EXPANDED ENVIRONMENTAL ASSESSMENT FORM (EAF)

THE SEASONS

Change of Zone Application

SCTM: 0400-17000-0200-015100

Hamlet of Elwood, Town of Huntington
Suffolk County, New York

Prepared for:
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For submission to:
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NP&V Project No. 11157

May 2014

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SECTION 1.0

DESCRIPTION OF THE PROPOSED PROJECT

1.0 DESCRIPTION OF THE PROPOSED PROJECT

This document is an Expanded Environmental Assessment Form (Expanded EAF) for a project known as **The Seasons** (hereafter, the "proposed project"). The site of this proposal is located in the hamlet of Elwood, Town of Huntington (hereafter, "the project site" or "the subject site"). The project site consists of 37.05 acres of mostly open, vegetated land on the west side of Elwood Road (County Route [CR] 10) opposite Hammond Road. The site is north of the Fair Oaks residential development, northeast of the Town's Elwood Park and southeast of two public school properties (the Elwood Middle School and Elwood-John H. Glenn High School). This property has been a dairy farm since at least 1932. Since 1981, the subject site has been owned and occupied by the Oak Tree Farm Dairy, Inc., which maintains its corporate offices and a dairy products processing facility in the site's southern quarter (there are no animal grazing activities on-site, and there are no animal barns or animal-related facilities present). The street address of the office building on the site is 544 Elwood Road. The property is more specifically identified by the Suffolk County Tax Map as: District 0400, Section 170, Block 2, Lot 15.1.

The applicant, BK Elwood, LLC, seeks Town Board approval to rezone the subject site from R-40 Residence to R-RM Retirement Community District and construct 360 condominium units for occupancy by qualified senior households, as regulated by the Town. In contrast, should the site be fully built-out under the proposed R-RM zone, an estimated 538 units could be constructed. The 360 proposed residences would be distributed in 56 two-story structures; each first-floor unit will have a floor area requiring 300 gallons of daily water daily (gpd) water use, and each second-floor unit will have a smaller floor area commensurate with 225 gpd of water consumption. Each unit will have two bedrooms, and each of the second-floor units in the four-unit buildings will have a den that could be used as a third bedroom. Thirty-four (34) of the buildings will contain eight (8) units (272 units total), and 22 buildings will have four (4) units each (88 units total). Each unit in the four-unit structures will have an attached garage; no garages are proposed for the units in the eight-unit buildings.

The proposed project will conform to Town Zoning Code Article 198-13 I (Affordable Housing), which requires a certain portion of the units to be designated "affordable" and set aside for purchase and occupancy by qualified households, of which at least 75 percent (%) must be provided on-site (the remaining units would be sold at a "market rate"; *see below*). Specifically, this Article indicates that, where a zone change is being sought so that the number of units would be increased from that of the existing zoning, 20% of the <u>increased</u> number of units is to be designated as affordable. As the site's yield under the existing R-40 zoning is estimated at 30 lots, and the requested yield under the proposed R-RM zoning is 360 units, the increase is 330 units (360 minus 30). Consequently, 66 of the units (330 divided by five) must be set aside as affordable. It is noteworthy that Article 198-13 I(1)(d) allows an applicant to "buyback" up to 25% of the affordable units, by making a one-time payment to the Town of Huntington Affordable Housing Trust and Agency Fund. In the R-RM district, this fee is $100,000 per lot or dwelling unit to be bought back. In case of such a payment, the number of market-rate units would be increased by the number of "bought-back" units. At the present time, the applicant has not determined whether, if at all, to utilize the buyback mechanism. In order to provide the Town Board will the information necessary to reach an informed decision on this application, this document will indicate, where applicable, the range in the number of affordable units, which is at least 50 and may be as high as 66 units. Regardless, the applicant will conform to Town requirements regarding affordable units. All of the affordable units will be within the eight-unit, non-garage structures.

As discussed in **Appendix A-1** and summarized below, the anticipated selling price for each market-rate unit in the eight-unit structures will be $475,000, and the sale price of each market-rate unit in the four-unit structures will be $589,000. However, with respect to the sales prices for the affordable units, half are anticipated to sell for $210,200 each, and the other half will sell at $315,300 each (an average sales price of $262,750/affordable unit).

Building Type	**Total Buildings**	**Total Units**	**Affordable Units**	**Garage?**	**Unit Selling Price**	
					Market-Rate Unit	Affordable Unit
Eight Units	34	272	50 - 66	No	$475,000	$262,750 (average)*
Four Units	22	88	n/a	Yes	$589,000	n/a
---	**56**	**360**	**50 - 66**	**88**	**---**	**---**

* Half of the affordable units will sell for $210,200 each, and half will sell for $315,300 each; see **Appendix A-1**.

The project includes an approximately 17,000 SF, two-story clubhouse building, with two outdoor swimming pools, a patio/outdoor barbeque area, a Jacuzzi, a car wash area, a walking trail, a dog run, and a 5,000 SF sewage treatment plant (STP). The Town Code requires a minimum of 540 parking spaces for this type and scale of project; the **Site Development Plan** O (*in a pouch at the end of this document*), shows that parking for a total of 816 cars is provided.

Under current site conditions, liquid wastes from the existing dairy operation are treated and recharged in an open-air treatment system comprised of freestanding buildings and surface recharge lagoons in the property's west-central area; sanitary wastes generated on the site are treated in septic systems. Both of these systems will be removed as part of the demolition/clearing operation. All of the proposal's wastewater would be retained on-site and treated in a modern, state-of-the-art STP. Stormwater runoff from the proposed project will be retained on-site and recharged via a drainage system designed to conform to all applicable Town requirements. This system will include a new recharge area and two new ponds created along the site's eastern border on Elwood Road. The two naturalized recharge areas surrounding these ponds may be revegetated with appropriate natural water-tolerant plant species to provide wildlife habitat and to provide an attractive appearance for passing motorists.

This document describes the proposed project, identifies its anticipated impacts, and indicates its potential mitigation measures. Further, it is intended to assist the Town Board (as lead agency under the New York State Environmental Quality Review Act, (SEQRA) in rendering an informed decision on the application.

1.1 Project Background, Need, Objectives and Benefits

1.1.1 Project Background

Based on review of Town documents associated with the prior Oak Tree Farm Dairy site plan application, the subject site has been in commercial operation as a dairy since at least 1932, and has been owned and occupied by the Oak Tree Farm Dairy since 1981. The existing dairy processing building was initially constructed in 1942 (it has been expanded a number of times since then), and the office portion of this structure was added in 1975. Development in the vicinity since the late 1940's includes two schools abutting the property to the northwest, a Town park to the southwest and residential properties to the east (across Elwood Road), west, north and south.

The following brief discussion of the factors that have led to the proposed project has been prepared from information provided by the applicant.

> Following a catastrophic fire in 1997, Oak Tree Farm Dairy rebuilt the dairy. At that time, the owner successfully went before the Town Zoning Board of Appeals (ZBA) for a Special Use permit, which affirmed the right to rebuild the facility. Oak Tree Farm Dairy's plans called for a maximum of about 50 trucks on the property, and it provided for about 60 employee parking spaces. However, the operations quickly exceeded these restrictions, which resulted in expressions of Town concerns regarding truck traffic.
>
> At the peak of operations, around 2005, Oak Tree Farm Dairy had 100 employees and about 80 trucks on the property, which the Town cited as a violation of the terms of the Special Use permit. Oak Tree Farm Dairy responded by showing that, while the use could be restricted in the number of trucks on the property that could be present at any given time, the use could not be restricted in the number of trucks that could be shuttled on and off the property. The Dairy then rented a piece of property on Jericho Turnpike and had a full-time jockey shuttle trucks back and forth.
>
> At this point in time, Oak Tree Farm Dairy has two options: (1) sell the property and allow it to be developed, or (2) sell the dairy to one of the other, larger dairy operations, which would be expected to continue the shuttle-parking strategy developed by Oak Tree Farm Dairy.
>
> There is only one other dairy in New York that serves the area south of Albany. If Oak Tree sells to this large corporation, it would, no doubt, seek to serve most of Long Island from the centralized location provided by Oak Tree Farm Dairy. This would entail:
>
> - Potential for around-the-clock delivery of milk tanker trucks to a facility that may operate 24 hours a day, seven days per week. Only one or two tankers would arrive at any given time, but the net result could be up to 150 tanker deliveries per week, each delivery spending one or two hours on the property, and occurring at all hours of day and night.
>
> - Such a ramped-up operation would substantially increase the number of truck movements and employee trips to and from the site, thereby significantly impacting the existing traffic flow along Elwood Road, but without the benefit of the extensive traffic mitigation measures that are proposed for and funded by the proposed project. Furthermore, northbound traffic would continue to be subject to an increasing number of stoppages and long queues when dairy trucks wait in the through lane and block northbound traffic before being able to turn into the dairy property. In

addition to disrupting traffic flow along Elwood Road, the trucks are noisy and dusty, and in their current configuration on the dairy property they are parked and idling right alongside the residential properties on Fair Oaks Court.

- Up to 125 delivery trucks would be involved in shuttle movements to and from the property, each truck potentially making up to four round trips per day. Trucks would arrive during the morning rush hour and unload cases into the facility. They would then leave, to be parked at the off-site storage yard, to wait for the next day's orders to be received. These delivery trucks would then return for partial loading of some products. In total, this scale of operation could result in up to 500 truck trips to and from the property over the course of a typical day.

Oak Tree Farm Dairy seeks to sell the property to BK Elwood, LLC for the purpose of site redevelopment for a residential use. In March 2012, the applicant submitted an application to the Huntington Town Board for a change of zone of the subject site to R-RM, to allow development of 482 senior condominium units. An Expanded EAF (EEAF) was submitted to the Town in June 2012. Subsequent discussions with the Town and community resulted in a reduction of the yield to 444 units, and the EEAF was revised accordingly and re-submitted. Following a second period of public review, the yield was reduced again to the current yield of 360 units. The EEAF has been revised again; a Part 1 EAF for the current yield is contained in **Appendix A-2**.

1.1.2 Public Need and Municipality Objectives

The proposed project will provide quality senior residences that will afford current area residents the opportunity to remain in the community (in proximity to family, friends and accustomed neighborhoods) that may be an attractive consideration for potential buyers. The proposed project will exceed the minimum of 10% (36 units) of its yield as required by Article 16-A of the New York State (NYS) General Municipal Law (Long Island Workforce Housing Act), by providing between 50 and 66 affordable units. The proposed project will also satisfy a Town goal of providing affordable senior residences.

As detailed in **Section 3.1.2**, the proposed project conforms to the applicable yield requirements of the requested R-RM zone, and in fact requests substantially fewer units than could be realized on a property of this size under this zoning. Specifically, at a yield calculated at 3,000 SF/unit, this 37.05-acre site could generate 538 residences; the 360 units requested represents 178 (or 33.1%) fewer units than could be allowed as-of-right in the R-RM district.

While the proposed project represents a change in the land use type of the site, the proposal is transitional with the land uses of the other sites in the vicinity. The site is on a county roadway that places the subject property in proximity to a regional transportation corridor, NYS Route 25/Jericho Turnpike, as well as the commercial and retail shopping opportunities along that corridor. The proposed project presents an opportunity to not only remove the dairy-related commercial/trucking operation and its associated noise and odor impacts, but would also remove a source of odors from the dairy waste treatment system , but would also result in a less-intensive and more appropriate use that would be transitional between the low-density residential lands to the east and west, the institutional and commercial uses to the north, and the public recreational (open space) land to the south.

The project is also consistent with the spirit and intent, as well as key elements of, the Town Comprehensive Plan Update, which recognizes the importance of providing a mix of senior housing types. The Town's growing senior population is currently under-served by available appropriate housing, particularly with regard to the diversity of housing types. This application assists in fulfilling the need for economically viable senior housing within the Town while avoiding substantial impact to the local land use pattern.

As a result, the proposed project is believed to be consistent with the goals of the Town Comprehensive Plan Update and provides improved economic and social benefits. Consequently, the proposed project has merit over the current zoning and is not in conflict with land use plans. A more detailed assessment of the Town Comprehensive Plan Update in relation to the proposed project is provided in **Section 3.1.2**.

The project will reduce the burden on community service providers through the proposal to maintain the STP, internal road and recharge facilities privately, thereby reducing the need for Town highway maintenance, snow plowing, drainage system maintenance and related efforts. The project's building design and resident facilities (e.g., the indoor and outdoor recreation areas, landscaping, etc.) will establish a sense of place and community interaction within the site. The project will result in significantly increased tax revenues for public service providers, which will assist in offsetting the incremental increase in demand for these services. It should be noted that the single largest component of local taxes, public schools, would only be beneficially impacted; the Elwood Union Free School District (UFSD) will receive a substantial increase in school taxes while experiencing no enrollment impact and therefore, no expenditure increase. Project benefits are described in more detail in **Section 1.1.4**.

1.1.3 Objectives of the Project Sponsor

The applicant has designed the project to achieve the following:

- Conformance with the Town Comprehensive Plan Update in terms of providing senior housing opportunities and economic housing alternatives for senior households;
- Remove the dairy-related commercial/trucking operation from an area that is dominated by residential uses;
- Construct a use that would be an appropriate transition between low-density residential, institutional, commercial and public recreational/open space uses.
- Minimize impact to groundwater resources by providing a new STP to treat all wastewater generated by the project.
- Remove the existing open-air treatment system for dairy wastes, which has been the subject of neighborhood odor complaints.
- Remove a long-standing potential impact to local stormwater runoff patterns, by containing all stormwater runoff within the site;
- Provide superior site design, including appropriate on-site recreational amenities; walkability and sense of place through attractive community architecture, indoor and outdoor recreational spaces, walking opportunities, landscaping and interior setbacks and open space.

1.1.4 Benefits of the Proposed Project

The types of residences proposed have a significant beneficial impact on the Elwood UFSD, as there would be no school-age children present, the proposal would not contribute to any enrollment increase, which would cause no increases in school district expenditures. As described in detail in **Section 3.3.2,** the significant increase in school taxes from this property would then be entirely available to the district to budget for any discretionary use. Depending on the number of affordable units provided, the proposed project is anticipated to generate net school tax revenues of between $1.965 and $2.005 million per year, which represents an increase of between approximately $1.847 and $1.993 million/year as compared to existing school taxes generated by the subject property. This is crucial at a time of fiscal and economic hardships throughout Long Island, New York State and the nation.

The project will be privately owned and maintained, and will be built in conformance with modern building construction standards, thereby minimizing impact to other service providers. Based on analysis contained in **Section 3.3.1**, the existing taxes on the property are $162,486 per year, and the project will generate between $2.708 and $2.763 million in property taxes per year. The increase in tax revenue generated by the proposed development would be between $2.546 and $2.601 million per year more than the site's existing conditions.

The proposed project will generate both temporary and permanent employment opportunities, which may be filled by Town and/or area residents. It is projected that, during the 30-36-month construction period, a total of 278 full time equivalent (FTE) employees would be generated. During the operation of the development, long-term jobs will also offer both direct and indirect benefits. The proposed development is anticipated to generate 10.0 FTE employees during annual operations. A detailed Fiscal and Economic Impact Analysis is contained in **Appendix A-1** of this document. A summary of benefits is provided as follows:

- The project will provide 360 senior condominiums, a type of residence desired in Town plans.
- The project is estimated to generate between $2.708 and $2.763 million in annual property tax revenue of which between $1.965 and $2.005 million would be allocated to the Elwood UFSD and the remainder is available to the Town of Huntington, Suffolk County, and other local and special taxing jurisdictions including the Greenlawn Fire District.
- Since the project is age-restricted, it will not generate any school-aged children. Therefore, the proposed project will not impact the Elwood UFSD in terms of an increased enrollment.
- The project will generate needed temporary construction jobs and permanent maintenance and operation jobs and thereby provide an employment benefit to the community.
- The proposed project will provide a land use that is compatible with land uses on the adjacent properties as well as with other properties in the vicinity.
- The proposed yield conforms to the allowed yield of the R-RM district under Section 198-21 of the Town Zoning Code.
- In conformance with Town Zoning Code Article 198-13 I requirements, between 50 and 66 of the units will be designated "affordable", to be occupied by qualified households, as administered by the Town, in conformance to Section 198-13.
- While the proposed project represents a change in the land use type of the site, the proposal is consistent with the usage type and character of the other uses to the east, west and south, and is transitional to the institutional uses to the north.

- The project will eliminate the open-air lagoons associated with the current dairy wastes treatment system, which is a source of neighborhood odor complaints.
- The project will avoid impact to groundwater resources by constructing a new, state-of-the-art on- site STP.
- The project will avoid impact to adjacent and nearby properties and roadways by containing all stormwater runoff within the site;
- The project will relate to community context by providing a quality residential use with substantial buffers and professional landscape design.
- The building design and resident facilities (e.g., indoor and outdoor recreation areas, outdoor furniture, landscaping) will establish a sense of place and community interaction on the site.
- The project will result in significantly increased tax revenues for public service providers, which will assist in offsetting the incremental increase in demand for these services.
- The project will reduce the burden on community service providers through the proposal to maintain the internal road and recharge facilities privately, thereby reducing the need for Town highway, open space and recreation area maintenance, snow plowing, drainage system maintenance and related efforts.
- The project will be privately owned and maintained with security services, and will be built in conformance with modern building construction standards, thereby minimizing impact on public community service providers.

1.2 Project Location and Existing Site Conditions

1.2.1 Project Location

The subject site is located in the hamlet of Elwood in the Town of Huntington, Suffolk County. It occupies 37.05 acres of mostly open, vegetated land on the west side of Elwood Road (CR 10) opposite Hammond Road; **Figure 1-1** provides a location map of the project site *(all figures are located in the section following the main text of this document)*. The site is north of the Fair Oaks residential development, northeast of the Town's Elwood Park and south of two public schools of the Elwood UFSD (the Elwood Middle School and Elwood John H. Glenn High School). The subject site is owned and occupied by the Oak Tree Farm Dairy, Inc., which maintains its corporate offices and a dairy products processing facility in the site's southern quarter (the majority of the site is open former grazing fields; there are at present no animal grazing activities on-site, and there are no animal barns or facilities present). The street address of the office building on the site is 544 Elwood Road. The property is more specifically identified as Suffolk County Tax Map as #400-170-2-15.1.

The site is within the following planning and service zones and districts:

- R-40 Residence zone
- Groundwater Management Zone I (600 gpd/acre)
- Federal Emergency Management Agency (FEMA) Flood Hazard Zone X (not mapped)
- Elwood UFSD
- Greenlawn Fire District (administration)
- Greenlawn Fire Department (service provider)
- Suffolk County Police Department (SCPD), 2nd Precinct

- Greenlawn Water District (GWD)
- Public Service Electric and Gas Company (PSE&G; electricity)/National Grid (natural gas)

The project site is not in the Central Pine Barrens Zone or a Special Groundwater Protection Area. There are three driveways on Elwood Road and onto the site at present; two serve the small parking area at the office structure, and the third driveway accesses the former single-family home. The project site is zoned R-40 Residence by the Town of Huntington. This zone would allow for approximately 30 individual lots on the property.

1.2.2 Existing Site Conditions

The site's existing conditions are shown in the **Map of Property** (*in a pouch at the end of this document*). **Figure 1-2** presents an aerial photograph of the subject site, which depicts its existing conditions, and the photographs in **Appendix B** provide a series of ground level views of the property. The site operates under a Special Use Permit granted by the Town ZBA on August 13, 1998. It is occupied by three buildings: a combined office/dairy processing structure (two stories, 50,000 SF), a residence (now used to store office records; two stories, 3,400 SF), and a combined warehouse/vehicle maintenance structure (one story, 6,000 SF). In addition, the dairy has an on-site, open-air treatment facility for dairy product process wastewater; this facility has five small mechanical buildings, a filter pond, an equalization pond, and two open-air surface lagoons for recharge. The treatment plant is designed and permitted for 100,000 gpd, and sludge is removed from it on an average of 3 to 6 times weekly. This facility has been the subject of odor complaints from the neighbors.

There are an estimated 65 employees, of which 25 to 30 are located in the office area. The former residence is unoccupied; it is used solely for office records storage. The dairy uses a total of about 100 trucks to transport products from the site to its customers. Because of Town Special Use Permit restrictions, only 50 trucks may be present on the site at any one time; the extra trucks are shuttled to and from the site and a rented storage lot off-site.

In October 2011, a Phase I Environmental Site Assessment (ESA I) was prepared by Impact Environmental of Bohemia, New York for the subject site. The following briefly describes the history and layout of the subject site, as related in that document:

> **Executive Summary**
> The Site is occupied by Oak Tree Dairy Farm and currently maintains three main buildings and a wastewater treatment plant which were inspected under the scope of this assessment. These buildings were constructed in several stages from the 1940's through the 2000's. Additional small and/or unsubstantial buildings/sheds were observed on the Site. However, due to their state of disrepair, these buildings could not be safely inspected. For ease of description of the buildings that were inspected, the buildings have been divided into four designations (the remainder of the Site, approximately 19 acres is undeveloped farmland). Building A is a two-story, masonry and steel building constructed in 1979 (without a basement), with an approximate footprint of 25,000 square feet. Said building is utilized for office space and the production of homogenized milk for distribution. Building B is a two-story, masonry and wood building constructed prior to 1955 (with a basement), with an approximate footprint of 1,700 square feet. Said building is a converted residential

dwelling, currently utilized for document storage. Building C is a one-story three-building cluster utilized for truck repairs. Building C is a one-story, masonry and wood building constructed prior to 1955 (without a basement), with an approximate footprint of 6,000 square feet. Said building is a converted private garage/barn utilized for the repair of fleet vehicles. The existing buildings maintained on the Site maintain separate on-site sanitary systems (except for the wastewater treatment plant). Building A is serviced by four on-site diesel powered generators (for electricity) and ceiling mounted forced hot air units. Buildings B and C are serviced by individual fuel oil fired heating systems and are connected to the LIPA electrical grid.

A wastewater treatment plant is maintained on the western portion of the Site. This area maintains several buildings. All of these structures are constructed on concrete slabs and do not maintain basements. The waste water treatment plant did not appear to have a heating source and was reportedly connected to the electrical grid.

The ESA I determined the following Recognized Environmental Conditions (RECs) on the site, which would merit further evaluation:

This assessment has revealed evidence of RECs associated with the Site. Accordingly, additional activities are recommended to define and/or enhance the environmental quality of the Site. The Recommended Phase II ESA Activities are outlined as follows. The RECs are summarized into five general categories. These categories include; Underground Injection Wells [UIW]; Underground Storage Tanks [USTs]; Land-Use Specific Issues; Wastewater Treatment Plant; and Closure/Compliance Issues. Based on the RECs outlined [in the ESA I], a comprehensive subsurface investigation should be conducted to determine if these RECs have adversely impacted the environmental quality of the Site.

In response to the ESA I report, the applicant engaged Impact Environmental to prepare a follow-up ESA II Report, to be limited to further investigate, characterize and recommend further actions in regard to the RECs. The following summarizes follow-up actions recommended in that report.

Underground Injection Wells
The Phase II ESA included the sampling and analysis of ten out of approximately seventy known UIWs (including two cesspools and eight storm water drywells). The sediment was analyzed for VOCs, SVOCs and Metals in accordance with SCDHS protocols. The analytical results for the sediment samples collected from three of these UIWs exhibited levels of contamination above SCDHS Action Levels and will require further investigation and remediation. The further investigation will include additional testing of "overflow pools" connected to those structures determined to be contaminated above action levels. There are estimated to be twenty overflow pools connected to the three UIWs that are contaminated above SCDHS Action Levels; thus totaling twenty-three UIWs that may require remediation. The UIW structures determined to be contaminated above SCDHS action levels will require remediation and endpoint sampling (confirmation).

Underground/Aboveground Storage Tanks & NYSDEC Spills
The Phase I ESA revealed that the Site has maintained four underground and above ground storage tanks (USTs and ASTs); including an active 12,000-gallon fuel oil UST, a former 10,000-gallon fuel oil UST previously removed, a former 12,000-gallon diesel UST with a filling pump previously removed, and one 275-gallon AST used to collect runoff water from the roof. The Phase II ESA included the performance of a ground penetrating radar (GPR) survey and the installation of eight soil

borings, and the analysis of eight soil samples for VOCs and SVOCs. The results of the GPR survey indicated that the former 10,000-gallon fuel oil UST and former 12,000-gallon diesel UST had been removed. A review of the analytical data from these subsurface soil samples failed to detect any target analytes at levels above the applicable NYSDEC Soil Cleanup Guidance CP-51. Based on this data, no remediation activities would be recommended should the 12,000-gallon fuel oil UST remain in operation. However, based on the potential future redevelopment activities, this UST would require removal at that time. This removal must be conducted under the auspices of the SCDHS and/or NYSDEC.

A review of NYSDEC Spill records revealed that an active spill (#08-06386) was on file for the Site during the performance of the Phase I ESA. Said spill was closed on November 23, 2011. Accordingly, no additional activities are currently recommended with regards to this spill at this time. No residual contamination was reported as being associated with this spill incident.

Several 55-gallon drums and other ASTs are maintained on the Site. The contents of these tanks include various oils, caustic and waste materials. These drums and ASTs must be properly removed in accordance with applicable rules and regulations at the time of the facility decommissioning. It is assumed that the seller is responsible for removal of all such on-site chemicals, drums and storage containers.

Land-Use Specific Issues

Historic Use of Agricultural/Farmland

According to available records and interviews, the Site has been utilized as a farm since at least the early 1940's. Based on a review of aerial photographs, the farmland occupied the majority of the Site which is approximately 36.87 acres. Application of chemicals such as fertilizers and pesticides were standard practice and typically utilized on farmland on Long Island. These chemicals leave residual contamination that can require special handling and/or disposal during redevelopment activities.

The Phase II ESA included the installation of twenty-two soil borings across the Site (with exception of the areas occupied by the plant), and the analysis of forty-nine soil samples for Pesticides and Heavy Metals. Said samples were acquired at depth intervals ranging from 0-12" below existing grade (BEG). The samples were analyzed at specific depth intervals to determine the potential depth of contamination. A review of the analytical results from the soil samples revealed concentrations of pesticides and/or metals at concentrations above the applicable United States Environmental Protection Agency (EPA) Generic Soil Screening Levels (SSLs) [1]for Residential Scenario (Ingestion-Dermal). The depth of contamination of pesticides at the Site was confirmed to a depth of at least 12" BEG. However, additional sampling is suggested to confirm the depth of the contamination, and to determine whether the pesticides and heavy metals at issue (or other substances of concern) exist elsewhere on the property. This was completed and is summarized later in this section.

Of the twenty-two soil borings installed at the Site for this REC, samples from five of the soil borings exceeded the SSLs for Residential Scenario, Ingestion-Dermal (a modified SSL for arsenic of 4 ppm is applied per SCDHS guidance). Remedial activities required for the pesticide and arsenic contamination related to the historic use of the Site as agricultural/farmland are routinely conducted

[1] And as modified by SCDHS for Arsenic (4 mg/kg) per *Procedures for Municipalities to Evaluate the Need for Soil Sampling and Soil Management at Subdivisions or Other Construction Projects with Potentially Contaminated Soils.*

in the Town of Huntington. Since approximately 2006, the Town of Huntington has required developers to implement mitigation measures to ensure that contaminated soils are managed in a manner that will eliminate the risk of exposure to future inhabitants. Management of impacted soils is achieved through the implementation of a Soil Management Plan, which must be submitted to the Town for its approval and which must be prepared in accordance with the provisions of the SCDHS guidance document *Procedures for Municipalities to Evaluate the Need for Soil Sampling and Soil Management at Subdivisions or Other Construction Projects with Potentially Contaminated Soils.*

The soil management involves excavating or "scraping" the top one-to-two feet of soil from the impacted areas, and isolating material on-site beneath at least one foot of clean cover material. Isolation may include placing it beneath impervious surfaces, under pond liners, within berms, or on-site burial provided at least one foot of clean cover material is provided. If grading is such that exposed soils are below the level to which pesticide/arsenic concentrations were detected, no further action is required in these areas provided "end point" samples confirm levels below the SCDHS guidance value of 4 mg/kg.

The Town of Huntington will require a soil management plan to be submitted for review and approval prior to implementation. Confirmation of successful soil management will be demonstrated through "end point" samples collected to demonstrate that surface soils achieve conformance to SSL's. Pesticide and arsenic concentrations are ubiquitous in the Town, particularly in areas subject to prior agricultural use. The Town routinely addresses these issues through soil management.

<u>Historic Dumping Areas</u>
The Phase I ESA inspection, review of the SCDHS CLEARS database, and aerial photographs revealed that dumping activities have been conducted on the Site (in locations adjacent to the wastewater treatment plant) since at least 1980.

The scope of the Phase II ESA included the installation of four soil borings and the analysis of four soil samples for VOCs, SVOCs, Metals, PCBs, and/or Pesticides. A review of the analytical results from these soil samples revealed concentrations of metals at concentrations above NYSDEC Part 375 Unrestricted Use SCOs, NYSDEC Part 375 Residential Use SCOs, NYSDEC Part 375 Restricted-Residential Use SCOs and/or the EPA SSLs for Residential Scenario (Ingestion-Dermal). One soil boring (SP-1) was determined to have elevated concentrations of heavy metals (arsenic, cadmium, and chromium) requiring additional investigation and remediation. The additional investigation will be required to fully delineate the contamination and determine if the soils demonstrate characteristics of hazardous waste. This area will require excavation and off-site disposal to an approved disposal facility. The analytical results from the other area of dumping exceeded NYSDEC Part 375 Unrestricted Use SCOs and EPA SSLs for Residential Scenario (Ingestion-Dermal). This area (and any other areas of confirmed dumping) may require off-site disposal and/or soil management.

Wastewater Treatment Plant & Closure/Compliance Issues
The Site currently maintains a SPDES permit regarding an active wastewater treatment plant. The wastewaters generated from the Site are injected into ponds, maintained on the western portion of the Site. A review of USGS maps and historic aerial photographs revealed that several ponds were maintained in different locations than those currently present. A review of Building Department records revealed that the wastewater treatment plant and settling ponds were permitted on the Site in 1979. A SPDES permit was provided regarding the approved wastewater discharge associated with this treatment plant. However, a review of historic aerial photographs revealed that several settling ponds had been constructed prior to the issuance of the permit.

The scope of the Phase II ESA for this REC included the installation of eleven soil borings and the analysis of five sediment samples for VOCs, SVOCs, Metals, and Pesticides. A review of the analytical results from these sediment samples failed to reveal any concentrations of contaminants at concentrations above NYSDEC Part 375 Unrestricted Use SCOs, NYSDEC Part 375 Residential Use SCOs, NYSDEC Part 375 Restricted-Residential Use SCOs, SCDHS Action Levels or the EPA SSLs for Residential Scenario (Ingestion-Dermal).

Closure of the Waste Water Treatment Plant, including the SPDES settling ponds will be required in accordance with NYSDEC 6 NYCRR §750-2 Closure Requirements. Additional activities may be required by the SCDHS and/or NYSDEC; including the installation of a monitoring well(s).

NP&V prepared additional sampling in a Pesticide Report (May 31, 2012), to examine the vertical and horizontal extent of pesticide and arsenic levels. The findings are outlined below:

1. Arsenic was detected at concentrations above the SSL (as modified by SCDHS) of 4 milligrams per kilogram (mg/kg) in 65 of the 80 samples analyzed for this constituent. The vertical extent of arsenic contamination was established for seven (7) of the sample locations and was found to range from 12 to 18 inches below grade. Arsenic generally decreased with depth and was found to be substantially lower in nearly all samples at the 18-24 inch depth range. A few exceptions include Z-7 (East), Z-8 (North) which increased at the 18-24 inch depth. The limited locations of increased arsenic indicate some areas of limited vertical mixing due to past farming practice. With respect to horizontal extent, nearly all supplemental samples found arsenic at concentrations above 4 mg/kg, indicating historic pesticide use throughout the open field areas subject to sampling. This sampling does assist in defining the areas of needed soil management. Given the general decreasing trend in arsenic concentrations, and the earthwork associated with proposed site development, it is expected that soil management to a depth of 18-24 inches will be sufficient to achieve suitable surface arsenic concentrations. This will be outlined in a Soil Management Plan (SMP) and confirmation of successful SMP implementation will be confirmed through end point sampling.

2. 4,4-DDT was detected at concentrations above the USEPA SSL of 2,000 mg/kg in 15 of the 48 samples analyzed for this compound. The vertical extent of 4,4-DDT contamination was established for all of the samples and was found to range from 12 to 18 inches below grade. With respect to horizontal extent, many of the supplemental samples found arsenic at concentrations above SSLs in shallow soils (0-12”), thus indicating that soil management for arsenic will be sufficient to address 4,4-DDT concentrations.

In summary, representative soils on the subject property were sampled and analyzed for the presence of 4,4-DDT and arsenic. As a result of site investigations, it is recommended that an appropriate Soil Management Plan (SMP) be prepared which considers the soil pesticide concentrations.

The applicant is committed to addressing and, as necessary, remediating, the RECs to the satisfaction of all applicable reviewing agencies.

1.3 Project Design and Layout

1.3.1 Overall Site Layout

The majority of the site, including areas that may formerly have been used for dairy animal grazing, and the area developed with various dairy-related buildings, will be re-developed for the proposed project. The existing open-air dairy waste treatment facility, recharge beds and lagoons, and septic systems will also be removed.

Figure 1-3 superimposes the proposed project on an aerial photograph of the site, which depicts the relationship between the project's layout and the site's existing conditions. The proposed project will have two vehicle access points. The main vehicle access will be located near the center of the property's frontage, on the western side of Elwood Road opposite Hammond Road. This access will be configured as a divided driveway having two entering lanes and two exiting lanes, and will be "stop"-controlled.. This access will be gated and there will be a guardhouse. The drive will continue westerly toward the center of the site and will terminate in a "roundabout" opposite the project's recreation building. A water feature may be installed in the roundabout. From this point, internal roadways will extend both northward and southward, serving as direct accesses to the various residential structures. A secondary access is planned at the site's southernmost frontage on Elwood Road; it will be configured for right turns entering and existing only, and will be stop-controlled. Deceleration and acceleration lanes will be provided at the main site vehicle access; a 6,743 SF/0.15 acre road widening dedication of land to the county will be made to provide these lanes. Finally, new sidewalks will be provided along the site's Elwood Road frontage.

The new STP building is planned for the site's west-central area, between the Town Park and the rear of the clubhouse building, and near the proposed dog run. A recharge area is placed in the site's extreme northern corner, abutting the public school property. The drainage system also includes two man-made ponds, on either side of the site entrance drive. Each of these ponds will be adjacent to naturalized recharge areas in the site's natural low area along Elwood Road.

There will be 56 residential buildings, a clubhouse building, and one building for the STP equipment. Each of the residential structures will be two floors in height and will be configured for either 4 units (22 buildings) or 8 units (34 buildings). Each unit will be on one level, and will contain 2 bedrooms (see **Tables 1-1**).

All first-floor units will exceed 1,600 SF of floor space, and so are assumed to generate (per SCDHS requirements) 300 gpd of wastewater, while all second-floor units will have between 1,200 and 1,600 SF, and would generate 225 gpd of wastewater. Thus, these values represent the assumed water uses for these units. The estimated 17,000 SF clubhouse building will be two stories high, and will include indoor amenities. There will also be an outdoor swimming pool/patio area, outdoor Jacuzzi, and a car wash area for residents. The development will include sidewalks between and along the parking spaces and buildings, and an internal walking trail winding along the site's perimeter, to provide an exercise amenity and safe pedestrian circulation within the site.

Table 1-1a
UNITS IN EACH TYPE OF RESIDENTIAL BUILDING

---	Units	Bedrooms/Unit	Water Use/Unit	Garage Parking	Driveway Parking
Eight-Unit Buildings (34 Buildings)					
First (Ground) Floor	4	2	300 gpd	n/a	n/a
Second Floor	4	2	225 gpd	n/a	n/a
Four-Unit Buildings (22 Buildings)					
First (Ground) Floor	2	2 (1)	300 gpd	1space	1space
Second Floor	2	2, plus den (2)	225 gpd	1space	1space

(1) Each unit will have a basement.
(2) Could be used as a third bedroom.

Table 1-1b
TOTAL UNITS IN RESIDENTIAL BUILDINGS

---	Total Units	Total Bedrooms	Total Water Use	Total Garage Parking	Total Driveway Parking
Eight-Unit Buildings (34 Buildings)					
First (Ground) Floor	136	272	40,800 gpd	n/a	n/a
Second Floor	136	272	30,600 gpd	n/a	n/a
Totals, 8-Unit Buildings	272	544	71,400 gpd	0	0
Four-Unit Buildings (22 Buildings)					
First (Ground) Floor	44	88 (1)	13,200 gpd	44 spaces	44 spaces
Second Floor	44	88 to 132 (2)	9,900 gpd	44 spaces	44 spaces
Totals, 4-Unit Buildings	88	176 to 220 (2)	23,100 gpd	88 spaces	88 spaces
Overall	**360**	**720 to 764** (2)	**94,500 gpd**	**88 spaces**	**88 spaces**

(1) Each unit will have a basement
(2) Total bedroom count depends upon number of dens used as third bedroom.

Based on Town Zoning Code requirements, a minimum of 540 parking spaces are necessary; a total of 816 parking spaces, including 28 spaces for handicapped drivers, will be provided along the interior roadways as head-in spaces; 39 of the spaces will be available at the clubhouse building.

As the site is developed, its natural vegetation was disturbed; however, the portion of the site lying west of the dairy waste treatment system lagoons has been allowed to revert to its prior Southern Harwood Forest and Old Field vegetation. As listed in **Table 1-2**, it is expected that there will be 1.35 acres of retained Successional Southern Hardwood Forest and 0.29 acres of Successional Old Field in this area. The remaining site acreage will be developed surfaces.

The project's landscaping will be distributed around and between the structures, as well as along the internal roadways. Each naturalized recharge area along Elwood Road may be planted with appropriate natural species, to serve aesthetic and habitat functions.

Table 1-2
SITE AND PROJECT CHARACTERISTICS
Existing Conditions & Proposed Project

Parameter	Existing Conditions	Proposed Project
Use	Commercial	Senior Residential
Zoning; Yield	R-40; Office, Dairy & Trucking	R-RM; 360 Condos
Wastewater Treatment System	On-Site Septic	On-Site STP
Coverages (acres)**:**	---	---
Successional Old Field	5.43	0.29
Successional Southern Hardwood Forest	8.81	1.35
Pastureland	12.29	0
Unvegetated	3.59	0
Recharge Area	0	0.69
Naturalized Recharge Areas (2)	0	1.81
Ponds (2)	0	0.73
Buildings	0.75	8.93
Paved Surfaces	5.09	8.72
Landscaped	1.09	14.53
Water Resources:	---	---
Domestic Water Use (gpd; annual, average)	39,306 (1)	97,000 (2)
Irrigation, annualized (gpd)	777	6,618
Total Water Use (gpd)	40,083	103,618
Recharge Volume (MGY)	39.18 (3)	66.73(4)
Nitrogen Concentration (mg/l)	4.64 (3)	5.46(4)
Intersection LOS (AM/PM Peak Hours; 2016)**:**	---	---
Jericho Turnpike at Elwood Road	D/F	D/F
Elwood Road at Warner Road	B/E	B/E (5)
Elwood Road at Cuba Hill Road/Burr Road	D/D	D/D (5)
Elwood Road at Cedar Drive	B/B	B/B
Elwood Road at High School Driveway	B/A	B/A
Elwood Road at Clay Pitts Road	C/C	C/C
Miscellaneous:	---	---
Affordable Units	n/a	50 - 66
Total Residents (capita)	0	540 (6)
Employees (FTE)	65	10
Total Taxes ($/year)	$162,486	$2.708-2.763 million
School Taxes ($/year)	$117,896	$1.965-2.005 million
Solid Waste Generation	60 CY/week	2,552 lbs/day (7)
Parking Required (spaces)	85±	540
Parking Provided (spaces)	85±	816

MGY-million gallons per year; mg/l - milligrams per liter; vph-vehicles per hour; LOS-level of service.
(1) Per water bills; assuming 459 gpd for 7,650 SF of office, leaves 38,847 gpd for 42,350 SF of processing facility.
(2) Based on SCDHS rates; see **Table 1-5**.
(3) See **Appendix C-2**.
(4) See **Appendix C-3**.
(5) With mitigation; see **Table 3-9**.
(6) Assuming 1.5 capita/senior unit; see **Appendix A-1**.
(7) Assuming 3.5 lbs/day/capita for senior units and 0.013 lbs/SF/day for clubhouse (**Nemerow, et al, 2009**).

The allowable sanitary wastewater flow for this site would be 18,156 gpd (see **Section 1.3.4** for a description of Groundwater Management Zones and Suffolk County Sanitary Code [SCSC] Article 6). This is the maximum allowable flow for a conventional sanitary system without the use of sewage treatment. Assuming sewage flow rates of the SCDHS, the proposed project would generate a total sanitary flow of 97,000 gpd. This exceeds the allowable sanitary flow for a septic system, so the applicant proposes to construct a new STP on-site. This facility would serve only the project.

Lighting will be consistent with current Town standards and requirements, with all installed lighting dark-sky compliant with downcast fixtures. Lighting will be provided to establish a safe and secure environment with illumination only in those areas where it is necessary. Illumination will not extend beyond the property boundaries and diffuse skyglow will not occur.

The applicant has designed the project to:

- Strike a balance between the yield permitted under the proposed R-RM zoning while remaining within a density that would not adversely impact the residential character of the area and still support an economically viable project;
- Provide a complementary land use that would provide a transitional use between the public recreational site to the southwest, the institutional uses to the northwest, and the single-family residential uses that dominate the areas to the east, west, north and south;
- Provide an aesthetically attractive development;
- Provide on-site recreational amenities to be used by site residents;
- Provide safe access in conformance with Town and County highway access limitations; and
- Conform to all other appropriate land use requirements.

1.3.2 Clearing, Grading and Drainage

Clearing and Grading

Based on the estimated site coverages in **Table 1-2**, it is expected that a maximum of 35.41 acres (95.6% of the site) may be cleared and/or graded for the proposed project (see **Table 1-3**).

It should be noted that, of the 35.41 acres that may be subject to clearing, 24.89 acres represent existing vegetated surfaces, and the remaining 10.52 acres are developed surfaces. Thus, clearing of vegetation represents a maximum of 67.2% of the site.

Soil disturbance is necessary to establish suitable grades for the proposed roads and building locations. Site grading and established surface slopes must consider requirements for low grades required for proper drainage, road grades, conformance with requirements of the Americans With Disabilities Act (ADA), and the convenience of the site's residents. Grade transitions will be made using slopes not to exceed 1:3. In order to reduce the acreage of disturbance and the volume of soil excavated, retaining walls may be proposed. This would be determined during preparation of the Grading and Drainage Plan, as part of the site plan application. All disturbed soil areas will be stabilized and all areas other than buildings and paved surfaces will be landscaped.

Table 1-3
ANTICIPATED CLEARING

Existing Coverage Type	Existing Coverage	Remaining Coverage	Subject to Clearing
Vegetated Surfaces			
Successional Old Field	5.43 acres	0.29 acres	5.14 acres
Successional Southern Hardwood Forest	8.81 acres	1.35 acres	7.46 acres
Pastureland	12.29 acres	0	12.29 acres
Total Vegetated Surfaces	*26.53 acre*	*1.64 acres*	*24.89 acres*
Developed Surfaces			
Unvegetated	3.59 acres	0	3.59 acres
Buildings	0.75 acres	0	0.75 acres
Paved Surfaces	5.09 acres	0	5.09 acres
Landscaped	1.09 acres	0	1.09 acres
Total Developed Surfaces	*10.52 acres*	*0*	*10.52 acres*
Totals	**37.05 acres**	**1.64 acres**	**35.41 acres**

In order to provide for a drainage system that will operate efficiently, a grading program will be undertaken, including three man-made recharge areas and two ponds. Generally, excavated material used elsewhere on-site to fill-in low areas, to provide suitable development surfaces.

The proposed project involves a change of zone. The plans provided herein are conceptual development plans prepared to a level of detail sufficient for analysis of potential environmental impacts. A detailed site plan for the project will be prepared for the Town Planning Board; that submission will include a Grading and Drainage Plan showing the final engineered grading design. The entire site plan, including the Grading and Drainage Plan, will require Town review and approval prior to implementation and subsequent to the change of zone.

The applicant proposes to re-use as much of the excavated soil on-site as fill as possible, so that no significant import or export of soil is expected. See **Section 2.1.2** for additional information regarding potential impact of grading activities.

Based on the recommendations of the ESA I, a Soil Management Plan (SMP) will be prepared on behalf of the applicant.

Drainage System

In conformance with Town requirements, all stormwater runoff generated on the developed portion of the property will be retained and recharged in an on-site drainage system designed to accommodate 5 inches of stormwater. The project's drainage system will utilize a recharge area in the lower northernmost corner of the site, to take advantage of the site's natural runoff flow, supplemented by two additional naturalized recharge areas to be excavated along the west side of Elwood Road, north and south of the project's entrance. Adjacent to each of these naturalized recharge areas will be a pond, which will be provided with an impervious liner that will ensure that a minimum depth of surface water will be permanently retained in each. Runoff water in excess of this minimum retained level will be able to expand into the supplemental naturalized recharge area or infiltrate over the liner and into the aquifer. It is expected that each pond will be equipped with a circulation system (to eliminate stagnant water conditions and mosquitoes, as well as separate water feeds to maintain minimum water levels. The drainage system will have a capacity in excess of the minimum volume required by the Town.

As noted above, a Grading & Drainage Plan will be prepared as part of the site plan submission, which will be subject to review and approval of the Town. This will ensure that the project's drainage system will operate properly and minimize potential runoff problems.

The drainage system will be designed to comply with SPDES requirements under NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP 0-10-001). Based on existing developments in the area, local geologic conditions, and adequate depth to groundwater, subsoils are expected to be of suitable quality to allow efficient recharge of stormwater, subject to further evaluation during subsequent project review (see **Section 1.4.2** for additional information in regard to erosion control during construction).

1.3.3 Vehicle Access, Parking and Road System

Vehicle Access

The subject property has frontage on two roadways: Ciro Street and Elwood Road. As the applicant seeks to minimize traffic impacts on adjacent local residential streets, all traffic associated with the project will utilize Elwood Road; no vehicle access to Ciro Street or any other street is anticipated. In the vicinity of the subject site, Elwood Road has one travel lane in each direction, but has shoulder lanes on each side. The main site access would create a "four-way" intersection on Elwood Road with Hammond Road, and is proposed with a divided, gated entranceway featuring two entering and two exiting lanes. This main access will be "stop-controlled" for exiting drivers. A secondary access will be provided onto Elwood Road, at the site's southernmost frontage on this roadway. It will be limited to right turns entering and right turns exiting. Deceleration and acceleration lanes are planned at the main vehicle access; a 6,743 SF/0.15 acre road widening dedication of land to the county will be made for these features. Finally, sidewalks will be installed along the site's Elwood Road frontage.

The Traffic Impact Study (TIS) prepared for the project (see **Appendix D**) indicates that a number of roadway improvements are proposed, including:

> *Elwood Road at Warner Road*
> The PM Peak Period results at Elwood Road and Warner Road show that the intersection operates at a Level of Service [LOS] D during the Existing Condition and at a LOS E in the No Build and Build Conditions. The southbound through movement operates at LOS F in the Build condition as compared to a LOS E in the No Build condition. In order to improve the southbound approach LOS, signal timing adjustments are needed. By allocating additional green time to the northbound and southbound approaches, the southbound LOS can be improved to LOS E with delays that are 4.5 seconds lower than the No Build delays. There is only a 0.3 second increase in overall intersection delay between the No Build and Build with Mitigation Conditions.

Elwood Road at Cuba Hill Road/Burr Road
The PM Peak Period results at Elwood Road and Cuba Hill Road/Burr Road show that the intersection operates at a LOS D during the Existing, No Build Conditions and changes to a LOS E in the Build Condition. In order to improve the overall intersection LOS back to levels experienced in the No Build Condition, signal timing adjustments are needed. By allocating additional green time to the northbound and southbound approaches, the overall intersection LOS can be improved back to LOS D with a 0.8 second decrease in overall delay compared to the No Build condition.

Additional Off-Site Mitigation
In order to address traffic safety flow issues and concerns raised by members of the community, the developer has agreed to the following additional traffic mitigation measures to be implemented along Elwood Road:

- Install school speed zone flashing beacons in proximity to the John Glenn High School access roadway.
- Provide new, wider sidewalks in close proximity to the John Glenn High School
- Install sidewalks, curbing and drainage along the entire site's frontage
- Widen the west side Elwood Road along the site's frontage to increase the radius of the present horizontal curve
- Install a right turn deceleration lane and a left turn lane at the proposed main site access
- Provide new traffic signal controllers at the following intersections along Elwood Road:
    - Clay Pitts Road
    - John Glenn High School Access/Cedar Road
    - Cuba Hill Road/Burr Road
    - Warner Road
- Provide wireless interconnect between traffic signal controllers within the study area. This will provide further improvement to traffic flow along Elwood Road.
- Provide emergency vehicle pre-emption at the signalized intersections within the study area.

The Traffic Mitigation Plan presented in **Figure 1-4** depicts the mitigation measures outlined above. The estimated costs associated with these mitigation measures is approximately $1,000,000.

Parking
As shown in **Table 1-4**, the Town Code (Section 198-47) requires that 1.5 parking spaces be provided for each residential unit. These would require a total of 540 parking spaces on-site. In contrast, the **Site Development Plan O** shows that the project provides for 640 spaces, as head-in stalls along both sides of the internal roadway. In addition, space for 88 cars on driveways and 88 garage spaces are planned. Thus, the proposed project will satisfy the Town Code requirement for parking spaces.

Road System
The project's internal aisle/roadway is proposed to be 25 feet in paved with, with an additional 20 feet of width in those areas where the head-in parking spaces are located. This surface will be curbed and served by curbside inlets and catchbasins connected to the site's overall drainage system. As stated in the TIS:

A careful review of the site plan revealed that the configuration of the parking layout and drive aisles provides for adequate on-site circulation.

Table 1-4
PARKING
Required and Proposed

Component (Yield)	**Minimum Required Spaces** (per Town Code)		**Provided**
Condominiums (360 units)	1.5 spaces/unit	540	640*
Driveways	n/a	---	88
Garages	n/a	---	88
TOTALS	**---**	**540**	**816****

* Of which 39 spaces are at the Clubhouse Building.
** Includes 28 handicapped spaces.

1.3.4 Water Supply and Sanitary Disposal Systems

<u>Water Supply</u>
Potable water will be provided to the proposed project from the GWD distribution system. It is anticipated that the project would be served by either an extension of the 10-inch main beneath the north side of Ciro Street, the 8-inch main beneath the west side of Elwood Road, or both. The final determination of this connection will be made as part of the site plan review process. All necessary connections, meters, easements and installations will be provided to ensure adequate water supply.

<u>Water Use</u>
Assuming the sanitary design flow rates used by the SCDHS for wastewater systems (which yields a conservative estimate of water used in-house), half of the condominiums will consume 300 gpd of potable water, and the other half will require 225 gpd. In addition, the 17,000-SF clubhouse building will require 1,700 gpd of water, and the two swimming pools will require 800 gpd. Water usage for the Jacuzzi is not anticipated to be significant. Therefore, a total of 97,000 gpd of water will be consumed for domestic purposes (see **Table 1-5**). It is expected that landscape irrigation will require an annualized average of 6,618 gpd, assuming that 16 inches are applied over the growing season, and 5.56 acres (15% of the site) are planted with fertilized (and therefore, irrigated) landscape vegetation. Thus, total water use of the proposed project is estimated at 103,618 gpd.

<u>Sanitary Wastewater Treatment</u>
As discussed in **Section 2.4.2**, sanitary wastewater flow and discharge requirements are determined by the SCDHS, under the jurisdiction of SCSC Article 6, which also addresses sewage facility requirements for realty subdivisions, development and other construction projects in order to limit the loading of nitrogen in various groundwater management zones as established by the SCDHS. The project site is located within Groundwater Management Zone I as defined by the SCDHS. Based on the requirements of SCSC Article 6, no more than 600 gallons may be discharged per acre on a daily basis within this zone. For the subject site, the maximum allowed

sanitary flow on-site is 18,156 gpd, if an on-site septic system is to be utilized. If use of an STP is proposed, the sanitary flow limitation does not apply, and the site's sanitary flow is then limited to the available capacity of the STP.

Table 1-5
DOMESTIC WATER USE & WASTEWATER FLOWS

Component	Yield	Flow Factor (1)	Total Use/Flow
Condominiums (1st Floor)	180 units	300 gpd/unit	54,000 gpd
Condominiums (2nd Floor)	180 units	225 gpd/unit	40,500 gpd
Clubhouse Building	17,000 SF	0.10 gpd/SF	1,700 gpd
Swimming Pools (2 @ 800 SF each)	160 users/day	5 gpd/user	800 gpd
Total Domestic Use/Wastewater Flow	---	---	*97,000 gpd (3)*
Irrigation	5.56 acres (2)	16 inches/year	6,618 gpd
Total Water Use	**---**	**---**	**103,618 gpd**

(1) Per SCDHS design criteria for wastewater system sizing.
(2) Assuming that 5.56 of the 14.53 acres of landscaping (15% of the site) are irrigated and fertilized.
(3) Maximum allowed sanitary flow for septic system in Zone I is 600 gpd/acre, or 18,156 gpd for site.

The proposed project will construct a new STP on-site that will be designed to handle only the wastewater generated by the proposed project. The design of the STP that the applicant proposes to construct is based on the Sequencing Batch Reactor (SBR) process; the following is a general description of this process.

> The SBR process is an activated sludge process that is designed to operate under non-steady state conditions. It is a wastewater treatment process where oxygen is bubbled through a discrete quantity of wastewater in order to reduce biochemical oxygen demand (BOD) and chemical oxygen demand (COD). An SBR treatment plant is typically a minimum of two treatment tanks that operate on a fill- and draw basis. Each tank in the SBR system is filled during a discrete period of time and then operated as a batch reactor. After the desired amount of treatment is achieved, the mixed liquor is allowed to settle and the clarified supernatant is then removed from the tank. The cycle for each tank in a typical SBR is divided into five discrete periods or cycles: Fill, React, Settle, Draw and Idle. The following is a description of each of the cycles:
>
> *Step 1 - Fill*
> During the fill phase, the treatment basin receives raw influent wastewater. The influent wastewater brings food to the microbes in the activated sludge, creating an environment for biochemical reactions to take place.
>
> *Step 2 - React*
> During this phase, no wastewater enters the treatment tank and the mechanical mixing and aeration units are on. Because there are no additional volume and organic loadings, the rate of organic removal increases dramatically. Most of the carbonaceous BOD removal occurs in the react phase. Further nitrification occurs by allowing the mixing and aeration to continue - the majority of denitrification takes place in the mixed-fill phase. The phosphorus released during mixed fill, plus some additional phosphorus, is taken up during the react phase.

Step 3 - Settle
During this phase, the activated sludge is allowed to settle under quiescent conditions - no flow enters the basin and no aeration and mixing takes place. The activated sludge tends to settle as a flocculent mass, forming a distinctive interface with the clear supernatant. The sludge mass is called the sludge blanket. This phase is a critical part of the cycle, because if the solids do not settle rapidly, some sludge can be drawn off during the subsequent decant phase and thereby degrade effluent quality.

Step 4 - Decant
During this phase, a decanter is used to remove the clear supernatant effluent. Once the settle phase is complete, a signal is sent to the decanter to initiate the opening of an effluent-discharge valve. There are floating and fixed-arm decanters. Floating decanters maintain the inlet orifice slightly below the water surface to minimize the removal of solids in the effluent removed during the decant phase.

Step 5 - Idle
This step occurs between the decant phase and the fill phase. The time varies, based on the influent flow rate and the operating strategy. During this phase, a small amount of activated sludge at the bottom of the SBR basin is pumped out and disposed of - a process called wasting.

The decanted effluent is then typically pumped to effluent filters to further reduce any suspended organic material and suspended solids remaining in the wastewater.

This facility would have a capacity of at least approximately 100,000 gpd. Approvals from the NYSDEC, SCDHS and Suffolk County Department of Public Works (SCDPW) will be required; review and approval of an Engineering Report and Construction Plans and Specifications by the SCDHS and SCDPW would be required, ensuring that this facility would be built to and operated in conformance to established regulations. Finally, the STP will be required to obtain a SPDES permit from the NYSDEC.

SCSC Article 12 regulates storage and handling of toxic and hazardous materials as a means to *"…maintain its [Suffolk County's] water resources as near to their natural condition of purity as reasonably possible for the safeguarding of the public health…"*. The project would not utilize any toxic or hazardous materials (other than common household cleaners), and so would conform to this regulation.

1.3.5 Site Landscaping, Open Space, Recreation and Lighting

Landscaping
Based on the quantities listed in **Table 1-2**, landscaping would cover 14.53 acres (39.2% of the site), though only 15% of the site (5.56 acres) is assumed here to represent the acreage of maintained (i.e., irrigated and fertilized) landscaping. Fertilizers are assumed to be applied at a rate of 2.30 pounds of nitrogen per 1,000 SF, and irrigated at a rate of 16 inches annually.

It is anticipated that native or native-compatible grasses will be planted throughout the landscaped areas, with decorative shrubs interspersed at appropriate locations as well. It is expected that trees will be planted along the internal roadways. The naturalized recharge areas will be planted with appropriate natural species having water-tolerant characteristics, which will provide natural habitat functions and a natural appearance to these areas, particularly the area along Elwood Road, which visually dominates the entire frontage of the property. In addition, an attractive community entrance sign with landscaping and spotlighting may be placed at the project's entrance.

A detailed Landscape Plan will be prepared for the site plan application, which would be submitted contingent on approval of the change of zone application, and will be subject to the review and approval of the Town.

Open Space
A perimeter walking trail is to be provided, which will provide an exercise/recreational amenity and safe and convenient pedestrian access to parking, the clubhouse building, and the dog run, as well as to Elwood Road and points north and south.

Recreation
The project's clubhouse building is expected to contain numerous facilities for the use and enjoyment of the site's residents; these may include but would not be limited to: card room, TV/game room, library, meeting room, gym/spa, indoor pool/locker rooms, bathrooms, office space, equipment room, storage, mechanical rooms, etc. A small kitchen may be provided, but it would not be configured to prepare meals on-site (such a facility, if present, would be limited to equipment to reheat prepared food).

As noted above, a sinuous internal walking trail will be provided, for the use and enjoyment of the site's residents. It would connect to the site's internal sidewalks that may be present. This feature may be provided with footlights, for safety/security purposes

Lighting
A Lighting Plan for the proposed project would be prepared as part of the site plan application, after the change of zone application is granted. In general, lighting will be provided to establish a safe and secure environment with illumination only in those areas where it is necessary. Illumination will not extend beyond the property boundaries and diffuse lighting will not occur.

The proposed project would illuminate the internal roadways and parking spaces, walking trial, sidewalks and building exteriors, along with safety/security lights in appropriate locations. Lighting will be provided consistent with the locations, pole heights and specifications of the type and power of fixtures ("luminaires") typical for a quality senior residential facility. Lighting for the project will conform to the applicable requirements of Town Zoning Code Chapter 143 (Outdoor Lighting). The applicant will ensure that only "dark sky" compliant luminaires will be used; this type of fixture is equipped with a full cut-off shroud that directs all illumination downward. By use of such fixtures the lower pole heights used, the potential for adverse impacts to the visibility of the nighttime sky for site residents, as well as impacts to the neighboring properties, will be minimized.

1.4 Construction Schedule and Operations

1.4.1 Construction Schedule

Based on a preliminary estimate, construction of the proposed project is anticipated to occur over four phases, with the construction of Phase 1 anticipated to begin in the Summer of 2015. Considering that the project is in the early stages of planning, the applicant has not determined which components of the project will be developed in each phase, so that the length of each phase is not known at the present time. However, it is expected that the entire construction process will last between 30 and 36 months, so that the project is anticipated to be completed between the Winter of 2017 and the Summer of 2018.

Construction activities will conform to Town Code regulations on hours, and would not occur between the hours of 6:00 PM and 7:00 AM on weekdays (weekend construction, and will conform to additional applicable Town regulations regarding construction noise generation.

1.4.2 Construction and Related Operations

The overall site development process will begin as soon as practicable following the completion of the change of zone and site plan approval processes, and building permit issuance.

<u>General Remediation And Demolition Process Descriptions</u>
Prior to the onset of site construction activities, including demolition/removal of the existing structures, wastewater treatment facilities and equipment on the site, the property will be subject to any remediation measures that may be required, as determined by the Town, County and/or State. Such operations would extend, but not necessarily be limited, to encompass the testing and remediation activities as determined in the ESA I (see **Section 1.2.2**).

The remediation phase will begin with a thorough subsurface investigation, to determine the presence (and, if found, the nature and extent) of soil contamination, and to locate all underground infrastructure; removal will be conducted subject to applicable Town, County and/or State standards. As part of the remediation process, spill reporting and cleanup, drainage structure testing and closure, septic system and dairy process wastewater treatment system testing, and all related such activities will be conducted under the auspices of the appropriate regulatory agency, including but not limited to the NYSDEC. The SCDHS will be notified of any storage tanks that require removal. If present, tanks will be removed under the oversight of SCDHS personnel and by a reputable, licensed contractor. If applicable, the applicant will utilize contractors licensed in lead-based paint materials control as well as asbestos removal, to ensure compliance with applicable health/safety requirements.

Subsequently, the existing office, storage and wastewater treatment buildings, developed areas and utilities on the site will be removed. A Demolition Plan will be prepared as part of the site plan application, for Town review and approval, and a demolition permit will be obtained prior to the onset of demolition activities. In general, demolition for each of the existing structures, including the dairy process wastewater treatment system, would follow a similar process, including cessation of activities and disconnection of utilities, followed by inspection for potentially hazardous or toxic building materials (e.g., asbestos, chemicals, etc.). Any necessary or appropriate removal or remediation activities required by applicable regulations would follow. After completion and approval for such activities is obtained from the regulating agency (such as the SCDHS or NYSDEC), building demolition would occur. Any recyclable materials would be removed at this time, to increase re-use of materials and reduce the volume of demolition wastes to be handled. For the office and the storage buildings (the former residence), demolition may be performed by use of a crane/wrecking ball unit or similar equipment, followed by use of an excavator and/or bulldozer to transfer the debris to dump trucks for disposal at an approved and permitted construction/demolition debris landfill. For the dairy wastewater facility, the demolition process would involve removal of the treatment structure (possibly by use of an excavator or bulldozer), excavations to remove pipe connections, and filling-in of the treatment lagoons. Overall, demolition activities will take place over a limited period of time (estimated to be 1-2 months in length). Trucks will access the site via the existing entrances on Elwood Road, and would likely use NYS Route 25/Jericho Turnpike approximately 1 road-mile to the south to approach the site; little potential for these trucks to use roads to the north of the site are expected. In this way, the potential for adverse impacts to the residential and school uses to the north would be minimized.

The property has historically been used as a dairy operation, so that the neighborhood has evolved to tolerate a level of activity on the site commensurate with this use. In addition, the portions of the site that will experience demolition activities are limited in terms of area (the former residence, the warehouse/maintenance building and the treatment structures), or location (the office/processing building is adjacent to Elwood Road and therefore accessible for quick removal), so that demolition would not take place over an extended period of time. These factors would mitigate the magnitude and duration of noise and dust impacts that neighbors would otherwise experience during this process.

General Construction Process Description

In general, the construction process will begin with establishment of flagged clearing limits, followed by installation of staked hay bales and silt fencing as necessary along the property periphery and adjacent to roadways. As construction begins, construction equipment, materials storage, and worker vehicles will be staged, parked and loaded/unloaded within the site. All construction access will be from Elwood Road, with no access through any abutting properties.

"Rumble strips" will be placed at the site entrance to prevent soil on truck tires from being tracked onto Elwood Road, and a water truck will be available to wet excessively dry soils.

In order to minimize the time span that denuded soil in the developed area is exposed to erosive elements, excavations will take place immediately after clearing/grading operations. These excavations are for building foundations, roadways and parking, the sanitary and drainage systems and utility connections. The excavation phase will be followed by pouring of concrete for the building foundations, curbing, etc. Building construction can then begin; concurrent activities may include installation of the utility connections and, later, final grading and preparation of the base for the internal roadways, parking spaces and sidewalks, and installation of the site lighting system may be performed while the buildings are being completed. Laying of the asphalt road surfaces, installation of landscaping and utility system commissioning will complete the construction process.

General Description of Erosion and Sedimentation Control Measures

The following discussion presents erosion and sedimentation control guidelines to be observed during construction in order to minimize impacts. In general, sediment will not be transported off-site by stormwater runoff and, as a result of proper grading procedures, drainage system design, erosion and sedimentation control measures and permit compliance that will be implemented during construction (both discussed below), no impact on local water quality is expected. A request for coverage under the NYSDEC General Permit will be filed in accordance with NYSDEC requirements, prior to the initiation of construction activities at the subject property.

As noted in **Section 1.3.2**, conformance to the Town Code and to the requirements of NYSDEC SPDES review of stormwater control measures is necessary, to be consistent with Phase II stormwater permitting requirements for construction sites in excess of 1-acre (the SPDES GP 0-10-001 permit). Under this program, a site-specific Stormwater Pollution Prevention Plan (SWPPP) must be prepared and submitted to the Town for review and approval prior to final site plan approval.[2] Once the SWPPP has been prepared and approved by the Town, the applicant will need to file a Notice of Intent with the NYSDEC to obtain coverage under GP 0-10-001. Additionally, the GP 0-10-001 permit requires that inspections of the construction site be performed under the supervision of a qualified professional to ensure that erosion controls are properly maintained during the construction period.

The construction manager, in combination with the various specialized contractors, will be responsible for all construction activities, site grading, and installation and maintenance of the erosion and sediment controls. The construction manager will also be responsible for ensuring proper storage and stockpiling of construction materials and that building supplies will be stored in designated areas, and that measures are implemented to prevent/reduce wind-blown dust. The construction manager will be responsible for securing an approved carter to empty the site dumpster and haul waste from the site to an approved location for disposal.

As discussed above, efforts will be made to prevent sediment from being transported off-site by stormwater runoff and, as a result of the erosion and sedimentation control measures and permit compliance that will be implemented during construction, no impact on local water quality is expected. However, should any sediment escape from the site, it will be swept back onto the

[2] The SWPPP must include: a description of the existing site conditions including topography, soils, potential receiving water bodies and stormwater runoff characteristics, a description of the proposed construction project, construction schedule, the erosion and sediment controls planned during construction activities and the details of the post construction stormwater management system design and consistency of said system with the *NYS Stormwater Design Manual*, appropriate maintenance procedures for the erosion and sediment controls and each component of the post construction drainage system, pollution prevention measures during construction activities, a post-construction hydrologic and hydraulic analysis for all structural components of the post construction stormwater management system for a 1, 10 and 100 year storm event, and comparison of existing and post construction peak stormwater discharges. The SWPPP must demonstrate that the proposed stormwater management system is sized adequately to ensure that there is no net increase in peak stormwater discharges from a property once developed.

site by manual or mechanical means (depending upon the amount of fugitive sediments) under the direction of the construction manager. It is expected that the erosion control plan will incorporate recommended measures of the NYSDEC Technical Guidance Manual, and use of measures such as:

- Silt fence, storm drain inlet protection, hay bales & good housekeeping procedures will be used;
- Construction equipment and vehicles will be parked and loaded/unloaded within the site;
- "Rumble strips" at the site entrance will prevent soil on truck tires from being tracked onto the public road system;
- The construction process will begin with establishment of flagged clearing limits, followed by installation of the erosion control measures; and
- The drainage system will provide permanent stormwater controls once construction is completed.

Covenants and restrictions will be adopted for post construction stormwater management in accordance with the SWPPP. Maintenance of all permanent stormwater management controls and drainage structures will be the responsibility of the site owner upon the completion of construction activities. Routine maintenance responsibilities for permanent stormwater structures and practices include:

1. Monitoring of the drainage inlets should be completed routinely, particularly following rainfall events with significant rainfall (defined as 0.5 inches of rainfall over a 24 hour period, or greater is recommended as a minimum).
2. Drainage grates should be kept free from obstruction of leaves, trash, and other debris.
3. Drainage structures are to be initially inspected annually to determine if sediment removal is necessary to ensure drainage structures are properly functioning and permitting adequate conveyance throughout the system and establish the frequency of future maintenance.
4. All seeded and landscaped areas are to be maintained, reseeded, and mulched as necessary to maintain a dense vegetative cover.

Maintenance Responsibilities
The property will be owned by a homeowners association (HOA), to be established by the applicant and registered with the State of New York. The condominium units will be sold to individual occupants, who will comprise the membership of the HOA. The HOA will operate the recreation building and the STP, and will be responsible for all on-site maintenance and repair, including all common areas, the internal roadways, the drainage system, the sanitary system, landscape and exterior building maintenance, snow removal, garbage pick-up, etc.

1.5 Permits and Approvals Required

All site development submissions are subject to review under SEQRA. For the proposed project, this review commenced with the submission of the change of zone application to the Town Board in March 2014. Based on the information presented in the documents comprising that application, the Town Board (as lead agency under SEQRA) will evaluate the project to determine if a significant impact to the environment would or may occur.

This EEAF has been prepared to address those potential impact issues that are anticipated to be of concern to the Town and community. This document will also provide an analysis of the potential impacts of development of this parcel consistent with its existing zoning, in order to establish a comparative assessment of impacts.

This EEAF is intended to provide the Huntington Town Board with information to assist it in reaching an informed decision on the application. This document is intended to comply with SEQRA requirements as administered by the Town.

Table 1-6 is a list of the permits and approvals anticipated to be necessary for the proposed project.

Table 1-6
PERMITS AND APPROVALS REQUIRED

Applicable Board/Agency	Permit/Approval Type
Town Board	Change of Zone approval
Town Planning Board	Site Plan approval
	Change of Zone review
Town Building Department	Building Permits
	239f review (to SCDPW)
Town ZBA	Vacate Special Use permit for dairy
Town Fire Marshal	Site Plan review
SCDHS	Wastewater Disposal & Water Supply permits
SCDPW	STP approval
	Roadwork permit (Section 136 of the Highway Law)
GWD	Water Supply and Connection approvals
NYSDEC	SPDES permit for STP
	SPDES - Stormwater permit

SECTION 2.0

NATURAL ENVIRONMENTAL RESOURCES

2.0 NATURAL ENVIRONMENTAL RESOURCES

2.1 Topography

2.1.1 Existing Conditions

The general topography in the area of the site (**Figure 2-1**) is characterized by the surface deposits of material generated when glaciers stopped advancing and began melting, which most recently occurred on Long Island between 25,000 and 10,000 years ago and trends from south to north. The site itself exhibits a varied and undulating topography characterize by several man-made open-air drainage lagoons used for the collection of dairy process wastewater and elevated mounds. The overall general topography of the site trends from a high elevation of 230 feet above mean sea (asl) located in the southeastern portion of the property down to 192 feet asl which is located in the northeastern portion of the property. Slopes encountered on the site range from approximately 1% to 45%.

2.1.2 Anticipated Impacts

Clearing and grading will occur throughout the developed area, which will occupy the majority (35.41 acres, 95.6%) of the site. This grading program will not encroach into the proposed 25-foot buffer of existing vegetation along the site's western and southern borders.

All construction trucks and equipment, as well as material storage and staging areas will use the proposed construction entrance to the site, which will be located on Elwood Road in the same location as the eventual site entrance to the project. Truck traffic impacts would be temporary, and would occur on roads (NYS Route 25 and Elwood Road) that have sufficient capacity to accommodate this traffic with minimal potential for impact.

The entire area that had been cleared and excavated will be re-graded for development. If necessary, this surface will be appropriately compacted to accommodate the project. Grade transitions will provide slopes not to exceed 1:3; no retaining walls are expected to be necessary to provide slopes conforming to requirements of the ADA.

As discussed in **Section 1.4.2**, all disturbed surfaces will be stabilized prior to construction, to minimize the potential for erosion. Other than excavations for the building foundations, recharge areas, retention ponds and subsurface utility connections, it is not expected that the depths of cutting and filling would be extensive, so that planned re-use of excavated material elsewhere on-site will not require significant import or export of fill.

Following construction, the roadways within the site will maintain grades ranging from 1.0 to 3.0 percent to direct stormwater runoff to drainage structures. A detailed Grading and Drainage Plan will be prepared as part of the site plan application, which will provide additional details of overall site grading, and will require Town planning and engineering reviews and Planning Board approval prior to implementation. The need for and details of any retaining walls will be determined during this period. All grading and the drainage system will conform to applicable Town regulations.

Grading activity will be conducted internally within the site and will not impact adjacent properties. In addition, construction management techniques outlined in **Section 1.4.2** will ensure that sedimentation and erosion control measures are implemented.

2.1.3 Proposed Mitigation

- Use excess excavated material as fill; developed areas will be stabilized and slopes won't exceed 1:3.
- All construction vehicle traffic to and from the site will utilize Elwood Road. Equipment involved in grading will be routed and parked within the site in proximity to the grading area, to minimize the amount of truck movements, thereby minimizing the potential for raising dust.

2.2 Surface Soils

2.2.1 Existing Conditions

The United States Department of Agriculture Soil Survey of Suffolk County, New York (**Warner et al., 1975**) provides a complete categorization, mapping and description of the soil types found in Suffolk County. Soils are classified by similar characteristics and depositional history into soil series, which are in turn grouped into associations. These classifications are based on profiles of the surface soils down to the parent material, which is little changed by leaching or the action of plant roots. An understanding of soil character is important in environmental planning as it aids in determining vegetation type, slope, engineering properties and land use limitations. These descriptions are general, however, and soils can vary greatly within an area, particularly soils of glacial origin. The slope identifiers named in this subsection are generalized based upon regional soil types; the more detailed subsection on topography should be consulted for analysis of slope constraints.

The Soil Survey identifies the subject site as lying within an area characterized by Montauk-Haven-Riverhead Association soils, which consist of deep, nearly level to strongly sloping, well-drained to moderately well-drained, moderately coarse-textured and medium-textured soils on moraines. Seven (7) soils have been identified on site; the locations of these soils are depicted in **Figure 2-2**, and are described below.

Carver and Plymouth Sands, 15-35% slopes (CpE) - The Carver series consists of deep, excessively drained coarse-textured soils. This soil type is found almost exclusively on moraines except for a few steep areas on side slopes along some of the more deeply cut drainage channels on outwash plains. The hazard for erosion is moderate to severe.

Fill Land, Sandy (Fs) - is made up of areas where sandy fill material has been placed on somewhat poorly drained, poorly drained, or very poorly drained soils to provide building sites. In place thin layers of loam or silt loam soil material are in the sandy fill. The thickness of the fill ranges from about 1-1/2 feet to 20 feet; however, thickness generally is about 4 to 10 feet. Slopes are mostly nearly level, but range to 8 percent where areas are graded around buildings. The sources of fill material used in this unit are variable; consequently, the fills are a heterogeneous mixture of sand and gravel that contain varying amounts of finer soil material. In places portions of fills have been made by using nonsoil materials. Fill land, sandy is mostly along the waterfront and is used as building sites. It is not suited to most other uses. Onsite investigation is needed to determine the suitability of individual areas for building sites. Because of droughtiness on thicker fills and low fertility of most fill material, limitations are severe on this land type for establishing and maintaining lawns and landscaping. Ground water pollution is a hazard where thinner fills provide little or no filter material between the bottoms of cesspools and the water table.

Haven Loam, 0-2% Slopes (HaA) - This soil has the profile described as representative of the series. It is mostly nearly level and generally is on outwash plains. Some areas of this soil are on moraines and generally are on top of low-lying hills. Some of these areas are slightly undulating. Most areas of this soil are large, but on moraines the areas are smaller and are irregular in shape. The hazard of erosion is slight on this Haven soil. Primary management concerns are keeping the soil from crusting after rain, maintaining tilth, and reducing the plowpan. The soil is used extensively for crops, and it is well suited to all crops commonly grown in the country. Potatoes are the main crop, but cauliflower, cabbage, corn, onion, and sod crops are also grown. Because of the nearly level slope and ease of excavation, most areas of this soil in the western part of the county are being used for housing developments and industrial parks.

Haven Loam, 2-6% Slopes (HaB) - This soil is on outwash plains and moraines, commonly along shallow, intermittent drainage channels. Slopes are short. In larger areas this soil is mostly undulating. Most areas of this soil are smaller than the areas of Haven loam, 0 to 2 percent slopes. The hazard of erosion is moderate to slight on this Haven soil. Management concerns are controlling runoff and erosion and keeping the surface loose and free from crusting. This soil is well suited to all crops commonly grown in the county. It is generally farmed the same as adjoining areas of nearly level soils. Crops commonly grown are potatoes, cauliflower, cabbage, and corn. Most areas in the western part of the county are used for housing developments.

Montauk Silt Loam, 3-8% Slopes (MkB) **-** The gently sloping to undulating soil is on moraines. Most areas are in the western part of the county south of Huntington, in the eastern parts of Shelter Island and at Montauk Point. Areas of this soil are medium to large in size. The hazard of erosion is moderate to slight on this Montauk soil. This soil is well suited to all cops commonly grown in the county. In areas that are farmed, the main concern of management is the control of runoff and erosion. A few areas are cleared for farming, but most areas are idle and are in brush and trees, or they are used as homesites.

Montauk Silt Loam, 8-15% Slopes (MkC) - This soil is on rolling moraines where many kettle holes or closed depressions dot the landscape. It is mainly in the area between Montauk and Montauk Pont. Slopes are complex in many places. Areas of this soil are medium to large in size. The hazard of erosion is moderately severe on this Montauk soil. This soil is suited to all crops commonly grown in the county. If this soil is cultivated, measures are needed to help to control erosion. A few areas near Montauk are in old grassland, and they are idle and slowly growing up in brush. Most other areas are wooded or are used as sites for housing developments.

Raynham Loam (Ra) - This is the only Raynham soil mapped in the county. This nearly level soil is in low-lying areas beside marshes and creeks. In many places it forms a transition between poorly drained areas and better-drained areas on uplands. It is on outwash plains and moraines. Areas generally are small and irregular. This soil is not well suited to crops commonly grown in the county unless it is artificially drained. Because of its position on the landscape, it is difficult to locate adequate drainage outlets. Most of the other areas of this soil are wooded. This soil is better suited to woodland and to recreational areas than to other uses. In places, areas of this soil have been filled and used as homesites. As demand for building lots increases, more areas will be filled for use as building sites.

The Soil Survey was also consulted for information on the potential limitations on development that the soils may present. Development constraints for the seven soils are summarized in **Table 2-1**. As noted in the table, five of the seven soils present "severe" limitations for development due to slopes, sandy surface layer, high water table, moderately slow permeability and seasonal high water table at ½ to 1-½ feet. The limitations of these soils are related to homesites and sewage disposal fields as well as paved, landscaped and recreational areas. The presence of these soils will be considered in site design.

2.2.2 Anticipated Impacts

Soils located on the property pose "severe" limitations for development due to slopes, sandy surface layer, high water table, moderately slow permeability and seasonable high water table at a ½ to 1-½ feet. Impacts to surface soils related to slopes will be reduced by use of sound grading principals and maintaining slopes with a suitable angle of repose as well as final preparation of regraded areas for development and/or landscape installation. As noted, erosion control measures and full site plan review for grading and drainage will minimize potential adverse impacts to surface soils as described in greater detail herein.

With respect to the presence of a sandy surface layer, topsoil is suitable for growth of vegetation as evidenced by the existing vegetation covering a majority of the property. Topsoil that is not subject to soil management activities will be stockpiled and re-used in landscaped areas in the developed parts of the site. Excess topsoil will be removed from the site to an approved disposal location, or isolated on-site in conformance with the SMP. Soil amendment will involve importation of clean topsoil to the site to supplement existing clean topsoil as needed. Topsoil will be used for landscaped areas around buildings and improvements. Grading, establishment of site improvements and topsoil with groundcovers will stabilize the surface soils on-site. Potential impacts with respect to the sandy surface layer will be adequately addressed as a result of these measures and through Planning Board review and approval. As a result, no long-term soil impacts are expected. Short-term soil impacts will be mitigated through erosion control measures that are described in **Section 1.4.2**. In general, the presence of a sandy surface layer is not anticipated to significantly impact the ability to develop the site as proposed.

Groundwater underlying the site is encountered at depths ranging from 120 feet to 158 feet below ground surface and as a result limitations to development with regard to high water table are not expected. However, issues related to seasonal high water table may result from the poorly drained soils found in both Fs and Ra soils. **Figure 2-2** illustrates the location of these soils in limited areas of the site. Impacts related to poor drainage will be reduced from the strategic design of on-site drainage.

Table 2-1
SOIL LIMITATIONS

<table>
<tr><th>Parameter</th><th>Carver and Plymouth sands, 15-35% slopes (CpE)</th><th>Fill land, sandy (Fs)</th><th>Haven loam, 0-2% slopes (HaA)</th><th>Haven loam, 2-6% slopes (HaB)</th><th>Montauk silt loam, 3-8% slopes (MkB)</th><th>Montauk silt loam, 8-15% slopes (MkC)</th><th>Raynham loam (Ra)</th></tr>
<tr><td colspan="8">SOIL FEATURES AFFECTING:</td></tr>
<tr><td>Highway location</td><td>Poor trafficability; extensive cuts.</td><td>*</td><td colspan="2">Very shallow cuts have nonuniform subgrade in places.</td><td colspan="2">Possible seepage along top of till; extensive cuts and fills likely on MkC; nonuniform subgrade in places.</td><td>Seasonal high water table.</td></tr>
<tr><td>Embankment foundation</td><td>Strength generally adequate for high embankments; slight settlement; moderately steep to steep slopes.</td><td>*</td><td colspan="2">Strength generally adequate for high embankments; slight settlement.</td><td colspan="2">Strength generally adequate for high embankments.</td><td>Strength generally adequate for high embankments; slight settlement.</td></tr>
<tr><td>Foundations for low buildings</td><td>Low compressibility; large settlement possible under vibratory load; moderately steep to steep slopes.</td><td>*</td><td colspan="2">Low compressibility.</td><td colspan="2">Low compressibility; moderate slopes on MkC.</td><td>Seasonal high water table; low compressibility; large settlement possible under vibratory load.</td></tr>
<tr><td>Irrigation</td><td>Very low available moisture capacity;
rapid water intake as well as moderate available moisture capacity.</td><td>*</td><td colspan="2">No unfavorable features.</td><td colspan="2">---</td><td>Seasonal high water table; moderate to slow water intake; moderate to high available moisture capacity.</td></tr>
<tr><td colspan="8">LIMITATIONS FOR:</td></tr>
<tr><td>Homesites</td><td rowspan="3">Severe: slopes</td><td rowspan="2">Severe: high water table</td><td rowspan="7">Slight</td><td rowspan="2">Slight</td><td>Slight</td><td>Moderate: slopes</td><td>Severe: seasonal high water table at depth of ½ to 1-1/2 feet.</td></tr>
<tr><td>Sewage disposal fields</td><td colspan="2">Severe: moderately slow permeability</td><td>Severe: moderately slow permeability; seasonal high water table at depth ½ to 1-1/2 feet.</td></tr>
<tr><td>Streets and parking lots</td><td>Moderate: high water table</td><td>Moderate: slopes</td><td>Moderate: slopes</td><td>Severe: slopes</td><td rowspan="4">Moderate: seasonal high water table at depth ½ to 1-1/2 feet.</td></tr>
<tr><td>Lawns & landscaping</td><td rowspan="4">Severe: slopes; sandy surface layer</td><td>Severe: slopes; sandy surface layer</td><td rowspan="3">Slight</td><td rowspan="3">Slight</td><td>Moderate: slopes</td></tr>
<tr><td>Paths & trails</td><td rowspan="3">Moderate: sandy surface layer</td><td>Slight</td></tr>
<tr><td>Picnic & play areas</td><td>Moderate: slopes</td></tr>
<tr><td>Athletic fields & play areas</td><td>Moderate: slopes</td><td>Moderate: moderately slow permeability</td><td>Severe: slopes</td><td>Severe: seasonal high water table at depth ½ to 1-1/2 feet.</td></tr>
</table>

* Not included because the characteristics of this soil are too variable to estimate.

In conformance with Town requirements, all stormwater runoff generated on the developed portion of the property will be retained and recharged in an on-site drainage system designed to accommodate 5 inches of stormwater. The project's drainage system will utilize a recharge area in the lower northernmost corner of the site, to take advantage of the site's natural runoff flow, supplemented by two additional naturalized recharge areas to be excavated along the west side of Elwood Road, north and south of the project's entrance. Adjacent to each these naturalized recharge areas, there will be a pond, which will be provided with an impervious liner that will ensure that a minimum depth of surface water will be permanently retained in each. Runoff water in excess of this minimum retained level will be able to expand into the naturalized recharge area or infiltrate over the liner and into the aquifer. It is expected that each pond will be equipped with a circulation system. The drainage system will have a capacity in excess of the minimum volume required by the Town. The proposed drainage system will remove the Fs and Ra soils as a result of the depth of excavations, to achieve drainage capacity as provided for in the conceptual design. As a result, these surface soils are not expected to adversely impact the use of the site.

A Grading & Drainage Plan will be prepared as part of the site plan submission, which will be subject to review and approval of the Town. This will ensure that the project's drainage system will operate properly and minimize potential stormwater impacts to the maximum extent practicable.

As listed in **Table 2-1**, "Severe" limitations caused by moderately slow permeability soils as related to sewage disposal fields have been noted for the MkB and MkC soils found in the western and northwestern portion of the property. No sewage disposal facilities are proposed for the areas of the site covered by MkC soils and as a result no impacts are expected. However, the proposed STP would be installed in the portion of the site covered by MkB soils. The STP will not employ shallow sewage disposal fields for effluent recharge. There is sufficient depth to water for installation of vertical leaching pools in a standard system to ensure subsurface effluent recharge. The system will extend below the MkB surface soil horizon and test borings will be completed to demonstrate the suitability of subsoils for effluent recharge. Approvals from the NYSDEC, SCDHS and SCDPW will be required for the STP; review and approval of an Engineering Report and Construction Plans and Specifications by the SCDHS and SCDPW would be required, ensuring that this facility would be built to and operated in conformance to established regulations. Leaching facilities will be installed within soils demonstrating appropriate leach characteristics as necessary under SCDHS requirements. Any unsuitable soils will be excavated and replaced with suitable materials as necessary.

2.2.3 Proposed Mitigation

- Topsoil not subject to the SMP will be re-used on-site for landscape areas.
- Test borings will be completed in drainage and sanitary effluent recharge areas to ensure that suitable subsoils for stormwater and effluent recharge are present.

- An SWPPP, including a detailed erosion and sediment control plan, will be prepared as part of the site plan to manage stormwater generated on the site during construction activities, and for post-construction stormwater management.
- Use of a water truck, rumble strip, proper internal staging areas and provision of buffer areas from surrounding uses would ensure minimal disturbance during construction.

2.3 Subsurface

2.3.1 Existing Conditions

Long Island is located within the Atlantic Coastal Plain, a physiographic province in which substantial sediment deposits overlie bedrock (**Fuller, 1914**). The surface topography primarily reflects the glacial history of Long Island and subsequent human activity. Understanding the geologic history and stratigraphy of Long Island is important in relating potential impacts of the project to hydrogeologic resources and their importance in Long Island's future.

The bedrock underlying Long Island slopes south and east at a rate of approximately 70 feet per mile, and the overlying sediments increase in thickness toward the south (**Jensen and Soren, 1974; Smolensky, et al., 1989**). The elevation of the top of bedrock is approximately 850 feet below sea level (bsl) in the area of the site (**Smolensky, et al., 1989**). Bedrock is probably of Precambrian age, and is overlain by unconsolidated sediments of Cretaceous and Quaternary age. The Cretaceous sediments contain three major groundwater aquifers: the Lloyd, Magothy and Upper Glacial Aquifers. **Figure 2-3** provides a generalized cross-section of Long Island for a profile running from Long Island Sound to the Atlantic Ocean in the vicinity of the project site (**Smolensky, et al. 1989**).

The primary Cretaceous sediments on Long Island are the Raritan and Magothy Formations, which were deposited atop bedrock during the mid to late Cretaceous period (138 to 65 million years ago) as a result of sediment transport from highlands to the north of the Island (**Koszalka, 1984**). The Raritan Formation consists of two members: the Lloyd Sand and the Raritan Clay. The Lloyd Sand contains the Lloyd aquifer, which is separated from the overlying Magothy aquifer by the low permeability Raritan Clay (**Sutter et al., 1949; Jensen and Soren, 1974**). The upper altitude of the Lloyd sand member is approximately 600 feet bsl in the vicinity of the site, indicating a thickness of 250 feet, and the top of the Raritan clay is approximately 400 feet bsl, indicating a thickness of 200 feet. The Magothy Formation and Matawan Group, which form the Magothy aquifer, were deposited in the late Cretaceous (approximately 75 million years ago) following a period of erosion of the Raritan clay. The base of the Magothy is composed of coarse sand, gravel and pebbles as large as 2 inches in diameter. These coarse sediments are interbedded with fine to clayey sands and solid clays. Locally thick clay beds have been traced to spans of up to one mile. At the site, the upper altitude of the Magothy Formation is approximately 300 feet bsl, indicating a thickness of about 100 feet (**Smolensky et al., 1989**).

During the Tertiary period (65 to 2 million years ago) there was erosion of Cretaceous deposits over much of Long Island due to hydrologic processes such as stream formation. Sea level was low, and a large valley formed north of Long Island in what is now Long Island Sound. Most of the surface sediments evident on Long Island were deposited during the glacial advances of the Pleistocene epoch, Quaternary period (2 million years ago to 10,000 years ago). The Pleistocene was marked by cycles of glacial advance and subsequent retreat producing morainal and glaciofluvial (outwash) sediments on top of the Magothy Formation and Matawan Group. These Quaternary sediments, which consist of clay, silt, sand, gravel, and boulders, include both the Gardiners Clay and the Upper Glacial aquifer. The Ronkonkoma and Harbor Hills Terminal Moraines were deposited as part of this Upper Glacial deposit along the spine and the North Shore of Long Island as the glaciers retreated during the Wisconsin stage of the Late Pleistocene (approximately 25,000 to 10,000 years ago; **Koszalka, 1984, p. 15**). Low, flat outwash plains formed southward as erosional processes carried sediments away from the moraines, and coastal processes formed barrier beaches along the south shore as sea level rose.

