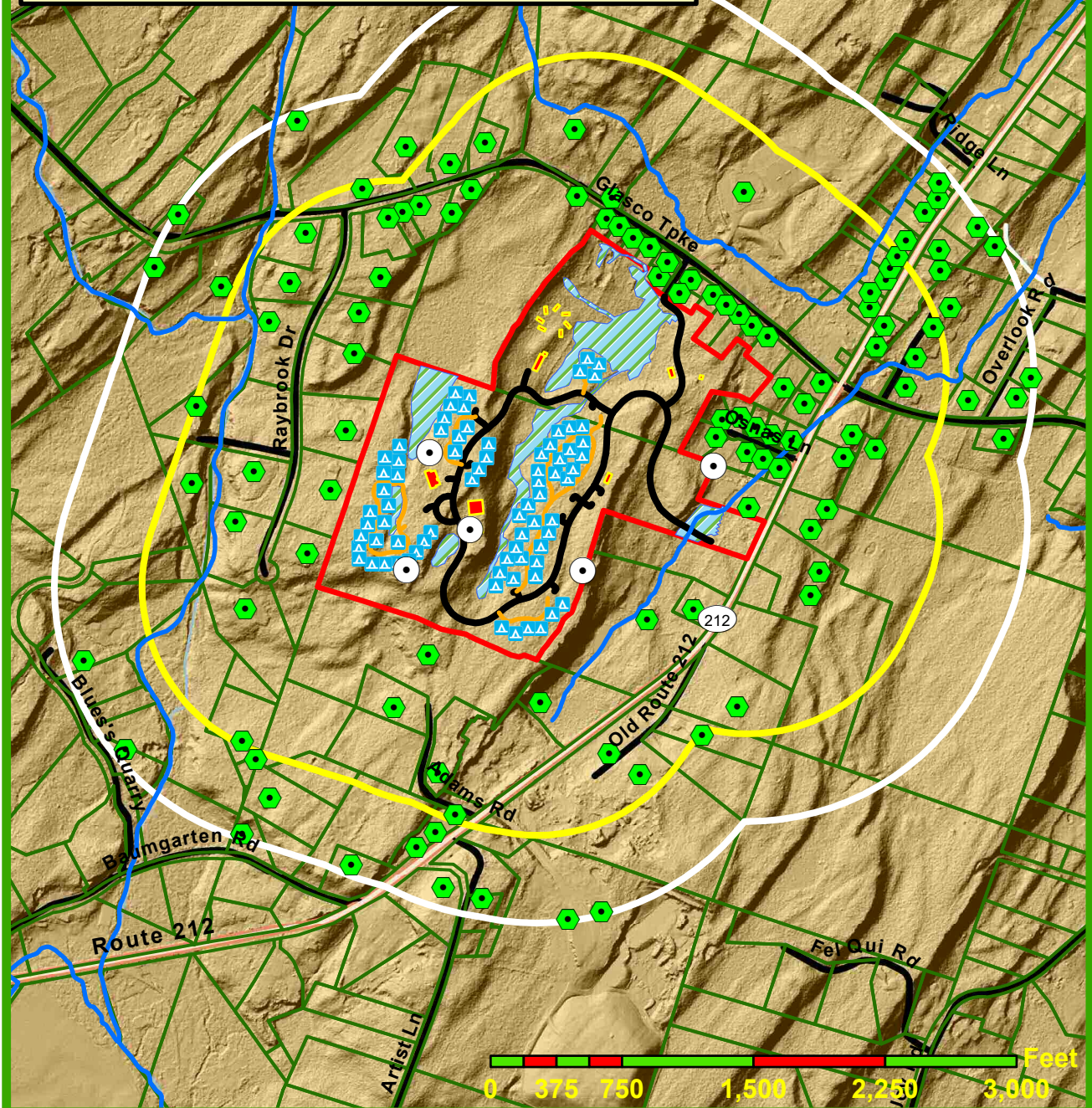
2016 Imagery

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Figure 1

Proposed Terramor Project Area and Surrounding Residential Land Use



Legend

~ Terramor Project Boundary

Site Wells

Tent Sites

Assorted Project Buildings

Offsite Houses & Large Buildings

Terramor Roads

Wetlands

1000-Foot Outward From Project Area

1500-Foot Outward From Project Area

Tax Parcels (Borders Approx.)

Map Date: 9-18-22

HydroQuest Graphic

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Figure 2