The site is located in the outwash plan immediately south of the Harbor Hill Moraine, which was created during the last glacial advance. Outwash deposits consisting of stratified sand and gravels generally have excellent leaching properties.

2.3.2 Anticipated Impacts

Grading operations or the excavations required for roads, buildings, stormwater collection areas and the sanitary leaching field area for the STP will be conducted in the unsaturated glacial outwash deposits and are not expected to result in subsurface soil disturbance to a depth which will adversely impact subsurface conditions. The portion of the site that will undergo the greatest excavation will be the stormwater collection areas as well as the leaching field for the STP. As the groundwater table lies at a depth of between 120 and 158 feet below grade, there will be a sufficient depth of soil between the recharge system and the water table to allow for their proper function.

Leaching facilities will be installed through removal of subsurface soil material to create recharge areas or install subsurface leaching pools. If needed and if this material displays acceptable bearing capacity and leaching characteristics, this soil material may be used as backfill in other areas of the site. Preliminary grading analysis finds that the site is expected to be "balanced" in terms of cut/fill. However, if there is any excess acceptable material generated, it will be removed and sold as backfill.

A detailed Grading and Drainage Plan will be prepared during the site plan review process, and will undergo thorough review by Town engineering staff prior to site plan approval and issuance of building permits.

No significant long-term adverse impacts are expected with respect to subsurface soils, based on the following considerations:

- The grading program will represent the minimum extent necessary to achieve the goals of the proposed project.

- Short-term impacts will be controlled by proper grading design, use of appropriate erosion control measures, and thorough and consistent construction management efforts.
- Site stabilization techniques to be employed are described in detail in **Section 1.4.2** of this document.

2.3.3 Proposed Mitigation

- Additional test holes may be determined necessary during the site plan review process to characterize subsurface conditions. In such a case, the borings will be completed as required.
- If the existing fill material proves unacceptable for leaching or load-bearing purposes, the material will be removed and replaced with acceptable materials; the displaced material would be re-used on-site, if it displays acceptable characteristics for this purpose.

2.4 Water Resources

2.4.1 Existing Conditions

<u>Surface Water and Drainage</u>

There are no natural surface water bodies or wetlands on the subject site. There are several artificial ponds on the western portion of the property, but these are man-made, open-air lagoons that recharge the treated wastewaters from the dairy product processing facility. These features generate offensive odors that have been the subject of neighborhood complaints.

The majority of the subject site is presently developed or was previously cleared. At present, stormwater runoff either percolates downward or runs along the ground surface to the lower elevations on the north and south sides of the site, where it infiltrates into the ground. **Figure 2-4** depicts the location of the nearest mapped freshwater wetland, which is designated G-9 by the NYSDEC and is located approximately 2.2 miles to the south.

The subject site lies within an area designated in Flood Hazard Zone X by FEMA, which is encompasses *"…areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile…"*. The Suffolk County Soil Survey does not depict any intermittent streams on the site (**Figure 2-2**) and there is no evidence of drainage channels or erosion on the site under existing conditions.

<u>Hydrogeology</u>

Groundwater on Long Island is entirely derived from precipitation. Precipitation entering the soils in the form of recharge passes through the unsaturated zone to a level below which all strata are saturated, referred to as the "water table". The groundwater table is equivalent to sea level on the north and south shores of Long Island, and rises in elevation toward the center of the Island. The high point of the parabola is referred to as the groundwater divide. The changes in elevation of the water table create a hydraulic gradient, which causes groundwater to flow downslope under gravity.

The subject parcel is north of the regional groundwater divide, and groundwater in the water table generally flows toward the northeast (**Figure 2-4**). Groundwater will ultimately be discharged from the subsurface system in the form of subsurface outflow to the Long Island Sound.

The elevation of groundwater beneath the subject site is approximately 72 feet asl, depending on meteorological conditions associated with the water year (**Busciolano, 2002**). The topographic elevation of the subject property ranges from 192 to 230 feet asl, therefore, the depth to groundwater ranges from approximately 120 feet (in the southwestern portion of the site) to 158 feet (along the site's eastern and northeastern areas).

Review of pertinent groundwater literature finds that some information is available with regard to aquifer properties. **McClymonds and Franke (1972)** estimated the median horizontal hydraulic conductivity of the Upper Glacial aquifer in the area of the site is approximately 187.6 feet per day. Review of the water table elevation map **(Figure 2-4)** indicates that the horizontal gradient in the Upper Glacial aquifer beneath the subject property is approximately 0.00106 feet/foot. Utilizing the above gradient and an average porosity of 0.30, the velocity of flow is calculated (using Darcy's Law) to be approximately 0.66 feet per day.

Groundwater Quality

Public Water Supply - Water quality data was obtained from the GWD for the nearest public supply well field in the area of the site. The nearest public water supply well is the GWD Well #13, which is located approximately 1,100 feet to the southeast of the site, at the end of Elmo Place. This well, also identified as S-29852 is screened into the Magothy Aquifer. Public supply wells are monitored routinely by GWD and SCDHS for water quality. The 2012 GWD Water Quality Statement (the most recent report available) was reviewed for the most recent available test results for overall water quality in the area of the subject property (samples taken in 2011). **Table 2-2** contains this information, based on this GWD on-line data resource.

The table indicates that no significant concentrations of synthetic organic chemicals or volatile organic compounds are present in Magothy aquifer groundwater supplied to the public, and no significant concentrations of inorganic constituents are present. In particular, the concentration of nitrate is 2.9 mg/l, which is well within the NYS drinking water standard of 10 mg/l. Groundwater quality is generally excellent in the general area of the project site. No constraints are expected with respect to groundwater and public water supply is available.

Pharmaceuticals - A general concern exists regarding in-home disposal of unused or unwanted pharmaceuticals, potentially causing groundwater and water supply contamination via wastewater recharge. As indicated by the Superintendent of the GWD, Mr. Robert Santoriello (**Santoriello, 2012**), the GWD does not currently test for pharmaceuticals in groundwater, as there are currently no regulations or standards for such substances. However, the SCDHS Office of Water Resources does test for a limited number of pharmaceuticals in public water supplies on an annual basis.

Table 2-2
GROUNDWATER QUALITY DATA, 2013
Greenlawn Water District, Well No. 13, S-29852

Parameters	**Average Value**	**Maximum Contaminant Limit** (MCL)
Inorganic Compounds		
Arsenic, µg/l*	ND	10.0
Barium, mg/l	0.02	2.0
Cadmium, µg/l	ND	5.0
Chromium, mg/l	ND	0.10
Flouride, mg/l	ND	2.2
Lead, µg/l	ND	[15.0]
Mercury, µg/l	ND	2.0
Selenium, mg/l	ND	10.0
Silver	ND	0.1 mg/l
Sodium, mg/l	30.3	20/270**
Specific Conductivity	250	---
Zinc, mg/l	ND	5.0
Color, color units	ND	15
Odor, odor units	ND	3
Iron, mg/l	0.1	0.3
Manganese, mg/l	ND	0.3
Ammonia	ND	---
Nitrite, mg/l	ND	1.0
Nitrate, mg/l	2.9	10.0
Chloride, mg/l	51.8	250
Total Hardness	33.1	---
pH (before treatment)	5.8	---
Sulfate, mg/l	ND	250
Antinomy, µg/l	ND	6.0
Beryllium, µg/l	ND	4.0
Calcium	8.2	---
Magnesium	3.1	---
Nickel, mg/l	0.003	0.10
Thallium	ND	2 µg/l
Cyanide, mg/l	ND	0.2
Perchlorate, µg/l	ND	18.0
Synthetic Organic Contaminants*		
Volatile Organic Compounds		
Dichlorodifluoromethane, µg/l	ND	5 µg/l
Chloromethane, µg/l	ND	5 µg/l
Vinyl Chloride, µg/l	ND	2 µg/l
Bromomethane, µg/l	ND	5 µg/l
Chloroethane, µg/l	ND	5 µg/l
Trichlorofluoromethane, µg/l	ND	5 µg/l
1,1-Dichloroethene, µg/l	ND	5 µg/l

Methylene Chloride, µg/l	ND	5 µg/l
Trans 1,2-Dichloroethene, µg/l	ND	5 µg/l
1,1-Dichloroethane, µg/l	0.7	5 µg/l
Cis-1,2-Dichloroethene, µg/l	0.4	5 µg/l
2,2-Dichloropropane, µg/l	ND	5 µg/l
Bromochloromethane, µg/l	ND	5 µg/l
1,1,1-Trichloroethane, µg/l	0.3	5 µg/l
Carbon Tetrachloride, µg/l	ND	5 µg/l
1,1-Dichloropropene, µg/l	ND	5 µg/l
1,2-Dichloroethane, µg/l	0.6	5 µg/l
Trichloroethene, µg/l	1.2	5 µg/l
1,2-Dichloropropane, µg/l	ND	5 µg/l
Dibromomethane, µg/l	ND	5 µg/l
Trans 1,3-Dichloropropene, µg/l	ND	5 µg/l
Cis 1,3-Dichloropropene, µg/l	ND	5 µg/l
1,1,2-Trichloroethane, µg/l	0.6	5 µg/l
Tetrachloroethene, µg/l	2.4	5 µg/l
1,3-Dichloropropane, µg/l	ND	5 µg/l
Chlorobenzene, µg/l	ND	5 µg/l
1,1,1,2-Tetrachloroethane, µg/l	ND	5 µg/l
Bromobenzene, µg/l	ND	5 µg/l
1,1,2,2-Tetrachloroethane, µg/l	ND	5 µg/l
1,2,3-Trichloropropane, µg/l	1.4	5 µg/l
2-Chlkorotoluene, µg/l	ND	5 µg/l
4-Chlorotoluene, µg/l	ND	5 µg/l
1,2-Dichlorobenzene, µg/l	ND	5 µg/l
1,3-Dichlorobenzene, µg/l	ND	5 µg/l
1,4-Dichlorobenzene, µg/l	ND	5 µg/l
1,2,4-Trochlorobenzene, µg/l	ND	5 µg/l
Hexachlorobutadiene, µg/l	ND	5 µg/l
1,2,3-Trichlorobenzene, µg/l	ND	5 µg/l
Benzene, µg/l	ND	5 µg/l
Toluene, µg/l	ND	5 µg/l
Ethylbenzene, µg/l	ND	5 µg/l
M,P-Xylene, µg/l	ND	5 µg/l
O-Xylene, µg/l	ND	5 µg/l
Styrene, µg/l	ND	5 µg/l
Isopropylbenzene, µg/l	ND	5 µg/l
N-Propylbenzene, µg/l	ND	5 µg/l
1,3,5-Trimethylbenzene, µg/l	ND	5 µg/l
Tert-Butylbenzene, µg/l	ND	5 µg/l
1,2,4-Trimethylbenzene, µg/l	ND	5 µg/l
Sec-Butylbenzene, µg/l	ND	5 µg/l
4-Isopropyltoluene, µg/l	ND	5 µg/l
N-Butylbenzene, µg/l	ND	5 µg/l
Methyl-Tert-Butyl Ether (MTBE), µg/l	1.9	10 µg/l
Trihalomethanes and Haloacetic Acids		
Chloroacetic Acid	ND	---

Bromoacetic Acid	ND	---
Dichloroacetic Acid	ND	---
Trichloroacetic Acid	ND	---
Dibromoacetic Acid	ND	---
Total Haloacetic Acid, µg/l	ND	60 µg/l
Chloroform, µg/l	1.4	50 µg/l
Bromodichloromethane, µg/l	ND	50 µg/l
Dibromochloromethane, µg/l	ND	50 µg/l
Bromoform, µg/l	ND	50 µg/l
Total Trihalomethanes, total, µg/l	1.4	80 µg/l

* µg/l - micrograms per liter; equivalent to parts per billion, ppb.
** 20 mg/l is the limit for people on highly restricted sodium diets, and 270 mg/l for those on moderately restricted diets.
*** None detected.
[ ] US Environmental Protection Agency (EPA)/NYS Department of Health Action Level.
ND: Not detected.

The US Geological Survey (USGS) issued a report in 2006 entitled "*Occurrence of Pharmaceuticals in Shallow Ground Water of Suffolk County, New York, 2002-2005*" which provided an assessment of the presence of pharmaceutical chemicals in groundwater resulting from wastewater treatment facility discharges to the shallow Upper Glacial aquifer. The study included the collection of 70 water samples from 61 wells that were sampled for 4 pharmaceutical compounds. Of the samples collected, only 28 revealed the presence of only one or two pharmaceuticals per sample with concentrations detected within a range of 0.001 to 0.1 µg/l. As noted in the study, these concentrations are five to seven orders of magnitude lower than a typical therapeutic dose and any toxic effects associated with such concentrations are unlikely (**US Geological Survey, 2006**). With regard to ecological communities, the USGS study offered no conclusions regarding the impact that pharmaceutical compounds in groundwater may have on these potential receptors. However, the USEPA has issued information regarding the impact that pharmaceutical and personal care products may have on the environment (**http://www.epa.gov/ppcp**). In review of a compilation of studies, the USEPA found information revealed that studies suggest that pharmaceutical compounds may cause ecological harm but the risks are uncertain since detected concentrations are generally low. The USEPA states that more research is needed to determine the extent of potential ecological harm.

Site-Generated Recharge and Nitrogen Concentration

The groundwater budget for an area is expressed in the hydrologic budget equation, which states that recharge equals precipitation minus evapotranspiration plus overland runoff. This indicates that not all rain falling on the land is recharged. Loss in recharge is represented by the sum of evapotranspiration and overland runoff. The equation for this concept is expressed as follows:

$$\mathbf{R = P - (E + Q)}$$

where: **R** = recharge
P = precipitation
E = evapotranspiration

Q = overland runoff

Nelson, Pope & Voorhis, LLC (NP&V) has utilized a microcomputer model developed for its exclusive use in predicting both the water budget of a site and the concentration of nitrogen in recharge. The model, named **SONIR** (**S**imulation **O**f **N**itrogen **I**n **R**echarge), utilizes a mass-balance concept to determine the nitrogen concentration in recharge. Critical in the determination of nitrogen concentration is a detailed analysis of the various components of the hydrologic water budget, including recharge, precipitation, evapotranspiration and overland runoff.

The **SONIR** model includes four sheets of computations: 1) Data Input Field; 2) Site Recharge Computations; 3) Site Nitrogen Budget; and 4) Final Computations. All information required by the model is input in Sheet 1. Sheets 2 and 3 utilize data from Sheet 1 to compute the Site Recharge and the Site Nitrogen Budget. Sheet 4 utilizes the total values from Sheets 2 and 3 to perform the final Nitrogen in Recharge computations. Sheet 4 also includes tabulations of all conversion factors utilized in the model.

It should be noted that the simulation is only as accurate as the data that is input into the model. An understanding of hydrologic principles is necessary to determine and justify much of the data inputs used for water budget parameters. Further principles of environmental science and engineering are applied in determining nitrogen sources, application and discharge rates, degradation and losses, and final recharge. Users must apply caution in arriving at assumptions in order to ensure justifiable results. There are a number of variables, values and assumptions concerning hydrologic principles, which are discussed in detail in a user manual developed for the SONIR Model and provided in **Appendix C-1.**

The model was run to obtain the existing water budget and nitrogen concentration in recharge. The run was based on current site conditions and land use coverages, which are listed in **Table 1-1**. The 37.05-acre site currently has a total site recharge of 39.18 MGY, with a total nitrogen concentration of 4.64 mg/l. It should be noted that total discharge flow under existing conditions is a combination of office flow (bathroom sanitary effluent) and commercial flow (dairy process effluent). The results of this analysis are presented in **Appendix C-2.** The major component of total flow is comprised of the dairy process flow that contributes 38,847 gpd of effluent (98.83%). The concentration of nitrogen in this component is based on discharge monitoring data that is collected monthly as required under the existing facilities SPDES permit. The nitrogen concentration of 12.07 mg/l used in the existing SONIR model run is an average of the monthly results reported during 2011. Monthly data was available from 2009 to 2011 and it should be noted that higher nitrogen concentration averages were reported over this time period.

<u>Water Resources Plans & Studies</u>
208 Study - The Long Island Regional Planning Board (LIRPB), in conjunction with other agencies, prepared a management plan for Long Island groundwater resources in 1978 under a program funded by Section 208 of the 1972 Federal Water Pollution Control Act Amendments. The purpose of the “208 Study” was to investigate waste disposal options and best practice for ground and surface water protection. The study delineated Hydrogeologic Zones for the formulation of management plans based on groundwater flow patterns and quality (**Koppelman,**

1978). These delineations were the basis for the establishment of Groundwater Management Zones by the SCDHS (see **Section 1.3.4**), and have been utilized to establish the SCSC Article 6 standards applied to sanitary wastewater treatment requirements. The subject site is located in Groundwater Management Zone I, which is characterized as a deep flow system that generally contributes water to the middle and lower portions of the Magothy Aquifer.

Nationwide Urban Runoff Program (NURP) Study - Stormwater, as runoff, is the vehicle by which pollutants move across land and through the soil to groundwater or surface waters. Contaminants accumulate or are disposed of on land and improved surfaces. Sources of contaminants include:

- animal wastes
- highway deicing materials
- decay products of vegetation and animal matter
- fertilizers
- pesticides
- air-borne contaminants deposited by gravity, wind or rainfall
- general urban refuse
- by-products of industry and urban development
- improper storage and disposal of toxic and hazardous material

In 1982, the LIRPB prepared the Long Island Segment of the NURP Study. The NURP Study was important in determining potential pollutants associated with stormwater based on various types of land use. This program attempted to address, among other things, the following:

- the actual proportion of the total pollutant loading that can be attributed to stormwater runoff, given the presence of other point and non-point sources and conditions within the receiving waters.

The purpose of the NURP Study, carried out by the USGS, was to determine:

- the source, type, quantity, and fate of pollutants in stormwater runoff routed to recharge basins, and
- the extent to which these pollutants are, or are not attenuated as they percolate through the unsaturated zone.

In order to accomplish this, five recharge basins, located in areas with distinct land use types, were selected for intensive monitoring during and immediately following storm events. Five recharge basins, three in Nassau and two in Suffolk, were chosen for the study on the basis of type of land use from which they receive stormwater runoff. The following is a listing and description of each drainage area:

Site Location	Land Use
Centereach	Strip Commercial
Huntington	Shopping Mall, Parking Lot
Laurel Hollow	Low Density Residential (1 acre zoning)

Plainview	Major Highway
Syosset	Medium Density Residential (1/4 acre zoning)

None of the pilot study locations are identical to the subject site; however, the medium density residential area findings are referenced for findings and conclusions generally applicable due to the proposed housing density on the subject site.

Finding: In the majority of storm events sampled, the ratio of the total volume of runoff to the volume of precipitation falling on impervious areas was less than one.

Conclusion: Most of the runoff into recharge basins is derived from rain that falls directly on impervious surfaces, except during storms of high intensity, high volume and/or long duration.

Finding: Stormwater runoff concentrations of most of the inorganic chemical constituents for which analyses were performed were generally low. In most cases, they fell within the permissible ranges for potable water; however, there were two notable exceptions:

- median lead concentrations in stormwater runoff samples collected at the recharge basin draining a major highway consistently exceeded the drinking water standards;
- chloride concentrations in stormwater runoff samples generally increase two orders of magnitude during the winter months.

Conclusion: In general, with the exception of lead and chloride, the concentrations of inorganic chemical measured in stormwater runoff do not have the potential to adversely affect groundwater quality.

Finding: The number of coliform and fecal streptococcal indicator bacteria in stormwater range from 10^0 MPN [Most Probable Number] to 10^{10} MPN per acre per inch of precipitation.

Conclusion: Coliform and fecal streptococcal indicator bacteria are removed from stormwater as it infiltrates through the soil.

Recommended stormwater management practices of the NURP Study and current Town requirements as well as potential stormwater impacts are discussed in **Section 2.4.2**.

Suffolk County Comprehensive Water Resources Management Plan (SCCWRMP; 1987 and 2009 Draft) - Several sources of information were investigated in order to characterize the existing groundwater quality in the vicinity of the site. The SCCWRMP provides general information concerning groundwater quality in Suffolk County based upon file review at the time of preparation of the study, which was released in 1987. It includes a compilation of available water quality data based upon the public and private water well monitoring efforts of the SCDHS and the USGS. The results of this survey are included in the water quality maps of nitrate occurrences and volatile organic compounds (VOC) occurrences. Water quality in the vicinity of the subject site has been generally documented as excellent (**SCDHS, 1987**).

For nitrate occurrences in between 0 and 100 feet within the water table, the site lies in a general area wherein water quality is found to be closely representative of "good" conditions with average nitrate concentrations of between 1 and 6 mg/l, though the report indicates the presence of a private well with a nitrate contamination exceeding the 10 mg/l NYS drinking water standard. As the subject site does not have any wells, this concern does not refer to the subject site. With respect to depths pf between 100 and 400 feet below the water table, the SCCWRMP indicates that the site is also characterized by "good" conditions, with average nitrate concentrations of between 1 and 6 mg/l in this level of the water table.

The SCDHS presents water quality data for VOC occurrences in the SCCWRMP. The VOCs used in the mapping include: tetrachlorethylene; 1,1,1 trichloroethane; 1,1,2 trichloroethylene; and benzene. Review of the available data indicates that VOCs in the interval 0-100 feet within the water table are classified as "good", meaning that these substances are found at concentrations less than 60% of their respective guideline values. For deeper (100 to 400 feet) depths in the water table, the SCCWRMP indicates that VOCs at this interval are "good" as well.

2.4.2 Anticipated Impacts

<u>Surface Water and Drainage</u>
As there are no natural surface water bodies or wetlands on the subject site, the proposed project would not impact such resources. As described in **Section 1.4.2**, the man-made ponds on the western portion of the property, which recharge the treated wastewaters from the dairy product processing facility, will be removed during the site clearing and grading phase. However, these are artificial water bodies, so that their removal would have only a beneficial impact on groundwater, as this existing wastewater treatment facility discharge will be removed.

In general, impacts to surface waters and drainage conditions may occur as a result of stormwater handling and potential erosion and sedimentation both during construction and after completion of the site development phase. During the project's construction period, precautions described in **Section 1.4.2 and 2.1.2** will be taken to ensure that sediment will not be transported off-site by stormwater runoff and, as a result, there would be no impact to local conditions (as noted above, there are no natural surface water bodies on or near the subject site that could be impacted, and no intermittent streams or evidence of overland flow at present). In addition, an erosion control plan will be prepared incorporating the NYSDEC Guidelines for Urban Erosion and Sediment Control, and use of measures such as:

- Silt fencing, storm drain inlet protection, hay bales, and good housekeeping procedures will be utilized.
- Construction equipment and vehicles will be parked and loaded/unloaded within the site.
- "Rumble strips" will be placed at the site entrance to prevent soil on truck tires from being tracked onto the public road system.
- The construction process will begin with establishment of flagged clearing limits, followed by installation of the erosion control measures.

- Construction of the structures can then begin concurrent with the utility connections. Once heavy construction is complete, finish grading will occur followed by soil preparation using topsoil mix, seeding and installation of the landscaping, which will be performed while the structures are being completed.
- The drainage system and revegetation plan will further provide permanent stormwater controls once construction is completed.

Subsequent to this period, permanent occupancy and operation of the proposed project would not impact these resources in consideration of the following:

- The Site Grading and Drainage Plan (to be prepared as part of the site plan application) will be subject to thorough review and approval of the Town Engineering Division prior to approval. This plan will be designed to prevent runoff from developed surfaces from causing erosion, sedimentation or impacts to land or water resources.
- The proposed project will be provided with a professionally-designed drainage system that will retain all runoff generated within the developed area and direct it into on-site recharge facilities, so that no such runoff may impact the wetlands.

It is not expected that the existing Flood Hazard Zone classification of the site (Zone X) would impact the project. The proposed structures will be constructed in conformance with all applicable Town and State Building Codes and requirements, will not encroach into low-lying areas or alter drainage characteristics of adjacent or nearby properties. Finally, the project will be subject to detailed review by the Town Engineering Division as part of the site plan review process, ensuring that no impact to or from floodwaters will occur.

<u>Hydrogeology</u>
As discussed below, the volume of water recharged on the site will be increased by the proposed project by 70.3%, but this increase is not expected to be sufficient to cause a significant rise in the elevation of the local water table. This is due to the fact that recharge will be distributed throughout the site in subsurface drainage structures and, as a result, the relatively high permeability of the Upper Glacial deposits will allow groundwater to rapidly flow horizontally and thereby maintain a relatively stable water table configuration. Consequently, the direction of horizontal flow of groundwater would not be affected by the expected recharge increase, as the shape of the water table controls this characteristic. In addition, the water table is more than 120 feet below the ground surface. Thus, the proposed project is not anticipated to impact hydrogeologic conditions.

<u>Groundwater Quality</u>
Public Water Supply - The information in **Table 2-2** indicates that no significant impacts with respect to groundwater quality presently exist in the area. The site will be utilized for senior residential purposes, so that no toxic or hazardous chemicals are anticipated to be present, utilized or disposed of on the site. As a result, the proposed project is not expected to result in any impacts to the public water supply through the use, generation or disposal of toxic substances that may be discharged. The recharge of stormwater on-site will result in an increase in groundwater volume as compared to existing conditions. However, this water is not expected to contain significant levels of contaminants, as determined by the NURP Study. All sanitary

waste will be conveyed to an on-site STP and therefore will be treated to applicable effluent discharge limitations. Consequently, effluent recharge will not contribute to an increase in on-site nitrogen concentrations. The STP will be designed and permitted with a flow of at least approximately 100,000 gpd, which can accommodate the proposed project. This facility will be subject to the review and approval of the SCDHS, SCDPW and NYSDEC, and will be operated under their supervision and performance standards.

Based on the above, it is anticipated that the proposed project will have no significant adverse impact on the quality of groundwater underlying the subject site and in the surrounding area. No other significant adverse groundwater impacts are expected.

Pharmaceuticals - Based on a review of the available information and the results of the on-going SCDHS monitoring program, no significant potential for impact to human or ecological resources is expected from pharmaceutical contamination in groundwater or the public water supply. In addition, no significant impact (cumulative or specific) to human or ecological communities is expected from in-home discharge of pharmaceutical compounds that may occur at the proposed project. The proposed project will be required to conform to applicable requirements should pharmaceutical disposal standards be established. It is expected that the existing area residents have been and remain free to dispose of such substances in their homes, which utilize individual on-lot septic tank/leaching pool systems. Such systems provide only a "primary" (i.e., one-stage) level of treatment, while the proposed project will utilize a "tertiary" (three-stage) STP. Based on the senior residential use proposed, and the expected building and grounds maintenance procedures to be performed on-site, other potential chemical discharges on-site are not expected.

Construction - Groundwater quality impacts that may occur during construction activities could potentially result from leaching of contaminants entrained in rain falling on building materials and equipment stored outdoors on-site. However, such materials are anticipated to be inert and therefore are not expected to have an adverse impact on the site. In addition, these materials would be present in such a condition for only a limited time before being used in construction, and would be stored under cover. Equipment stored on-site which will be utilized during clearing and construction activities will be properly maintained to eliminate leakage of fluids and reputable contractors will be used for all site work.

<u>Site-Generated Recharge and Nitrogen Concentration</u>
The proposed development will be used for senior residential purposes and all sanitary wastes will be conveyed to a new, on-site STP for disposal. As a result, the only impacts to groundwater resources underlying the site will result from stormwater runoff and irrigation.

Utilizing the same mass balance model described in **Section 2.4.1**, the water balance and concentration of nitrogen in recharge was calculated for the proposed project. **Table 1-1** provides a tabulation of existing and proposed site conditions. These coverages were used in the SONIR model to obtain the results described herein. Development of the site will result in an increase in impermeable surfaces and, as a result groundwater recharge will increase due to increased surface runoff volumes and a decrease in runoff lost through evapotranspiration.

Groundwater recharge is expected to increase 70.3% annually from the 39.18 MGY generated under existing conditions to 66.73 MGY under the proposed project (see **Appendix C-3**). However, due to the hydrogeologic properties of the Upper Glacial aquifer, which consists of an elevated hydrologic conductivity and rapid infiltration, the increase in on-site recharge is not anticipated to have an adverse impact on groundwater levels underlying the site.

The concentration of nitrate (as nitrogen) in recharge is anticipated to be increased by the proposed project, due primarily to the use of an on-site STP for sanitary wastewater treatment, the increase in sanitary flow and, to a lesser extent, to the presence of nitrogen in fertilizers spread over landscaped areas. Specifically, overall nitrogen concentration will be increased from the existing 4.64 mg/l to 5.46 mg/l (see **Appendix C-3**). This is less than the 10-mg/l nitrogen standard drinking water.

Based on the analyses presented above, the proposed project is not expected to result in any long or short-term adverse environmental impacts to surface or groundwater resources. In comparison to the existing conditions, the proposed project will recharge a higher volume of water, and will increase the concentration of nitrogen in recharge.

The design, installation and operation of the project's STP will be subject to review and approval of the SCDPW, SCDHS and NYSDEC, ensuring that the proper level of groundwater protection is provided. In addition, the project will control all runoff in an on-site drainage system and will provide for proper sanitary system maintenance, as required by the SCDHS.

<u>Water Resources Plans & Studies</u>
208 Study - The project site is located within Groundwater Management Zone I as defined by the SCDHS based on the 208 Study. This classification pertains to SCSC Article 6, which addresses sewage facility requirements for realty subdivisions, development and other construction projects in order to limit the loading of nitrogen in various groundwater management zones as established by the SCDHS. As promulgated under Article 6, a Population Density Equivalent must be determined for the subject site in order to determine the type of sewage disposal system required for the proposed project. This equivalent (or total allowable flow) is then compared to the design sewage flow for the project. If the project's design sewage flow exceeds the Population Density Equivalent, a community sewerage system or on-lot sewage treatment system is required. If the project's design sewage flow is less than the site's Population Density Equivalent, a conventional subsurface sewage disposal system (i.e., a typical septic system) may be used, provided individual systems comply with the current design standards and no community sewerage system is available or accessible.

Based on the requirements of Article 6, no more than 600 gallons of sanitary wastewater may be discharged per acre on a daily basis for a site served by a septic system within Zone I. The site acreage used for determining this Population Density Equivalent must not include wetlands, surface waters, or land in flood zones. The subject site has a total acreage of 37.05 acres, and does not feature any wetlands surface waters or flood zone areas. Thus, based on SCDHS methodology, the Population Density Equivalent (total allowable flow) on the subject site is calculated as:

(37.05 acres x 0.75 x 43,560 SF x 600 gpd/acre)/40,000 SF = 18,156 gpd

The current design sewage flow standard applied by the SCDHS estimates that the proposed project would generate approximately 97,000 gpd of sanitary effluent. This will exceed the 18,156 gpd allowable for the site in Groundwater Management Zone I and as a result, use of an STP will be required for disposal of sanitary waste.

As discussed in **Section 1.3.4**, the proposed project will construct and utilize a new, on-site STP that will be designed and engineered to treat only the wastewater generated by the proposed project; it will not have the capacity to handle wastewater generated on other properties in the area, and so would not promote other development in the area.

Nationwide Urban Runoff Program (NURP) Study - The description of the NURP report identified in **Section 2.4.1** presented data from drainage areas analyzed under that study. The proposed project is compared with one of the land use study drainage areas (the Syosset medium density residential area) and therefore it is anticipated that the conclusions reached in the NURP study for this area will be similar to what is expected for the proposed project. The relevant findings and conclusions for these areas are presented below.

Based upon information presented in the NURP Study, stormwater recharge volumes are not anticipated to contain significant concentrations of pollutants due to the following reasons:

- The study found that storm water runoff concentrations of most of the inorganic chemical constituents for which analyses were performed were generally low and in most cases, fell within the permissible ranges.
- In general, with the exception of lead and chloride, the concentrations of inorganic chemicals measured in storm water runoff do not have the potential to adversely affect groundwater quality.
- The number of coliform and fecal streptococcal indicator bacteria in stormwater range from 10^0 MPN to 10^{10} MPN per acre per inch of precipitation.
- Coliform and fecal streptococcal indicator bacteria are removed from stormwater as it infiltrates through the soil.

As discussed previously, the project site is located within Groundwater Management Zone I and is characterized as a deep flow system, which generally contributes water to the middle and lower portions of the Magothy. The depth to water underlying the site ranges from 120 to 158 feet below surface grade. This provides an adequate unsaturated zone through which recharge can percolate prior to reaching the water table and result in the attenuation or filtration of potential pollutants, particularly in the proposed development areas of the site. Therefore, the proposed project will conform to the applicable recommendations of the NURP Study in regard to the proposed stormwater recharge system and as a result no significant adverse stormwater impacts are anticipated.

Suffolk County Comprehensive Water Resources Management Plan (SCCWRMP; 1987 and 2009 Draft) - This report indicates that no significant adverse impacts with respect to nitrates or VOCs have occurred in the vicinity of the project site. The proposed project will incorporate a number of features that will protect groundwater quality, including:

- The project will utilize an on-site drainage system;
- The project will construct and utilize a new, on-site STP for treatment and disposal of its sanitary wastewater;
- The project assumes a limit on the use of fertilized landscaping to 15% of the site; and
- The project would not use, generate or dispose of toxic or hazardous substances.

In consideration of the above-noted project features, it is expected that no significant impacts to subsurface water quality would occur.

2.4.3 Proposed Mitigation

- The construction of a new, on-site STP will allow the proposed project to conform to SCSC Article 6 and applicable agency requirements for wastewater management.
- The proposed project will be designed to conform to the applicable recommendations of the NURP Study in regard to the proposed stormwater recharge system and as a result no significant adverse stormwater impacts are anticipated.
- Precautions will be taken to ensure sediment will not be transported off-site by stormwater runoff and as a result there is no expected impact to local water quality as a result of erosion and sedimentation control measures and permit compliance that will be implemented during construction activities.
- An SWPPP will be prepared to ensure compliance with water quality and quantity requirements pursuant to Technical Guidance and GP 0-10-001 and Town of Huntington requirements. In addition, an erosion control plan will be prepared incorporating the NYSDEC Guidelines for Urban Erosion and Sediment Control.

2.5 Vegetation & Wildlife

2.5.1 Existing Conditions

Vegetation

The 37.05-acre project site is comprised of disturbed areas with successional vegetation, landscaped areas and developed areas; very little natural vegetation remains on the site. The vegetation communities on the non-developed parts of the site can best be described as successional southern hardwood forest, successional old field, and pastureland. **Figure 2-6** depicts the habitats identified on the subject property and **Table 2-3** lists the existing acreages associated with each habitat.

The following descriptions were taken from **Edinger** (**2002**) of the three habitats found on the subject site.

Table 2-3
HABITAT QUANTITIES
Existing Conditions

Coverage Type	Quantity	
	acres	% of site
Successional Old Field	5.43	14.66%
Successional Southern Hardwood Forest	8.81	23.78%
Pastureland	12.29	33.17%
Unvegetated	3.59	9.69%
Impervious	5.84	15.76%
Landscaped	1.09	2.94%
TOTALS	**37.05**	**100.0%**

Successional southern hardwoods: a hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed. Characteristic trees and shrubs include any of the following: American elm (*Ulmus americana*), slippery elm (*U. rubra*), white ash (*Fraxinus americana*), red maple (*Acer rubrum*), box elder (*Acer negundo*), silver maple (*A. saccharinum*), sassafras (*Sassafras albidum*), gray birch (*Betula populifolia*), hawthorns (*Crataegus* spp.), eastern red cedar (*Juniperus virginiana*), and choke-cherry (*Prunus virginiana*). Certain introduced species are commonly found in successional forests, including black locust (*Robinia pseudo-acacia*), tree of- heaven (*Ailanthus altissima*), and buckthorn (*Rhamnus cathartica*). Any of these may be dominant or codominant in a successional southern hardwood forest. Southern indicators include American elm, white ash, red maple, box elder, choke-cherry, and sassafras. This is a broadly defined community and several serial and regional variants are known (**Edinger, 2002**).

Successional old field: a meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned. Characteristic herbs include goldenrods (*Solidago altissima, S. nemoralis, S. rugosa, S. juncea, S. canadensis,* and *Euthamia graminifolia*), bluegrasses (*Poa pratensis, P. compressa*), timothy (*Phleum pratense*), quackgrass (*Agropyron repens*), smooth brome (*Bromus inermis*), sweet vernal grass (*Anthoxanthum odoratum*), orchard grass (*Dactylis glomerata*), common chickweed (*Cerastium arvense*), common evening primrose (*Oenothera biennis*), oldfield cinquefoil (*Potentilla simplex*), calico aster (*Aster lateriflorus*), New England aster (*Aster novae-angliae*), wild strawberry (*Fragaria virginiana*), Queen-Anne'slace (*Daucus corota*), ragweed (*Ambrosia artemisiifolia*), hawkweeds (*Hieracium* spp.), dandelion (*Taraxacum officinale*), and ox-tongue (*Picris hieracioides*). Shrubs may be present, but collectively they have less than 50% cover in the community. Characteristic shrubs include gray dogwood (*Cornus foemina* ssp. *racemosa*), silky dogwood (*Cornus amomum*), arrowwood (*Viburnum recognitum*), raspberries (*Rubus* spp.), sumac (*Rhus typhina, R. glabra*), and eastern red cedar (*Juniperus virginiana*). A characteristic bird is the field sparrow (*Spizella pusilla*). This is a relatively short-lived community that succeeds to a shrubland, woodland, or forest community (**Edinger, 2002**).

Pastureland: agricultural land permanently maintained (or recently abandoned) as a pasture area for livestock. Characteristic birds include grasshopper sparrow (*Ammodramus savannarum*), vesper sparrow (*Pooecetes gramineus*), horned lark (*Eremophila alpestris*), killdeer (*Charadrius vociferus*), and upland sandpiper (*Bartramia longicauda*) (**Edinger, 2002**).

As noted, the forested habitat found on site is best characterized as successional southern hardwood forest, which comprises 8.81 acres (23.78%) of the site. Invasive species such as Norway maple dominate the tree canopy while Japanese honeysuckle and autumn olive are the predominant understory species. Other associated native vegetation observed within this habitat include scarlet oak, red cedar, white birch, black cherry, white oak, box elder, cottonwood, white pine, English ivy and garlic mustard.

The areas of successional old field on the property occupy approximately 5.43 acres (14.66%) of the site. Species identified as occurring within this habitat include mugwort, goldenrod, phragmites, asters, blackberry, garlic mustard and common mullein.

The former pastureland (12.29 acres, 33.17%) is maintained by regular mowing. It is anticipated that the pastureland is comprised of species that are appropriate for cattle grazing.

Review of NYSDEC Freshwater Wetland maps indicate that no regulated freshwater wetlands are located within the immediate vicinity of the subject property (**Figure 2-6**). The nearest freshwater wetland is identified as wetland G-9 which is located approximately 2.2 miles south of the subject property.

<u>Wildlife</u>
Relatively few wildlife species were observed on-site, although it is expected that the property should support a number of wildlife species common to suburban and forested habitats, particularly those that are more tolerant of human activity. Species that avoid humans, and/or those that are sensitive to developed areas and activities associated with such properties are less likely to inhabit the subject site and are not expected to be abundant in the surrounding areas.

Avian species that might be expected on the property include a variety of woodpeckers, wrens, titmice, nuthatches, kinglets, thrushes, creepers, flycatchers, swallows, warblers, corvids, thrashers, orioles and blackbirds, doves, starling, grosbeaks, finches, towhees, juncos, and sparrows. During the warmer months, a variety of warblers may also migrate into the area. Though limited for hunting, owls and raptors may potentially utilize the site for nesting. Black capped chickadees, blue jays, and Canada geese were heard and/or seen on the subject property during the February 2012 visit. Data from the 2004 Breeding Bird Survey for the census block that contains the site was obtained from the NYSDEC (**Appendix E-1**). This study surveyed the entire State by 25 km^2 census blocks over a five-year period (2000 to 2004) to determine the bird species which breed within the State. Most of the species listed by the NYSDEC breeding bird survey are likely to be found on site, with the exception of species common to habitats not found on site. No unique species were sighted during field inspections on the site nor are they expected, given the prior site disturbance and level of activity in the area.

A variety of small mammals would be expected and include the eastern chipmunk, house mouse, white-footed mouse, Norway rat, eastern mole, short-tailed shrew, masked shrew, and meadow vole. Of the larger mammals, the Virginia opossum, fox and raccoon would also be expected to utilize the property, although in somewhat lesser numbers than smaller mammals. It was noted that a feral cat colony exists on the subject site, and a cat was observed during the February 2012 site visit.

Among amphibian species, the American toad, spadefoot toad, Fowler's toad and common gray treefrog are expected, as they are found in upland habitats. The red-backed salamander is the most common salamander on Long Island, and is highly terrestrial. It prefers a dry woodland habitat with plenty of leaf litter and fallen logs to forage for insects (**Bishop, 1943**), and generally lays its eggs in clumps on damp logs or moss (**Conant and Collins, 1991**). Only a limited amount of the site contains forested areas of suitable habitat for this amphibian. The most likely reptiles to be present on site are the colubrid snakes, including the eastern garter snake, eastern hognose snake and eastern milk snake. The only turtle species common to terrestrial habitats on Long Island is the eastern box turtle, which requires very little water (**Obst, 1988**). The box turtle is found in a variety of habitats, although it prefers moist woodlands, and would be expected on site and in the surrounding areas.

<u>Rare and Endangered Species/Unique Habitat Potential</u>
No rare, threatened or endangered plants were observed on site. The NYS Natural Heritage Program (NHP) was contacted to determine if there are any records of rare plants or wildlife in the vicinity. **Appendix E-2** includes a copy of the correspondence received from the NHP. The Program did not have any records of known occurrences of rare, threatened or endangered species within the vicinity of the proposed project.

"Exploitably vulnerable" plants are species which are not currently threatened or endangered, but which are commonly collected for flower arrangements or other uses. Native plants listed under NYCRR Section 193.3 are protected pursuant to the NYS Environmental Conservation Law (ECL) Section 9-1503 subdivision (f), which states that no person may knowingly *"pick, pluck, sever, remove, damage by the application of herbicides or defoliants, or carry away, without the consent of the owner, any protected plant"* (**NYSDEC, 1975**). As per this section of the ECL, the site owner would not be restricted in utilizing the site for the intended purpose. No exploitably vulnerable species were identified on the subject property.

Of the animal species that may utilize or be expected on the site, eastern spadefoot toad, eastern hognose snake and eastern box turtle are listed as special concern species. Special concern species are native species that are not recognized as endangered or threatened, but for which there is documented concern about their welfare in New York State as a whole. Unlike threatened or endangered species, species of special concern receive no additional legal protection under ECL 11-0535. This category is intended to enhance public awareness of those species that deserve additional attention (**NYSDEC, 2007**).

2.5.2 Anticipated Impacts

<u>Vegetation</u>
The impacts to the ecological resources of a project site are generally a direct result of clearing of natural vegetation, increase in human activity and associated wildlife stressors, and the

resulting loss and fragmentation of wildlife habitat. The changes in habitat quantities are listed in **Table 2-4**.

The habitats in the areas of development are not unique or sensitive, particularly in view of the large amounts of disturbance within the property. The proposed project includes the retention of 0.29 acres of Successional Old Field and 1.35 acres of Successional Southern Hardwood Forest. Given the lack of site sensitivity, and the poor condition of the vegetated areas on site that currently include invasive species and provide only limited habitat, no significant adverse impacts to vegetation or habitat are expected.

Table 2-4
CHANGE IN HABITAT QUANTITIES
Existing Conditions vs. Proposed Project

Coverage Type	**Existing Conditions**		**Proposed Project**		**Change** (acres)
	acres	% of site	acres	% of site	
Successional Old Field	5.43	14.66%	0.29	0.78%	-5.14
Successional Southern Hardwood Forest	8.81	23.78%	1.35	3.64%	-7.46
Pastureland	12.29	33.17%	0	0	-12.29
Unvegetated	3.59	9.69%	0	0	-3.59
Impervious	5.84	15.76%	17.65	47.64%	+11.81
Landscaped	1.09	2.94%	14.53	39.22%	+13.44
Recharge Areas/Ponds	0	0	3.23	8.72%	+3.23
TOTALS	**37.05**	**100.00%**	**37.05**	**100.00%**	**---**

Wildlife
The majority of habitat on the property is dominated by Successional Southern Hardwood Forest and Successional Old Field, both of which are in poor condition due to the prevalence of invasive species within these habitats and the high amount of disturbance observed within the habitats. The property is not expected to act as a refuge for rare native flora or fauna. In addition, a total of 1.64 acres of the site will remain as natural area. The proposed project will favor those wildlife species that prefer edge and suburban habitats and those that are relatively tolerant of human activity. Most of the species expected on the property are at least somewhat tolerant of human activity, but others will be impacted by the proposed clearing operation and increase in human activity. It is also expected that wildlife species that may utilize the area to be developed (particularly avian species) will migrate to undisturbed areas on the edges of the property, adjacent or near the site as a result of development. As a result, impacts to wildlife species that may utilize the subject site are anticipated to be minimal.

Rare and Endangered Species/Unique Habitat Potential
As previously stated, the NHP did not identify the presence of any rare, threatened or endangered species in the vicinity of the project site and as such, no impacts to species within these categories are anticipated as a result of the proposed development. Exploitably vulnerable plant species are protected primarily because they are indiscriminately collected, rather than due to

rarity within the State. The presence of these plants would not preclude development of the site, as a property owner is permitted to remove exploitably vulnerable plant species from a site. There are no rare or endangered wildlife species expected on the site given the habitats present. The eastern spadefoot toad, eastern hognose snake, and eastern box turtle are the only species potentially expected on site that are listed as special concern species. Although there is documented concern about their welfare in New York State, these species receive no additional legal protection under ECL 11-0535. This category is presented primarily to enhance public awareness of these species, which bear additional attention (**NYSDEC, 2007**).

2.5.3 Proposed Mitigation

- Plant species that provide food and shelter to wildlife will be utilized in landscaped areas.
- The loss of habitat in the site will also be partially mitigated by the use of a comprehensive landscape plan that will utilize native and four-season plantings to create habitat for wildlife.
- Disturbance will be minimized to the maximum extent practicable, including delineating clearing limits at the site prior to construction in order to avoid inadvertent clearing.
- No known invasive plant species will be utilized, including those species specifically those species listed in Resolution 614-2007 enacted by the Suffolk County Legislature.

SECTION 3.0

HUMAN ENVIRONMENTAL RESOURCES

3.0 HUMAN ENVIRONMENTAL RESOURCES

3.1 Land Use, Zoning and Plans

3.1.1 Existing Conditions

Land Use
The subject site is presently owned and occupied by Oak Tree Farm Dairy, which maintains its corporate offices and a dairy products processing facility in the site's southern quarter (the rest of the site is open former grazing fields; there are no animal grazing activities on-site, and there are no animal barns or facilities present).

Current land use in the surrounding area is described based on aerial photography and visual observations (see **Figure 3-1**). In general, the site is a large commercial property at the focal point of a variety of land uses that are characterized by differing land use intensities. That is, properties to the north are commercial and institutional in use; lands to the east and west are low-density residential, and the area to the south includes low-density residential and public open space uses. The following describes the local land use pattern in more detail:

North: Single-Family Residential, Commercial (agriculture-related), Institutional (high school & middle school)
South: Single-Family Residential, Public Open Space (Elwood Park), Transportation (Little Plains Road)
East: Transportation (Elwood Road), Single-Family Residential
West: Single-Family Residential, Institutional (high school)

Zoning
The subject property is zoned R-40 Residence (see **Figure 3-2**). Similar to the land use surrounding the site, zoning surrounding the subject site includes R-40 to the north, south and west of the site, and R-20 Residence to the east of the site. In general, the pattern of land uses in the area reflects the uses permitted by the pattern of zoning in the area. It is noted that the existing institutional uses are permitted in residential zones, as noted below. The plant nursery is a pre-existing use.

Permitted uses in the R-40 district include single-family dwellings; farm, nursery, truck garden, country estate; churches or similar religious facilities; public schools; private elementary and secondary schools; not-for-profit library, museum or art gallery; town recreational uses; municipal parking field; and fire station. **Table 3-1** shows the dimensional requirements for the existing zoning on the project site.

Under the existing R-40 Residence zoning, approximately 30 individual single-family lots could be accommodated on the property.

Table 3-1
DIMENSIONAL REQUIREMENTS
Existing R-40 Residence Zoning

Dimension	Requirement
Maximum building height (feet/stories)	35/2
Minimum lot area:	---
Area per dwelling unit (SF)	1 acre
Gross area (SF)	1 acre
Minimum lot frontage (feet)	40
Minimum lot width (feet)	125
Minimum front yard depth (feet)	50
Minimum side yard depth (feet)	25
Minimum total side yard depth (feet)	50
Minimum rear yard depth (feet)	50

Land Use Plans
Horizons 2020: Huntington Comprehensive Plan Update (December 2008) - The Comprehensive Plan Update articulates a Vision of Huntington in the years beyond 2020 based on extensive citizen input during the planning process and provides the means to realize the Vision through clear and consistent goals, policies and strategies and through specific actions that the Town will take to positively and deliberately influence growth and change to achieve expressed citizens' values and aspirations for the community. The Vision of Huntington is divided into four themes:

1. Community Character
2. Quality of Life
3. Sustainable Community Structure
4. Responsive Town Government

Figure 3-3 provides the Generalized Future Land Use for the subject site, as identified in the Comprehensive Plan Update. The site is identified as appropriate for low-density residential development, which is defined as single-family residential with a minimum lot size of 20,000 SF. It is recognized that existing zoning has a minimum lot size of 1- acre.

3.1.2 Anticipated Impacts

Land Use
The proposed project will change the land use classification of the site from its current commercial status to senior residential use. However, in consideration of the existing mix and pattern of institutional, recreational and residential uses in the area, this change would not represent a significant adverse land use impact. Rather, the project will reduce the amount and intensity of commercial use along this section of Elwood Road, and change the site character to one that is more residential. The proposed project will provide quality senior residences that will afford current area residents the opportunity to remain in the community (in proximity to family, friends and accustomed neighborhoods) that may be an attractive consideration for potential

buyers. As described on **Page 1-1**, the proposed project will exceed the minimum of 10% (36 units) of its yield as required by Article 16-A of the New York State (NYS) General Municipal Law (Long Island Workforce Housing Act), by providing 66 affordable units. The proposed project will also satisfy a Town goal of providing affordable <u>senior</u> residences.

The site lies on a significant county roadway that places the subject property in proximity to a regional transportation corridor, Jericho Turnpike, as well as the commercial and retail shopping opportunities along that corridor

While the proposed project represents a change in the land use type of the site, the proposed senior residential development will provide a complementary land use that would provide a transitional use between the public recreational site to the southwest, the institutional uses to the northwest, and the single-family residential uses that dominate the areas to the east, west, north and south. Furthermore, the development will strike a balance between the yield permitted under the proposed R-RM zoning while remaining within a density that would not adversely impact the residential character of the area, and still supports an economically viable project. Land use considerations are discussed further herein.

The aesthetic character of the project is intended to minimize the potential impact of the proposed project on the land use character in the area of the project site. This is accomplished by use of a professionally designed and executed landscape plan, and retention of 25-foot natural buffers (within 100-foot setbacks) along the western and southern boundaries, and a minimum 100-foot setback along Elwood Road. Approximately 1.64 acres of the existing vegetation on the property would be retained. This includes Successional Southern Hardwood Forest (1.35 acres) and Successional Old Field (0.29 acres).

The new residents will provide economic benefits to local merchants, service-oriented businesses and general consumer activities in the area, which represent beneficial impacts to the land use pattern of the area. The convenience of local shopping and resultant use by the residents would help to strengthen the residential character of the community. The proposed project will generate construction jobs and operation and maintenance jobs for the facility and will result in an immediate realization of these economic benefits.

The target market for the type of units offered is expected to include senior residents who wish to remain near their families in downsized living quarters. The type of housing offered will help to diversify available housing types in the area and may afford current area residents the opportunity to remain in the community. Single-family residential development is a prevalent type of housing in the area, with intermittent townhouse/condominium developments in localized settings. The proposed project provides quality housing for senior citizens, and as a result, the project will serve a need for the aging senior population, and will add to the diversity of housing in the surrounding area. The project will include an affordable housing component that, as previously mentioned, will conform to the Town's affordable housing requirements.

<u>Zoning</u>
The proposed project would change the zoning of the site, from R-40 Residence to R-RM Retirement Community district. The only permitted use in the requested R-RM district is senior

housing. The project conforms to the R-RM zoning requirements set forth by the Town Code as illustrated in **Table 3-2** below. No variances or zoning exemptions are necessary.

Table 3-2
CONFORMANCE TO DIMENSIONAL REQUIREMENTS
Proposed R-RM Zoning

Dimension	Requirement	Proposed Project*
Maximum building height (feet/stories)	35/2	35/2
Minimum lot area:	---	---
Area per dwelling unit (SF)	3,000	4,483
Gross area (acres)	10	37.05
Minimum front yard depth (feet)	100	100
Minimum side yard depth (feet)	50	100
Minimum total side yard depth (feet)	100	200
Minimum rear yard depth (feet)	50	100
Maximum lot coverage (%)	25	19.1
Maximum units per acre	14.52	9.72
Maximum percent lot coverage	25	24.1

* Anticipated, based on **Site Development Plan O**.

The proposed project conforms to the applicable yield requirements of the requested R-RM zone, and in fact requests substantially fewer units than could be realized on a property of this size. Specifically, at a yield calculated at 3,000 SF/unit, this 37.05-acre site could generate 538 residences; the 360 units requested represents 178 (or 33.1%) fewer units than could be allowed as-of-right in the R-RM district.

Supplemental regulations required for the R-RM Retirement Community district, along with the proposed project's conformance to each, include the following:

1. A lot shall have frontage on a major collector street, and circulation facilities shall be designed that vehicular traffic generated by the use is not directed primarily over minor residential streets.

   The subject property has primary frontage on Elwood Road, which is considered a significant county roadway that places the subject property on a regional transportation corridor. The project's main vehicle access will be located near the center of the property's frontage, on the western side of Elwood Road, and opposite Hammond Road. The site access is proposed with a divided entranceway featuring two entry and two exit lanes, and will be stop-controlled. There will be a gate and guardhouse on this feature.

   Ciro Street, which is a residential street located west of the subject property, dead-ends at the subject site's western property boundary, however no access to/from the site is proposed for Ciro Street. A secondary vehicle access is proposed off Elwood Road, at the site's southern corner; it will be configured for right turns into and out of the site only.

2. A buffer strip not less than twenty-five (25) feet in width, consisting of massed trees and shrubbery, shall be maintained along property lines adjacent to residentially zoned property. The trees and shrubbery shall consist of evergreens and deciduous plant material to create a tall,

dense buffer creating habitat for wildlife and visual relief for the neighbors. A landscape plan shall be required for all projects approved under this section.

A 25-foot buffer is proposed along the southern and western property boundaries, adjacent to residential and recreational uses. This buffer area will remain in its current natural condition and will have supplemental plantings planted, as required. As shown on the ***Site Development Plan O****, approximately 14.53 acres of the site will be landscaped, with an additional 1.64 acres of retained vegetation in the buffer areas, and 1.81 acres of naturalized recharge areas. A detailed Landscape Plan will be prepared for the site plan application, which would be submitted contingent on approval of the change of zone application, and will be subject to the review and approval of the Town.*

3. Not more than twenty-five (25%) percent of the site may be covered by buildings and at least twenty-five (25%) percent of the total site area shall be devoted to unpaved non-vehicular open space which shall be landscaped and well maintained with grass, benches, appropriate recreational amenities, walking paths, trees, shrubbery and other suitable plant materials approved during site plan review and consistent with the Town's regulations for landscaping.

Approximately 8.93 acres (or 24.1%) of the property will contain buildings. As previously mentioned and as shown on the ***Site Development Plan O****, approximately 14.53 acres (or 39.21%) of the site will be landscaped, with an additional 1.64 acres of retained vegetation in the buffer areas, and 1.81 acres of naturalized recharge areas. A detailed Landscape Plan will be prepared for the site plan application, which would be submitted contingent on approval of the change of zone application, and will be subject to the review and approval of the Town.*

The proposed project will include an approximately 17,000 SF clubhouse building, two outdoor pools and Jacuzzi, a patio/outdoor barbeque area, a walking path along the perimeter of the site, and a dog run.

4. Any property line that is contiguous with the property line of any residentially zoned property shall have a one-hundred-foot building setback; and accessory structure and parking setbacks shall not be any closer than fifty (50) feet to any adjacent residentially zoned property.

The proposed condominium units will be setback a minimum of 100 feet from all property lines, ensuring appropriate setbacks from sensitive residential uses in the vicinity of the subject property.

5. Parking shall not be allowed within fifty (50) feet of the front property line.

As shown on the ***Site Development Plan O****, at its closest setback, parking is located approximately 170 feet from the front property line.*

6. When adjacent to any residence district, no signs shall be permitted other than one (1) indirectly illuminated identification sign on each major street frontage. Such freestanding or monument sign or signs shall not be more than twenty (20) square feet in area, not more than six (6) feet above grade level in height and set back at least ten (10) feet from any property line. When located in an area that is wholly surrounded by business zoning district(s), all applicable regulations (Town Zoning Code, Article XIV, § 198-91 through § 198-101) shall apply for size and location of signs. When located in or adjacent to residentially zoned property, facial signs shall be limited to building entrance and direction signs only; freestanding signs may be

permitted on the subject grounds, but they shall be limited in height, illumination and to providing direction/instructions for visitors by the Planning Board during site plan review and approval.

It is anticipated that the only signage along Elwood Road will be an attractive community entrance sign with landscaping and spotlighting placed at the project's entrance. Any signage will conform to Town requirements.

7. During site plan review the Planning Board may modify setbacks and landscape buffer widths at a contiguous lot line when two (2) facilities are approved, pursuant to this section, adjacent to one another, if such setback modification will encourage better site design, including minimizing impacts on the surrounding community and more efficient traffic circulation.

The applicant feels that the requested R-RM zoning classification is an appropriate transition from the R-40 zoning and existing institutional and recreational development directly to the north/northwest and south of the premises and the single-family residences to the west and across Elwood Road to the east of the property.

The proposed development will also feature several amenities in the units as well as on the grounds of the development for the use and convenience of active senior residents, including a clubhouse building, two pools and a Jacuzzi, a patio/outdoor barbeque area, a walking path along the boundary of the property, and a dog run. The project's building design and resident facilities (e.g., the walking paths, indoor and outdoor recreation areas, outdoor furniture, landscaping) will establish a sense of place and community interaction on the site.

In general, through the requested rezoning, the proposed project would provide a complementary land use in the area and provide housing for an under-served portion of the population in the Town.

The community would benefit economically from increased housing diversity, the increased value of the property, and from tax benefits. The proposed project would result in generation of a substantial number of temporary jobs during the construction phase in addition to the number of jobs created due to operation of site facilities. In addition, the project would generate substantial real property tax revenues to applicable taxing jurisdictions, though it would result in incremental increases in demand for services. Finally, the project has merit over the current single-family residential zoning with the Special Permit that allows for the existing commercial use and is not in conflict with land use plans. As a result, no significant adverse impacts are anticipated to arise from the requested site zoning or to the zoning pattern of the area.

<u>Land Use Plans</u>
Horizons 2020: Huntington Comprehensive Plan Update (December 2008) - The proposed project is consistent with several action agenda items and goals identified in the Plan.

The following action agenda items from the Vision Statement are relevant to the proposed project:

- Quality housing, including a broader array of housing choices, is accessible to and affordable for households of different ages, lifestyles and economic means.
- New development and redevelopment throughout Huntington is carefully managed to protect the character of neighborhoods, villages, and other established land use patterns; preserve open space; and set high standards for aesthetic quality.

Furthermore, the following policies are relevant to the proposed project:

- Address the impact of new residential developments on schools and other community facilities.
- Address the need for workforce housing.
- Promote the diversification of housing stock to meet the changing demographics of Huntington's population.
- Provide for the housing needs of low income and special needs populations.
- Address the potential impacts of new housing developments on schools.

The Housing chapter of the Comprehensive Plan Update states that multi-family and specialized housing districts account for approximately 1% of all residentially-zoned land in the Town. The Plan identifies the demographic shift in housing types towards smaller, "non-traditional" households, including empty nesters and retirees. The Plan states, "*Because Huntington's present housing stock does not reflect the needs of non-traditional households, there is a pressing need for diverse housing types to serve a changing population*".

The proposed project is consistent with the spirit and intent, as well as key elements of, the Town Comprehensive Plan Update, which recognizes the importance of providing a mix of housing types, including senior housing and affordable units. The Town's growing senior population is currently under-served by available appropriate housing, particularly with regard to the diversity of housing types. This application assists in fulfilling the need for economically viable senior housing within the Town while avoiding substantial impact to the local land use pattern.

The proposed project will supplement the tax base as well as generate local jobs, despite being residential in nature. The types of residences proposed have a significant beneficial impact on the Elwood UFSD; as there would be no school-age children present, the proposal would not contribute to any enrollment increase, which would cause no increases in school district expenditures. The project will result in significantly increased tax revenues for public service providers, which will assist in offsetting the incremental increase in demand for these services. The new jobs created during both construction and operation of the proposed project will help to increase business and household income in the community. In turn, as spending increases, this creates additional jobs and further increases business and employee household income.

3.1.3 Proposed Mitigation

- The proposed project will provide a transition between the institutional and recreational uses to the north/northwest and south and single-family residences to the east and west.
- In conformance with Town Zoning Code Article 198-13 I requirements, the proposed project will provide between 50 and 66 affordable units.

- The proposed project will conform to the supplementary requirements for the R-RM zoning district, which include providing buffers, limiting site coverage and requiring greater building and parking setbacks.
- The project would mitigate the unfulfilled need for a variety of housing options for the senior population in the Town, which is a goal of the Town Comprehensive Plan Update.
- The project will have a significant beneficial impact on the Elwood UFSD by its generation of significant school taxes and, as there would be no school-age children present, would not contribute to any enrollment increase, thereby not increasing school district expenditures.
- Superior site design providing appropriate on-site recreational amenities; walkability and sense of place through attractive community architecture, walking opportunities, landscaping and interior setbacks and open space.
- The proposed development is designed with inherent land use mitigation, as it will provide setbacks and buffers to increase land use compatibility in transition between the condominium style development and single-family development directly west of the site.
- The project will provide an alternative to single-family home ownership in a quality housing development.
- The project is consistent with the spirit and intent, as well as key elements of, the Town Comprehensive Plan Update, which recognizes the importance of providing a mix of housing types in the Town.

3.2 Community Character

3.2.1 Existing Conditions

The property currently consists of a dairy processing facility, former pasture, leaching fields and vacant land. Residential uses dominate the land use in the immediate vicinity of the subject site as described in **Section 3.1.1**. The following discussion presents the existing visual character of the site and vicinity; the photographs in **Appendix B** represent typical views of the site and its environs and depict the visual resources of the surrounding area.

Photographs 1, 2, 5 and 6 depict views along Elwood Road in the vicinity of the subject site. These views illustrate the residential character surrounding the subject site, the existing dairy buildings, and the former pasture.

Photographs 3, 4, 7, 8 and 10 depict views from the surrounding residential neighborhoods towards the subject property. As illustrated in Photographs 3 and 4, the predominant feature visible from the neighborhood on the east side of Elwood Road is the former pasture, particularly for residents exiting South Shelby Road and Hammond Road. Photographs 7 and 8 illustrate views from the Fair Oaks Court development in which the residences are the primary foreground features and the existing office building and warehouse are prominent background features. Finally, Photograph 10 illustrates the view from Ciro Street, in which the existing vegetation within the subject property is visible and screens the residents from the other features on the subject site.

Photograph 9 illustrates the view towards the subject site from Elwood Park. The park features and amenities are the prominent features visible from this vantage point as a result of the existing vegetation bordering both the subject property and Elwood Park; however, it is anticipated that from certain locations within the park, portions of the existing warehouse and office building may be visible due to the size of the buildings.

In general, views of residential neighborhoods dominate the character surrounding the subject property. The subject property is most visible from areas along Elwood Road and is currently entirely or partially screened from view for the remainder of the surrounding neighborhoods and Elwood Park.

3.2.2 Anticipated Impacts

As described in **Section 1.0**, the subject property is proposed to be developed with 360 senior units, a clubhouse, a car wash area, a walking trail, a dog run and an STP. As a result, the majority of the subject property will be cleared for development. A 25-foot natural buffer (within overall 100-foot deep setbacks) will be retained along the southern, western and northern site boundaries and, with landscaping along these three borders and naturally-planted recharge areas along Elwood Road, will provide screening for the school and public park properties to the north and south, respectively, and residences to the east, west and south.

The proposed development would be most visible for individuals travelling along Elwood Road. The proposed ponds and naturalized recharge areas may be visible to travelers, however as these features have a low profile, the units situated closest to Elwood Road will be the predominant feature within this view, though these will be set back 100 feet from Elwood Road and screened by landscaping.

It is anticipated that the residences to the south and west of the subject property will have partially screened views of the proposed units, as a result of the 25-foot retained natural buffers (within 100-foot building setbacks) in these areas. Views of the STP may be available from the northern portion of Elwood Park due to its proximity to the project site's boundary, however, it is anticipated that the 25-foot retained natural buffers in this area (within the subject site's overall 100-foot deep building setbacks) and the existing buffer vegetation within Elwood Park will provide screening for the STP. Additional screening will result from landscaping to be planted in these areas. As with the STP, views of some of the units and clubhouse may be intermittently available from Elwood Park.

The proposed development would not be out of character with the surrounding community given the existing residential uses surrounding the subject property. The proposed development would be expected to complement the character of the area by providing a permanent quality retirement community featuring attractive architecture and landscaping. The proposed architecture for the units will provide features enhancing the aesthetics of the building (such as balconies, varied roof lines, a cupola, and attractive windows and doors) and will complement the residential character of the surrounding community. In general, the greatest visual impact will be for motorists along Elwood Road who would have a direct view of the proposed development. The project would enhance the built character of the area by use of landscaping, architectural designs and building materials that would further enhance the site.

As a result, the proposed project would not be out of character with the surrounding community and therefore adverse impacts associated with community character are not anticipated.

3.2.3 Proposed Mitigation

- Potential impacts on observers to the west and south will be mitigated by the retention of setbacks and naturally-vegetated buffers in these directions.
- On site landscaping will serve to enhance the views of the proposed development and will provide some screening of the proposed structures.
- Implementation of a consistent architectural theme, using construction materials having textures and colors appropriate for the residential character of the surrounding neighborhood.

3.3 Community Services

3.3.1 Existing Conditions

The various community services relevant to the project site include schools, police, fire and ambulance, water supply, solid waste disposal, parks and recreation services and energy/utility service providers. Each service provider was contacted to inform them of the project and obtain input with respect to their service capabilities. **Appendix F** contains correspondence with community service providers regarding facilities, services and conditions. The information given in the service provider responses is included in the following subsections. Also identified herein is information on the site's existing tax structure, and existing and anticipated future tax revenues.

<u>Taxes</u>
The majority of the Town's revenues are levied through property tax generation, which is based upon a rate per $100 of assessed valuation for a given parcel. During the 2013 14 fiscal year, property owners within this part of the Town of Huntington are taxed at a rate of $342.075 per $100 of assessed valuation. These tax rates account for property taxes paid to Elwood UFSD, Library District, Suffolk County, SCPD, various Town funds, Metropolitan Transportation Authority and other local taxing jurisdictions.

According to the Town of Huntington Assessor's Office, the tax parcel that comprises the subject property is assessed at $47,500 (100% of the market valuation). This translates into a current generation of $162.486 in property tax revenues. Of this, $117,896 or 72.6% of the total taxes generated by the site are distributed to the Elwood UFSD, and $4,086 or 2.5% of the taxes are allocated to the Library District. An additional $19,138 or 11.7% of the total tax revenues are distributed to Suffolk County, which includes the General Fund, the SCPD, and Out of County Tuition. Approximately 6.7% of the tax revenue is levied to the Town of Huntington, which includes the Town/Part Town funds, Highway Fund and Town-Wide Lighting District. These three line items combine to total over $11,001 in revenues. The Greenlawn Fire District levies $5,790, or 3.6% of the total tax revenue generated by the subject parcel. The balance of the current property tax revenues is apportioned to various other town and local taxing jurisdictions. **Table 3-3** provides a summary of the taxing jurisdictions, tax rates and tax revenue compiled for the entire site.

Table 3-3
TAX REVENUES, 2013-14 Tax Year
Existing Conditions

Taxing Jurisdiction	Current Tax Rate (per $100 Assessed Valuation)	Current Taxes ($/year)	Percent of Total Taxes
Elwood UFSD	248.202	117,896	72.6%
Elwood Library District	8.602	4,086	2.5%
Suffolk County	2.843	1,350	0.8%
SCPD	36.577	17,374	10.7%
Out of County Tuition	0.854	406	0.2%
Town/Part Town	121.093	5,744	3.5%
Highway Tax	9.938	4,721	2.9%
Town-Wide Lighting District	1.129	536	0.3%
NYS Real Property Tax Law	4.065	1,931	1.2%
Open Space Bonds	0.456	217	0.1%
NYS MTA Tax	0.157	75	0.0%
Greenlawn Fire District	12.189	5,790	3.6%
GWD	4.970	2,361	1.5%
TOTALS	**342.075**	**162,486**	**100.0%**

Source: Town of Huntington Property Tax Record; Analysis by NP&V.

Schools
The subject property is located within the Elwood UFSD. The district is comprised of four (4) schools – Harley Avenue Primary School (K-2), James H. Boyd Intermediate School (grades 3-5), Elwood Middle School (grades 6-8) and Elwood – John H. Glenn High School (grades 9-12). Under existing conditions, there are no school-aged children residing at the subject property.

The cumulative enrollment within the school district has increased by 94 students, or 3.8%, over the ten (10) years between 2002-03 and 2011-12. It is important to note, however, that the district's student population has remained relatively steady, remaining relatively unchanged between the 2004-05 and 2010-11 academic years. In the 2011-12 academic year, the enrollment declined substantially. Regardless of these trends; however, there are no known capacity or overcrowding issues within the school district.

According to the New York State School Report Card, Fiscal Accountability Supplement for Elwood UFSD, expenditures averaged $10,489 per general education student and $33,516 per special education student during the 2010-11 academic year.[1] During this year, 277 students, or 9.4% of the students within Elwood UFSD, were enrolled in the special education program.

[1] As of the date of submission of this analysis, this represents the most current year that such detailed financial data is available.

Based on the 2013-14 tax rates, the subject site generates approximately $117,896 in annual property tax allocations to the Elwood UFSD.

Police Protection

The site and surrounding area are located within the jurisdiction of the 2nd precinct, sector 210 of the SCPD. The station house for the 2nd Precinct is located at 1071 Park Avenue, Huntington 11743. **Figure 3-4** illustrates the location of police services within the vicinity of the site.

Based on the 2013-14 tax rates, the subject site generates approximately $17,374 in annual property tax allocations to the SCPD.

Fire Protection

The site and surrounding area are located within the jurisdiction of the Greenlawn Fire District. Headquarters is located at 23 Boulevard Avenue, approximately three miles northwest of the subject property, and Station 1 is located at 210 Little Plains Road, approximately 1.6 miles west of the subject property. **Figure 3-4** illustrates the fire stations in the area.

Correspondence from the Greenlawn Fire District indicates that they currently have 56 volunteer members at the headquarters and 65 volunteers at Station 1. The district also has paid paramedics on weekdays (6 AM to 6 PM), assigned to three ALS-equipped ambulances. All members are cardio-pulmonary resuscitation (CPR) qualified. At their headquarters, available equipment includes one quint truck (ladder and heavy rescue), one brush truck, one Class A pumper, and two ambulances. Station 1 equipment includes one Class A pumper, one 100-foot ladder truck, one heavy rescue truck, and one ambulance. The District's 2014 annual operating budget is $2,747,100.

Funding for fire protection is received through property taxes placed on lands within the fire districts. Based on the 2013-14 tax rates, the subject site generates approximately $5,790 in annual property tax allocations to the Greenlawn Fire District.

Water Supply

The area on and surrounding the subject site receives public water supply from the GWD. District water mains presently exist on the north side of Ciro Street (10-inch) and the west side of Elwood Road (8-inch). Water bills obtained by the property owner indicate that the site currently uses approximately 40,083 gpd of potable water. Assuming that the 1.09 acres of existing landscaping are irrigated at 5.5 inches annually, 777 gpd of this total are used for irrigation, leaving 39,306 gpd for use in the office and dairy product processing buildings. Based on the square footage of the office portion (7,650 SF) and the SCDHS design rate for this use (0.06 gpd/SF), it is expected that this structure uses 459 gpd of water, leaving 38,847 gpd for use in the dairy product processing portion of this building.

Wastewater Treatment

Liquid wastes from the existing dairy operation are treated and recharged in a system comprised of freestanding buildings and surface recharge lagoons in the property's west-central area; sanitary wastes generated on the site are treated in septic systems. This facility is assumed to treat the 38,847 gpd of water consumed in the dairy product processing building, and is permitted for a design flow of 100,000 gpd.

The 7,650 SF office portion of this building is served by a separate septic system for wastewater treatment. This building is expected to generate 459 gpd of sanitary wastewater, based on the pertinent SCDHS design standard for this use.

Recreational Facilities

The subject site is owned and occupied by the Oak Tree Farm Dairy, which maintains its corporate offices and a dairy products processing facility in the site's southern quarter (the rest of the site is open former grazing fields; there are at present no animal grazing activities on-site, and there are no animal barns or facilities present). As a result, no recreational facilities are present on the site. Elwood Park is located south of the property, with access via Little Plains Road. Manor Plains Nature Park is located southwest of the property on Manor Road and Berkeley Jackson County Parkland is located south of the property, between Manor Road and Warner Road. Verleye Avenue Park is located southeast of the property in the residential neighborhood south of Burr Road.

Solid Waste Removal

The project site lies within the Town of Huntington Refuse District 07. The Town of Huntington manages municipal (i.e., non-hazardous) solid waste generated within the Town, and collects such wastes from qualified residential development as well. However, as the subject site is presently in a private commercial use, the property owners utilize a licensed private hauler to collect and dispose of their solid wastes. As indicated by the applicant, the dairy utilizes a single 30 cubic yard (CY) yard dumpster on the site to store all non-hazardous wastes; this dumpster is currently collected and emptied twice a week.

Based on the rate of 1 pound per 100 SF daily, as presented in **Salvato (2009)**, it is estimated that the office portion of the Oak Tree Farm Dairy operation would generate approximately 77 pounds of solid waste daily (lbs/day). This material would be composed of paper products and other non-hazardous materials typical of office use. The solid wastes generated in the dairy product processing facility are expected to consist of empty diary processing-related containers and other miscellaneous wastes; any liquid wastes generated here are conveyed to the on-site, open-air waste treatment facility for treatment and disposal. Other than cleaning products, no hazardous materials are anticipated to be present at either the office or processing facility. No estimate of the weight of the solid wastes generated in the dairy product processing facility is available.

The dairy facility would operate subject to sanitation regulations of the SCDHS and State Health Department, including regular inspections and permit reviews, which would minimize the potential for impacts from unsafe and/or unsanitary conditions.

Correspondence from the Town of Huntington's Department of Environmental Waste Management indicates that, in 2013, the Town of Huntington's Resource Recovery Facility (RRF) handled 109,984 tons of solid wastes. Of this, 26.3% was recycled (in various private facilities), 73.2% was incinerated, and the remaining 0.6±% was landfilled. As stated in its response letter (see **Appendix F**):

> The Town typically accepts waste from residential dwellings…; however, the Town makes no guarantee as to the availability of disposal capacity at the RRF if the project will be serviced by a private carter. Depending on the class of property and construction type, this project may be part of the Town-wide Residential refuse District. When available, please provide us with a detailed site plan so a determination can be made. For further information on the Town of Huntington refuse and disposal regulations, you may consult the code of the Town of Huntington at www.HuntingtonNY.gov.

Energy Supply

PSE&G is the public electric company in the area, however electricity for the corporate offices and dairy products processing facility on the property is generated on-site with four diesel engines in a co-generation plant that runs round the clock in the site's southern quarter. National Grid serves as the natural gas supplier for the area, however there is no natural gas currently available or in use on the site.

3.3.2 Anticipated Impacts

Taxes

Many of the Town and County's community services and facilities are supported in large part by the revenues generated through property taxes. The Town of Huntington and Suffolk County, as well as other local taxing jurisdictions will greatly benefit from an increase in such property tax revenues, resulting from the development and operation of The Seasons.

For the purpose of the Fiscal and Economic Impact Analysis (see **Appendix A-1**), it is necessary to determine the assessed valuation for The Seasons. The value was determined based upon estimated selling prices for the residential units, and correspondence with the Town of Huntington Assessor. Selling prices for the market-rate condominiums are anticipated to range from $425,000 - $500,000, and for the purpose of this analysis it was assumed that all market-rate units would sell for an average of $462,500.

Selling prices for the affordable residential units are based on the Town's Affordable Housing Law, which states that *"the initial sale price of half the units shall be an amount equal to eighty (80%) percent of the median family income multiplied by 2.5."* As further mentioned in the Town Code, the sale price of the other half of the units can range up to *"one hundred twenty (120%) percent of the median family income multiplied by 2.5."* According to the U.S. Department of Housing and Urban Development, the 2014 area median income for Suffolk County was $105,100. As such, and at two-and-a-half times 80% of the area median income ($84,080), selling prices for half of the units are anticipated to be $210,200. At two-and-a-half times 120% of the area median income ($129,000), selling prices for the other half of the units are anticipated to be $315,300. This results in an average selling price of $262,750. Such selling prices are assumed for the purpose of this analysis.[2]

[2] Selling prices, as well as costs associated with construction of the clubhouse, was provided by The Engel-Burman

Given the above-mentioned assumptions regarding selling prices, and when applied to the 50 affordable units and the 310 market-rate units, the estimated market valuation for the residential units for taxing purposes is approximately $170.4 million. This was then applied to the Town of Huntington's current residential assessment ratio (RAR) of 0.79%, which resulted in a market valuation of approximately $1.34 million. For the purpose of this analysis, the value of the recreational building and other improvements to the property is included within this assessment. When applying a 40% reduction in assessment to account for the condominium status of the proposed community, and then an equalization rate of 100%, the projected assessed valuation of the community upon full build-out and occupancy is $807,788. This is seen in **Table 3-4a**.

Table 3-4a
ESTIMATED ASSESSED VALUATION
310 Market-Rate Units & 50 Affordable Units

Type of Unit	Number of Units	Proposed Selling Price	Assessed Valuation
Market-Rate Condominiums (without garages)	222	$475,000	$105,450,000
Market-Rate Condominiums (with garages)	88	$589,000	$51,832,000
Affordable Condominiums (without garages)	50	$262,750[3]	$13,137,500
Sub-total: All Residential Units	*360*	--	*$170,419,500*
Residential Assessment Ratio	--	--	0.79
Market Valuation: Residential Units	--	--	*$1,346,314*
Condominium Assessment Reduction			40% Reduction
Assessed Valuation			$807,788
Equalization Rate			100.00%
Projected Assessed Valuation: Proposed Community			**$807,788**

Source: Data provided by The Engel-Burman Group; Analysis by Nelson, Pope & Voorhis, LLC.

When applied to the 66 affordable units and the 294 market-rate units, the estimated market valuation for the residential units for taxing purposes is approximately $167.0 million. This was then applied to the Town of Huntington's current RAR of 0.79%, which resulted in a market valuation of approximately $1.32 million. For the purpose of this analysis, the value of the recreational building and other improvements to the property is included within this assessment. When applying a 40% reduction in assessment to account for the condominium status of the proposed community, and then an equalization rate of 100%, the projected assessed valuation of the community upon full build-out and occupancy is $791,691. This is seen in **Table 3-4b.**

Group, in February 2012. It is important to note that all costs are estimates based upon market conditions as of the date of submission of this analysis.

[3] For the purpose of this analysis, it is assumed that half of the affordable residences will sell for $210,200 (80% of the area median income, multiplied by 2.5), and half of the affordable residences will sell for $315,300 (120% of the area median income, multiplied by 2.5).

Table 3-4b
ESTIMATED ASSESSED VALUATION
294 Market-Rate Units & 66 Affordable Units

Type of Unit	Number of Units	Proposed Selling Price	Assessed Valuation
Market-Rate Condominiums (without garages)	206	$475,000	$97,850,000
Market-Rate Condominiums (with garages)	88	$589,000	$51,832,000
Affordable Condominiums (without garages)	66	$262,750[4]	$17,341,500
Sub-total: All Residential Units	*360*	--	*$167,023,500*
Residential Assessment Ratio	--	--	0.79
Market Valuation: Residential Units	--	--	*$1,319,486*
Condominium Assessment Reduction			40% Reduction
Assessed Valuation			$791,691
Equalization Rate			100.00%
Projected Assessed Valuation: Proposed Community			**$791,691**

Source: Data provided by The Engel-Burman Group; Analysis by Nelson, Pope & Voorhis, LLC.

Current tax and equalization rates can be applied to the assessed valuation in order to project the impact that this development scenario will have on the local tax base. **Table 3-5** shows the current tax rates and revenues that are projected to be levied from full build-out of the proposed development, assuming either 50 or 66 affordable units. The information provided in the table was derived from the current assessment factors and tax rates provided by the Town of Huntington Receiver of Taxes, the Town of Huntington Assessor's Office, as well as the total projected assessed valuation for the development upon full build-out. It is important to note that all analyses are based on current tax dollars, and the revenue allotted among taxing jurisdictions will vary from year to year, depending on the annual tax rates, assessed valuation and equalization rates. Further, the final assessment and levy will be determined by the sole assessor at the time of occupancy. Projections included herein are as accurate as possible using fiscal impact methodologies, for the purpose of the planning and land use approval process.

The proposed community will significantly increase taxes generated by the site, resulting in a substantial increase in revenues distributed to each taxing jurisdiction. At full build-out and depending on the number of affordable units developed, the proposed community is projected to generate between $2.708 and $2,763 million in annual taxes. This represents a net increase of between $2.2.546 and $2.601 million per year when compared to existing site conditions.

Upon full build-out, The Seasons will levy between $1.965 and $2.005 million to the Elwood UFSD, representing 72.6% of the total tax generated by the site. Likewise, the proposed development will levy between $68,101 and $69,486 to the Library District, comprising 2.5% of the tax levy. Suffolk County – which includes taxes generated for the General Fund, the Police Department, and the Out of County Tuition Fund – is projected to levy between $318,846 and $325,329, comprising 11.7% of the total generation. Moreover, the Town of Huntington is

[4] For the purpose of this analysis, it is assumed that half of the affordable residences will sell for $210,200 (80% of the area median income, multiplied by 2.5), and half of the affordable residences will sell for $315,300 (120% of the area median income, multiplied by 2.5).

projected to generate between $183,355 and $187,084 in annual property tax revenues under the proposed development, representing 6.7% of the tax generation. This reflects taxes paid to the Town/Part Town fund, the Highway Tax, and the Town-Wide Lighting District. Between $172,881 and $176,397, or 6.4%, will be generated by the proposed development and distributed among the Town's special taxing jurisdictions, including the Greenlawn Fire Districts, as well as the New York State Real Property Tax Law, the New York State MTA, the Open Space Bonds Fund, and the GWD.

Table 3-5
TAX REVENUES, 2013-14 Tax Year
Proposed Project

Taxing Jurisdiction	**Current Taxes** ($/year)	**Projected Taxes** ($/year)		**Increased Taxes vs. Existing** ($/year)	
		55 Affordable Units	66 Affordable Units	55 Affordable Units	66 Affordable Units
Elwood UFSD	117,896	2,004,947	1,961,994	1,887,051	1,844,098
Elwood Library District	4,086	69,486	68,101	65,400	64,015
Suffolk County	1,350	22,965	22,508	21,615	21,158
SCPD	17,374	296,465	289,577	279,091	272,203
Out of County Tuition	406	6,899	6,761	6,493	6,355
Town/Part Town	5,744	97,686	95,739	91,942	89,995
Highway Tax	4,721	80,278	78,678	75,557	73,957
Town-Wide Lighting District	536	9,120	8,938	8,584	8,402
NYS Real Property Tax Law	1,931	32,837	32,182	30,906	30,251
Open Space Bonds	217	3,684	3,610	3,467	3,393
NYS MTA Tax	75	1,268	1,243	1,193	1,168
Greenlawn Fire District	5,790	98,461	96,499	92,671	90,709
GWD	2,361	40,147	39,347	37,786	36,986
TOTALS	**162,486**	**2,763,242**	**2,708,178**	**2,600,756**	**2,545,692**

Source: Town of Huntington Receiver of Taxes; Analysis by Nelson, Pope & Voorhis, LLC.

As described on **Page 1-1**, the applicant may choose to "buy back" up to sixteen (16) of the required 66 affordable units, by making a one-time payment of $100,00 per unit (and thereby increase the number of market-rate units by a corresponding number) to the Town's Affordable Housing Trust and Agency Fund, for public use to *"…finance affordable housing initiatives that increase the number of available affordable units…"*

Schools

The impact of any project upon the local school district in which it is located depends on the number of school-age children that will be generated, offset by increased tax revenues and the ability of the school district to provide educational services for these children. The ability of a school district to handle increased demand for educational services depends primarily upon the adequacy of long-term planning within the district, in combination with increased tax revenue generation to strengthen the tax base of the community.

Since the proposed project is a senior care community, school-aged children are not anticipated to reside within the development. As such, the proposed project will not generate additional school-aged children to the Elwood UFSD. However, the proposed development will levy property taxes for the Elwood UFSD, without imposing additional costs resulting from an increased enrollment. This net revenue – between approximately $1.965 and $2.005 million per year – could ease the district's need to tap into additional fund balances, reduce their financial burden associated with providing tuition expenses to local high schools, and could also help alleviate an increased burden on other taxpayers throughout the district. All of these alternatives are most crucial during a time of fiscal and economic hardships throughout Long Island, New York State and the nation.

Police Protection

The proposed project will be serviced by the SCPD 2nd precinct. A letter was sent regarding the subject site and the ability of the precinct to handle the proposed redevelopment. As of the date this document was prepared, no response has been received. However, based on the SCPD 2nd precinct response to a similar inquiry for the 444-unit proposal (see **Section 1.1.1**), it is anticipated that *"…the Department will adapt as necessary to protect and serve the community as it grows."*

It is expected that the project will result in an increase of between $272,203 and $279,091 in annual tax revenue for the SCPD, which is expected to offset the costs to provide the increase in police services.

Fire Protection

Development of the proposed project would incrementally increase the potential need for emergency services of the Greenlawn Fire District. The response letter received from the department did not indicate that the proposed project would have an adverse impact on the District's ability to serve the property.

It is expected that the project will result in an increase of between $90,709 and $92,671 per year in tax revenue for the Greenlawn Fire District, which is expected to offset the costs to provide the increase in fire protective services related to the development.

Project construction will include current building materials and safety installations per the NYS Building Code. All of the units and the clubhouse building will be sprinklered. The project will be planned with suitable access for emergency vehicles and will include installation of fire hydrants as directed through the site plan review process.

Water Supply

The project will utilize public water, to be supplied by the GWD via a connection to the existing water mains in the vicinity. The total water requirement of the project of approximately 103,618 gpd is greater than the current water consumption but is not anticipated to impact the ability of the District to serve the subject site and existing customers. The GWD is chartered to provide water to its service district customers, based on approved tariffs. The site will continue to pay the required rates for water used.

Wastewater Treatment

The proposed project will generate a total of 97,000 gpd of sanitary wastewater. The proposed project will construct a new, state-of-the-art, tertiary STP on-site that will be designed to handle only the wastewater generated by the proposed project. This facility would have a capacity of at least approximately 100,000 gpd. Approvals from the NYSDEC, SCDHS and SCDPW will be required; review and approval of an Engineering Report and Construction Plans and Specifications by the SCDHS and SCDPW would be required, ensuring that this facility would be built to and operated in conformance to established regulations. Finally, the STP will be required to obtain a SPDES permit from the NYSDEC.

Recreational Facilities

The proposed project will include a 17,000 SF clubhouse building which is expected to contain numerous facilities for the use and enjoyment of the site's residents; these may include but would not be limited to: card room, TV/game room, library, meeting room, gym/spa, locker rooms, bathrooms, office space, equipment room, storage, mechanical rooms, etc. A small kitchen may be provided, but it would not be configured to prepare meals on-site (such a facility, if present, would be limited to equipment to reheat prepared food). The clubhouse building will also include two outdoor pools, a hot tub, and a patio/outdoor barbeque area. Furthermore, the site will include a network of sidewalks, as well as a walking path along the perimeter of the site, which will provide safe and convenient pedestrian access to parking, the clubhouse building, and the dog run, as well as to Elwood Road and points north and south.

Solid Waste Removal

It is anticipated that the proposed project would generate a total of 2,552 lbs/day of solid waste, as follows:

Generator	**Rate**	**Quantity**	**Waste Generated** (lbs/day)
Senior Condominiums	3.5 lbs/day/capita*	540 capita	1,890
Recreational Bldg.	0.013 lbs/SF/day**	17,000 SF	221
Total	**---**	**---**	**2,552**

* Assuming generation rate for "Resort", per **Nemerow (2009)**.
** Assuming generation rate for "Retail and service facility", per **Nemerow (2009)**.

Solid waste generation for the residences was estimated based on an average of 3.5 pounds per day per capita for the residences, plus 0.013 pounds per SF per day for the recreational building. Based on the residential use proposed, this volume is not anticipated to contain significant amounts of potentially toxic or hazardous materials, other than empty household cleaner containers. It is anticipated that site-generated solid waste will be collected via private carters operating under contract with the site owner and/or HOA, and taken to the Town RRF for disposal. If the RRF is not available to the carter, an approved private disposal facility will be used.

Energy Supply

In its response letter, PSE&G has confirmed that it will supply electricity to the proposed project. Generally, PSE&G provides service in accordance with their filed tariff and schedules in effect at the time service is required. Connections will be made to each utility through the creation of an internal distribution network within the proposed development. It is anticipated that both of these energy supply companies maintain adequate resources to supply the proposed project. In addition, energy saving devices will be utilized where practical to reduce the total energy demand that will be required by the project site upon completion.

3.3.3 Proposed Mitigation

- Adherence to the NYS Fire and Building Codes will increase the level of safety from fires and minimize the potential for use of ambulance services. In addition, use of sprinklers and fire/smoke alarms in all of the units and the clubhouse building will assist in minimizing the incremental increase in the potential need for fire protective services.
- Streets, sidewalk, recreation and common areas will be maintained privately.
- Water-conserving plumbing fixtures, mechanical systems, and rain sensors on irrigation systems will be utilized in construction, which will further minimize the volume of water required from the public water supply.
- It is anticipated that sustainable energy-conserving measures, including energy-saving wall insulations, triple-glazed windows and energy efficient mechanical systems will be utilized, thereby mitigating the anticipated increase in energy consumption.
- The project will reduce the burden on community service providers through the proposal to maintain the internal road and recharge facilities privately, thereby reducing the need for Town highway maintenance, snow plowing, drainage system maintenance and related efforts.

3.4 Transportation

3.4.1 Existing Conditions

Traffic

Appendix D contains the TIS for the proposed project; it was prepared by VHB Engineering of Hauppauge, New York. The following analyses of the existing traffic conditions, as well as of the anticipated impacts of the proposed project, have been taken from that document.

Intersections Studied

To determine the potential traffic impacts of the proposed project, the following study intersections were identified for analysis under the Existing, No-Build and Build Conditions:

- Elwood Road at NYS Route 25/Jericho Turnpike
- Elwood Road at Warner Road
- Elwood Road at Cuba Hill Road/ Burr Road
- Elwood Road at Hammond Road
- Elwood Road at Cedar Road
- Elwood Road at John Glenn High School Access

- Elwood Road at Clay Pitts Road

Roadway Conditions
The principal roadways and intersections in the project area are described below. The descriptions of the roadways and study intersections include the geometric conditions and traffic control characteristics.

NYS Route 25/Jericho Turnpike - Jericho Turnpike is a major east-west arterial that is under the jurisdiction of the NYSDOT. In the study area, Jericho Turnpike provides two travel lanes in each direction, with additional turn lanes at the intersection of Elwood Road. On this section of Jericho Turnpike, the 2007 NYSDOT estimate of average daily traffic is 31,900 vehicles. The posted speed within the study area is 40 miles per hour.

Elwood Road (CR. 10) - Elwood Road, designated County Road 10, is a collector roadway under the jurisdiction of the SCDPW. Elwood Road runs in a north-south direction along the eastern boundary of the site. In the vicinity of the site, it provides one travel lane in each direction and has a posted speed limit of 40 miles per hour.

Warner Road - Warner Road is a north-south collector roadway under the jurisdiction of the Town of Huntington. Warner Road begins at Jericho Turnpike and runs in a northeasterly direction to its terminus at Elwood Road. Warner Road provides one travel lane in each direction and has a posted speed limit of 30 miles per hour within the study area.

Cuba Hill Road - Cuba Hill Road is an east-west collector roadway under the jurisdiction of the Town of Huntington. Located approximately one and a quarter-miles to the south of the project site, it provides one travel lane in each direction and has additional turn lanes at its intersection with Elwood Road, where it becomes Burr Road. It has a posted speed limit of 30 miles per hour within the study area.

Burr Road - Burr Road is an east-west collector roadway under the jurisdiction of the Town of Huntington. Also located approximately a quarter-mile to the south of the project site, it provides one travel lane in each direction and has additional turn lanes at its intersection with Elwood Road, where it becomes Cuba Hill Road. It has a posted speed limit of 30 miles per hour within the study area.

Hammond Road - Hammond Road is an east-west local roadway under the jurisdiction of the Town of Huntington. Hammond Road begins at Elwood Road and runs in an easterly direction where it terminates approximately 325 feet after its intersection with Shari Lane. Hammond Road provides one travel lane in each direction and has a speed limit of 30 miles per hour.

Cedar Road - Cedar Road is an east-west local roadway under the jurisdiction of the Town of Huntington. Cedar Road begins at Elwood Road and runs in an easterly direction to its terminus at Town Line Road. Cedar Road provides one travel lane in each direction and has a posted speed limit of 30 miles per hour within the study area.

Clay Pitts Road - Clay Pitts Road is an east-west collector roadway under the jurisdiction of the Town of Huntington. Clay Pitts Road begins at Cuba Hill Road and runs in an easterly direction to its terminus at Town Line Road. Clay Pitts Road provides one travel lane in each direction and has a posted speed limit of 30 miles per hour within the study area.

Intersection Status

Elwood Road at Jericho Turnpike - Elwood Road and Jericho Turnpike is a multiphase, signalized four-legged intersection. The eastbound Jericho Turnpike provides an exclusive left-turn lane, a through and a shared through/right-turn lane and in the westbound direction it provides an exclusive left-turn lane, two through and a shared through/right-turn lane. The southbound Elwood Road approach provides an exclusive left-turn lane, a shared through/right-turn lane and an exclusive right-turn lane. The northbound approach is a driveway to a shopping center located on the south side of the intersection; it provides an exclusive left-turn lane and a shared through/right-turn lane.

Elwood Road at Warner Road and Cuba Hill Road/Burr Road - Elwood Road at Warner Road is a signalized three-legged intersection. The eastbound Warner Road approach provides an exclusive left-turn lane, and a channelized right turn controlled by a yield sign. The northbound Elwood Road approach provides an exclusive left-turn lane, and a through lane. The southbound approach provides a through lane and a channelized right-turn lane.

Elwood Road at Cuba Hill Road/Burr Road is a signalized four-legged intersection, located immediately to the north of Elwood Road and Warner Road intersection. Eastbound Cuba Hill Road provides an exclusive left-turn lane, a through and a channelized right-turn lane. The westbound Burr Road approach provides an exclusive left-turn lane and a shared through/right-turn lane. The north and south Elwood Road approaches provide an exclusive left-turn lane and a shared through/right-turn lane in both directions.

Both intersections are controlled by multi-phase traffic signals and are coordinated with an offset.

Elwood Road at Hammond Road - Elwood Road and Hammond Road is an unsignalized three-legged intersection. The westbound Hammond Road approach provides a shared left and right-turn lane. The northbound Elwood Road approach provides a shared through and right-turn lane and the southbound Elwood Road approach provides a shared through and left-turn lane.

Elwood Road at Cedar Road and John Glenn High School Access - Elwood Road and Cedar Road is a signalized three-legged intersection. The westbound Cedar Road approach provides a left-turn lane and a right-turn lane. The northbound Elwood Road approach provides a shared through/right-turn lane. In the southbound direction it provides an exclusive left-turn lane and a through lane.

The Elwood Road and John Glenn High School access is a signalized three-legged intersection located immediately to the north of Elwood Road and Cedar Road. The eastbound school access provides a left-turn lane and a right-turn lane. The northbound Elwood Road approach provides an exclusive left-turn lane, and a through lane. In the southbound direction it provides a shared through/right-turn lane.

Both intersections are controlled by the same multi-phase signal controller.

Elwood Road at Clay Pitts Road - The intersection of Elwood Road and Clay Pitts Road is a multiphase, signalized four-legged intersection. Eastbound Clay Pitts Road provides a shared left-turn/through/right-turn lane. In the westbound direction it provides an exclusive left-turn lane, and a shared through/right-turn lane. The north and south Elwood Road approaches provide an exclusive left-turn lane, and a shared through/right-turn lane in both directions.

Accident Data

Accident data from the most recent available NYSDOT Accident Location Information System records for the most recent three-year period were requested and Accident Verbal Description Reports from March 1, 2010 through February 28, 2013 were obtained for the following roadway segment that comprised of intersections to the north and south of the project site and the roadway segment in between. The limits of the study are outlined below:

- Elwood Road from Fair Oaks Court to Cedar Road

As indicated below in **Table 3-6**, from March 1, 2010 to February 28, 2013, a total of 10 accidents occurred in the study area. There were a total of 5 accidents resulting in personal injuries, and 5 involving property damage only. There were no fatalities.

The accidents with the highest occurrence rates were rear end collisions, accounting for 60% of all accidents (6 accidents), collisions with fixed objects accounted for 20% of the accidents (2 accidents), and left turn and side-swipe accidents accounted for 10% each (1 accidents each).

A collision diagram showing the accident location and the manner of collisions can be found in Appendix E [of **Appendix D**]. A review of the accident data records along this segment of Elwood Road does not reveal any patterns that would be exacerbated as a result of the proposed development.

Table 3-6
ACCIDENT DATA

Location	Accident Severity				Totals	Accident Type					
	Fatality	Injury	Property Damage	Non-Reportable	---	Rear End	Right Angle	Left Turn	Fixed Object	Side Swipe	Other
Elwood Rd. & Fair Oaks Ct.	---	---	1	---	**1**	1	---	---	---	---	---
Elwood Rd. Fair Oaks Ct. to Hammond Rd.	---	1	---	---	**1**	---	---	---	1	---	---
Elwood Rd. & Hammond Rd.	---	---	3	---	**3**	3	---	---	---	---	---
Elwood Rd., Hammond Rd. to South Shelby Rd.	---	---	---	---	**---**	---	---	---	---	---	---
Elwood Rd. & South Shelby Rd.	---	---	---	---	**---**	---	---	---	---	---	---
Elwood Rd., South Shelby Rd. to Cedar Rd.	---	2	---	---	**2**	2	---	---	---	---	---
Elwood Rd. & Cedar Rd.	---	2	1	---	**3**	---	---	1	1	1	---
Totals	**---**	**5**	**5**	**---**	**10**	**6**	**---**	**1**	**2**	**1**	**---**

Continuation of Dairy Operation

The Seasons developer has been told by the owner of the Oak Tree Farm Dairy that, should the proposed change of zone not be approved by the Town of Huntington, it is likely that the business will seek to maximize the sale value of the property by selling to a larger, regional dairy corporation. This could be accomplished (and would still be in compliance with the conditions of the Special Use permit previously granted by the Town) by operating the dairy within the existing building, but for longer periods, possibly 24 hours per day, 7 days per week. Such a greatly ramped-up operation would substantially increase the truck movements and employee trips, thereby significantly impacting the existing traffic flow along Elwood Road, but without the benefit of the extensive traffic mitigation measures which have been proposed to be funded and implemented by the Seasons of Elwood developer. Furthermore, northbound traffic would continue to be subject to an increasing number of stoppages and long queues when dairy trucks wait in the through lane and block northbound traffic before being able to turn into the dairy property. In addition to disrupting traffic flow along Elwood Road, the trucks are noisy and dusty, and in their current configuration on the dairy property they are parked and idling right alongside the residential properties on Fair Oaks Court. This situation would remain if the change of zone is not approved.

Pedestrian Environment

The current accommodations for pedestrians in the vicinity include:

- Along the east side of Elwood Road, there are sidewalks from Burr Road to the southern end of the marginal road, just north of the dairy office building, about 200 feet south of Hammond Road; and
- an asphalt pathway from Shelby Road northward.
- Along the west side of Elwood Road, there are sidewalks from the dairy office building south to the end of the Fair Oaks development.
- There are marked crosswalks at the signalized intersection of Elwood Road and the entrance to the Elwood UFSD property; but
- there are no marked crosswalks at the signalized intersection of Elwood Road and Clay Pitts Road.

3.4.2 Anticipated Impacts

The analysis of future conditions with the proposed project ("Build Condition") was performed to evaluate the impacts on future traffic in the area. The existing traffic volumes were expanded to the year 2016, reflecting the year when the project is expected to be completed and operational.

Traffic

Future No-Build Conditions

Background Traffic Growth - To account for increases in general population and background growth not related to the proposed project, an annual growth factor was applied to the existing traffic volumes, based on the NYSDOT's *Long Island Transportation Plan* (LITP). The LITP is the primary long term planning model used by the NYSDOT for Long Island. The growth rate anticipated for the Town of Huntington in Suffolk County is 1.0% per year. Therefore, to obtain the future No-Build traffic volumes, a total growth rate of 3.0% was applied to the existing traffic data to develop the background traffic for the year 2016.

Other Planned Developments - Based upon information received from the Town of Huntington's Department of Planning and Environment, there is one other significant approved or planned development in the vicinity of the subject site that may impact future traffic conditions in the area: The Matinecock Court development is located on the northwest corner of Pulaski Road and Elwood Road. This proposed project is would be comprised of 78 rental apartments and 77 condos/townhouses. The Matinecock Court site will be serviced via two unsignalized access points; one along Pulaski Road and the other along Elwood Road.

In order to estimate the number of trips generated by the Matinecock Court development, the trip generation estimates presented in the April 20, 2007 Supplemental Traffic Impact Study prepared by RMS Engineering for the project were utilized. That study estimates that that project will generate 84 and 109 trips during the AM and PM peak periods, respectively. That study shows that only 5% of those site generated trips will actually travel through the study area for The Seasons. However, in order to provide a more conservative analysis, it was the assumed that the percentage of trips that will travel through the study area is 10%.

The trips originating from and destined to the Matinecock Court development were then assigned to the adjacent roadways, as shown in Figures 4 and 5 [see **Appendix D**]. These trips were then added to the 2016 background traffic to develop the No-Build traffic volumes. The No-Build Condition reflects the traffic levels that would be expected in the year 2016 without the construction of The Seasons. The resulting No-Build traffic volumes for the AM and PM peak periods are shown in Figures 6 and 7 [see **Appendix D**], respectively.

Trip Generation

To estimate the traffic impact of the proposed project, it is necessary to determine the traffic volumes expected to be generated. To estimate the project-generated traffic for the proposed development mix, a review was undertaken of the available trip generation data sources, including the reference published by the Institute of Transportation Engineers ("ITE"), Trip Generation, 9th Edition. This widely utilized reference source contains trip generation rates for related uses, "Senior Adult Housing (ITE Land Use Code #251). **Table 3-7** summarizes the trips likely to be generated by the proposed development for AM and PM peak periods.

Table 3-7
TRIP GENERATION
Proposed Project

Component	Size/Density		AM Peak Hour Trips		PM Peak Hour Trips	
Senior Housing (ITE #251, Senior Adult Housing, Detached)	360	Units	Rate = 0.22		Rate = 0.27	
			Entering	Exiting	Entering	Exiting
			35%	65%	61%	39%
			28	51	59	38
			79		97	

Based upon the above, it is estimated that the proposed project will generate a total of 79 and 97 trips during the AM and PM peak hours, respectively.

Level of Service and Delay Criteria
The evaluation criteria used to analyze area intersections in this traffic study are based on the 2000 Highway Capacity Manual . The term 'level of service' (LOS) is used to denote the different operating conditions that occur at an intersection under various traffic volume loads. It is a qualitative measure that considers a number of factors including roadway geometry, speed, travel delay and freedom to maneuver. LOS provides an index to the operational qualities of a roadway segment or an intersection. LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

The LOS designations, which are based on delay, are reported differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection and the LOS designation is for overall conditions at the intersection. For unsignalized intersections, however, the analysis assumes that traffic on the mainline is not affected by traffic on the side streets. Thus the LOS designation is for the critical movement exiting the side street, which is generally the left turn out of the side street or side driveway.

It should be noted that the analytical methodologies typically used for the analysis of unsignalized intersections use conservative parameters such as long critical gaps. Actual field observations indicate that drivers on minor streets generally accept shorter gaps in traffic than those used in the analysis procedures and therefore experience less delay than reported by the analysis software. The analysis methodologies also do not take into account the beneficial grouping effects caused by nearby signalized intersections. The net effect of these analysis procedures is the over-estimation of calculated delays at unsignalized intersections in the study area. Cautious judgment should therefore be exercised when interpreting the capacity analysis results at unsignalized intersections.

Level of Service Analysis
LOS analyses were conducted for the Existing Conditions and for future No-Build and Build conditions at the study intersections. The signalized intersection analysis results for the weekday AM and PM peak hours can be found in **Tables 3-8a and 3-8b**, respectively.

Signalized Intersection Analysis Results
Jericho Turnpike at Elwood Road - The AM Peak Period results at Jericho Turnpike and Elwood Road show that the intersection operates at a LOS D during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is an imperceptible 0.7 second increase in overall intersection delay between the No Build and Build Conditions.

The PM Peak Period results at Jericho Turnpike and Elwood Road show that the intersection operates at a LOS F during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are also consistent with those of the No Build Condition. There is only a 3.7 second increase in overall intersection delay when comparing the No Build and Build Conditions. An increase in overall intersection delay of this magnitude is insignificant and no mitigation is required.

Table 3-8a
LOS SUMMARY, AM Peak Period
Signalized Intersections

Intersection	Movement	Lane Group	Existing 2013		No Build 2016		Build 2016	
			Delay	LOS	Delay	LOS	Delay	LOS
Jericho Turnpike & Elwood Road	EB	L	78.8	E	80.4	F	83.5	F
		TR	13.8	B	14.0	B	14.1	B
		Approach	31.2	C	31.8	C	33.2	C
	WB	L	57.3	E	57.3	E	57.3	E
		TR	28.8	C	30.2	C	30.5	C
		Approach	28.9	C	30.3	C	30.6	C
	NB	L	67.0	E	67.5	E	67.5	E
		TR	61.3	E	61.6	E	61.6	E
		Approach	64.3	E	64.7	E	64.7	E
	SB	L	61.2	E	62.7	E	63.4	E
		T	61.5	E	62.5	E	63.0	E
		R	43.6	D	44.4	D	44.0	D
		Approach	54.5	D	55.5	E	55.9	E
	Overall		**36.8**	**D**	**37.9**	**D**	**38.6**	**D**
Elwood Road & Warner Road	EB	L	65.5	E	66.1	E	66.1	E
		R	19.6	B	18.8	B	18.8	B
		Approach	55.8	E	55.7	E	55.7	E
	NB	L	3.3	A	3.5	A	3.5	A
		T	5.9	A	6.4	A	6.8	A
		Approach	5.9	A	6.4	A	6.8	A
	SB	T	14.4	B	20.8	C	27.2	C
		R	1.6	A	2.1	A	2.1	A
		Approach	11.9	B	17.3	B	22.6	C
	Overall		**12.2**	**B**	**15.6**	**B**	**18.9**	**B**
Elwood Road & Cuba Hill Road/Burr Road	EB	L	50.0	D	50.7	D	51.5	D
		T	65.0	E	65.1	E	65.1	E
		R	27.8	C	30.2	C	31.4	C
		Approach	41.1	D	42.7	D	43.5	D
	WB	L	71.0	E	75.3	E	79.0	E
		TR	49.3	D	50.1	D	50.2	D
		Approach	59.5	E	61.9	E	63.6	E
	NB	L	34.3	C	35.3	D	34.5	C
		TR	13.6	B	13.3	B	14.2	B
		Approach	21.8	C	21.9	C	22.1	C
	SB	L	19.3	B	19.9	B	19.8	B
		TR	33.3	C	37.4	D	41.2	D
		Approach	33.2	C	37.2	D	41.0	D
	Overall		**37.3**	**D**	**39.2**	**D**	**40.8**	**D**
Elwood Road & Cedar Road	WB	L	32.8	C	33.4	C	33.8	C
		R	43.3	D	45.1	D	45.1	D
		Approach	39.7	D	41.1	D	41.1	D
	NB	TR	18.4	B	20.4	C	21.2	C

		Approach	18.4	B	20.4	C	21.2	C
	SB	L	4.4	A	4.3	A	4.4	A
		T	6.4	A	6.4	A	6.4	A
		Approach	6.2	A	6.2	A	6.3	A
	Overall		**14.2**	**B**	**14.9**	**B**	**15.4**	**B**
Elwood Road & High School Driveway	EB	L	36.3	D	37.3	D	37.3	D
		R	29.1	C	26.9	C	26.9	C
		Approach	30.2	C	28.5	C	28.5	C
	NB	L	7.3	A	12.9	B	13.4	B
		R	2.6	A	2.9	A	3.0	A
		Approach	4.2	A	6.5	A	6.6	A
	SB	TR	21.6	C	25.0	C	25.5	C
		Approach	21.6	C	25.0	C	25.5	C
	Overall		**16.4**	**B**	**18.3**	**B**	**18.5**	**B**
Elwood Road & Clay Pitts Road	EB	LTR	22.9	C	27.9	C	28.4	C
		Approach	22.9	C	27.9	C	28.4	C
	WB	L	19.7	B	21.7	C	22.0	C
		TR	29.3	C	33.3	C	33.6	C
		Approach	28.2	C	31.8	C	32.1	C
	NB	L	23.9	C	26.0	C	28.6	C
		T	13.4	B	13.0	B	13.1	B
		R	3.7	A	3.4	A	3.2	A
		Approach	14.7	B	14.8	B	15.3	B
	SB	L	11.3	B	10.9	B	10.9	B
		TR	25.3	C	25.7	C	25.8	C
		Approach	23.8	C	24.1	C	24.2	C
	Overall		**22.9**	**C**	**24.8**	**C**	**25.0**	**C**

Table 3-8b
LOS SUMMARY, PM Peak Period
Signalized Intersections

Intersection	**Movement**	**Lane Group**	**Existing 2013**		**No Build 2016**		**Build 2016**	
			Delay	LOS	Delay	LOS	Delay	LOS
Jericho Turnpike & Elwood Road	EB	L	108.8	F	132.4	F	149.0	F
		TR	66.9	E	80.2	F	80.9	F
		Approach	77.5	E	93.5	F	98.7	F
	WB	L	63.5	E	64.0	E	64.0	E
		TR	108.3	F	122.2	F	125.1	F
		Approach	107.5	F	121.1	F	124.0	F
	NB	L	79.9	E	80.7	F	80.7	F
		TR	59.9	E	60.3	E	60.3	E
		Approach	71.5	E	72.2	E	72.2	E
	SB	L	71.8	E	74.6	E	76.5	E
		T	71.2	E	75.2	E	76.8	E
		R	20.3	C	20.5	C	20.6	C
		Approach	55.1	E	57.7	E	58.9	E

	Overall		**82.8**	**F**	**95.4**	**F**	**99.1**	**F**
Elwood Road & Warner Road	EB	L	67.6	E	68.2	E	68.2	E
		R	16.8	B	17.2	B	17.2	B
		Approach	60.0	E	60.5	E	60.5	E
	NB	L	5.8	A	6.1	A	6.2	A
		T	34.8	C	45.9	D	53.8	D
		Approach	34.1	C	44.9	D	52.7	D
	SB	T	71.5	E	77.8	E	80.2	F
		R	2.2	A	2.3	A	2.3	A
		Approach	64.5	E	70.3	E	72.6	E
	Overall		**50.4**	**D**	**57.8**	**E**	**62.3**	**E**
Elwood Road & Cuba Hill Road/Burr Road	EB	L	39.1	D	39.8	D	40.4	D
		T	59.6	E	61.2	E	62.0	E
		R	11.4	B	13.3	B	14.2	B
		Approach	33.0	C	34.7	C	35.6	D
	WB	L	34.2	C	35.2	**D**	35.8	D
		TR	35.8	D	36.6	D	37.2	D
		Approach	35.4	D	36.2	D	36.9	D
	NB	L	26.5	C	28.1	C	28.3	C
		TR	54.0	D	75.1	E	96.3	F
		Approach	47.5	D	64.2	E	80.9	F
	SB	L	25.1	C	27.9	C	30.8	C
		TR	44.7	D	51.7	D	56.1	E
		Approach	43.6	D	50.4	D	54.7	D
	Overall		**41.8**	**D**	**51.0**	**D**	**59.4**	**E**
Elwood Road & Cedar Road	WB	L	28.9	C	28.9	C	29.4	C
		R	37.9	D	37.9	D	37.9	D
		Approach	35.1	D	35.1	D	35.0	D
	NB	TR	18.9	B	20.7	C	21.5	C
		Approach	18.9	B	20.7	C	21.5	C
	SB	L	3.5	A	4.2	A	5.0	A
		T	3.4	A	3.5	A	3.5	A
		Approach	3.4	A	3.6	A	3.6	A
	Overall		**13.7**	**B**	**14.7**	**B**	**15.1**	**B**
Elwood Road & High School Driveway	EB	L	31.4	C	31.4	C	31.4	C
		R	19.2	B	19.4	B	19.4	B
		Approach	20.8	C	20.9	C	20.9	C
	NB	L	0.9	A	0.9	A	0.9	A
		R	3.0	A	3.5	A	3.8	A
		Approach	2.8	A	3.3	A	3.6	A
	SB	TR	14.4	B	15.3	B	15.8	B
		Approach	14.4	B	15.3	B	15.8	B
	Overall		**8.6**	**A**	**9.2**	**A**	**9.6**	**A**
Elwood Road & Clay Pitts Road	EB	LTR	27.4	C	30.9	C	31.9	C
		Approach	27.4	C	30.9	C	31.9	C
	WB	L	19.1	B	20.8	C	21.6	C
		TR	18.6	B	20.2	C	20.5	C
		Approach	18.6	B	20.2	C	20.6	C

	NB	L	15.1	B	15.2	B	15.4	B
		T	22.8	C	23.1	C	23.0	C
		R	2.6	A	2.4	A	2.4	A
		Approach	18.9	B	19.2	B	19.1	B
	SB	L	36.7	D	46.7	D	45.7	D
		TR	17.3	B	17.2	B	17.1	B
		Approach	20.7	C	22.2	C	21.9	C
	Overall		**21.0**	**C**	**22.4**	**C**	**22.5**	**C**

Elwood Road at Warner Road - The AM Peak Period results at the intersection of Elwood Road and Warner Road show that the intersection operates at a LOS B during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is only an increase of 3.3 seconds in overall intersection delay as a result of the project-generated traffic when comparing the No Build and Build Conditions.

The PM Peak Period results at Elwood Road and Warner Road show that the intersection operates at a Level of Service D during the Existing Condition and at a Level of Service E in the No Build and Build Conditions. The southbound through movement operates at Level of Service F in the Build condition as compared to a Level of Service E in the No Build condition. In order to improve the southbound approach levels of service, signal timing adjustments are needed. By allocating additional green time to the northbound and southbound approaches, the southbound level of service can be improved to LOS E with delays that are 4.5 seconds lower than the No Build delays. There is only a 0.3 second increase in overall intersection delay between the No Build and Build with Mitigation Conditions. **Table 3-9** provides the results of the mitigation and a comparison of the No Build and Future Build Conditions.

Elwood Road at Cuba Hill Road/ Burr Road - The AM Peak Period results at Elwood Road and Cuba Hill Road/Burr Road show that the intersection operates at a LOS D during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is an increase of 1.6 seconds in overall intersection delay when comparing the No Build and Build Conditions.

The PM Peak Period results at Elwood Road and Cuba Hill Road/Burr Road show that the intersection operates at a Level of Service D during the Existing, No Build Conditions and changes to a Level of Service E in the Build Condition. In order to improve the overall intersection level of service back to levels experienced in the No Build Condition, signal timing adjustments are needed. By allocating additional green time to the northbound and southbound approaches, the overall intersection level of service can be improved back to LOS D with a 0.8 second <u>decrease</u> in overall delay compared to the No Build condition. **Table 3-9** provides the results of the mitigation and a comparison of the No Build and Future Build Conditions.

Elwood Road at Cedar Road - The AM Peak Period results at Elwood Road and Cedar Road show that the intersection operates at a LOS B during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is only an increase of 0.5 seconds in overall intersection delay as a result of the project generated traffic when comparing the No Build and Build Conditions.

Table 3-9
LOS SUMMARY, Mitigation Measures
PM Peak Period

Intersection	Movement	Lane Group	No Build 2016		Build 2016		Build 2016, w/ Mitigation	
			Delay	LOS	Delay	LOS	Delay	LOS
Elwood Road & Warner Road	EB	L	68.2	E	68.2	E	75.2	E
		R	17.2	B	17.2	B	19.9	B
		Approach	60.5	E	60.5	E	66.9	E
	NB	L	6.1	A	6.2	A	5.3	A
		T	45.9	D	53.8	D	49.2	D
		Approach	44.9	D	52.7	D	48.1	D
	SB	T	77.8	E	80.2	F	73.3	E
		R	2.3	A	2.3	A	2.1	A
		Approach	70.3	E	72.6	E	66.4	E
	Overall		**57.8**	**E**	**62.3**	**E**	**58.1**	**E**
Elwood Road & Cuba Hill Road/Burr Road	EB	L	39.8	D	40.4	D	42.4	D
		T	61.2	E	62.0	E	65.7	E
		R	13.3	B	14.2	B	14.7	B
		Approach	34.7	C	35.6	D	37.5	D
	WB	L	35.2	D	35.8	D	40.6	D
		TR	36.6	D	37.2	D	40.8	D
		Approach	36.2	D	36.9	D	40.8	D
	NB	L	28.1	C	28.3	C	29.8	C
		TR	75.1	E	96.3	F	71.8	E
		Approach	64.2	E	80.9	F	62.3	E
	SB	L	27.9	C	30.8	C	25.0	C
		TR	51.7	D	56.1	E	46.6	D
		Approach	50.4	D	54.7	D	45.3	D
	Overall		**51.0**	**D**	**59.4**	**E**	**50.2**	**D**

The PM Peak Period results at Elwood Road and Cedar Road show that the intersection also operates at a LOS B during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is also less than a 1 second increase in overall intersection delay when comparing the No Build and Build Conditions, and is therefore, insignificant. An increase in overall intersection delay of this magnitude is unperceivable.

Elwood Road at John Glenn High School Access - The AM Peak Period results at Elwood Road and John Glen High School Access show that it operates at a LOS B during the Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is only a 0.2 second increase in overall intersection delay compared to the No Build and Build Conditions, and is therefore, insignificant.

The PM Peak Period results at Elwood Road and John Glen High School Access show that the intersection operates at a LOS A during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build

Condition, and there is less than a 1 second increase in overall intersection delay between the No Build and Build Conditions. This is a relatively insignificant increase in overall intersection delay and no mitigation is required.

Elwood Road at Clay Pitts Road **-** The AM Peak Period results at Elwood Road and Clay Pitts Road show that the intersection operates at a LOS C during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is less than a 1 second increase in overall intersection delay when comparing the No Build and Build Conditions, and is therefore insignificant.

The PM Peak Period results at Elwood Road and Clay Pitts Road show that the intersection operates at a LOS C during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is an imperceptible 0.1 second increase in overall intersection delay when comparing the No Build and Build Conditions, therefore, mitigation is not required.

Site Access
Access to the proposed development will be provided via a main access driveway located directly opposite Hammond Road, on the west side of Elwood Road. The site access location, as proposed provides full access from Elwood Road and provides a shared through and left-turn lane and an exclusive right-turn lane exiting from the site. **Table 3-10** shows the results of an unsignalized access analysis during the future Build Conditions for the AM and PM peak periods, respectively.

Table 3-10
LOS SUMMARY
Unsignalized Site Access

Intersection	**Critical Approach/Movement**	**Build 2016**			
		AM Peak Hour		PM Peak Hour	
		Delay	LOS	Delay	LOS
Elwood Road & Site Access/Hammond Road	EB	27.2	D	42.6	E
	NBL	0.6	A	1.2	A
	WB	19.9	C	37.4	E
	SBL	0.3	A	0.2	A

The provision of left turn lanes at the site access will also offer a substantial improvement over existing conditions near the property. Currently, northbound trucks waiting to make a left turn into the dairy block through traffic along Elwood Road, since it only has a single lane in the northbound direction.

A secondary southerly driveway with limited movements (right turn in/right turn out only) will also be provided on Elwood Road, subject to approval from the Suffolk County Department of Public Works.

Sight Distance
A review of the proposed site plan shows there will be substantial clearing and landscape improvements within the front yard setback in the vicinity of the proposed site access. In order to ensure drivers sight lines are not obstructed when exiting the site, it is recommended that no

landscaping, berms or any other roadside objects be placed along the site's frontage for a distance of 300 feet to the north and 375 feet to the south. This will ensure sight lines are not obstructed and they will be able to safely make their exiting maneuvers.

Off-Street Parking and Site Circulation
According to Section 198-47 of the Town of Huntington Zoning Code, each senior housing unit requires 1.5 parking spaces be provided. Based on the **Site Development Plan O** [see also **Table 1-3**], the proposed development consists of 360 senior housing units and therefore the proposed development will require a total of 540 off-street parking spaces be provided. The site plan depicts 640 parking spaces along the internal roadways, with another 88 spaces on driveways and 88 spaces in garages, for a total parking capacity of 816 spaces, thus substantially exceeding the parking requirements outlined in the Town's Zoning Code.

A careful review of the site plan revealed that the configuration of the parking layout and drive aisles provides for adequate on-site circulation.

Conclusions
Based on the [TIS] findings described herein, the following conclusions were developed:

- All existing study intersections during the AM Peak Period will continue to operate at levels of service comparable to the No-Build Condition. At no time was there more than a 4 second increase in overall intersection delay, which is relatively insignificant and no mitigation is required. The provision of the proposed interconnected signal system will also improve overall traffic flow along the Elwood Road corridor.

- During the PM Peak Period, the intersections of Jericho Turnpike at Elwood Road, Elwood Road at Cedar Drive, Elwood Road at High School Driveway and Elwood Road at Clay Pitts Road will continue to operate at levels of service comparable to the No-Build Condition. At no time was there more than a 4 second increase in overall intersection delay, which is relatively insignificant and no mitigation is required.

- During the PM Peak Period, the intersection of Elwood Road and Cuba Hill Road/Burr Road will have overall LOS changes from D to E when comparing the No-Build and Build Conditions. Although the overall Build condition LOS at the Elwood Road and Warner Road intersection will operate at No-Build levels, the southbound through movement will change from LOS E to LOS F. With adjustments to the signal timings at these two intersections, the LOSs will be improved and relatively comparable to conditions experienced in the No-Build Condition.
- The inclusion of exclusive northbound and southbound left-turn lanes along the Elwood Road approaches to the site and Hammond Road will minimize the potential for rear-end accidents by removing stopped vehicles waiting to turn left from the through lane. At the present time, trucks waiting to turn into the dairy site block all northbound traffic, since there is no turning lane.

- The configuration of the parking layout and drive aisles, as depicted on the proposed **Site Development Plan O,** will provide for adequate on-site circulation. Additionally, more than sufficient on-site parking is being provided to accommodate the anticipated demand.

- The additional mitigation measures proposed by the developer will improve emergency vehicle access through the study area, traffic operations and infrastructure along Elwood Road, and will increase the safety of pedestrians traversing through the study area.

It is our professional opinion that, following the implementation of the above mentioned improvements at the expense of the applicant, there will not be a significant adverse impact on the surrounding roadway system, but rather an improvement to safety conditions.

Pedestrian Environment

As shown in the **Site Development Plan O**, the proposed project will provide new sidewalks along its entire frontage on the west side of Elwood Road, which will extend sidewalks northward from its current terminus opposite the existing office structure to a point opposite Shelby Road.

3.4.3 Proposed Mitigation

- The PM Peak Period results at Elwood Road and Warner Road show that the intersection operates at a Level of Service D during the Existing Condition and at a Level of Service E in the No Build and Build Conditions. The southbound through movement operates at Level of Service F in the Build condition as compared to a Level of Service E in the No Build condition. In order to improve the southbound approach levels of service, signal timing adjustments are needed. By allocating additional green time to the northbound and southbound approaches, the southbound level of service can be improved to LOS E with delays that are 4.5 seconds lower than the No Build delays. There is only a 0.3 second increase in overall intersection delay between the No Build and Build with Mitigation Conditions.
- The PM Peak Period results at Elwood Road and Cuba Hill Road/Burr Road show that the intersection operates at a Level of Service D during the Existing, No Build Conditions and changes to a Level of Service E in the Build Condition. In order to improve the overall intersection level of service back to levels experienced in the No Build Condition, signal timing adjustments are needed. By allocating additional green time to the northbound and southbound approaches, the overall intersection level of service can be improved back to LOS D with a 0.8 second decrease in overall delay compared to the No Build condition.
- In order to address traffic safety flow issues and concerns raised by members of the community, the developer has agreed to the following additional traffic mitigation measures to be implemented along Elwood Road:
  - Install school speed zone flashing beacons in proximity to the John Glenn High School access roadway.
  - Provide new, wider sidewalks in close proximity to the John Glenn High School
  - Install sidewalks, curbing and drainage along the entire site's frontage
  - Widen the west side Elwood Road along the site's frontage to increase the radius of the present horizontal curve
  - Install a right turn deceleration lane and a left turn lane at the proposed site access
  - Provide new traffic signal controllers at the following intersections along Elwood Road:
    - Clay Pitts Road
    - John Glenn High School Access/ Cedar Road
    - Cuba Hill Road/ Burr Road
    - Warner Road
  - Provide wireless interconnect between traffic signal controllers within study area. This will provide further improvement to traffic flow along Elwood Road.
  - Provide emergency vehicle pre-emption at the signalized intersections within the study area

- The Traffic Mitigation Plan presented in **Figure 1-4** depicts the mitigation measures outlined above. The estimated costs associated with these mitigation measures is approximately $1,000,000.

3.5 Cultural

3.5.1 Existing Conditions

Appendix G contains the Archaeological Investigation undertaken for the project site. The following description and discussion of the site's cultural resources has been taken from that report.

Introduction
Between March 9 and 23, 2012, Tracker Archaeology, Inc. conducted a Phase IA documentary study and a Phase IB archaeological survey for the proposed residences at The Seasons, in Elwood, Town of Huntington, Suffolk County, New York.

The purpose of the Phase IA documentary study was to determine the prehistoric and historic potential of the property for the recovery of archaeological remains. This was accomplished by a review of the original and current environmental data, archaeological site files, other archival literature, maps, and documents.
A prehistoric site file search was conducted utilizing the resources of the New York State Historic Preservation Office - Field Services Bureau in Waterford, New York. Various historical and archaeological web sites were reviewed for any pertinent information.

The purpose of the Phase lB survey was to recover physical evidence for the presence or absence of archaeological sites on the property. This was accomplished through subsurface testing and ground surface reconnaissance.

Prehistoric Potential [Phase IA Study]
A prehistoric site file search was conducted at the New York State Historic Preservation Office (NYSHPO). Archaeological sites recorded within 1 mile of the study area included:

NYSM Sites	NYSHPO Sites	Distance from APE* (feet/meters)	Site Type
	10304.0083 D01	1,238/377	No information

* APE - Area of Potential Effect

Indian foot trails passed through the vicinity. One such trail traversed along or near Jericho Turnpike. The foot trail along or near Jericho Turnpike has been documented in town documents and archaeological evidence shows the trail appears to have functioned since the Archaic Period. Another trail traversed north-south from Northport Harbor to Jericho Turnpike near the project area (possibly along Stony Hollow Road).

Assessing the known environmental and prehistoric archaeological data, we can summarize the following points:

- The project is approximately 2.7 miles southeast of Northport Harbor.

- The project area contains level to steeply sloped topography with well and poorly drained soils. One area consists of fill soils.
- Indian foot trails passed very close to the project area.
- A prehistoric site is recorded nearby.

In our opinion, the study area has a higher than average potential for the recovery of prehistoric archaeological remains.

Historic Potential [Phase IA Study]
An historic site file search was conducted at the New York State Historic Preservation Office (NYSHPO). Archaeological sites recorded within 1 mile of the study area included:

NYSM Sites	NYSHPO Sites	Distance from APE (feet/meters)	Site Type
	10304.0981	5,287 (1,611)	Nathaniel Buffet Farm: one of the largest farms in this area mostly for hay grazing and horses plus woodcutting, ca. 1875-1925

NYSHPO records show that several other archaeological surveys in the surrounding area came up negative.

Assessing the known environmental and historic archaeological data, we can summarize the following points:

- The project area is approximately 2.7 miles southeast of Northport Harbor.
- The project area contains level to steeply sloped topography with well and poorly drained soils. One area consists of fill soils.
- Indian foot trails passed nearby the project area.
- An historic site is recorded in the vicinity of the project area.
- An historic map documented structure appears possibly on the 1896 map [**Figure 5, Appendix G**] but appears to be located off the project area on the 1903 map [**Figure 6, Appendix G**]. An early twentieth century house appears in the project area along Elwood Road.

In our opinion, the study area has a higher than average potential for the recovery of early twentieth century sites. There is a moderate potential for the recovery of late nineteenth century sites associated with Beers house as well as historic aboriginal remains.

Field Methods [Phase IB Survey]
Walkover-Reconnaissance
Exposed ground surfaces (70 to 100 percent visibility) were subjected to a close quarters walkover, at 3 to 5 meter intervals, to observe for artifacts. Covered ground terrain was reconnoitered at about 15 meter (50 foot) intervals to observe for any above ground features, such as berms, depressions, or rock configurations, which could be evidence for a prehistoric or historic site. Photographs were taken of the project area.

Shovel Testing

Shovel tests (STs) were excavated at about 15 to 7.5 meter (50-25 foot) intervals across the project area. The closer intervals were utilized around the 1903 dwelling.

Each ST measured about 30 to 40 centimeters in diameter and was dug into the underlying subsoil (B horizon) 10 to 20 centimeters when possible. All soils were screened through ¼-inch wire mesh and observed for artifacts. Shovel tests and surface finds were flagged in the field. All STs were mapped on the project area map at this time.

Soil stratigraphy was recorded according to texture and color. Soil color was matched against the Munsell color chart for soils. Notes were transcribed in a notebook and on pre-printed field forms.

Field Results [Phase IB Survey]

Field testing of the project area included the excavation of 507 STs across the project area. No prehistoric artifacts or features were encountered. No historic artifacts or features were encountered.

The property consists of the Oak Tree Dairy Farm. It is the only dairy farm left on Long Island and has been in operation since 1939. The cows have been moved to upstate but the packaging plant remains (www.oaktreedairy.com). The dairy farm property contained parking areas, recharge beds, and open-air waste ponds. Numerous twentieth century buildings on the project area are related to the dairy farm past and present and include: an office and pasteurization building and a wood frame dwelling with brick foundation and concrete dressing, asphalt roofing, vinyl siding and brick chimney. The house dates to 1903, according to the property manager. This would be the previously cited building in **Historic Potential**.

3.5.2 Anticipated Impacts

The following discussion pertains to the site's cultural resources, and has been taken from the Archaeological Investigation (see **Appendix G**).

Conclusions and Recommendations

Based upon topographic characteristics, distance to other known prehistoric sites and an Indian trail, the property was assessed as having a higher than average potential for encountering prehistoric sites.

Based upon topographic characteristics, distance to historic map documented structures or sites, Indian trails or wigwams, the property was assessed as having a higher than average to moderate potential for encountering historic sites.

The field testing included the excavation of 507 STs in the project area. No historic artifacts or features were encountered. No prehistoric artifacts or features were encountered. No further work is recommended.

3.5.3 Proposed Mitigation

- As no prehistoric or historic artifacts or features were found and no further investigations in this regard were recommended, no adverse impacts to such resources are anticipated, and no mitigation measures are necessary or proposed.

SECTION 4.0

OTHER IMPACTS

4.0 OTHER IMPACTS

4.1 Cumulative Impacts

This subsection analyzes the impacts of other projects in the area whose impacts, in conjunction with those of the proposed project, may cumulatively result in impacts that are significantly greater than the individual impacts that would occur from each project.

Based on the TIS (as determined by the Town for that study), there is only one (1) other development project pending in the vicinity of the subject site:

- Matinecock Court, at the northwest corner of Pulaski Road at Elwood Road. This is a residential application for 78 rental apartments and 77 townhouses.

The following briefly describes and discusses potential cumulative impacts that may be expected.

- Temporary increases in the potential for fugitive dust and construction traffic and noise impacts during construction would be expected for any proposal. However, as these impacts would be temporary in nature, no significant cumulative construction impacts are expected.
- While these two applications would combine to increase the demand upon local community services (e.g., schools, fire and police protection, utilities, and solid waste handling), these service demand increases would be incremental in nature, and these services will receive an increase in funds from the tax revenues generated from the developments, which would enable these service providers to continue to have sufficient capability to provide services.
- As each of these two projects would change the use and appearance of their sites, there will be a cumulative impact on the visual resources and character of the community. However, the area is already significantly developed with uses of a type similar to those of these two proposals. New uses are anticipated to occupy buildings that would conform to height, bulk and setback requirements of their respective zonings, unless special permits or variances are requested. In such cases, the applicable Town entity would be responsible to determine the degree of conformance to, among other parameters, the land use pattern, recommendations of the Town Land Use Plan, etc. As a result, development of each of these two sites would conform to established Town use requirements, minimizing the potential for adverse visual impacts.

In general, while some impacts are anticipated from these projects, based on the forgoing considerations, it is the applicant's opinion that impacts would not cumulatively be significant. Ultimately the involved agencies will review each application on its own merits, will weigh the potential cumulative impacts outlined herein, and will render a decision on the significance of impacts and appropriateness of each project.

4.2 Adverse Impacts That Cannot Be Avoided

The site and project have been characterized, and the potential adverse impacts to the existing site and vicinity have been assessed, quantified and discussed. For those adverse impacts that cannot be quantified, qualitative discussions have been provided. Mitigation measures have been described; however, some adverse impacts may still exist for which no mitigation is available. In general therefore, the adverse impacts of the proposed project will be minimized where possible, but this section acknowledges those adverse impacts that may still occur, as follows:

- Grading will permanently alter the site's topography.
- Despite the planned mitigation measures (such as soil wetting, etc.), temporary increases in the potential for the raising of fugitive dust during the construction period may still occur.
- Increase in the concentration of nitrogen in site-generated recharge, from 4.64 mg/l at present, to 5.46 mg/l.
- Temporary increases in construction traffic and noise during the construction period.
- Removal of an estimated 24.89 acres of vegetation from the site (an additional 10.52 acres of developed surfaces associated with the dairy operation will also be removed).
- Increase in vehicle trips generated on the site in comparison to its existing conditions (though proposed off-site mitigation would avoid decreased LOS at local intersections).
- Increased total anticipated water consumption on the site, from 40,083 gpd at present to 103,618 gpd.
- Increased potential need for emergency services of the SCPD 2nd Precinct and the Greenlawn Fire Department (increased costs to be offset by increase in tax revenues).
- Increased demand on energy services of LIPA and National Grid (to be paid for according to rate tariffs).

4.3 Irreversible and Irretrievable Commitment of Resources

This subsection is intended to identify those natural and human resources discussed in **Sections 2.0 and 3.0** that will be consumed, converted or made unavailable for future use as a result of the proposed project. The proposed project will result in irreversible and irretrievable commitment of resources, as follows:

- Building materials used to construct the various structures, including but not limited to: wood, asphalt, concrete, fiberglass, steel, aluminum, etc.
- An estimated 24.89 acres of vegetation to be cleared from the site.
- Increase in the concentration of nitrogen in site-generated recharge.
- Energy used in the construction, operation and maintenance of this project, including fossil fuels (i.e., oil and natural gas) and electricity.
- Potable water to be consumed on a daily basis, for the operation of the project, totaling an estimated 103,618 gpd.

However, the impact of this commitment of resources is not anticipated to be significant, as the magnitude of these losses is not substantial.

4.4 Growth-Inducing Aspects

Growth-inducing aspects of a proposed development are those project characteristics which would cause or promote further development in the vicinity, either due directly to the project, or indirectly as a result of a change in the population, markets or potential for development in that community. Direct impacts might include, for example, increased employment and economic activity from the creation of a major employment center, increased use of utility services from new development or extended utility services, or increased use of social services after the development of a large residential project, particularly if that project were designed for a specific age group. An indirect impact would occur as a result of a direct impact; for example, an increase in the potential for further development in an area after creation of a major employment center, extension of utility services or facilities, or construction of a large residential development, or for expansion of services after completion of a major employment center, extension of utility services, or a large residential project.

It is anticipated that the proposed project would contribute to an increase in activity for local businesses. The project will increase the number of residents in an area where commercial and service-oriented businesses are available by relatively short auto trips. These businesses, especially those serving the needs of senior customers, would tend to experience incrementally increased activity due to the increase in their customer bases.

The construction of the site will create both short-term and long-term job opportunities. In the short-term, development will create an estimated 278 construction jobs (to last multiple years), and indirectly jobs may be created based on increased patronage of material suppliers. In the long-term, the proposed project will create a small number of maintenance-related and recreation building-related permanent jobs. These jobs may be filled first from within the local labor pool. These job opportunities would not require relocation of specialized labor forces or influx of large businesses from outside the area to provide construction support. Overall, job-related growth-inducing aspects of the proposed project are not expected to be significant.

Development of the site will result in an incrementally increased usage of utilities. Electrical and natural gas services are generally available throughout Long Island (and are presently available in the immediate vicinity of the subject site), and water mains are adjacent; therefore, significant expansions of these utilities are not expected. Because these facilities and services already exist and have the capacity to service the proposed project, no significant change in potential growth is expected to result solely from this availability. As the project will be developed at a density in excess of that allowable under Article 6 of the SCSC, on-site septic systems are not allowed, so a new on-site STP is proposed. As this facility is proposed to only serve the subject site, it would not represent a growth-inducing aspect with respect to potential off-site development, as it would not be available for off-site growth.

The proposed project may lead to the improvement or expansion of community services in the area as stimulated by the increased need for services, the costs of which would be offset by the increased taxes generated by the project.

In consideration of the above, it must be acknowledged that **The Seasons** possesses growth-inducing aspects that would result in direct and indirect impacts. These aspects include its:

- increased residential population;
- increased senior population;

- increased utility usages;
- increased trip generation;
- senior residential land use;
- change in zoning; and
- increased taxes.

It should be noted that the proposed project reflects an on-going trend in the Town for residential growth, for growth in affordable housing, and for growth in senior housing. Therefore, the proposed project does not in itself represent a trigger for such growth, but represents the applicant's response to established need for senior residential development.

4.5 Effects on the Use and Conservation of Energy Resources

An increase in the consumption of energy resources would typically be expected from the intensification of land use on a site. Thus, use of electricity and, possibly natural gas would occur, though estimates of the expected increases cannot be provided at the present time. It order to reduce these increases, the buildings will be constructed in conformance with New York State and Town building codes, which stipulate a number of design standards that reduce energy use. The proposed project will also adhere to appropriate energy-efficiency design standards, and use of energy-efficient building materials (e.g., insulations, windows, weather stripping, door seals, etc.) and mechanical systems (e.g., air conditioners, heating systems, heating, ventilation and air conditioning [HVAC] systems, water heaters, heat pumps, etc.) is anticipated. Incorporation of such energy-conserving measures is not only required by New York State, but is a sensible building practice, particularly in light of the increasing cost of energy resources. Water-saving plumbing fixtures can be specified for the proposed buildings in accordance with current building requirements and practice of the trade. Installation of low-flow toilets, showers, sinks and equipment would reduce unnecessary water loss, which would translate into conservation of the energy resources required to heat this water.

It is expected that the public energy-supply utilities available in the area (PSE&G and National Grid) will be able to meet the expected increase in demand represented by the proposed project.

There will be an increase in energy use during the construction phase of the proposed project. These impacts are expected to be of short duration, and the long-term energy demand associated with operation of the proposed project will remain stable or decline over time, as increasingly efficient systems and appliances are used on-site.

In summary, it is not anticipated that the project will result in significant adverse impacts on energy resources.

SECTION 5.0

SUMMARY AND CONCLUSIONS

5.0 SUMMARY AND CONCLUSIONS

This section provides a summary of the anticipated impacts of the proposed project on the environmental and human resources of the area, that were described in detail in **Sections 2.0 and 3.0**. This is then followed by a brief statement addressing the balance between impacts and benefits of this change of zone application, to enable an informed decision by each of the various involved agencies.

5.1 Summary of Anticipated Impacts and Benefits

The following items summarize the anticipated potential environmental impacts of the proposed project, as presented in more detail in **Sections 2.0 and 3.0** of this document.

Topography
- Clearing and grading of up to 35.41 acres (including 24.89 acres of vegetation) would be necessary.
- Site will be stabilized through proper engineering/construction and erosion control.

Soils
- During the construction period, soil erosion may occur. However, precautions will be taken to ensure that sediment will not be transported off-site by stormwater runoff and, as a result, there would be no impact to local roadways or adjacent properties.

Subsurface
- No adverse impacts with respect to drainage are anticipated in relation to the proposed project, due to subsoil quality and SCDHS design review/approval of all installations.
- A detailed Grading and Drainage Plan will be prepared during the site plan review process, and will undergo thorough review by qualified Town engineering staff prior to issuance of building permits.

Water
- The concentration of nitrogen in recharge will be increased as a result of the proposed project.
- The concentration of nitrogen in total site recharge will continue to remain well within the NYS Drinking Water Standard.
- The volume of groundwater recharged on-site will be significantly increased, by 70.3%.
- Groundwater quality will be protected by use of a new, state-of-the-art on-site STP, so that sanitary wastewater will be treated to a tertiary level.
- The project will conform to applicable Town requirements for stormwater control and recharge, so that potential impacts to roadways and adjacent properties will be minimized.

Vegetation and Wildlife
- An estimated 24.89 acres of the site's existing vegetation will be removed.
  No unique species were noted in association with the site, and the majority of the site was previously disturbed.

Land Use, Zoning and Plans

- The proposed project will change the land use classification of the site from its current commercial status to senior residential use. However, in consideration of the existing mix of public open space, institutional and residential uses represented in the area and adjacent to the project, this change does not represent a significant land use impact.
- The proposed project conforms to the R-RM zoning requirements set forth by the Town Code.
- The project will provide quality senior housing opportunities in an enhanced setting that will benefit residents with on-site recreation and nearby services and will provide for a beneficial use of the site. In addition, the project has merit over the current site use and is not in conflict with land use plans.
- The proposed project will be consistent with the Town Plan Update recommendation for one acre or less residential use on the site. However, the Town Plan Update also identified a need for a diverse housing supply in the Town as its population ages. As such, no adverse impact to this recommendation of the Town Plan Update is anticipated.
- In conformance with Town Zoning Code Article 198-13 I requirements, the proposed project will provide between 50 and 66 units of affordable housing.

Community Character

- In general, the impact of the project on the visual resources of the area would be minimal, as passing motorists and observers would view the structures across (i.e., behind) a substantial naturally-replanted drainage depression in the foreground, which will soften views of the structure and visually blend it into the adjacent developed residential lands on either side.

Community Services

- The proposed project will significantly increase taxes generated by the site, resulting in a substantial rise in tax revenues distributed to each taxing jurisdiction.
- The project will not generate additional school-aged children to the Elwood UFSD.
- Based on its response to a request for its input on the previous 444-unit proposal for the subject site, it is expected that the SCPD 2nd Precinct *"…will adapt as necessary to protect and serve the community as it grows."*
- It is expected that the project will result in a substantial increase in annual tax revenue for the SCPD, which is expected to offset the costs to provide the increase in police services.
- Development of the proposed project would incrementally increase the potential need for emergency services of the Greenlawn Fire Department.
- Project construction will include current building materials and safety installations per the NYS Building Code. All units and the clubhouse will be sprinklered. The project will be planned with suitable access for emergency vehicles and will be subject to Town review through the site plan review process.
- It is expected that the project will result in a substantial increases in tax revenues for the Greenlawn Fire Department, which would offset the costs to provide the increase in fire protective services imposed on the development.
- While the total water consumption on-site will be increased, it is not anticipated to impact the ability of the GWD to serve the subject site or its existing customers.
- It is anticipated that the proposed project would generate a total of 2,552 lbs/day of solid waste. Based on the type of residential use proposed, this volume is not anticipated to contain significant amounts of potentially toxic or hazardous materials, other than empty household cleaner containers.

- The proposed project will use PSE&G and National Grid to supply energy resources to the subject property. It is anticipated that both of these utilities maintain adequate resources to supply the project site.

<u>Transportation</u>

- The PM Peak Period results at Elwood Road and Warner Road show that the intersection operates at a LOS D during the Existing Condition and at a LOS E in the No Build and Build Conditions. The southbound through movement operates at LOS F in the Build condition as compared to a LOS E in the No Build condition. In order to improve the southbound approach LOS, signal timing adjustments are needed. By allocating additional green time to the northbound and southbound approaches, the southbound LOS can be improved to LOS E with delays that are 4.5 seconds lower than the No Build delays. There is only a 0.3 second increase in overall intersection delay between the No Build and Build with Mitigation Conditions.

- The PM Peak Period results at Elwood Road and Cuba Hill Road/Burr Road show that the intersection operates at a LOS D during the Existing, No Build Conditions and changes to a LOS E in the Build Condition. In order to improve the overall intersection LOS back to levels experienced in the No Build Condition, signal timing adjustments are needed. By allocating additional green time to the northbound and southbound approaches, the overall intersection LOS can be improved back to LOS D with a 0.8 second <u>decrease</u> in overall delay compared to the No Build condition.

- In order to address traffic safety flow issues and concerns raised by members of the community, the developer has agreed to the following additional traffic mitigation measures to be implemented along Elwood Road:
  - Install school speed zone flashing beacons in proximity to the John Glenn High School access roadway.
  - Provide new, wider sidewalks in close proximity to the John Glenn High School
  - Install sidewalks, curbing and drainage along the entire site's frontage
  - Widen the west side Elwood Road along the site's frontage to increase the radius of the present horizontal curve
  - Install a right turn deceleration lane and a left turn lane at the proposed main site access
  - Provide new traffic signal controllers at the following intersections along Elwood Road:
    - Clay Pitts Road
    - John Glenn High School Access/Cedar Road
    - Cuba Hill Road/Burr Road
    - Warner Road
  - Provide wireless interconnect between traffic signal controllers within the study area. This will provide further improvement to traffic flow along Elwood Road.
  - Provide emergency vehicle pre-emption at the signalized intersections within the study area
  - The Traffic Mitigation Plan presented in **Figure 1-4** depicts the mitigation measures outlined above.
  - The estimated costs associated with these mitigation measures is approximately $1,000,000.

<u>Cultural</u>

- During the course of the Phase IB survey, no prehistoric artifacts or features were encountered. No historic artifacts or features were encountered. No further work is recommended.

In contrast to the above, the following (derived from discussions presented in **Section 1.1**) summarizes the anticipated benefits of the proposed project:

- The proposed project will provide a land use that is compatible with land uses on the adjacent properties as well as with other properties in the vicinity.
- The proposed project will develop a substantial number of senior residences that will afford current area residents opportunities to remain in the community (perhaps in proximity to family, friends and accustomed neighborhoods).
- The project will provide 360 senior condominiums, a type of residence desired in Town plans.
- The proposed yield conforms to allowed yield of the R-RM district under Section 198-21 of the Town Zoning Code.
- In conformance with Town Zoning Code Article 198-13 I requirements, between 50 and 66 of the units will be designated "affordable", to be occupied by qualified households, as administered by the Town.
- The project is consistent with the spirit and intent, as well as key elements of, the Town Land Use Plan Update, which recognizes the importance of providing quality senior housing.
- While the proposed project represents a change in the land use type of the site, the proposal is consistent with the usage type and character of the other uses to the east, west and south, and is transitional to the institutional uses to the north.
- The project will eliminate the open-air lagoons associated with the current dairy wastes treatment system, which is a source of neighborhood odor complaints.
- The project will avoid impact to groundwater resources by constructing a new, state-of-the-art on-site STP.
- The project will avoid impact to adjacent and nearby properties and roadways by containing all stormwater runoff within the site;
- The project will relate to community context by providing a quality residential use with substantial buffers and professional landscape design.
- The project's building design and resident facilities (e.g., indoor and outdoor recreation areas, outdoor furniture, landscaping) will establish a sense of place and community interaction on the site.
- The proposal would not contribute to any enrollment or expenditure increases for the Elwood UFSD.
- The project will result in significantly increased tax revenues for public service providers, which will assist in offsetting the incremental increase in demand for these services.
- The project will reduce the burden on community service providers through the proposal to maintain the internal road and recharge facilities privately, thereby reducing the need for Town highway, open space and recreation area maintenance, snow plowing, drainage system maintenance and related efforts.
- The project will be privately owned and maintained with security services, and will be built in conformance with modern building construction standards, thereby minimizing impact on public community service providers.
- The proposed project meets the Town's goals of job creation. The new jobs created during construction and, to a lesser degree, operation of the proposed project will help to increase

business and household income in the community. In turn, as spending increases, this creates additional jobs and further increases business and employee household income.

- The project is estimated to generate between $2.708 and $2.763 million in annual property tax revenue, of which between $1.965 and $2.005 million would be allocated to the Elwood UFSD and the remainder is available to the Town of Huntington, Suffolk County, and other local and special taxing jurisdictions including the Greenlawn Fire District.

5.2 Preliminary Findings

This investigation is useful in determining the importance of the impacts based on the criteria included in the format for an Expanded EAF. The criteria are as follows:

- Probability of the impact occurring,
- The duration of the impact,
- Its irreversibility, including permanently lost resources of value,
- Whether the impact can or will be controlled,
- The regional consequence of the impact,
- The potential divergence from local needs and goals,
- Whether known objections to the project relate to this impact.

The environmental review process is a balancing process. The proposed project is in conformance with the local land use pattern, it conforms to the Town Comprehensive Plan Update, complements the existing surrounding land uses, and incorporates sensitive environmental design. The project also fulfills a need in the Town for affordable senior housing, by providing 66 units for such households. The analyses in this document support a conclusion that the potential impacts of the proposed project will be either not significant or beneficial, and that the adverse impacts will be localized, so that no regional impacts are expected.

This report has been structured to provide additional information on the issues anticipated to be of concern to the Town planning and environmental staff on behalf of the Town Board. This additional information will be used to determine the environmental significance of the proposed project. Therefore, based on this EEAF, it is respectfully submitted that no significant impacts are expected to occur, and as a result, a Negative Declaration is appropriate for the proposed **The Seasons** project.

SECTION 6.0

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6.0 REFERENCES

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FIGURES

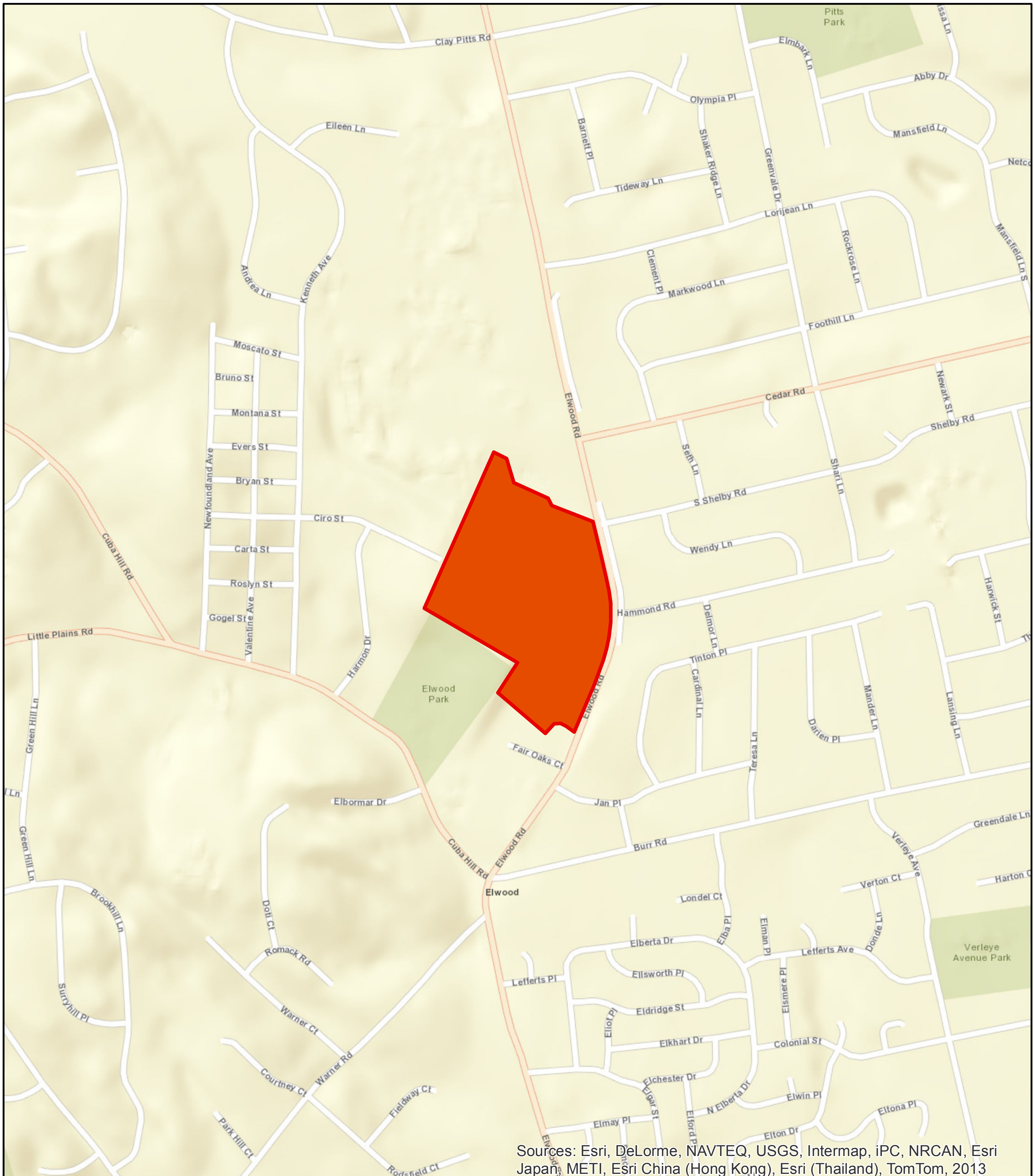

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FIGURE 1-1
LOCATION MAP

Source: ESRI Web Mapping Service
Scale: 1 inch = 1,000 feet

N

The Seasons, Elwood

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FIGURE 1-2
EXISTING SITE AND AREA CONDITIONS

Source: NYSGIS Orthoimagery Program 2010
Scale: 1" = 500'

NORTH

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FIGURE 1-3
PROPOSED PROJECT AERIAL OVERLAY

Source: NYSGIS Orthoimagery Program 2010
Scale: 1" = 500'

NORTH

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FIGURE 1-4
TRAFFIC MITIGATION PLAN

Source: NYSGIS Orthoimagery Program, 2010;VHB, June, 2012
Scale: 1 inch = 500 feet

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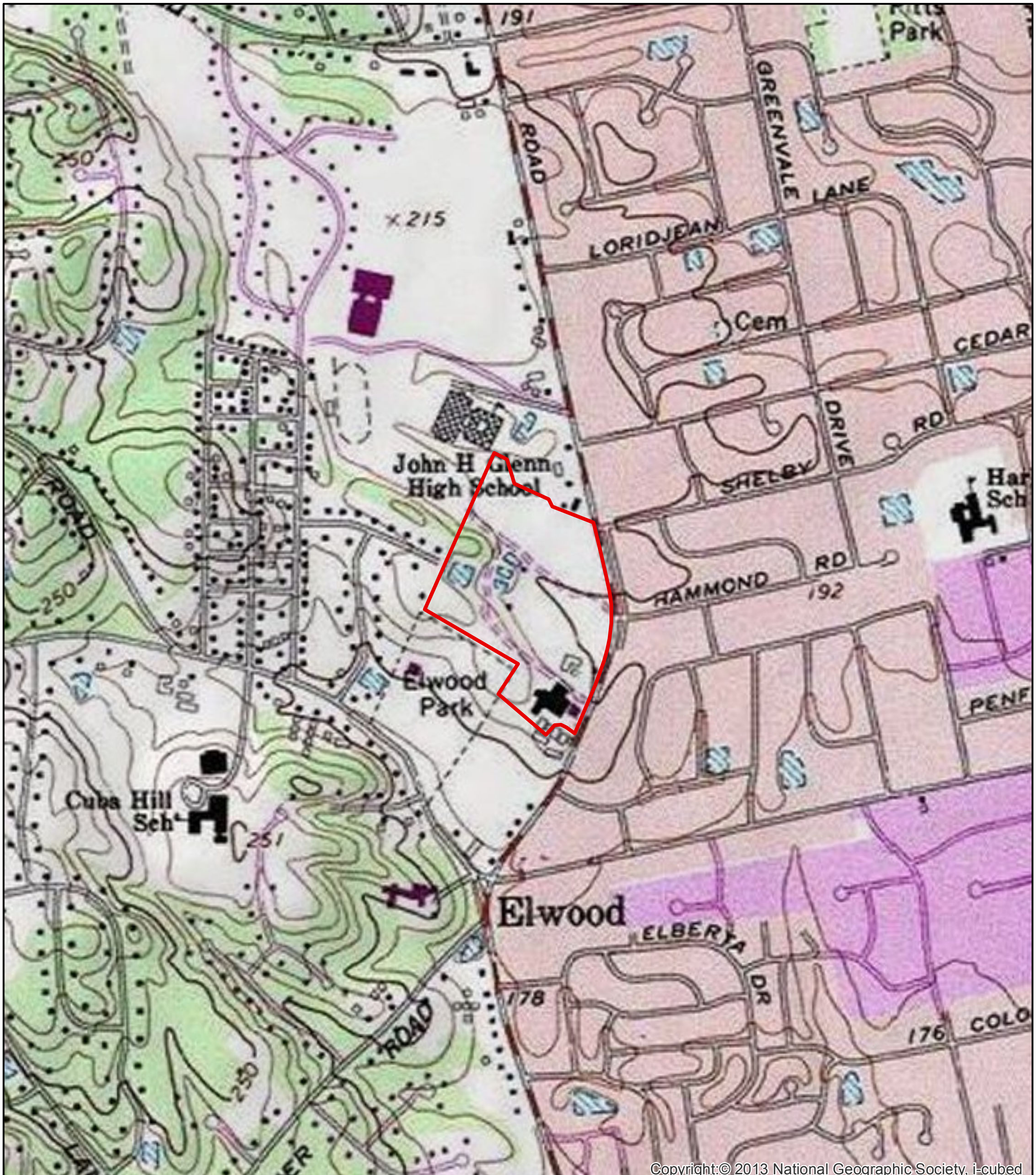

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FIGURE 2-1
TOPOGRAPHIC MAP

Source: ESRI Web Mapping Service
Scale: 1 inch = 1,000 feet

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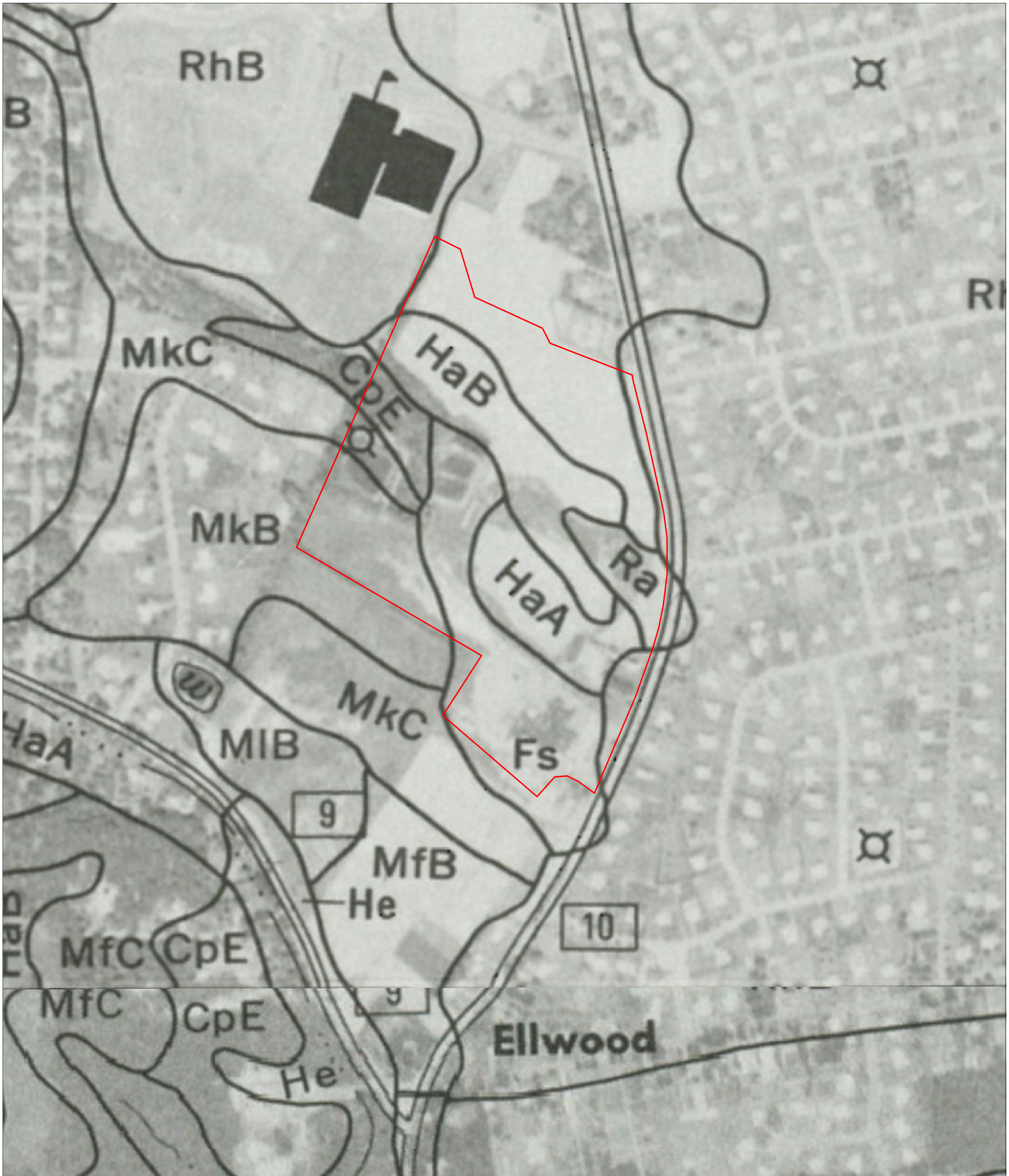

FIGURE 2-2
SOIL MAP

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Source: Suffolk County Soil Survey
Scale: 1" = 500'

NORTH

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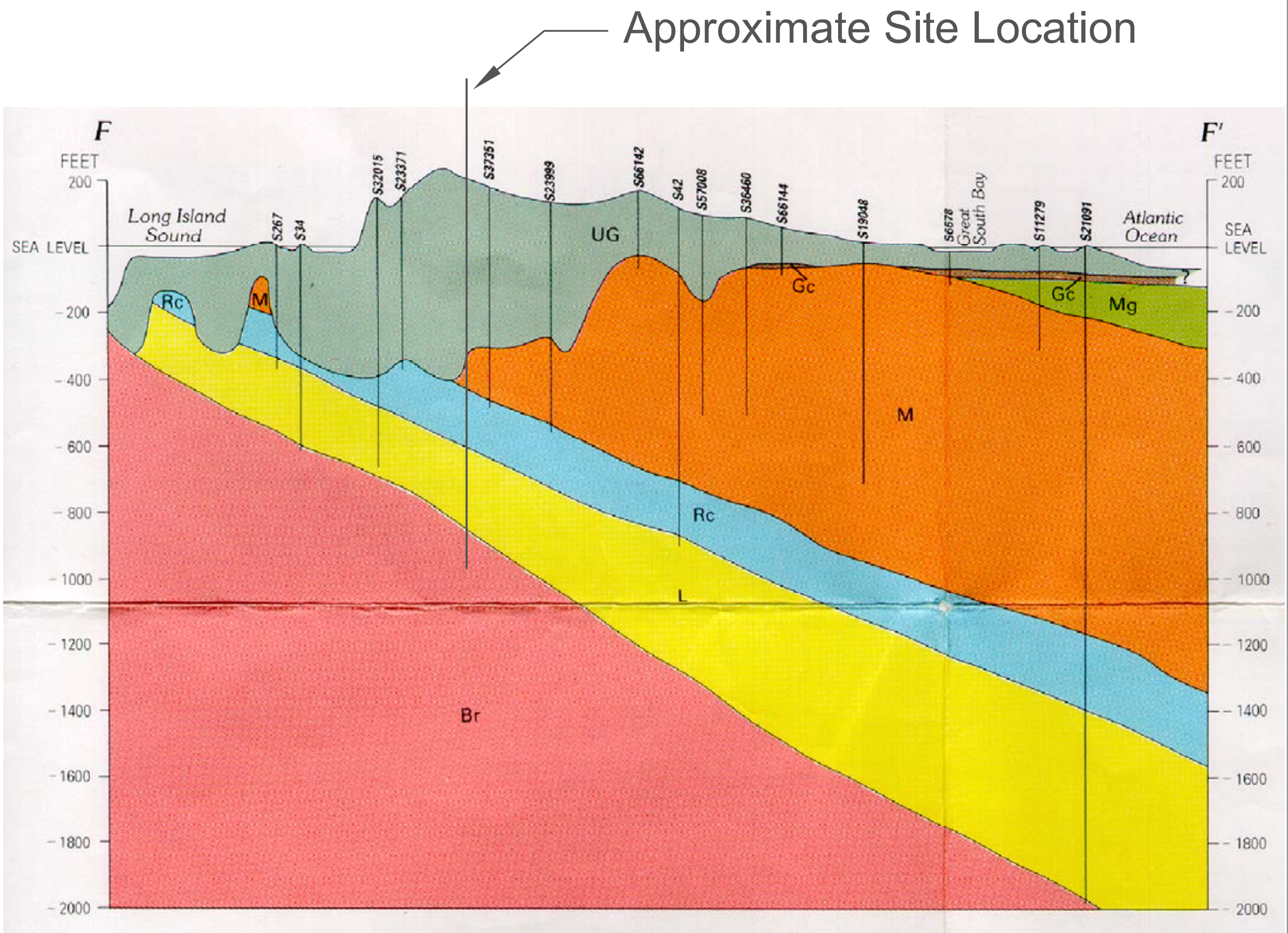

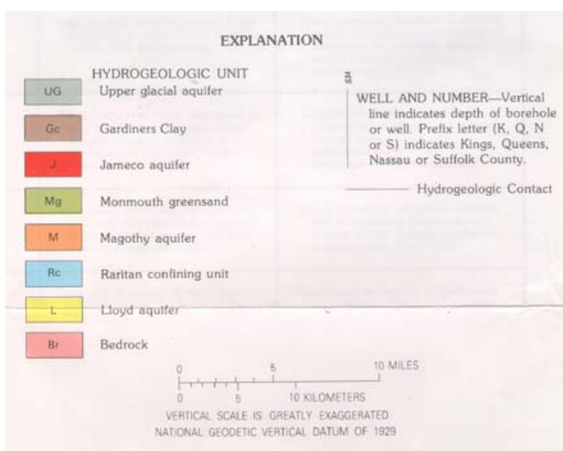

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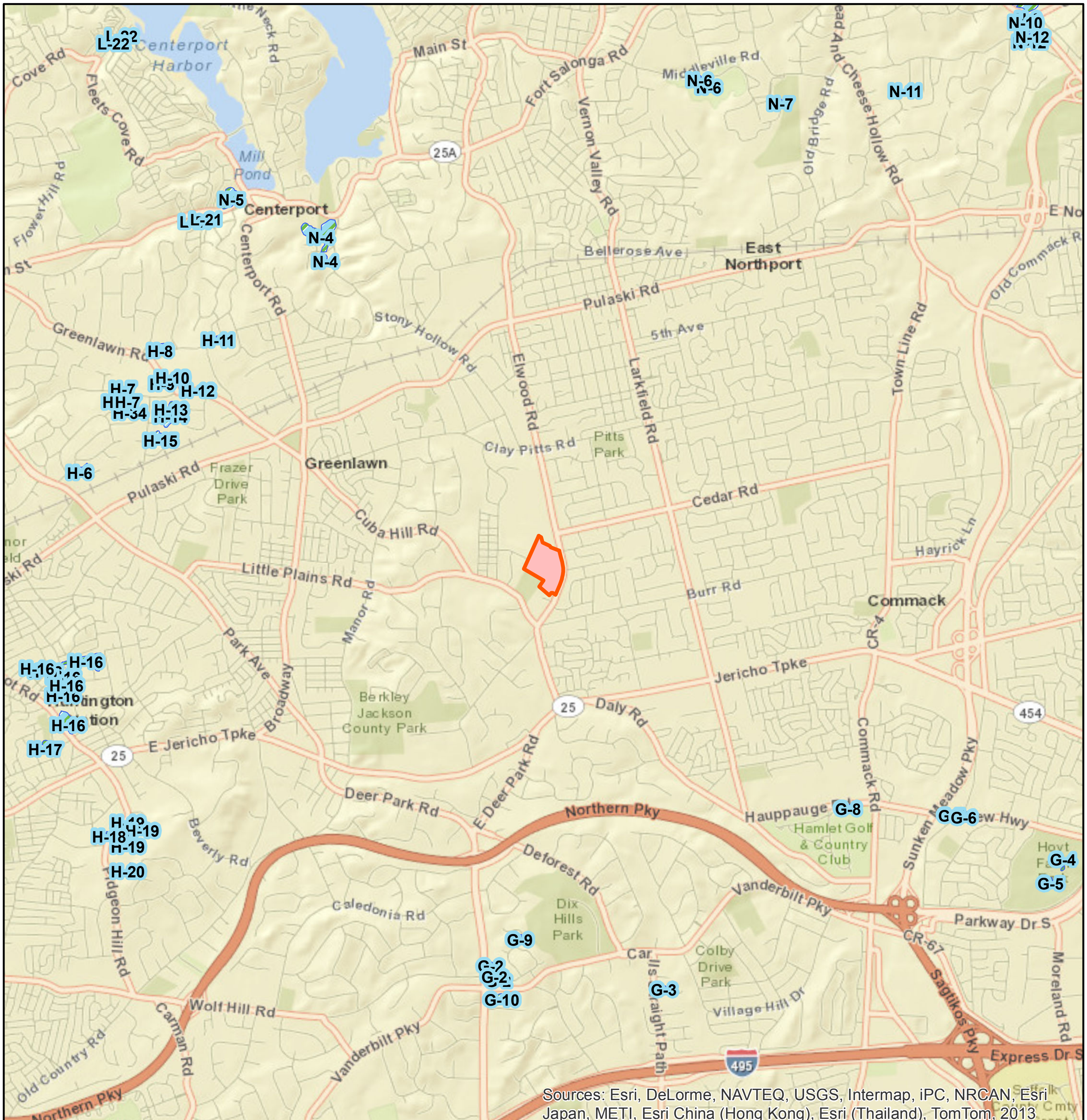
FIGURE 2-3
GEOLOGIC CROSS-SECTION

Source: Smolensky, Buxton, & Shernoff
Not to Scale

NORTH

The Seasons, Elwood

Expanded EAF



Legend NYSDEC Freshwater Wetlands

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FIGURE 2-4
NYSDEC FRESHWATER WETLANDS MAP

Source: ESRI Web Mapping Service
Scale: 1 inch = 5,000 feet

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FIGURE 2-5
WATER TABLE CONTOUR MAP

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Source: NYSGIS Orthoimagery Program, 2010;
Upper Glacial Groundwater Contours, 2006
Scale: 1 inch = 2,000 feet

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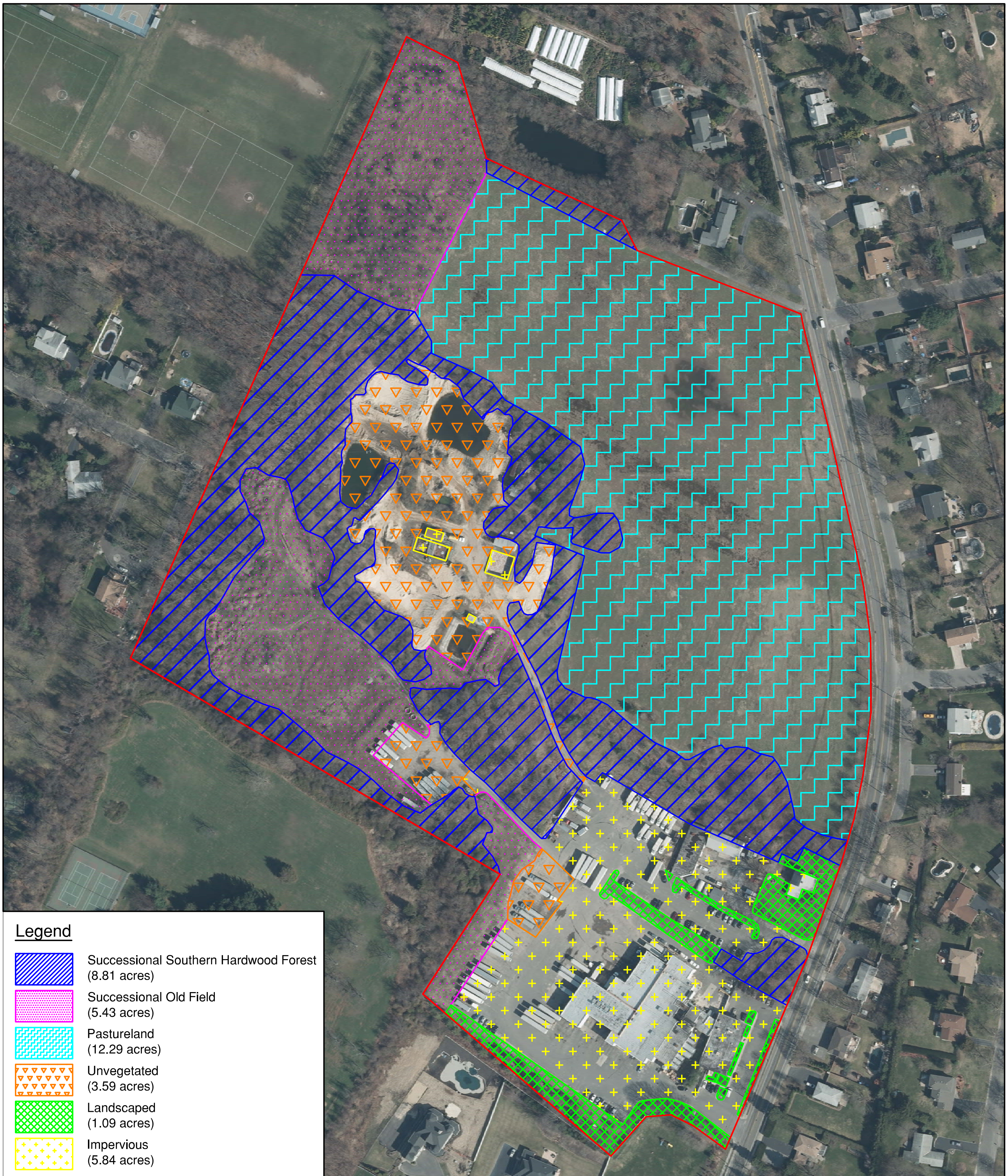

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FIGURE 2-6
HABITAT MAP

Source: NYSGIS Orthoimagery Program 2010
Scale: 1" = 250'

NORTH

The Seasons, Elwood

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FIGURE 3-1
LAND USE MAP

Source: NYSGIS Orthoimagery Program 2010
Scale: 1" = 500'

NORTH

The Seasons, Elwood

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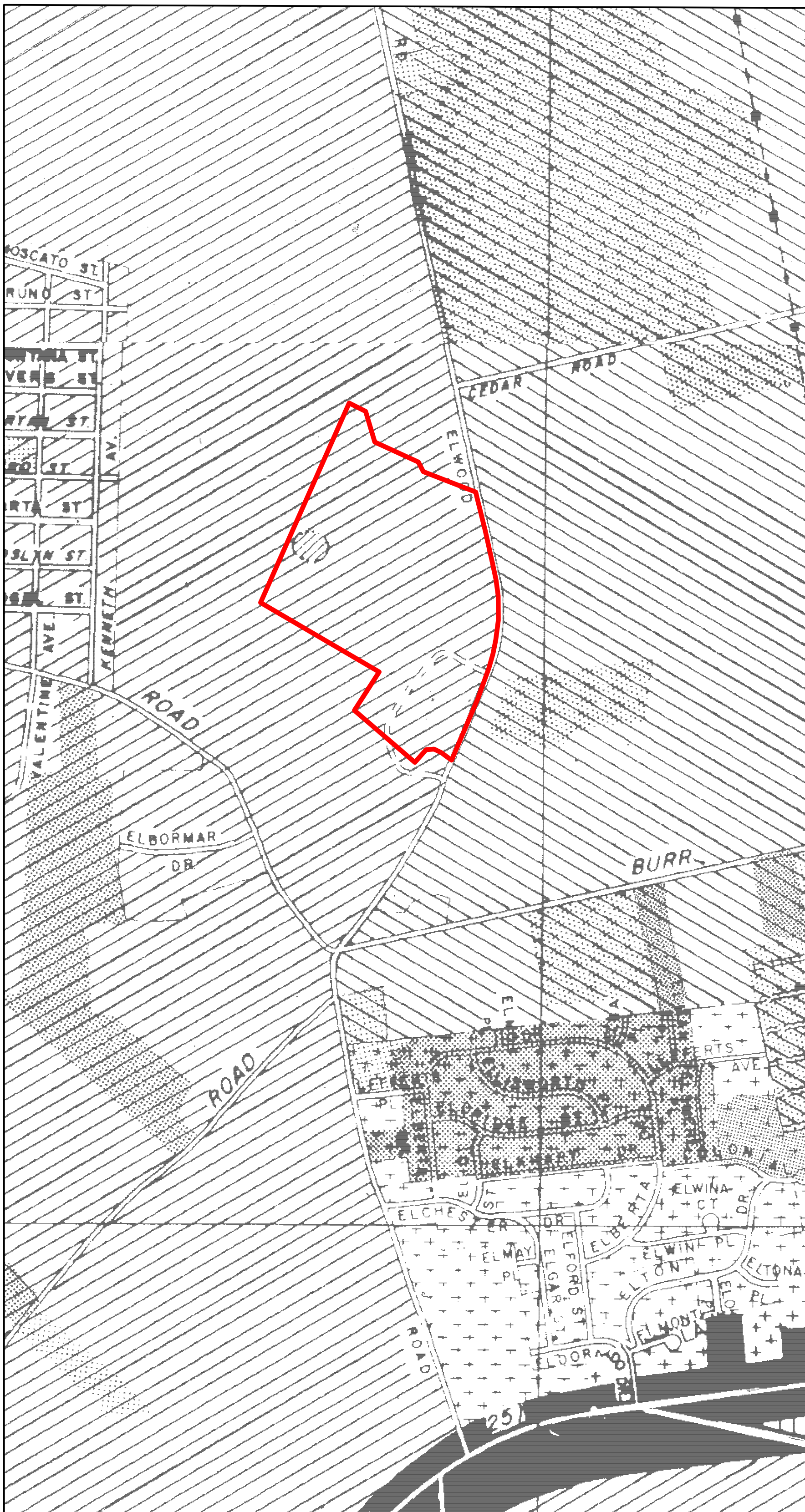

	198 - 13	R-80 RESIDENCE
	198 - 14	R-40 RESIDENCE
	198 - 15	R-20 RESIDENCE
	198 - 16	R-15 RESIDENCE
	198 - 17	R-10 RESIDENCE
	198 - 18	R-7 RESIDENCE
	198 - 19	R-5 RESIDENCE
	198 - 20	R-3M RESIDENCE
	198 - 21	R-RM RESIDENCE
R-MS	198 - 21.1	R-MS MEDICAL SERVICES
	198 - 22	C-1 OFFICE RESIDENCE
	198 - 23	C-2 SINGLE PURPOSE OFFICE BUILDING
	198 - 24	C-3 SPECIAL BUSINESS
	198 - 25	C-4 NEIGHBORHOOD BUSINESS
	198 - 26	C-5 PLANNED SHOPPING CENTER
	198 - 27	C-6 GENERAL BUSINESS
	198 - 28	C-7 HIGHWAY BUSINESS
	198 - 29	C-8 GENERAL BUSINESS "A"
	198 - 30	C-9 HARBOR USE
	198 - 31	C-10 PLANNED MOTEL
A	198 - 32	C-11 AUTOMOTIVE SERVICE STATION
	198 - 33	C-12 PROFESSIONAL
CC	198 - 33.1	C-13 CULTURAL CENTER
CR	198 - 33.2	C-14 COMMERCIAL RECREATION
A	198 - 34	I-1 LIGHT INDUSTRY
B	198 - 35	I-2 LIGHT INDUSTRY
C	198 - 36	I-3 LIGHT INDUSTRY
	198 - 37	I-4 LIGHT INDUSTRY
	198 - 38	I-5 GENERAL INDUSTRY
	198 - 39	I-6 GENERATING STATION

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FIGURE 3-2
ZONING MAP

Source: Huntington Zoning Map
Scale: 1" = 1,000'

NORTH

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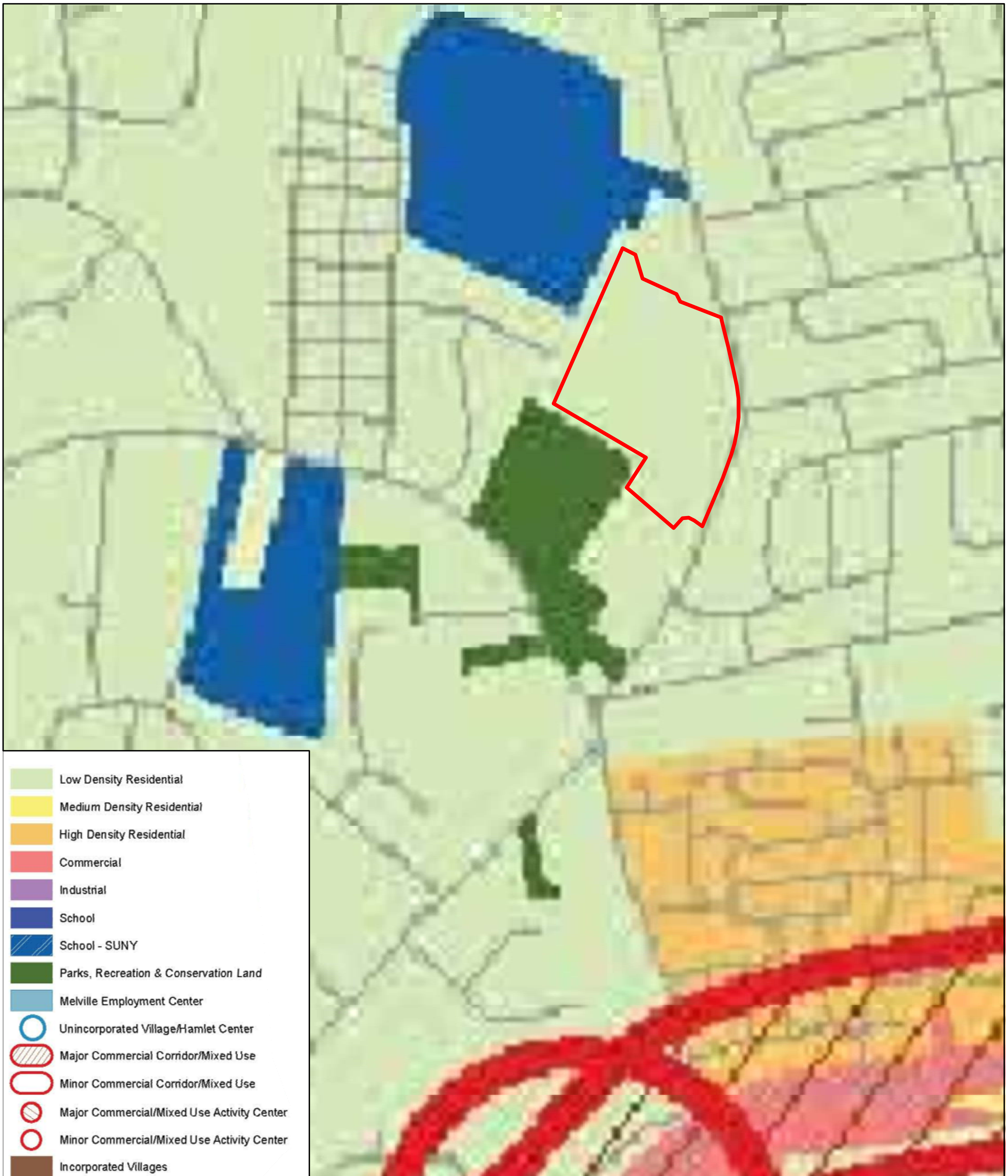

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FIGURE 3-3
TOWN HORIZONS 2020
PLAN MAP

Source: Huntington Draft Comprehensive Plan Update 2008
Scale: 1" = 1,000'

NORTH

The Seasons, Elwood

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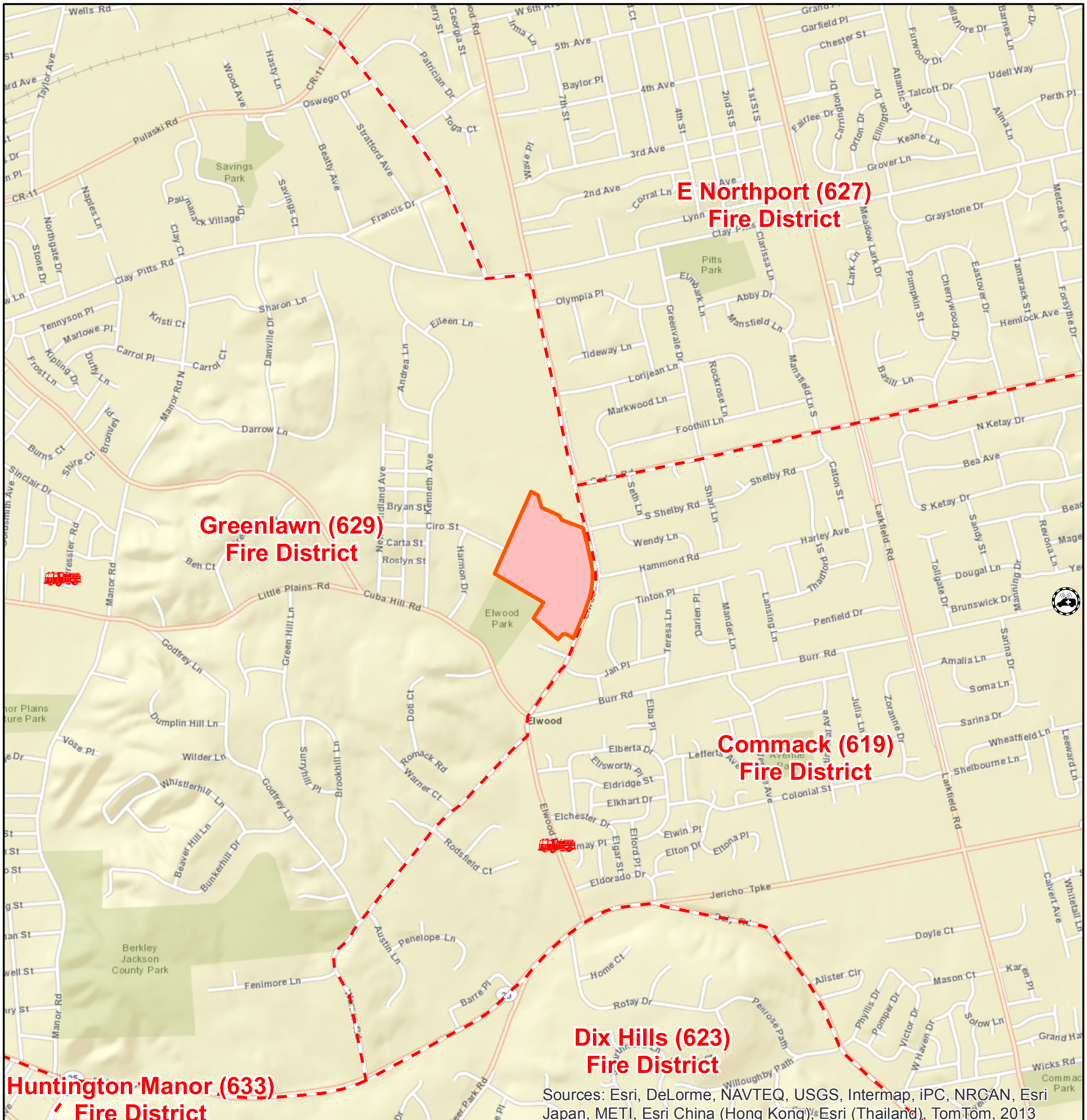

Legend Ambulance/EMS Fire Districts

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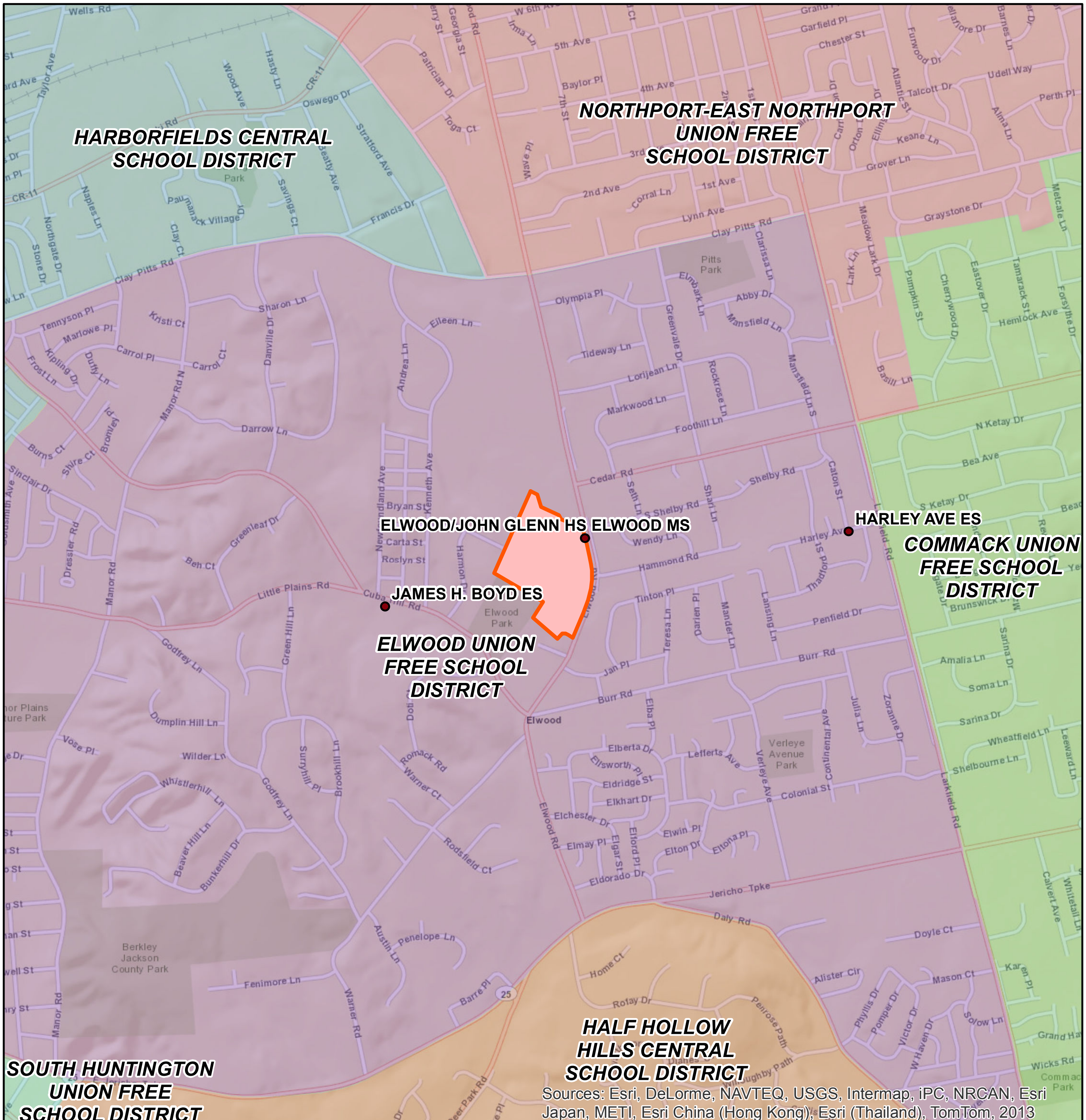
FIGURE 3-4
PUBLIC SAFETY RESOURCES

Source: ESRI Web Mapping Service
Scale: 1 inch = 2,000 feet

The Seasons, Elwood

Expanded EAF



Legend • Schools · Libraries

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FIGURE 3-5
EDUCATIONAL RESOURCES

Source: ESRI Web Mapping Service
Scale: 1 inch = 2,000 feet

The Seasons, Elwood

Expanded EAF

APPENDICES

APPENDIX A

MISCELLANEOUS DOCUMENTS

Appendix A-1
Fiscal and Economic Impact Analysis and Assessment of Project Needs and Benefits

NP&V, LLC

March 2014

NELSON POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING

FISCAL AND ECONOMIC IMPACT ANALYSIS AND ASSESSMENT OF NEEDS AND BENEFITS

The Seasons

East Northport, New York

NP&V No. 11157

Submitted to: BK Elwood, LLC
67 Clinton Road
Garden City, New York 11530

Submitted by: Nelson, Pope & Voorhis, LLC,
E*nvironmental Planning Consultants*
572 Walt Whitman Road
Melville, New York 11747
Phone: (631) 427-5665

May 5, 2014

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FISCAL AND ECONOMIC IMPACT ANALYSIS AND ASSESSMENT OF NEEDS AND BENEFITS

The Seasons

East Northport, New York

NP&V No. 11157

Prepared For:	BK Elwood, LLC 67 Clinton Road Garden City, New York 11530
Prepared By:	Nelson, Pope & Voorhis, LLC 572 Walt Whitman Road Melville, New York 11747 (631) 427-5665
Date:	May 5, 2014

1.0 INTRODUCTION AND PURPOSE

Nelson, Pope & Voorhis, LLC has prepared this fiscal and economic impact analysis as part of the Expanded Environmental Assessment Form (EAF) for The Seasons. NP&V is a professional environmental and planning firm with qualifications and expertise to prepare fiscal and economic impact analyses, and has a track record of similar completed fiscal and economic impact analysis, as well as residential and commercial market analysis and related economic development services to private and municipal clients. The economic qualifications of the firm and personnel are provided in **Attachment A**.

The ±37.05-acre subject property consists of one (1) parcel, identified as Suffolk County Tax Map District 400, Section 170, Block 2, Lot 15.1. The parcel is located on the west side of Elwood Road (County Route [CR] 10) opposite Hammond Road, within the hamlet of East Northport, Town of Huntington, Suffolk County, New York.

There currently exists a shortage of quality senior housing communities in Suffolk County. As baby boomers start to retire and empty nesters and seniors continue to age, the demand for this type of community will become an even greater and more prevalent issue in the local housing market. The current need for senior housing communities would be partially addressed through the construction of The Seasons in East Northport.

The Seasons community is proposed to include the construction of 360 condominium units for occupancy by qualified senior households, as regulated by the Town of Huntington zoning ordinance. The 360 proposed residences would be distributed in 56 two (2)-story structures. Thirty-four (34) of the buildings will contain eight (8) units (272 units total), and 22 buildings will have four (4) units each (88 units total). Each unit in the four (4)-unit structures will have an attached garage; no garages are proposed for the units in the eight-unit buildings. Each unit will have two (2) bedrooms, and each of the second-floor units in the four (4)-unit buildings will have a den that could be used as a third bedroom. The project also includes an approximately 17,000 SF, two (2)-story clubhouse building, with two (2) outdoor swimming pools, a patio/outdoor barbeque area, a Jacuzzi, a car wash area, a walking trail, a dog run, and a 5,000 SF sewage treatment plant (STP).

The proposed project will conform to Town Zoning Code Article 198-13 I (Affordable Housing), which requires a certain portion of the units to be designated "affordable" and set aside for purchase and occupancy by qualified households, of which at least 75% must be provided on-site (the remaining units would be sold at a "market rate"). Specifically, this Article indicates that, where a zone change is being sought so that the number of units would be increased from that of the existing zoning, 20% of the <u>increased</u> number of units are to be designated as affordable. As the site's yield under existing R-40 zoning is estimated at 30 lots, and the requested yield under the proposed R-RM zoning is 360 units, the increase is 330 units (360 minus 30). Consequently, 66 of the units must be set aside as affordable. It is noteworthy that Article 198-13 I(1)(d) allows an applicant to "buy back" up to 25% of the affordable units, by making a one-time payment to the Town of Huntington Affordable Housing Trust and Agency Fund. In the R-RM district, this fee is $100,000 per lot or dwelling unit to be bought back. In case of such a payment, the number of market-rate units would be increased by the number of "bought-back" units. At the present time, the applicant has not determined whether or not to utilize the buyback mechanism. In order to provide the Town Board with the information necessary to reach an informed decision on this application, this Fiscal and Economic Impact Analysis will indicate, where applicable, the range in the number of affordable units, which is at least 50 and may be as high as 66 units. Regardless, the applicant will conform to Town requirements regarding affordable units. All of the affordable units will be within the eight (8)-unit, non-garage structures.

The Seasons will create strong economic activity by providing jobs and a solid tax base. Consumer activity will ripple through the local community, creating beneficial fiscal and economic impacts throughout East Northport, the Town of Huntington, Suffolk County, and the region as a whole. The following analysis examines and quantifies the fiscal and economic impacts that are anticipated to result from the development of 360 senior residences at The Seasons. **Section 2.0** presents an executive summary and key findings of the fiscal and economic impact analysis. **Section 3.0** outlines the methodology and the sources of data used to project the fiscal and economic impacts generated in this analysis. **Section 4.0** describes the existing fiscal and economic conditions – including enrollment trends/population, budget, and current tax rates and levies for the Elwood Union Free School District (UFSD). This section also examines the land use and tax base composition, detailed budgets and the current tax rates and levies for both the Town of Huntington and Suffolk County. **Section 5.0** details the fiscal impacts that are anticipated to result from the proposed development. These include beneficial impacts to the local school district as well as the generation of annual property tax revenues allocated to each of the taxing jurisdictions located within the boundary of the site. **Section 6.0** depicts the economic impacts – on output, employment and labor income – during both the construction period and annually, upon a stabilized year of operations of the development. **Section 7.0** provides a conclusion with respect to the overall fiscal and economic impact analysis, and **Section 8.0** outlines the references utilized in this analysis.

2.0 EXECUTIVE SUMMARY

As noted in **Section 1.0**, this analysis examines the existing conditions and the fiscal and economic impacts that are associated with the development of 360 senior residences at The Seasons. Fiscal impacts include the generation of property tax revenues and their distribution among local taxing jurisdictions. Economic impacts include direct, indirect and induced benefits on output, employment and associated labor income during the construction phase and during a stabilized year of annual operations.

A summary of findings is provided herein, with detailed methodologies and references provided in the subsequent sections of this analysis. This analysis was prepared using methods, data and information that are considered to be industry standard for such fiscal and economic impact analyses.

Statement of Need

There currently exists a shortage of quality senior housing communities in Suffolk County. As baby boomers start to retire and empty nesters and seniors continue to age, the demand for this type of community will become an even greater and more prevalent issue in the local housing market. The current need for senior housing communities would be partially addressed through the construction of The Seasons in East Northport.

The proposed community will provide quality senior residences that will provide current area residents with the opportunity to remain in the community (perhaps in proximity to family, friends and accustomed neighborhoods) that may be an attractive consideration for potential buyers. The proposed community will conform to Article 16-A of the NYS General Municipal Law (Long Island Workforce Housing Act), by setting aside at least 10% of its yield for affordable housing, as defined by that law. In fact, the community will exceed this requirement, by providing between 50 and 66 affordable units. The proposed project will also satisfy a Town goal of providing affordable senior residences. The community is consistent with the spirit and intent, as well as key elements of, the Town Comprehensive Plan Update, which recognizes the importance of providing a mix of senior housing types. The Town's growing senior population is currently under-served by available appropriate housing, particularly with regard to the diversity of housing types.

The proposed community will increase the distribution of tax ratables throughout the Elwood UFSD, the Town of Huntington and Suffolk County. Moreover, The Seasons community will generate immediate construction jobs as well as permanent employment opportunities for Town and area residents. Such fiscal and economic benefits are most crucial during the current economic state throughout Long Island, New York State and the nation as a whole.

Definition of Economic Impacts

A *direct impact* arises from the first round of buying and selling. These direct impacts can be used to identify additional rounds of buying and selling for other sectors of the economy and to identify the impact of spending by local households. An *indirect impact* refers to the increase in sales of other industry sectors, which include further round-by-round sales. An *induced impact* accounts for the changes in output and labor income by those employed within the region, resulting from direct and indirect impacts. The *total impact* is the sum of the direct, indirect and induced impacts.

Key Findings

Existing Conditions

- While the largest land use category in the Town of Huntington is residential, the Town supports many retail and service businesses as well as office and industrial uses.
- According to the U.S. Census Bureau, there are 203,264 persons residing within 71,948 housing units located within the Town of Huntington.
- The vast majority of assessed parcels in the Town of Huntington are residential properties, comprising 86.9% of the total number of parcels. However, such properties comprise 69.1% of the Town's tax base and cause the greatest burden on community services.
- The Town of Huntington created a near-balanced budget for the 2013-14 fiscal year, with budgeted expenditures of approximately $185.2 million and anticipated revenues of approximately $181.9 million, leaving an appropriated fund balance of $4.3 million.
- Suffolk County created a 2013-14 budget with expenditures of over $2.7 billion and revenues of over $3.4 billion.
- The Seasons community is located within the Elwood Union Free School District. Student enrollment within the Elwood (UFSD) has increased by 94 students, or 3.8%, over the ten (10) years between 2002-03 and 2011-12. It is important to note, however, that the district's student population has remained relatively steady, remaining relatively unchanged between the 2004-05 and 2010-11 academic years. In the 2011-12 academic year, the enrollment declined substantially.
- The Elwood UFSD passed a balanced budget for the 2013-14 academic year, with revenues and expenditures totaling $57,035,292.
- When compared to rates over the past few years, unemployment has actually decreased slightly. However, as of March 2014, approximately 5,400 persons – 5.1% of the Town's labor force – are unemployed. It is important to note, however, that this data is not seasonally adjusted. Regardless, such trends are lower than Suffolk County, Long Island, and New York State, yet the relatively elevated levels of unemployment are indicative of the ongoing fiscal and economic constraints facing the state and the nation.
- It is important to note that such economic conditions facing the Town of Huntington and the Long Island region are temporary. The Long Island Association indicates overall employment growth of 2.2% between August 2012 and August 2013. Moreover, the median price of newly sold homes has been increasing throughout Long Island, and both Nassau and Suffolk counties experienced a significant increase in total property sales over the past year, providing further evidence that the local housing market is on the road to recovery.
- Property owners residing in this part of the Town of Huntington are currently taxed at a rate of $342.075 per $100 of assessed valuation. These tax rates account for property taxes paid to Elwood UFSD, Library District, Suffolk County, Suffolk County Police Department, various Town funds, Metropolitan Transportation Authority and other local taxing jurisdictions.
- The subject property is assessed at $47,500 (100% of the market valuation). Combined, this translates into a current generation of $162,486 in property tax revenues.

General Impacts

- The Seasons is proposed to include the development of 360 condominium units for senior residents.
- It is assumed that each of the units will generate an average of 1.5 residents. Given these assumptions and the proposed unit mix, it is projected that the development of The Seasons will create 540 residents. Since the proposed community is age-restricted, it is not anticipated to generate any school-aged children.

Anticipated Fiscal Impacts

- Between 50 and 66 of the 360 senior housing units at The Seasons will be "affordable". The remainder (between 294 and 310) will be sold as "market-rate" units.
- For taxing purposes, the total estimated market valuation of the "50 affordable/310 market-rate" scenario of the proposed community is approximately $170.4 million. Likewise, the total estimated market valuation of the "66 affordable/294 market-rate" scenario of the proposed community is approximately $167.0 million. Each scenario is based upon estimated selling prices for the affordable and market-rate residential units, and correspondence with the Town of Huntington Assessor. After applying a residential assessment ratio, a reduction in assessment to account for the condominium status of the community, and an equalization rate of 100%, the estimated assessed valuation of the community upon full build-out and occupancy ranges from $791,691 to $807,788.
- Regardless of the number of affordable units, the proposed community will significantly increase taxes generated by the site, resulting in a substantial increase in revenues distributed to each taxing jurisdiction. At full build-out, the proposed community is projected to generate over $2.7 million in annual taxes. This represents a net increase of between $2.5 and $2.6 million per year when compared to existing site conditions.
- Upon full build-out, The Seasons will levy between $1.96 and $2.0 million to the Elwood UFSD, representing 72.6% of the total tax generated by the site.
- The proposed development will levy between $68,101 and $69,486 to the Library District, comprising 2.5% of the tax levy.
- Suffolk County – which includes taxes generated for the General Fund, the Police Department, and the Out of County Tuition Fund – is projected to levy between $318,846 and $325,329, comprising 11.8% of the total generation.
- The Town of Huntington is projected to generate between $183,356 and $187,084 in annual property tax revenues under the proposed development, representing 6.8% of the tax generation. This reflects taxes paid to the Town/Part Town fund, the Highway Tax, and the Town-Wide Lighting District.
- The remainder of the projected taxes generated by the proposed development will be distributed among the Town's special taxing jurisdictions, including the Greenlawn Fire Districts, as well as the New York State Real Property Tax Law, the New York State MTA, the Open Space Bonds Fund, and the Greenlawn Water District.
- The proposed community will not generate additional school-aged children to the Elwood UFSD. However, the proposed development will levy property taxes for the Elwood UFSD, without imposing additional costs resulting from an increased enrollment. This net revenue – ranging from $1.96 to $2.0 million per year – could ease the district's need to tap into additional fund balances, and could also help alleviate an increased burden on other taxpayers throughout the district. Both of these alternatives are most crucial during a time of fiscal and economic hardships throughout Long Island, New York State and the nation.

A summary of key fiscal findings is provided in **Table 1**. The methodologies and full derivation of the facts and figures presented in the above summary are fully described in subsequent sections of this analysis.

Table 1
SUMMARY OF KEY FISCAL FINDINGS

Fiscal Parameter	Impact: 50 Affordable/310 Market-Rate Unit Scenario	Impact: 66 Affordable/294 Market-Rate Unit Scenario
Existing Tax Revenue Generation: Subject Property	$162,486	
Projected Residents	540	
School-Aged Children	*0*	
Total Estimated Assessed Valuation: The Seasons	$807,788	$791,691
Projected Total Tax Revenue: The Seasons	$2,763,242	$2,708,178
To Elwood UFSD	*$2,004,947*	*$1,964,994*
To Library District	*$69,486*	*$68,101*
To Suffolk County Police Department	*$295,465*	*$289,577*
To Other Departments at Suffolk County	*$29,864*	*$29,269*
To Town of Huntington	*$187,084*	*$183,356*
To Local and Special Taxing Jurisdictions	*$185,517*	*$181,820*

Source: Analysis by Nelson, Pope & Voorhis, LLC.

Anticipated Economic Impacts

- For the purpose of this analysis, it is anticipated that construction of The Seasons will commence in the fall of 2013, with construction occurring over four (4) phases. It is anticipated that construction will be complete after approximately 30-36 months, between the spring and fall of 2016.
- The construction period is projected to represent a total of $95 million in investment. This direct output is projected to generate an indirect impact of over $21.2 million, and an induced impact of over $31.8 million, bringing the total economic impact on output to nearly $148.1 million during the 30-36 month construction period.
- It is projected that the construction period will necessitate 278.0 full time equivalent employees. It is assumed that the same basic construction crew will be utilized from the commencement until the culmination of construction.
- The 278.0 FTE jobs created during the construction period will have an indirect impact of 184.7 FTE employees and an induced impact of 242.1 FTE employees in other industry sectors, bringing the total impact of construction to 705.1 FTE jobs during the construction period. This job creation – direct, as well as indirect and induced – is most crucial during Long Island's present economic state, and presents opportunities for persons who remain unemployed throughout the Town and the region.
- Labor income from the construction jobs are projected to amount to $62,190 per year, per employee. This represents approximately $171,023 per employee, and $47.5 million in collective earnings among the 278.0 FTE employees over the 30-36 month construction period. This labor income is projected to have an indirect impact of nearly $9.1 million and an induced impact of

nearly $11.3 million, bringing the total economic impact of the construction to nearly $67.9 million in labor income.

- The Seasons will begin the operational phase of development upon the completion of the four (4)-phase, 30-36 month construction period, anticipated to occur between the spring and fall of 2016. For the purpose of this analysis, a stabilized year of operations is assumed to occur in 2017, at which time The Seasons will be operating at full occupancy.
- The Seasons is projected to generate nearly $1.3 million in annual operational revenues, stemming from monthly homeowner's association fees.
- The $1.3 million in direct operational revenues are projected to generate an indirect impact of over $418,000 and an induced impact of over $298,000 per year. This additional output is generated through round-by-round sales made at various merchants in other sectors of the regional economy. These include local retailers, service providers, banks, grocers, restaurants, financial institutions, insurance companies, health and legal services providers, and other establishments in the region.
- The sum of the direct, indirect and induced impacts results in a total economic impact on output of over $2.0 million during annual operations.
- The Seasons is anticipated to generate ten (10) FTE employees during annual operations. The ten (10) FTE direct employment positions are projected to result in an indirect impact of 2.2 FTE jobs, and an induced impact of 2.1 FTE jobs throughout the region, bringing the total economic impact of operational employment to 14.3 FTE jobs during annual operations.
- The ten (10) FTE employees are anticipated to earn a total of approximately $375,000 in collective labor income. This direct labor income is projected to result in an indirect impact of over $141,000 and an induced impact of nearly $103,000, bringing the total economic impact of labor income to over $619,000 during annual operations.

A summary of key economic findings is provided in **Table 2**. The methodologies and full derivation of the facts and figures presented in the above summary are fully described in subsequent sections of this analysis.

Table 2
SUMMARY OF KEY ECONOMIC FINDINGS

Economic Impact Parameter	Output (Revenue)	Employment (Number of Jobs)	Labor Income (Wages)
Economic Impact of Construction			
Direct Impact	$95,000,000	278.0	$47,500,000
Indirect Impact	$21,216,581	184.7	$9,120,435
Induced Impact	$31,864,051	242.4	$11,278,330
Total Economic Impact of Construction	$148,080,632	705.1	$67,898,768
Economic Impact of a Stabilized Year of Operations			
Direct Impact	$1,296,000	10.0	$375,000
Indirect Impact	$418,466	2.2	$141,284
Induced Impact	$298,135	2.1	$102,924
Total Economic Impact of a Stabilized Year of Operations	$2,012,601	14.3	$619,209

Source: Data provided by BK Elwood, LLC; Analysis by Nelson, Pope & Voorhis, LLC, via IMPLAN software.

3.0 METHODOLOGY

Various data and information from state and local sources was used to analyze the fiscal and economic impacts stemming from the proposed development of The Seasons community.

BK Elwood, LLC supplied information regarding the existing condition of the subject property, the proposed unit mix, construction costs, construction/phasing schedule, projected employment and earnings during annual operations, estimated selling prices and monthly association fees.

Elwood UFSD provides data pertaining to the budget, enrollment trends, education costs and location of school buildings within the boundaries of the district.

The Town of Huntington and Suffolk County provides information regarding approved budgets and current tax rates for the parcel that comprise the subject property. This tax information was used to compare the existing revenues to those that are projected to be generated upon full build-out of The Seasons community.

New York State Education Department provides the School Report Card and the Fiscal Accountability Summary reports specific to the Elwood UFSD. This information allows for an analysis of how the development may affect the school district's enrollment and future budget.

New York State Office of the State Comptroller and New York State Office of Real Property Services both provide municipal tax information, and data pertaining to the existing tax base and tax revenues for the Town of Huntington and Suffolk County, New York. This information was used to better understand how local budgets and taxing jurisdictions will be affected by the development of The Seasons community.

United States Bureau of Labor Statistics and New York State Department of Labor publish the Occupational Employment Statistics survey. This survey was used to estimate the wages earned among those employed within construction and extraction occupations in the Long Island region. These wages were assumed for each of the employees during the construction of the proposed development.

United States Census Bureau provides the latest population counts and other pertinent demographic data for the Town of Huntington and Suffolk County.

Minnesota IMPLAN Group developed an economic impact modeling system called IMPLAN, short for "impact analysis for planning". The program was developed in the 1970s through the United States Department of Agriculture's Forest Service, and was privatized in 1993.

IMPLAN is built on a mathematical input-output (I-O) model to express relationships between various sectors of the economy in a specific geographic location. The I-O model assumes fixed relationships between producers and their suppliers based on demand, and the inter-industry relationships within a region largely determine how that economy will respond to change. In an

I-O model, the increase in demand for a certain product or service causes a multiplier effect; increased demand for a product affects the producer of the product, the producer's employees, the producer's suppliers, the supplier's employees, and so on, ultimately generating a total impact in the economy that is greater than the initial change in demand.

The IMPLAN model is a method for estimating local economic multipliers, including those pertaining to production, value-added, employment, wage and supplier data. IMPLAN differentiates in its software and data sets between 440 sectors that are recognized by the United States Department of Commerce. Multipliers are available for all states, counties and zip codes, and are derived from production, employment and trade data from sources including the United States Census Bureau, County Business Patterns, Annual Survey of Government Employment, Annual Survey of Retail Trade; United States Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Consumer Expenditure Survey; United States Department of Labor; Office of Management and Budget; United States Department of Commerce; Internal Revenue Service; United States Department of Agriculture, National Agricultural Statistical Service; Federal Procurement Data Center; and United States Bureau of Economic Analysis, Regional Economic Information System, Survey of Current Business, among other national, regional, state and local data sources.

IMPLAN is widely accepted as the industry standard for estimating how much a one-time or sustained increase in economic activity in a particular region will be supplied by industries located in the region. Federal government agencies such as the Army Corps of Engineers, Bureau of Economic Analysis, Bureau of Land Management, Environmental Protection Agency, Federal Reserve Bank, Fish and Wildlife Service, and National Park Service have used the multipliers to study the local impact of government regulation on specific industries and to assess the local economic impacts of Federal actions. State and local governments including New York State Department of Labor, New York State Division of the Budget, New York State Office of the State Comptroller, New York State Assembly and New York City Economic Development Corporation, have used the multipliers to estimate the regional economic impacts of government policies and projects and of events, such as the location of new businesses within their state, or to assess the impacts of tourism. Likewise, businesses, universities and private consultants have used the multipliers to estimate the economic impacts of a wide range of projects, such as building a new sports facility or expanding an airport; of natural disasters; of student spending; or of special events, such as national political conventions.

NP&V personnel have received formal IMPLAN training through the Minnesota Implan Group, and possess the qualifications to project economic impacts for a multitude of project types using this software. For the purpose of this analysis, multipliers specific to socio-economic data in Suffolk County were purchased and analyzed to determine the direct, indirect and induced economic impacts during both the short-term construction period and during annual operations of the proposed community. The economic impacts can be found in **Section 6.0** of this analysis.

4.0 EXISTING CONDITIONS

4.1 Municipal Fiscal Conditions

While the largest land use category in the Town of Huntington is residential, the Town supports many retail and service businesses as well as office and industrial uses. According to the U.S. Census Bureau, there are 203,264 persons residing within 71,948 housing units located within the Town of Huntington.[1] This large residential component is verified with land use classification data.[2] As seen in **Table 3** and in **Chart 1**, the vast majority of assessed parcels in the Town are residential properties, comprising 86.9% of the total number of parcels. The majority of parcels are classified as residential; however, residential parcels comprise a smaller portion of the Town's tax base, at 69.1% of the total assessed valuation. Vacant properties are the second most abundant land use, comprising 5.7% of the Town's parcels, yet only 0.7% of the local tax base. All other properties combine to constitute 7.4% of the number of parcels within the Town, yet make up 30.2% of the tax base.

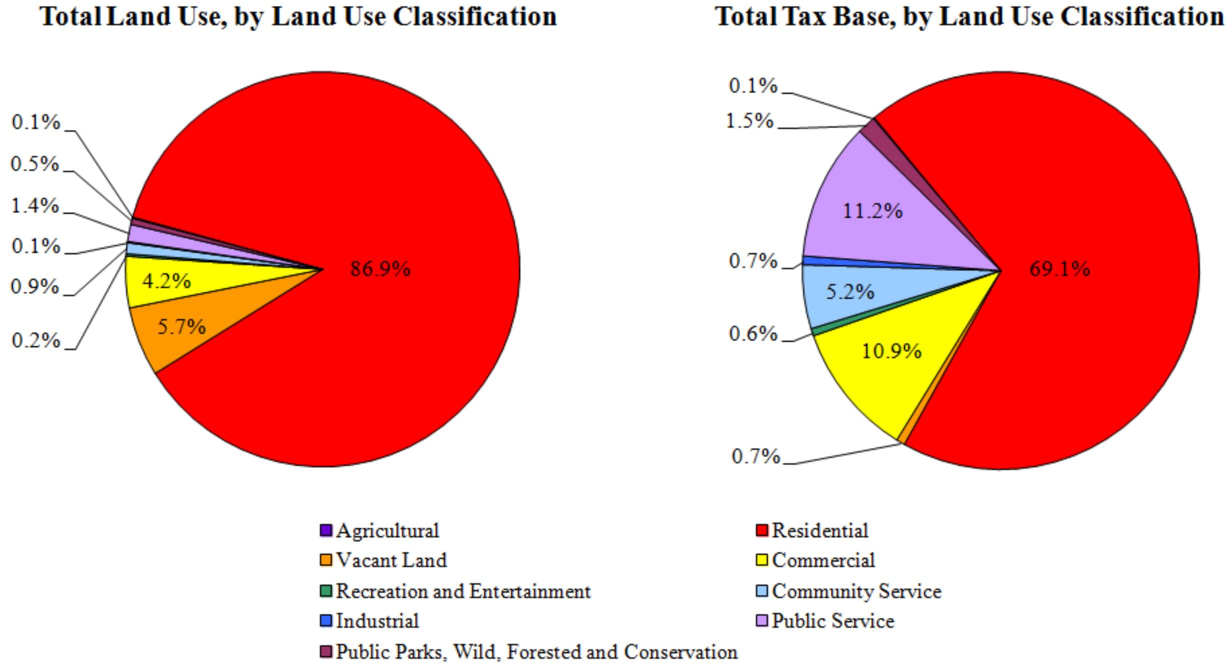
Table 3
LAND USE AND TAX BASE COMPOSITION, TOWN OF HUNTINGTON: 2012

Land Use Classification	Number of Parcels	Percent of Total Land Use	Assessed Valuation	Percent of Total Tax Base
Agricultural Properties	57	0.1%	$345,795	0.1%
Residential Properties	63,211	86.9%	$257,776,954	69.1%
Vacant Land	4,144	5.7%	$2,495,226	0.7%
Commercial Properties	3,037	4.2%	$40,501,691	10.9%
Recreation and Entertainment Properties	146	0.2%	$2,294,200	0.6%
Community Service Properties	655	0.9%	$19,463,767	5.2%
Industrial Properties	96	0.1%	$2,721,230	0.7%
Public Service Properties	1,036	1.4%	$41,659,937	11.2%
Public Parks, Wild, Forested and Conservation Properties	375	0.5%	$5,596,218	1.5%
TOTAL: ALL PROPERTIES	**72,757**	**100.0%**	**$372,855,018**	**100.0%**

Source: New York State Office of Real Property Services; Analysis by Nelson, Pope & Voorhis, LLC.

[1] 2010 Decennial Census via the U.S. Census Bureau.
[2] New York State Office of Real Property Services, 2012 Annual Assessment Rolls, 2012 Parcel Counts by Individual Property Class Code.

Chart 1
LAND USE AND TAX BASE COMPOSITION, TOWN OF HUNTINGTON: 2012
Source: New York State Office of Real Property Services; Analysis by Nelson, Pope & Voorhis, LLC



The Town of Huntington created a near-balanced budget for the 2013-14 fiscal year, with budgeted expenditures of approximately $185.2 million and anticipated revenues of approximately $181.9 million, leaving an appropriated fund balance of $4.3 million. The Town's budget is comprised of thirteen (13) major funds. These include the General Fund, the Highway Fund, the Consolidated Refuse Fund, the Part Town fund, the Business Improvement District fund, the Fire Protection fund, the Street Lighting fund, the Commack Ambulance fund, the Huntington Community Ambulance fund, the Huntington Sewer fund, the Centerport Sewer fund, the Waste Water Disposal fund, and the Dix Hills Water District fund.[3]

Suffolk County created a 2013-14 budget with expenditures of over $2.7 billion and revenues of over $3.4 billion. This budget includes 53 funds, with the major operating funds being the General Fund and the Police District Fund.[4]

[3] Town of Huntington, 2014 Adopted Budget.
[4] Recommended Operating Budget: Narrative and Appropriations, County of Suffolk, New York, Volume No. 1, 2014.

Table 4
MUNICIPAL BUDGETS: FISCAL YEAR 2013-14

	Town of Huntington	Suffolk County
Total Expenditures	$185,253,796	$2,756,284,724
Total Revenues	$185,253,796	$3,470,272,120

Source: Town of Huntington; Suffolk County; Analysis by Nelson, Pope & Voorhis, LLC

A closer examination of the audited and reported 2012[5] fiscal year financial data for the Town of Huntington and Suffolk County reveals the actual revenues and expenditures that occurred. In fiscal year 2012, the Town of Huntington expended approximately $211.6 million. The two (2) largest categories of the Town's budget were employee benefits – which comprised 17.4% of the total budget – and sanitation – which accounted for 16.7% of the budget. Less than one (1%) percent of the budget was allocated to education, health, and social services during the year.[6]

The Town levied approximately $214.3 million in revenues in fiscal year 2012. Not surprisingly, the two (2) largest sources of income in the Town's budget include real property taxes and assessments, and charges for services. Real property taxes and assessments generated approximately $115.0 million and levied roughly 53.6% of the Town's revenues, and charges for services levied over $42.3 million, comprising 19.8% of Town revenues. In fiscal year 2012, the Town of Huntington experienced a surplus of over $2.7 million. Nevertheless, the Town is indebted over $112.7 million.[7]

In fiscal year 2012, Suffolk County expended approximately $3.4 billion. Indicative of the different levels of government and services provided to its residents, Suffolk County reported public safety and social services as their top expenditures. Public safety expenses totaled $686.5 million, and comprised 20.0% of the County budget. Likewise, approximately $597.5 million was allocated to social services, which made up 17.4% of the annual budget. Similar to the Town's expenditures, very little money was allocated to economic development, culture and recreation, community services and utilities, with all four (4) line items comprising only 2.8% of the budget.[8]

During the same year, the County levied nearly $3.3 billion in revenues. The largest source of income levied by the County was sales and use tax, which accounted for approximately $1.2 billion or 36.6% of total County revenues. Real property taxes and assessments levied $566.9 million and comprised 17.3% of annual revenues. The $144.6 million deficit will contribute to the County's debt, which exceeded $2.2 billion as of the end of the 2012 fiscal year.[9]

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[5] As of the date of submission of this analysis, this represents the most current year that such detailed financial data is available.
[6] New York State Office of the State Comptroller, 2012 Report on Financial Data for Local Governments.
[7] New York State Office of the State Comptroller, 2012 Report on Financial Data for Local Governments.
[8] New York State Office of the State Comptroller, 2012 Report on Financial Data for Local Governments.
[9] New York State Office of the State Comptroller, 2012 Report on Financial Data for Local Governments.

Table 5
ACTUAL MUNICIPAL EXPENDITURES AND REVENUES: FISCAL YEAR 2012

	Town of Huntington	Percent of Town Budget	Suffolk County	Percent of County Budget
Total Expenditures	**$211,592,147**	**100.0%**	**$3,427,952,028**	**100.0%**
General Government	$27,110,434	12.8%	$301,455,833	8.8%
Education	$0	0.0%	$208,241,279	6.1%
Public Safety	$27,075,774	12.8%	$686,568,330	20.0%
Health	$867,103	0.4%	$170,642,655	5.0%
Transportation	$27,792,750	13.1%	$167,782,894	4.9%
Social Services	$93,032	< 0.1%	$597,547,312	17.4%
Economic Development	$1,409,128	0.7%	$38,643,150	1.1%
Culture and Recreation	$13,564,210	6.4%	$28,575,285	0.8%
Community Services	$3,246,540	1.5%	$22,470,620	0.7%
Utilities	$15,780,485	7.5%	$4,591,681	0.1%
Sanitation	$35,372,454	16.7%	$82,877,240	2.4%
Employee Benefits	$36,732,435	17.4%	$572,651,651	16.7%
Debt Service	$17,012,774	8.0%	$167,643,821	4.9%
Other Uses	$5,535,028	2.6%	$378,260,277	11.0%
Total Revenues	**$214,355,870**	**100.0%**	**$3,283,336,761**	**100.0%**
Real Property Taxes and Assessments	$114,982,478	53.6%	$566,966,640	17.3%
Other Real Property Tax Items	$360,646	0.2%	$47,152,295	1.4%
Sales and Use Tax	$144,701	0.1%	$1,200,861,256	36.6%
Other Non Property Taxes	$3,788,185	1.8%	$17,474,664	0.5%
Charges for Services	$42,368,596	19.8%	$205,726,826	6.3%
Charges to Other Governments	$232,123	0.1%	$15,000,567	0.5%
Use and Sale of Property	$5,288,104	2.5%	$21,758,034	0.7%
Other Local Revenues	$3,484,062	1.6%	$66,304,892	2.0%
State Aid	$13,482,704	6.3%	$291,300,980	8.9%
Federal Aid	$17,089,243	8.0%	$295,457,783	9.0%
Proceeds of Debt	$7,600,000	3.5%	$153,014,960	4.7%
Other Sources	$5,535,028	2.6%	$402,317,864	12.3%
Total Indebtedness	**$112,712,845**	**--**	**$2,265,488,472**	**--**

Source: New York State Office of the State Comptroller; Analysis by Nelson, Pope & Voorhis, LLC

4.2 School District Fiscal Conditions

The Seasons community is located within the Elwood UFSD. The district is comprised of four (4) schools: Harley Avenue Primary School (K-2), James H. Boyd Intermediate School (grades 3-5), Elwood Middle School (grades 6-8) and Elwood-John H. Glenn High School (grades 9-12).

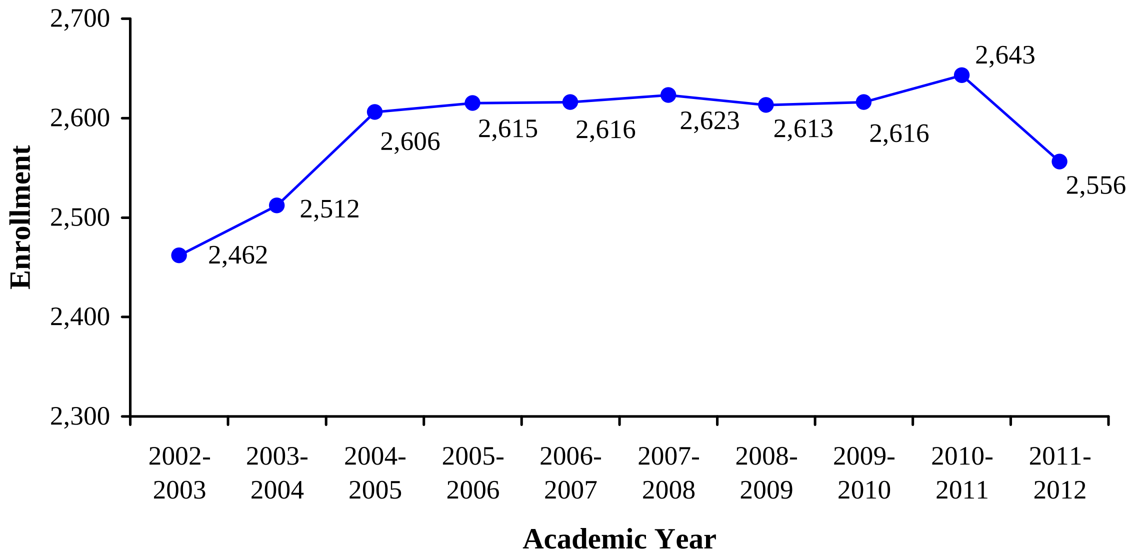
As seen in **Table 6** and **Chart 2**, the cumulative enrollment within the school district has increased by 94 students, or 3.8%, over the ten (10) years between 2002-03 and 2011-12. It is important to note, however, that the district's student population has remained relatively steady, remaining relatively unchanged between the 2004-05 and 2010-11 academic years. In the 2011-12 academic year, the enrollment declined substantially. Regardless of these trends; however, there are no known capacity or overcrowding issues within the school district.

Table 6
ENROLLMENT TRENDS: ELWOOD UFSD

Academic Year	Harley Avenue Primary School	James H. Boyd Intermediate School	Elwood Middle School	Elwood - John H. Glenn High School	Total: Elwood UFSD
2002-03	607	622	604	629	2,462
2003-04	597	647	604	664	2,512
2004-05	625	631	618	732	2,606
2005-06	615	622	622	756	2,615
2006-07	569	627	657	763	2,616
2007-08	527	647	644	805	2,623
2008-09	528	637	637	811	2,613
2009-10	539	593	653	831	2,616
2010-11	572	564	667	840	2,643
2011-12	520	550	642	844	2,556
Change: 2002-03 to 2011-12	**-14.3%**	**-11.6%**	**+6.3%**	**+34.2%**	**+94 students 3.8% increase**

Source: New York State Education Department; Analysis by Nelson, Pope & Voorhis, LLC.

Chart 2
ENROLLMENT TRENDS
Source: New York State Education Department; Analysis by Nelson, Pope & Voorhis, LLC.



According to the New York State School Report Card, Fiscal Accountability Supplement for Elwood UFSD, expenditures averaged $10,489 per general education student and $33,516 per special education student during the 2010-11 academic year.[10] During this year, 277 students, or 9.4% of the students within Elwood UFSD, were enrolled in the special education program.

The Elwood UFSD passed a balanced budget for the 2013-14 academic year, with revenues and expenditures totaling $57,035,292. Similar to municipal budgets, school district budgets are projected to be balanced. A closer examination of the audited and reported 2012[11] Elwood UFSD financial data reveals that the district generated approximately $55.7 million. Of this, over $35.1 million was levied through property taxes and assessments, and over $11.6 million from state aid. In 2012, expenditures nearly equaled revenues, at $53.7 million. This included over $33.9 million for education expenses and nearly $11.8 million for employee benefits. The school district witnessed a $1.9 million surplus in 2012; nevertheless, the district is indebted over $15.4 million.[12]

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[10] As of the date of submission of this analysis, this represents the most current year that such detailed financial data is available.
[11] As of the date of submission of this analysis, this represents the most current year that such detailed financial data is available.
[12] New York State Office of the State Comptroller, 2012 Report on Financial Data for Local Governments.

Table 7
SCHOOL DISTRICT BUDGET

	2012 Actual	2013-14 Adopted
Total Expenditures	$53,741,742	$57,035,292
Total Revenues	$55,710,984	$57,035,292

Source: Elwood UFSD; New York State Office of the State Comptroller; Analysis by Nelson, Pope & Voorhis, LLC.

4.3 Unemployment Trends

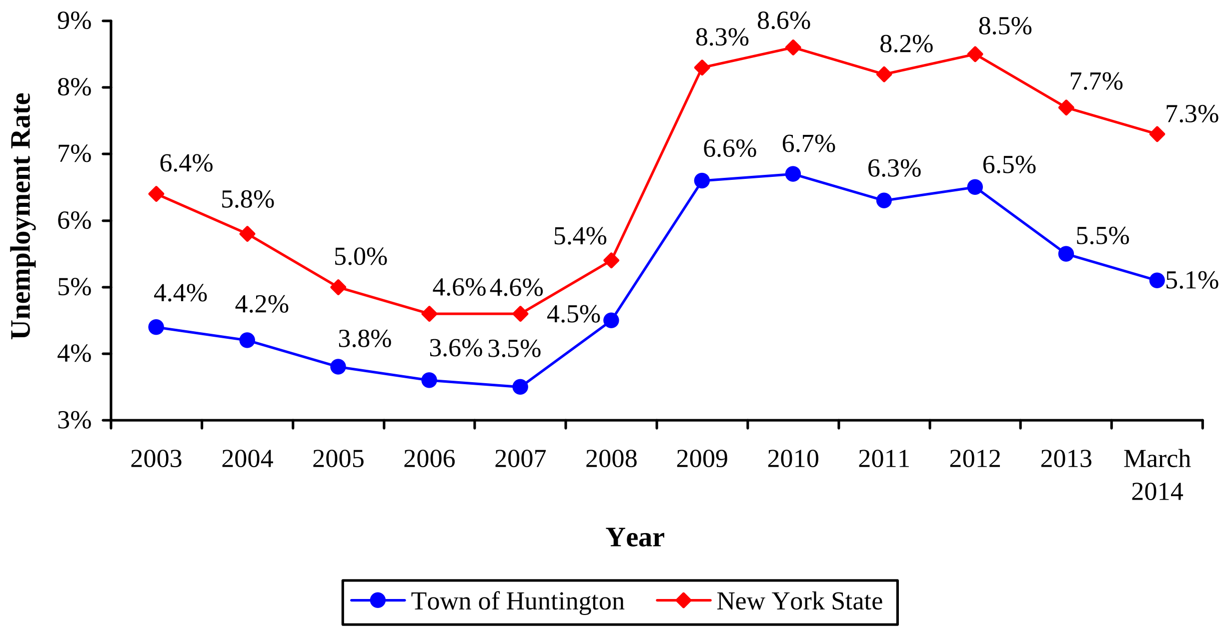
Unemployment data for the Town of Huntington, Suffolk County and Long Island were compared to that of New York State to illustrate the current economic state of the region. As evidenced in **Table 8** and **Chart 3**, unemployment rates in the Town of Huntington have increased substantially over the past few years. According to New York State Department of Labor, the Town's unemployment rate nearly doubled between 2007 and 2010. This rate had decreased slightly over the past few years, with the latest estimates (from March 2014) suggesting that approximately 5,400 persons – 5.1% of the Town's labor force – are unemployed. It is important to note, however, that this data is not seasonally adjusted; annual data indicates that unemployment rates have decreased since their 2010 peak. Such trends in the Town of Huntington are lower than Suffolk County, Long Island, and New York State, yet the relatively elevated levels of unemployment are indicative of the ongoing fiscal and economic constraints facing the state and the nation.

Table 8
UNEMPLOYMENT TRENDS

Year	Town of Huntington		Suffolk County		Long Island		New York State	
	Percent	Number	Percent	Number	Percent	Number	Percent	Number
2003	4.4%	4,500	4.8%	36,800	4.8%	68,600	6.4%	595,100
2004	4.2%	4,400	4.7%	36,000	4.6%	67,000	5.8%	544,100
2005	3.8%	4,000	4.2%	33,100	4.2%	61,300	5.0%	474,300
2006	3.6%	3,800	4.0%	31,400	3.9%	58,000	4.6%	437,400
2007	3.5%	3,700	3.9%	31,000	3.8%	57,000	4.6%	434,300
2008	4.5%	4,800	5.0%	40,000	4.9%	73,000	5.4%	518,000
2009	6.6%	7,000	7.4%	58,200	7.2%	106,500	8.3%	804,600
2010	6.7%	7,100	7.6%	60,000	7.4%	108,900	8.6%	827,500
2011	6.3%	6,700	7.4%	58,300	7.1%	104,700	8.2%	786,800
2012	6.5%	6,900	7.6%	59,800	7.3%	108,400	8.5%	815,200
2013	5.5%	6,000	6.4%	50,900	6.2%	92,300	7.7%	737,300
March 2014	5.1%	5,400	6.0%	47,300	5.7%	83,200	7.3%	697,400

Source: New York State Department of Labor; Analysis by Nelson, Pope & Voorhis, LLC.

Chart 3
UNEMPLOYMENT TRENDS
Source: New York State Department of Labor; Analysis by Nelson, Pope & Voorhis, LLC



It is important to note that such economic conditions facing the Town of Huntington and the Long Island region are temporary. The Long Island Association indicates overall employment growth of 2.2% between August 2012 and August 2013. The greatest job growth occurred in various industry sectors, including Couriers and Messengers, Specialty Trade Contractors, Admin Supply and Waste Management Services, Arts, Entertainment and Recreation, and Natural Resources, Mining and Construction. On the contrary, the largest job losses occurred within the following industries: State Government Hospitals, Durable Goods Manufacturing, Clothing and Accessory Stores, Wholesale Trade, and the Federal Government.

The median price of newly sold homes has been increasing throughout Long Island – by 2.3% in Nassau County and by 8.7% in Suffolk County between August 2012 and August 2013. Moreover, both Nassau and Suffolk counties experienced a significant increase in total property sales over the past year, providing further evidence that the local housing market is on the road to recovery.[13]

4.4 Existing Tax Revenue and Distribution of Subject Property

As evidenced in **Section 4.1** and **Table 5**, the majority of the Town's revenues are levied through property tax generation, which is based upon a rate per $100 of assessed valuation for a given

[13] Long Island Association, *"LIA Monthly Economic Report,"* October, 2013.

parcel. As indicated in **Table 9**, property owners within this part of the Town of Huntington are currently[14] taxed at a rate of $342.075 per $100 of assessed valuation. These tax rates account for property taxes paid to Elwood UFSD, Library District, Suffolk County, Suffolk County Police Department, various Town funds, Metropolitan Transportation Authority and other local taxing jurisdictions.

According to the Town of Huntington Assessor's Office, the tax parcel that comprises the subject property is assessed at $47,500 (100% of the market valuation). This translates into a current generation of $162,486 in property tax revenues. Of this, $117,896 or 72.6% of the total taxes generated by the site are distributed to the Elwood UFSD, and $4,086 or 2.5% of the taxes are allocated to the Library District. An additional $19,130 or 11.8% of the total tax revenues are distributed to Suffolk County, which includes the General Fund, the Police Department, and Out of County Tuition. Approximately 6.8% of the tax revenue is levied to the Town of Huntington, which includes the Town/Part Town funds, Highway Fund and Town-Wide Lighting District. These three (3) line items combine to total $11,000 in revenues. The Greenlawn Fire District levies $5,790, or 3.6% of the total tax revenue generated by the subject parcel. The balance of the current property tax revenues are apportioned to various other local taxing jurisdictions, as seen in **Table 9**.

**Table 9
EXISTING TAX REVENUES**

Taxing Jurisdiction	Current Tax Rate (per $100 Assessed Valuation)	Current Tax Revenue	Percent of Total Tax Revenue
Elwood UFSD	248.202	$117,896	72.6%
Elwood Library District	8.602	$4,086	2.5%
Suffolk County	2.843	$1,350	0.8%
Suffolk County Police District	36.577	$17,374	10.7%
Out of County Tuition	0.854	$406	0.2%
Town/Part Town	12.093	$5,744	3.5%
Highway Tax	9.938	$4,721	2.9%
Town-Wide Lighting District	1.129	$536	0.3%
New York State Real Property Tax Law	4.065	$1,931	1.2%
New York State MTA Tax	0.456	$217	0.1%
Open Space Bonds II & III	0.157	$75	0.0%
Greenlawn Fire District	12.189	$5,790	3.6%
Greenlawn Water District	4.970	$2,361	1.5%
TOTAL: ALL TAXING JURISDICTIONS	**342.075**	**$162,486**	**100.0%**

Source: Town of Huntington Receiver of Taxes; Analysis by Nelson, Pope & Voorhis, LLC.

[14] The Town of Huntington's fiscal year is between December 1, 2013 and November 31, 2014.

5.0 ANTICIPATED FISCAL IMPACTS

5.1 General Impacts

This section seeks to determine the population that would likely reside within The Seasons in order to quantify fiscal impacts. As discussed in **Section 1.0**, the proposed community is anticipated to include 360 condominium units for senior residents. For the purpose of this analysis, it is assumed that each of the units will generate an average of 1.5 residents. Given these assumptions and the proposed unit mix, it is projected that the development of The Seasons will create 540 residents. Since the proposed community is age-restricted, it is not anticipated to generate any school-aged children.

5.2 Municipal Fiscal Impacts

Many of the Town and County's community services and facilities are supported in large part by the revenues generated through property taxes. The Town of Huntington and Suffolk County, as well as other local taxing jurisdictions will greatly benefit from an increase in such property tax revenues, resulting from the development and operation of The Seasons.

For the purpose of this analysis, it is necessary to determine the assessed valuation for The Seasons. The value was determined based upon estimated selling prices for the residential units, and correspondence with the Town of Huntington Assessor. Selling prices for the market-rate condominiums are anticipated to range from $475,000 for the condominium units without garages, to $589,000 for the condominium units with garages.

Selling prices for the affordable residential units are based on the Town's Affordable Housing Law, which states that *"the initial sale price of half the units shall be an amount equal to eighty (80%) percent of the median income multiplied by 2.5."* As further mentioned in the Town Code, the sale price of the other half of the units can range up to *"one hundred twenty (120%) percent of the median income multiplied by 2.5."* According to the U.S. Department of Housing and Urban Development, the 2014 area median family income for a family of four (4) in Suffolk County was $105,100. As such, and at two-and-a-half times 80% of the area median family income ($84,080), selling prices for half of the units are anticipated to be $210,200. At two-and-a-half times 120% of the area median family income ($129,000), selling prices for the other half of the units are anticipated to be $315,300. This results in an average selling price of $262,750. Such selling prices are assumed for the purpose of this analysis.[15]

As stated in **Section 1.0**, the proposed project will conform to Town Zoning Code Article 198-13 I (Affordable Housing), which requires a certain portion of the units to be designated "affordable" and set aside for purchase and occupancy by qualified households. As such, 66 of the 360 proposed senior housing units must be set aside as affordable. However, it is important to note

[15] Selling prices were provided by BK Elwood, LLC, in March 2014. It is important to note that all costs are estimates based upon market conditions as of the date of submission of this analysis.

that Article 198-13 I(1)(d) allows an applicant to "buyback" up to 25% of the affordable units, by making a one-time payment to the Town of Huntington Affordable Housing Trust and Agency Fund. In case of such a payment, the number of market-rate units would be increased by the number of "bought-back" units. At the present time, the applicant has not determined whether or not to utilize the buyback mechanism. As such, and in an effort to provide the Town Board with the information necessary to reach an informed decision on this application, the following section will indicate the range in the number of affordable units, which is at least 50 and may be as high as 66 units. Likewise, the number of market-rate units would range from 294 to 310 units. The following analysis examines both scenarios.

50 Affordable Unit/310 Market-Rate Unit Scenario

Given the above-mentioned assumptions regarding selling prices, and when applied to the 50 affordable units and the 310 market-rate units, the estimated market valuation for the residential units for taxing purposes is approximately $170.4 million. This was then applied to the Town of Huntington's current residential assessment ratio (RAR) of 0.79%, which resulted in a market valuation of approximately $1.34 million. For the purpose of this analysis, the value of the recreational building and other improvements to the property is included within this assessment. When applying a 40% reduction in assessment to account for the condominium status of the proposed community, and then an equalization rate of 100%, the projected assessed valuation of the community (assuming this scenario) upon full build-out and occupancy is $807,788. This is seen in **Table 10a**.

Table 10a
ESTIMATED ASSESSED VALUATION:
50 AFFORDABLE UNIT/310 MARKET-RATE UNIT-SCENARIO

Type of Unit	Number of Units	Proposed Selling Price	Assessed Valuation
Market-Rate Condominiums (without garages)	222	$475,000	$105,450,000
Market-Rate Condominiums (with garages)	88	$589,000	$51,832,000
Affordable Condominiums (without garages)	50	$262,750[16]	$13,137,500
Sub-total: All Residential Units	*360*	--	*$170,419,500*
Residential Assessment Ratio	--	--	0.79
Market Valuation: Residential Units	--	--	*$1,346,314*
Condominium Assessment Reduction			40% Reduction
Assessed Valuation			$807,788
Equalization Rate			100.00%
Projected Assessed Valuation: Proposed Community			**$807,788**

Source: Data provided by BK Elwood, LLC; Analysis by Nelson, Pope & Voorhis, LLC.

[16] For the purpose of this analysis, it is assumed that half of the affordable residences will sell for $210,200 (80% of the area median family income, multiplied by 2.5), and half of the affordable residences will sell for $315,300 (120% of the area median family income, multiplied by 2.5).

Current tax and equalization rates can be applied to the assessed valuation in order to project the impact that this development scenario will have on the local tax base. **Table 11a** shows the current tax rates and revenues that are projected to be levied from full build-out of the proposed development scenario with 50 affordable units and 310 market-rate units. The information provided in the table was derived from the current assessment factors and tax rates provided by the Town of Huntington Receiver of Taxes, the Town of Huntington Assessor's Office, as well as the total projected assessed valuation for the development upon full build-out. It is important to note that all analyses are based on current tax dollars, and the revenue allotted among taxing jurisdictions will vary from year to year, depending on the annual tax rates, assessed valuation and equalization rates. Further, the final assessment and levy will be determined by the sole assessor at the time of occupancy. Projections included herein are as accurate as possible using fiscal impact methodologies, for the purpose of the planning and land use approval process.

Table 11a
ANTICIPATED TAX REVENUE GENERATION:
50 AFFORDABLE UNIT/310 MARKET-RATE UNIT-SCENARIO

Taxing Jurisdiction	Current Tax Revenue	Projected Tax Revenue	Increase in Tax Revenue	Percent of Total Tax Revenue
Elwood UFSD	$117,896	$2,004,947	$1,887,051	72.6%
Elwood Library District	$4,086	$69,486	$65,400	2.5%
Suffolk County	$1,350	$22,965	$21,615	0.8%
Suffolk County Police District	$17,374	$295,465	$278,091	10.7%
Out of County Tuition	$406	$6,899	$6,493	0.2%
Town/Part Town	$5,744	$97,686	$91,942	3.5%
Highway Tax	$4,721	$80,278	$75,557	2.9%
Town-Wide Lighting District	$536	$9,120	$8,584	0.3%
New York State Real Property Tax Law	$1,931	$32,837	$30,906	1.2%
New York State MTA Tax	$217	$3,684	$3,467	0.1%
Open Space Bonds II & III	$75	$1,268	$1,194	0.0%
Greenlawn Fire District	$5,790	$98,461	$92,672	3.6%
Greenlawn Water District	$2,361	$40,147	$37,786	1.5%
TOTAL: ALL TAXING JURISDICTIONS	**$162,486**	**$2,763,242**	**$2,600,757**	**100.0%**

Source: Town of Huntington Receiver of Taxes; Analysis by Nelson, Pope & Voorhis, LLC.

66 Affordable Unit/294 Market-Rate Unit Scenario

Given the above-mentioned assumptions regarding selling prices, and when applied to the 66 affordable units and the 294 market-rate units, the estimated market valuation for the residential units for taxing purposes is approximately $167.0 million. This was then applied to the Town of Huntington's current residential assessment ratio (RAR) of 0.79%, which resulted in a market valuation of approximately $1.32 million. For the purpose of this analysis, the value of the recreational building and other improvements to the property is included within this assessment.

When applying a 40% reduction in assessment to account for the condominium status of the proposed community, and then an equalization rate of 100%, the projected assessed valuation of the community upon full build-out and occupancy is $791,691. This is seen in **Table 10b**.

Table 10b
ESTIMATED ASSESSED VALUATION:
66 AFFORDABLE UNIT/294 MARKET-RATE UNIT-SCENARIO

Type of Unit	Number of Units	Proposed Selling Price	Assessed Valuation
Market-Rate Condominiums (without garages)	206	$475,000	$97,850,000
Market-Rate Condominiums (with garages)	88	$589,000	$51,832,000
Affordable Condominiums (without garages)	66	$262,750[17]	$17,341,500
Sub-total: All Residential Units	*360*	--	*$167,023,500*
Residential Assessment Ratio	--	--	0.79
Market Valuation: Residential Units	--	--	*$1,319,486*
Condominium Assessment Reduction			40% Reduction
Assessed Valuation			$791,691
Equalization Rate			100.00%
Projected Assessed Valuation: Proposed Community			**$791,691**

Source: Data provided by BK Elwood, LLC; Analysis by Nelson, Pope & Voorhis, LLC.

Current tax and equalization rates can be applied to the assessed valuation in order to project the impact that this development scenario will have on the local tax base. **Table 11b** shows the current tax rates and revenues that are projected to be levied from full build-out of the proposed development scenario with 66 affordable units and 294 market-rate units. The information provided in the table was derived from the current assessment factors and tax rates provided by the Town of Huntington Receiver of Taxes, the Town of Huntington Assessor's Office, as well as the total projected assessed valuation for the development upon full build-out. It is important to note that all analyses are based on current tax dollars, and the revenue allotted among taxing jurisdictions will vary from year to year, depending on the annual tax rates, assessed valuation and equalization rates. Further, the final assessment and levy will be determined by the sole assessor at the time of occupancy. Projections included herein are as accurate as possible using fiscal impact methodologies, for the purpose of the planning and land use approval process.

[17] For the purpose of this analysis, it is assumed that half of the affordable residences will sell for $210,200 (80% of the area median family income, multiplied by 2.5), and half of the affordable residences will sell for $315,300 (120% of the area median family income, multiplied by 2.5).

Table 11b
ANTICIPATED TAX REVENUE GENERATION:
66 AFFORDABLE UNIT/294 MARKET-RATE UNIT-SCENARIO

Taxing Jurisdiction	Current Tax Revenue	Projected Tax Revenue	Increase in Tax Revenue	Percent of Total Tax Revenue
Elwood UFSD	$117,896	$1,964,994	$1,847,098	72.6%
Elwood Library District	$4,086	$68,101	$64,015	2.5%
Suffolk County	$1,350	$22,508	$21,157	0.8%
Suffolk County Police District	$17,374	$289,577	$272,203	10.7%
Out of County Tuition	$406	$6,761	$6,355	0.2%
Town/Part Town	$5,744	$95,739	$89,995	3.5%
Highway Tax	$4,721	$78,678	$73,958	2.9%
Town-Wide Lighting District	$536	$8,938	$8,402	0.3%
New York State Real Property Tax Law	$1,931	$32,182	$30,251	1.2%
New York State MTA Tax	$217	$3,610	$3,394	0.1%
Open Space Bonds II & III	$75	$1,243	$1,168	0.0%
Greenlawn Fire District	$5,790	$96,499	$90,709	3.6%
Greenlawn Water District	$2,361	$39,347	$36,986	1.5%
TOTAL: ALL TAXING JURISDICTIONS	**$162,486**	**$2,708,178**	**$2,545,693**	**100.0%**

Source: Town of Huntington Receiver of Taxes; Analysis by Nelson, Pope & Voorhis, LLC.

Regardless of the number of affordable units, the proposed community will significantly increase taxes generated by the site, resulting in a substantial increase in revenues distributed to each taxing jurisdiction. At full build-out, the proposed community is projected to generate over $2.7 million in annual taxes. This represents a net increase of between $2.5 and $2.6 million per year when compared to existing site conditions.

Upon full build-out, The Seasons will levy between $1.96 and $2.0 million to the Elwood UFSD, representing 72.6% of the total tax generated by the site. Likewise, the proposed development will levy between $68,101 and $69,486 to the Library District, comprising 2.5% of the tax levy. Suffolk County – which includes taxes generated for the General Fund, the Police Department, and the Out of County Tuition Fund – is projected to levy between $318,846 and $325,329, comprising 11.8% of the total generation. Moreover, the Town of Huntington is projected to generate between $183,356 and $187,084 in annual property tax revenues under the proposed development, representing 6.8% of the tax generation. This reflects taxes paid to the Town/Part Town fund, the Highway Tax, and the Town-Wide Lighting District. The remainder of the projected taxes generated by the proposed development will be distributed among the Town's special taxing jurisdictions, including the Greenlawn Fire Districts, as well as the New York State Real Property Tax Law, the New York State MTA, the Open Space Bonds Fund, and the Greenlawn Water District.

5.3 School District Fiscal Impacts

As seen in **Section 5.1**, the proposed community will not generate additional school-aged children to the Elwood UFSD. However, and as presented in **Section 5.2** in **Table 11a** and **11b**, the proposed development will levy property taxes for the Elwood UFSD, without imposing additional costs resulting from an increased enrollment. This net revenue – ranging from $1.96 to $2.0 million per year – could ease the district's need to tap into additional fund balances, and could also help alleviate an increased burden on other taxpayers throughout the district. Both of these alternatives are most crucial during a time of fiscal and economic hardships throughout Long Island, New York State and the nation.

6.0 ANTICIPATED ECONOMIC IMPACTS

For the purpose of this analysis, it is anticipated that construction of The Seasons will commence in the fall of 2013, with construction occurring over four (4) phases.[18] It is anticipated that construction will be complete after approximately 30-36 months, between the spring and fall of 2016. Upon culmination of the construction period, The Seasons will operate 360 senior residential units and a clubhouse for the use and enjoyment of its residents.

It is projected that the construction and operations of The Seasons will contribute positively to the local economy. During the construction period, opportunities for employment will offer direct, indirect and induced benefits among businesses and households located throughout the region. During the operation of the development, long term jobs will also offer direct, indirect and induced benefits to the hamlet of East Northport, the Town of Huntington, Suffolk County and the region as a whole. The new jobs created during both construction and operation of the development will help to increase business and household income in the community. In turn, as spending increases, this creates additional jobs and further increases business and household income throughout Suffolk County.

A detailed analysis of direct, indirect and induced impacts (as defined in **Section 2.0**) generated during the construction period is outlined in **Section 6.1**. It is important to note that each of these impacts are temporary and are projected to occur only while the proposed community is being constructed. Economic impacts generated during operations; however, are permanent and on-going and they are projected on an annual basis, assuming continued stabilized operations. A detailed analysis of direct, indirect and induced impacts during annual operations is described in **Section 6.2.**

6.1 Economic Impacts of Construction

During the construction period, *output* refers to the investment, or total costs associated with the construction of The Seasons. The construction period is projected to represent a total of $95 million in investment. This output includes construction and land development costs associated with the development of the proposed community.[19] The $95 million[20] in direct output is projected to generate an indirect impact of over $21.2 million, and an induced impact of over $31.8 million, bringing the total economic impact on output to nearly $148.1 million during the

[18] Construction schedule provided by BK Elwood, LLC in March 2014.
[19] Construction costs provided by BK Elwood, LLC in March 2014. It is important to note that all costs are estimates based upon market conditions as of the date of submission of this analysis.
[20] For the purpose of this analysis, this figure and all other figures in this section reflect 2013 dollars, the year in which construction is assumed to commence.

30-36 month construction period.[21] A summary of the top industries affected during the construction period, sorted by the total impact on output is provided in **Table 12**.

Table 12
TOP INDUSTRIES AFFECTED DURING CONSTRUCTION PERIOD, BY TOTAL IMPACT ON OUTPUT

Sector	Output (Revenue)	Employment (Number of Jobs)	Labor Income (Wages)
IMPLAN Sector 37: Construction of new residential permanent site single- and multi-family structures	$95,000,000	278.0	$47,500,000
IMPLAN Sector 361: Imputed rental activity for owner-occupied dwellings	$4,355,315	0.0	$0
IMPLAN Sector 360: Real estate establishments	$3,286,901	14.8	$163,762
IMPLAN Sector 354: Monetary authorities and depository credit intermediation activities	$2,823,254	5.8	$372,721
IMPLAN Sector 319: Wholesale trade businesses	$2,401,792	12.3	$1,038,169

Source: Direct impact of output (construction costs) provided by BK Elwood, LLC; Analysis by Nelson, Pope & Voorhis, LLC, via IMPLAN software.

During the construction period, direct *employment* refers to the number of short-term jobs necessary to build the residential community. It is projected that the construction period will necessitate 278.0 full time equivalent (FTE) employees. It is assumed that the same basic construction crew will be utilized from the commencement until the culmination of construction.

Direct employment creates additional opportunities for job creation throughout other sectors of the economy through expenditures derived from labor income and output. As such, the 278.0 FTE jobs created during the construction period will have an indirect impact of 184.7 FTE employees and an induced impact of 242.1 FTE employees in other industry sectors, bringing the total impact of construction to 705.1 FTE jobs during the construction period.[22] This job creation – direct, as well as indirect and induced – is most crucial during Long Island's current economic state, and presents significant opportunities for the thousands of persons who are unemployed throughout the region. A summary of the top industries affected during the construction period, sorted by the total impact on employment is provided in **Table 13**.

[21] According to IMPLAN, a multiplier of 1.491949 represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand through the "Construction of new residential permanent site single- and multi-family structures" (IMPLAN Sector 37) in Suffolk County, New York.
[22] According to IMPLAN, a multiplier of 10.665368 represents the total change in the number of jobs that occurs in all industries for each additional one million dollars of output delivered to final demand through the "Construction of new residential permanent site single- and multi-family structures" (IMPLAN Sector 37) in Suffolk County, New York.

Table 13
TOP INDUSTRIES AFFECTED DURING CONSTRUCTION PERIOD, BY TOTAL IMPACT ON EMPLOYMENT

Sector	Output (Revenue)	Employment (Number of Jobs)	Labor Income (Wages)
IMPLAN Sector 37: Construction of new residential permanent site single- and multi-family structures	$95,000,000	278.0	$47,500,000
IMPLAN Sector 413: Food services and drinking places	$2,065,507	32.5	$791,284
IMPLAN Sector 324: Retail Stores - Food and beverage	$1,670,663	27.1	$891,444
IMPLAN Sector 329: Retail Stores - General merchandise	$1,548,650	25.5	$690,659
IMPLAN Sector 369: Architectural, engineering, and related services	$2,373,119	20.1	$1,370,951

Source: Analysis by Nelson, Pope & Voorhis, LLC, via IMPLAN software.

During the construction period, direct *labor income* refer to the earnings, wages, or salary paid to each of the construction workers. Labor income typically comprises approximately 50% of the total cost of residential construction; the remaining 50% represents the cost of construction materials.[23] Assuming the payment of the area standard wage, each of the construction workers will earn the projected average annual wage of $62,190.[24] This represents approximately $171,023 per employee, and $47.5 million in collective earnings among the 278.0 FTE employees over the 30-36 month construction period. This labor income is projected to have an indirect impact of nearly $9.1 million and an induced impact of nearly $11.3 million, bringing the total economic impact of the construction to nearly $67.9 million in labor income.[25] A summary of the top industries affected during the construction period, sorted by the total impact on labor income is provided in **Table 14**.

[23] Construction labor and materials estimates per architectural design group Hawkins, Webb, Jaeger, PLLC.
[24] New York State Department of Labor's Occupational Employment Statistics Survey reports an average wage of $62,190 among those employed within the construction and extraction occupations in the Long Island labor market as of the first quarter of 2013.
[25] According to IMPLAN, a multiplier of 0.592120 represents the total dollar change in labor income of households employed by all industries for each additional dollar of output delivered to final demand through the "Construction of new residential permanent site single- and multi-family structures" (IMPLAN Sector 37) in Suffolk County, New York.

Table 14
TOP INDUSTRIES AFFECTED DURING CONSTRUCTION PERIOD, BY TOTAL IMPACT ON LABOR INCOME

Sector	Output (Revenue)	Employment (Number of Jobs)	Labor Income (Wages)
IMPLAN Sector 37: Construction of new residential permanent site single- and multi-family structures	$95,000,000	278.0	$47,500,000
IMPLAN Sector 369: Architectural, engineering, and related services	$2,373,119	20.1	$1,370,951
IMPLAN Sector 394: Offices of physicians, dentists, and other health practitioners	$1,969,312	15.6	$1,215,301
IMPLAN Sector 356: Securities, commodity contracts, investments, and related activities	$1,704,707	4.8	$1,152,743
IMPLAN Sector 319: Wholesale trade businesses	$2,401,792	12.3	$1,038,169

Source: Analysis by Nelson, Pope & Voorhis, LLC, via IMPLAN software.

A summary of the derivation of the collective economic benefits during the construction period is provided in **Table 15**.

Table 15
ECONOMIC IMPACTS OF CONSTRUCTION

Impact Type	Output (Revenue)	Employment (Number of Jobs)	Labor Income (Wages)
IMPLAN Sector 37: Construction of new residential permanent site single- and multi-family structures			
Direct Impact	$95,000,000	278.0	$47,500,000
Indirect Impact	$21,216,581	184.7	$9,120,435
Induced Impact	$31,864,051	242.4	$11,278,330
Total Impact	$148,080,632	705.1	$67,898,768

Source: Analysis by Nelson, Pope & Voorhis, LLC, via IMPLAN software.

6.2 Economic Impacts of a Stabilized Year of Operations

For the purpose of this analysis, it is assumed that The Seasons will begin the operational phase of development upon the completion of the four (4)-phase, 30-36 month construction period, anticipated to occur between the spring and fall of 2016. For the purpose of this analysis, a stabilized year of operations is assumed to occur in 2017, at which time The Seasons will be operating at full occupancy.

During operations, direct *output* refers to the total revenues derived from the annual operation of The Seasons. This includes monthly homeowner's association fees from each housing unit in the proposed development. As seen in **Table 16**, output is estimated at $300 per month for each housing unit.[26] This translates into $3,600 per year, per housing unit. As such, The Seasons is projected to generate nearly $1.3 million in annual operational revenues.

Table 16
PROJECTED ANNUAL OUTPUT

Parameter	Projected Annual Output
Number of Units	360
Annual HOA Fees	$3,600
Annual Revenue: The Seasons	**$1,296,000**

Source: Data provided by BK Elwood, LLC; Analysis by Nelson, Pope & Voorhis, LLC.

The $1.3 million[27] in direct operational revenues are projected to generate an indirect impact of over $418,000 and an induced impact of over $298,000 per year. This additional output is generated through round-by-round sales made at various merchants in other sectors of the regional economy. These include local retailers, service providers, banks, grocers, restaurants, financial institutions, insurance companies, health and legal services providers, and other establishments in the region. The sum of the direct, indirect and induced impacts results in a total economic impact on output of over $2.0 million during annual operations.[28] A summary of the top industries affected during annual operations, sorted by the total impact on output is provided in **Table 17**.

[26] Construction schedule provided by BK Elwood, LLC in April 2014.
[27] For the purpose of this analysis, this figure and all other figures in this section reflect 2017 dollars, the year in which a stabilized year of operations is anticipated to commence.
[28] According to IMPLAN, a multiplier of 1.825346 represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by “Civic, social, professional, and similar organizations” (IMPLAN Sector 425) in Suffolk County, New York.

Table 17
TOP INDUSTRIES AFFECTED DURING ANNUAL OPERATIONS, BY TOTAL IMPACT ON OUTPUT

Sector	Output (Revenue)	Employment (Number of Jobs)	Labor Income (Wages)
IMPLAN Sector 425: Civic, social, professional, and similar organizations	$1,298,765	10.0	$377,019
IMPLAN Sector 354: Monetary authorities and depository credit intermediation activities	$120,086	0.2	$15,600
IMPLAN Sector 360: Real estate establishments	$73,898	0.3	$3,531
IMPLAN Sector 356: Securities, commodity contracts, investments, and related activities	$68,118	0.2	$48,306
IMPLAN Sector 361: Imputed rental activity for owner-occupied dwellings	$41,079	0.0	$0

Source: Direct impact of output (monthly homeowners association fees) provided by BK Elwood, LLC; Analysis by Nelson, Pope & Voorhis, LLC, via IMPLAN software.

During operations, direct *employment* refers to the number of persons that are employed by The Seasons, but not including those employees who will be contracted by the proposed community. It is estimated that the development will generate ten (10) FTE employees[29] during annual operations. It is anticipated that these employees will include:

- (5) full-time security staff;
- (1) full-time Superintendent;
- (1) full-time Assistant to Superintendent;
- (1) full-time Lifestyle Director;
- (1) full-time Assistant to Lifestyle director;
- (1) part-time cleaning staff[30]; and
- (1) part-time lifeguard/pool attendant[31]

The ten (10) FTE direct employment positions are projected to result in an indirect impact of 2.2 FTE jobs, and an induced impact of 2.1 FTE jobs throughout the region, bringing the total economic impact of operational employment to 14.3 FTE jobs during annual operations.[32] A summary of the top industries affected during annual operations, sorted by the total impact on employment is provided in **Table 18**.

[29] Job creation provided by BK Elwood, LLC in April 2014.
[30] For the purpose of this analysis, it is assumed that this position will translate into a 0.5 FTE employee.
[31] It is anticipated that the lifeguard/pool attendant will be employed as a seasonal full-time position. For the purpose of this analysis, it is assumed that this will translate into a 0.5 FTE employee.
[32] According to IMPLAN, a multiplier of 26.245573 represents the total change in the number of jobs that occurs in all industries for each additional one million dollars of output delivered to final demand by "Civic, social, professional, and similar organizations" (IMPLAN Sector 425) in Suffolk County, New York.

Table 18
TOP INDUSTRIES AFFECTED DURING ANNUAL OPERATIONS, BY TOTAL IMPACT ON EMPLOYMENT

Sector	Output (Revenue)	Employment (Number of Jobs)	Labor Income (Wages)
IMPLAN Sector 425: Civic, social, professional, and similar organizations	$1,298,765	10.0	$377,019
IMPLAN Sector 413: Food services and drinking places	$26,181	0.4	$9,778
IMPLAN Sector 360: Real estate establishments	$73,898	0.3	$3,531
IMPLAN Sector 393: Other private educational services	$13,700	0.3	$4,523
IMPLAN Sector 354: Monetary authorities and depository credit intermediation activities	$120,086	0.2	$15,600

Source: Direct impact of employment provided by BK Elwood, LLC; Analysis by Nelson, Pope & Voorhis, LLC, via IMPLAN software.

During operations, direct *labor income* refers to annual wages, earnings or salary that is paid to the proposed development's ten (10) FTE employees. It is assumed that the salaries will collectively total approximately $375,000 per year, during annual operations at The Seasons.[33]

The $375,000 in direct labor income is projected to result in an indirect impact of over $141,000 and an induced impact of nearly $103,000, bringing the total economic impact of labor income to over $619,000 during annual operations.[34] A summary of the top industries affected during annual operations, sorted by the total impact on labor income is provided in **Table 19**.

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[33] Salary ranges provided by BK Elwood, LLC in March 2014.
[34] According to IMPLAN, a multiplier of 1.061410 represents the total dollar change in labor income of households employed by all industries for each additional dollar of output delivered to final demand by "Civic, social, professional, and similar organizations" (IMPLAN Sector 425) in Suffolk County, New York.

Table 19
TOP INDUSTRIES AFFECTED DURING ANNUAL OPERATIONS, BY TOTAL IMPACT ON LABOR INCOME

Sector	Output (Revenue)	Employment (Number of Jobs)	Labor Income (Wages)
IMPLAN Sector 425: Civic, social, professional, and similar organizations	$1,298,765	10.0	$377,019
IMPLAN Sector 356: Securities, commodity contracts, investments, and related activities	$68,118	0.2	$48,306
IMPLAN Sector 354: Monetary authorities and depository credit intermediation activities	$120,086	0.2	$15,600
IMPLAN Sector 394: Offices of physicians, dentists, and other health practitioners	$18,952	0.1	$11,096
IMPLAN Sector 355: Nondepository credit intermediation and related activities	$14,789	0.1	$10,455

Source: Direct impact of labor income (employee wages) provided by BK Elwood, LLC; Analysis by Nelson, Pope & Voorhis, LLC, via IMPLAN software.

A summary of the derivation of the collective economic benefits during a stabilized year of operations is provided in **Table 20**.

Table 20
ECONOMIC IMPACTS OF A STABILIZED YEAR OF OPERATIONS

Impact Type	Output (Revenue)	Employment (Number of Jobs)	Labor Income (Wages)
IMPLAN Sector 425: Civic, social, professional, and similar organizations			
Direct Impact	$1,296,000	10.0	$375,000
Indirect Impact	$418,466	2.2	$141,284
Induced Impact	$298,135	2.1	$102,924
Total Impact	$2,012,601	14.3	$619,209

Source: Data provided by BK Elwood, LLC; Analysis by Nelson, Pope & Voorhis, LLC, via IMPLAN software.

7.0 CONCLUSION

There currently exists a shortage of quality senior housing communities in Suffolk County. As baby boomers start to retire and empty nesters and seniors continue to age, the demand for this type of community will become an even greater and more prevalent issue in the local housing market. The current need for senior housing communities would be partially addressed through the construction of The Seasons in East Northport.

The proposed community will provide quality senior residences that will provide current area residents with the opportunity to remain in the community (perhaps in proximity to family, friends and accustomed neighborhoods) that may be an attractive consideration for potential buyers. The proposed community will conform to Article 16-A of the NYS General Municipal Law (Long Island Workforce Housing Act), by setting aside at least 10% of its yield for affordable housing, as defined by that law. In fact, the community will exceed this requirement, by providing between 50 and 66 affordable units. The proposed project will also satisfy a Town goal of providing affordable senior residences. The community is consistent with the spirit and intent, as well as key elements of, the Town Comprehensive Plan Update, which recognizes the importance of providing a mix of senior housing types. The Town's growing senior population is currently under-served by available appropriate housing, particularly with regard to the diversity of housing types.

The Seasons community is proposed to include the construction of 360 condominium units for occupancy by qualified senior households, as regulated by the Town of Huntington zoning ordinance. The 360 proposed residences would be distributed in 56 two (2)-story structures. Thirty-four (34) of the buildings will contain eight (8) units (272 units total), and 22 buildings will have four (4) units each (88 units total). Each unit in the four (4)-unit structures will have an attached garage; no garages are proposed for the units in the eight-unit buildings. Each unit will have two (2) bedrooms, and each of the second-floor units in the four (4)-unit buildings will have a den that could be used as a third bedroom. The project also includes an approximately 17,000 SF, two (2)-story clubhouse building, with two (2) outdoor swimming pools, a patio/outdoor barbeque area, a Jacuzzi, a car wash area, a walking trail, a dog run, and a 5,000 SF sewage treatment plant (STP).

The proposed community will increase the distribution of tax ratables throughout the Elwood UFSD, the Town of Huntington and Suffolk County. Moreover, The Seasons will generate immediate construction jobs as well as permanent employment opportunities for Town and area residents. Such fiscal and economic benefits are most crucial during the current economic state throughout Long Island, New York State and the nation as a whole.

The Seasons community is projected to create strong fiscal and economic activity through the provision of jobs, housing opportunities and an improved tax base. As seen in **Section 5.0**, the proposed community will have a beneficial impact on local fiscal conditions through the increased distribution of tax ratables throughout the Elwood UFSD, the Town of Huntington and Suffolk County. Regardless of the number of affordable units, the proposed community is projected to generate over $2.7 million in annual taxes. This represents a net increase of between $2.5 and $2.6 million per year when compared to existing site conditions. These annual property taxes will be distributed among all local taxing jurisdictions throughout the Town.

Moreover, as described in **Section 6.0**, it is projected that the construction and annual operations of The Seasons will contribute positively to the local economy. The proposed community will generate both immediate and permanent employment opportunities for the Town of Huntington and area residents. During the construction period, opportunities for employment will offer direct, indirect and induced benefits for residents of the Town of Huntington, as well as for those residing throughout the region. During the operation of the development, long term jobs will also offer direct, indirect and induced benefits to the Town of Huntington, Suffolk County and the region as a whole. The new jobs created during both construction and annual operations of the proposed development will help to increase business and household income in the community. In turn, as spending increases, this creates additional jobs and further increases business and household income. This job creation – direct, as well as indirect and induced – is most crucial during Long Island's current economic state, and presents significant opportunities for the thousands of persons who remain unemployed throughout the Town and the region.

8.0 REFERENCES

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ATTACHMENT A

Nelson, Pope & Voorhis, LLC
Economic Qualifications

ABOUT NELSON, POPE & VOORHIS...

ENVIRONMENTAL
PLANNING
CONSULTING

MUNICIPAL PLANNING
SEQRA COMPLIANCE
HARBOR MANAGEMENT PLANNING
FEASIBILITY STUDIES
DUE DILIGENCE ASSISTANCE
REGIONAL PLANNING
ECONOMIC PLANNING
ENVIRONMENTAL SITE ASSESSMENT
ENVIRONMENTAL SCIENCE & ANALYSIS
WETLAND PERMITTING
STORM WATER MANAGEMENT PLANS
WATERFRONT & COASTAL ZONE PROJECTS
MAPPING
WATERSHED MANAGEMENT & WATER SUPPLY
PERMITTING & PROCESSING
SUSTAINABILITY & LEED
PROJECT PLANNING & SUPPORT

NELSON POPE & VOORHIS

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Nelson, Pope & Voorhis, LLC was formed in 1997 and has grown in capabilities and size since that time. The merging of Charles Voorhis & Associates (13 year history) with Nelson & Pope (a 50-year tradition in engineering and related services) created an environmental planning firm with a wealth of experience to bring to complex environmental problem solving, planning and feasibility, resource assessment and site investigations.

Nelson, Pope & Voorhis serves governmental and private sector clients in preparing creative solutions in the specialized area of complex environmental project management and land use planning and analysis.

Nelson, Pope & Voorhis has the benefit of knowledge of local issues, local resources, and the passion to provide the very best solutions and strategies for the local area. This provides unparalleled knowledge of the application of the community planning process, comprehensive planning and SEQRA Administration. The result is a team of highly compatible land use professionals that will get the job done in a manner that ensures real and implementable solutions.

Nelson, Pope & Voorhis employees are recognized as experts in environmental, land use and planning issues and have provided consulting services to various municipalities. NP&V encourages continuing education through participation in conferences and seminars for all staff and holds regular training luncheons utilizing APA and other training packages.

Nelson, Pope & Voorhis has a capable staff of professionals, including planners and economic analysts, ecologists, hydrologists, wetlands specialists and environmental professionals. When integrated with technical staff of Nelson & Pope, the team is expanded to include civil, sanitary and transportation engineers and land surveyors.

Nelson, Pope & Voorhis would appreciate the opportunity to discuss how we can assist you in achieving your goals. We are committed to providing quality environmental, planning and consulting services to all clients. This statement of qualifications is an introduction to the many services we provide with a focus on municipal services; the following pages contain a more detailed presentation of services offered by Nelson, Pope & Voorhis, as well as a sampling of completed projects and key staff resumes.

Call us at (631) 427-5665. We welcome the opportunity to serve your environmental, planning and consulting needs.

MORE ABOUT NELSON, POPE & VOORHIS...

ENVIRONMENTAL PLANNING CONSULTING

MUNICIPAL PLANNING
SEQRA COMPLIANCE
HARBOR MANAGEMENT PLANNING
FEASIBILITY STUDIES
DUE DILIGENCE ASSISTANCE
REGIONAL PLANNING
ECONOMIC PLANNING
ENVIRONMENTAL SITE ASSESSMENT
ENVIRONMENTAL SCIENCE & ANALYSIS
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Charles Voorhis is managing partner and is a member of the American Institute of Certified Planners (AICP) and is a Certified Environmental Professional (CEP), having over 30 years of experience in environmental planning on Long Island and the New York area. Mr. Voorhis oversees the business in terms of management, marketing and expertise, provides expert testimony in hearings and court proceedings, and ensures that client needs are served to the best of the firm's ability.

The firm has significant expertise in applied use of the State Environmental Quality Review Act (SEQRA) with understanding of the practical and legal use of this law from both the private and municipal perspective. Staffing includes environmental professionals assembled to work together as a team with complementary expertise and interests. NP&V personnel maintain wildlife collection permits in New York State, and are active contributors to the Long Island Geographic Information System (GIS) user group meetings and publications.

The firm has developed a number of copyright protected computer models for environmental analysis in the areas of: wildlife and ecology; water budget analysis and groundwater impacts; economic and market analysis; and stormwater impact prediction. The reports and graphics generated for projects are high in quality and professionally prepared through the use of state-of-the-art technology in digital aerial photography, geocoding and mapping of site features using differential global positioning systems (GPS), AutoCAD analysis/mapping, ESRI geographic information systems (GIS) programs including ArcMap and 3D Analyst and Spatial Analyst, custom spreadsheet models for regional land use impact assessment, and related technological tools for advanced data management and word processing. The seamless integration of environmental and engineering services with Nelson & Pope is accomplished by direct communication and computer networking to ensure that projects are managed through the review process to the development stage.

NP&V features three divisions, created to better serve clients with high quality, innovative and responsive consulting

THE THREE DIVISIONS OF NP&V...

ENVIRONMENTAL PLANNING CONSULTING

MUNICIPAL PLANNING
SEQRA COMPLIANCE
HARBOR MANAGEMENT PLANNING
FEASIBILITY STUDIES
DUE DILIGENCE ASSISTANCE
REGIONAL PLANNING
ECONOMIC PLANNING
ENVIRONMENTAL SITE ASSESSMENT
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The division of **ENVIRONMENTAL & COMMUNITY PLANNING** specializes in comprehensive local and regional planning. Technology is key in today's planning field and NP&V continues to keep pace with the most current tools available for planning applications. Use of Geographic Information System (GIS) software, 3D Analyst, ArcScene and Spatial Analyst, as well as CommunityViz (3-D simulation and analysis software), architectural SketchUp (modeling software), AutoCAD, and planning and analysis software and spreadsheets, results in rapid, accurate and high quality data, analysis, illustration and reporting. This division conducts planning studies, revitalization plans, community development/public participation activities, and human resource analysis including noise, air, demographic, socio-economic and visual resource assessment (including 3D simulations, photo simulations and shadow studies). The division is directed by Kathryn Eiseman, AICP and includes planners, economic analysts and GIS specialists with environmental, planning and architectural backgrounds.

The division of **ENVIRONMENTAL RESOURCE & WETLANDS ASSESSMENT** provides quality services in the preparation of Environmental Impact Statements (EIS's), Environmental Assessments (EA's), planning and zoning law review and preparation, stormwater permitting and erosion control compliance, and wetland delineation, assessment, mitigation and permitting. This division is headed by Carrie O'Farrell, AICP and has a capable staff including environmental scientists, wetland ecologists and environmental professionals to ensure timely delivery of quality products.

The division of **PHASE I/II ASSESSMENTS & REMEDIATION** performs Phase I and II Environmental Site Assessments (ESA's), voluntary cleanup, brownfields cleanup, RI/FS and all aspects of site remediation and investigation. The division is headed by Steven McGinn, CEI a member of Nelson & Pope's environmental services branch for 13 years with significant experience in preparation of Phase I/II ESA's field investigations and remediation. This division includes a staff of hydrogeologists and environmental professionals and coordinates required field equipment and laboratory services. NP&V has performed large and small assessments and provides the fastest possible turnaround to meet due diligence periods and deadlines which are often a factor in real estate transactions. NP&V Phase I/II ESA services are known and accepted by lending institutions throughout the tri-state area. NP&V owns, maintains and operates GPR (Ground Penetrating Radar) and PowerProbe units to provide expanded services in site investigations. A description of NP&V qualifications and resumes of personnel proposed for the project and specific project experience is included in the

Nelson Pope & Voorhis

Summary of Services...

Environmental Planning Consulting

Municipal Planning
SEQRA Compliance
Harbor Management Planning
Feasibility Studies
Due Diligence Assistance
Regional Planning
Economic Planning
Environmental Site Assessment
Environmental Science & Analysis
Wetland Permitting
Storm Water Management Plans
Waterfront & Coastal Zone Projects
Mapping
Watershed Management & Water Supply
Permitting & Processing
Sustainability & LEED Project Planning & Support

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What we do at Nelson, Pope & Voorhis...

- **SEQRA Compliance and Environmental Analysis:** Environmental impact statements (EIS); assessment forms (EAF); ecological and wildlife studies; noise and air emission impact studies; and compliance with Federal, State & local environmental regulations & laws.
- **Municipal Planning:** Full environmental and planning review services for municipalities including site plan and subdivision review, zoning board review and SEQRA Administration.
- **Regional and Community Planning:** Conceptual site development planning; public outreach: visioning workshops and charrettes; development alternatives; zoning; site yield studies; build-out analysis; visual analysis (3-D modeling; photo simulations) and comprehensive regional and hamlet planning studies.
- **Feasibility and Due Diligence Assistance:** Comprehensive research into site development related issues affecting project implementation, timing and costs.
- **Economic Planning: Fiscal** and economic impact analyses, market analyses & feasibility studies, economic development strategies, niche market and branding planning, tax base analysis, housing incentives and programs and community development.
- **Grants Administration:** Preparation of federal and state funded municipal grant applications, project management; including the preparation of all reporting documents.
- **Environmental Site Assessment:** Phase I, II and III environmental site assessments; geophysical surveys; remedial investigation and feasibility studies; Brownfield investigations; voluntary cleanup program; oil spill closure; asbestos and lead testing and abatement.
- **Soil Borings & Subsurface Investigations:** Soil borings, Ground Penetrating Radar; groundwater investigations, modeling; and flow studies; monitoring well and peizometer installation.

NELSON POPE & VOORHIS

SUMMARY OF SERVICES...

ENVIRONMENTAL PLANNING CONSULTING

MUNICIPAL PLANNING
SEQRA COMPLIANCE
HARBOR MANAGEMENT PLANNING
FEASIBILITY STUDIES
DUE DILIGENCE ASSISTANCE
REGIONAL PLANNING
ECONOMIC PLANNING
ENVIRONMENTAL SITE ASSESSMENT
ENVIRONMENTAL SCIENCE & ANALYSIS
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- **STORM WATER MANAGEMENT PLANS (SWPPPS):** Design of management plans for storm water and erosion control compliance with latest Federal and State regulations; preparation and processing of NOI; and site compliance during construction…

- **WATERFRONT AND COASTAL ZONE PROJECTS:** Planning; permitting of waterfront improvement projects; water quality data management and studies; and docking facilities…

- **MAPPING:** Inventory of physical features; GIS mapping; data management and analysis; and ground penetrating radar for identification of subsurface conditions…

- **WATERSHED MANAGEMENT AND WATER SUPPLY:** Comprehensive regional watershed and water supply management and planning studies…

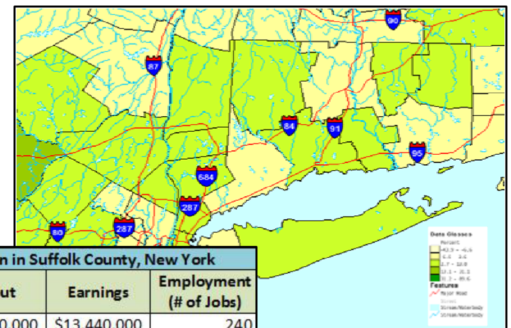
- **PERMITTING AND PROCESSING:** Preparation and processing of environmental applications for submittal; client representation before municipal agencies and departments and expert testimony for legal support and hearings…

- **Wetland Permitting:** Flagging and identification of fresh water and tidal wetlands; preparation of wetland permitting; and wetland restoration plans.

Nelson, Pope & Voorhis has the benefit of knowledge of local issues, local resources, and the passion to provide the very best solutions and strategies for the local area. This provides unparalleled knowledge of the application of the community planning process, comprehensive planning and SEQRA Administration. The result is a team of highly compatible land use professionals that will get the job done in a manner that ensures real and feasible solutions.

Economic and Fiscal Impact Analysis, Demographic and Community Needs Assessments

- Fiscal Analysis
- Economic Impact Analysis
- Economic Development Strategies
- Market Positioning & Branding
- Main Street Revitalization
- Comprehensive Community Needs Assessments
- Socioeconomic Analysis
- Demographic analysis
- Tax Base Analysis



NAICS CODE 230000: Construction in Suffolk County, New York	Output	Earnings	Employment (# of Jobs)
Direct Impact	$33,600,000	$13,440,000	240
RIMS Multiplier	1.9793	0.5803	14.0154
Indirect and Induced Impact	$66,504,480	$7,799,232	100
Total Impact	**$100,104,480**	**$21,239,232**	**340**

Many of our clients know of our quality services in tax revenue and demographic impact analysis including demographic and school district impact assessments. This expertise combined with our expert use of Geographic Information System (GIS) and census data has allowed NP&V to complete quality fiscal and economic impact studies since the company was formed in 1997.

Our fiscal impact analyses identify project benefits in terms of tax revenue projections and demand for community services from various providers. We have expanded our capabilities and recently, our economic impact analyses concentrate on an expanded quantification of project benefits including job generation during the construction and operation of development, projected salaries, consumer spending, sales tax generation from spending and other economic "ripple effect" benefits. It is critically important to understand the full benefits of economic development projects during difficult economic times.

NP&V has a track record of completed, successful and built projects involving fiscal impact analysis, demographic assessment, market studies and customized analyses of community service related impacts in nearly all Towns in Nassau and Suffolk Counties. NP&V's economic planning expertise can be integrated into economic development strategies, project feasibility, balancing of mixed-use project scenarios, community development and assistance programs and needs assessments. Please contact us for more information on how we can assist with the economic planning aspects of your development, re-development, revitalization or community needs assessment project.

Environmental Planning Consulting

Feasibility & Due Diligence Assistance
Regional & Site Planning
Economic Planning
Environmental Site Assessment
Environmental Science & Analysis
Wetland Permitting
Storm Water Management Plans
Waterfront & Coastal Zone Projects
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Watershed Management & Water Supply
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MARKET ANALYSIS

ENVIRONMENTAL PLANNING CONSULTING

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ECONOMIC PLANNING
ENVIRONMENTAL SITE ASSESSMENT
ENVIRONMENTAL SCIENCE & ANALYSIS
WETLAND PERMITTING
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NP&V is a professional environmental and planning firm with qualifications and expertise to prepare various types of residential and commercial market analyses and feasibility studies, and has a track record of such completed projects throughout Long Island.

In the preparation of a market analysis, NP&V strives to identify and quantify the need for a specific type of development – be it a shopping center, office space, a new residential subdivision or an assisted living community, among others – that can be accommodated at a given location. NP&V is able to analyze the relationship between the supply and demand and reveal whether or not a given development could be supported in a specified location. This is accomplished through the definition of a target market area, a critical evaluation of demographics, socioeconomic characteristics and consumer trends, and an analysis of existing and comparable developments.

Findings and recommendations of our market analyses are tailored to each community, and provide the facts necessary to determine the viability of a given project, attract specific types of businesses, and market projects to possible investors. As such, our market analyses have proven to be a valuable tool in the decision-making process – for both the public sector and private developers.

Niche Market and Branding Plan & Build-Out/Tax Base Analysis
Town of Brookhaven

Environmental Planning Consulting

Feasibility & Due Diligence Assistance
Regional & Site Planning
Economic Planning
Grant Preparation & Administration
Environmental Site Assessment
Environmental Science & Analysis
Wetland Permitting
Storm Water Management Plans
Waterfront & Coastal Zone Projects
Mapping
Watershed Management & Water Supply
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Nelson, Pope & Voorhis (NP&V) is working with the Town of Brookhaven on a niche market and branding plan for Greater Bellport community. The focus of this plan is to form a set of recommendations that outline the necessary steps that members in the Greater Bellport community can take in order to successfully create a sense of place, community pride and positive perceptions through a more niche-oriented position in the local market. NP&V recommended various initiatives to make the Greater Bellport community unique and marketable, creating a place that people want to be, where people are comfortable, and a place that people remember and come back to time and again. The niche market and branding plan strives to promote the community's niche market to new residents, visitors and economic development opportunities alike, offering the Greater Bellport community the opportunity to develop a theme that they want to be known for.

NP&V is also working with the Town of Brookhaven on a build-out/tax base analysis, to analyze how the local school district could be impacted by growth. NP&V is working on the creation of a GIS model to compare tax assessments for various land use scenarios to ensure an adequate tax base to support increased growth in school population without disproportionate increases in residential tax rates. This model will be used to test assumptions for future development and analyze various alternatives in an automated fashion, allowing for easily comparison of scenarios and results. Ultimately, the model will provide a reality check for future planning with respect to provision of quality community services, and may provide support for creating additional commercial tax base within the district. The project is underway, and is nearing completion.

Economic Development Chapter of the Comprehensive Plan Update
Town of Southold

Environmental Planning Consulting

Feasibility & Due Diligence Assistance
Regional & Site Planning
Economic Planning
Environmental Site Assessment
Environmental Science & Analysis
Wetland Permitting
Storm Water Management Plans
Waterfront & Coastal Zone Projects
Mapping
Watershed Management & Water Supply
Permitting & Processing
Sustainability & LEED
Project Planning & Support

In an effort to achieve the Town's vision, five goals and numerous objectives were formed to provide direction for future decision-making pertaining to the Town's economy. Much of the Town's economic vitality is based on the Town's unique rural, historic and maritime-based character as well as its natural resources. It is critical that these qualities be recognized, enhanced and protected. NP&V is currently working on the preparation of the economic chapter of the Comprehensive Plan Update for the Town of Southold to allow for the formation of appropriate recommendations and implementation strategies focused on long-term economic sustainability throughout the Town.

One of the specific tasks involved with the economic chapter of the Town's Comprehensive Plan is the zoning/build-out analysis. The Town of Southold is facing development pressure and is concerned about the impact that the current zoning may have on the Town's resources. The Town of Southold prepared a build-out analysis of several zoning districts, and NP&V funneled these findings into a model to assess the regional impact of full build-out and modified development scenarios. Ensuring quality of life, protection of environmental resources, housing needs and maintenance of the tax base were key elements of the model. This project involved the creation of a spreadsheet model to synthesize multiple evaluation factors to analyze the impact of full build out of the Town of Southold under its current zoning. This project is an update to a similar project completed for the Town in 2003.

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RESUMES

Nelson, Pope & Voorhis

Charles J. Voorhis, AICP, CEP

PERSONAL PROFESSIONAL QUALIFICATIONS

Licensing and Certification:

- Certified Environmental Professional (CEP)
- American Institute of Certified Planners (AICP)
- Certified Environmental Inspector, Environmental Assessment Association
- US Coast Guard Master Steam and Auxiliary Sail Vessels

Experience:

- Managing Partner of Firm, Nelson, Pope & Voorhis, LLC; Melville, New York (1/97-Present)
- Principal of Firm, Charles Voorhis & Associates, Inc.; Miller Place, New York (8/88-1/97)
- Director, Division of Environmental Protection, Department of Planning, Environment and Development; Town of Brookhaven, New York (3/86-8/88)
- Environmental Analyst, Division of Environmental Protection, Department of Planning, Environment and Development; Town of Brookhaven, New York (8/82-3/86)
- Private and Public Consultant, Planning and Environmental Issues (8/82-3/87)
- Public Health Sanitarian, Suffolk County Department of Health Services; Hauppauge, New York (1/80-8/82)
- Environmentalist I, Suffolk County Department of Environmental Control, Central Islip, New York (2/78- 8/79)

Education:

- SUNY at Stony Brook; Master of Science in Environmental Engineering, concentration in Water Resource Management, 1984
- Princeton Associates; Groundwater Pollution and Hydrology Short Course, Princeton, New Jersey, 1983
- New York State Health Department, Environmental Health Training Course, Hauppauge, New York, 1982
- Southampton College of Long Island University; Bachelor of Science in Environmental Geology, 1977

Significant Professional Achievements:

- Lake Agawam Comprehensive Management Plan, 2008
- Southold TDR Planning Report and GEIS, 2008
- Suffolk County North Shore Embayments Watershed Management Plan, 2007
- Mt. Sinai Harbor Management Plan, 2006
- The Residences at North Hills, DEIS and FEIS, 2005-06
- Shelter Island Water Supply Study, 2005
- Town of Southold Comprehensive Implementation Strategy, 2003
- Lower Port Jefferson Harbor Action Plan, 2002
- Setauket Fire District Needs Analysis, 2001
- Southampton Agricultural Opportunities Subdivision, DEIS, FEIS and Findings, 2001
- Old Orchard Woods, DEIS and FEIS, 2000
- Town of Smithtown Armory Park, DEIS, 2000
- Town of Southold Water Supply Management & Water Protection Strategy, 2000
- CVS @ Greenlawn, DEIS and FEIS, 1998
- Knightsbridge Gardens, DEIS and FEIS, 1997
- Camelot Village @ Huntington, DEIS, 1997
- Airport International Plaza, DEIS and FEIS, 1996
- Price Club @ New Rochelle, DEIS and FEIS, 1995
- Commack Campus Park @ Commack DEIS and FEIS, 1994
- Water Mill Shops @ Water Mill DEIS, 1993
- PJ Venture Wholesale Club @ Commack DEIS and FEIS, 1993
- Dowling College NAT Center DEIS and FEIS, 1992
- Final EIS Angel Shores @ Southold, 1991
- Town of Brookhaven Boat Mooring Plan, 1991
- Draft EIS Round Hill @ Old Westbury, 1990
- GEIS Commercial Rezonings on the Towns Own Motion, 1988
- Draft EIS St. Elsewhere @ Nesconset, 1989
- EQBA, Acquisition Study for Brookhaven Town, 1987
- Award for Environmentally Sensitive Land Design, Pine Barrens Review Comm., 1988
- Town of Brookhaven Land Use Plan, 1987
- Discussion of Hydrogeologic Zone Boundaries in the Vicinity of S. Yaphank, LI, NY, 1986
- Comprehensive Review of Industrial Zoned Land in the Sensitive Hydrogeologic Zone, Brookhaven, 1983

Professional & Other Organizations (past and present):

- American Planning Association, Washington, D.C.
- National Association of Environmental Professionals, Alexandria, VA
- Environmental Assessment Association, Scottsdale, Arizona
- American Water Resources Association, Syracuse, New York
- New York Water Pollution Control Association, Riverdale, New York
- Water Pollution Control Federation, Washington, D.C.
- Long Island Seaport & EcoCenter, Inc., Director, Port Jefferson, NY
- Boy Scouts of America, Trained Scoutmaster, Nathanial Woodhull District, NY
- Historical Society of Port Jefferson, Trustee, Port Jefferson, NY
- Environmental Conservation Board, Village of Port Jefferson, NY
- Port Jefferson Village, Waterfront Advisory Committee, Port Jefferson, NY
- Town of Brookhaven Mount Sinai Harbor Advisory Committee, Medford, NY
- Brookhaven Conservation Advisory Council, Medford, NY

Steven J. McGinn, CEI

PERSONAL PROFESSIONAL QUALIFICATIONS

Licensing and Certification:

- Licensed Asbestos Inspector
- OSHA 40 Hour HAZWOPER
- Certified Environmental Inspector, Environmental Assessment Association (CEI)
- Lead Based Paint Risk Assessor
- Radon Measurement Specialist

Experience:

- Partner/Division Manager, Nelson, Pope & Voorhis, LLC (July 2005 to Present)
- Senior Environmental Analyst, Nelson, Pope & Voorhis, LLC (January 1997 to July 2005)
- Environmental Analyst, Nelson & Pope, LLP (July 1989 to January 1997)
- Project Manager, Middleton Kontokosta & Associates (May 1988 to July 1989)
- Planning Aide, Town of Huntington Planning Department (January 1987 to May 1988)

Education:

- 8-Hour HAZWOPER Refresher Course
- 40-Hour Course Hazardous Materials Training
- Performing Phase I Environmental Inspections, Environmental Assessment Association, Sept. 1997
- Environmental Regulations Course, Executive Enterprises, June 1996
- Environmental Impact Statements, Cook College/Rutgers University, December 1994
- State University of New York at Cortland - Bachelor of Science in Geography, January 1986

Significant Professional Achievements:

- Village of Hempstead Urban Renewal Project - Phase I ESA
- Coram Plaza, Coram - Phase I, II & III ESA and Asbestos Survey
- 744 Clinton Street, Brooklyn - Phase I & II ESA
- Middle Island Country Club, Middle Island - Phase I & II ESA
- Tyrolean Auto Sport, Northport - Phase II & III ESA
- Long Island Children's Museum, Westbury - Phase I & II ESA
- 940 Bryant Avenue, Bronx - Phase I ESA
- 1345 Seneca Avenue, Bronx - Phase I ESA
- Red Roof Farms, Rye Brook - Phase I & II ESA
- Thomas Dodge Subaru, Port Jefferson - Phase I & II ESA
- 221 Skip Lane, Bay Shore - Phase I & II ESA
- 950 West Main Street, Riverhead - Phase I ESA
- Long Island Galleria/Price Club Plaza, Westbury - DEIS & FEIS
- Currans Road Development, Middle Island - DEIS & FEIS
- Timber Ridge at the Plains, Greenlawn - DEIS & FEIS
- Greene's Creek Marina, Sayville - DEIS
- Town of Brookhaven Marine Reconstruction Projects, Patchogue, Blue Point, Port Jefferson, Mount Sinai, - Tidal Wetland Permits
- Village of Lake Success, Lake Success - Land Use and Zoning Analyses

Professional Responsibilities:

- Division Manager for Phase I and Phase II Environmental Site Assessments, Site Remediation Coordination and Supervision, Lead-Based Paint sampling and Asbestos Surveys for lending institutions
- Author of numerous Phase I & II ESA reports, remediation & brownfield projects work plans, and closure reports in both draft and final formats for major large scale, high-profile projects.
- Other responsibilities include the preparation of various environmental, planning and zoning studies and the preparation of various state and federal applications such as: land use and zoning studies, noise and air quality assessments, feasibility studies, economic analyses, freshwater and tidal wetland permits, etc.
- Interaction with various Town, County, State and Federal officials, attorneys, developers, engineers, Town Boards, Planning Boards, and Zoning Boards of Appeals.

Professional & Other Organizations (past and present):

- American Planning Association, Washington, D.C.
- National Association of Environmental Professionals, Alexandria, VA
- Environmental Assessment Association, Scottsdale, Arizona
- National Groundwater Association, Assoc. of Groundwater Scientists and Engineers

Carrie O'Farrell, AICP

PERSONAL PROFESSIONAL QUALIFICATIONS

Experience:

- Partner/Division Manager of the Environmental Resource & Wetland Assessment Division, Nelson, Pope & Voorhis, LLC Melville, New York (3/2004 - present).

- Environmental Planner; Nelson, Pope & Voorhis, LLC, Melville, NY (10/2002 to 2/2004). Preparation of environmental assessments, environmental impact statements and various other land use and feasibility studies. Development of land use plans for town zoning and planning purposes, and coordinate reviews with various town and state officials. Preparation of freshwater & tidal wetlands permits & permit plans, NYSDEC Stormwater Pollution Prevention Plans and Stormwater General Permit filings.

- Consultant and Environmental Policy Analyst, Booz Allen Hamilton, Inc., Washington, D.C. (1999 to 2002). Provide program management, planning, on-site support, and data analysis for various federal agency environmental programs including U.S. De partment of Energy, Federal Aviation Administration (FAA), and U.S. Department of Defense.
  Prepared policy recommendations, program information briefings, Congressional testimony, and various program support active ties. Reviewed and prepared sections of environmental impact analyses, policy language, responses to public comments, press releases, and fact sheets; and coordinated interagency meetings and comment resolution between various federal offices.

Education:

- Bachelor of Science: University of Rochester, Environmental Science, May 1999

Significant Professional Achievements:

- Environmental Impact Statements (EIS): Lighthouse@Long Island, Kensington Estates, Woodbury; Roslyn Landing@Roslyn; Tiana Commons PDD, Town of Southampton; Glen Harbor Partners Town of N. Hempstead; The Residences @ North Hills, Village of North Hills; Lands End, Village of Sands Point; Korean Church of Long Island, Village of Lake Success; Sandy Hills, Town of Brookhaven;
- Draft Generic EIS and Mixed Use Planned Development District legislation: Gabreski Airport PDD; North Sea Mixed Use Development District, Southampton, NY.
- Planned Development District Master Plan & Planned Development District (PDD) Legislation: Gabreski Airport Master Plan, Town of Southampton; North Sea PDD, Town of Southampton; Poxabogue Golf Course PDD, Town of Southampton
- Expanded Part I & Part III Environmental Assessments: Parrish Art Museum, Town of Southampton; Cenacle Manor, Ronkonkoma; The Seasons at East Meadow; Laurel Hollow Subdivision; Greenport Marina, Greenport, NY; Engel Burman @ Plainview; Shaw Estates at Manorville
- DEC SPDES Phase II Permits & Municipal Compliance: Village of Poquott, Village of Port Jefferson, & Village of Bellport Stormwater Management Plans; Completion of DEC annual re ports; completion of 75+ Stormwater Pollution Prevention Plans for Stormwater Discharges from Construction Activity (GP-0-08-001) for construction sites throughout Nassau & Suffolk Counties.
- Municipal Planning Studies: Mount Sinai Harbor Management Plan, Town of Brookhaven; NYSDOS Beaverdam Creek Watershed Management Plan; NYSDOS Barriers to Fish Passage in six South Shore Estuary Reserve Tributaries; Town of North Hempstead, North Sheets Creek Beach Shoreline & Park Improvements; Town of Shelter Island Water Supply Study; Village of Manorhaven Nature Preserve.
- Wetlands Permits & Feasibility Studies: Fire Island Pines Property Owner's Association, Brookhaven; Bedford Ponds, Bedford, NY; Kismet Walks, Town of Islip; Mooney Pond, Coram, Town of Brookhaven; Port Washington Yacht Club, Port Washington;
- Site plan/subdivision review: Town of Southampton, Town of Southold, & Village of Poquott.
- US Department of Energy Yucca Mountain Project Draft, Supplemental, and Final EIS. Conducted headquarters poli cy review, prepared draft language, and coordinated interagency comment/review of documents for nationwide NEPA project.
- U.S. Department of Energy Yucca Mountain Site Re commendation. Assisted in the development and review of U.S. Secretary of Energy's Yucca Mountain Site Recommendation Decision and Congressional approval.
- NYC CEQR Environmental Assessments: Briarwood Plaza Bell Boulevard Rezoning; Hatzolah of Boro Park
- NEPA Environmental Assessment: Heckscher Museum, Huntington, NY.

Kathryn J. Eiseman, AICP

PERSONAL PROFESSIONAL QUALIFICATIONS

Licensing and Certification:

- American Institute of Certified Planners (AICP)

Experience:

- Partner/Division Manager of the Environmental & Community Planning Division, Nelson, Pope & Voorhis, LLC Melville, NY) and Charles Voorhis & Associates, Inc. (Miller Place, NY) (7/93 to Present). Project management, preparation of planning studies, downtown revitalization plans, visual preference surveys and public workshop planning and facilitation, environmental impact statements, Geographic Information Systems analysis and mapping, air impact studies, air dispersion modeling (CAL3QHC), noise impact analysis and mitigation, conduct planning studies for land use compatibility/precedent, school and fiscal analysis, testimony at Planning Board meetings.
- Arlington Central School District; Poughkeepsie, NY. (9/91 - 6/93). Mathematics teacher, grade 7.
- Hyde Park Central School District; Hyde Park, NY. (9/89 - 6/91). Mathematics teacher, grades 7 and 8. Yearbook and Mathcounts Club advisor.

Education:

- State University of NY at Stony Brook, Masters Degree in Environmental and Waste Management, 12/96.
- State University of New York at New Paltz; New York (9/89- 6/93). Graduate studies in mathematics, education, computer science, environmental studies and liberal arts.
- Syracuse University; Syracuse, New York. Bachelors Degree. Dual Majors: Mathematics and Education, 5/88.
- Université de Grenoble; Grenoble, France. French language certificate program for foreign students, 5/84.

Significant Professional Achievements:

- Montauk Highway Corridor Study & Land Use Plan for Mastic and Shirley Phase II , 2009
- East Hampton Commercial Districts Study, 2009
- Oyster Bay LWRP, in progress
- Town of Brookhaven Athletic Fields Needs Assessment, in progress
- Planning Consultant to the Village of Southampton, ongoing
- Eastern Waterfront Community Vision & Revitalization Plan , 6/09
- Lake Ronkonkoma Clean Lakes Study Update, 7/08
- Suffolk County North Shore Embayments Watershed Management Plan, (Final), 11/07
- Syosset Downtown Redevelopment & Revitalization Plan, 9/05
- East Hills Architectural Review Board Planning Study, 1/05
- East Hills Residential Bulk Regulations Review & Study, 1/05
- Stormwater Outfall and Conveyance Inventory and Mitigation Plan for Town of Islip, 2003
- Mt. Sinai Harbor Shellfish Closure Area Investigation, Town of Brookhaven, 2/03
- Hicksville Fire District Mapping and Spatial Analysis, 2003.
- Visual Preference Survey, Port Jefferson Village, 6/02
- Setauket Fire District Needs Analysis, Setauket, New York, 2001
- Review of Past Water Quality Studies, Port Jefferson Village, 2000
- Stormwater Study, Inventory & Analysis of Stormwater Outfalls for the Town of Brookhaven South Shore Bays, 1996, West Meadow Creek, 2000, and Town of Islip, 2001

Professional Organizations, Certifications & Training:

- APA Metro Long Island Section Treasurer
- Boys & Girls Club of Bellport Advisory Council Member
- American Institute of Certified Planners since July 2000
- American Planning Association Member since 1997
- IAP2 Certificate Course in Public Participation, January 2004
- CommunityViz Scenario Constructor, SiteBuilder 3D™, Policy Simulator training, November 2002
- Introduction to ArcView GIS, ESRI 16 hour course, 4/00
- Fundamentals of Dispersion Modeling and Computer Modeling Laboratory, June, 1998
- Rutgers University, Methodology of Delineating Wetlands, July 1987

NICOLE L. DELLAVECCHIA

PERSONAL PROFESSIONAL QUALIFICATIONS

Experience:

Economic Analyst/Planner, Nelson, Pope & Voorhis, LLC (2009-Present)

- Completed fiscal impact analyses and economic impact analyses for planned development districts, as well as residential, commercial, recreational and mixed-use developments
- Prepared market analyses, feasibility studies, and needs assessments on small and large-scale shopping centers, mixed use developments, as well as residential developments, including independent senior living, assisted living facilities, continuing care retirement communities (CCRC) and other senior housing developments
- Completed property tax and sales tax analyses
- Prepared niche market/branding plans
- Conducted tax base, build-out, and zoning analyses
- Completed analyses to assess and quantify impacts to school districts and other local community service providers
- Involved with the preparation of SEQR review documents including Environmental Assessment Forms and Environmental Impact Statements
- Conducted demographic and socioeconomic analyses
- Prepared proposals and other marketing efforts

Urban Planner/Economic Analyst, Saratoga Associates, Saratoga Springs, NY (2006-2008)

- Completed comprehensive/master plans in urban, suburban and rural communities
- Conducted comprehensive community needs assessments, and demographic and socioeconomic analyses
- Heavily involved in economic development strategies, mall redevelopment, and tourism plans

Prepared market analyses and feasibility studies, as well as fiscal and economic impact analyses on variety of uses

- Involved with the preparation of corridor management plans, environmental impact statements, brownfield and industrial park redevelopment plans, local waterfront revitalization programs, parking demand analyses
- Facilitated public participation, community visioning processes and public forums
- Created maps, images, graphics and other visuals for various plans and presentations
- Prepared and reviewed grants for federal, state and local funding sources

Significant Professional Achievements:

- Waterfront Market Analysis: *Town of Oyster Bay Eastern Waterfront Area (2011)*
- Commercial Market Analysis: *The Meadows at Yaphank PDD (2011), Mt. Sinai Village Centre (2011), Artist Lake Plaza (2010), Eastport Hamlet Centre (2009)*
- Residential Market Analysis: *The Uplands at St. Johnland CCRC (2011), Assisted Living Community in Speonk (2010)*
- School District Analysis: *Jefferson Meadows (2011), North Manor Estates (2011)*
- Comprehensive Master Plan: Village of Poquott (2011), *Town of Southold - Economic Development Chapter and Demographics Chapter (2011)*
- Niche Market and Branding Plan: *North Bellport Community (2011)*
- Fiscal Impact Analysis: *The Meadows at Yaphank PDD (2011), Mt. Sinai Village Centre (2011), New Frontier (2011), Eastport Hamlet Centre (2010), The Hamptons Club at Eastport (2009)*
- Economic Impact Analysis: *The Meadows at Yaphank PDD (2011), Mt. Sinai Village Centre (2011), New Frontier (2011), Assisted Living Community at East Northport (2009), The Hamptons Club at Eastport (2009)*
- Planning Analysis in Support of Use Variance: *Edwards Avenue Property, Calverton (2011)*
- Received formal training in the IMPLAN Economic Modeling System through the Minnesota Implan Group, 2009

Education:

- **Master of Urban Planning**
  Specialization in International and Economic Development
  State University of New York, University at Buffalo, 2006
- **Bachelor of Arts - Economics**
  State University of New York, College at Geneseo, 2004
- **Bachelor of Arts - International Relations**
  Specialization in Economic Development
  State University of New York, College at Geneseo, 2004

Professional Organizations and Interests:

- American Planning Association, Member
- United States Green Building Council, Member
- State University of New York, College at Geneseo, Long Island Regional Alumni Committee, Member
- Ronald McDonald House of Long Island, Volunteer
- Special Olympics of New York, New York City Region and Long Island Region, Volunteer
- Alpha Phi Omega, Alumni

Appendix A-2
Environmental Assessment Form, (EAF) Part 1

NP&V, LLC

2/24/14

NELSON POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING

617.20
Appendix A
State Environmental Quality Review
FULL ENVIRONMENTAL ASSESSMENT FORM

PURPOSE: The full EAF is designed to help applicants and agencies determine, in an orderly manner, whether a project or action may be significant. The question of whether an action may be significant is not always easy to answer. Frequently, there are aspects of a project that are subjective or unmeasurable. It is also understood that those who determine significance may have little or no formal knowledge of the environment or may not be technically expert in environmental analysis. In addition, many who have knowledge in one particular area may not be aware of the broader concerns affecting the question of significance.

The Full EAF is intended to provide a method whereby applicants and agencies can be assured that the determination process has been orderly, comprehensive in nature, yet flexible enough to allow introduction of information to fit a project or action.

FULL EAF COMPONENTS: The full EAF is comprised of three parts:

Part 1: Provides objective data and information about a given project and its site. By identifying basic project data, it assists a reviewer in the analysis that takes place in Parts 2 and 3.

Part 2: Focuses on identifying the range of possible impacts that may occur from a project or action. It provides guidance as to whether an impact is likely to be considered small to moderate or whether it is a potentially large impact. The form also identifies whether an impact can be mitigated or reduced.

Part 3: If any impact in Part 2 is identified as potentially-large, then Part 3 is used to evaluate whether or not the impact is actually important.

DETERMINATION OF SIGNIFICANCE -- Type 1 and Unlisted Actions

Identify the Portions of EAF completed for this project: ☑ **Part 1** ☐ **Part 2** ☐ **Part 3**

Upon review of the information recorded on this EAF (Parts 1 and 2 and 3 if appropriate), and any other supporting information, and considering both the magnitude and importance of each impact, it is reasonably determined by the lead agency that:

☐ **A.** The project will not result in any large and important impact(s) and, therefore, is one which will not have a significant impact on the environment, therefore a negative declaration will be prepared.

☐ **B.** Although the project could have a significant effect on the environment, there will not be a significant effect for this Unlisted Action because the mitigation measures described in PART 3 have been required, therefore a CONDITIONED negative declaration will be prepared.*

☐ **C.** The project may result in one or more large and important impacts that may have a significant impact on the environment, therefore a positive declaration will be issued and an Environmental Impact Statement will be prepared.

***A Conditioned Negative Declaration is only valid for Unlisted Actions**

The Seasons	***Town of Huntington, Town Board***
Name of Action	Name of Lead Agency
Hon. Frank P. Petrone	***Town Supervisor***
Print or Type Name of Responsible Officer in Lead Agency	Title of Responsible Officer
Signature of Responsible Officer in Lead Agency	Signature of Preparer (if different from responsible officer)

Date

PART 1--PROJECT INFORMATION
Prepared by Project Sponsor

NOTICE: This document is designed to assist in determining whether the action proposed may have a significant effect on the environment. Please complete the entire form, Parts A through E. Answers to these questions will be considered as part of the application for approval and may be subject to further verification and public review. Provide any additional information you believe will be needed to complete Parts 2 and 3.
It is expected that completion of the full EAF will be dependent on information currently available and will not involve new studies, research or investigation. If information requiring such additional work is unavailable, so indicate and specify each instance.

Name of Action *The Seasons*	Suffolk County Tax Map Number *0400-170-2-15.1*	
Location of Action (include Street Address, Municipality and County) *544 Elwood Rd., west side of Elwood Rd., opposite Hammond Rd., East Northport*		
Name of Applicant/Sponsor *BK Elwood, LLC, Steve Krieger, Principal*	Business Telephone *(516) 747-1200*	
Address *67 Clinton Road*		
City *Garden City*	State *New York*	Zip Code *11530*
Name of Owner (if different than applicant) *Oak Tree Farm Dairy, Inc., Harry Singh*	Business Telephone *(631) 368-3600*	
Address *544 Elwood Road*		
City *East Northport*	State *NY*	Zip Code *11731*
Description of Action *Site is presently occupied by the Oak Tree Farm Dairy facility, a pre-existing, non-conforming use in a residential zoning district. Proposal is for rezone of 37.05-acre site from R-40 to R-RM, for construction of 360 senior condominium units (in 56 multi-unit structures). Project will conform to Town Code requirements regarding affordable units. All wastewater to be treated in new on-site STP; Existing STP (used to treat waste from dairy operation and subject of odor complaints) will be removed. Runoff to be handled in on-site drainage system, to include recharge area and 2 naturalized recharge areas and 2 ponds. Project includes 17,000 SF clubhouse building, dog run, jacuzzi, and two outdoor swimming pool/patio area.*		

Use the last page or the back of this form to answer questions for which there is insufficient space on the form to include all pertinent information.

Please Complete Each Question - Indicate N.A. if not applicable

A. SITE DESCRIPTION

Physical setting of overall project, both developed and undeveloped areas.

1. Present land use: ☐ Urban ☐ Industrial ☑ Commercial ☐ Residential (suburban) ☑ Rural (non-farm)
   ☐ Forest ☐ Agriculture ☑ Other *(Dairy product processing facility and trucking operation; pre-existing, non-conforming use)*
2. Total acreage of project area: *37.05* acres.

APPROXIMATE ACREAGE	PRESENTLY	AFTER COMPLETION
Meadow or Brushland (Non-agricultural)	*26.53* acres	*1.64* acres
~~Forested~~ *Recharge Areas (3)*	*0* acres	*2.50* acres
Agricultural (Includes orchards, cropland, pasture, etc.)	*0* acres	*0* acres
Wetland (Freshwater or tidal as per Articles 24,25 of ECL)	*0* acres	*0* acres
Water Surface Area *(Ponds)*	*0* acres	*0.73* acres
Unvegetated (Rock, earth or fill)	*3.59* acres	*0* acres
Roads, buildings and other paved surfaces	*5.84* acres	*17.65* acres
Other (Indicate type) *landscaping*	*1.09* acres	*14.53* acres

3. What is predominant soil type(s) on project site? *Haven loam (HaA, HaB), Carver and Plymouth Sands (CpE), Fill land, sandy (FS), Raynham loam (RA), Montauk silt loam (MkB, MkC)*
   a. Soil drainage: ☑ Well drained *80* % of site ☑ Moderately well drained *20* % of site ☐ Poorly drained ____ % of site
   b. If any agricultural land is involved, how many acres of soil are classified within soil group 1 through 4 of the NYS Land Classification System? *N/A* acres (See 1 NYCRR 370).

4. Are there bedrock outcroppings on project site? ☐ Yes ☑ No
   a. What is depth to bedrock? *±1,000* (in feet)

5. Approximate percentage of proposed project site with slopes:
   ☑ 0-10% *90* % ☑ 10-15% *10* % ☐ 15% or greater ____ %

6. Is project substantially contiguous to or is it occupied by an historic building or landmark as designated pursuant to Article VI of the Town Code? ☐ Yes ☑ No *(per: Town Code Sec. 198-42B)*

7. Is project substantially contiguous to, or contain a building, site, or district, listed on the State or the National Registers of Historic Places or the Register of Natural Landmarks? ☐ Yes ☑ No *(per: OPRHP Cultural Resources Sensitivity Map)*

8. Is the project site within a one mile radius of an archeologically significant site or multiple site zone, as has been identified by the New York State Office of Parks, Recreation and Historic Preservation using the "circles and squares" method of evaluation? ☑Yes ☐No *(per: OPRHP Cultural Resources Sensitivity Map)*

9. What is the depth of the water table? *>100* feet
   to Groundwater? *±115* feet *(minimum)*

10. Is site located over a primary, principal, or sole source aquifer? ☑Yes ☐No

11. Do hunting, fishing or shell fishing opportunities presently exist in the project area? ☐Yes ☑No
    If yes, will they continue after completion of project? ☐Yes ☐No

12. Does project site contain any species of plant or animal life that is identified as threatened or endangered? ☐Yes ☑No
    According to *None known or suspected; per NPV site visit of 1/9/12*
    Identify each species ____

13. Are there any unique or unusual land forms on the project site? (i.e., cliffs, dunes, other geological formations)?
    ☐Yes ☑No Describe ____

14. Is the project site presently used by the community or neighborhood as an open space or recreation area? ☐Yes ☑No
    If yes, explain ____
    If yes, will the use continue at the completion of the project? ☐Yes ☐No

15. Does the present site include scenic views known to be important to the community? ☑Yes ☐No
    If yes, will the views be retained with the completion of the project? ☐Yes ☑No

16. Streams within or contiguous to project area: *N/A*
    a. Name of Stream and name of River to which it is tributary ____

17. Lakes, ponds, wetland areas within or contiguous to project area: *N/A*
    a. Name ____ b. Size (In acres) ____

18. Is the site served by existing public utilities? ☑Yes ☐No
    a) If Yes, does sufficient capacity exist to allow connection? ☑Yes ☐No
    b) If Yes, will improvements be necessary to allow connection? ☑Yes ☐No

19. Is the site located in an agricultural district certified pursuant to Agriculture and Markets Law, Article 25-AA, Section 303 and 304? ☐Yes ☑No

20. Is the site located in or substantially contiguous to a Critical Environmental Area designated pursuant to Article 8 of the ECL, and 6 NYCRR 617 (SEQRA)? ☐Yes ☑No

21. Has the site ever been used for the disposal of solid or hazardous wastes? ☐Yes ☑No

B. PROJECT DESCRIPTION

1. Physical dimensions and scale of project (fill in dimensions as appropriate)
   a. Total contiguous acreage owned or controlled by project sponsor *37.05* acres.
   b. Project acreage to be developed: *±37.05* acres initially; *±37.05* acres ultimately.
   c. Project acreage to remain undeveloped *0* acres.
   d. Length of project, in miles: *N/A* (if appropriate).
   e. If the project is an expansion, indicate percent of expansion proposed *N/A* %.
   f. Number of off-street parking spaces existing *±20*; proposed *±816*; required by Code: *±540*.
   g. Maximum vehicular trips generated per hour *98* (upon completion of project). ***(per:VHB, Weekday PM Peak Hour)***
   h. If residential, number and type of housing units:

	One Family	Two Family	Multiple Family	Attached Cluster
Initially			*360*	
Ultimately			*360*	

   i. Dimensions (in feet) of largest proposed structure *35* height; *±65* width; *±95* length.
   j. If commercial/industrial the gross floor area of proposed building *N/A* sq. ft.
   k. If commercial/industrial the "Floor Area Ratio" *N/A* FAR.
   (Proposed building area in square feet divided by lot area in square feet)
   l. Linear feet of frontage along any road in the Town? *±1,313* ft.

**** unknown at present***

2. How much natural material (i.e., rock, earth, etc.) will be removed from the site? * tons/cubic yards.

3. Will disturbed areas be reclaimed? ☑Yes ☐No ☐N/A
   a. If yes, for what intended purpose is the site being reclaimed? ***Homesites, landscaping, roadways***
   b. Will topsoil be stockpiled for reclamation? ☑Yes ☐No
   c. Will upper subsoil be stockpiled for reclamation? ☑Yes ☐No

4. How many acres of vegetation (trees, shrubs, ground covers) will be removed from site? *24.89* acres. ***(estimated)***

5. Will any mature forest (over 100 years old) or other locally-important vegetation and/or NYS protected native plants be removed by this project? ☐Yes ☑No

6. If single phase project: Anticipated period of construction *N/A* months, (including demolition).

7. If multi-phased:
   a. Total number of phases anticipated *4 ** (number). ***(2 sections each phase)***
   b. Anticipated date of commencement phase 1 *Spring* month *2015* year,(including demolition).
   c. Approximate completion date of final phase *Spring* month *2017* year. ****details undetermined at present***
   d. Is phase 1 functionally dependent on subsequent phases? ☑Yes ☐No

8. Number of jobs generated: during construction? *268*; ***(Full-time equivalents; assume 3 year construction)***
   If industrial/office or retail number of job generated after project is complete? *N/A*.

9. Number of jobs eliminated by this project? *65*.

10. Will project require relocation of any projects or facilities? ☐Yes ☑No
    If yes, explain

11. Is surface liquid waste discharge to a body of water involved? ☐Yes ☑No
    a. If yes, indicate type of waste (sewage, industrial, etc.) and amount
    b. Name of water body into which effluent will be discharged

12. Is subsurface liquid waste disposal involved? ☑Yes ☐No
    Type ***Sanitary wastewater*** ***(stormwater, sanitary wastewater)***
    If yes, volume per day; *97,000±* gallons.

13. Will surface area of an existing water body increase or decrease, or will the bottom become deeper as a result of the project? ☐Yes ☑No * Explain ****However, existing wastewater treatment lagoons will be removed.***

14. Is project, or any portion of project, located in a 50 or 100 year flood plain? ☐Yes ☑No
    If yes, which: ☐50 year ☐ 100 year

15. Will the project generate solid waste? ☑Yes ☐No
 a. If yes, what is the amount per month? *28.35* tons.*(based on 3.5 lbs/capita assuming 540 residents and 0.10 lbs/SF/day of recreational bldg.)*
 b. If yes, will an existing solid waste facility be used? ☑Yes ☐No
 c. If yes, give name *Huntington Resource Recovery Facility*;
 location *East Northport*

16. Will any wastes NOT go into a sewage disposal system or into a sanitary landfill? ☑Yes ☐No
 e. If Yes, explain *Recyclable portion to be separately handled*
 f. Volume of solid waste that will be recycled each month: *±7.09* tons.

To be answered only if the project is one that will operate a facility that disposes of solid wastes.

17. Will the project involve the disposal of solid waste? ☐Yes ☐No
 a. If yes, what is the anticipated rate of disposal? ________ tons/month.
 b. If yes, what is the anticipated site life? ________ years.

18. Will project use herbicides or pesticides? ☐Yes ☑No

19. Will project routinely produce odors (more than one hour per day)? ☐Yes ☑No

20. Will project produce operating noise exceeding the local ambient noise levels? ☐Yes ☑No

21. Will project result in an increase in energy use? ☑Yes ☐No
 If yes, indicate type(s) *Electricity, fossil fuels*

22. If water supply is from wells, indicate pumping capacity *N/A* gallons/minute.

23. Total anticipated water usage per day *99,275 ±* gallons/day.*(estimated; includes anticipated lawn irriga*

24. Does project involve Local, State or Federal funding? ☐Yes ☑No
 If yes, explain ________

25. Approvals Required:

	Yes	No	Type	Submittal Date
Town Board	☑Yes	☐No	*Rezone*	*Pending*
Planning Board	☑Yes	☐No	*Site Plan*	*Pending*
Town ZBA	☐Yes	☑No		
Health Department	☑Yes	☐No	*Wastewater Disposal, Water Supply*	*Pending*
Other Local Agencies	☑Yes	☐No	*Town Building Permits, SWPPP, STP & Roadwork*	*Pending*
State Agencies	☑Yes	☐No	*NYSDEC SPDES General Permit*	*Pending*
Federal Agencies	☐Yes	☑No		
Other	☑Yes	☐No	*Water Supply (Greenlawn WD)*	*Pending*

C. ZONING and PLANNING INFORMATION

1. Does proposed action involve a planning or zoning decision? ☑Yes ☐No
 If Yes, indicate decision required:
 ☑ zoning amendment ☐ zoning variance ☐ special use permit ☐ subdivision
 ☑ site plan ☐ new/revision of master plan ☐resource management plan
 ☐ other ________

2. What is the zoning classification(s) of the site? *R-40 (Residence)*

3. What is the maximum potential development of the site if developed as permitted by the present zoning?
 30 lots

4. What is the proposed zoning of the site? *R-RM*

5. What is the maximum potential development of the site if developed as permitted by the proposed zoning?
 538 units (estimated)

6. Is the proposed action consistent with the recommended uses in adopted local land use plans? ☐Yes ☑No
(Town Horizon's 2020 Plan Update recommends Low-Density Residential Use.)

7. What are the predominant land use(s) and zoning classifications within a 1/4 mile radius of proposed action?
Residential, Commercial, Public Open Space, Institutional; R-40, R-20, C-1, R-RM, C-3, C-2,

8. Is the proposed action compatible with adjoining/surrounding land uses within a 1/4 mile? ☑Yes ☐No

9. If the proposed action is the subdivision of land, how many lots are proposed? ***N/A***
a. What is the minimum lot size proposed? ______

10. Will proposed action require any authorization(s) for the formation of sewer or water districts? ☐Yes ☑No

11. Will the proposed action create a demand for any community provided services (recreation, education, police, fire protection)? ☑Yes ☐No
a. If yes, is existing capacity sufficient to handle projected demand? ☑Yes ☐No

12. Will the proposed action result in the generation of traffic significantly above present levels? ☑Yes ☐No
a. If yes, is the existing road network adequate to handle the additional traffic? ☑Yes ☐No
b. Will improvements be necessary? ☑Yes ☐No
c. If yes to either a. or b., what is the basis for such opinion and agency name and documentation that supports the conclusion: ***TIS (VHB); traffic signal and deceleration lane at site entrance and signal timing changes needed***

D. INFORMATIONAL DETAILS

Attach any additional information as may be needed to clarify your project. If there are, or may be, any adverse impacts associated with your proposal, please discuss such impacts and the measures which you propose to mitigate or avoid them.

E. VERIFICATION

I hereby certify that I have filled out the above form for the action known as:

The Seasons

and to the best of my knowledge all of the answers are true.

Applicant/Sponsor Name:

Phil Malicki, CEP, AICP, LEED® AP; NP&V, LLC Date 2/24/14

Signature [signature] Title ***Senior Environmental Planner***

If the action is in the Coastal Area, and you are a state agency, complete the Coastal Assessment Form before proceeding with this assessment.

If the Applicant/Sponsor did not fill out this form then the following verification must be signed.

I am the applicant/sponsor of the proposed project described above and I hereby certify that I have given the above signed individual/company permission to fill out this form on my behalf. I further certify that the above signed c consultant has made me aware of the questions on this form and explained the answers that have been provided, and I understand the proposed project and the answers provided on this form.

Name: ______________________________ Date: ______________________
(Print or type name)

Signed: ______________________________ Title: ______________________

APPENDIX B

PHOTOGRAPHS OF SITE AND VICINITY

NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING

APPENDIX B
PHOTO KEY INDEX

Source: NYSGIS Orthoimagery Program 2010
Scale: 1" = 500'

NORTH

The Seasons, Elwood

Expanded EAF

1. Photo taken from northeast corner of the property, looking north along Elwood Road.

2. Photo taken from the northeast corner of the property looking south along Elwood Road.

3. Photo taken from the western terminus of South Shelby Road looking west towards the subject site.

4. Photo taken from the western terminus of Hammond Road looking west towards the subject site.

5. Photo taken from the northern office building entrance looking north along Elwood Road.

6. Photo taken from the northern office building entrance looking south along Elwood Road.

7. Photo taken from the intersection of Fair Oaks Court and Elwood Road, looking north towards the subject site.

8. Photo taken from the western terminus of Fair Oaks Court, looking northeast towards the subject site.

9. Photo taken from Elwood Park, looking northeast towards the subject site.

10. Photo taken from the eastern terminus of Ciro Street looking east towards subject site.

APPENDIX C

SONIR COMPUTER MODEL DOCUMENTATION

Appendix C-1
SONIR Model User's Guide

SONIR MODEL USER'S GUIDE

Simulation of Nitrogen in Recharge (SONIR)
Nelson, Pope & Voorhis, LLC Microcomputer Model

INTRODUCTION

SONIR is a microcomputer model developed by Charles J. Voorhis, CEP, AICP for use by Nelson, Pope & Voorhis, LLC in order to simulate the hydrologic water budget of a site and determine total nitrogen and nitrogen present in recharge in connection with land use projects. The model was developed on the Microsoft Excel Spreadsheet (trademark of Microsoft Products) for IBM (trademark of International Business Machines, Inc.) or compatible Personal Computers capable of running Excel.

Nitrogen has been identified as a source of contamination primarily from sanitary discharge and lawn fertilization. Nitrogen is of concern as a drinking water contaminant, and there is an established health limit of 10 milligrams per liter (mg/l) in drinking water. Nitrogen is also of concern in surface water, as it is a nutrient that when present in high concentrations can cause algal blooms, resulting in biological oxygen demand as algae is biologically decomposed. Depleted oxygen in surface waters causes conditions unfavorable to fish species and can result in extremely undesirable aesthetic impacts, primarily related to odors. Accordingly, it is necessary to understand the concentration of nitrogen recharge as related to a proposed site development.

Utilizing a mass-balance concept, and applying known hydrologic facts and basic assumptions, it is possible to predict the concentration of nitrogen in recharge to the shallow aquifer underlying a given site. This prediction can in turn be used to determine impacts and significance of impacts in consideration of hydrogeologic factors. Similar techniques have been used to simulate nitrogen in recharge as published by the New York State Water Resources Institute, Center for Environmental Research at Cornell University, Ithaca, New York (**Hughes and Pacenka, 1985**). SONIR is intended to provide a more versatile model based upon the BURBS Mass-Balance concept. SONIR allows for use of the model to predict nitrogen impact from many sources including sewage treatment plants, and further allows for determination of a wider variety site recharge components under the hydrologic water budget section. SONIR has more versatility in the input of information, and also provides a printout of each step performed by the model, in order for regulatory agencies and review entities to understand how values are derived.

This text describes in detail the definition of terms, supported by referenced information regarding input of data for the simulation. The concept of determining the concentration of nitrogen in recharge involves a predication of the weight of nitrogen introduced to the site, as compared to the quantity of recharge resulting from precipitation and wastewater water discharge. Losses due to evapotranspiration and runoff must be accounted for in the simulation. The values and relationship associated with these parameters determines the quantity of recharge that enters the site. The prediction is generally annualized due to the availability of average annual hydrologic data; however, data input can be determined on a seasonal basis if information is available.

The model includes four (4) data sheets identified as follows:

* Data Input Field - Sheet 1
* Site Recharge Computations - Sheet 2
* Site Nitrogen Budget - Sheet 3
* Nitrogen in Recharge Output Field - Sheet 4

All information required by the model is input in Sheet 1 - Data Input Field. Sheets 2 and 3 utilize data from Sheet 1 to compute the Site Recharge and the Site Nitrogen Budget. Sheet 4 utilizes the total values from Sheets 2 and 3 to perform the final Nitrogen in Recharge computations. Sheet 4 also includes tabulations of all conversion factors utilized in the model.

It should be noted that the simulation is only as accurate as the data which is input into the model. An understanding of hydrologic principles is necessary to determine and justify much of the data inputs used for water budget parameters. Further principles of environmental science and engineering are applied in determining nitrogen sources, application and discharge rates, degradation and losses, and final recharge. Users must apply caution in arriving at assumptions in order to ensure justifiable results.

SITE RECHARGE COMPUTATIONS

Overview

SONIR utilizes the basic hydrologic equation for determining the quantity of recharge anticipated by subtracting recharge losses from total precipitation. The quantity of recharge resulting from a given site is determined using the hydrologic budget equation **(Koszalka, 1984; p. 19):**

$$R = P - (E + Q)$$

where:

R = recharge
P = precipitation
E = evapotranspiration
Q = overland runoff

The quantity of recharge must be determined for each type of land use existing on a site, in order to determine the resultant site recharge. Surfaces commonly considered include: impervious surfaces; turfed areas; and natural areas; however, SONIR allows for a variety of land cover types to be considered in the model. In addition, site recharge occurs as a result of irrigation and wastewater discharge. In cases where water is imported to a site via a public water system, this quantity of recharge must be considered as additional water recharged on site. SONIR allows for all of these recharge components to be included in the simulation. Many sites have fresh surface water in the form of lakes and ponds. Precipitation falls upon these surfaces; however, such features generally act as a mechanism for water loss as a result of evaporation. SONIR includes a Water Area Loss component in determining the site Hydrologic Water Budget and in computing recharge nitrogen.

Data Input - Sheet 1

The following provides a discussion of data sources and assumptions associated with the hydrologic water budget, corresponding to the Data Input Field in Sheet 1 of SONIR:

1. *Area of Site* - The total area of the site (in acres) that is capable of recharging precipitation is entered in this data cell. For sites that include tidal wetlands, the area that is inundated by tidal waters should be excluded, as recharge from these areas should not be considered in the context of nitrogen simulation. For sites that include surface water, the area can be included, provided evaporative water loss from surface water is considered by entering the acreage of surface water in Data Cell 15 noted below.

2. *Precipitation Rate* - Precipitation in the form of rainfall and snowmelt is determined using long-term recorded values from local weather stations. Cornell University maintains the Northeast Regional Climate Center, from which long-term precipitation data for Long Island weather stations is available. Monthly precipitation averages are published for the period 1951-1980 in Thornthwaite and Mather's Climatic Water Budget Method **(Snowden and Pacenka, 1985).** A tabulation of monthly and annual precipitation averages excerpted from this reference is included in the table cited for Evapotranspiration values. Data entry is in inches.

3. *Acreage of Lawn* - The total area of lawn (in acres) is entered in this Data Cell. This area includes all lawn area whether it is irrigated, fertilized or unmaintained. If there is no lawn area, a value of zero (0) is entered.

4. *Fraction of Land in Lawn* - No entry need be made in this Data Cell. SONIR will compute the Fraction of Land in Lawn by dividing the lawn area by total area.

5. *Evapotranspiration from Lawn* - Evapotranspiration is the natural water loss attributed to evaporation and plant utilization. Rainwater that is evaporated and transpired by plants is returned to the atmosphere as vapor. There are various methods for determining evapotranspiration, including direct measure and calculation. A commonly recognized method is the Thornthwaite and Mather Climatic Water Budget Method. Evapotranspiration rates for various locations on Long Island have been determined by the U.S. Geological Survey, as documented in: "Ground-Water-Recharge Rates in

Nassau and Suffolk Counties, New York" **(Peterson, 1987; p. 10).** The following general rates as a percent of total precipitation are excerpted from that reference:

Location	Soil Type	Vegetation	ET (in)	ET (%)
Bridgehampton	sandy loam	shallow root	21.2	46.6
	silt loam	shallow root	21.4	47.2
LaGuardia	sand	shallow root	24.2	52.9
	clay loam	shallow root	25.4	55.5
	sandy loam	moderate root	26.2	57.2
JFK Airport	sand	shallow root	22.5	53.8
	clay loam	shallow root	23.9	57.3
	sandy loam	moderate root	25.0	60.0
Mineola	sand	shallow root	22.4	47.8
	sand-silt	shallow root	23.8	51.0
	sandy loam	moderate root	25.1	53.7
	sandy loam	orchards	25.5	54.5
Patchogue	fine sand	mature forest	25.5	53.5
Riverhead	sandy loam	shallow root	22.4	49.3
		orchards	24.8	54.7
Setauket	sandy loam	mature forest	26.8	57.9
Upton	silt loam	deep root	23.9	48.4
	sandy loam	moderate root	23.0	46.5

6. *Runoff from Lawn* - Runoff is the quantity of water that travels overland during a precipitation event. Soil infiltration capacity is the critical factor in determining runoff; however, factors such as slope and vegetation also determine runoff characteristics to a lesser extent on Long Island because of soil conditions. Less urbanized areas of Long Island with characteristically dry soils with groundcover will have a low runoff percentage as a function of total precipitation, as compared to the more urbanized portions of western Long Island. Peterson **(1984; p. 14)** estimates runoff as a percent of total precipitation for Nassau County (2.1 percent); Suffolk County (0.7 percent), and Long Island in general (1.0 percent). If an average precipitation rate of 45 inches per year is assumed, runoff will vary from 0.31 to 0.94 inches. Lawn areas would be expected to be in the lower end of the range. Judgements of higher and lower runoff can be made on a site-specific basis depending upon slope and groundcover types.

7. *Acreage of Impervious* - The total area of impervious surface (in acres) is entered in this Data Cell. This area includes paved driveways, parking areas, roofs, roads, etc. If there are no impervious surfaces, a value of zero (0) is entered.

8. *Fraction of Land Impervious* - No entry need be made in this Data Cell. SONIR will compute the Fraction of Land in Impervious by dividing the impervious area by total area.

9. *Evaporation from Impervious* - Impervious surfaces will allow water to evaporate, particularly during summer months. There is no vegetation; therefore there is no transpiration by plants. Evaporation from Impervious is estimated to be approximately 10 percent of total precipitation **(Hughes and Porter, 1983; p. 10).** This value accounts for evaporation from parking lots and other surfaces during summer months, averaged over the entire year. This indicates that recharge/runoff would comprise the remaining 90 percent of precipitation. This assumption coincides with most drainage computations required by Code Subdivision Regulations for determined leaching pool capacity.

10. *Runoff from Impervious* - The approximation of Evaporation from Impervious would indicate that recharge/runoff would comprise the remaining 90 percent of precipitation, as there are no other losses from impervious surfaces. In consideration of paved areas, runoff is not transported off the site or to surface water as a loss. Runoff is diverted to leaching pools and allowed to re-enter the hydrologic system beneath a given site. Therefore, in terms of site recharge computations, the value for Runoff from Impervious is zero (0).

11. *Acreage of Unvegetated* - The total acreage of unvegetated area is entered in this Data Cell. This area includes sand, barren soils, and porous drives and trails. If there is no unvegetated area, a value of zero (0) is used.

12. *Fraction of Land Unvegetated* - No entry need be made in this Data Cell. SONIR will compute the Fraction of Land Unvegetated by dividing the unvegetated area by total area.

13. *Evapotranspiration from Unvegetated* - Evapotranspiration from Unvegetated areas is determined in the same manner as described for Data Cell 5 above.

14. *Runoff from Unvegetated* - The runoff coefficients noted in the discussion for Data Cell 6 above, are applied to unvegetated areas on a site-specific basis. Runoff in the middle to the higher end of the range (0.7 to 2.1 percent of precipitation) is expected due to lack of groundcover vegetation.

15. *Acreage of Water* - SONIR considers evaporation from surface water in the computation of site recharge. Surface water, particularly groundwater fed lakes and ponds are a source of water loss in the water budget. The quantity of fresh surface water (in acres) is entered in this Data Cell.

16. *Fraction of Land in Water* - No entry need be made in this Data Cell. SONIR will compute the Fraction of Water on the site by dividing the water area by total area.

17. *Evaporation from Water* - Surface water features will cause evaporation of water in excess of normal evapotranspiration as documented by **Warren et al, 1968,** Hydrology of Brookhaven National Laboratory and Vicinity Suffolk County, New York. It is estimated that the upper limit of evaporation from a large free-water surface is

approximately 30.00 inches per year **(Warren et al, 1968; p. 26).** This value is entered in Data Cell 17 as the most accurate approximation.

18. *Makeup Water* - SONIR allows for consideration of the impact of man-made lakes on site recharge. Lakes are generally lined with an impermeable material. Evaporation occurs from the surface of the lake at a rate of 30.00 inches per year. In order to maintain a constant water level, an on-site well is generally installed to provide make-up water to the lake or pond. The quantity of make-up water is equivalent to the quantity of evaporation, given the fact that the function of the well is to replace water that is evaporated. Therefore, for cases where make-up water is used to maintain a constant water level, a value of 30.00 inches per year is entered in Data Cell 18.

19. *Acreage of Natural* - The total quantity of natural area (in acres) is entered in this Data Cell. This area includes naturally vegetated areas such as woodland, meadow, etc. If there is no natural area, a value of zero (0) is entered.

20. *Fraction of Land Natural* - No entry need be made in this Data Cell. SONIR will compute the Fraction of Land Natural by dividing the natural area by total area.

21. *Evapotranspiration from Natural* - Evapotranspiration from Natural areas is determined in the same manner as described for Data Cell 5 above.

22. *Runoff from Natural* - The runoff coefficients noted in the discussion for Data Cell 6 above, are applied to natural areas on a site specific basis. Generally lower values in the range of 0.7 percent of precipitation are expected due to groundcover and canopy vegetation.

23. *Acreage of Other Area* - This is a general category which can be used to include additional groundcover types in the simulation. Acreage of Other Area is entered (in acres). This Data Cell can be used to include site recharge considerations from a portion of the site that has different hydrologic properties, such as a moist hardwood forest or vegetated freshwater wetland, where evapotranspiration would be high and runoff would be extremely low.

24. *Fraction of Land in Other Area* - No entry need be made in this Data Cell. SONIR will compute the Fraction of Land in Other Area by dividing the land in other area by total area.

25. *Evapotranspiration from Other Area* - Evapotranspiration from Other areas is determined in the same manner as described for Data Cell 5 above. Value can be varied depending upon the hydrologic properties of the groundcover type.

26. *Runoff from Other Area* - The runoff coefficients noted in the discussion for Data Cell 6 above, are applied to Other Areas on a site-specific basis. Value can be varied depending upon the hydrologic properties of the groundcover type.

27. *Acreage of Land Irrigated* - Imported water for irrigation purposes is an additional site recharge component not considered in any of the Data Cells above. The quantity of land irrigated on a given site is entered in this Data Cell (in acres).

28. *Fraction of Land Irrigated* - No entry need be made in this Data Cell. SONIR will compute the Fraction of Land Irrigated by dividing the Land Irrigated area by total area.

29. *Irrigation Rate* - The rate of irrigation must be entered in this Data Cell (in inches). Hughes and Porter **(1983; p. 19)** have indicated that lawn irrigation is estimated to be about 16 inches per year. This value is entered in Data Cell 29 as the most accurate approximation.

30. *Number of Dwellings* - The number of dwellings is entered in this Data Cell in order to allow for computation of wastewater disposal from residential use. Wastewater imported to a site, or even withdrawn from on-site wells and recharged through sanitary effluent is an additional recharge component that must be considered. If the project is for a commercial use or utilizes a denitrification system, the number of dwellings should not be entered in the Data Entry Field, as the wastewater flow will include recharge and nitrogen components.

31. *Water Use per Dwelling* - The water use should correspond to the total site non-irrigation water use, divided by the number of units.

32. *Wastewater Design Flow* - No entry need be made in this Data Cell. SONIR will compute the Wastewater Design Flow by multiplying the Number of Dwellings by the Water Use per Dwelling.

33. *Commercial/STP Design Flow* - SONIR permits the consideration of recharge from commercial projects, denitrification systems and sewage treatment plants. The Commercial/STP Design Flow is entered in this Data Cell as per County Health Department or engineering design standards.

Site Recharge Computations - Sheet 2

Once data entry is complete for Site Recharge Parameters, SONIR will complete a series of detailed Water Budget computations for the overall site. The following describes the computations that are performed by the model:

A. *Lawn Area Recharge* - Lawn Area Recharge is determined by use of the basic Hydrologic Budget Equation [R = P - (E + Q)] as defined previously. The quantity of recharge determined by this method is then multiplied by that portion of the site occupied by Lawn Area to determine the component of Lawn Area Recharge in overall site recharge.

B. *Impervious Area Recharge* - Impervious area recharge is also determined using the Hydrologic Budget Equation; however, the value for runoff is zero (0) due to the fact that runoff is controlled by conveyance to on site leaching facilities or is allowed to runoff into depressions where runoff is recharged on site.

C. *Unvegetated Area Recharge* - Unvegetated Area Recharge is determined by use of the basic Hydrologic Budget Equation. The quantity of recharge determined by this method is then multiplied by that portion of the site occupied by Unvegetated Area to determine the component of Unvegetated Area Recharge in overall site recharge.

D. *Water Area Loss* - The Hydrologic Budget Equation is modified to consider Water Area Loss. This is particularly useful in water quantity stressed areas of Long Island. If runoff (Q) is considered be zero (0), then lake storage/recharge without make-up water would be Precipitation minus Evaporation (P - E). The resultant quantity of lake storage/recharge is then reduced by the amount of make-up water (M). The final quantity of loss is then multiplied by that portion of the site occupied by water to determine the component of water loss as related to the overall site water budget.

E. *Natural Area Recharge* - Natural Area Recharge is determined by use of the basic Hydrologic Budget Equation. The quantity of recharge determined by this method is then multiplied by that portion of the site occupied by Natural Area to determine the component of Natural Area Recharge in overall site recharge.

F. *Other Area Recharge* - Other Area Recharge is determined by use of the basic Hydrologic Budget Equation. The quantity of recharge determined by this method is then multiplied by that portion of the site occupied by Other Area to determine the component of Other Area Recharge in overall site recharge.

G. *Irrigation Recharge* - Irrigation recharge is an additional recharge component artificially added on sites where irrigation occurs. This quantity is determined in the same manner as the Hydrologic Water Budget except that the irrigation rate (in inches) is substituted for precipitation. The resultant recharge is multiplied by the area of the site that is irrigated, in order to determine the Irrigation Recharge in overall site recharge.

H. *Wastewater Recharge* - Wastewater is also a recharge component artificially added to a site. SONIR annualizes the wastewater design flow and assumes it is applied over the entire by multiplying Wastewater Design Flow by the Area of the Site, resulting in a per foot measure of wastewater over the site. This is converted to inches to be included in overall site recharge.

Once the eight (8) series of Site Recharge Computations are complete, SONIR totals each individual component to determine Total Site Recharge. The sum of these recharge contributions, is that quantity of water that is expected to enter the site on an annual basis due to precipitation, after the development is completed. This value is important in determining the concentration of nitrogen in recharge, and is important as a means of determining hydrologic impacts of a project in terms of changes to site recharge.

SITE NITROGEN BUDGET

Overview

The total nitrogen released on a given site must be determined in order to provide a means of simulating nitrogen in recharge. Nitrogen sources include: sanitary nitrogen; fertilizer nitrogen; pet waste nitrogen; precipitation nitrogen; and water supply nitrogen (wastewater and irrigation). The total of these quantities represents total site nitrogen.

Data Input - Sheet 1

The following provides a discussion of data sources and assumptions associated with the nitrogen budget, corresponding to the Data Input Field in Sheet 1 of SONIR:

1. *Persons per Dwelling* - The number of persons per dwelling is a demographic multiplier used in the determination of human population of a site. Based on multipliers listed in "The New Practitioner's Guide to Fiscal Impact Analysis", (**Rutgers, 1985**), the average number of residents is calculated at 0.00/unit (Existing Conditions), and will be 4.1/unit (Proposed Conditions).

2. *Nitrogen per Person per Year* - Annual nitrogen per person is a function of nitrogen bearing waste in wastewater. For residential land use the population of the development is determined and the nitrogen generated is assumed to be 10 pounds per capita per year **(Hughes and Porter, 1983; p. 8).**

3. *Sanitary Nitrogen Leaching Rate* - For normal residential systems, Porter and Hughes report that 50 percent of the nitrogen entering the system is converted to gaseous nitrogen and the remainder leaches into the soil **(Porter and Hughes, 1983; p. 14).**

4. *Area of Land Fertilized 1* - The area of land fertilized is input in Data Cell 4. This value may correspond to the Acreage of Lawn and/or the Acreage of Land Irrigated, but is not necessarily the same value. This entry should be determined on a site-specific basis.

5. *Fertilizer Application Rate 1* - Fertilizer nitrogen is determined by a fertilizer application rate over a specified area of the site. The fertilizer application rates vary depending upon the type of use. The following table indicates the rate of fertilization as a function of use as excerpted from the Non-Point Source Management Handbook **(Koppelman, 1984; Chapter 5, p.6):**

Residential (contract)	1.5 lbs/1000 sq ft
Residential (unmanaged)	2.3 lbs/1000 sq ft
Commercial	3.5 lbs/1000 sq ft
Golf Course	3.5 lbs/1000 sq ft
Sod Farms	4.0 lbs/1000 sq ft
Recreational Lands	0.2 lbs/1000 sq ft

A commercial landscaping firm has been interviewed to determine trends in commercial fertilizer application. Various fertilizer formulations are used including 10-6-4, 16-4-8 and 20-10-5 (nitrogen-phosphate-potash) depending upon season. Heavier nitrogen application rates are generally used in the spring. Fertilizer used is 50 percent organic nitrogen. This is applied in a dry form approximately 2-3 times per year, and a 50-pound bag is applied over approximately 16,000 square feet. Based on this rate if 20- 10-5 nitrogen were applied in the spring, and 16-4-8 were applied during summer and fall, this would result in an application rate of 1.5-2.1 pounds per 1000 square feet. The high of this range is a conservative value based on three applications of relatively high nitrogen fertilizer, which will be used for nitrogen in recharge simulation.

In addition, it is noted that the Non-Point Source Management Handbook indicates that application rates as low as 1.0 lb/1000 sq ft can be achieved with proper fertilizer management control.

6. *Fertilizer Nitrogen Leaching Rate 1* - Nitrogen applied as fertilizer is subject to plant uptake (20 to 80%; 50% on average) and storage in thatch and soils (36 to 47%), thereby reducing the total amount of nitrogen leached. The percentage of plant uptake and storage are based on studies cited in the LIRPB's Special Groundwater Protection Area Plan. Based on those studies, a conservative nitrogen leaching rate of 14% has been applied in the model.

7. *Area of Land Fertilized 2* - More than one fertilizer nitrogen input is provided in order allow consideration of mixed use and/or golf course projects where land is fertilized at different rates.

8. *Fertilizer Application Rate 2* - Fertilizer Application Rates for this entry can be determined based upon Data Cell 5 above.

9. *Fertilizer Nitrogen Leaching Rate 2* - Fertilizer Nitrogen Leaching Rates can be determined based upon Data Cell 6 above.

10. *Pet Waste Application Rate* - Pet Waste Nitrogen results from the excretion of domestic pets in the outside environment. There is relatively little definitive information concerning this nitrogen source; however, several references were located and are analyzed herein. The 208 Study provides a table of nitrogen concentration in manure for various animals, not including dogs or cats. Total nitrogen values in the range of 0.30-

0.43 lbs/day/1000 lbs live weight are reported for cattle, sheep and horses **(Koppelman, 1978; Animal Waste report p. 3).** It is assumed that dogs constitute the major source of animal waste that would be present in the yards of residential developments. Cat waste would be significantly less due to the lesser live weight of cats and the fact that many cat owners dispose of cat waste in solid waste by using an indoor litter box. If an average of 0.35 lbs of nitrogen is assumed for dogs, and an average of 25 pounds live weight is assumed per dog, then the total annual nitrogen per pet would be 3.19 lbs/year. The only other reference located that approximates nitrogen in pet waste is Land Use and Ground-Water Quality in the Pine Barrens of Southampton **(Hughes and Porter, 1983; p. 10).** This reference assumed an application rate of 6.5 lbs/acre of nitrogen. Pet waste was assumed to be deposited evenly over all turf. This assumption was not correlated to population density or pet density, but only to turfed acreage. In comparison of the two values, the per pet value corresponds to approximately 2 turfed acres. For the purpose of this model, the value of 3.19 lbs/pet/year is considered to be the most justifiable value for pet waste and is entered in this Data Cell.

11. *Pet Waste Nitrogen Leaching Rate* - Pet waste is also subject to a leaching rate factor whereby, 50 percent of the nitrogen applied to the ground is removed as a gas.

12. *Area of Land Irrigated* - No entry need be made in this Data Cell. This value is the same as Data Cell 27 of the Site Recharge Parameters and SONIR will transfer the data entry to this Cell.

13. *Irrigation Rate* - No entry need be made in this Data Cell. This value is the same as Data Cell 29 of the Site Recharge Parameters and SONIR will transfer the data entry to this Cell.

14. *Irrigation Nitrogen Leaching Rate* - Hughes and Porter **(1983; p. 10)** states "plant uptake and gaseous losses are assumed to remove 85% of the nitrogen entering in precipitation". Irrigation nitrogen would be expected to be subject to the same losses; therefore, a leaching rate of 15% is entered in this Data Cell.

15 *Nitrogen in Precipitation* - Groundwater nitrogen is partially derived from rainwater. Nitrate-nitrogen concentrations in precipitation have been reported to be on the order of 1-2 mg/l in Nassau and Suffolk Counties **(SCDHS, 1987; p. 6-4).**

16. *Precipitation Nitrogen Leaching Rate* - As indicated above, a nitrogen leaching rate of 15% is applied to precipitation nitrogen.

17. *Nitrogen in Water Supply* - The concentration of Nitrogen in Water Supply determines the quantity of nitrogen that enters the site as a result of irrigation nitrogen and wastewater flow. Local water supply data should be utilized if available, otherwise a value of between 1 and 2 mg/l could be utilized.

18. *Nitrogen in Commercial/STP Flow* - This data entry allows SONIR to compute the quantity of nitrogen resulting from commercial discharge, denitrification systems and/or sewage treatment plants. Total nitrogen in community wastewater is identified as having a total nitrogen concentration of 20 mg/l in weak effluent; 40 mg/l in medium strength effluent, and 85 mg/l in strong effluent **(Metcalf & Eddy, Inc, 1991).** It is recommended that a value of 40 mg/l be used for total nitrogen concentration in commercial sanitary systems. Properly functioning denitrification systems and sewage treatment plants are capable of reducing total nitrogen to less than 10 mg/l in accordance with discharge limitations. A value of 10 mg/l can be entered in this data cell for such systems. The SONIR model computes the number of pounds of nitrogen in sanitary discharge as a function of concentration. The absolute nitrogen is utilized in the model; however, it must be recognized that, from the discharge point, nitrogen is nitrified through conversion of ammonia to nitrate in the leaching area beneath the discharge point. Further natural transformation in the form of denitrification occurs as a result of bacteria. This causes release of nitrogen gas and may account for further reduction of 50 percent or more subsequent to discharge **(Canter and Knox, 1979; pp. 77-78; Hughes and Porter, 1983; p. 14).** As a result SONIR is conservative in predicting the concentration of nitrogen in recharge, and when natural denitrification of sanitary effluent is considered, actual concentration would be less.

Site Nitrogen Budget - Sheet 2

Once data entry is complete for Nitrogen Budget Parameters, SONIR will complete a series of detailed computations to determine the individual component of nitrogen from each source and the total nitrogen for the overall site and use. The following describes the computations that are performed by the model:

A. *Sanitary Nitrogen - Residential* - SONIR establishes the site population using the number of units on the site, and the demographic multiplier. The nitrogen load factor is then applied and reduced by the leaching rate, resulting in the total residential nitrogen component. If the project is for a commercial use or utilizes a denitrification system, the number of dwellings should not be entered in the Data Entry Field, in which case the total nitrogen from this source will be zero (0).

B. *Pet Waste Nitrogen* - The pet waste nitrogen was determined on a per pet basis; however, the number of pets for a given residential project must be determined. In order to correlate the number of pets to human population, a ratio was determined using information contained in the 208 Study, wherein it was estimated that there is 1 dog per 5 residents in suburban areas and 1 dog per 7 residents in urban areas **(Koppelman, 1978; Animal Waste Report, pp. 6).** This results in an average number of dogs based upon of 17 percent of the human population. Accordingly, this multiplier is used based upon the population of a land use project in order to estimate the nitrogen waste from pets. The pet waste nitrogen is subject to reduction as a function of the leaching rate, leading to the total pet waste nitrogen in pounds.

C. *Sanitary Nitrogen (Commercial/STP)* - SONIR utilizes the Commercial/STP Flow that is converted to liters and multiplied by the nitrogen concentration in waste. This provides a weight of nitrogen in milligrams, which is converted to pounds for the total nitrogen from this component.

D. *Water Supply Nitrogen* - SONIR utilizes the residential wastewater design flow to compute the weight of nitrogen contributed from the water supply. The method of calculation is the same as Sanitary Nitrogen (Commercial/STP). For commercial projects, this value is accounted for in the Commercial/STP Flow.

E. *Fertilizer Nitrogen 1* - This calculation utilizes data entry from the Area of Land Fertilized 1, in the Data Input Field, to determine the weight of fertilizer nitrogen applied to the area. The area is multiplied by the application rate and reduced by the leaching rate documented previously to arrive at total weight.

F. *Fertilizer Nitrogen 2* - If fertilization rates vary, the Area of Land Fertilized 2, is utilized to determine nitrogen from this source.

G. *Precipitation Nitrogen* - Nitrogen in precipitation is considered by determining the liters of Natural Recharge entering the site, multiplied by the concentration of nitrogen in precipitation. SONIR uses the sum of natural recharge components from the Site Recharge Computations to establish the natural recharge. A precipitation nitrogen leaching rate of 15% is utilized as referenced above.

H. *Irrigation Nitrogen* - Although a very small component, the Irrigation Nitrogen is determined using the Irrigation Recharge R(irr) computed in the Site Recharge Computations, over the irrigated area of the site to produce a volume of irrigation recharge. The Irrigation Recharge value is used in order to account for reduction of recharge due to evapotranspiration, since this component is only intended to determine nitrogen leaching into soil as a result of irrigation nitrogen in the water supply. This value is converted to liters and multiplied by the concentration of nitrogen in irrigation water supply. The Irrigation Nitrogen Leaching Rate (expected to the same as for precipitation) is applied to the weight to determine the total nitrogen from this source.

Once the eight (8) series of Site Nitrogen Budget computations are complete, SONIR totals each individual component to determine the Total Site Nitrogen. This value is used in determining the weight per volume ratio of nitrogen in recharge as computed in Sheet 4 of the SONIR model.

FINAL COMPUTATIONS AND SUMMARY

SONIR utilizes data generated in Sheets 2 and 3 of the model to compute a mass/volume ratio for nitrogen in recharge. Nitrogen in recharge is converted from pounds to milligrams in order to provide units compatible for mass/volume concentration. Likewise, the quantity of site recharge is applied over the site in order to determine an overall volume number for site recharge. This is then converted to liters. The final computation divides the total weight of nitrogen in milligrams, by the total volume of recharge in liters, to arrive at the Nitrogen in Recharge ratio in milligrams per liter (mg/l). This concentration represents the Final Concentration of Nitrogen in Recharge, which is highlighted on Sheet 4.

Sheet 4 also provides a site recharge summary in order to compare recharge between natural conditions, a proposed project and/or alternatives. Total Site Recharge is presented in both inches, and as a volume in cubic feet/year, gallons/year and million gallons/year (MGY).

The final field summarizes the Conversions Used in SONIR. Conversions are standard conversion multipliers as found in standard engineering references.

SONIR is a valuable tool allowing for versatile determination of site recharge as determined from many components of site recharge. SONIR determines the weight of nitrogen applied to a site from a variety of sources as well. SONIR is a fully referenced model utilizing basic hydrologic and engineering principals, in a simulation of nitrogen in recharge. Input data should be carefully justified in order to achieve best results. SONIR can be used effectively in comparing land use alternatives and relative impact upon groundwater due to nitrogen. By running the model for Existing Conditions, Proposed Project conditions and/or alternative land uses comparison of impacts can be made for consideration in land use decision-making. Questions, comments or suggestions concerning this model should be addressed to Nelson, Pope & Voorhis, LLC, 572 Walt Whitman Road, Melville, New York 11747.

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

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Appendix C-2
Existing Conditions

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

NAME OF PROJECT The Seasons

DATA INPUT FIELD Existing Conditions **SHEET 1**

A	*Site Recharge Parameters*	*Value*	*Units*
1	Area of Site	37.05	acres
2	Precipitation Rate	45.32	inches
3	Acreage of Lawn	1.09	acres
4	Fraction of Land in Lawn	0.029	fraction
5	Evapotranspiration from Lawn	22.40	inches
6	Runoff from Lawn	0.45	inches
7	Acreage of Impervious	5.84	acres
8	Fraction of Land Impervious	0.158	fraction
9	Evaporation from Impervious	4.53	inches
10	Runoff from Impervious	0.00	inches
11	Acreage of Unvegetated	3.59	acres
12	Fraction of Land Unvegetated	0.097	fraction
13	Evapotrans. from Unvegetated	22.40	inches
14	Runoff from Unvegetated	0.63	inches
15	Acreage of Water	0.00	acres
16	Fraction of Site in Water	0.000	fraction
17	Evaporation from Water	30.00	inches
18	Makeup Water (if applicable)	30.00	inches
19	Acreage of Natural Area	26.53	acres
20	Fraction of Land Natural	0.716	fraction
21	Evapotrans. from Natural Area	26.80	inches
22	Runoff from Natural Area	0.32	inches
23	Acreage of Other Area	0.00	acres
24	Fraction of Land Other Area	0.000	fraction
25	Evapotrans. from Other Area	23.00	inches
26	Runoff from Other Area	0.45	inches
27	Acreage of Land Irrigated	1.09	acres
28	Fraction of Land Irrigated	0.029	fraction
29	Irrigation Rate	16.00	inches
30	Number of Dwellings	1	units
31	Water Use per Dwelling	0	gal/day
32	Wastewater Design Flow-Office	459	gal/day
33	Commercial /STP Design Flow	38,847	gal/day

B	*Nitrogen Budget Parameters*	*Value*	*Units*
1	Persons per Dwelling	25.00	persons
2	Nitrogen per Person per Year	10.0	lbs
3	Sanitary Nitrogen Leaching Rate	50	percent
4	Area of Land Fertilized 1	1.09	acres
5	Fertilizer Application Rate 1	2.30	lbs/1000 sq ft
6	Fertilizer Nitrogen Leaching Rate 1	14	percent
7	Area of Land Fertilized 2	0.00	acres
8	Fertilizer Application Rate 2	0.00	lbs/1000 sq ft
9	Fertilizer Nitrogen Leaching Rate 2	0	percent
10	Pet Waste Application Rate	0.00	lbs/pet
11	Pet Waste Nitrogen Leaching Rate	0	percent
12	Area of Land Irrigated	1.09	acres
13	Irrigation Rate	16.00	inches
14	Irrigation Nitrogen Leaching Rate	15	percent
15	Nitrogen in Precipitation	1.00	mg/l
16	Precipitation Nitrogen Leaching Rate	15	percent
17	Nitrogen in Water Supply	2.90	mg/l
18	Nitrogen in Office Flow	50.00	mg/l
19	Nitrogen in Commercial Flow	12.07	mg/l

C	*Comments*
1)	Please refer to user manual for data input instructions.
2)	Total site discharge flow is 39,306. 459 gallons is office discharge and 38,847 gallons is commercial process water water.
3)	Concentration of nitrogen in commercial flow based on average of monthly monitoring data as required under facility SPDES permit.

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

SITE RECHARGE COMPUTATIONS — Existing Conditions — **SHEET 2**

A	*Lawn Area Recharge*	*Value*	*Units*
1	A = Fraction of Land in Lawn	0.029	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evapotranspiration Rate	22.40	inches
4	Q = Runoff Rate	0.45	inches
5	R(l) = P - (E + Q)	22.47	inches
6	R(L) = R(l) x A	0.66	inches

B	*Impervious Area Recharge*	*Value*	*Units*
1	A = Fraction of Land in Impervious	0.158	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evapotranspiration Rate	4.53	inches
4	Q = Runoff Rate	0.00	inches
5	R(i) = P - (E + Q)	40.79	inches
6	R(I) = R(i) x A	6.43	inches

C	*Unvegetated Area Recharge*		
1	A = Fraction of Land Unveg.	0.097	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evapotranspiration Rate	0.63	inches
4	Q = Runoff Rate	0.00	inches
5	R(u) = P - (E + Q)	44.69	inches
6	R(U) = R(u) x A	4.33	inches

D	*Water Area Loss*		
1	A = Fraction of Site in Water	0.000	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evaporation Rate	30.00	inches
4	Q = Runoff Rate	0.00	inches
5	M = Makeup Water	30.00	inches
6	R(w) = {P - (E+Q)} - M	-14.68	inches
7	R(W) = R(w) x A	0.00	inches

E	*Natural Area Recharge*		
1	A = Fraction of Land in Natural	0.716	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evapotranspiration Rate	26.80	inches
4	Q = Runoff Rate	0.32	inches
5	R(n) = P - (E + Q)	18.20	inches
6	R(N) = R(n) x A	13.03	inches

F	*Other Area Recharge*		
1	A = Fraction of Land in Other	0.000	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evapotranspiration Rate	23.00	inches
4	Q = Runoff Rate	0.45	inches
5	R(o) = P - (E + Q)	21.87	inches
6	R(O) = R(o) x A	0.00	inches

G	*Irrigation Recharge*		
1	A = Fraction of Land Irrigated	0.029	fraction
2	I = Irrigation Rate	16.00	inches
3	E = Evaptranspiration Rate	7.91	inches
4	Q = Runoff Rate	0.45	inches
5	R(irr) = I - (E + Q)	7.64	inches
6	R(IRR) = R(irr) x A	0.22	inches

H	*Wastewater Recharge*		
1	WDF = Wastewater Design Flow	39,306	gal/day
2	WDF = Wastewater Design Flow	1,918,152.45	cu ft/yr
3	A = Area of Site	1,613,898	sq ft
4	R(ww) = WDF/A	1.19	feet
5	R(WW) = Wastewater Recharge	14.26	inches

Total Site Recharge		
R(T) =	R(L) + R(I) + R(U) + R(W) + R(N) + R(O) + R(IRR) + R(WW)	
R(T) =	**38.94**	**inches**

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

SITE NITROGEN BUDGET Existing Conditions **SHEET 3**

A	*Sanitary Nitrogen-Office*	*Value*	*Units*
1	CF = Commercial/STP Flow	459	gal/day
2	CF = Commercial/STP Flow	634,120	liters/yr
3	N = Nitrogen in Commercial	50.00	mg/l
4	N(S) = CF x N	31,705,999	milligrams
5	N(S) = Sanitary Nitrogen [1]	69.91	lbs

B	*Pet Waste Nitrogen*	*Value*	*Units*
1	AR = Application Rate	0.00	lbs/pet
2	Human Population	25	capita
3	Pets = 17 percent of capita	4	pets
4	N(p) = AR x pets	0.00	lbs
5	LR = Leaching Rate	0	percent
6	N(P) = N(p) x LR	0.00	lbs
7	N(P) = Pet Waste Nitrogen	0.00	lbs

C	*Sanitary Nitrogen (Commercial)*		
1	CF = Commercial/STP Flow	38,847	gal/day
2	CF = Commercial/STP Flow	53,668,102	liters/yr
3	N = Nitrogen in Commercial	12.07	mg/l
4	N(S) = CF x N	647,559,315	milligrams
5	N(S) = Sanitary Nitrogen [1]	1427.87	lbs

D	*Water Supply Nitrogen*		
1	WDF = Wastewater Design Flow	0	gal/day
2	WDF = Wastewater Design Flow	0	liters/yr
3	N = Nitrogen in Water Supply	2.90	mg/l
4	N(WW) = WDF x N	0	milligrams
5	N(WW) = Wastewater Nitrogen	0.00	lbs

E	*Fertilizer Nitrogen 1*		
1	A = Area of Land Fertilized 1	47,480	sq ft
2	AR = Application Rate	2.30	lbs/1000 sf
3	LR = Leaching Rate	14	percent
4	N(F1) = A x AR x LR	15.29	lbs
5	N(F1) = Fertilizer Nitrogen	15.29	lbs

F	*Fertilizer Nitrogen 2*		
1	A = Area of Land Fertilized 2	0	sq ft
2	AR = Application Rate	0.00	lbs/1000 sf
3	LR = Leaching Rate	0	percent
4	N(F2) = A x AR x LR	0.00	lbs
5	N(F2) = Fertilizer Nitrogen	0.00	lbs

G	*Precipitation Nitrogen*		
1	R(n) = Natural Recharge (feet)	2.04	feet
2	A = Area of Site (sq ft)	1,613,898	sq ft
3	R(N) = R(n) x A	3,288,595	cu ft
4	R(N) = Natural Recharge (liters)	93,133,003	liters
5	N = Nitrogen in Precipitation	1.00	mg/l
6	LR = Leaching Rate	15	percent
7	N(ppt) = P(S) x N x LR	931,330	milligrams
8	N(ppt) = Precipitation Nitrogen	2.05	lbs

H	*Irrigation Nitrogen*		
1	R = Irrigation Recharge (inches)	7.64	inches
2	R = Irrigation Rate (feet)	0.64	feet
3	A = Area of Land Irrigated	47,480	sq ft
4	R(I) = R(irr) x A	30,236	cu ft
5	R(I) = Site Precipitation (liters)	856,291	liters
6	N = Nitrogen in Water Supply	2.90	mg/l
7	LR = Leaching Rate	15	percent
8	N(irr) = R(I) x N x LR	372,487	milligrams
9	N(irr) = Irrigation Nitrogen	0.82	lbs

Total Site Nitrogen		
N=	N(S) + N(P) + N(WW) + N(F1) + N(F2) + N(ppt) + N(irr)	
N=	1515.94	lbs

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

NAME OF PROJECT

The Seasons
Existing Conditions

FINAL COMPUTATIONS **SHEET 4**

A	*Nitrogen in Recharge*	*Value*	*Units*
1	N = Total Nitrogen (lbs)	1515.94	lbs
2	N = Total Nitrogen (milligrams)	688,238,404	milligrams
3	R(T) = Total Recharge (inches)	38.94	inches
4	R(T) = Total Recharge (feet)	3.24	feet
5	A = Area of Site	1,613,898	sq ft
6	R = R(T) x A	5,236,983	cu ft
7	R = Site Recharge Volume	148,311,371	liters
9	NR = N/R	4.64	mg/l

FINAL CONCENTRATION OF NITROGEN IN RECHARGE

4.64

B	*Site Recharge Summary*	*Value*	*Units*
1	R(T) = Total Site Recharge	38.94	inches/yr
2	R = Site Recharge Volume	5,236,983	cu ft/yr
3	R = Site Recharge Volume	39,175,359	gal/yr
4	R = Site Recharge Volume	39.18	MG/yr

C	*Total Sanitary Nitrogen*	*Value*	*Units*
1	TSN = SN(res) + SN(comm./STP)	1497.78	lbs
2			
3			

Conversions used in SONIR
Acres x 43,560 = Square Feet
Cubic Feet x 7.48052 = Gallons
Cubic Feet x 28.32 = Liters
Days x 365 = Years
Feet x 12 = Inches
Gallons x 0.1337 = Cubic Feet
Gallons x 3.785 = Liters
Grams / 1,000 = Milligrams
Grams x 0.002205 = Pounds
Milligrams / 1,000 = Grams

Appendix C-3
Proposed Project

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

NAME OF PROJECT The Seasons

DATA INPUT FIELD Proposed Project, 360 units **SHEET 1**

A	*Site Recharge Parameters*	*Value*	*Units*
1	Area of Site	37.05	acres
2	Precipitation Rate	45.32	inches
3	Acreage of Lawn	14.53	acres
4	Fraction of Land in Lawn	0.392	fraction
5	Evapotranspiration from Lawn	22.40	inches
6	Runoff from Lawn	0.45	inches
7	Acreage of Impervious	17.65	acres
8	Fraction of Land Impervious	0.476	fraction
9	Evaporation from Impervious	4.53	inches
10	Runoff from Impervious	0.00	inches
11	Acreage of Unvegetated	0.00	acres
12	Fraction of Land Unvegetated	0.000	fraction
13	Evapotrans. from Unvegetated	22.40	inches
14	Runoff from Unvegetated	0	inches
15	Acreage of Water	0.73	acres
16	Fraction of Site in Water	0.020	fraction
17	Evaporation from Water	30.00	inches
18	Makeup Water (if applicable)	30.00	inches
19	Acreage of Natural Area	4.14	acres
20	Fraction of Land Natural	0.112	fraction
21	Evapotrans. from Natural Area	26.80	inches
22	Runoff from Natural Area	0.32	inches
23	Acreage of Other Area	0.00	acres
24	Fraction of Land Other Area	0.000	fraction
25	Evapotrans. from Other Area	23.00	inches
26	Runoff from Other Area	0.45	inches
27	Acreage of Land Irrigated	5.56	acres
28	Fraction of Land Irrigated	0.150	fraction
29	Irrigation Rate	16.00	inches
30	Number of Dwellings	0	units
31	Water Use per Dwelling	0	gal/day
32	Wastewater Design Flow-Office	0	gal/day
33	Commercial /STP Design Flow	97,000	gal/day

B	*Nitrogen Budget Parameters*	*Value*	*Units*
1	Persons per Dwelling	0.00	persons
2	Nitrogen per Person per Year	10.0	lbs
3	Sanitary Nitrogen Leaching Rate	50	percent
4	Area of Land Fertilized 1	5.56	acres
5	Fertilizer Application Rate 1	2.30	lbs/1000 sq ft
6	Fertilizer Nitrogen Leaching Rate 1	14	percent
7	Area of Land Fertilized 2	0.00	acres
8	Fertilizer Application Rate 2	0.00	lbs/1000 sq ft
9	Fertilizer Nitrogen Leaching Rate 2	0	percent
10	Pet Waste Application Rate	3.19	lbs/pet
11	Pet Waste Nitrogen Leaching Rate	50	percent
12	Area of Land Irrigated	5.56	acres
13	Irrigation Rate	16.00	inches
14	Irrigation Nitrogen Leaching Rate	15	percent
15	Nitrogen in Precipitation	1.00	mg/l
16	Precipitation Nitrogen Leaching Rate	15	percent
17	Nitrogen in Water Supply	2.90	mg/l
18	Nitrogen in Office Flow	50.00	mg/l
19	Nitrogen in Commercial Flow	10.00	mg/l

C	*Comments*
1)	Please refer to user manual for data input instructions.
2)	Total site discharge flow is 39,306. 459 gallons is office discharge and 38,847 gallons is commercial process water water.
3)	Concentration of nitrogen in commercial flow based on average of monthly monitoring data as required under facility SPDES permit.

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

SITE RECHARGE COMPUTATIONS Proposed Project, 360 units **SHEET 2**

A	Lawn Area Recharge	Value	Units
1	A = Fraction of Land in Lawn	0.392	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evapotranspiration Rate	22.40	inches
4	Q = Runoff Rate	0.45	inches
5	R(l) = P - (E + Q)	22.47	inches
6	R(L) = R(l) x A	8.81	inches

B	Impervious Area Recharge	Value	Units
1	A = Fraction of Land in Impervious	0.476	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evapotranspiration Rate	4.53	inches
4	Q = Runoff Rate	0.00	inches
5	R(i) = P - (E + Q)	40.79	inches
6	R(I) = R(i) x A	19.43	inches

C	Unvegetated Area Recharge		
1	A = Fraction of Land Unveg.	0.000	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evapotranspiration Rate	0.00	inches
4	Q = Runoff Rate	0.73	inches
5	R(u) = P - (E + Q)	44.59	inches
6	R(U) = R(u) x A	0.00	inches

D	Water Area Loss		
1	A = Fraction of Site in Water	0.020	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evaporation Rate	30.00	inches
4	Q = Runoff Rate	0.00	inches
5	M = Makeup Water	30.00	inches
6	R(w) = {P - (E+Q)} - M	-14.68	inches
7	R(W) = R(w) x A	-0.29	inches

E	Natural Area Recharge		
1	A = Fraction of Land in Natural	0.112	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evapotranspiration Rate	26.80	inches
4	Q = Runoff Rate	0.32	inches
5	R(n) = P - (E + Q)	18.20	inches
6	R(N) = R(n) x A	2.04	inches

F	Other Area Recharge		
1	A = Fraction of Land in Other	0.000	fraction
2	P = Precipitation Rate	45.32	inches
3	E = Evapotranspiration Rate	23.00	inches
4	Q = Runoff Rate	0.45	inches
5	R(o) = P - (E + Q)	21.87	inches
6	R(O) = R(o) x A	0.00	inches

G	Irrigation Recharge		
1	A = Fraction of Land Irrigated	0.150	fraction
2	I = Irrigation Rate	16.00	inches
3	E = Evaptranspiration Rate	7.91	inches
4	Q = Runoff Rate	0.45	inches
5	R(irr) = I - (E + Q)	7.64	inches
6	R(IRR) = R(irr) x A	1.15	inches

H	Wastewater Recharge		
1	WDF = Wastewater Design Flow	97,000	gal/day
2	WDF = Wastewater Design Flow	4,733,648.50	cu ft/yr
3	A = Area of Site	1,613,898	sq ft
4	R(ww) = WDF/A	2.93	feet
5	R(WW) = Wastewater Recharge	35.20	inches

Total Site Recharge			
R(T) =	R(L) + R(I) + R(U) + R(W) + R(N) + R(O) + R(IRR) + R(WW)		
R(T) =	66.33	inches	

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

SITE NITROGEN BUDGET Proposed Project; 360 units **SHEET 3**

A	*Sanitary Nitrogen-Office*	*Value*	*Units*
1	CF = Commercial/STP Flow	0	gal/day
2	CF = Commercial/STP Flow	0	liters/yr
3	N = Nitrogen in Commercial	50.00	mg/l
4	N(S) = CF x N	0	milligrams
5	N(S) = Sanitary Nitrogen [1]	0.00	lbs

B	*Pet Waste Nitrogen*	*Value*	*Units*
1	AR = Application Rate	3.19	lbs/pet
2	Human Population	0	capita
3	Pets = 17 percent of capita	0	pets
4	N(p) = AR x pets	0.00	lbs
5	LR = Leaching Rate	50	percent
6	N(P) = N(p) x LR	0.00	lbs
7	N(P) = Pet Waste Nitrogen	0.00	lbs

C	*Sanitary Nitrogen (Commercial)*		
1	CF = Commercial/STP Flow	97,000	gal/day
2	CF = Commercial/STP Flow	134,007,925	liters/yr
3	N = Nitrogen in Commercial	10.00	mg/l
4	N(S) = CF x N	1,340,079,250	milligrams
5	N(S) = Sanitary Nitrogen [1]	2954.87	lbs

D	*Water Supply Nitrogen*		
1	WDF = Wastewater Design Flow	0	gal/day
2	WDF = Wastewater Design Flow	0	liters/yr
3	N = Nitrogen in Water Supply	2.90	mg/l
4	N(WW) = WDF x N	0	milligrams
5	N(WW) = Wastewater Nitrogen	0.00	lbs

E	*Fertilizer Nitrogen 1*		
1	A = Area of Land Fertilized 1	242,194	sq ft
2	AR = Application Rate	2.30	lbs/1000 sf
3	LR = Leaching Rate	14	percent
4	N(F1) = A x AR x LR	77.99	lbs
5	N(F1) = Fertilizer Nitrogen	77.99	lbs

F	*Fertilizer Nitrogen 2*		
1	A = Area of Land Fertilized 2	0	sq ft
2	AR = Application Rate	0.00	lbs/1000 sf
3	LR = Leaching Rate	0	percent
4	N(F2) = A x AR x LR	0.00	lbs
5	N(F2) = Fertilizer Nitrogen	0.00	lbs

G	*Precipitation Nitrogen*		
1	R(n) = Natural Recharge (feet)	2.50	feet
2	A = Area of Site (sq ft)	1,613,898	sq ft
3	R(N) = R(n) x A	4,033,211	cu ft
4	R(N) = Natural Recharge (liters)	114,220,539	liters
5	N = Nitrogen in Precipitation	1.00	mg/l
6	LR = Leaching Rate	15	percent
7	N(ppt) = P(S) x N x LR	1,142,205	milligrams
8	N(ppt) = Precipitation Nitrogen	2.52	lbs

H	*Irrigation Nitrogen*		
1	R = Irrigation Recharge (inches)	7.64	inches
2	R = Irrigation Rate (feet)	0.64	feet
3	A = Area of Land Irrigated	242,194	sq ft
4	R(I) = R(irr) x A	154,233	cu ft
5	R(I) = Site Precipitation (liters)	4,367,872	liters
6	N = Nitrogen in Water Supply	2.90	mg/l
7	LR = Leaching Rate	15	percent
8	N(irr) = R(I) x N x LR	1,900,024	milligrams
9	N(irr) = Irrigation Nitrogen	4.19	lbs

Total Site Nitrogen		
N=	N(S) + N(P) + N(WW) + N(F1) + N(F2) + N(ppt) + N(irr)	
N=	3039.57	lbs

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

NAME OF PROJECT

The Seasons
Proposed Project, 560 units

FINAL COMPUTATIONS

SHEET 4

A	*Nitrogen in Recharge*	*Value*	*Units*
1	N = Total Nitrogen (lbs)	3039.57	lbs
2	N = Total Nitrogen (milligrams)	1,379,964,418	milligrams
3	R(T) = Total Recharge (inches)	66.33	inches
4	R(T) = Total Recharge (feet)	5.53	feet
5	A = Area of Site	1,613,898	sq ft
6	R = R(T) x A	8,921,092	cu ft
7	R = Site Recharge Volume	252,645,336	liters
9	NR = N/R	5.46	mg/l

FINAL CONCENTRATION OF NITROGEN IN RECHARGE

5.46

B	*Site Recharge Summary*	*Value*	*Units*
1	R(T) = Total Site Recharge	66.33	inches/yr
2	R = Site Recharge Volume	8,921,092	cu ft/yr
3	R = Site Recharge Volume	66,734,410	gal/yr
4	R = Site Recharge Volume	66.73	MG/yr

C	*Total Sanitary Nitrogen*	*Value*	*Units*
1	TSN = SN(res) + SN(comm./STP)	2954.87	lbs
2			
3			

Conversions used in SONIR
Acres x 43,560 = Square Feet
Cubic Feet x 7.48052 = Gallons
Cubic Feet x 28.32 = Liters
Days x 365 = Years
Feet x 12 = Inches
Gallons x 0.1337 = Cubic Feet
Gallons x 3.785 = Liters
Grams / 1,000 = Milligrams
Grams x 0.002205 = Pounds
Milligrams / 1,000 = Grams

APPENDIX D

TRAFFIC IMPACT STUDY

VHB Engineering, PC

February 27, 2014

Traffic Impact Study

The Seasons

Elwood Road
East Northport, New York

PREPARED FOR

BK at Huntington, LLC
c/o Engel Burman Group
67 Clinton Road
Garden City, New York 11530

PREPARED BY

VHB Engineering, Surveying and Landscape Architecture, P.C.

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February 27, 2014

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1.0 Introduction

VHB Engineering, Surveying and Landscape Architecture, P.C. (VHB) has performed an assessment of the potential traffic impacts associated with The Seasons senior housing community (55 years of age or older) in the hamlet of East Northport, Town of Huntington, Suffolk County, New York. The study quantifies existing and projected traffic conditions and compares changes in the existing operating conditions at select intersections in the vicinity of the project, with the introduction of the proposed development. The purpose of this study is to determine if there are any significant traffic impacts due to the proposed project and to evaluate and propose mitigation measures, if required. This report presents the findings of the traffic study and summarizes the data collection process, traffic analysis procedures and study conclusions.

Project Description

The proposed Seasons senior community is located along the west side of Elwood Road, approximately 1,250 feet north of the intersection of Burr Road/Cuba Hill Road and Elwood Road. The proposed site plan depicts a 360 unit senior residential community with a recreation building. The site plan further depicts a main gated site entrance along Elwood Road, located directly across from Hammond Road. The site access point will provide two entering lanes and two exiting lanes, will be stop controlled and will be further described herein. There will also be a secondary driveway near the southerly corner of the site along Elwood Road, which will allow right turns in and out only.

The subject site is further illustrated in Figure 1 on the following page.


Site
SITE LOCATION MAP
VHB
FIGURE 1

Study Methodology

The following describes the methodology used in this traffic study:

- The site plan and related documents were reviewed to obtain an understanding of the scope and layout of the proposed project.
- The adjacent roadway system was reviewed and the intersections of Route 25 at Elwood Road, Elwood Road at Warner Road, Elwood Road at Cuba Hill Road/ Burr Road, Elwood Road at Hammond Road, Elwood Road at Cedar Road, Elwood Road at John Glenn High School Access and Elwood Road at Clay Pitts Road were identified for study purposes as key study intersections.
- Field inspections were conducted within the study area limits.
- Manual turning movement counts were collected at the study intersections during the AM and PM peak periods on a typical weekday.
- The existing traffic volumes at the study intersections were expanded to a future No Build year (assumed to be 2016).
- Traffic generated by other planned developments in the vicinity of the project site was added to obtain the volumes for the No Build Condition.
- The traffic generated by the proposed development was estimated based on recognized traffic engineering standards.
- The site-generated volumes were distributed along the adjacent roadway network and added to the No Build volumes to produce the proposed Build volumes.
- Capacity analyses were performed at the study intersections for the Existing, No Build and Future Build Conditions.
- The results of the analyses for the Existing, No Build and Future Build Conditions were compared to assess any significant traffic impacts due to the proposed project.
- The proposed site access and circulation was reviewed.
- The need for traffic mitigation measures was evaluated.

2.0 Existing Conditions

Evaluation of the potential transportation impacts associated with the proposed project requires a thorough understanding of the current transportation system in the project study area. Existing transportation conditions include roadway geometry, traffic control devices, peak-hour traffic volumes, and roadway operating characteristics. An inventory of the available information on the local roadways and traffic control in the vicinity of the project was compiled. The following sections present a summary of this information.

Study Intersections

To determine the potential traffic impacts of the proposed project, the following study intersections were identified for analysis under the Existing, No Build and Build Conditions:

- Elwood Road at Jericho Turnpike (Route 25)
- Elwood Road at Warner Road
- Elwood Road at Cuba Hill Road/ Burr Road
- Elwood Road at Hammond Road
- Elwood Road at Cedar Road
- Elwood Road at John Glenn High School Access
- Elwood Road at Clay Pitts Road

Roadway and Intersection Conditions

The principal roadways and intersections in the project area are described below. The descriptions of the roadways and study intersections include the geometric conditions and traffic control characteristics.

Roadways

Route 25

Route 25 is a major east-west arterial that is under the jurisdiction of the New York State Department of Transportation (NYSDOT). In the study area, Route 25 provides two travel lanes in each direction, with additional turn lanes at the intersection of Elwood Road. On this section of Route 25, the 2007 NYSDOT estimate of average daily traffic (AADT) is 31,900 vehicles. The posted speed within the study area is 40 miles per hour.

Elwood Road (C.R. 10)

Elwood Road, designated County Road 10 (C.R. 10), is a collector roadway under the jurisdiction of the Suffolk County Department of Public Works (SCDPW). Elwood Road runs in a north-south direction along the eastern boundary of the site. In the vicinity of the site, it provides one travel lane in each direction and has a posted speed limit of 40 miles per hour.

Warner Road

Warner Road is a north-south collector roadway under the jurisdiction of the Town of Huntington. Warner Road begins at Jericho Turnpike and runs in a northeasterly direction to its terminus at Elwood Road. Warner Road provides one travel lane in each direction and has a posted speed limit of 30 miles per hour within the study area.

Cuba Hill Road

Cuba Hill Road is an east-west collector roadway under the jurisdiction of the Town of Huntington. Located approximately one and a quarter-miles to the south of the project site, it provides one travel lane in each direction and has additional turn lanes at its intersection with Elwood Road, where it becomes Burr Road. It has a posted speed limit of 30 miles per hour within the study area.

Burr Road

Burr Road is an east-west collector roadway under the jurisdiction of the Town of Huntington. Also located approximately a quarter-mile to the south of the project site, it provides one travel lane in each direction and has additional turn lanes at its intersection with Elwood Road, where it becomes Cuba Hill Road. It has a posted speed limit of 30 miles per hour within the study area.

Hammond Road

Hammond Road is an east-west local roadway under the jurisdiction of the Town of Huntington. Hammond Road begins at Elwood Road and runs in an easterly direction where it terminates approximately 325 feet after its intersection with Shari Lane. Hammond Road provides one travel lane in each direction and has a speed limit of 30 miles per hour.

Cedar Road

Cedar Road is an east-west local roadway under the jurisdiction of the Town of Huntington. Cedar Road begins at Elwood Road and runs in an easterly direction to its terminus at Town Line Road. Cedar Road provides one travel lane in each direction and has a posted speed limit of 30 miles per hour within the study area.

Clay Pitts Road

Clay Pitts Road is an east-west collector roadway under the jurisdiction of the Town of Huntington. Clay Pitts Road begins at Cuba Hill Road and runs in an easterly direction to its terminus at Town Line Road. Clay Pitts Road provides one travel lane in each direction and has a posted speed limit of 30 miles per hour within the study area.

VHB

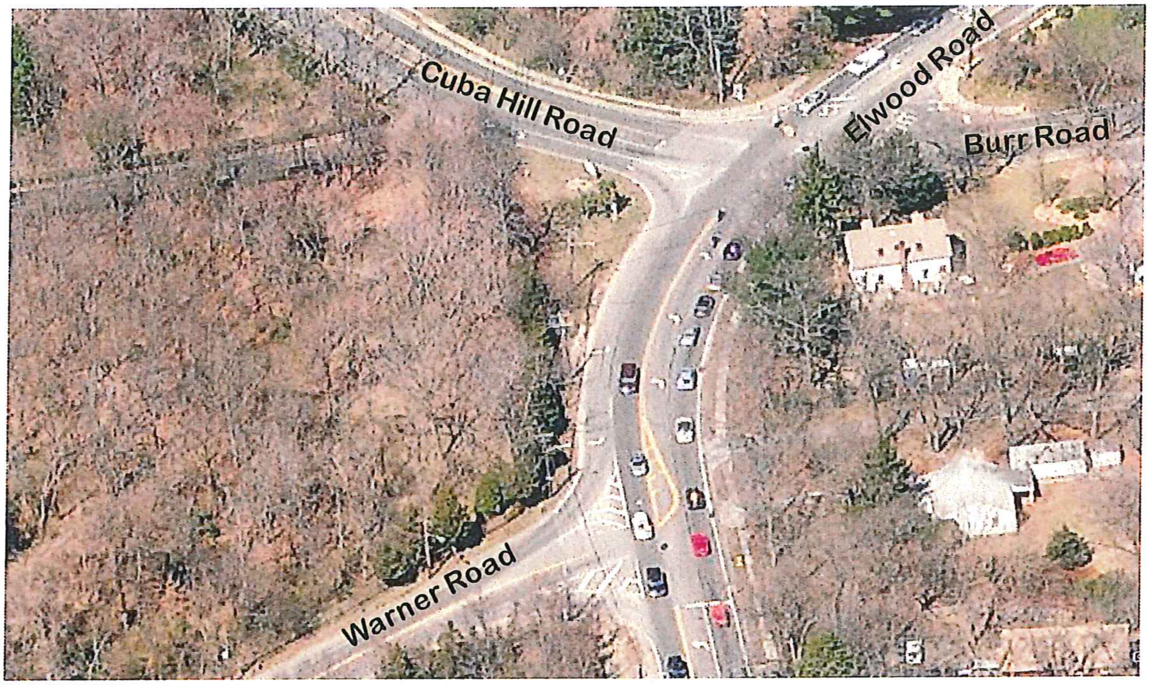
Engineering, Surveying and Landscape Architecture, P.C.

Study Intersections

Elwood Road at Route 25

Elwood Road and Route 25 is a multiphase, signalized four-legged intersection. The eastbound Route 25 provides an exclusive left-turn lane, a through and a shared through/right-turn lane and in the westbound direction it provides an exclusive left-turn lane, two through and a shared through/right-turn lane. The southbound Elwood Road approach provides an exclusive left-turn lane, a shared through/right-turn lane and an exclusive right-turn lane. The northbound approach is a driveway to a shopping center located on the south side of the intersection; it provides an exclusive left-turn lane and a shared through/right-turn lane.

Elwood Road at Warner Road and Cuba Hill Road / Burr Road



Elwood Road and Warner Road is a signalized three-legged intersection. The eastbound Warner Road approach provides an exclusive left-turn lane, and a channelized right turn controlled by a yield sign. The northbound Elwood Road approach provides an exclusive left-turn lane, and a through lane. The southbound approach provides a through lane and a channelized right-turn lane.

Elwood Road and Cuba Hill Road/Burr Road is a signalized four-legged intersection, located immediately to the north of Elwood Road and Warner Road intersection. Eastbound Cuba Hill Road provides an exclusive left-turn lane, a through and a channelized right-turn lane. The westbound Burr Road approach provides an exclusive left-turn lane and a shared through/right-turn lane. The north and south Elwood Road approaches provide an exclusive left-turn lane and a shared through/right-turn lane in both directions.

Both intersections are controlled by multi-phase traffic signals and are coordinated with an offset.

Elwood Road at Hammond Road

Elwood Road and Hammond Road is an unsignalized three-legged intersection. The westbound Hammond Road approach provides a shared left and right-turn lane. The northbound Elwood Road approach provides a shared through and right-turn lane and the southbound Elwood Road approach provides a shared through and left-turn lane.

Elwood Road at Cedar Road and John Glenn High School Access

Elwood Road and Cedar Road is a signalized three-legged intersection. The westbound Cedar Road approach provides a left-turn lane and a right-turn lane. The northbound Elwood Road approach provides a shared through/right-turn lane. In the southbound direction it provides an exclusive left-turn lane and a through lane.

The Elwood Road and John Glenn High School access is a signalized three-legged intersection located immediately to the north of Elwood Road and Cedar Road. The eastbound School access provides a left-turn lane and a right-turn lane. The northbound Elwood Road approach provides an exclusive left-turn lane, and a through lane. In the southbound direction it provides a shared through/right-turn lane.

Both intersections are controlled by the same multi-phase signal controller.

Elwood Road at Clay Pitts Road

The intersection of Elwood Road and Clay Pitts Road is a multiphase, signalized four-legged intersection. Eastbound Clay Pitts Road provides a shared left-turn/through/right-turn lane. In the westbound direction it provides an exclusive left-turn lane, and a shared through/right-turn lane. The north and south Elwood Road approaches provide an exclusive left-turn lane, and a shared through/right-turn lane in both directions.

Existing Traffic Volume Data

Intersection turning movement counts at the study intersections were manually collected on a typical Wednesday, December 11, 2013 during the weekday AM and PM peak periods. The weekday AM peak period counts were performed from 7:00 AM to 9:00 AM and the PM peak period counts were performed from 4:00 PM to 6:00 PM. These times reflect the heaviest traffic flows coinciding with commuter and shopping activities. The existing AM and PM peak hour volumes for the busier conditions are shown in Figures 2 and 3, respectively, and the manual turning movement count data can be found in Appendix A.

Additionally, 24 hour traffic volume data was collected along Elwood Road using automatic traffic recorders (ATR's). The ATR's were placed at two locations along Elwood Road for a one week period from Wednesday, December 11, 2013 to December 18, 2013. The first location was 400 feet south of the proposed site access driveway and the other location was approximately 300 feet south of Clay Pitts Road. The 24 hour traffic volume data was utilized to verify that the turning movement counts were conducted during the periods when traffic flows along Elwood Road were highest. Detailed ATR data can be found in Appendix B.

Network Peak Hour

Based on a review of the 24 hour vehicle volume data (ATR) and the turning movement counts collected along Elwood Road, the peak AM traffic volumes occurred between 7:15 AM and 8:15 AM, and the peak PM traffic volumes occurred between 4:45 PM and 5:45 PM. Therefore, these were taken as network peak hours for AM and PM peak periods, respectively. The traffic at each intersection was computed for the network peak hours and used for the analysis. It is important to note, weekend traffic volumes were reviewed and found to be lower than the weekday AM and PM peak period volumes, therefore, the weekend peak periods were not analyzed.

Accident Data

Accident data from the most recent available NYSDOT Accident Location Information System (ALIS) records for the most recent three-year period were requested and Accident Verbal Description Reports (VDR) from March 1, 2010 through February 28, 2013 were obtained for the following roadway segment that comprised of intersections to the north and south of the project site and the roadway segment in between. The limits of the study are outlined below:

- Elwood Road from Fair Oaks Court to Cedar Road

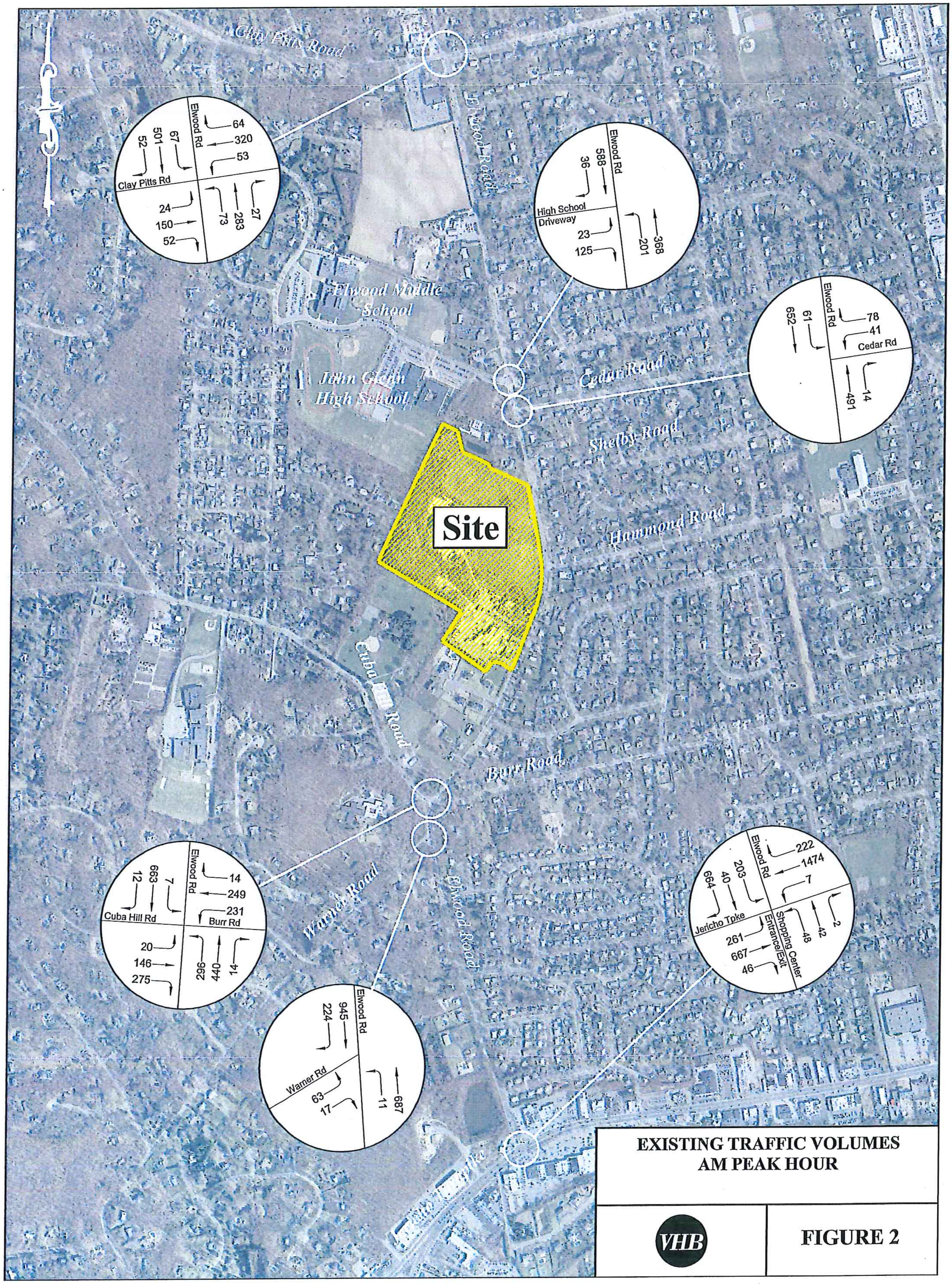
As indicated below in Table 1, from March 1, 2010 to February 28, 2013, a total of 10 accidents occurred in the study area. There were a total of 5 accidents resulting in personal injuries, and 5 involving property damage only. There were no fatalities.

The accidents with the highest occurrence rates were rear end collisions, accounting for 60% of all accidents (6 accidents), collisions with fixed objects accounted for 20% of the accidents (2 accidents), and left turn and side-swipe accidents accounted for 10% each (1 accidents each).

A collision diagram showing the accident location and the manner of collisions can be found in Appendix E. A review of the accident data records along this segment of Elwood Road does not reveal any patterns that would be exacerbated as a result of the proposed development.

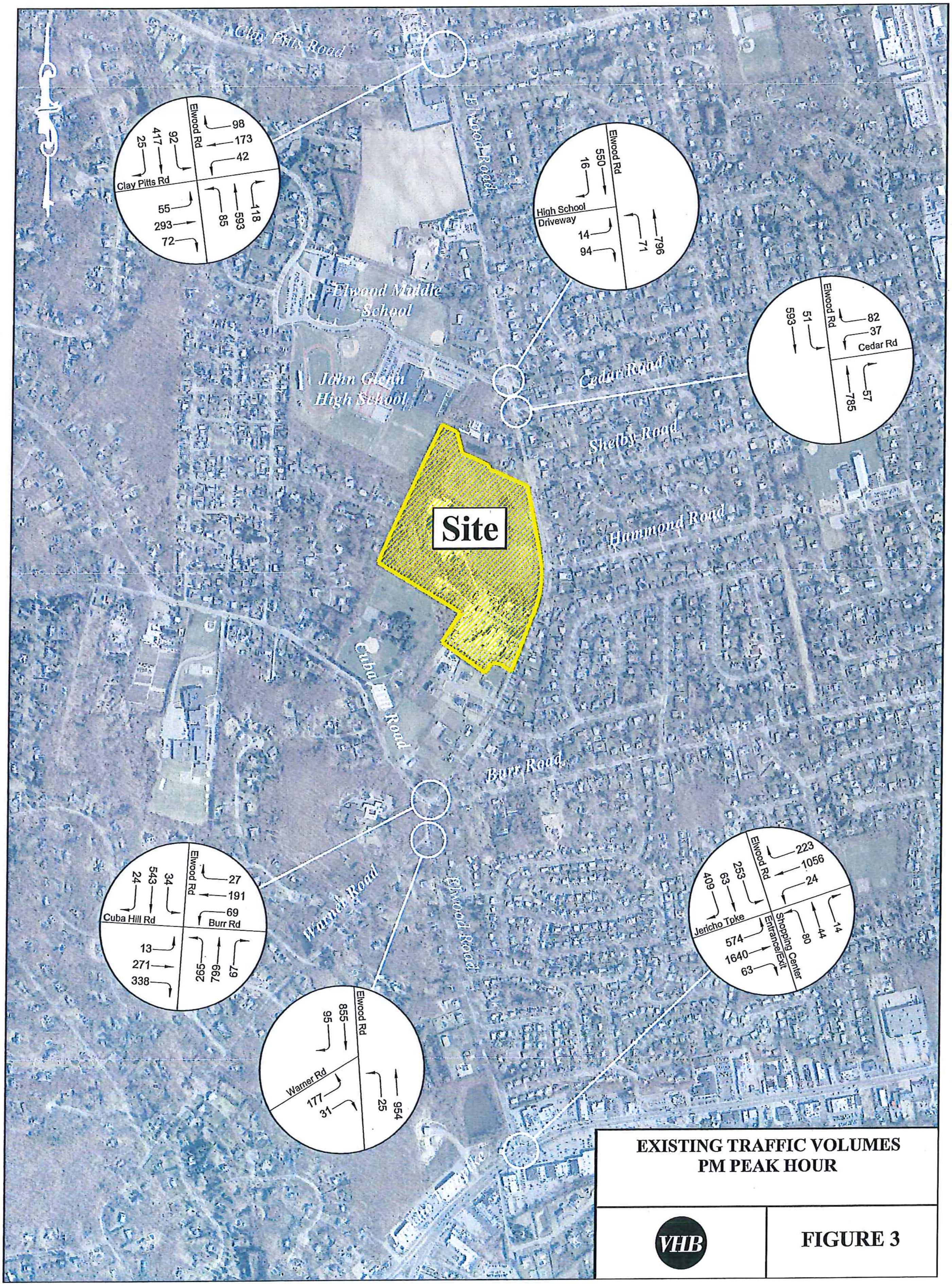
Table 1 – Accident Data

Location	Accident Severity				Total	Accident Type					
	Fatality	Injury	Property Damage	Non-Reportable		Rear End	Right Angle	Left Turn	Fixed Object	Side-Swipe	Other/ Unknown
Elwood Road @ Fair Oaks Court	-	-	1	-	**1**	1	-	-	-	-	-
Elwood Road between Fair Oaks & Hammond Road	-	1	-	-	**1**	-	-	-	1	-	-
Elwood Road @ Hammond Road	-	-	3	-	**3**	3	-	-	-	-	-
Elwood Road between Hammond & S. Shelby Road	-	-	-	-	-	-	-	-	-	-	-
Elwood Road @ South Shelby Road	-	-	-	-	-	-	-	-	-	-	-
Elwood Road between S. Shelby & Cedar Road	-	2	-	-	**2**	2	-	-	-	-	-
Elwood Road @ Cedar Road	-	2	1	-	**3**	-	-	1	1	1	-
Total	-	5	5	-	**10**	6	-	1	2	1	-



EXISTING TRAFFIC VOLUMES
AM PEAK HOUR

FIGURE 2



EXISTING TRAFFIC VOLUMES
PM PEAK HOUR

FIGURE 3

3.0 Future Conditions

The analysis of future conditions with the proposed project ("Build Condition") was performed to evaluate the impacts on future traffic in the area. The existing traffic volumes were expanded to the year 2016, reflecting the year when the project is expected to be completed and operational.

Future No Build Conditions

Background Traffic Growth

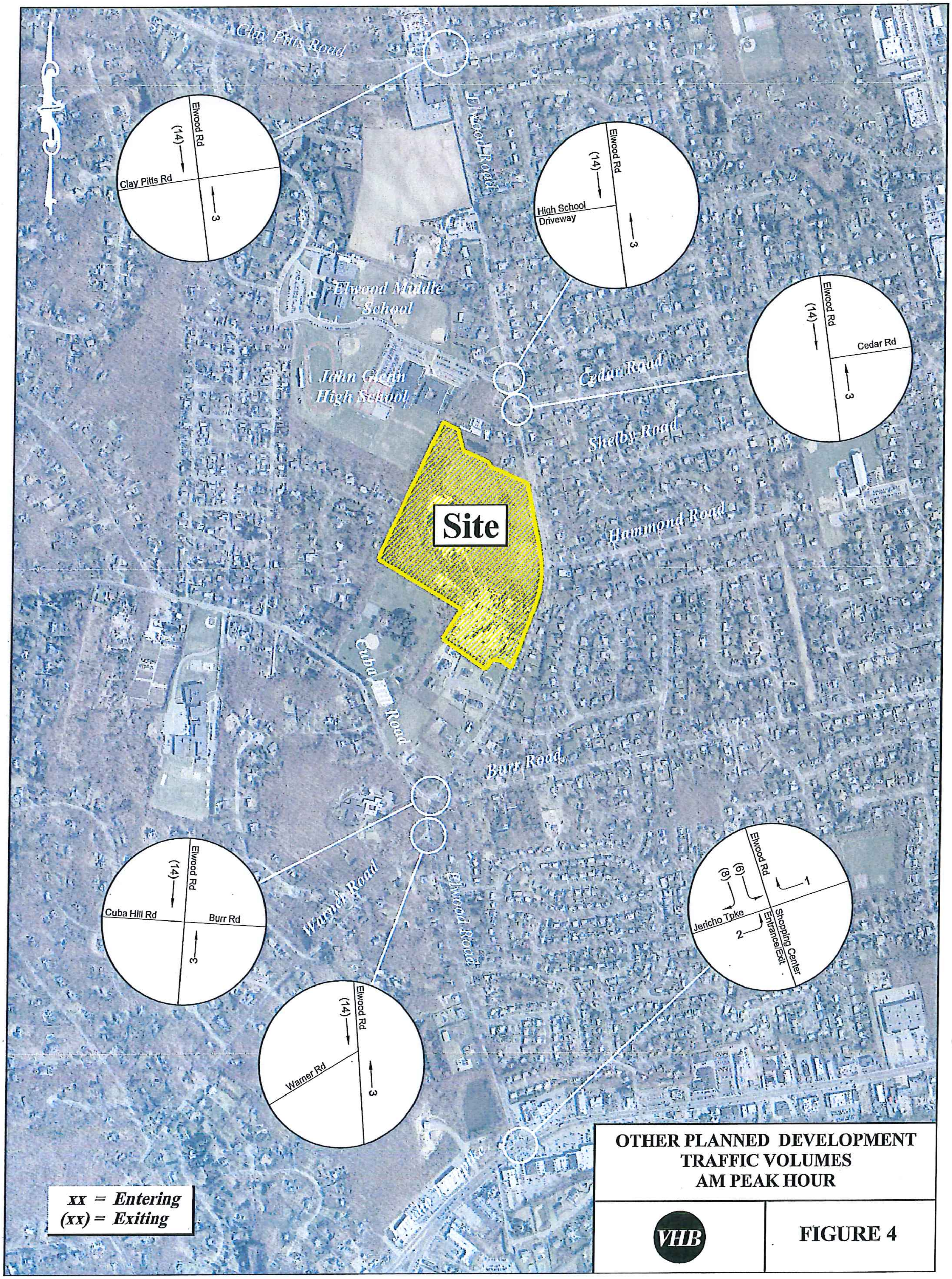
To account for increases in general population and background growth not related to the proposed project, an annual growth factor was applied to the existing traffic volumes, based on the NYSDOT's *Long Island Transportation Plan* (LITP 2000). The LITP is the primary long term planning model used by the NYSDOT for Long Island. The growth rate anticipated for the Town of Huntington in Suffolk County is 1.0 percent per year. Therefore, to obtain the future No Build traffic volumes, a total growth rate of 3.0% was applied to the existing traffic data to develop the background traffic for the year 2016.

Other Planned Developments

Based upon information received from the Town of Huntington's Department of Planning and Environment, there is one other significant approved or planned development in the vicinity of the subject site that may impact future traffic conditions in the area: The Matinecock Court development, which is located on the northwest corner of Pulaski Road and Elwood Road. The proposed project would be comprised of 78 rental apartments and 77 condos/townhouses. The site will be serviced via two unsignalized access points; one along Pulaski Road and the other along Elwood Road.

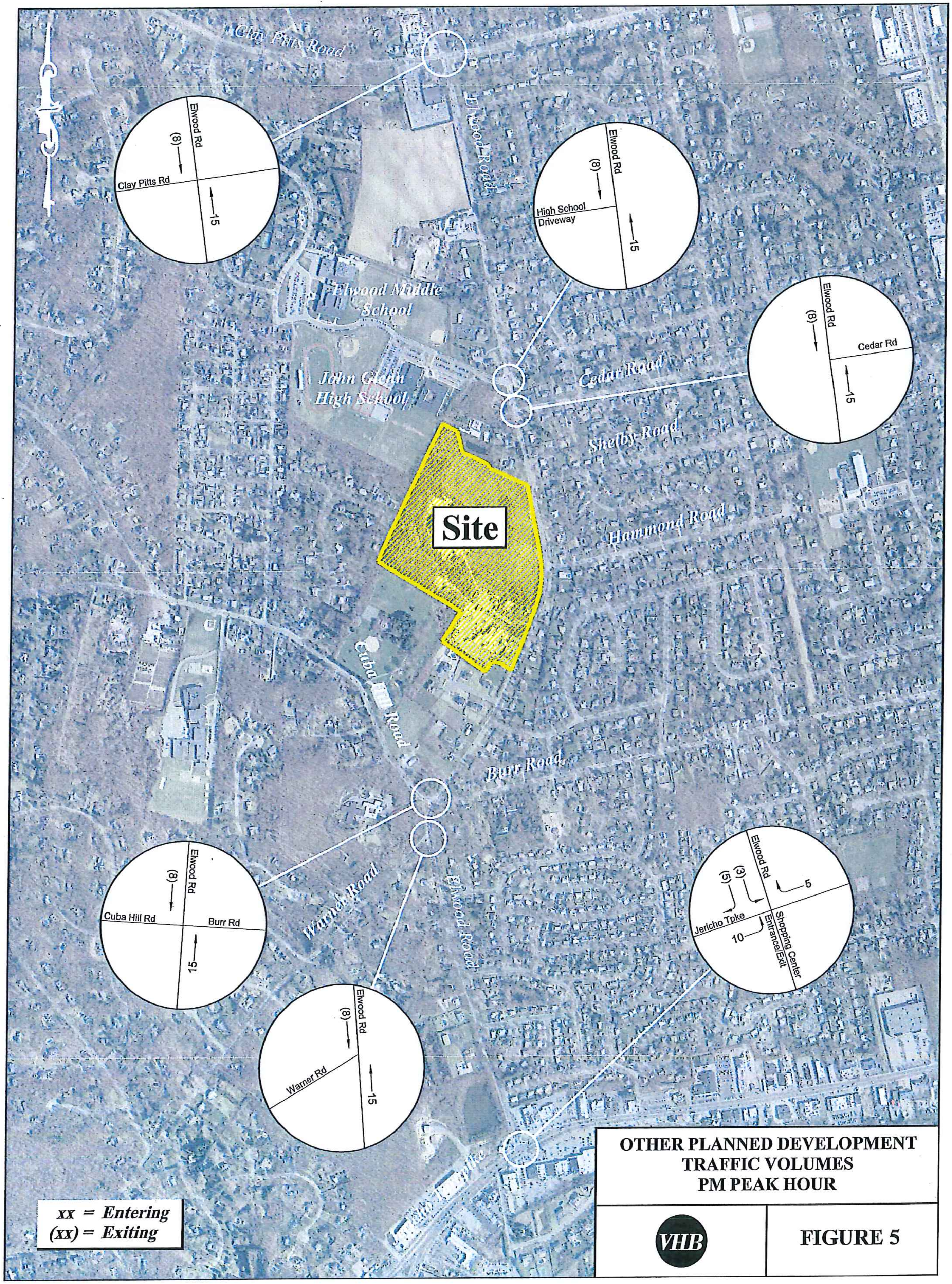
In order to estimate the number of trips generated by the Matinecock Court development, the trip generation estimates presented in the April 20, 2007 Supplemental Traffic Impact Study prepared by RMS Engineering for the project were utilized. The study estimates that the proposed project will generate 84 and 109 trips during the AM and PM peak periods, respectively. That study shows that only 5% of those site generated trips will actually travel through the study area. However, in order to provide a more conservative analysis, it was the assumed that the percentage of trips that will travel through the study area is 10%.

The trips originating from and destined to the Matinecock Court development were then assigned to the adjacent roadways, as shown in Figures 4 and 5. These trips were then added to the 2016 background traffic to develop the No Build traffic volumes. The No Build Condition reflects the traffic levels that would be expected in the year 2016 without the construction of The Seasons senior community. The resulting No Build traffic volumes for the AM and PM peak periods are shown in Figures 6 and 7, respectively.



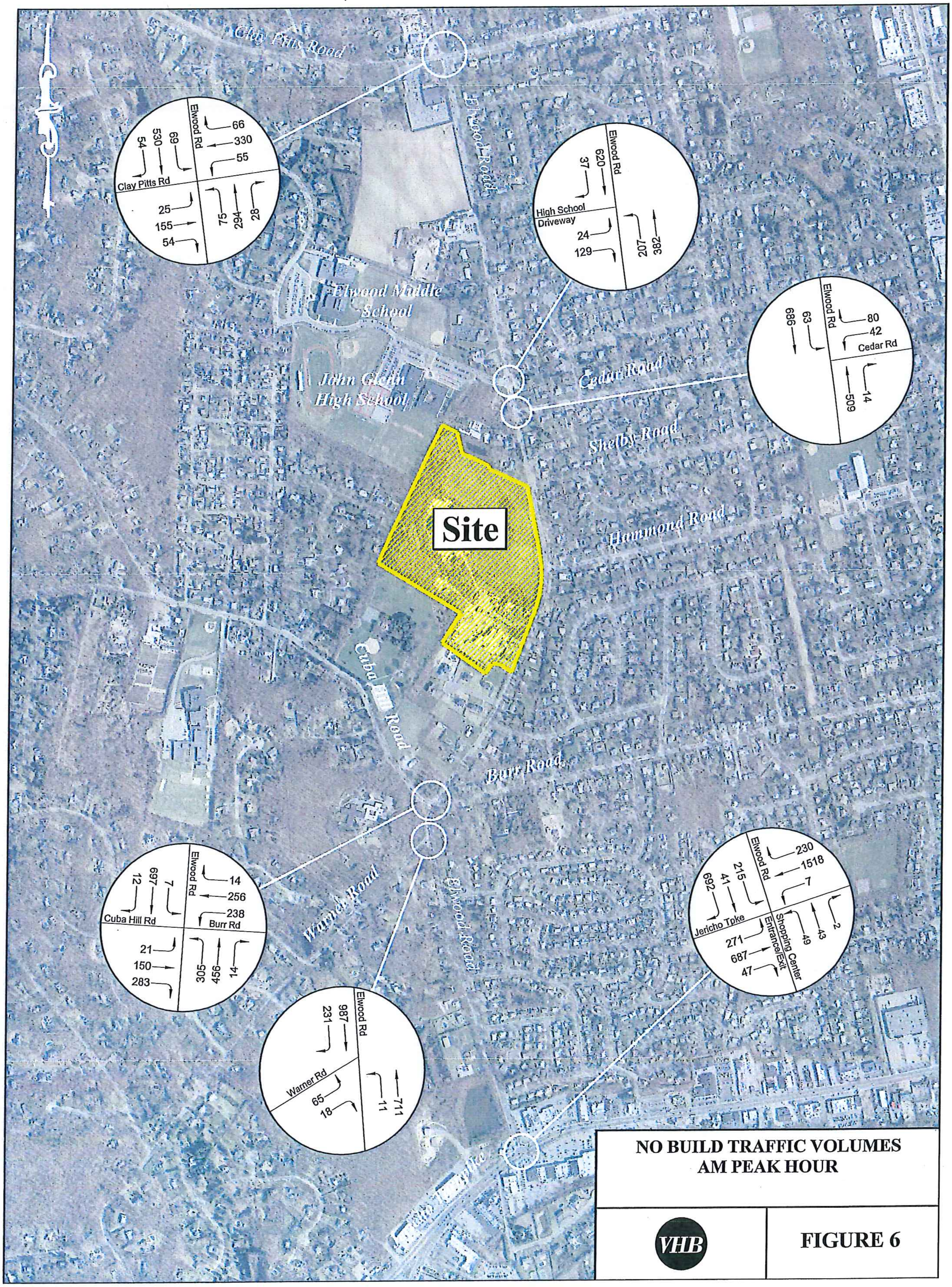
OTHER PLANNED DEVELOPMENT TRAFFIC VOLUMES AM PEAK HOUR

FIGURE 4



OTHER PLANNED DEVELOPMENT
TRAFFIC VOLUMES
PM PEAK HOUR

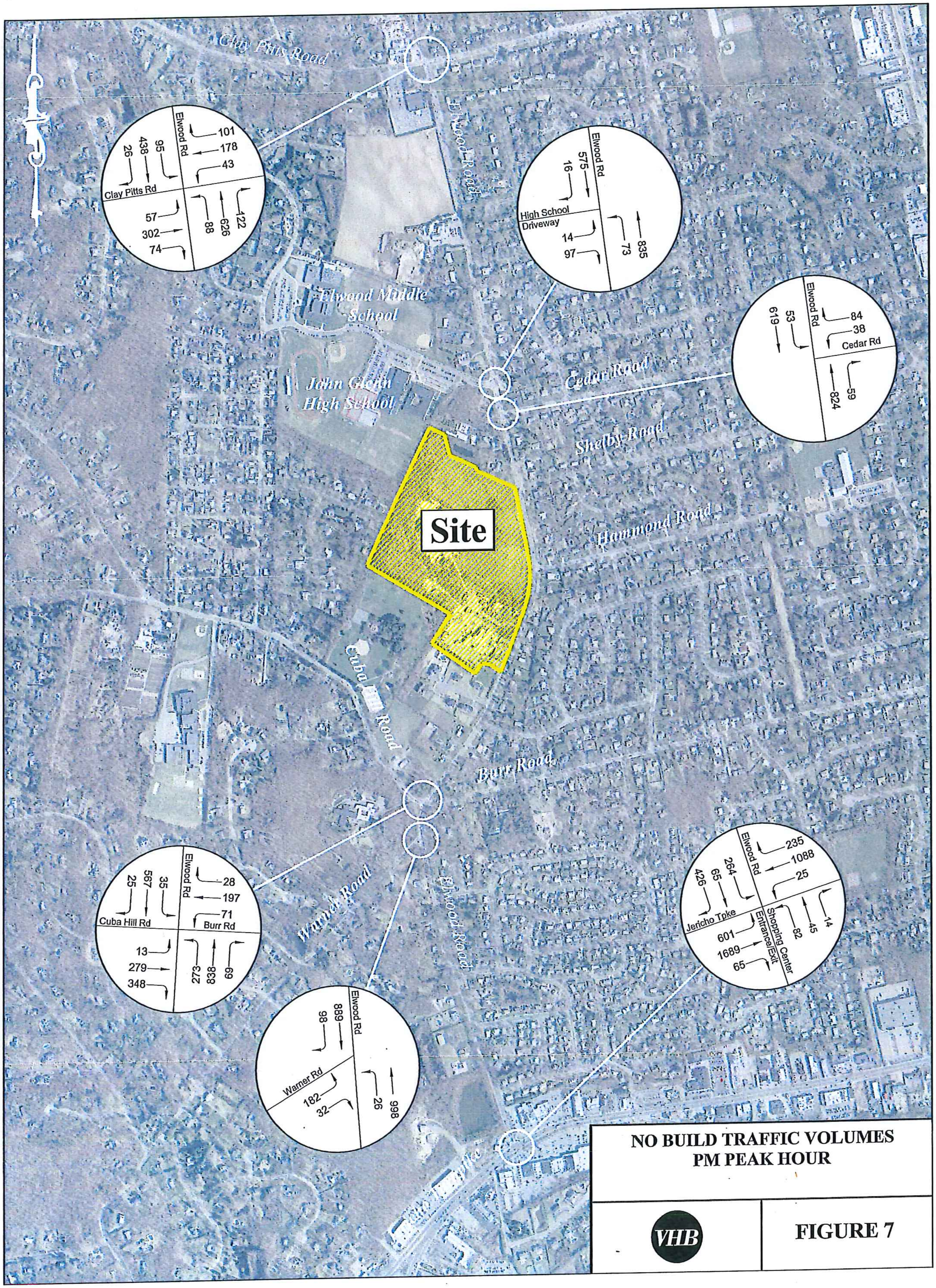
FIGURE 5



NO BUILD TRAFFIC VOLUMES
AM PEAK HOUR

VHB

FIGURE 6



NO BUILD TRAFFIC VOLUMES
PM PEAK HOUR

FIGURE 7

Build Condition

To estimate the traffic impact of the proposed senior community, it is necessary to determine the traffic volumes expected to be generated.

Trip Generation

To estimate the project-generated traffic for the proposed development mix, a review was undertaken of the available trip generation data sources, including the reference published by the Institute of Transportation Engineers ("ITE"), Trip Generation, 9th Edition. This widely utilized reference source contains trip generation rates for related uses, "Senior Adult Housing (Land Use Code #251). Table 2 summarizes the trips likely to be generated by the proposed development for AM and PM peak periods.

Table 2 – Trip Generation

Component	Size/Density		AM Peak Hour Trips		PM Peak Hour Trips	
			Rate = 0.22		Rate = 0.27	
			Entering	Exiting	Entering	Exiting
SENIOR HOUSING ITE # 251 Senior Adult Housing - Detached	360	Units	35%	65%	61%	39%
			28	51	59	38
			79		97	

Based upon the above, it is estimated that the proposed project will generate a total of 79 and 97 trips during the AM and PM peak hours, respectively.

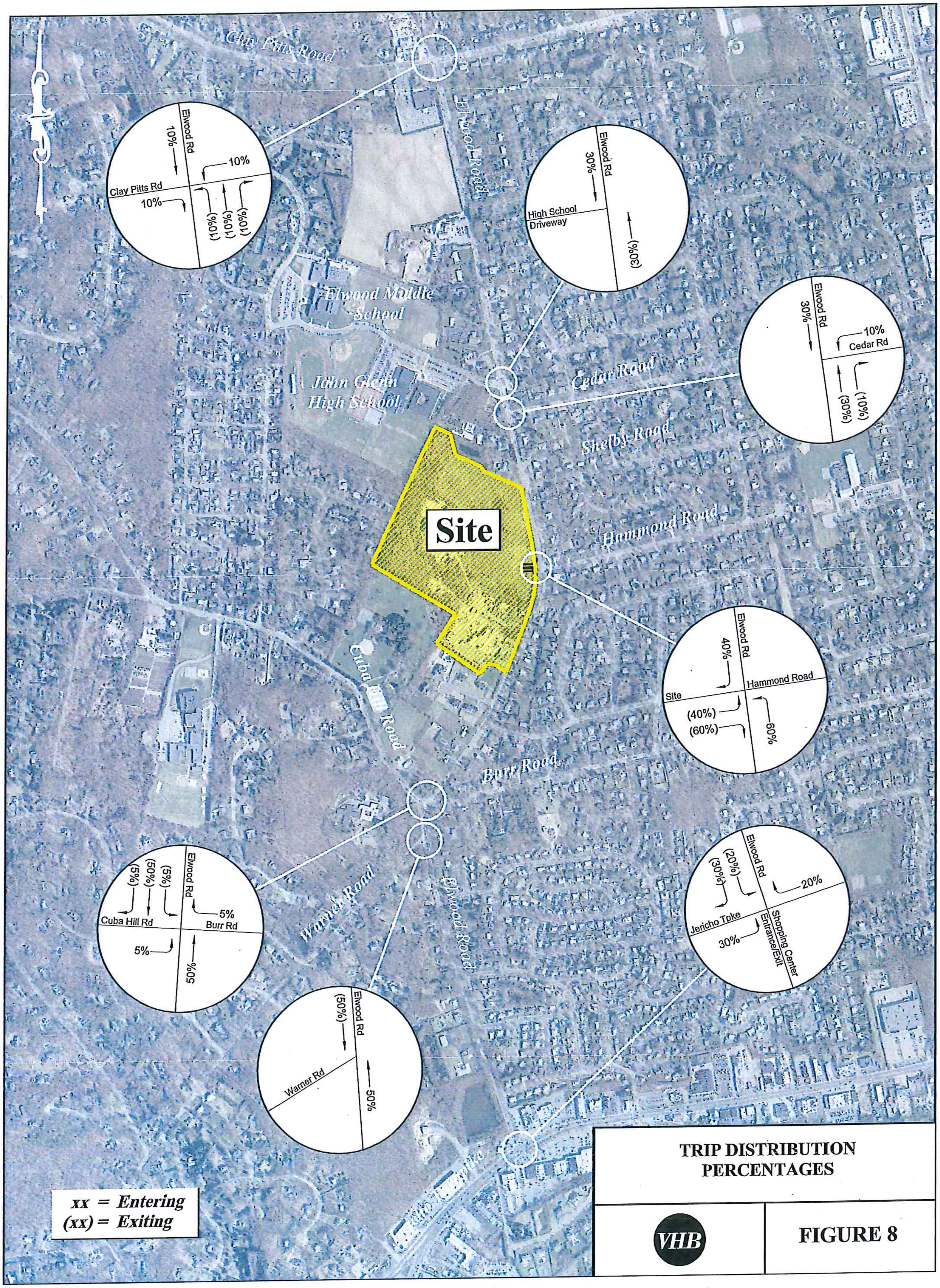
Continuation of Dairy Operation

The Seasons at Elwood developer has been told by the owner of the Oak Tree Farm Dairy that, should the proposed change of zone not be approved by the Town of Huntington, it is likely that the business will seek to maximize the sale value of the property by selling to a larger, regional dairy corporation. This could be accomplished (and would still be in compliance with the conditions of the Special Use permit previously granted by the Town) by operating the dairy within the existing building, but for longer periods, possibly 24 hours per day, 7 days per week. Such a greatly ramped-up operation would substantially increase the truck movements and employee trips, thereby significantly impacting the existing traffic flow along Elwood Road, but without the benefit of the extensive traffic mitigation measures which have been proposed to be funded and implemented by the Seasons of Elwood developer. Furthermore, northbound traffic would continue to be subject to an increasing number of stoppages and long queues when dairy trucks wait in the through lane and block northbound traffic before being able to turn into the dairy property. In addition to disrupting traffic flow along Elwood Road, the trucks are noisy and dusty, and in their current configuration on the dairy property they are parked and idling right alongside the residential properties on Fair Oaks Court. This situation would remain if the change of zone is not approved.

Trip Distribution and Assignment

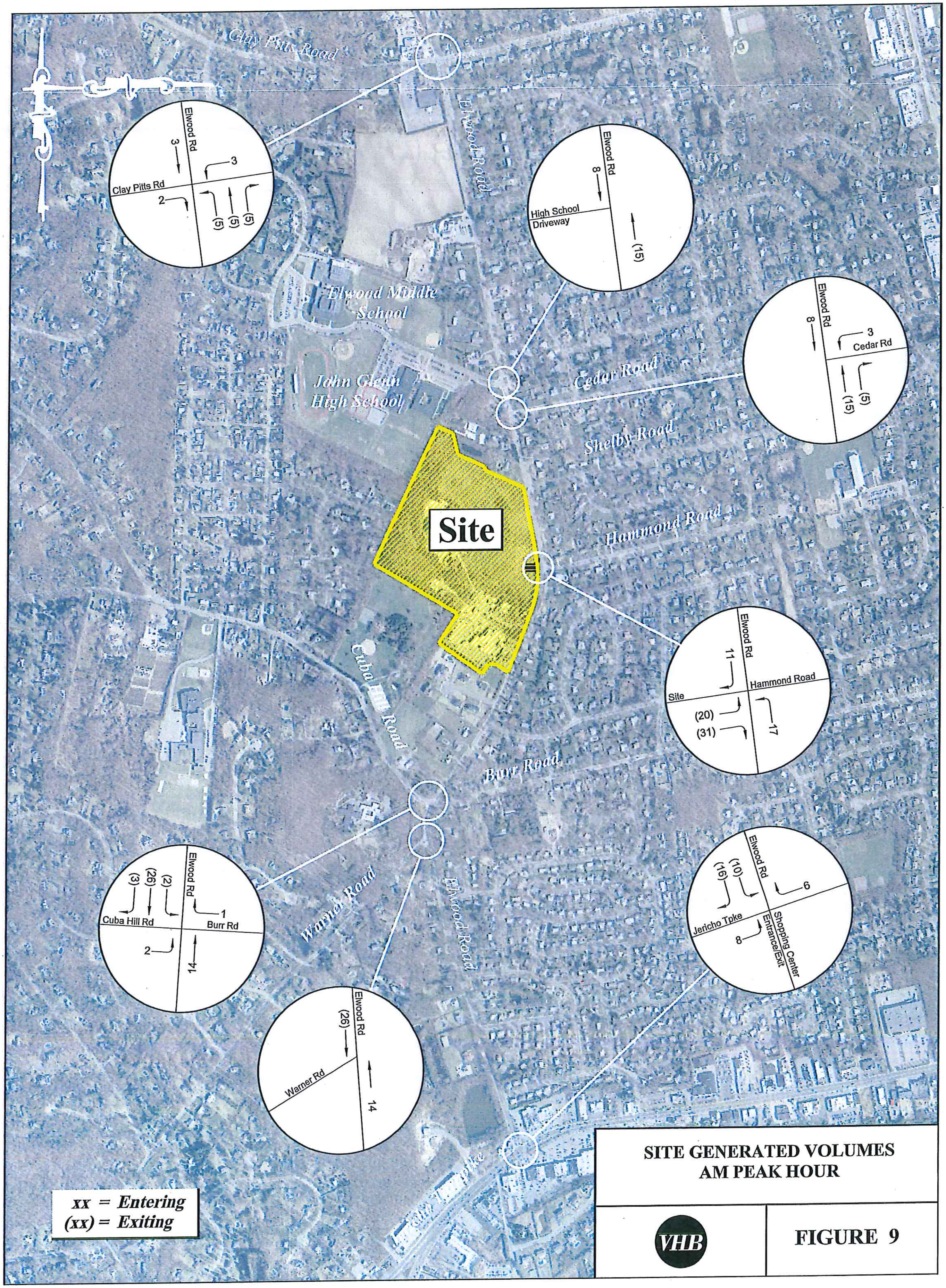
The trips originating from and destined to the project site were assigned to the adjacent roadways based on the characteristics of the roadway network and the location of the proposed site access driveway. The trip distribution percentages, shown in Figure 8, were then applied to the site generated traffic and assigned to the local roadway network. The resulting traffic volumes for the weekday AM and PM peak hours are presented in Figures 9 and 10, respectively. The site generated trips were then added to the No Build turning movement volumes at the study intersections to develop the Build AM and PM peak hour traffic volumes, shown in Figures 11 and 12, respectively.

Note: Even though it is proposed to have a southerly site driveway (limited to right turns in and right turns out of the senior community) along Elwood Road, it was assumed (to present a conservative analysis) that all entering and exiting traffic would use the main driveway.



TRIP DISTRIBUTION PERCENTAGES

FIGURE 8

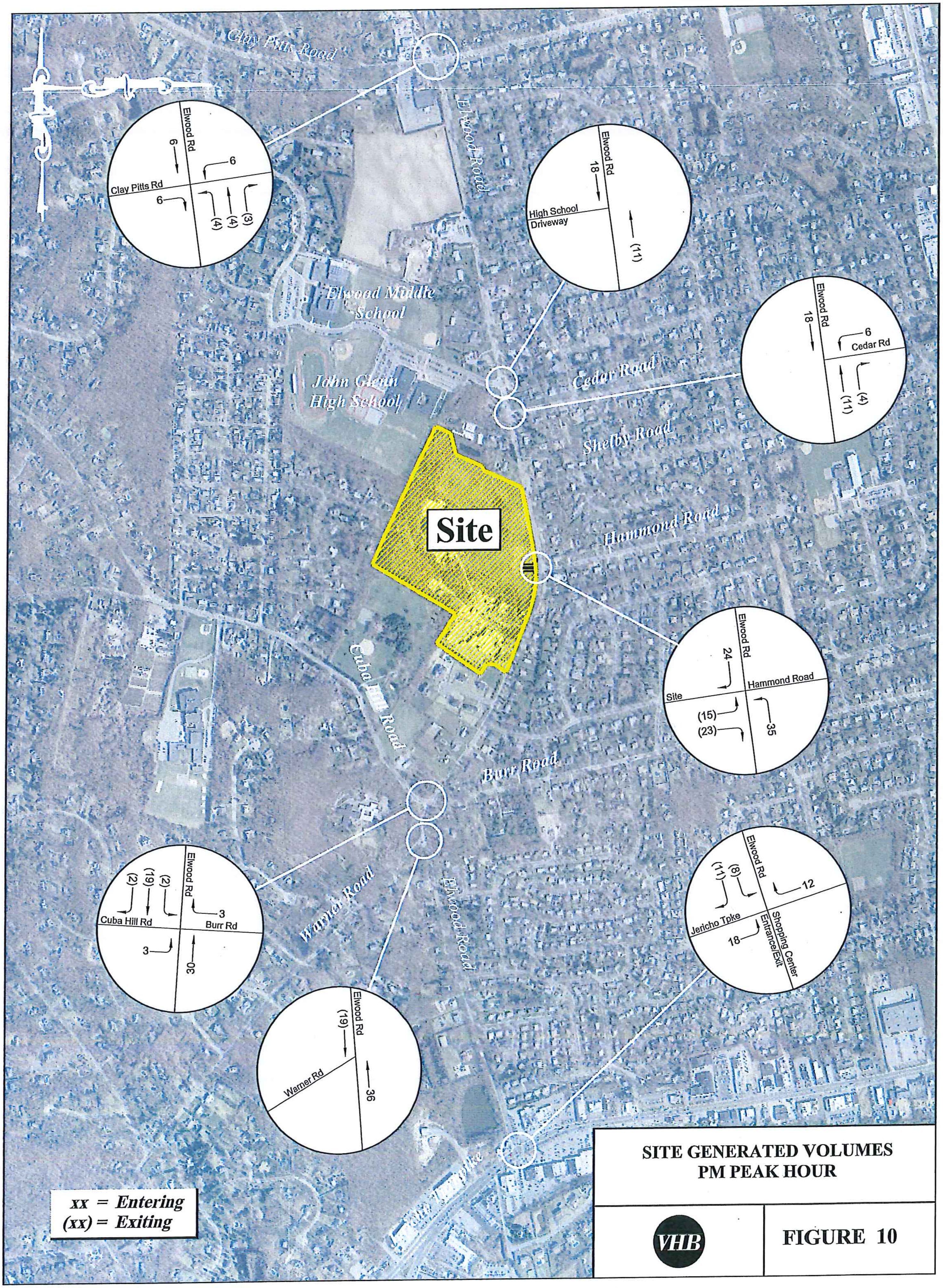


xx = Entering
(xx) = Exiting

SITE GENERATED VOLUMES
AM PEAK HOUR

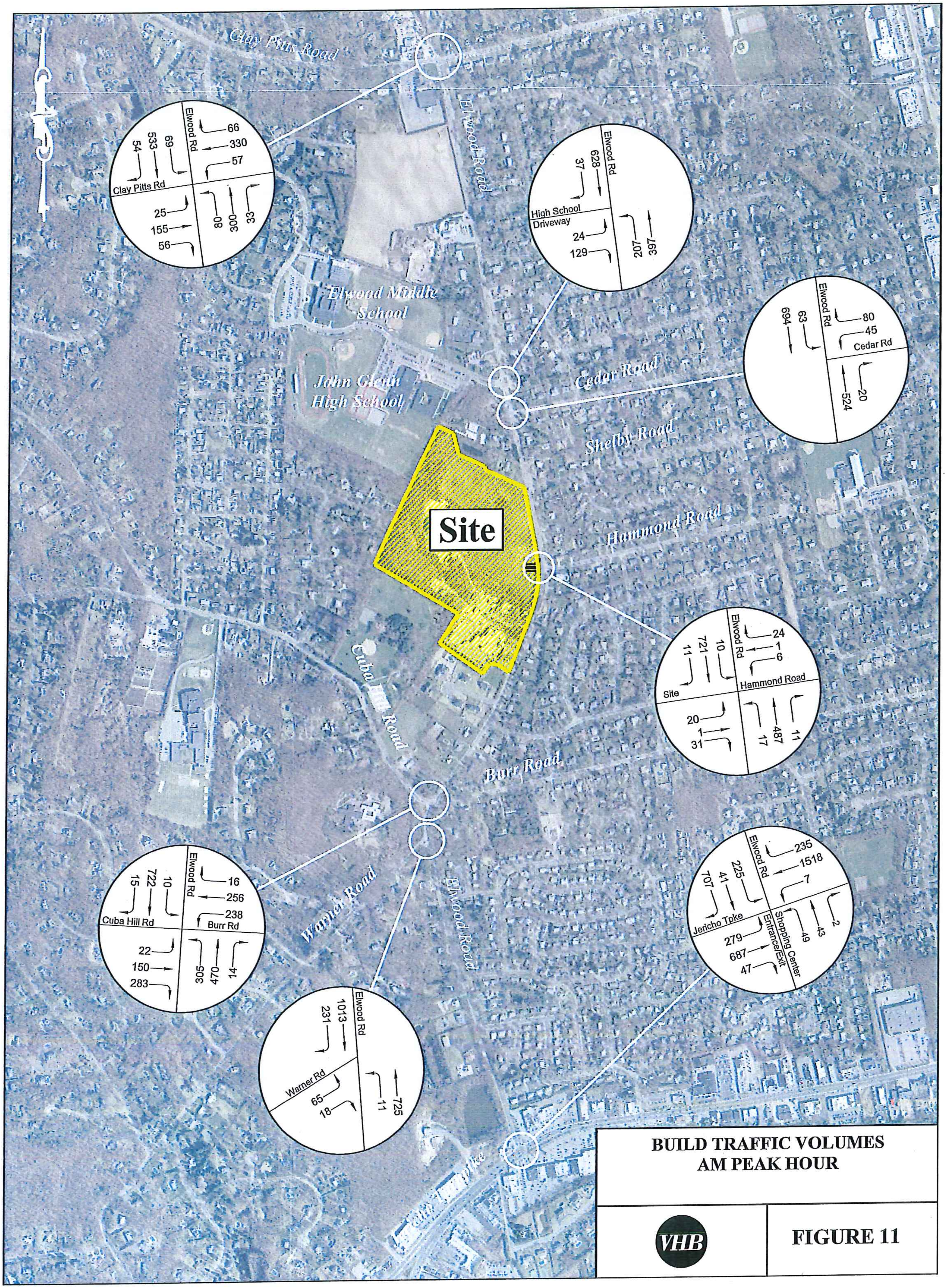
VHB

FIGURE 9



SITE GENERATED VOLUMES
PM PEAK HOUR

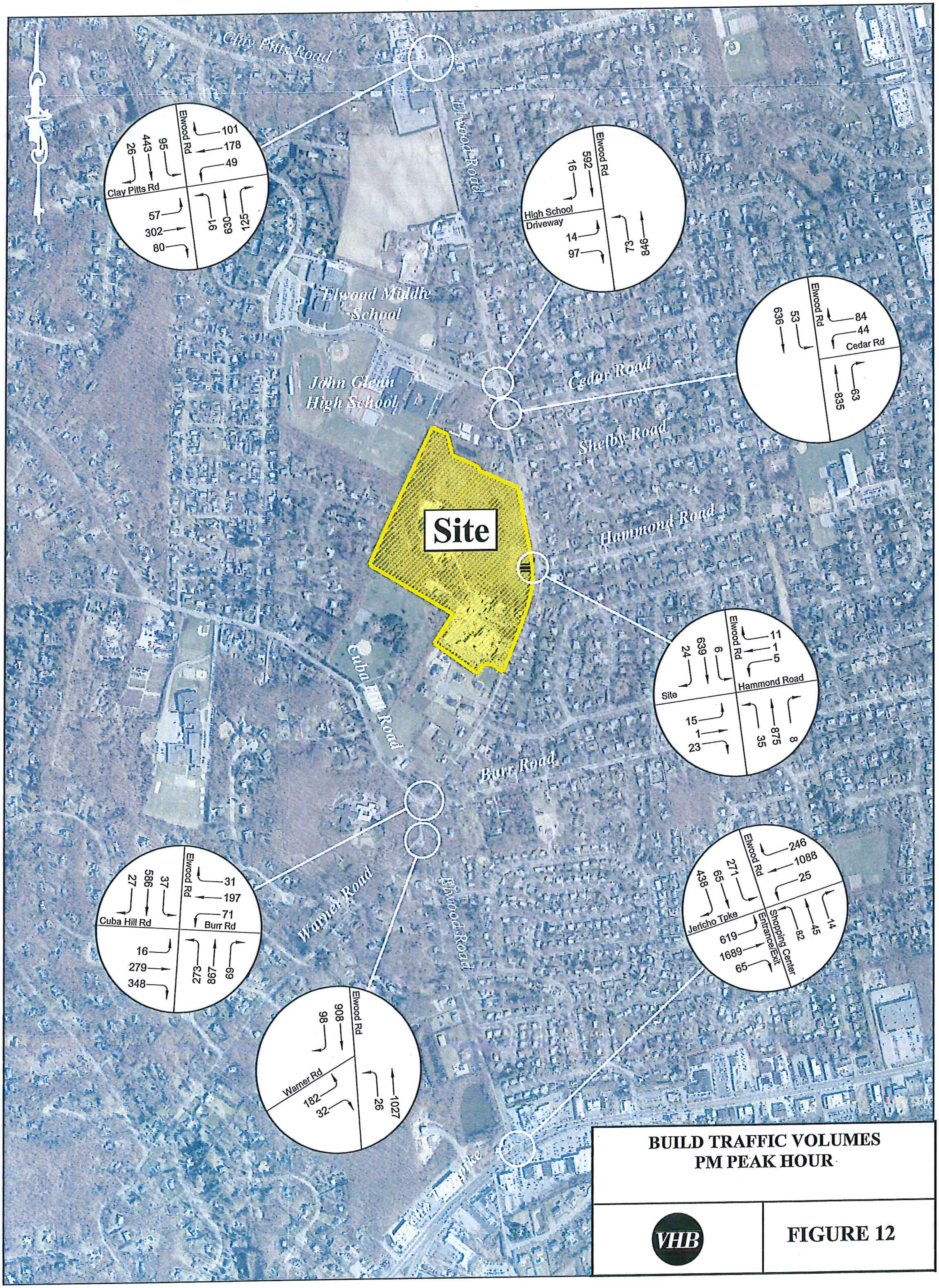
FIGURE 10



BUILD TRAFFIC VOLUMES
AM PEAK HOUR

VHB

FIGURE 11



BUILD TRAFFIC VOLUMES
PM PEAK HOUR

VHB

FIGURE 12

4.0

Traffic Operations Analysis

Measuring existing traffic volumes and projecting future traffic volumes quantifies traffic flow within the study area. To assess the quality of traffic flow, roadway capacity analyses were conducted with respect to the Existing, No Build and Future Build Conditions. These capacity analyses provide an indication of the adequacy of the roadway facilities to serve the anticipated traffic demands.

Level of Service and Delay Criteria

The evaluation criteria used to analyze area intersections in this traffic study are based on the 2000 Highway Capacity Manual (HCM). The term 'level of service' (LOS) is used to denote the different operating conditions that occur at an intersection under various traffic volume loads. It is a qualitative measure that considers a number of factors including roadway geometry, speed, travel delay and freedom to maneuver. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions.

The level of service designations, which are based on delay, are reported differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection and the LOS designation is for overall conditions at the intersection. For unsignalized intersections, however, the analysis assumes that traffic on the mainline is not affected by traffic on the side streets. Thus the LOS designation is for the critical movement exiting the side street, which is generally the left turn out of the side street or side driveway.

It should be noted that the analytical methodologies typically used for the analysis of unsignalized intersections use conservative parameters such as long critical gaps. Actual field observations indicate that drivers on minor streets generally accept shorter gaps in traffic than those used in the analysis procedures and therefore experience less delay than reported by the analysis software. The analysis methodologies also do not take into account the beneficial grouping effects caused by nearby signalized intersections. The net effect of these analysis procedures is the over-estimation of calculated delays at unsignalized intersections in the study area. Cautious judgment should therefore be exercised when interpreting the capacity analysis results at unsignalized intersections.

Software

The capacity analyses were done using the traffic analysis and simulation software Synchro, *version 7*, a computer program developed by Trafficware Ltd. Synchro adheres to and implements the guidelines and methods set forth in the 2000 Highway Capacity Manual, Chapters 16 and 17. This analysis methodology is used to evaluate the ability of an intersection or roadway to efficiently handle the number of vehicles using the facility. Synchro was used to analyze the Existing, No Build and Build Conditions at the study intersections.

Level of Service Analysis

Level of service analyses were conducted for the Existing Conditions and for future No Build and Build conditions at the study intersections. The signalized intersection analysis results for the weekday AM and PM peak hours can be found in Tables 3 and 4, respectively.

Table 3 – Signalized Intersections Level of Service Summary – AM Peak Period

Intersection	Movement	Lane Group	Existing 2013		No Build 2016		Build 2016	
			Delay	LOS	Delay	LOS	Delay	LOS
Jericho Turnpike & Elwood Road	EB	L	78.8	E	80.4	F	83.5	F
		TR	13.8	B	14.0	B	14.1	B
		Approach	31.2	C	31.8	C	33.2	C
	WB	L	57.3	E	57.3	E	57.3	E
		TR	28.8	C	30.2	C	30.5	C
		Approach	28.9	C	30.3	C	30.6	C
	NB	L	67.0	E	67.5	E	67.5	E
		TR	61.3	E	61.6	E	61.6	E
		Approach	64.3	E	64.7	E	64.7	E
	SB	L	61.2	E	62.7	E	63.4	E
		T	61.5	E	62.5	E	63.0	E
		R	43.6	D	44.4	D	44.0	D
		Approach	54.5	D	55.5	E	55.9	E
	Overall		**36.8**	**D**	**37.9**	**D**	**38.6**	**D**
Elwood Road & Warner Road	EB	L	65.5	E	66.1	E	66.1	E
		R	19.6	B	18.8	B	18.8	B
		Approach	55.8	E	55.7	E	55.7	E
	NB	L	3.3	A	3.5	A	3.5	A
		T	5.9	A	6.4	A	6.8	A
		Approach	5.9	A	6.4	A	6.8	A
	SB	T	14.4	B	20.8	C	27.2	C
		R	1.6	A	2.1	A	2.1	A
		Approach	11.9	B	17.3	B	22.6	C
	Overall		**12.2**	**B**	**15.6**	**B**	**18.9**	**B**
Elwood Road & Cuba Hill Road / Burr Road	EB	L	50.0	D	50.7	D	51.5	D
		T	65.0	E	65.1	E	65.1	E
		R	27.8	C	30.2	C	31.4	C
		Approach	41.1	D	42.7	D	43.5	D
	WB	L	71.0	E	75.3	E	79.0	E
		TR	49.3	D	50.1	D	50.2	D
		Approach	59.5	E	61.9	E	63.6	E
	NB	L	34.3	C	35.3	D	34.5	C
		TR	13.6	B	13.3	B	14.2	B
		Approach	21.8	C	21.9	C	22.1	C
	SB	L	19.3	B	19.9	B	19.8	B
		TR	33.3	C	37.4	D	41.2	D
		Approach	33.2	C	37.2	D	41.0	D
	Overall		**37.3**	**D**	**39.2**	**D**	**40.8**	**D**
Elwood Road & Cedar Road	WB	L	32.8	C	33.4	C	33.8	C
		R	43.3	D	45.1	D	45.1	D
		Approach	39.7	D	41.1	D	41.1	D
	NB	TR	18.4	B	20.4	C	21.2	C
		Approach	18.4	B	20.4	C	21.2	C
	SB	L	4.4	A	4.3	A	4.4	A
		T	6.4	A	6.4	A	6.4	A
		Approach	6.2	A	6.2	A	6.3	A
	Overall		**14.2**	**B**	**14.9**	**B**	**15.4**	**B**

Table 3 – Signalized Intersections Level of Service Summary – AM Peak Period……Continued

Intersection	Movement	Lane Group	Existing 2013		No Build 2016		Build 2016	
			Delay	LOS	Delay	LOS	Delay	LOS
Elwood Road & High School Driveway	EB	L	36.3	D	37.3	D	37.3	D
		R	29.1	C	26.9	C	26.9	C
		Approach	30.2	C	28.5	C	28.5	C
	NB	L	7.3	A	12.9	B	13.4	B
		R	2.6	A	2.9	A	3.0	A
		Approach	4.2	A	6.5	A	6.6	A
	SB	TR	21.6	C	25.0	C	25.5	C
		Approach	21.6	C	25.0	C	25.5	C
	Overall		**16.4**	**B**	**18.3**	**B**	**18.5**	**B**
Elwood Road & Clay Pitts Road	EB	LTR	22.9	C	27.9	C	28.4	C
		Approach	22.9	C	27.9	C	28.4	C
	WB	L	19.7	B	21.7	C	22.0	C
		TR	29.3	C	33.3	C	33.6	C
		Approach	28.2	C	31.8	C	32.1	C
	NB	L	23.9	C	26.0	C	28.6	C
		T	13.4	B	13.0	B	13.1	B
		R	3.7	A	3.4	A	3.2	A
		Approach	14.7	B	14.8	B	15.3	B
	SB	L	11.3	B	10.9	B	10.9	B
		TR	25.3	C	25.7	C	25.8	C
		Approach	23.8	C	24.1	C	24.2	C
	Overall		**22.9**	**C**	**24.8**	**C**	**25.0**	**C**

Table 4 – Signalized Intersections Level of Service Summary – PM Peak Period

Intersection	Movement	Lane Group	Existing 2013		No Build 2016		Build 2016	
			Delay	LOS	Delay	LOS	Delay	LOS
Jericho Turnpike & Elwood Road	EB	L	108.8	F	132.4	F	149.0	F
		TR	66.9	E	80.2	F	80.9	F
		Approach	77.5	E	93.5	F	98.7	F
	WB	L	63.5	E	64.0	E	64.0	E
		TR	108.3	F	122.2	F	125.1	F
		Approach	107.5	F	121.1	F	124.0	F
	NB	L	79.9	E	80.7	F	80.7	F
		TR	59.9	E	60.3	E	60.3	E
		Approach	71.5	E	72.2	E	72.2	E
	SB	L	71.8	E	74.6	E	76.5	E
		T	71.2	E	75.2	E	76.8	E
		R	20.3	C	20.5	C	20.6	C
		Approach	55.1	E	57.7	E	58.9	E
	Overall		**82.8**	**F**	**95.4**	**F**	**99.1**	**F**
Elwood Road & Warner Road	EB	L	67.6	E	68.2	E	68.2	E
		R	16.8	B	17.2	B	17.2	B
		Approach	60.0	E	60.5	E	60.5	E
	NB	L	5.8	A	6.1	A	6.2	A
		T	34.8	C	45.9	D	53.8	D
		Approach	34.1	C	44.9	D	52.7	D
	SB	T	71.5	E	77.8	E	80.2	F
		R	2.2	A	2.3	A	2.3	A
		Approach	64.5	E	70.3	E	72.6	E
	Overall		**50.4**	**D**	**57.8**	**E**	**62.3**	**E**
Elwood Road & Cuba Hill Road / Burr Road	EB	L	39.1	D	39.8	D	40.4	D
		T	59.6	E	61.2	E	62.0	E
		R	11.4	B	13.3	B	14.2	B
		Approach	33.0	C	34.7	C	35.6	D
	WB	L	34.2	C	35.2	D	35.8	D
		TR	35.8	D	36.6	D	37.2	D
		Approach	35.4	D	36.2	D	36.9	D
	NB	L	26.5	C	28.1	C	28.3	C
		TR	54.0	D	75.1	E	96.3	F
		Approach	47.5	D	64.2	E	80.9	F
	SB	L	25.1	C	27.9	C	30.8	C
		TR	44.7	D	51.7	D	56.1	E
		Approach	43.6	D	50.4	D	54.7	D
	Overall		**41.8**	**D**	**51.0**	**D**	**59.4**	**E**
Elwood Road & Cedar Road	WB	L	28.9	C	28.9	C	29.4	C
		R	37.9	D	37.9	D	37.9	D
		Approach	35.1	D	35.1	D	35.0	D
	NB	TR	18.9	B	20.7	C	21.5	C
		Approach	18.9	B	20.7	C	21.5	C
	SB	L	3.5	A	4.2	A	5.0	A
		T	3.4	A	3.5	A	3.5	A
		Approach	3.4	A	3.6	A	3.6	A
	Overall		**13.7**	**B**	**14.7**	**B**	**15.1**	**B**

Table 4 – Signalized Intersections Level of Service Summary – PM Peak Period ....Continued

Intersection	Movement	Lane Group	Existing 2013		No Build 2016		Build 2016	
			Delay	LOS	Delay	LOS	Delay	LOS
Elwood Road & High School Driveway	EB	L	31.4	C	31.4	C	31.4	C
		R	19.2	B	19.4	B	19.4	B
		Approach	20.8	C	20.9	C	20.9	C
	NB	L	0.9	A	0.9	A	0.9	A
		R	3.0	A	3.5	A	3.8	A
		Approach	2.8	A	3.3	A	3.6	A
	SB	TR	14.4	B	15.3	B	15.8	B
		Approach	14.4	B	15.3	B	15.8	B
	Overall		**8.6**	**A**	**9.2**	**A**	**9.6**	**A**
Elwood Road & Clay Pitts Road	EB	LTR	27.4	C	30.9	C	31.9	C
		Approach	27.4	C	30.9	C	31.9	C
	WB	L	19.1	B	20.8	C	21.6	C
		TR	18.6	B	20.2	C	20.5	C
		Approach	18.6	B	20.2	C	20.6	C
	NB	L	15.1	B	15.2	B	15.4	B
		T	22.8	C	23.1	C	23.0	C
		R	2.6	A	2.4	A	2.4	A
		Approach	18.9	B	19.2	B	19.1	B
	SB	L	36.7	D	46.7	D	45.7	D
		TR	17.3	B	17.2	B	17.1	B
		Approach	20.7	C	22.2	C	21.9	C
	Overall		**21.0**	**C**	**22.4**	**C**	**22.5**	**C**

Signalized Intersection Analysis Results

Route 25 at Elwood Road

The AM Peak Period results at Route 25 and Elwood Road show that the intersection operates at a Level of Service D during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is an imperceptible 0.7 second increase in overall intersection delay between the No Build and Build Conditions.

The PM Peak Period results at Route 25 and Elwood Road show that the intersection operates at a Level of Service F during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are also consistent with those of the No Build Condition. There is only a 3.7 second increase in overall intersection delay when comparing the No Build and Build Conditions. An increase in overall intersection delay of this magnitude is insignificant and no mitigation is required.

Elwood Road at Warner Road

The AM Peak Period results at the intersection of Elwood Road and Warner Road show that the intersection operates at a Level of Service B during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is only an increase of 3.3 seconds in overall intersection delay as a result of the project generated traffic when comparing the No Build and Build Conditions.

The PM Peak Period results at Elwood Road and Warner Road show that the intersection operates at a Level of Service D during the Existing Condition and at a Level of Service E in the No Build and Build Conditions. The southbound through movement operates at Level of Service F in the Build condition as compared to a Level of Service E in the No Build condition. In order to improve the southbound approach levels of service, signal timing adjustments are needed. By allocating additional green time to the northbound and southbound approaches, the southbound level of service can be improved to LOS E with delays that are 4.5 seconds lower than the No Build delays. There is only a 0.3 second increase in overall intersection delay between the No Build and Build with Mitigation Conditions. Table 5 provides the results of the mitigation and a comparison of the No Build and Future Build Conditions.

Elwood Road at Cuba Hill Road/ Burr Road

The AM Peak Period results at Elwood Road and Cuba Hill Road/Burr Road show that the intersection operates at a Level of Service D during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is an increase of 1.6 seconds in overall intersection delay when comparing the No Build and Build Conditions.

The PM Peak Period results at Elwood Road and Cuba Hill Road/Burr Road show that the intersection operates at a Level of Service D during the Existing, No Build Conditions and changes to a Level of Service E in the Build Condition. In order to improve the overall intersection level of service back to levels experienced in the No Build Condition, signal timing adjustments are needed. By allocating additional green time to the northbound and southbound approaches, the overall intersection level of service can be improved back to LOS D with a 0.8 second decrease in overall delay compared to the No Build condition. Table 5 provides the results of the mitigation and a comparison of the No Build and Future Build Conditions.

Elwood Road at Cedar Road

The AM Peak Period results at Elwood Road and Cedar Road show that the intersection operates at a Level of Service B during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is only an increase of 0.5 seconds in overall intersection delay as a result of the project generated traffic when comparing the No Build and Build Conditions.

The PM Peak Period results at Elwood Road and Cedar Road show that the intersection also operates at a Level of Service B during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is also less than a 1 second increase in overall intersection delay when comparing the No Build and Build Conditions, and is therefore, insignificant. An increase in overall intersection delay of this magnitude is unperceivable.

Elwood Road at John Glenn High School Access

The AM Peak Period results at Elwood Road and John Glenn High School Access show that the intersection operates at a Level of Service B during the Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is only a 0.2 second increase in overall intersection delay when comparing the No Build and Build Conditions, and is therefore, insignificant.

The PM Peak Period results at Elwood Road and John Glenn High School Access show that the intersection operates at a Level of Service A during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition and there is less than a 1 second increase in overall intersection delay between the No Build and Build Conditions. This is a relatively insignificant increase in overall intersection delay and no mitigation is required.

Elwood Road at Clay Pitts Road

The AM Peak Period results at Elwood Road and Clay Pitts Road show that the intersection operates at a Level of Service C during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is less than a 1 second increase in overall intersection delay when comparing the No Build and Build Conditions, and is therefore, insignificant.

The PM Peak Period results at Elwood Road and Clay Pitts Road show that the intersection operates at a Level of Service C during all three scenarios, Existing, No Build and Build Conditions. The results for individual movements in the Build Condition are consistent with those of the No Build Condition. There is an imperceptible 0.1 second increase in overall intersection delay when comparing the No Build and Build Conditions, therefore, mitigation is not required.

Table 5 – Mitigation – PM Peak Period

Intersection	Movement	Lane Group	No Build 2016		Build 2016		Build Mitigation	
			Delay	LOS	Delay	LOS	Delay	LOS
Elwood Road & Warner Road	EB	L	68.2	E	68.2	E	75.2	E
		R	17.2	B	17.2	B	19.9	B
		Approach	60.5	E	60.5	E	66.9	E
	NB	L	6.1	A	6.2	A	5.3	A
		T	45.9	D	53.8	D	49.2	D
		Approach	44.9	D	52.7	D	48.1	D
	SB	T	77.8	E	80.2	F	73.3	E
		R	2.3	A	2.3	A	2.1	A
		Approach	70.3	E	72.6	E	66.4	E
	Overall		**57.8**	**E**	**62.3**	**E**	**58.1**	**E**
Elwood Road & Cuba Hill Road / Burr Road	EB	L	39.8	D	40.4	D	42.4	D
		T	61.2	E	62.0	E	65.7	E
		R	13.3	B	14.2	B	14.7	B
		Approach	34.7	C	35.6	D	37.5	D
	WB	L	35.2	D	35.8	D	40.6	D
		TR	36.6	D	37.2	D	40.8	D
		Approach	36.2	D	36.9	D	40.8	D
	NB	L	28.1	C	28.3	C	29.8	C
		TR	75.1	E	96.3	F	71.8	E
		Approach	64.2	E	80.9	F	62.3	E
	SB	L	27.9	C	30.8	C	25.0	C
		TR	51.7	D	56.1	E	46.6	D
		Approach	50.4	D	54.7	D	45.3	D
	Overall		**51.0**	**D**	**59.4**	**E**	**50.2**	**D**

Additional Off-site Mitigation

In order to address traffic safety flow issues and concerns raised by members of the community, the developer has agreed to the following additional traffic mitigation measures to be implemented along Elwood Road:

- Install school speed zone flashing beacons in proximity to the John Glenn High School access roadway
- Provide new, wider sidewalks in close proximity to the John Glenn High School
- Install sidewalks, curbing and drainage along the entire site's frontage
- Widen the west side Elwood Road along the site's frontage to increase the radius of the present horizontal curve

- Install a right turn deceleration lane and a left turn lane at the proposed site access
- Provide new traffic signal controllers at the following intersections along Elwood Road:
  - Clay Pitts Road
  - John Glenn High School Access/ Cedar Road
  - Cuba Hill Road/ Burr Road
  - Warner Road
- Provide wireless interconnect between traffic signal controllers within study area. This will provide further improvement to traffic flow along Elwood Road.
- Provide emergency vehicle pre-emption at the signalized intersections within the study area

A Traffic Mitigation Plan is presented in Figure 13 depicting the mitigation measures outlined above. The estimated costs associated with these mitigation measures is approximately $1,000,000.

Site Access

Access to the proposed development will be provided via a main access driveway located directly opposite Hammond Road, on the west side of Elwood Road. The site access location, as proposed provides full access from Elwood Road and provides a shared through and left-turn lane and an exclusive right-turn lane exiting from the site. Table 6 shows the results of an unsignalized access analysis during the future Build Conditions for the AM and PM peak periods, respectively.

Table 6 – Unsignalized Site Access – LOS Summary

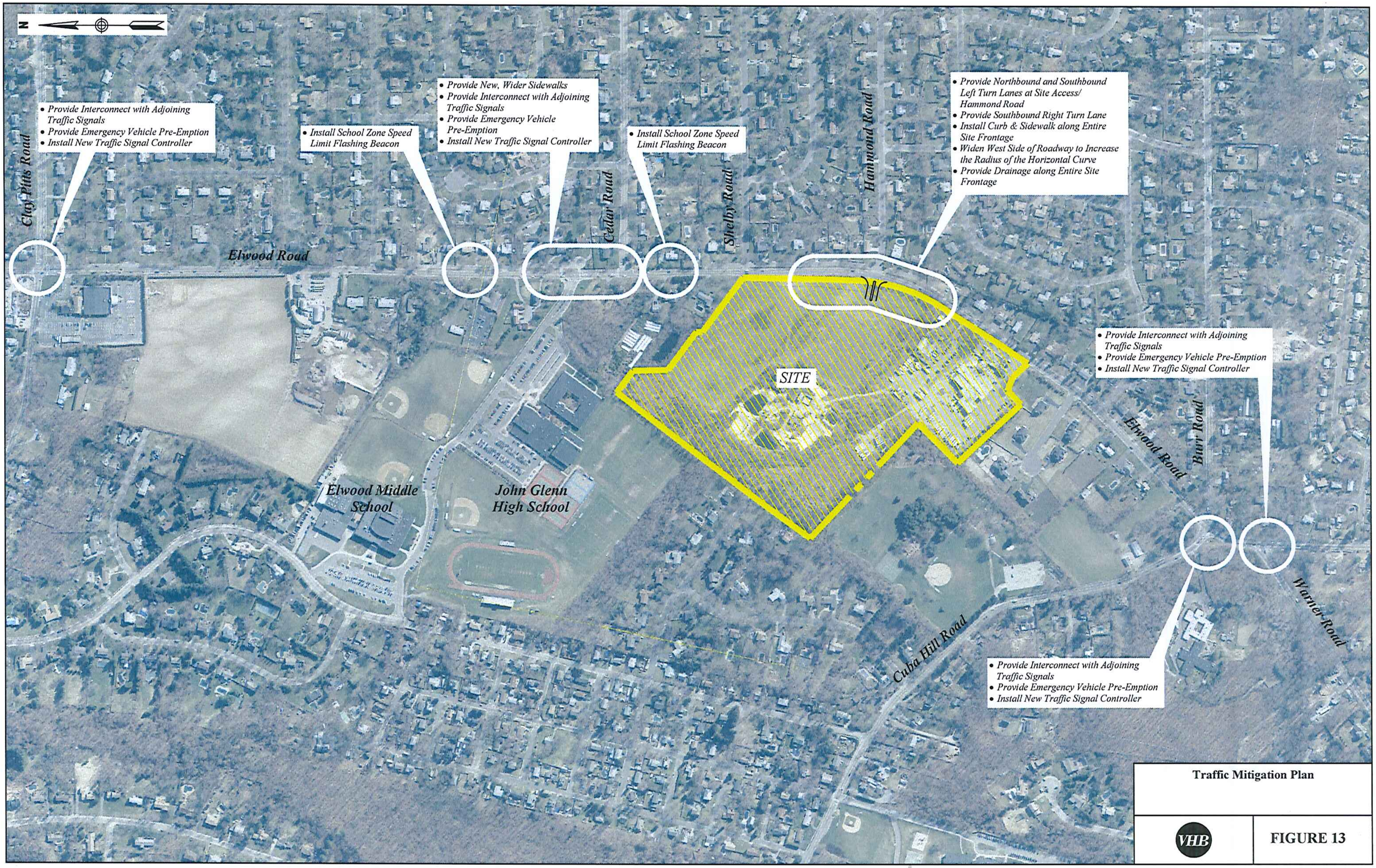
Intersection	Critical Approach/ Movement	Build 2016			
		AM Peak		PM Peak	
		Delay	LOS	Delay	LOS
Elwood Road & Site Access/Hammond Road	EB (Site Access)	27.2	D	42.6	E
	NB L	0.6	A	1.2	A
	WB (Hammond Road)	19.9	C	37.4	E
	SBL	0.3	A	0.2	A

The provision of left turn lanes at the site access will also offer a substantial improvement over existing conditions near the property. Currently, northbound trucks waiting to make a left turn into the dairy block through traffic along Elwood Road, since it only has a single lane in the northbound direction.

A secondary southerly driveway with limited movements (right turn in/right turn out only) will also be provided on Elwood Road, subject to approval from the Suffolk County Department of Public Works.

Sight Distance

A review of the proposed site plan shows there will be substantial clearing and landscape improvements within the front yard setback in the vicinity of the proposed site access. In order to ensure drivers sight lines are not obstructed when exiting the site, it is recommended that no landscaping, berms or any other roadside objects be placed along the site's frontage for a distance of 300 feet to the north and 375 feet to the south. This will ensure sight lines are not obstructed and they will be able to safely make their exiting maneuvers.



Traffic Mitigation Plan

VHB

FIGURE 13

Off-Street Parking and Site Circulation

According to Section 198-47 of the Town of Huntington Zoning Code, each senior housing unit requires 1.5 parking spaces be provided. Based on the site plan, the proposed development consists of 360 senior housing units and therefore the proposed development will require a total of 540 off-street parking spaces to be provided. The site plan depicts 640 parking spaces along the internal roadways, with another 88 spaces on driveways and 88 spaces in garages, for a total parking capacity of 816 spaces, thus substantially exceeding the parking requirements outlined in the Town's Zoning Code.

A careful review of the site plan revealed that the configuration of the parking layout and drive aisles provides for adequate on-site circulation.

5.0
Conclusions

Based on the findings described herein, the following conclusions were developed:

- All existing study intersections during the AM Peak Period will continue to operate at levels of service comparable to the No Build Condition. At no time was there more than a 4 second increase in overall intersection delay, which is relatively insignificant and no mitigation is required. The provision of the proposed interconnected signal system will also improve overall traffic flow along the Elwood Road corridor.

- During the PM Peak Period, the intersections of Route 25 at Elwood Road, Elwood Road at Cedar Drive, Elwood Road at High School Driveway and Elwood Road at Clay Pitts Road will continue to operate at levels of service comparable to the No Build Condition. At no time was there more than a 4 second increase in overall intersection delay, which is relatively insignificant and no mitigation is required.

- During the PM Peak Period, the intersection of Elwood Road and Cuba Hill Road/Burr Road will have overall levels of service change from D to E when comparing the No Build and Build Conditions. Although the overall Build condition level of service at the Elwood Road and Warner Road intersection will operate at No Build levels, the southbound through movement will change from E to F. With adjustments to the signal timings at these two intersections, the levels of service will be improved and relatively comparable to conditions experienced in the No Build Condition.

- The inclusion of exclusive northbound and southbound left-turn lanes along the Elwood Road approaches to the site and Hammond Road will minimize the potential for rear-end accidents by removing stopped vehicles waiting to turn left from the through lane. At the present time, trucks waiting to turn into the dairy site block all northbound traffic, since there is no turning lane.

- The configuration of the parking layout and drive aisles, as depicted on the proposed site plan, will provide for adequate on-site circulation. Additionally, more than sufficient on-site parking is being provided to accommodate the anticipated demand.

- The additional mitigation measures proposed by the developer will improve emergency vehicle access through the study area, traffic operations and infrastructure along Elwood Road, and will increase the safety of pedestrians traversing through the study area.

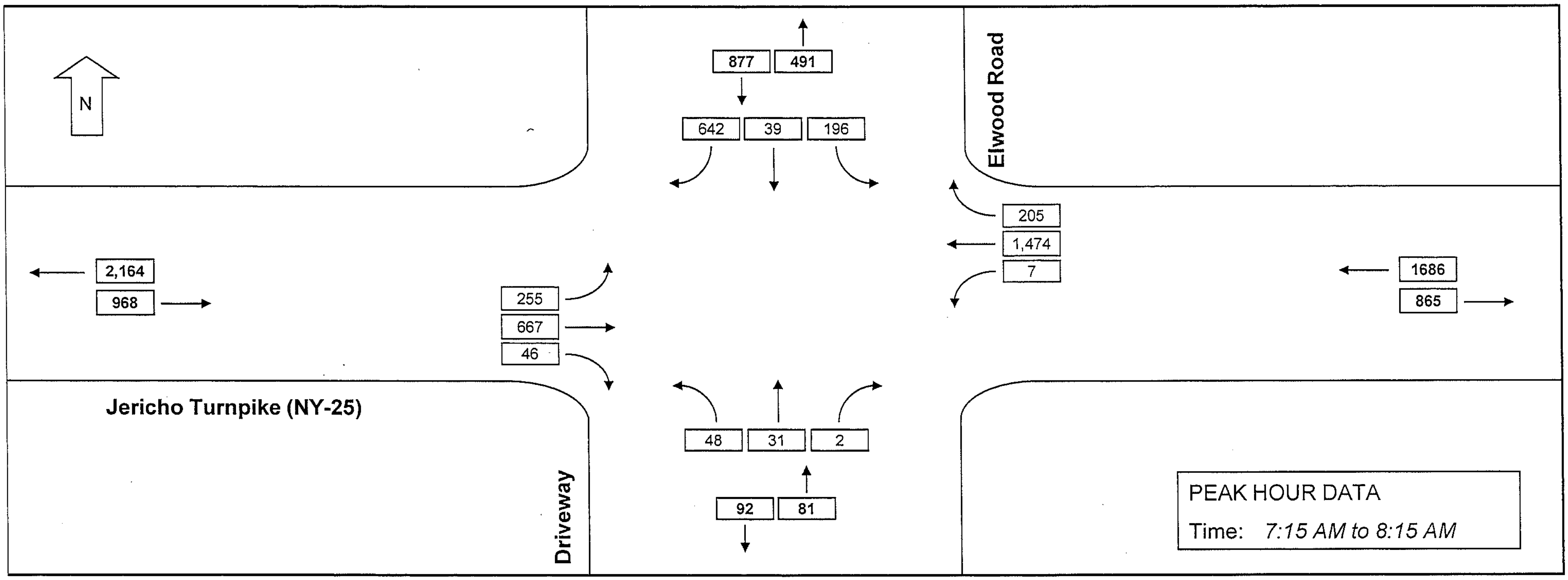
It is our professional opinion that, following the implementation of the above mentioned improvements at the expense of the developer, there will not be a significant adverse impact on the surrounding roadway system, but rather an improvement to safety conditions.

Attachment A
Turning Movement Counts

Jericho Turnpike (NY-25) at Elwood Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

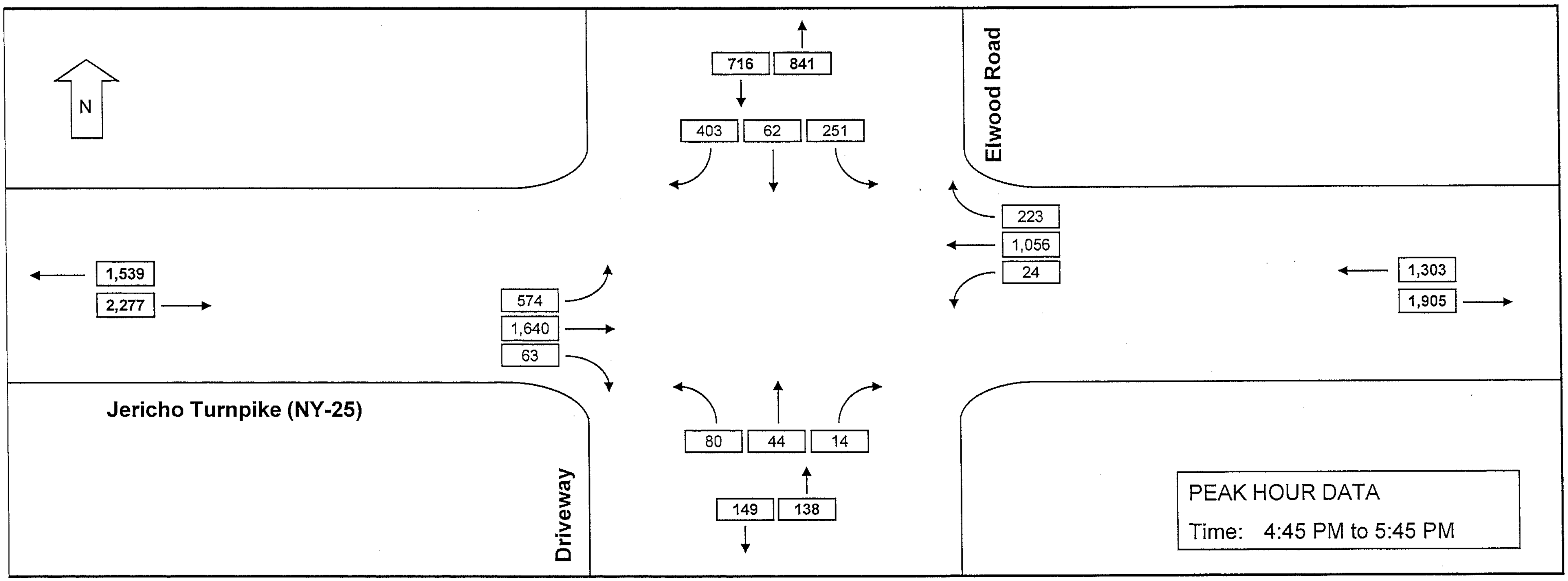
Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
7:15 AM	65	132	6	203	2	332	46	380	7	2	1	10	48	10	160	218	811	
7:30 AM	68	161	8	237	2	377	61	440	16	6	0	22	47	8	159	214	913	
7:45 AM	71	198	13	282	2	395	51	448	14	11	1	26	53	12	170	235	991	3,400
8:00 AM	51	176	19	246	1	370	47	418	11	12	0	23	48	9	153	210	897	3,612
Peak Hour 7:15 AM to 8:15 AM	**255**	**667**	**46**	**968**	**7**	**1,474**	**205**	**1686**	**48**	**31**	**2**	**81**	**196**	**39**	**642**	**877**	**3612**	
PHF				0.86				0.94				0.78				0.93		



Jericho Turnpike (NY-25) at Elwood Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
4:45 PM	142	381	16	539	6	232	61	299	23	13	6	42	61	20	106	187	1,067	4,195
5:00 PM	133	429	17	579	8	276	53	337	18	15	1	34	57	14	95	166	1,116	4,223
5:15 PM	158	438	22	618	6	244	49	299	21	6	4	31	68	13	101	182	1,130	4,357
5:30 PM	141	392	8	541	4	304	60	368	18	10	3	31	65	15	101	181	1,121	4,434
Peak Hour 4:45 PM to 5:45 PM	574	1,640	63	2,277	24	1,056	223	1,303	80	44	14	138	251	62	403	716	4,434	
PHF				0.92				0.89				0.82				0.96		



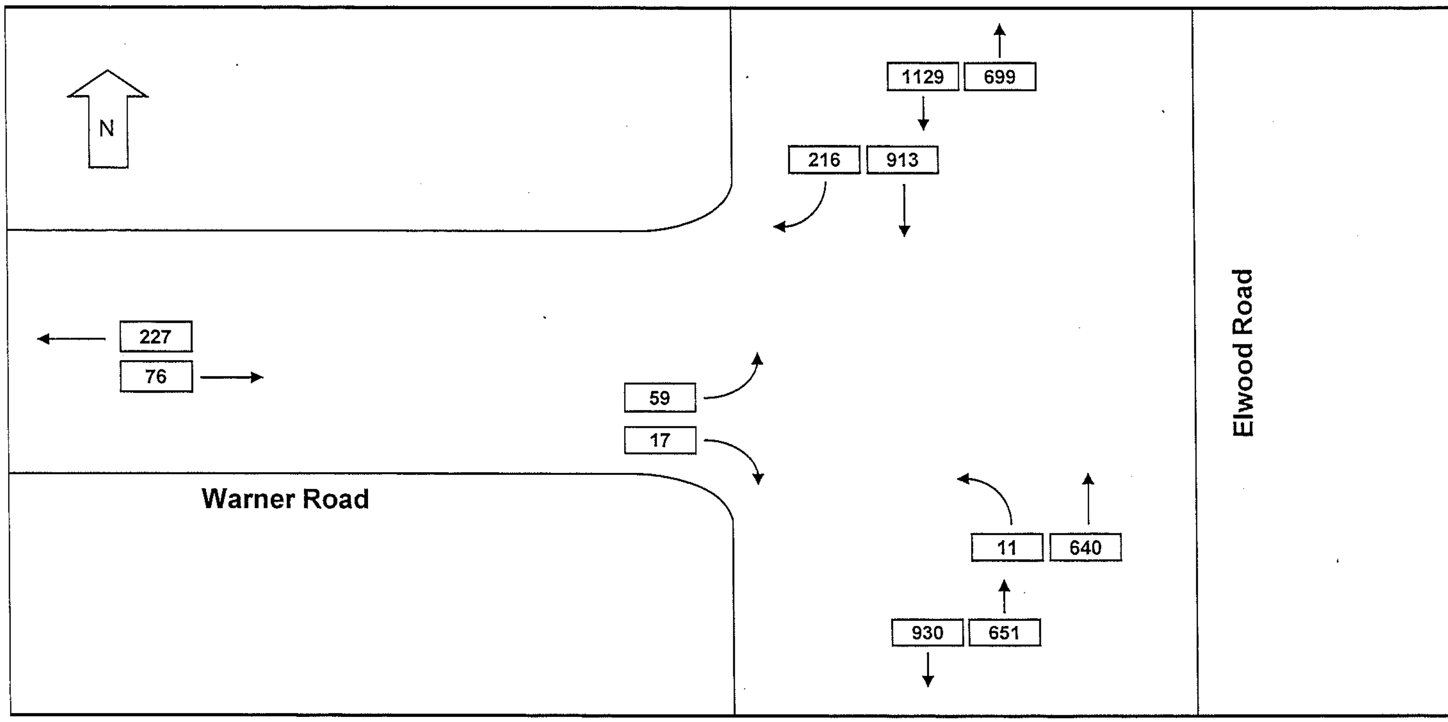
TRAFFIC VOLUME DATA

VHB Engineering, Surveying and Landscape Architecture, P.C.

Elwood Road at Warner Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
7:15 AM	15		3	18					3	159		162		215	39	254	434	
7:30 AM	9		3	12					4	161		165		237	44	281	458	
7:45 AM	16		4	20					1	162		163		221	75	296	479	1,755
8:00 AM	19		7	26					3	158		161		240	58	298	485	1,856
Peak Hour *7:15 AM to 8:15 AM*	59		17	76					11	640		651		913	216	1129	1856	
PHF				0.73								0.99				0.95		



PEAK HOUR DATA
Time: *7:15 AM to 8:15 AM*

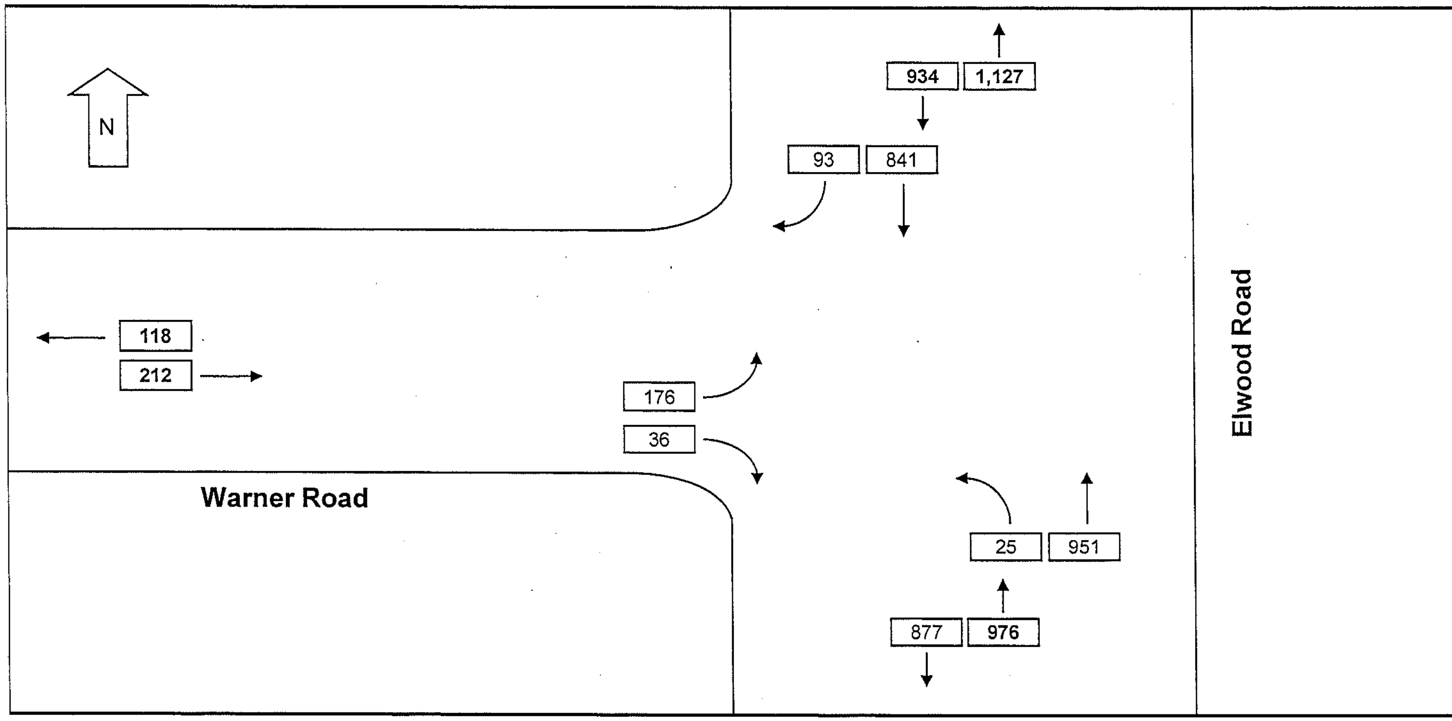
TRAFFIC VOLUME DATA

VHB Engineering, Surveying and Landscape Architecture, P.C.

Elwood Road at Warner Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
4:45 PM	34		6	40					6	251		257		198	20	218	515	1,980
5:00 PM	48		10	58					3	230		233		206	30	236	527	2,005
5:15 PM	51		10	61					7	228		235		231	19	250	546	2,071
5:30 PM	43		10	53					9	242		251		206	24	230	534	2,122
Peak Hour 4:45 PM to 5:45 PM	176		36	212					25	951		976		841	93	934	2,122	
PHF				0.87								0.95				0.93		



PEAK HOUR DATA
Time: 4:45 PM to 5:45 PM

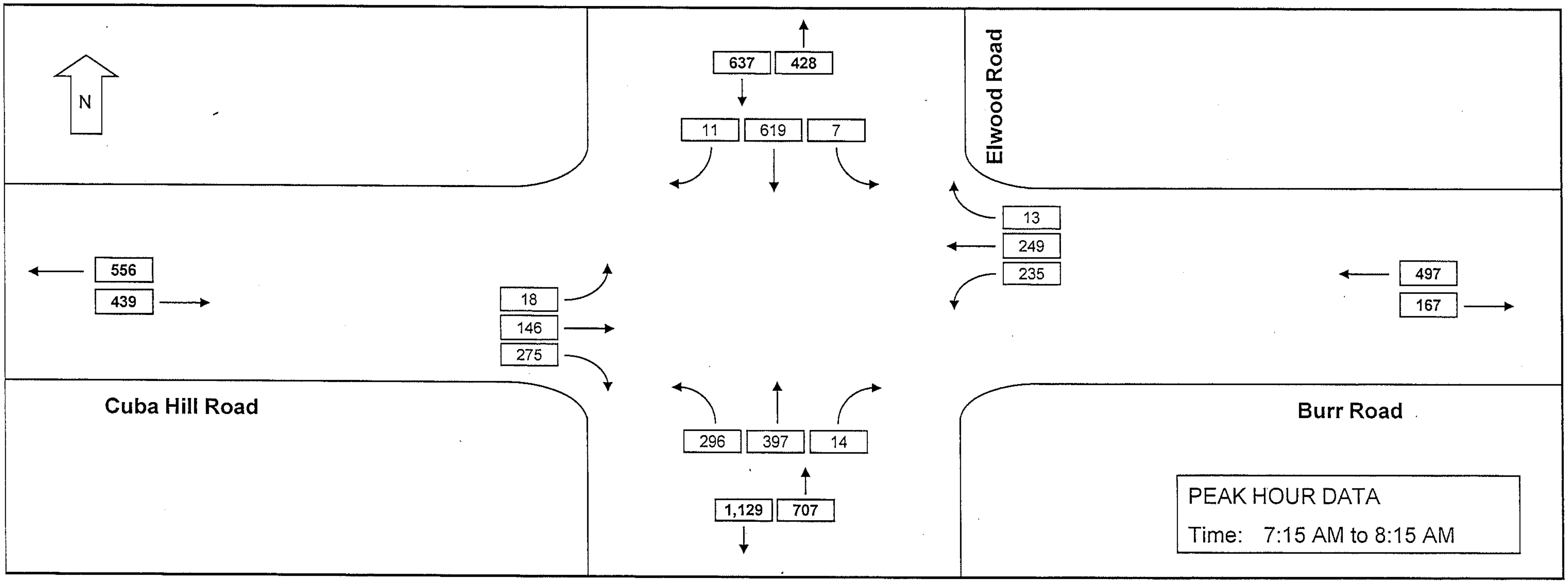
TRAFFIC VOLUME DATA

VHB Engineering, Surveying and Landscape Architecture, P.C.

Elwood Road at Cuba Hill Road / Burr Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
7:15 AM	0	31	49	80	43	68	4	115	90	97	3	190	1	159	2	162	547	
7:30 AM	5	29	78	112	49	63	1	113	65	97	0	162	4	149	4	157	544	
7:45 AM	8	43	68	119	79	69	4	152	73	105	5	183	1	155	2	158	612	2,143
8:00 AM	5	43	80	128	64	49	4	117	68	98	6	172	1	156	3	160	577	2,280
Peak Hour ***7:15 AM to 8:15 AM*** *PHF*	18	146	275	439 0.86	235	249	13	497 0.82	296	397	14	707 0.93	7	619	11	637 0.98	2280	



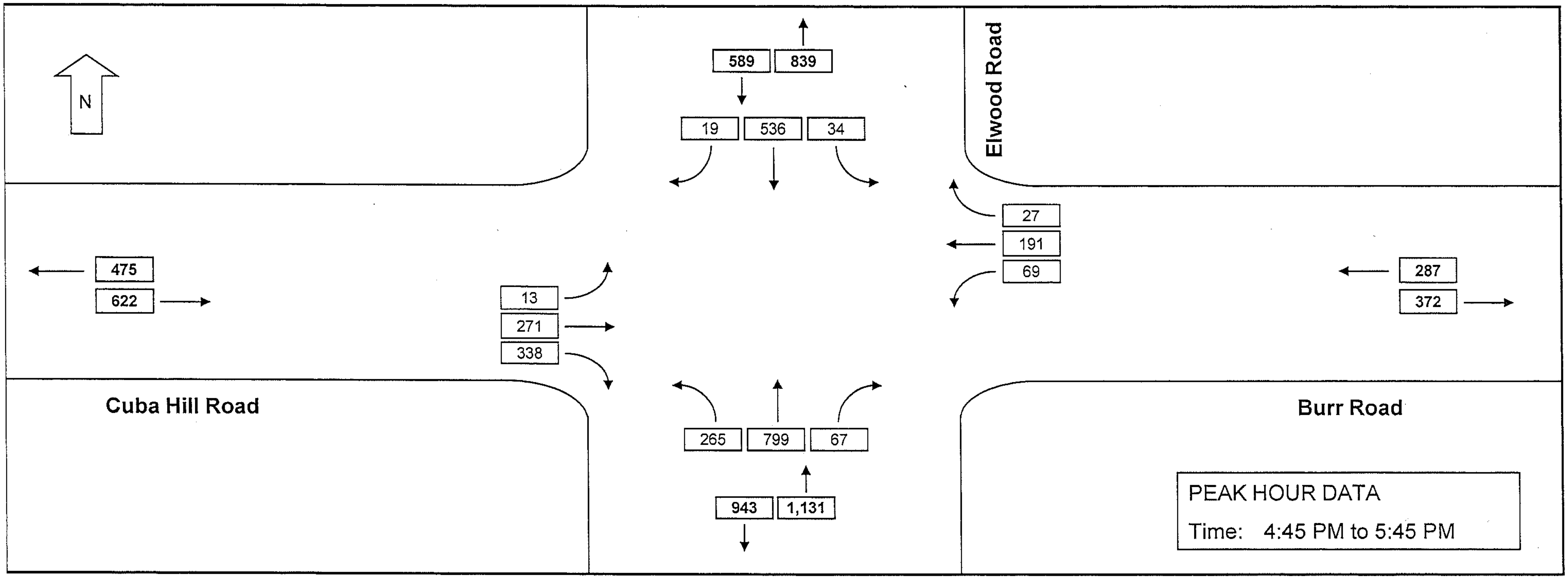
TRAFFIC VOLUME DATA

Engineering, Surveying and Landscape Architecture, P.C.

Elwood Road at Cuba Hill Road / Burr Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
4:45 PM	4	78	78	160	15	63	7	85	75	193	13	281	4	129	5	138	664	2,435
5:00 PM	1	66	77	144	20	52	6	78	69	208	18	295	9	140	6	155	672	2,494
5:15 PM	2	60	98	160	15	35	5	55	61	197	18	276	11	133	4	148	639	2,550
5:30 PM	6	67	85	158	19	41	9	69	60	201	18	279	10	134	4	148	654	2,629
Peak Hour 4:45 PM to 5:45 PM	13	271	338	622	69	191	27	287	265	799	67	1,131	34	536	19	589	2,629	
PHF				0.97				0.84				0.96				0.95		



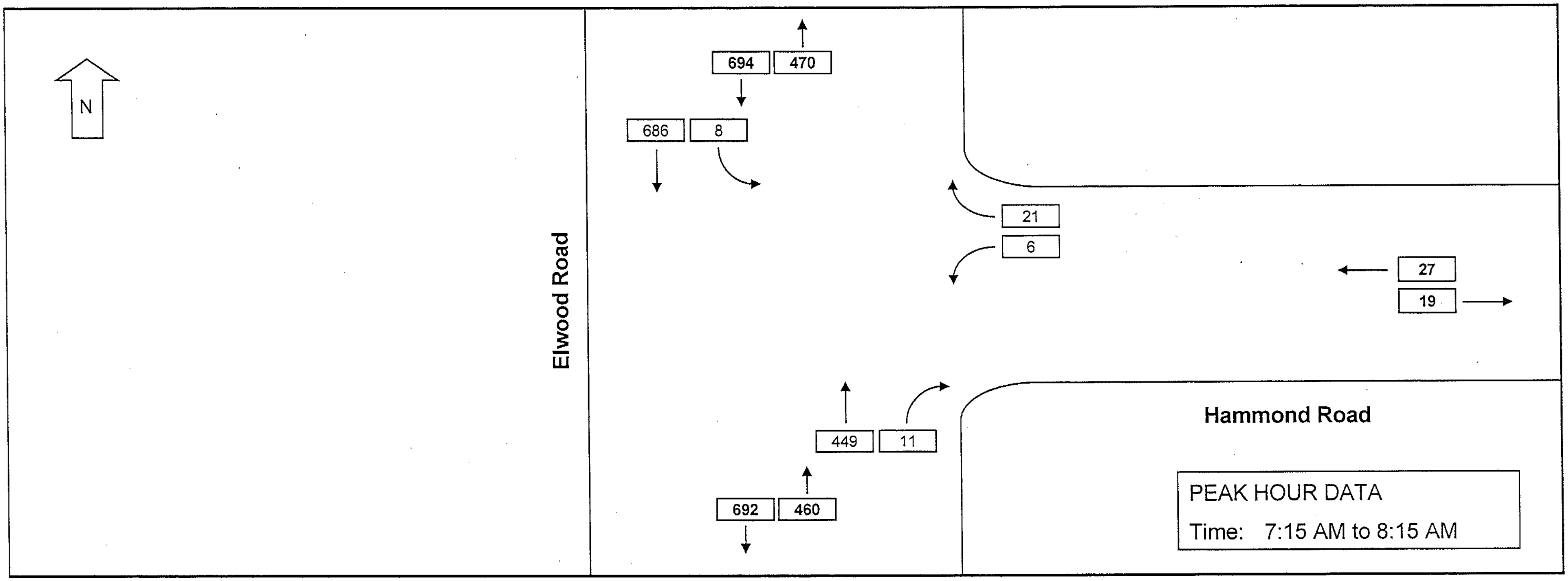
TRAFFIC VOLUME DATA

VHB Engineering, Surveying and Landscape Architecture, P.C.

Elwood Road at Hammond Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound Left	Eastbound Thru	Eastbound Right	Eastbound Total	Westbound Left	Westbound Thru	Westbound Right	Westbound Total	Northbound Left	Northbound Thru	Northbound Right	Northbound Total	Southbound Left	Southbound Thru	Southbound Right	Southbound Total	TOTAL	Cum. Hourly
7:15 AM					1		7	8		116	1	117	5	177		182	307	
7:30 AM					0		2	2		104	3	107	0	159		159	268	
7:45 AM					4		3	7		111	3	114	1	171		172	293	1,159
8:00 AM					1		9	10		118	4	122	2	179		181	313	1,181
Peak Hour 7:15 AM to 8:15 AM					6		21	27		449	11	460	8	686		694	1,181	
PHF								0.68				0.94				0.95		



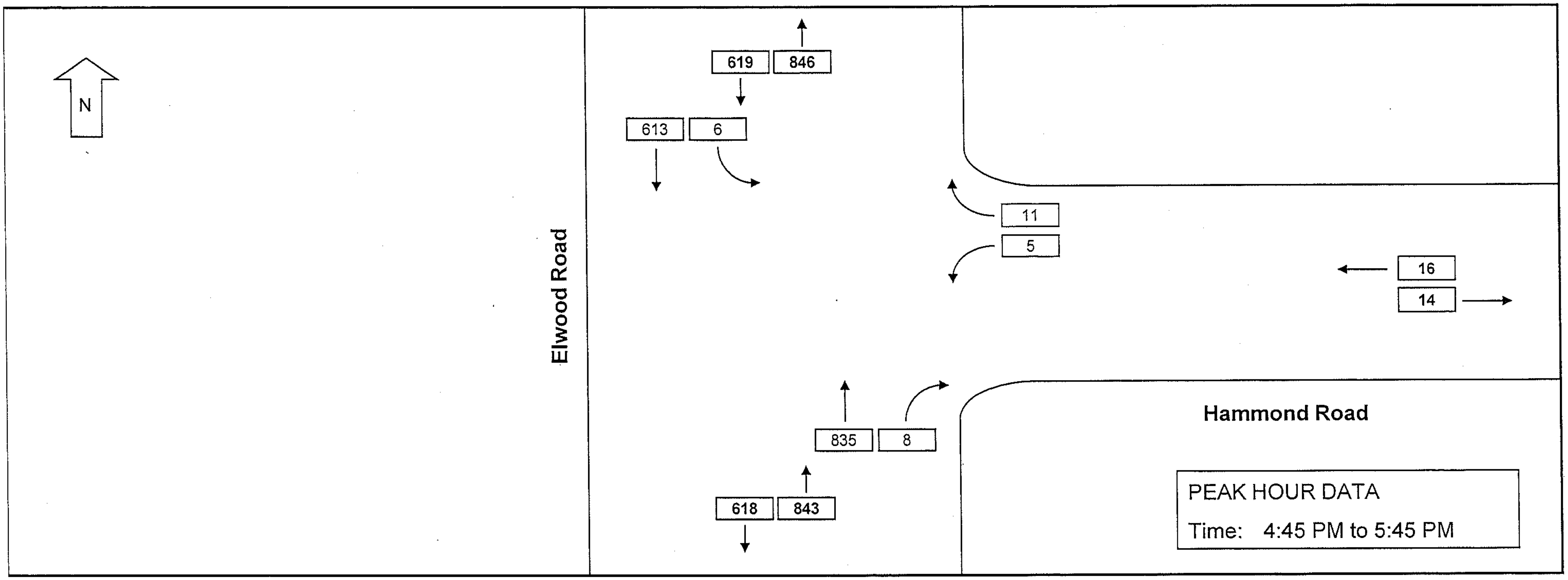
TRAFFIC VOLUME DATA

Engineering, Surveying and Landscape Architecture, P.C.

Elwood Road at Hammond Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
4:45 PM					1		3	4		203	2	205	2	145		147	356	1,388
5:00 PM					1		3	4		200	0	200	0	160		160	364	1,371
5:15 PM					0		4	4		221	3	224	0	170		170	398	1,443
5:30 PM					3		1	4		211	3	214	4	138		142	360	1,478
Peak Hour 4:45 PM to 5:45 PM					5		11	16		835	8	843	6	613		619	1,478	
PHF								1.00				0.94				0.91		



Wed_PM
28650_TMC_Elwood_Hammond 2014

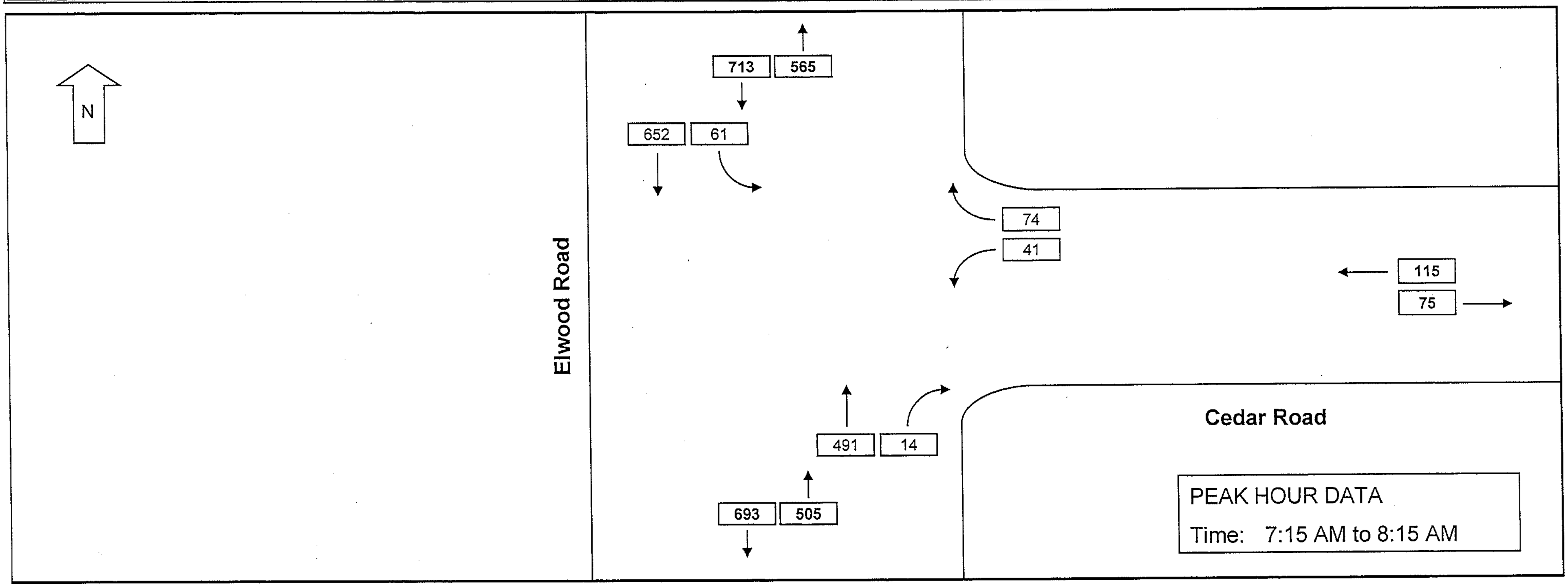
2/4/2014

TRAFFIC VOLUME DATA

Elwood Road at Cedar Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
7:15 AM					10		28	38		145	1	146	28	177		205	389	
7:30 AM					12		13	25		106	3	109	11	146		157	291	
7:45 AM					11		14	25		115	2	117	10	157		167	309	1,332
8:00 AM					8		19	27		125	8	133	12	172		184	344	1,333
Peak Hour 7:15 AM to 8:15 AM					41		74	115		491	14	505	61	652		713	1,333	
PHF								0.76				0.86				0.87		

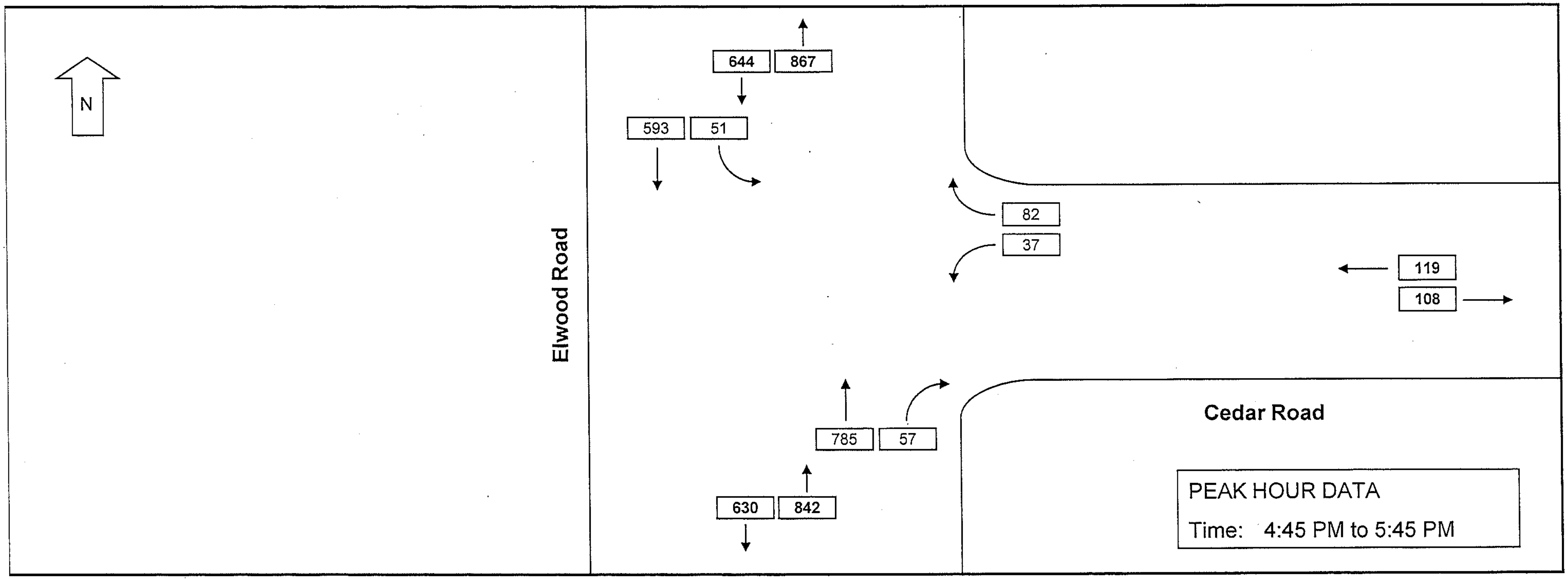


TRAFFIC VOLUME DATA

Elwood Road at Cedar Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
4:45 PM					10		22	32		191	12	203	13	146		159	394	1,515
5:00 PM					9		20	29		186	15	201	8	153		161	391	1,501
5:15 PM					9		18	27		203	16	219	18	159		177	423	1,553
5:30 PM					9		22	31		205	14	219	12	135		147	397	1,605
Peak Hour 4:45 PM to 5:45 PM					37		82	119		785	57	842	51	593		644	1,605	
PHF								0.93				0.96				0.91		

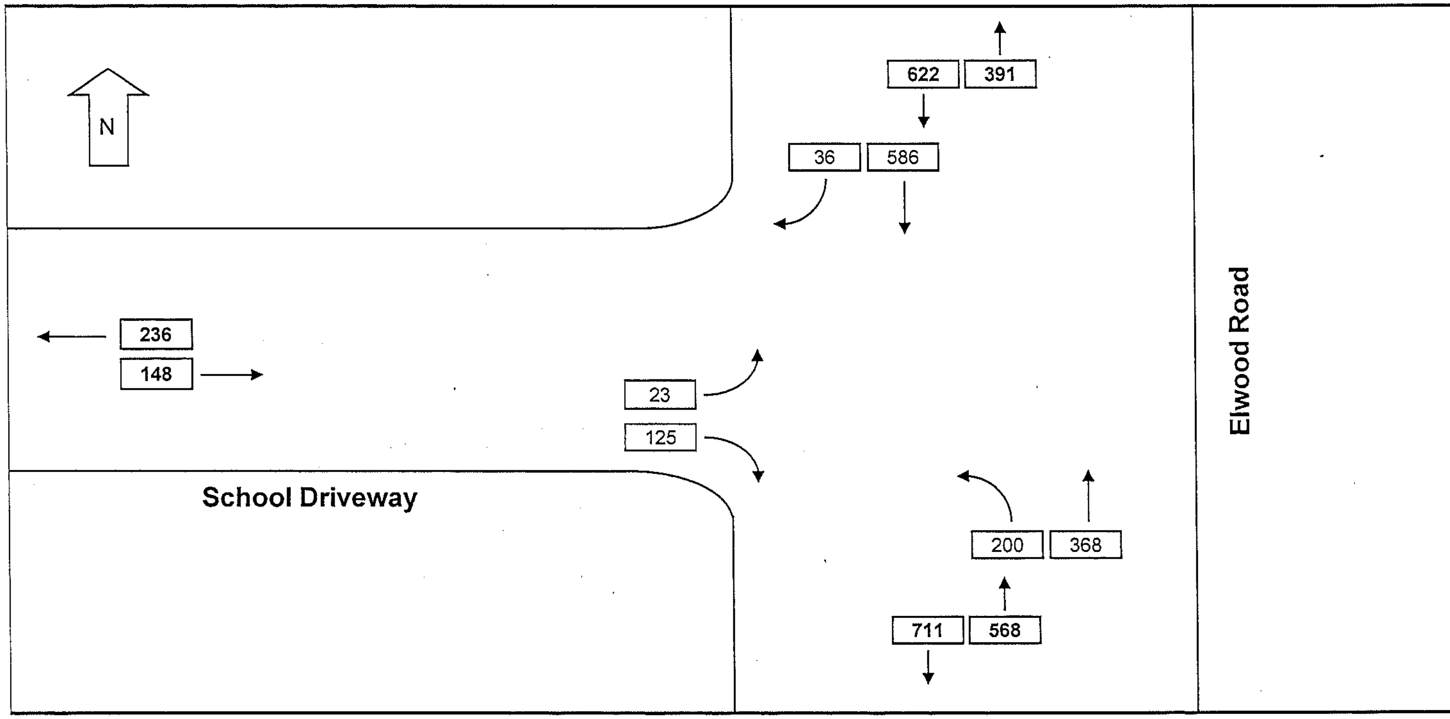


TRAFFIC VOLUME DATA

Elwood Road at School Driveway
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
7:15 AM	14		79	93					94	84		178		125	20	145	416	
7:30 AM	2		17	19					18	97		115		135	5	140	274	
7:45 AM	4		9	13					36	102		138		167	5	172	323	1,381
8:00 AM	3		20	23					52	85		137		159	6	165	325	1,338
Peak Hour 7:15 AM to 8:15 AM	23		125	148					200	368		568		586	36	622	1338	
PHF				0.40								0.80				0.90		



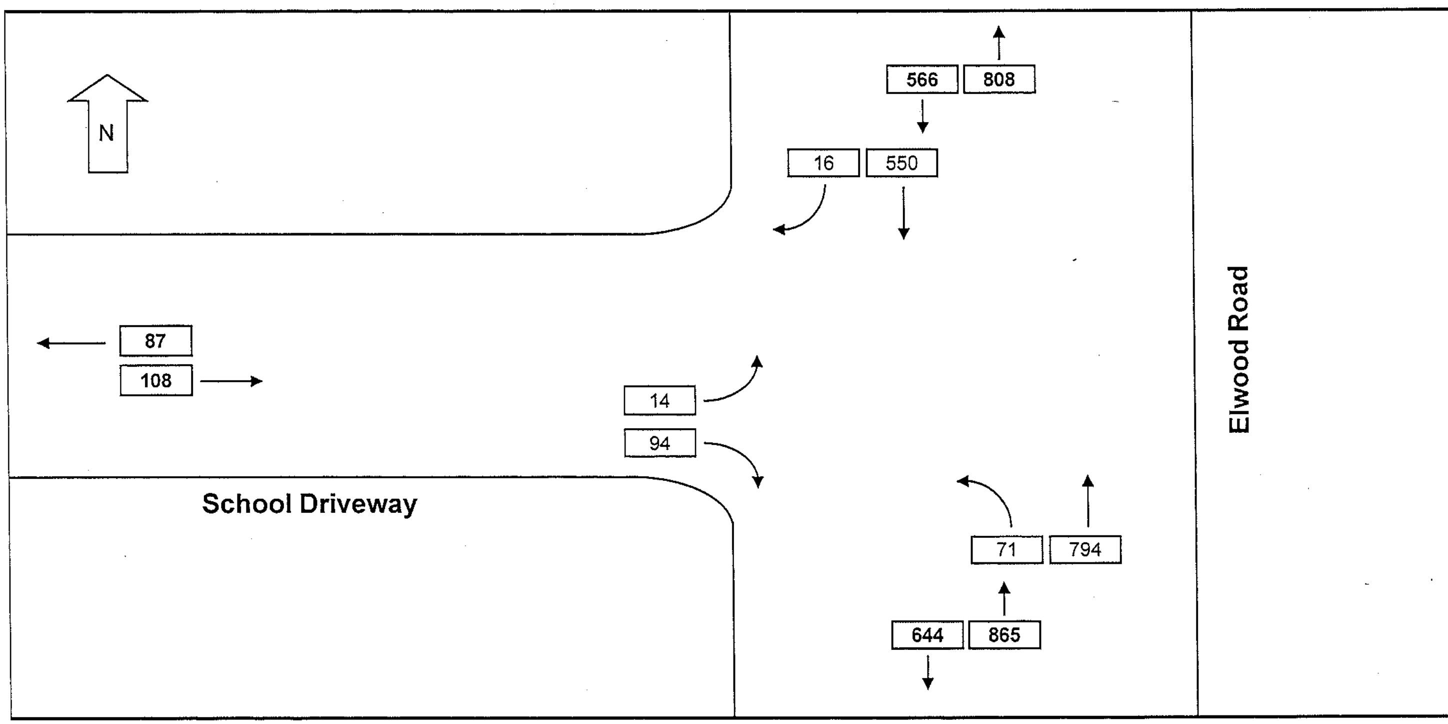
PEAK HOUR DATA
Time: 7:15 AM to 8:15 AM

TRAFFIC VOLUME DATA

Elwood Road at School Driveway
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound Left	Eastbound Thru	Eastbound Right	Eastbound Total	Westbound Left	Westbound Thru	Westbound Right	Westbound Total	Northbound Left	Northbound Thru	Northbound Right	Northbound Total	Southbound Left	Southbound Thru	Southbound Right	Southbound Total	TOTAL	Cum. Hourly
4:45 PM	2		17	19					18	190		208		135	6	141	368	1,453
5:00 PM	3		22	25					19	187		206		145	5	150	381	1,443
5:15 PM	4		34	38					13	211		224		149	0	149	411	1,507
5:30 PM	5		21	26					21	206		227		121	5	126	379	1,539
Peak Hour 4:45 PM to 5:45 PM	14		94	108					71	794		865		550	16	566	1,539	
PHF				0.71								0.95				0.94		



PEAK HOUR DATA

Time: 4:45 PM to 5:45 PM

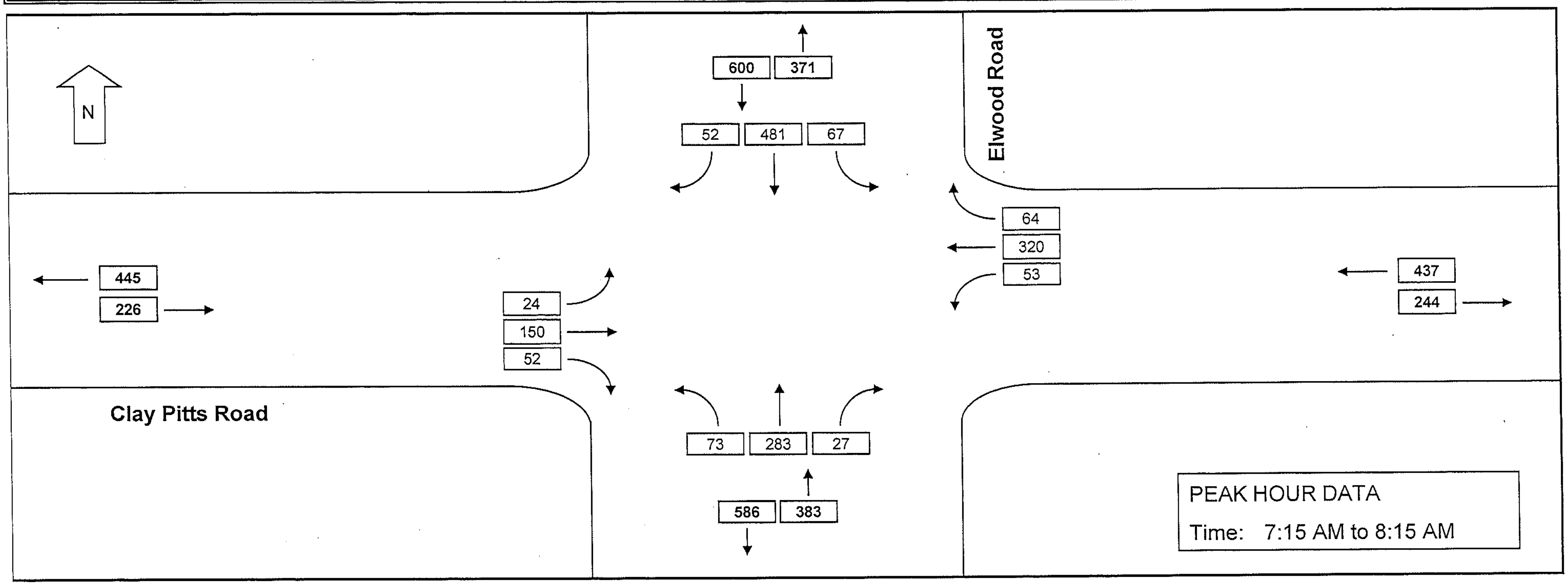
TRAFFIC VOLUME DATA

VHB Engineering, Surveying and Landscape Architecture, P.C.

Elwood Road at Clay Pitts Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
7:15 AM	4	32	15	51	15	75	15	105	13	61	14	88	14	110	9	133	377	
7:30 AM	5	34	12	51	13	103	20	136	24	70	6	100	15	96	14	125	412	
7:45 AM	8	50	15	73	16	74	15	105	20	82	3	105	20	129	15	164	447	1,563
8:00 AM	7	34	10	51	9	68	14	91	16	70	4	90	18	146	14	178	410	1,646
Peak Hour 7:15 AM to 8:15 AM PHF	24	150	52	226 0.77	53	320	64	437 0.80	73	283	27	383 0.91	67	481	52	600 0.84	1646	



Wed_AM
28650_TMC_Elwood_Clay Pitts 2014

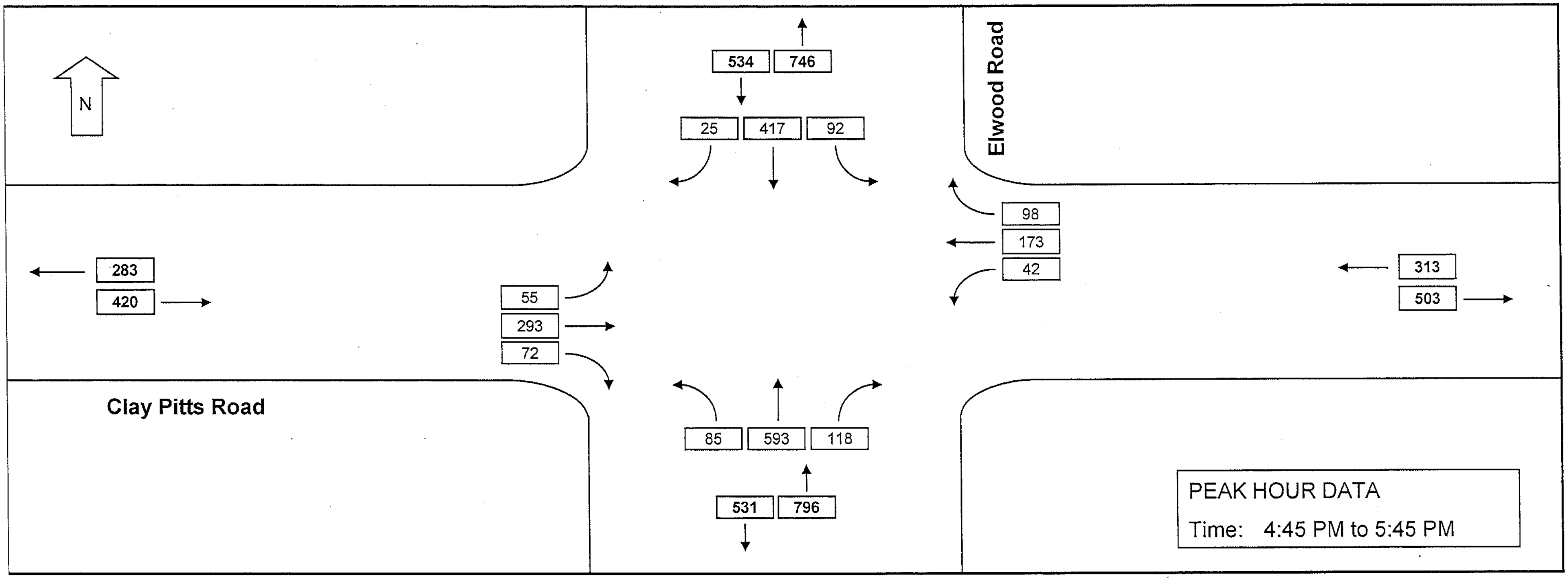
2/4/2014

Engineering, Surveying and Landscape Architecture, P.C.

Elwood Road at Clay Pitts Road
East Northport, NY

Date Collected: 12/11/13 (Wednesday)

Start Time	Eastbound				Westbound				Northbound				Southbound				TOTAL	Cum. Hourly
	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total	Left	Thru	Right	Total		
4:45 PM	11	84	14	109	6	32	26	64	23	132	26	181	25	104	6	135	489	2,023
5:00 PM	11	69	17	97	12	46	23	81	17	149	29	195	27	109	1	137	510	2,018
5:15 PM	15	76	17	108	9	52	25	86	21	145	31	197	19	120	13	152	543	2,039
5:30 PM	18	64	24	106	15	43	24	82	24	167	32	223	21	84	5	110	521	2,063
Peak Hour 4:45 PM to 5:45 PM	55	293	72	420	42	173	98	313	85	593	118	796	92	417	25	534	2,063	
PHF				0.96				0.91				0.89				0.88		



Attachment B
24 Hour Traffic Volume Data

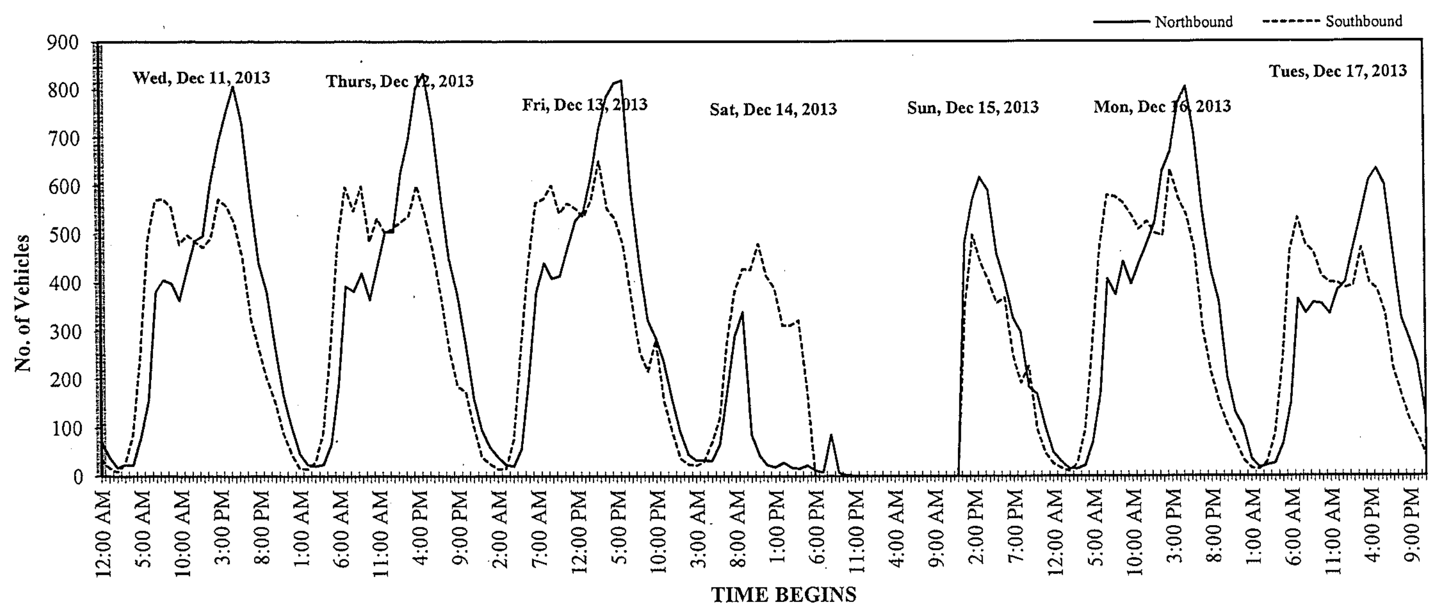
HOURLY TRAFFIC VOLUMES
Elwood Road north of Olympia Place
Wednesday, December 11, 2013 - Tuesday, December 17, 2013

TIME	Wed, Dec 11, 2013			Thurs, Dec 12, 2013			Fri, Dec 13, 2013			Sat, Dec 14, 2013			Sun, Dec 15, 2013			Mon, Dec 16, 2013			Tues, Dec 17, 2013		
BEGIN	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	70	34	104	102	45	147	96	39	135	160	93	253	0	0	0	49	26	75	100	33	133
1:00 AM	39	17	56	46	16	62	60	26	86	92	37	129	0	0	0	30	17	47	34	16	50
2:00 AM	17	9	26	24	15	39	40	15	55	45	25	70	0	0	0	16	10	26	18	14	32
3:00 AM	24	26	50	21	29	50	24	15	39	33	22	55	0	0	0	15	26	41	22	29	51
4:00 AM	23	86	109	25	91	116	21	76	97	33	30	63	0	0	0	22	95	117	26	87	113
5:00 AM	79	253	332	66	270	336	56	261	317	32	69	101	0	0	0	69	267	336	66	241	307
6:00 AM	156	489	645	186	486	672	203	439	642	66	119	185	0	0	0	170	471	641	149	466	615
7:00 AM	381	570	951	393	597	990	381	565	946	179	282	461	0	0	0	408	580	988	365	533	898
8:00 AM	406	573	979	382	548	930	440	573	1013	290	381	671	0	0	0	375	577	952	336	478	814
9:00 AM	399	556	955	420	599	1019	409	601	1010	339	428	767	0	0	0	443	565	1008	358	462	820
10:00 AM	363	479	842	365	484	849	414	543	957	86	427	513	0	0	0	397	540	937	355	413	768
11:00 AM	429	499	928	434	533	967	473	564	1037	42	480	522	0	0	0	441	510	951	335	400	735
12:00 PM	486	485	971	505	501	1006	528	553	1081	23	415	438	0	0	0	481	526	1007	384	400	784
1:00 PM	496	472	968	505	513	1018	547	535	1082	19	389	408	482	351	833	525	502	1027	401	389	790
2:00 PM	606	492	1098	627	525	1152	618	569	1187	28	312	340	570	498	1068	629	497	1126	473	394	867
3:00 PM	689	572	1261	697	538	1235	717	651	1368	18	312	330	617	442	1059	670	633	1303	539	471	1010
4:00 PM	752	558	1310	803	601	1404	784	552	1336	16	322	338	590	404	994	770	574	1344	610	400	1010
5:00 PM	807	522	1329	833	541	1374	813	531	1344	22	186	208	460	357	817	805	538	1343	634	386	1020
6:00 PM	731	448	1179	732	464	1196	819	477	1296	12	0	12	403	369	772	709	468	1177	601	334	935
7:00 PM	575	324	899	578	369	947	591	366	957	8	0	8	328	249	577	546	302	848	461	218	679
8:00 PM	440	260	700	450	261	711	444	256	700	86	0	86	299	192	491	428	212	640	327	164	491
9:00 PM	383	198	581	379	185	564	324	217	541	7	0	7	183	227	410	360	148	508	284	115	399
10:00 PM	269	153	422	279	174	453	286	281	567	2	0	2	169	96	265	204	104	308	233	83	316
11:00 PM	168	87	255	162	101	263	238	157	395	1	0	1	102	47	149	131	70	201	121	41	162
DAILY TOTAL	8,788	8,162	16,950	9,014	8,486	17,500	9,326	8,862	18,188	1,639	4,329	5,968	4,203	3,232	7,435	8,693	8,258	16,951	7,232	6,567	13,799

HOURLY TRAFFIC VOLUMES

Elwood Road north of Olympia Place

Wednesday, December 11, 2013 - Tuesday, December 17, 2013



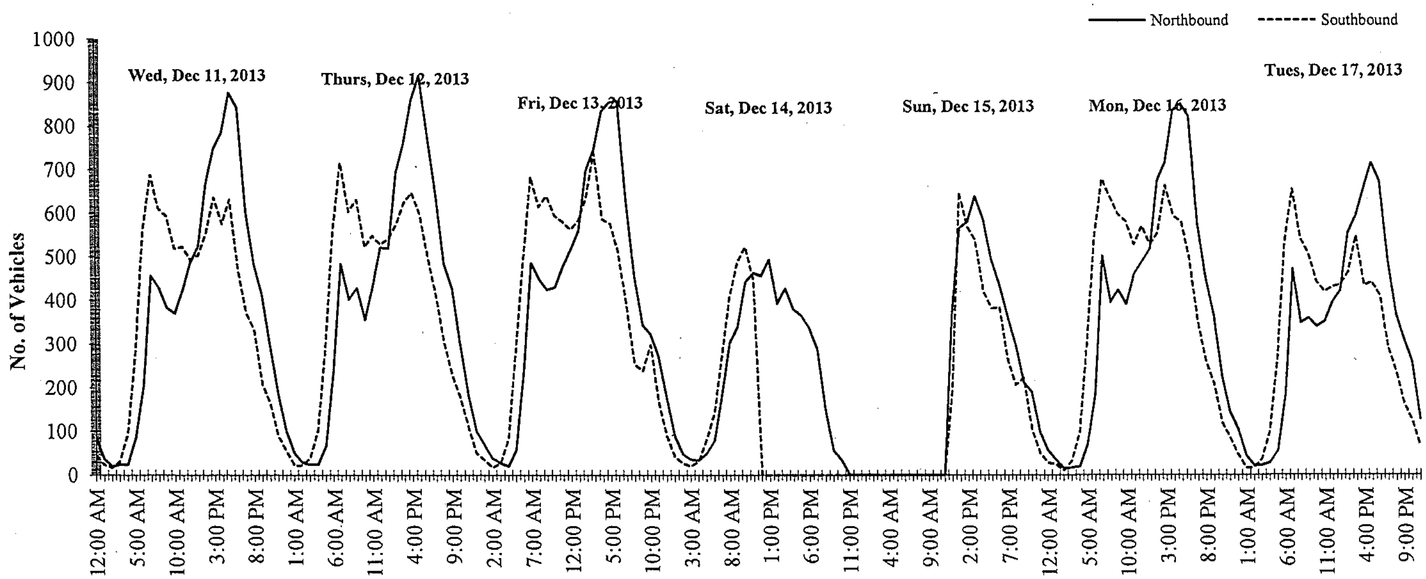
HOURLY TRAFFIC VOLUMES
Elwood Road south of Hammond Road
Wednesday, December 11, 2013 - Tuesday, December 17, 2013

TIME	Wed, Dec 11, 2013			Thurs, Dec 12, 2013			Fri, Dec 13, 2013			Sat, Dec 14, 2013			Sun, Dec 15, 2013			Mon, Dec 16, 2013			Tues, Dec 17, 2013		
BEGIN	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	84	42	126	99	54	153	100	49	149	177	89	266	1	0	1	56	27	83	104	45	149
1:00 AM	36	23	59	49	21	70	69	34	103	88	41	129	0	0	0	34	24	58	43	15	58
2:00 AM	19	16	35	28	22	50	37	17	54	47	26	73	0	0	0	14	9	23	20	16	36
3:00 AM	24	32	56	23	38	61	27	27	54	35	20	55	0	0	0	16	32	48	21	35	56
4:00 AM	23	95	118	24	103	127	20	83	103	33	31	64	0	0	0	19	98	117	27	99	126
5:00 AM	85	282	367	67	299	366	57	284	341	49	81	130	0	0	0	69	305	374	54	266	320
6:00 AM	201	562	763	237	558	795	237	492	729	78	141	219	0	0	0	183	544	727	184	534	718
7:00 AM	457	687	1144	484	716	1200	486	683	1169	187	276	463	0	0	0	502	678	1180	471	654	1125
8:00 AM	430	611	1041	402	604	1006	449	615	1064	303	407	710	0	0	0	396	637	1033	348	543	891
9:00 AM	383	593	976	429	631	1060	425	640	1065	340	488	828	0	0	0	424	598	1022	359	507	866
10:00 AM	370	519	889	356	523	879	431	595	1026	443	523	966	0	0	0	391	581	972	340	443	783
11:00 AM	423	523	946	431	549	980	478	581	1059	464	448	912	0	0	0	460	529	989	351	420	771
12:00 PM	486	493	979	522	529	1051	518	563	1081	457	0	457	370	195	565	489	571	1060	395	431	826
1:00 PM	523	503	1026	520	542	1062	561	584	1145	494	0	494	567	648	1215	518	529	1047	421	436	857
2:00 PM	666	555	1221	692	574	1266	698	637	1335	393	0	393	579	569	1148	673	555	1228	555	463	1018
3:00 PM	748	636	1384	760	624	1384	747	738	1485	428	0	428	639	539	1178	716	663	1379	593	548	1141
4:00 PM	785	576	1361	860	647	1507	835	587	1422	380	0	380	587	421	1008	835	593	1428	656	434	1090
5:00 PM	877	631	1508	916	596	1512	856	576	1432	366	0	366	493	382	875	851	579	1430	714	442	1156
6:00 PM	843	472	1315	777	496	1273	859	512	1371	338	0	338	436	384	820	823	494	1317	672	410	1082
7:00 PM	603	371	974	640	408	1048	629	389	1018	288	0	288	363	262	625	578	352	930	492	291	783
8:00 PM	483	333	816	485	302	787	456	253	709	148	0	148	300	206	506	453	259	712	367	234	601
9:00 PM	415	209	624	429	227	656	345	238	583	56	0	56	212	222	434	365	208	573	311	163	474
10:00 PM	296	164	460	297	176	473	323	298	621	34	0	34	189	103	292	224	118	342	258	123	381
11:00 PM	185	88	273	181	108	289	271	167	438	1	0	1	97	50	147	143	84	227	127	63	190
DAILY TOTAL	9,445	9,016	18,461	9,708	9,347	19,055	9,914	9,642	19,556	5,627	2,571	8,198	4,833	3,981	8,814	9,232	9,067	18,299	7,883	7,615	15,498

HOURLY TRAFFIC VOLUMES

Elwood Road south of Hammond Road

Wednesday, December 11, 2013 - Tuesday, December 17, 2013



Attachment C
Level of Service (LOS) Definitions

Level of Service Definitions

Signal Controlled Intersections

The level of service and capacity of a signalized intersection are the criteria by which the quality of traffic service is measured. The levels of service range between level of service A (relatively congestion-free) and level of service F (congested).

The capacity of a signalized intersection is based upon the concepts of saturation flow and saturation flow rate. This is the maximum rate of flow that can pass through a given lane group under prevailing traffic and roadway conditions. The volume-to-capacity ratio is the ratio of the traffic flow for a given lane group or approach to the capacity. A V/C ratio of 1.0 indicates that the flow rate equals the capacity. Values over 1.0 indicate a temporary excess of demand. This does not necessarily indicate an intersection failure.

The level of service of a signalized intersection is evaluated on the basis of average control delay per vehicle for various movements within the intersection. The control delay is a function of the arrivals, delay from queuing and over saturation.
The following general statements may be made regarding the level of service of a signalized intersection.

- *Level of service A* describes operations with a very low delay. This occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short traffic signal cycles may contribute to low delay.
- *Level of service B* generally occurs with good progression and/or short traffic signal cycle lengths. More vehicles stop than for level of service A, causing higher average delays.
- *Level of service C* has higher delays than level of service B. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures, where motorists are required to wait through an entire signal cycle, may begin to appear in this level. The number of vehicles

stopping is significant at this level, although many still pass through the intersection without stopping.

- *Level of service D* means the influence of congestion has become more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths or high volume to capacity ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
- *Level of service E* is considered the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths and high volume to capacity ratios. Individual cycle failures are frequent occurrences.
- *Level of Service F* has delays that are considered unacceptable to most drivers. This condition often occurs with over saturations, i.e., when arrival flow rates exceed the capacity of the intersection. It may occur at volume to capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

The following average stopped delays are utilized to determine intersection and approach roadway levels of service for signalized intersections:

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SEC)
A	≤ 10.0
B	> 10.0 and ≤ 20.0
C	> 20.0 and ≤ 35.0
D	> 35.0 and ≤ 55.0
E	> 55.0 and ≤ 80.0
F	> 80.0

Two Way Stop Controlled Intersections

The level of service and capacity of a two-way stop controlled (TWSC) intersection are the criteria that are used to measure the quality of the traffic operations. The levels of service range between level of service A (relatively congestion-free) and level of service F (very congested).

The right of way at the TWSC intersection is controlled by stop signs on two opposing minor-street approaches (or on one leg of a "T"-type intersection). The capacity of a controlled approach is based on the distribution of gaps in the major street traffic flow, driver judgment in selecting a gap through which to execute the desired maneuver and the follow up time required by each driver in a queue.

The level of service for the subject lane group movement of an approach of a TWSC intersection is evaluated based on the average total delay per vehicle. Control delay is a function of the capacity of the approach and the degree of saturation. It is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time the vehicle departs from the stop line. This includes the time required for the vehicle to travel from the end of the queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue. The average approach delay for all vehicles on a particular approach is computed as the weighted average of the control delay estimates for each individual movement on the approach.

The following levels of average control delay are used to determine approach levels of service:

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SEC)
A	$\leq$ 10.0
B	> 10.0 and $\leq$ 15.0
C	> 15.0 and $\leq$ 25.0
D	> 25.0 and $\leq$ 35.0
E	> 35.0 and $\leq$ 50.0
F	> 50.0

While the level of service criteria are applied to each approach of a TWSC intersection, the average delay for an entire intersection can be calculated by taking a weighted average of the vehicles stopped on the minor approaches and the vehicles in the major street traffic flow, which suffer no delays. This total average control delay provides a means of comparison for two intersections.

All Way Stop Controlled Intersections

The level of service and capacity of an all way stop controlled (AWSC) intersection are the criteria by which the quality of traffic service is measured. The levels of service range between level of service A (relatively congestion-free) and level of service F (very congested).

The key variable in determining the capacity of an AWSC intersection is the distribution of traffic volumes among the approaches. Under ideal conditions traffic would be evenly distributed among the approaches. The flow rate for any given approach increases as the traffic decreases on the other approaches, allowing a smaller headway between vehicles departing from the stop line.

The capacity of each approach is computed under the assumption that the flows on the opposing and conflicting approaches are constant. The level of service of an AWSC intersection is evaluated based on the average total delay per vehicle. Total delay is defined as the total elapsed time from when a vehicle stops at the end of a queue until the vehicle departs from the stop line. This includes the time required for the vehicle to travel from the end of the queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue. This delay is based on the flow rate for each approach. As indicated above, the flow rate and therefore the delay, is directly proportional to the distribution of vehicles among the approaches.

The following levels of average control delay are used to determine approach levels of service:

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (SEC)
A	$\leq$ 10.0
B	> 10.0 and $\leq$ 15.0
C	> 15.0 and $\leq$ 25.0
D	> 25.0 and $\leq$ 35.0
E	> 35.0 and $\leq$ 50.0
F	> 50.0

The average control delay is the most effective measure for indicating the performance of an AWSC intersection because it can readily be measured by a transportation analyst and can be clearly communicated to a lay person. In addition, the use of delay will result in a consistent measure for both signalized and unsignalized intersections. While both types of intersections are evaluated in terms of average delay, the level of service criteria are different. This is due to drivers who expect different levels of performance from different types of intersection controls. Since signalized intersections are designed to carry higher traffic volumes compared with AWSC intersections, higher levels of control delay are more acceptable at signalized intersections for the same level of service.

Engineering, Surveying and Landscape Architecture, P.C.

Attachment D
Synchro Analysis Worksheets

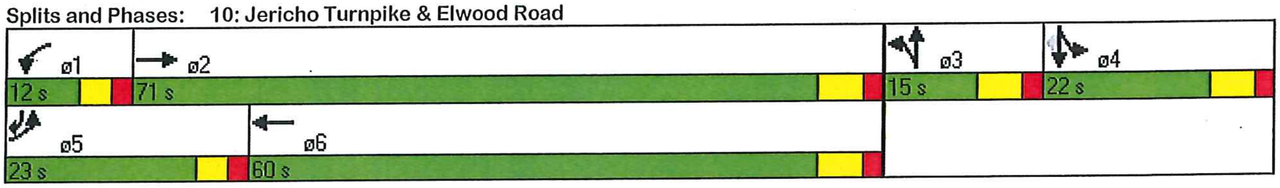
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	261	667	46	7	1474	222	48	42	2	203	40	664
Satd. Flow (prot)	*2500	3340	0	*1850	4796	0	*1900	*2000	0	*2600	*4000	1678
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	*2500	3340	0	*1850	4796	0	1703	1778	0	*2600	*4000	1678
Satd. Flow (RTOR)		9			30			2				
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.94	0.94	0.94	0.78	0.78	0.78	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	6%	6%	6%	6%	6%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												47%
Lane Group Flow (vph)	303	829	0	7	1804	0	62	57	0	218	379	378
Turn Type	Prot			Prot			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases												4
Detector Phase	5	2		1	6		3	3		4	4	5
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		6.0	6.0		10.0	10.0	4.0
Minimum Split (s)	10.0	29.3		10.0	32.3		36.3	36.3		17.3	17.3	10.0
Total Split (s)	23.0	71.0	0.0	12.0	60.0	0.0	15.0	15.0	0.0	22.0	22.0	23.0
Total Split (%)	19.2%	59.2%	0.0%	10.0%	50.0%	0.0%	12.5%	12.5%	0.0%	18.3%	18.3%	19.2%
Yellow Time (s)	3.0	4.3		3.0	4.3		4.3	4.3		4.3	4.3	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.3	4.0	5.0	6.3	4.0	6.3	6.3	4.0	6.3	6.3	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	Min	C-Max		None	C-Max		None	None		Min	Min	Min
Act Effct Green (s)	17.2	78.4		5.1	58.4		8.0	8.0		14.9	14.9	38.4
Actuated g/C Ratio	0.14	0.65		0.04	0.49		0.07	0.07		0.12	0.12	0.32
v/c Ratio	0.84	0.38		0.09	0.77		0.49	0.42		0.67	0.76	0.70
Control Delay	78.8	13.8		57.3	28.8		67.0	61.3		61.2	61.5	43.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	78.8	13.8		57.3	28.8		67.0	61.3		61.2	61.5	43.6
LOS	E	B		E	C		E	E		E	E	D
Approach Delay		31.2			28.9			64.3			54.5	
Approach LOS		C			C			E			D	
Queue Length 50th (ft)	243	153		5	435		47	41		163	301	264
Queue Length 95th (ft)	#343	194		21	503		81	74		246	409	383
Internal Link Dist (ft)		214			401			45			654	
Turn Bay Length (ft)				200						475		475
Base Capacity (vph)	375	2186		108	2351		138	147		340	523	548
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.81	0.38		0.06	0.77		0.45	0.39		0.64	0.72	0.69

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 3 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 36.8 — Intersection LOS: D
Intersection Capacity Utilization 88.6% — ICU Level of Service E
Analysis Period (min) 15
* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: Jericho Turnpike & Elwood Road

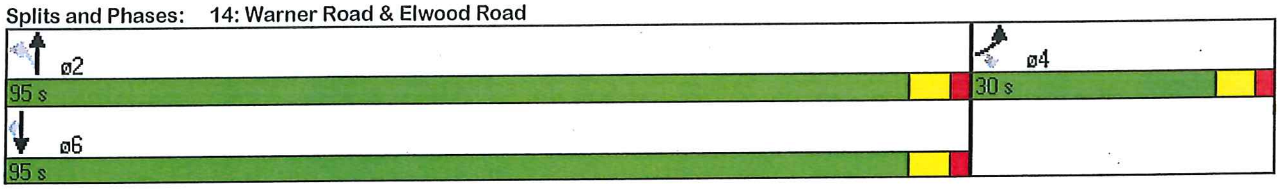


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	63	17	11	687	945	224
Satd. Flow (prot)	1671	1695	1574	1717	1766	1605
Flt Permitted	0.950		0.232			
Satd. Flow (perm)	1671	1695	384	1717	1766	1605
Satd. Flow (RTOR)		23				236
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.73	0.99	0.99	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	7%	7%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	86	23	11	694	995	236
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.0	23.0	23.5	23.5	23.0	23.0
Total Split (s)	30.0	30.0	95.0	95.0	95.0	95.0
Total Split (%)	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	12.0	12.0	101.0	101.0	101.0	101.0
Actuated g/C Ratio	0.10	0.10	0.81	0.81	0.81	0.81
v/c Ratio	0.54	0.13	0.04	0.50	0.70	0.18
Control Delay	65.5	19.6	3.3	5.6	9.0	0.4
Queue Delay	0.0	0.0	0.0	0.3	5.4	1.1
Total Delay	65.5	19.6	3.3	5.9	14.4	1.6
LOS	E	B	A	A	B	A
Approach Delay	55.8			5.9	11.9	
Approach LOS	E			A	B	
Queue Length 50th (ft)	68	0	1	144	261	0
Queue Length 95th (ft)	95	17	6	254	449	m13
Internal Link Dist (ft)	786			511	145	
Turn Bay Length (ft)		100	150			
Base Capacity (vph)	321	344	310	1388	1427	1342
Starvation Cap Reductn	0	0	0	0	366	881
Spillback Cap Reductn	0	0	0	217	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.07	0.04	0.59	0.94	0.51

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 80 (64%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 12.2 — Intersection LOS: B
Intersection Capacity Utilization 66.4% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Warner Road & Elwood Road



15: Cuba Hill Road / Burr Road & Elwood Road
Lanes, Volumes, Timings

Existing 2013
AM Peak

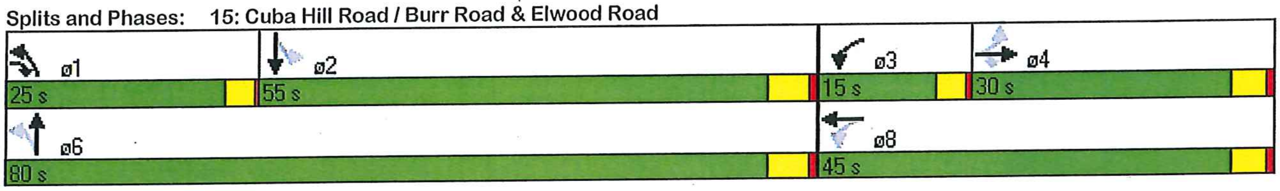
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	146	275	231	249	14	296	440	14	7	663	12
Satd. Flow (prot)	1574	*1900	1409	*1850	*1850	0	*1750	1708	0	1646	1728	0
Flt Permitted	0.551			0.315			*0.200			0.486		
Satd. Flow (perm)	913	*1900	1409	*1000	*1850	0	331	1708	0	842	1728	0
Satd. Flow (RTOR)			133		2			2			1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.82	0.82	0.82	0.93	0.93	0.93	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	4%	4%	4%	7%	7%	7%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	23	170	320	282	321	0	318	488	0	7	689	0
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		
Protected Phases		4	1	3	8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	3	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0	2.0	2.0	8.0		2.0	16.0		14.0	14.0	
Minimum Split (s)	22.5	22.5	12.0	10.0	26.5		12.0	23.0		28.0	28.0	
Total Split (s)	30.0	30.0	25.0	15.0	45.0	0.0	25.0	80.0	0.0	55.0	55.0	0.0
Total Split (%)	24.0%	24.0%	20.0%	12.0%	36.0%	0.0%	20.0%	64.0%	0.0%	44.0%	44.0%	0.0%
Yellow Time (s)	3.5	3.5	3.0	3.0	3.5		3.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	0.5	0.5	1.0		0.5	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	3.5	4.5	4.0	3.5	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	C-Min		C-Min	C-Min	
Act Effct Green (s)	16.5	16.5	35.0	32.7	31.7		85.3	83.8		66.2	66.2	
Actuated g/C Ratio	0.13	0.13	0.28	0.26	0.25		0.68	0.67		0.53	0.53	
v/c Ratio	0.19	0.68	0.65	0.82	0.68		0.83	0.43		0.02	0.75	
Control Delay	50.0	65.0	27.5	61.1	49.3		30.9	12.2		19.3	31.6	
Queue Delay	0.0	0.0	0.2	9.9	0.0		3.4	1.4		0.0	1.7	
Total Delay	50.0	65.0	27.8	71.0	49.3		34.3	13.6		19.3	33.3	
LOS	D	E	C	E	D		C	B		B	C	
Approach Delay		41.1			59.5			21.8			33.2	
Approach LOS		D			E			C			C	
Queue Length 50th (ft)	17	133	137	200	235		143	146		2	403	
Queue Length 95th (ft)	40	189	180	245	282		153	308		13	#801	
Internal Link Dist (ft)		284			581			145			2139	
Turn Bay Length (ft)	100			175			150			100		
Base Capacity (vph)	186	388	571	342	601		474	1145		446	916	
Starvation Cap Reductn	0	0	0	0	0		83	446		0	0	
Spillback Cap Reductn	0	0	31	41	0		0	0		0	102	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.12	0.44	0.59	0.94	0.53		0.81	0.70		0.02	0.85	

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 75 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 37.3 — Intersection LOS: D
Intersection Capacity Utilization 87.6% — ICU Level of Service E
Analysis Period (min) 15
* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Cuba Hill Road / Burr Road & Elwood Road

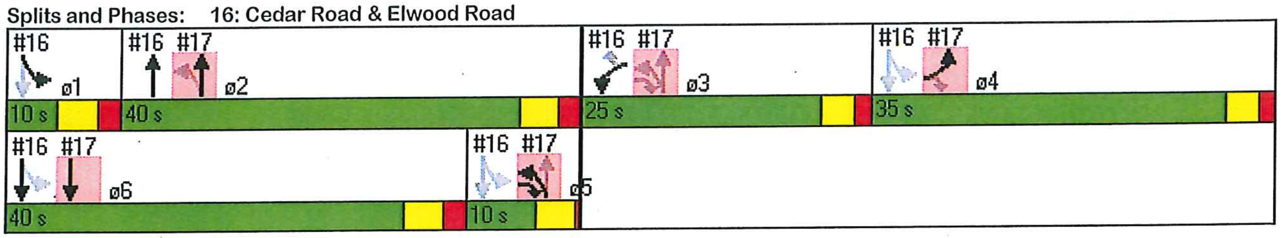


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø4	ø5
Lane Configurations								
Volume (vph)	41	78	491	14	61	652		
Satd. Flow (prot)	1719	1487	1726	0	1719	1810		
Flt Permitted	0.950				0.295			
Satd. Flow (perm)	1719	1487	1726	0	534	1810		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.76	0.76	0.86	0.86	0.87	0.87		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	5%	5%	6%	6%	5%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	54	103	587	0	70	749		
Turn Type		Perm			custom			
Protected Phases	3		2		1	6	4	5
Permitted Phases		3			4 5 6	1 4 5		
Detector Phase	3	3	2		1	6		
Switch Phase								
Minimum Initial (s)	4.0	4.0	20.0		4.0	20.0	4.0	4.0
Minimum Split (s)	24.5	24.5	25.5		10.0	25.5	24.5	10.0
Total Split (s)	25.0	25.0	40.0	0.0	10.0	40.0	35.0	10.0
Total Split (%)	22.7%	22.7%	36.4%	0.0%	9.1%	36.4%	32%	9%
Yellow Time (s)	3.0	3.0	3.5		3.5	3.5	3.0	3.5
All-Red Time (s)	1.5	1.5	2.0		2.0	2.0	1.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	5.5	4.0	5.5	5.5		
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	Min		None	Min	None	None
Act Effct Green (s)	8.4	8.4	40.2		49.5	54.0		
Actuated g/C Ratio	0.12	0.12	0.59		0.72	0.79		
v/c Ratio	0.26	0.57	0.58		0.15	0.53		
Control Delay	32.8	43.3	18.4		4.2	5.0		
Queue Delay	0.0	0.0	0.0		0.2	1.4		
Total Delay	32.8	43.3	18.4		4.4	6.4		
LOS	C	D	B		A	A		
Approach Delay	39.7		18.4			6.2		
Approach LOS	D		B			A		
Queue Length 50th (ft)	23	46	204		9	104		
Queue Length 95th (ft)	47	79	356		m12	145		
Internal Link Dist (ft)	328		1267			133		
Turn Bay Length (ft)	175				65			
Base Capacity (vph)	529	458	1011		465	1422		
Starvation Cap Reductn	0	0	0		125	444		
Spillback Cap Reductn	0	0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		
Reduced v/c Ratio	0.10	0.22	0.58		0.21	0.77		

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 68.7
Natural Cycle: 95
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 14.2 — Intersection LOS: B
Intersection Capacity Utilization 46.3% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Cedar Road & Elwood Road



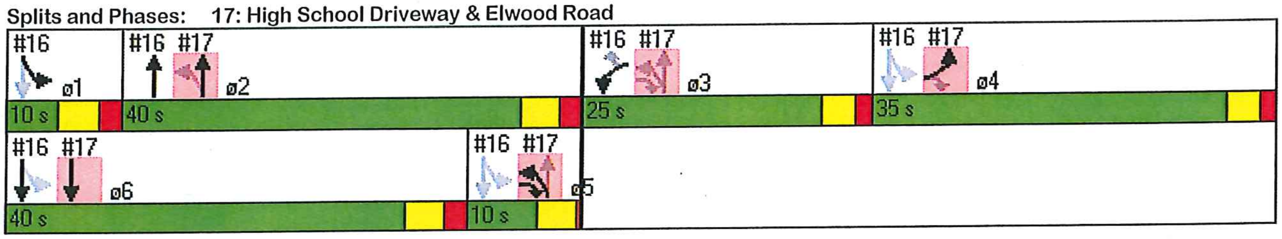
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø1	ø3
Lane Configurations								
Volume (vph)	23	125	201	368	588	36		
Satd. Flow (prot)	1986	1359	1589	1733	*1900	0		
Flt Permitted	0.950		0.307					
Satd. Flow (perm)	1986	1359	514	1733	*1900	0		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.40	0.40	0.80	0.80	0.90	0.90		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	3%	3%	6%	6%	5%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%			0%	0%			
Shared Lane Traffic (%)								
Lane Group Flow (vph)	58	312	251	460	693	0		
Turn Type		custom	custom					
Protected Phases	4	5	5	2	6		1	3
Permitted Phases		3 4	2 3	3 5				
Detector Phase	4	5	5	2	6			
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	20.0	20.0		4.0	4.0
Minimum Split (s)	24.5	10.0	10.0	25.5	25.5		10.0	24.5
Total Split (s)	35.0	10.0	10.0	40.0	40.0	0.0	10.0	25.0
Total Split (%)	31.8%	9.1%	9.1%	36.4%	36.4%	0.0%	9%	23%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5		3.5	3.0
All-Red Time (s)	1.5	0.5	0.5	2.0	2.0		2.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.0	4.0	5.5	5.5	4.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lead		Lead	Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	Min	Min		None	None
Act Effct Green (s)	6.7	23.3	47.8	50.8	35.6			
Actuated g/C Ratio	0.10	0.34	0.70	0.74	0.52			
v/c Ratio	0.30	0.68	0.55	0.36	0.70			
Control Delay	36.3	25.9	7.1	2.1	21.6			
Queue Delay	0.0	3.2	0.2	0.4	0.0			
Total Delay	36.3	29.1	7.3	2.6	21.6			
LOS	D	C	A	A	C			
Approach Delay	30.2			4.2	21.6			
Approach LOS	C			A	C			
Queue Length 50th (ft)	26	107	10	20	255			
Queue Length 95th (ft)	26	63	21	19	#514			
Internal Link Dist (ft)	299			133	434			
Turn Bay Length (ft)			68					
Base Capacity (vph)	910	461	455	1282	985			
Starvation Cap Reductn	0	0	18	407	0			
Spillback Cap Reductn	0	76	0	0	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.06	0.81	0.57	0.53	0.70			

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 68.7
Natural Cycle: 95
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 16.4 — Intersection LOS: B
Intersection Capacity Utilization 59.3% — ICU Level of Service B
Analysis Period (min) 15
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 17: High School Driveway & Elwood Road

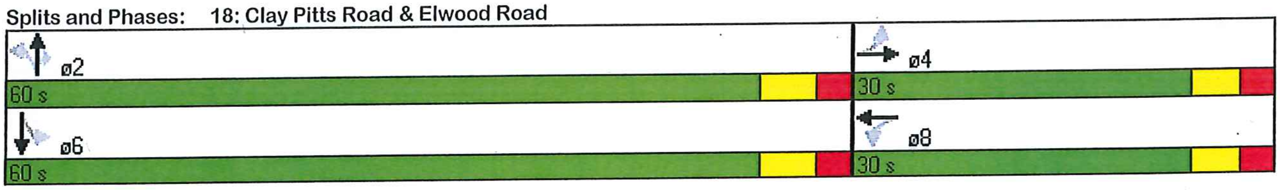


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	150	52	53	320	64	73	283	27	67	501	52
Satd. Flow (prot)	0	1712	0	1719	1764	0	1687	1776	1509	1719	1784	0
Flt Permitted		0.850		0.550			0.206			0.547		
Satd. Flow (perm)	0	1463	0	995	1764	0	366	1776	1509	990	1784	0
Satd. Flow (RTOR)		16			11				30		10	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.80	0.80	0.80	0.91	0.91	0.91	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	7%	7%	7%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	294	0	66	480	0	80	311	30	80	658	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		18.0	18.0	18.0	18.0	18.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		24.5	24.5	24.5	24.5	24.5	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	60.0	60.0	60.0	60.0	60.0	0.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%	66.7%	66.7%	66.7%	66.7%	66.7%	0.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.5	6.5	6.5	6.5	6.5	4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Act Effct Green (s)		24.4		24.4	24.4		29.5	29.5	29.5	29.5	29.5	
Actuated g/C Ratio		0.37		0.37	0.37		0.44	0.44	0.44	0.44	0.44	
v/c Ratio		0.54		0.18	0.74		0.49	0.40	0.04	0.18	0.83	
Control Delay		22.9		19.7	29.3		23.9	13.4	3.7	11.3	25.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		22.9		19.7	29.3		23.9	13.4	3.7	11.3	25.3	
LOS		C		B	C		C	B	A	B	C	
Approach Delay		22.9			28.2			14.7			23.8	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		86		18	160		22	80	0	19	217	
Queue Length 95th (ft)		170		51	#335		60	129	11	38	295	
Internal Link Dist (ft)		755			973			516			398	
Turn Bay Length (ft)				100			100		200	180		
Base Capacity (vph)		546		365	653		299	1451	1238	809	1459	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.54		0.18	0.74		0.27	0.21	0.02	0.10	0.45	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 66.7
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 22.9 — Intersection LOS: C
Intersection Capacity Utilization 92.2% — ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Clay Pitts Road & Elwood Road



10: Jericho Turnpike & Elwood Road
Lanes, Volumes, Timings

No Build 2016
AM Peak

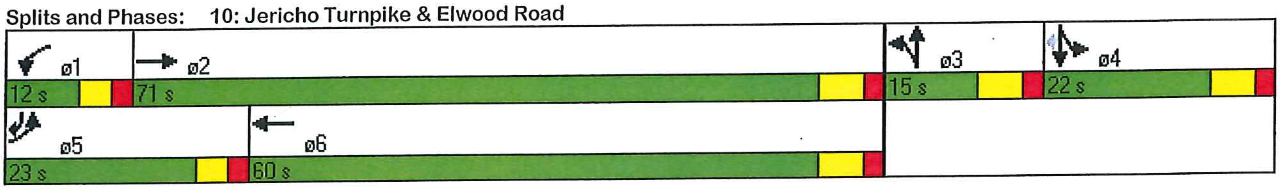
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	271	687	47	7	1518	230	49	43	2	215	41	692
Satd. Flow (prot)	*2500	3340	0	*1850	4796	0	*1900	*2000	0	*2600	*4000	1678
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	*2500	3340	0	*1850	4796	0	1703	1778	0	*2600	*4000	1678
Satd. Flow (RTOR)		9			31			2				
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.94	0.94	0.94	0.78	0.78	0.78	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	6%	6%	6%	6%	6%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												47%
Lane Group Flow (vph)	315	854	0	7	1860	0	63	58	0	231	394	394
Turn Type	Prot			Prot			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases												4
Detector Phase	5	2		1	6		3	3		4	4	5
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		6.0	6.0		10.0	10.0	4.0
Minimum Split (s)	10.0	29.3		10.0	32.3		36.3	36.3		17.3	17.3	10.0
Total Split (s)	23.0	71.0	0.0	12.0	60.0	0.0	15.0	15.0	0.0	22.0	22.0	23.0
Total Split (%)	19.2%	59.2%	0.0%	10.0%	50.0%	0.0%	12.5%	12.5%	0.0%	18.3%	18.3%	19.2%
Yellow Time (s)	3.0	4.3		3.0	4.3		4.3	4.3		4.3	4.3	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.3	4.0	5.0	6.3	4.0	6.3	6.3	4.0	6.3	6.3	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	Min	C-Max		None	C-Max		None	None		Min	Min	Min
Act Effct Green (s)	17.5	78.2		5.1	57.9		8.0	8.0		15.1	15.1	38.9
Actuated g/C Ratio	0.15	0.65		0.04	0.48		0.07	0.07		0.13	0.13	0.32
v/c Ratio	0.86	0.39		0.09	0.80		0.50	0.43		0.71	0.78	0.72
Control Delay	80.4	14.0		57.3	30.2		67.5	61.6		62.7	62.5	44.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	80.4	14.0		57.3	30.2		67.5	61.6		62.7	62.5	44.4
LOS	F	B		E	C		E	E		E	E	D
Approach Delay		31.8			30.3			64.7			55.5	
Approach LOS		C			C			E			E	
Queue Length 50th (ft)	253	158		5	457		48	42		173	313	278
Queue Length 95th (ft)	#364	199		21	528		81	75		259	425	403
Internal Link Dist (ft)		214			401			45			654	
Turn Bay Length (ft)				200						475		475
Base Capacity (vph)	378	2181		108	2331		138	147		340	523	553
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.83	0.39		0.06	0.80		0.46	0.39		0.68	0.75	0.71

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 3 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 37.9 — Intersection LOS: D
Intersection Capacity Utilization 90.8% — ICU Level of Service E
Analysis Period (min) 15
* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: Jericho Turnpike & Elwood Road

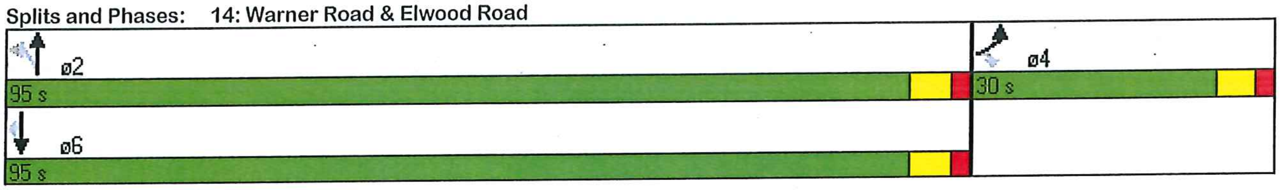


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	65	18	11	711	987	231
Satd. Flow (prot)	1671	1695	1574	1717	1766	1605
Flt Permitted	0.950		0.212			
Satd. Flow (perm)	1671	1695	351	1717	1766	1605
Satd. Flow (RTOR)		25				243
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.73	0.99	0.99	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	7%	7%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	89	25	11	718	1039	243
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.0	23.0	23.5	23.5	23.0	23.0
Total Split (s)	30.0	30.0	95.0	95.0	95.0	95.0
Total Split (%)	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	12.2	12.2	100.8	100.8	100.8	100.8
Actuated g/C Ratio	0.10	0.10	0.81	0.81	0.81	0.81
v/c Ratio	0.55	0.13	0.04	0.52	0.73	0.18
Control Delay	65.7	18.8	3.5	5.9	9.6	0.8
Queue Delay	0.4	0.0	0.0	0.5	11.2	1.3
Total Delay	66.1	18.8	3.5	6.4	20.8	2.1
LOS	E	B	A	A	C	A
Approach Delay	55.7			6.4	17.3	
Approach LOS	E			A	B	
Queue Length 50th (ft)	70	0	1	155	262	0
Queue Length 95th (ft)	97	18	6	274	382	m24
Internal Link Dist (ft)	786			511	145	
Turn Bay Length (ft)		100	150			
Base Capacity (vph)	321	346	283	1385	1425	1342
Starvation Cap Reductn	0	0	0	0	371	890
Spillback Cap Reductn	58	0	0	282	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.07	0.04	0.65	0.99	0.54

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 80 (64%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 15.6 — Intersection LOS: B
Intersection Capacity Utilization 68.6% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Warner Road & Elwood Road



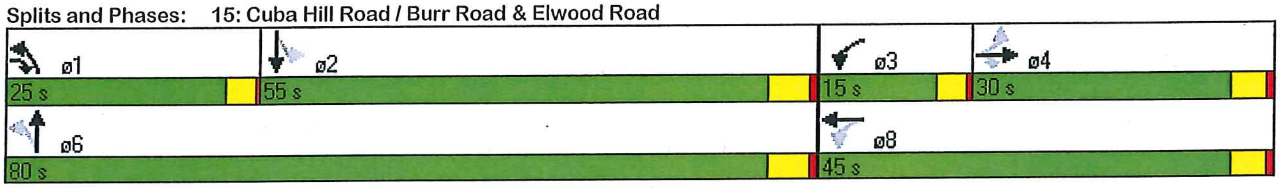
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	150	283	238	256	14	305	456	14	7	697	12
Satd. Flow (prot)	1574	*1900	1409	*1850	*1850	0	*1750	1710	0	1646	1729	0
Flt Permitted	0.516			0.308			*0.200			0.478		
Satd. Flow (perm)	855	*1900	1409	*1000	*1850	0	331	1710	0	828	1729	0
Satd. Flow (RTOR)			121		2			2			1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.82	0.82	0.82	0.93	0.93	0.93	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	4%	4%	4%	7%	7%	7%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	24	174	329	290	329	0	328	505	0	7	723	0
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		
Protected Phases		4	1	3	8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	3	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0	2.0	2.0	8.0		2.0	16.0		14.0	14.0	
Minimum Split (s)	22.5	22.5	12.0	10.0	26.5		12.0	23.0		28.0	28.0	
Total Split (s)	30.0	30.0	25.0	15.0	45.0	0.0	25.0	80.0	0.0	55.0	55.0	0.0
Total Split (%)	24.0%	24.0%	20.0%	12.0%	36.0%	0.0%	20.0%	64.0%	0.0%	44.0%	44.0%	0.0%
Yellow Time (s)	3.5	3.5	3.0	3.0	3.5		3.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	0.5	0.5	1.0		0.5	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	3.5	4.5	4.0	3.5	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	C-Min		C-Min	C-Min	
Act Effct Green (s)	16.7	16.7	35.9	32.7	31.7		85.3	83.8		65.6	65.6	
Actuated g/C Ratio	0.13	0.13	0.29	0.26	0.25		0.68	0.67		0.52	0.52	
v/c Ratio	0.21	0.69	0.67	0.85	0.70		0.83	0.44		0.02	0.80	
Control Delay	50.7	65.1	29.8	64.4	50.1		30.8	11.7		19.9	34.4	
Queue Delay	0.0	0.0	0.4	10.9	0.0		4.5	1.6		0.0	3.0	
Total Delay	50.7	65.1	30.2	75.3	50.1		35.3	13.3		19.9	37.4	
LOS	D	E	C	E	D		D	B		B	D	
Approach Delay		42.7			61.9			21.9			37.2	
Approach LOS		D			E			C			D	
Queue Length 50th (ft)	18	136	154	206	241		151	183		3	443	
Queue Length 95th (ft)	42	192	194	251	288		122	301		13	#875	
Internal Link Dist (ft)		284			581			145			2139	
Turn Bay Length (ft)	100			175			150			100		
Base Capacity (vph)	174	388	567	340	601		477	1147		435	909	
Starvation Cap Reductn	0	0	0	0	0		89	446		0	0	
Spillback Cap Reductn	0	0	46	36	0		0	0		0	103	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.45	0.63	0.95	0.55		0.85	0.72		0.02	0.90	

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 75 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 39.2 — Intersection LOS: D
Intersection Capacity Utilization 90.3% — ICU Level of Service E
Analysis Period (min) 15
* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Cuba Hill Road / Burr Road & Elwood Road



16: Cedar Road & Elwood Road
Lanes, Volumes, Timings

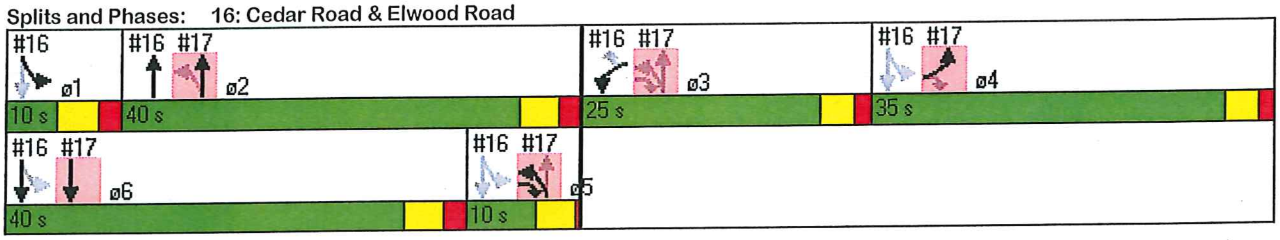
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø4	ø5
Lane Configurations								
Volume (vph)	42	80	509	14	63	686		
Satd. Flow (prot)	1719	1487	1726	0	1719	1810		
Flt Permitted	0.950				0.280			
Satd. Flow (perm)	1719	1487	1726	0	507	1810		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.76	0.76	0.86	0.86	0.87	0.87		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	5%	5%	6%	6%	5%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	55	105	608	0	72	789		
Turn Type		Perm			custom			
Protected Phases	3		2		1	6	4	5
Permitted Phases		3			4 5 6	1 4 5		
Detector Phase	3	3	2		1	6		
Switch Phase								
Minimum Initial (s)	4.0	4.0	20.0		4.0	20.0	4.0	4.0
Minimum Split (s)	24.5	24.5	25.5		10.0	25.5	24.5	10.0
Total Split (s)	25.0	25.0	40.0	0.0	10.0	40.0	35.0	10.0
Total Split (%)	22.7%	22.7%	36.4%	0.0%	9.1%	36.4%	32%	9%
Yellow Time (s)	3.0	3.0	3.5		3.5	3.5	3.0	3.5
All-Red Time (s)	1.5	1.5	2.0		2.0	2.0	1.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	5.5	4.0	5.5	5.5		
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	Min		None	Min	None	None
Act Effct Green (s)	8.6	8.6	40.3		50.6	56.3		
Actuated g/C Ratio	0.12	0.12	0.57		0.71	0.79		
v/c Ratio	0.27	0.58	0.62		0.17	0.55		
Control Delay	33.4	45.1	20.4		4.1	4.8		
Queue Delay	0.0	0.0	0.0		0.2	1.6		
Total Delay	33.4	45.1	20.4		4.3	6.4		
LOS	C	D	C		A	A		
Approach Delay	41.1		20.4			6.2		
Approach LOS	D		C			A		
Queue Length 50th (ft)	24	47	218		9	109		
Queue Length 95th (ft)	47	80	#391		m11	151		
Internal Link Dist (ft)	328		1267			133		
Turn Bay Length (ft)	175				65			
Base Capacity (vph)	512	443	981		440	1434		
Starvation Cap Reductn	0	0	0		109	438		
Spillback Cap Reductn	0	0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		
Reduced v/c Ratio	0.11	0.24	0.62		0.22	0.79		

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 71
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 14.9 — Intersection LOS: B
Intersection Capacity Utilization 47.8% — ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Cedar Road & Elwood Road



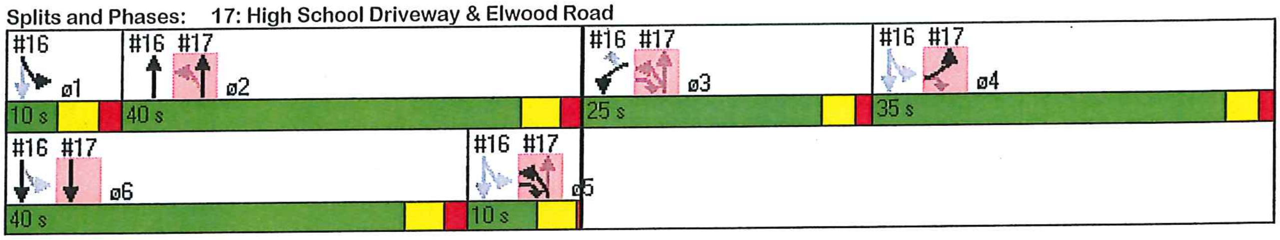
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø1	ø3
Lane Configurations								
Volume (vph)	24	129	207	382	620	37		
Satd. Flow (prot)	1986	1359	1589	1733	*1900	0		
Flt Permitted	0.950		0.265					
Satd. Flow (perm)	1986	1359	443	1733	*1900	0		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.40	0.40	0.80	0.80	0.90	0.90		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	3%	3%	6%	6%	5%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%			0%	0%			
Shared Lane Traffic (%)								
Lane Group Flow (vph)	60	322	259	478	730	0		
Turn Type		custom	custom					
Protected Phases	4	5	5	2	6		1	3
Permitted Phases		3 4	2 3	3 5				
Detector Phase	4	5	5	2	6			
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	20.0	20.0		4.0	4.0
Minimum Split (s)	24.5	10.0	10.0	25.5	25.5		10.0	24.5
Total Split (s)	35.0	10.0	10.0	40.0	40.0	0.0	10.0	25.0
Total Split (%)	31.8%	9.1%	9.1%	36.4%	36.4%	0.0%	9%	23%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5		3.5	3.0
All-Red Time (s)	1.5	0.5	0.5	2.0	2.0		2.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.0	4.0	5.5	5.5	4.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lead		Lead	Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	Min	Min		None	None
Act Effct Green (s)	6.7	25.6	48.0	51.0	35.6			
Actuated g/C Ratio	0.09	0.36	0.68	0.72	0.50			
v/c Ratio	0.32	0.66	0.65	0.38	0.77			
Control Delay	37.3	24.5	12.9	2.4	25.0			
Queue Delay	0.0	2.3	0.0	0.6	0.0			
Total Delay	37.3	26.9	12.9	2.9	25.0			
LOS	D	C	B	A	C			
Approach Delay	28.5			6.5	25.0			
Approach LOS	C			A	C			
Queue Length 50th (ft)	27	112	19	19	279			
Queue Length 95th (ft)	27	65	37	19	#561			
Internal Link Dist (ft)	299			133	434			
Turn Bay Length (ft)			68					
Base Capacity (vph)	880	490	399	1244	952			
Starvation Cap Reductn	0	0	0	404	0			
Spillback Cap Reductn	0	77	0	0	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.07	0.78	0.65	0.57	0.77			

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 71
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 18.3 — Intersection LOS: B
Intersection Capacity Utilization 61.3% — ICU Level of Service B
Analysis Period (min) 15
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 17: High School Driveway & Elwood Road

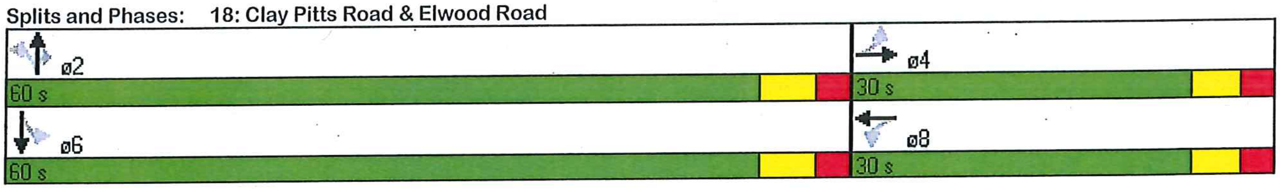


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	155	54	55	330	66	75	294	28	69	530	54
Satd. Flow (prot)	0	1712	0	1719	1764	0	1687	1776	1509	1719	1784	0
Flt Permitted		0.781		0.529			0.189			0.537		
Satd. Flow (perm)	0	1344	0	957	1764	0	336	1776	1509	972	1784	0
Satd. Flow (RTOR)		16			11				31		10	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.80	0.80	0.80	0.91	0.91	0.91	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	7%	7%	7%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	303	0	69	494	0	82	323	31	82	695	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		18.0	18.0	18.0	18.0	18.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		24.5	24.5	24.5	24.5	24.5	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	60.0	60.0	60.0	60.0	60.0	0.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%	66.7%	66.7%	66.7%	66.7%	66.7%	0.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.5	6.5	6.5	6.5	6.5	4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Act Effct Green (s)		24.5		24.5	24.5		31.9	31.9	31.9	31.9	31.9	
Actuated g/C Ratio		0.35		0.35	0.35		0.46	0.46	0.46	0.46	0.46	
v/c Ratio		0.62		0.20	0.78		0.53	0.39	0.04	0.18	0.84	
Control Delay		27.9		21.7	33.3		26.0	13.0	3.4	10.9	25.7	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		27.9		21.7	33.3		26.0	13.0	3.4	10.9	25.7	
LOS		C		C	C		C	B	A	B	C	
Approach Delay		27.9			31.8			14.8			24.1	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		97		20	177		23	84	0	19	237	
Queue Length 95th (ft)		193		56	#375		66	133	11	38	317	
Internal Link Dist (ft)		755			973			516			398	
Turn Bay Length (ft)				100			100		200	180		
Base Capacity (vph)		487		340	633		266	1404	1200	769	1413	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.62		0.20	0.78		0.31	0.23	0.03	0.11	0.49	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 69.2
Natural Cycle: 65
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 24.8 — Intersection LOS: C
Intersection Capacity Utilization 95.1% — ICU Level of Service F
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Clay Pitts Road & Elwood Road



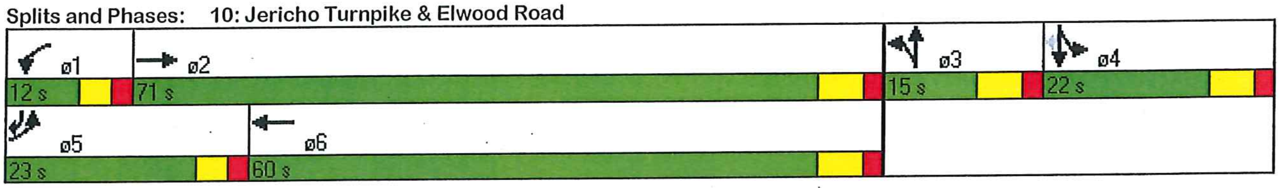
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑↱		↰	↱		↰	↱	↱
Volume (vph)	279	687	47	7	1518	235	49	43	2	225	41	707
Satd. Flow (prot)	*2500	3340	0	*1850	4796	0	*1900	*2000	0	*2600	*4000	1678
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	*2500	3340	0	*1850	4796	0	1703	1778	0	*2600	*4000	1678
Satd. Flow (RTOR)		9			31			2				
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.94	0.94	0.94	0.78	0.78	0.78	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	6%	6%	6%	6%	6%	4%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												48%
Lane Group Flow (vph)	324	854	0	7	1865	0	63	58	0	242	409	395
Turn Type	Prot			Prot			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases												4
Detector Phase	5	2		1	6		3	3		4	4	5
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		6.0	6.0		10.0	10.0	4.0
Minimum Split (s)	10.0	29.3		10.0	32.3		36.3	36.3		17.3	17.3	10.0
Total Split (s)	23.0	71.0	0.0	12.0	60.0	0.0	15.0	15.0	0.0	22.0	22.0	23.0
Total Split (%)	19.2%	59.2%	0.0%	10.0%	50.0%	0.0%	12.5%	12.5%	0.0%	18.3%	18.3%	19.2%
Yellow Time (s)	3.0	4.3		3.0	4.3		4.3	4.3		4.3	4.3	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.3	4.0	5.0	6.3	4.0	6.3	6.3	4.0	6.3	6.3	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	Min	C-Max		None	C-Max		None	None		Min	Min	Min
Act Effct Green (s)	17.5	77.9		5.1	57.6		8.0	8.0		15.4	15.4	39.3
Actuated g/C Ratio	0.15	0.65		0.04	0.48		0.07	0.07		0.13	0.13	0.33
v/c Ratio	0.89	0.39		0.09	0.80		0.50	0.43		0.72	0.80	0.72
Control Delay	83.5	14.1		57.3	30.5		67.5	61.6		63.4	63.0	44.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	83.5	14.1		57.3	30.5		67.5	61.6		63.4	63.0	44.0
LOS	F	B		E	C		E	E		E	E	D
Approach Delay		33.2			30.6			64.7			55.9	
Approach LOS		C			C			E			E	
Queue Length 50th (ft)	260	158		5	460		48	42		182	327	280
Queue Length 95th (ft)	#379	199		21	530		81	75		#274	#449	404
Internal Link Dist (ft)		214			401			45			654	
Turn Bay Length (ft)				200						475		475
Base Capacity (vph)	375	2172		108	2318		138	147		344	528	555
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.86	0.39		0.06	0.80		0.46	0.39		0.70	0.77	0.71

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 3 (3%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 140
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 38.6 — Intersection LOS: D
Intersection Capacity Utilization 91.6% — ICU Level of Service F
Analysis Period (min) 15
* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 10: Jericho Turnpike & Elwood Road

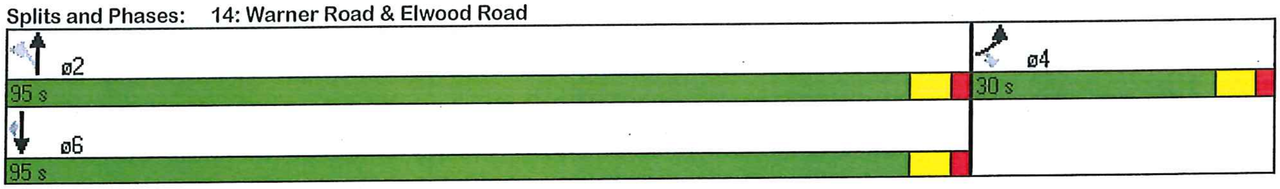


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	65	18	11	725	1013	231
Satd. Flow (prot)	1671	1695	1574	1717	1766	1605
Flt Permitted	0.950		0.201			
Satd. Flow (perm)	1671	1695	333	1717	1766	1605
Satd. Flow (RTOR)		25				243
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.73	0.73	0.99	0.99	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	8%	7%	7%	4%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	89	25	11	732	1066	243
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.0	23.0	23.5	23.5	23.0	23.0
Total Split (s)	30.0	30.0	95.0	95.0	95.0	95.0
Total Split (%)	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	12.2	12.2	100.8	100.8	100.8	100.8
Actuated g/C Ratio	0.10	0.10	0.81	0.81	0.81	0.81
v/c Ratio	0.55	0.13	0.04	0.53	0.75	0.18
Control Delay	65.7	18.8	3.5	6.1	10.0	0.8
Queue Delay	0.4	0.0	0.0	0.8	17.2	1.3
Total Delay	66.1	18.8	3.5	6.8	27.2	2.1
LOS	E	B	A	A	C	A
Approach Delay	55.7			6.8	22.6	
Approach LOS	E			A	C	
Queue Length 50th (ft)	70	0	1	160	243	0
Queue Length 95th (ft)	97	18	6	282	402	m23
Internal Link Dist (ft)	786			511	145	
Turn Bay Length (ft)		100	150			
Base Capacity (vph)	321	346	269	1385	1425	1342
Starvation Cap Reductn	0	0	0	0	372	893
Spillback Cap Reductn	58	0	0	343	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.07	0.04	0.70	1.01	0.54

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 80 (64%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 18.9 — Intersection LOS: B
Intersection Capacity Utilization 70.0% — ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Warner Road & Elwood Road



15: Cuba Hill Road / Burr Road & Elwood Road

Build 2016
AM Peak

Lanes, Volumes, Timings

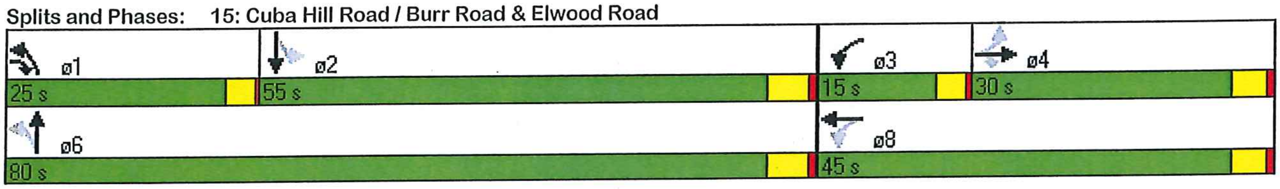
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	150	283	238	256	16	305	470	14	10	722	15
Satd. Flow (prot)	1574	*1900	1409	*1850	*1850	0	*1750	1710	0	1646	1728	0
Flt Permitted	0.507			0.308			*0.200			0.471		
Satd. Flow (perm)	840	*1900	1409	*1000	*1850	0	331	1710	0	816	1728	0
Satd. Flow (RTOR)			114		3			2			1	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.86	0.86	0.86	0.82	0.82	0.82	0.93	0.93	0.93	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	4%	4%	4%	7%	7%	7%	6%	6%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	26	174	329	290	332	0	328	520	0	10	752	0
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		
Protected Phases		4	1	3	8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	3	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0	2.0	2.0	8.0		2.0	16.0		14.0	14.0	
Minimum Split (s)	22.5	22.5	12.0	10.0	26.5		12.0	23.0		28.0	28.0	
Total Split (s)	30.0	30.0	25.0	15.0	45.0	0.0	25.0	80.0	0.0	55.0	55.0	0.0
Total Split (%)	24.0%	24.0%	20.0%	12.0%	36.0%	0.0%	20.0%	64.0%	0.0%	44.0%	44.0%	0.0%
Yellow Time (s)	3.5	3.5	3.0	3.0	3.5		3.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	0.5	0.5	1.0		0.5	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	3.5	4.5	4.0	3.5	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	C-Min		C-Min	C-Min	
Act Effct Green (s)	16.7	16.7	35.9	32.7	31.7		85.3	83.8		65.6	65.6	
Actuated g/C Ratio	0.13	0.13	0.29	0.26	0.25		0.68	0.67		0.52	0.52	
v/c Ratio	0.23	0.69	0.68	0.85	0.70		0.83	0.45		0.02	0.83	
Control Delay	51.5	65.1	31.0	64.4	50.2		30.0	12.5		19.8	36.4	
Queue Delay	0.0	0.0	0.5	14.6	0.0		4.5	1.7		0.0	4.8	
Total Delay	51.5	65.1	31.4	79.0	50.2		34.5	14.2		19.8	41.2	
LOS	D	E	C	E	D		C	B		B	D	
Approach Delay		43.5			63.6			22.1			41.0	
Approach LOS		D			E			C			D	
Queue Length 50th (ft)	19	136	160	206	243		152	211		4	475	
Queue Length 95th (ft)	44	192	199	251	290		122	309		17	#928	
Internal Link Dist (ft)		284			581			145			2139	
Turn Bay Length (ft)	100			175			150			100		
Base Capacity (vph)	171	388	562	340	601		477	1147		428	908	
Starvation Cap Reductn	0	0	0	0	0		89	440		0	0	
Spillback Cap Reductn	0	0	45	42	0		0	0		0	103	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.45	0.64	0.97	0.55		0.85	0.74		0.02	0.93	

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 75 (60%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 40.8 — Intersection LOS: D
Intersection Capacity Utilization 91.9% — ICU Level of Service F
Analysis Period (min) 15
* User Entered Value

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 15: Cuba Hill Road / Burr Road & Elwood Road



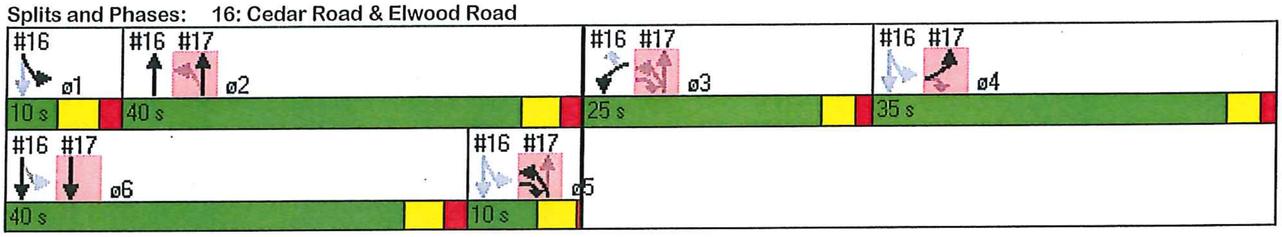
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø4	ø5
Lane Configurations								
Volume (vph)	45	80	524	20	63	694		
Satd. Flow (prot)	1719	1487	1724	0	1719	1810		
Flt Permitted	0.950				0.264			
Satd. Flow (perm)	1719	1487	1724	0	478	1810		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.76	0.76	0.86	0.86	0.87	0.87		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	5%	5%	6%	6%	5%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	59	105	632	0	72	798		
Turn Type		Perm			custom			
Protected Phases	3		2		1	6	4	5
Permitted Phases		3			4 5 6	1 4 5		
Detector Phase	3	3	2		1	6		
Switch Phase								
Minimum Initial (s)	4.0	4.0	20.0		4.0	20.0	4.0	4.0
Minimum Split (s)	24.5	24.5	25.5		10.0	25.5	24.5	10.0
Total Split (s)	25.0	25.0	40.0	0.0	10.0	40.0	35.0	10.0
Total Split (%)	22.7%	22.7%	36.4%	0.0%	9.1%	36.4%	32%	9%
Yellow Time (s)	3.0	3.0	3.5		3.5	3.5	3.0	3.5
All-Red Time (s)	1.5	1.5	2.0		2.0	2.0	1.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	5.5	4.0	5.5	5.5		
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	Min		None	Min	None	None
Act Effct Green (s)	8.6	8.6	40.3		50.6	56.3		
Actuated g/C Ratio	0.12	0.12	0.57		0.71	0.79		
v/c Ratio	0.29	0.58	0.64		0.17	0.56		
Control Delay	33.8	45.1	21.2		4.2	4.8		
Queue Delay	0.0	0.0	0.0		0.2	1.6		
Total Delay	33.8	45.1	21.2		4.4	6.4		
LOS	C	D	C		A	A		
Approach Delay	41.1		21.2			6.3		
Approach LOS	D		C			A		
Queue Length 50th (ft)	25	47	232		9	109		
Queue Length 95th (ft)	50	80	#441		m11	151		
Internal Link Dist (ft)	328		1267			133		
Turn Bay Length (ft)	175				65			
Base Capacity (vph)	512	443	980		422	1434		
Starvation Cap Reductn	0	0	0		92	436		
Spillback Cap Reductn	0	0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		
Reduced v/c Ratio	0.12	0.24	0.64		0.22	0.80		

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 71
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 15.4 — Intersection LOS: B
Intersection Capacity Utilization 48.5% — ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Cedar Road & Elwood Road



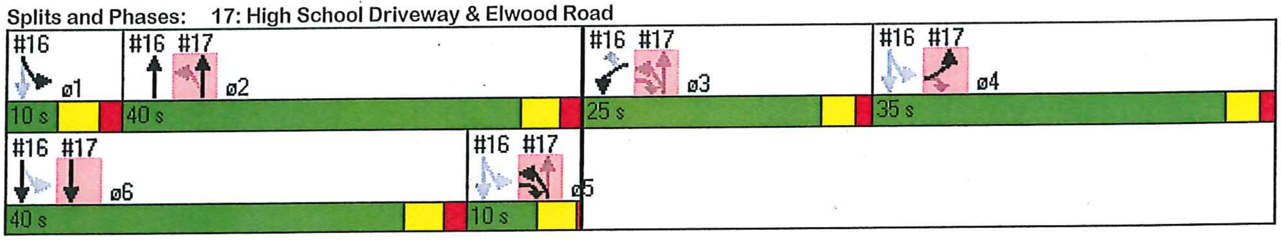
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø1	ø3
Lane Configurations								
Volume (vph)	24	129	207	397	628	37		
Satd. Flow (prot)	1986	1359	1589	1733	*1900	0		
Flt Permitted	0.950		0.258					
Satd. Flow (perm)	1986	1359	432	1733	*1900	0		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.40	0.40	0.80	0.80	0.90	0.90		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	3%	3%	6%	6%	5%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%			0%	0%			
Shared Lane Traffic (%)								
Lane Group Flow (vph)	60	322	259	496	739	0		
Turn Type		custom	custom					
Protected Phases	4	5	5	2	6		1	3
Permitted Phases		3 4	2 3	3 5				
Detector Phase	4	5	5	2	6			
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	20.0	20.0		4.0	4.0
Minimum Split (s)	24.5	10.0	10.0	25.5	25.5		10.0	24.5
Total Split (s)	35.0	10.0	10.0	40.0	40.0	0.0	10.0	25.0
Total Split (%)	31.8%	9.1%	9.1%	36.4%	36.4%	0.0%	9%	23%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5		3.5	3.0
All-Red Time (s)	1.5	0.5	0.5	2.0	2.0		2.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.0	4.0	5.5	5.5	4.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lead		Lead	Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	Min	Min		None	None
Act Effct Green (s)	6.7	25.6	48.0	51.0	35.6			
Actuated g/C Ratio	0.09	0.36	0.68	0.72	0.50			
v/c Ratio	0.32	0.66	0.66	0.40	0.78			
Control Delay	37.3	24.5	13.4	2.4	25.5			
Queue Delay	0.0	2.3	0.0	0.6	0.0			
Total Delay	37.3	26.9	13.4	3.0	25.5			
LOS	D	C	B	A	C			
Approach Delay	28.5			6.6	25.5			
Approach LOS	C			A	C			
Queue Length 50th (ft)	27	112	20	20	285			
Queue Length 95th (ft)	27	65	39	19	#571			
Internal Link Dist (ft)	299			133	434			
Turn Bay Length (ft)			68					
Base Capacity (vph)	880	490	393	1244	952			
Starvation Cap Reductn	0	0	0	402	0			
Spillback Cap Reductn	0	77	0	0	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.07	0.78	0.66	0.59	0.78			

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 71
Natural Cycle: 105
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 18.5 Intersection LOS: B
Intersection Capacity Utilization 61.8% ICU Level of Service B
Analysis Period (min) 15
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 17: High School Driveway & Elwood Road

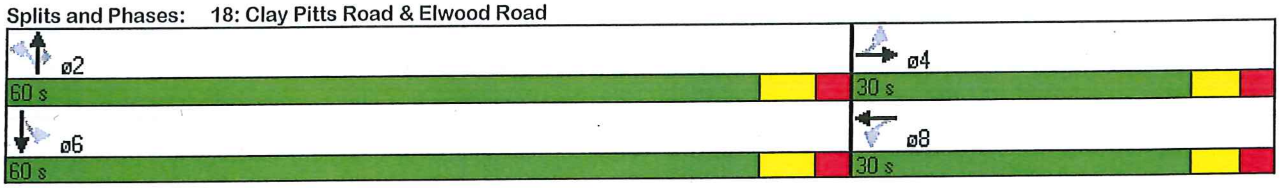


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	155	56	57	330	66	80	300	33	69	533	54
Satd. Flow (prot)	0	1710	0	1719	1764	0	1687	1776	1509	1719	1784	0
Flt Permitted		0.777		0.525			0.188			0.530		
Satd. Flow (perm)	0	1336	0	950	1764	0	334	1776	1509	959	1784	0
Satd. Flow (RTOR)		17			11				36		10	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.77	0.77	0.77	0.80	0.80	0.80	0.91	0.91	0.91	0.84	0.84	0.84
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	5%	5%	5%	7%	7%	7%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	306	0	71	494	0	88	330	36	82	699	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		18.0	18.0	18.0	18.0	18.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		24.5	24.5	24.5	24.5	24.5	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	60.0	60.0	60.0	60.0	60.0	0.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%	66.7%	66.7%	66.7%	66.7%	66.7%	0.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.5	6.5	6.5	6.5	6.5	4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Act Effct Green (s)		24.5		24.5	24.5		32.1	32.1	32.1	32.1	32.1	
Actuated g/C Ratio		0.35		0.35	0.35		0.46	0.46	0.46	0.46	0.46	
v/c Ratio		0.63		0.21	0.78		0.57	0.40	0.05	0.18	0.84	
Control Delay		28.4		22.0	33.6		28.6	13.1	3.2	10.9	25.8	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		28.4		22.0	33.6		28.6	13.1	3.2	10.9	25.8	
LOS		C		C	C		C	B	A	B	C	
Approach Delay		28.4			32.1			15.3			24.2	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		99		20	178		25	86	0	19	239	
Queue Length 95th (ft)		195		58	#378		73	136	12	38	320	
Internal Link Dist (ft)		755			973			516			398	
Turn Bay Length (ft)				100			100		200	180		
Base Capacity (vph)		483		336	631		263	1400	1197	756	1408	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.63		0.21	0.78		0.33	0.24	0.03	0.11	0.50	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 69.4
Natural Cycle: 65
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 25.0 — Intersection LOS: C
Intersection Capacity Utilization 95.4% — ICU Level of Service F
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 18: Clay Pitts Road & Elwood Road



21: Site Access & Elwood Road
HCM Unsignalized Intersection Capacity Analysis

Build 2016
AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	1	31	6	1	24	17	487	11	10	721	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.68	0.68	0.68	0.94	0.94	0.94	0.95	0.95	0.95
Hourly flow rate (vph)	22	1	34	9	1	35	18	518	12	11	759	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1382	1352	765	1380	1352	524	771			530		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1382	1352	765	1380	1352	524	771			530		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.4	2.2			2.2		
p0 queue free %	80	99	92	92	99	94	98			99		
cM capacity (veh/h)	110	145	403	105	145	544	844			1037		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	23	34	46	548	781
Volume Left	22	0	9	18	11
Volume Right	0	34	35	12	12
cSH	111	403	287	844	1037
Volume to Capacity	0.21	0.08	0.16	0.02	0.01
Queue Length 95th (ft)	18	7	14	2	1
Control Delay (s)	45.6	14.7	19.9	0.6	0.3
Lane LOS	E	B	C	A	A
Approach Delay (s)	27.2		19.9	0.6	0.3
Approach LOS	D		C		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

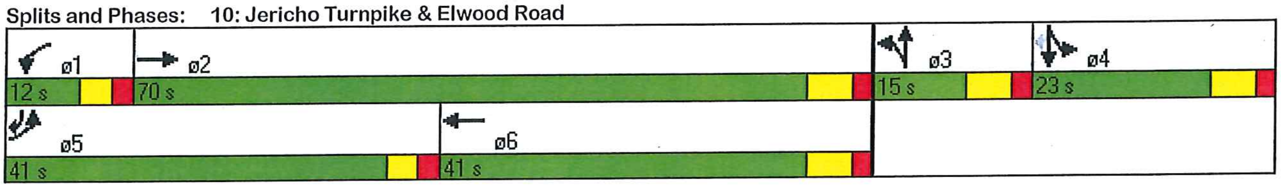
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↑↱		↰	↱		↰	↱	↱
Volume (vph)	574	1640	63	24	1056	223	80	44	14	253	63	409
Satd. Flow (prot)	1770	*3000	0	1770	*4300	0	*2000	1813	0	*2400	*2300	1440
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	*3000	0	1770	*4300	0	*2000	1813	0	*2400	*2300	1440
Satd. Flow (RTOR)		5			38			10				
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.82	0.82	0.82	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	3%	1%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												43%
Lane Group Flow (vph)	624	1851	0	27	1438	0	98	71	0	264	249	243
Turn Type	Prot			Prot			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases												4
Detector Phase	5	2		1	6		3	3		4	4	5
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		6.0	6.0		10.0	10.0	4.0
Minimum Split (s)	10.0	29.3		10.0	32.3		36.3	36.3		17.3	17.3	10.0
Total Split (s)	41.0	70.0	0.0	12.0	41.0	0.0	15.0	15.0	0.0	23.0	23.0	41.0
Total Split (%)	34.2%	58.3%	0.0%	10.0%	34.2%	0.0%	12.5%	12.5%	0.0%	19.2%	19.2%	34.2%
Yellow Time (s)	3.0	4.3		3.0	4.3		4.3	4.3		4.3	4.3	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.3	4.0	5.0	6.3	4.0	6.3	6.3	4.0	6.3	6.3	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	Min	C-Max		None	C-Max		None	None		Min	Min	Min
Act Effct Green (s)	37.0	69.6		6.0	34.7		8.4	8.4		16.0	16.0	59.3
Actuated g/C Ratio	0.31	0.58		0.05	0.29		0.07	0.07		0.13	0.13	0.49
v/c Ratio	1.14	1.06		0.30	1.13		0.70	0.52		0.82	0.81	0.34
Control Delay	108.8	66.9		63.5	108.3		79.9	59.9		71.8	71.2	20.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	108.8	66.9		63.5	108.3		79.9	59.9		71.8	71.2	20.3
LOS	F	E		E	F		E	E		E	E	C
Approach Delay		77.5			107.5			71.5			55.1	
Approach LOS		E			F			E			E	
Queue Length 50th (ft)	~563	~886		21	~467		75	46		201	198	117
Queue Length 95th (ft)	m#663	m#933		51	#554		#130	87		#326	#325	182
Internal Link Dist (ft)		214			401			45			654	
Turn Bay Length (ft)				200						475		475
Base Capacity (vph)	545	1742		103	1270		145	141		334	320	711
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.14	1.06		0.26	1.13		0.68	0.50		0.79	0.78	0.34

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 10 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 82.8 — Intersection LOS: F
Intersection Capacity Utilization 96.1% — ICU Level of Service F
Analysis Period (min) 15
* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Jericho Turnpike & Elwood Road



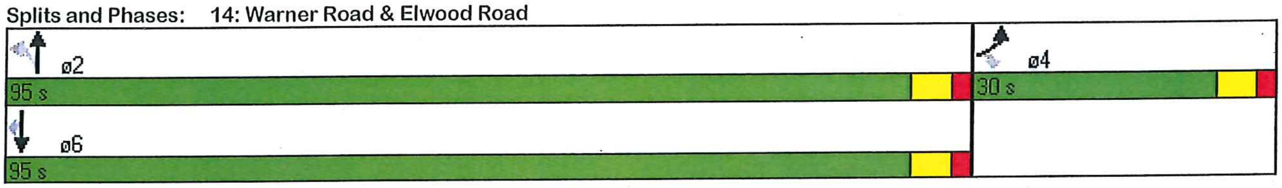
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	177	31	25	954	855	95
Satd. Flow (prot)	1770	1794	1652	*1400	1801	1636
Flt Permitted	0.950		0.234			
Satd. Flow (perm)	1770	1794	407	*1400	1801	1636
Satd. Flow (RTOR)		32				102
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.95	0.95	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	203	36	26	1004	919	102
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.0	23.0	23.5	23.5	23.0	23.0
Total Split (s)	30.0	30.0	95.0	95.0	95.0	95.0
Total Split (%)	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	19.1	19.1	93.9	93.9	93.9	93.9
Actuated g/C Ratio	0.15	0.15	0.75	0.75	0.75	0.75
v/c Ratio	0.75	0.12	0.08	0.95	0.68	0.08
Control Delay	67.6	16.8	5.8	34.8	11.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	59.6	1.1
Total Delay	67.6	16.8	5.8	34.8	71.5	2.2
LOS	E	B	A	C	E	A
Approach Delay	60.0			34.1	64.5	
Approach LOS	E			C	E	
Queue Length 50th (ft)	158	3	5	630	333	0
Queue Length 95th (ft)	225	31	16	#1106	547	15
Internal Link Dist (ft)	786			511	145	
Turn Bay Length (ft)		100	150			
Base Capacity (vph)	340	370	306	1052	1353	1255
Starvation Cap Reductn	0	0	0	0	534	979
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.10	0.08	0.95	1.12	0.37

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 80 (64%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 50.4 — Intersection LOS: D
Intersection Capacity Utilization 70.0% — ICU Level of Service C
Analysis Period (min) 15
* User Entered Value

 # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Warner Road & Elwood Road



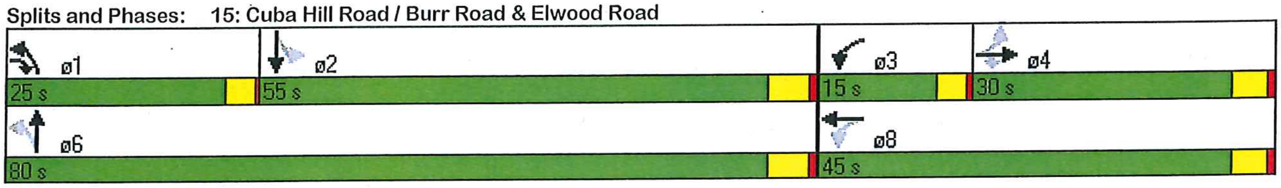
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	271	338	69	191	27	265	799	67	34	543	24
Satd. Flow (prot)	1652	1801	1478	1711	1766	0	1652	1779	0	1711	*1400	0
Flt Permitted	0.599			0.227			0.231			0.206		
Satd. Flow (perm)	1041	1801	1478	409	1766	0	*325	1779	0	371	*1400	0
Satd. Flow (RTOR)			237		6			6			2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.84	0.84	0.84	0.96	0.96	0.96	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	279	348	82	259	0	276	902	0	36	597	0
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		
Protected Phases		4	1	3	8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	3	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0	2.0	2.0	8.0		2.0	16.0		14.0	14.0	
Minimum Split (s)	22.5	22.5	12.0	11.5	26.5		12.0	23.0		28.0	28.0	
Total Split (s)	30.0	30.0	25.0	15.0	45.0	0.0	25.0	80.0	0.0	55.0	55.0	0.0
Total Split (%)	24.0%	24.0%	20.0%	12.0%	36.0%	0.0%	20.0%	64.0%	0.0%	44.0%	44.0%	0.0%
Yellow Time (s)	3.5	3.5	3.0	3.0	3.5		3.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	0.5	0.5	1.0		0.5	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	3.5	4.5	4.0	3.5	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		Min	Min	
Act Effct Green (s)	20.9	20.9	37.8	30.7	29.7		69.0	67.5		51.6	51.6	
Actuated g/C Ratio	0.20	0.20	0.35	0.29	0.28		0.65	0.63		0.48	0.48	
v/c Ratio	0.06	0.79	0.52	0.40	0.52		0.76	0.80		0.20	0.88	
Control Delay	39.1	59.6	11.4	34.2	35.8		25.5	23.6		25.1	44.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.9	30.4		0.0	0.0	
Total Delay	39.1	59.6	11.4	34.2	35.8		26.5	54.0		25.1	44.7	
LOS	D	E	B	C	D		C	D		C	D	
Approach Delay		33.0			35.4			47.5			43.6	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	7	183	53	41	142		81	462		15	377	
Queue Length 95th (ft)	28	#335	139	80	223		173	773		48	#757	
Internal Link Dist (ft)		284			581			145			2110	
Turn Bay Length (ft)	100			175			150			100		
Base Capacity (vph)	254	439	788	261	687		483	1277		179	677	
Starvation Cap Reductn	0	0	0	0	0		63	417		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.64	0.44	0.31	0.38		0.66	1.05		0.20	0.88	

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 106.9
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 41.8 — Intersection LOS: D
Intersection Capacity Utilization 92.0% — ICU Level of Service F
Analysis Period (min) 15
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 15: Cuba Hill Road / Burr Road & Elwood Road



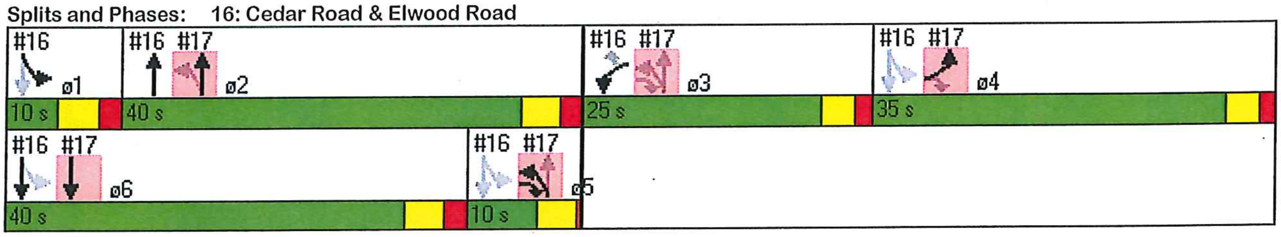
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø4	ø5
Lane Configurations								
Volume (vph)	37	82	785	57	51	593		
Satd. Flow (prot)	1770	1531	1784	0	1770	1863		
Flt Permitted	0.950				0.144			
Satd. Flow (perm)	1770	1531	1784	0	268	1863		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.93	0.93	0.96	0.96	0.91	0.91		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	40	88	877	0	56	652		
Turn Type		Perm			custom			
Protected Phases	3		2		1	6	4	5
Permitted Phases		3			4 5 6	1 4 5		
Detector Phase	3	3	2		1	6		
Switch Phase								
Minimum Initial (s)	4.0	4.0	20.0		4.0	20.0	4.0	4.0
Minimum Split (s)	24.5	24.5	25.5		10.0	25.5	24.5	10.0
Total Split (s)	25.0	25.0	40.0	0.0	10.0	40.0	35.0	10.0
Total Split (%)	22.7%	22.7%	36.4%	0.0%	9.1%	36.4%	32%	9%
Yellow Time (s)	3.0	3.0	3.5		3.5	3.5	3.0	3.5
All-Red Time (s)	1.5	1.5	2.0		2.0	2.0	1.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	5.5	4.0	5.5	5.5		
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	Min		None	Min	None	None
Act Effct Green (s)	7.3	7.3	42.3		47.5	49.6		
Actuated g/C Ratio	0.11	0.11	0.66		0.74	0.78		
v/c Ratio	0.20	0.51	0.74		0.19	0.45		
Control Delay	28.9	37.9	18.9		3.5	3.0		
Queue Delay	0.0	0.0	0.0		0.0	0.4		
Total Delay	28.9	37.9	18.9		3.5	3.4		
LOS	C	D	B		A	A		
Approach Delay	35.1		18.9			3.4		
Approach LOS	D		B			A		
Queue Length 50th (ft)	14	32	246		3	41		
Queue Length 95th (ft)	44	82	#692		m7	65		
Internal Link Dist (ft)	328		1281			133		
Turn Bay Length (ft)	175				65			
Base Capacity (vph)	574	497	1182		306	1448		
Starvation Cap Reductn	0	0	0		0	340		
Spillback Cap Reductn	0	0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		
Reduced v/c Ratio	0.07	0.18	0.74		0.18	0.59		

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 63.8
Natural Cycle: 125
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 13.7 — Intersection LOS: B
Intersection Capacity Utilization 58.2% — ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Cedar Road & Elwood Road

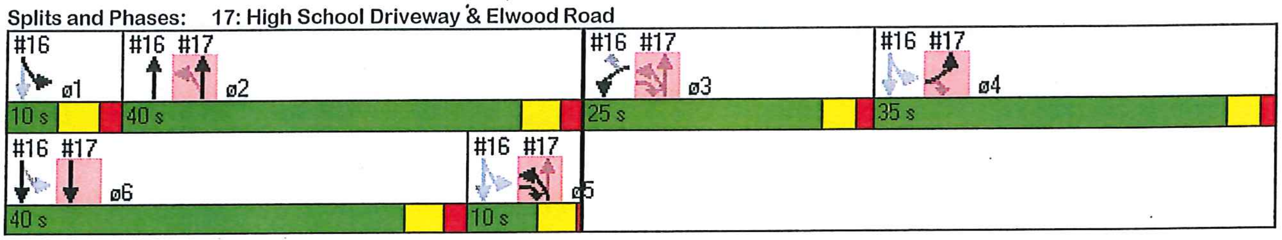


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø1	ø3
Lane Configurations								
Volume (vph)	14	94	71	796	550	16		
Satd. Flow (prot)	1912	1372	1652	1801	1791	0		
Flt Permitted	0.950		0.395					
Satd. Flow (perm)	1912	1372	687	1801	1791	0		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.71	0.71	0.95	0.95	0.94	0.94		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	7%	2%	2%	2%	2%	6%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%			0%	0%			
Shared Lane Traffic (%)								
Lane Group Flow (vph)	20	132	75	838	602	0		
Turn Type		custom	custom					
Protected Phases	4	5	5	2	6		1	3
Permitted Phases		3 4	2 3	3 5				
Detector Phase	4	5	5	2	6			
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	20.0	20.0		4.0	4.0
Minimum Split (s)	24.5	10.0	10.0	25.5	25.5		10.0	24.5
Total Split (s)	35.0	10.0	10.0	40.0	40.0	0.0	10.0	25.0
Total Split (%)	31.8%	9.1%	9.1%	36.4%	36.4%	0.0%	9%	23%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5		3.5	3.0
All-Red Time (s)	1.5	0.5	0.5	2.0	2.0		2.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.0	4.0	5.5	5.5	4.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lead		Lead	Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	Min	Min		None	None
Act Effct Green (s)	5.3	17.6	50.1	53.3	36.6			
Actuated g/C Ratio	0.08	0.28	0.79	0.84	0.57			
v/c Ratio	0.13	0.35	0.12	0.56	0.59			
Control Delay	31.4	19.2	0.7	2.4	14.4			
Queue Delay	0.0	0.0	0.1	0.6	0.0			
Total Delay	31.4	19.2	0.9	3.0	14.4			
LOS	C	B	A	A	B			
Approach Delay	20.8			2.8	14.4			
Approach LOS	C			A	B			
Queue Length 50th (ft)	7	39	1	24	132			
Queue Length 95th (ft)	23	57	m1	64	357			
Internal Link Dist (ft)	299			133	434			
Turn Bay Length (ft)			68					
Base Capacity (vph)	923	382	633	1505	1026			
Starvation Cap Reductn	0	0	169	300	0			
Spillback Cap Reductn	0	0	0	0	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.02	0.35	0.16	0.70	0.59			

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 63.8
Natural Cycle: 125
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 8.6 — Intersection LOS: A
Intersection Capacity Utilization 53.6% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: High School Driveway & Elwood Road



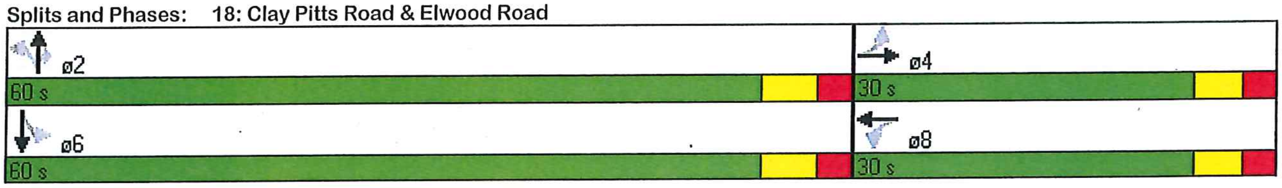
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	293	72	42	173	98	85	593	118	92	417	25
Satd. Flow (prot)	0	1809	0	1770	1762	0	1770	*1950	1583	1770	1848	0
Flt Permitted		0.915		0.431			0.349			0.193		
Satd. Flow (perm)	0	1665	0	803	1762	0	650	*1950	1583	360	1848	0
Satd. Flow (RTOR)		11			31				133		6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.91	0.91	0.91	0.89	0.89	0.89	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	437	0	46	298	0	96	666	133	105	502	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		18.0	18.0	18.0	18.0	18.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		24.5	24.5	24.5	24.5	24.5	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	60.0	60.0	60.0	60.0	60.0	0.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%	66.7%	66.7%	66.7%	66.7%	66.7%	0.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.5	6.5	6.5	6.5	6.5	4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Act Effct Green (s)		24.4		24.4	24.4		28.6	28.6	28.6	28.6	28.6	
Actuated g/C Ratio		0.37		0.37	0.37		0.44	0.44	0.44	0.44	0.44	
v/c Ratio		0.70		0.15	0.44		0.34	0.79	0.17	0.67	0.62	
Control Delay		27.4		19.1	18.6		15.1	22.8	2.6	36.7	17.3	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		27.4		19.1	18.6		15.1	22.8	2.6	36.7	17.3	
LOS		C		B	B		B	C	A	D	B	
Approach Delay		27.4			18.6			18.9			20.7	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		139		12	76		24	214	0	32	144	
Queue Length 95th (ft)		#360		43	184		54	317	22	88	215	
Internal Link Dist (ft)		755			973			516			398	
Turn Bay Length (ft)				100			100		200	180		
Base Capacity (vph)		626		298	674		552	1657	1365	306	1571	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.70		0.15	0.44		0.17	0.40	0.10	0.34	0.32	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 65.7
Natural Cycle: 60
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 21.0 — Intersection LOS: C
Intersection Capacity Utilization 105.0% — ICU Level of Service G
Analysis Period (min) 15
* User Entered Value
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 18: Clay Pitts Road & Elwood Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑↱		↰	↱		↰	↱	↱
Volume (vph)	601	1689	65	25	1088	235	82	45	14	264	65	426
Satd. Flow (prot)	1770	*3000	0	1770	*4300	0	*2000	1815	0	*2400	*2300	1440
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	*3000	0	1770	*4300	0	*2000	1815	0	*2400	*2300	1440
Satd. Flow (RTOR)		5			40			10				
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.82	0.82	0.82	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	3%	1%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												44%
Lane Group Flow (vph)	653	1907	0	28	1486	0	100	72	0	275	263	249
Turn Type	Prot			Prot			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases												4
Detector Phase	5	2		1	6		3	3		4	4	5
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		6.0	6.0		10.0	10.0	4.0
Minimum Split (s)	10.0	29.3		10.0	32.3		36.3	36.3		17.3	17.3	10.0
Total Split (s)	41.0	70.0	0.0	12.0	41.0	0.0	15.0	15.0	0.0	23.0	23.0	41.0
Total Split (%)	34.2%	58.3%	0.0%	10.0%	34.2%	0.0%	12.5%	12.5%	0.0%	19.2%	19.2%	34.2%
Yellow Time (s)	3.0	4.3		3.0	4.3		4.3	4.3		4.3	4.3	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.3	4.0	5.0	6.3	4.0	6.3	6.3	4.0	6.3	6.3	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	Min	C-Max		None	C-Max		None	None		Min	Min	Min
Act Effct Green (s)	36.8	69.4		6.0	34.7		8.5	8.5		16.2	16.2	59.2
Actuated g/C Ratio	0.31	0.58		0.05	0.29		0.07	0.07		0.14	0.14	0.49
v/c Ratio	1.20	1.10		0.31	1.17		0.71	0.52		0.85	0.85	0.35
Control Delay	132.4	80.2		64.0	122.2		80.7	60.3		74.6	75.2	20.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	132.4	80.2		64.0	122.2		80.7	60.3		74.6	75.2	20.5
LOS	F	F		E	F		F	E		E	E	C
Approach Delay		93.5			121.1			72.2			57.7	
Approach LOS		F			F			E			E	
Queue Length 50th (ft)	~610	~934		21	~495		77	47		210	211	121
Queue Length 95th (ft)	m#695	m#958		53	#582		#135	87		#347	#352	187
Internal Link Dist (ft)		214			401			45			654	
Turn Bay Length (ft)				200						475		475
Base Capacity (vph)	542	1737		103	1272		145	141		334	320	711
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.20	1.10		0.27	1.17		0.69	0.51		0.82	0.82	0.35

Intersection Summary

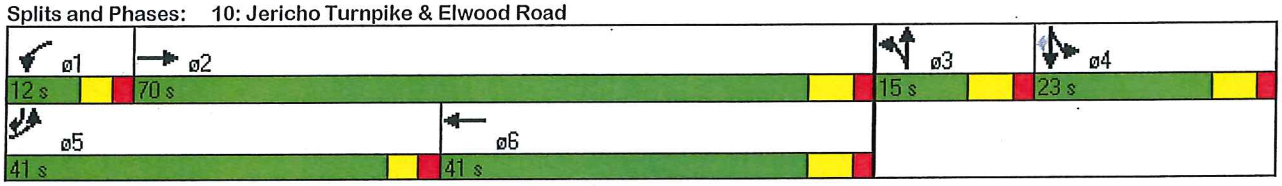
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 10 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 95.5 — Intersection LOS: F
Intersection Capacity Utilization 99.1% — ICU Level of Service F
Analysis Period (min) 15
* User Entered Value

10: Jericho Turnpike & Elwood Road
Lanes, Volumes, Timings

No Build 2016
PM Peak

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Jericho Turnpike & Elwood Road



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	182	32	26	998	889	98
Satd. Flow (prot)	1770	1794	1652	*1400	1801	1636
Flt Permitted	0.950		0.215			
Satd. Flow (perm)	1770	1794	374	*1400	1801	1636
Satd. Flow (RTOR)		32				105
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.95	0.95	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	209	37	27	1051	956	105
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.0	23.0	23.5	23.5	23.0	23.0
Total Split (s)	30.0	30.0	95.0	95.0	95.0	95.0
Total Split (%)	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	19.4	19.4	93.6	93.6	93.6	93.6
Actuated g/C Ratio	0.16	0.16	0.75	0.75	0.75	0.75
v/c Ratio	0.76	0.12	0.10	1.00	0.71	0.08
Control Delay	68.2	17.2	6.1	45.9	12.9	1.1
Queue Delay	0.0	0.0	0.0	0.0	64.9	1.1
Total Delay	68.2	17.2	6.1	45.9	77.8	2.3
LOS	E	B	A	D	E	A
Approach Delay	60.5			44.9	70.3	
Approach LOS	E			D	E	
Queue Length 50th (ft)	163	3	5	~785	367	0
Queue Length 95th (ft)	232	32	17	#1185	598	16
Internal Link Dist (ft)	786			511	145	
Turn Bay Length (ft)		100	150			
Base Capacity (vph)	340	370	280	1049	1349	1252
Starvation Cap Reductn	0	0	0	0	507	974
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.10	0.10	1.00	1.14	0.38

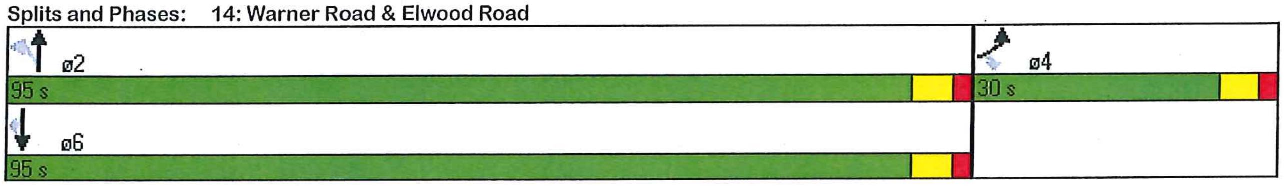
Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 80 (64%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 57.8 — Intersection LOS: E
Intersection Capacity Utilization 72.6% — ICU Level of Service C
Analysis Period (min) 15
* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Warner Road & Elwood Road



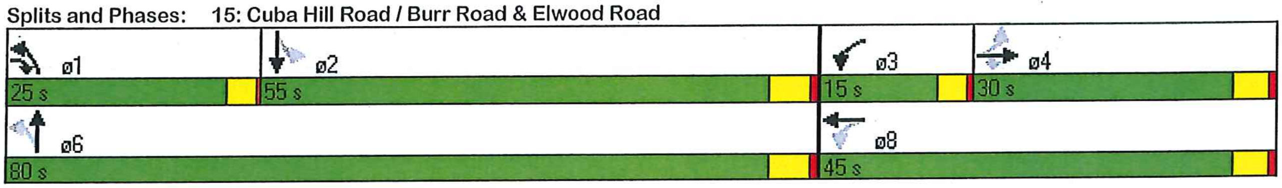
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	13	279	348	71	197	28	273	838	69	35	567	25
Satd. Flow (prot)	1652	1801	1478	1711	1768	0	1652	1781	0	1711	*1400	0
Flt Permitted	0.594			0.217			0.206			0.172		
Satd. Flow (perm)	1033	1801	1478	391	1768	0	*325	1781	0	310	*1400	0
Satd. Flow (RTOR)			221		6			6			2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.84	0.84	0.84	0.96	0.96	0.96	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	13	288	359	85	268	0	284	945	0	37	623	0
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		
Protected Phases		4	1	3	8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	3	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0	2.0	2.0	8.0		2.0	16.0		14.0	14.0	
Minimum Split (s)	22.5	22.5	12.0	11.5	26.5		12.0	23.0		28.0	28.0	
Total Split (s)	30.0	30.0	25.0	15.0	45.0	0.0	25.0	80.0	0.0	55.0	55.0	0.0
Total Split (%)	24.0%	24.0%	20.0%	12.0%	36.0%	0.0%	20.0%	64.0%	0.0%	44.0%	44.0%	0.0%
Yellow Time (s)	3.5	3.5	3.0	3.0	3.5		3.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	0.5	0.5	1.0		0.5	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	3.5	4.5	4.0	3.5	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		Min	Min	
Act Effct Green (s)	21.6	21.6	39.2	31.7	30.7		70.2	68.6		52.1	52.1	
Actuated g/C Ratio	0.20	0.20	0.36	0.29	0.28		0.64	0.63		0.48	0.48	
v/c Ratio	0.06	0.81	0.53	0.42	0.53		0.77	0.84		0.25	0.93	
Control Delay	39.8	61.2	13.3	35.2	36.6		26.9	26.3		27.9	51.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0		1.2	48.8		0.0	0.0	
Total Delay	39.8	61.2	13.3	35.2	36.6		28.1	75.1		27.9	51.7	
LOS	D	E	B	D	D		C	E		C	D	
Approach Delay		34.7			36.2			64.2			50.4	
Approach LOS		C			D			E			D	
Queue Length 50th (ft)	7	192	68	43	149		87	529		16	422	
Queue Length 95th (ft)	28	#353	160	81	231		183	#936		53	#808	
Internal Link Dist (ft)		284			581			145			2110	
Turn Bay Length (ft)	100			175			150			100		
Base Capacity (vph)	247	430	776	256	674		476	1252		148	670	
Starvation Cap Reductn	0	0	0	0	0		64	391		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.05	0.67	0.46	0.33	0.40		0.69	1.10		0.25	0.93	

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 109
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 51.0 Intersection LOS: D
Intersection Capacity Utilization 94.5% ICU Level of Service F
Analysis Period (min) 15
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 15: Cuba Hill Road / Burr Road & Elwood Road



16: Cedar Road & Elwood Road
Lanes, Volumes, Timings

No Build 2016
PM Peak

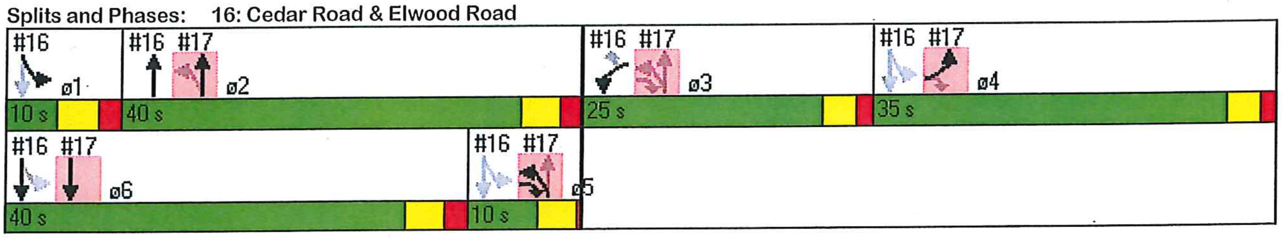
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø4	ø5
Lane Configurations								
Volume (vph)	38	84	824	59	53	619		
Satd. Flow (prot)	1770	1531	1784	0	1770	1863		
Flt Permitted	0.950				0.118			
Satd. Flow (perm)	1770	1531	1784	0	220	1863		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.93	0.93	0.96	0.96	0.91	0.91		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	41	90	919	0	58	680		
Turn Type		Perm			custom			
Protected Phases	3		2		1	6	4	5
Permitted Phases		3			4 5 6	1 4 5		
Detector Phase	3	3	2		1	6		
Switch Phase								
Minimum Initial (s)	4.0	4.0	20.0		4.0	20.0	4.0	4.0
Minimum Split (s)	24.5	24.5	25.5		10.0	25.5	24.5	10.0
Total Split (s)	25.0	25.0	40.0	0.0	10.0	40.0	35.0	10.0
Total Split (%)	22.7%	22.7%	36.4%	0.0%	9.1%	36.4%	32%	9%
Yellow Time (s)	3.0	3.0	3.5		3.5	3.5	3.0	3.5
All-Red Time (s)	1.5	1.5	2.0		2.0	2.0	1.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	5.5	4.0	5.5	5.5		
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	Min		None	Min	None	None
Act Effct Green (s)	7.3	7.3	41.9		47.0	49.2		
Actuated g/C Ratio	0.12	0.12	0.66		0.74	0.78		
v/c Ratio	0.20	0.51	0.78		0.22	0.47		
Control Delay	28.9	37.9	20.7		4.2	3.1		
Queue Delay	0.0	0.0	0.0		0.0	0.4		
Total Delay	28.9	37.9	20.7		4.2	3.5		
LOS	C	D	C		A	A		
Approach Delay	35.1		20.7			3.6		
Approach LOS	D		C			A		
Queue Length 50th (ft)	14	32	272		4	43		
Queue Length 95th (ft)	45	83	#740		m7	67		
Internal Link Dist (ft)	328		1281			133		
Turn Bay Length (ft)	175				65			
Base Capacity (vph)	580	501	1180		275	1447		
Starvation Cap Reductn	0	0	0		0	339		
Spillback Cap Reductn	0	17	0		0	0		
Storage Cap Reductn	0	0	0		0	0		
Reduced v/c Ratio	0.07	0.19	0.78		0.21	0.61		

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 63.4
Natural Cycle: 125
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 14.7 — Intersection LOS: B
Intersection Capacity Utilization 60.5% — ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Cedar Road & Elwood Road



17: High School Driveway & Elwood Road
Lanes, Volumes, Timings

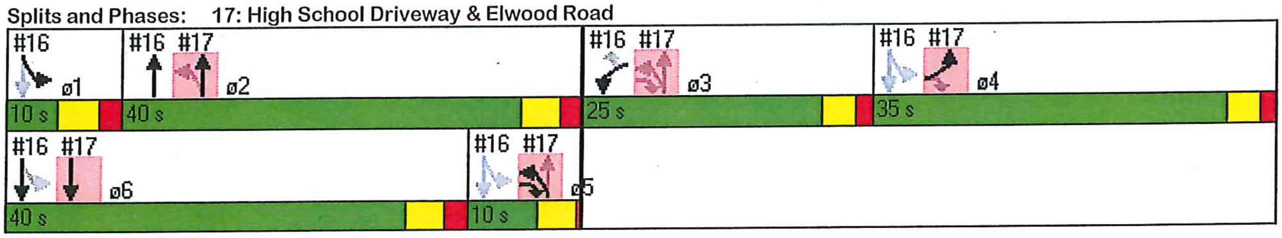
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø1	ø3
Lane Configurations								
Volume (vph)	14	97	73	835	575	16		
Satd. Flow (prot)	1912	1372	1652	1801	1792	0		
Flt Permitted	0.950		0.371					
Satd. Flow (perm)	1912	1372	645	1801	1792	0		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.71	0.71	0.95	0.95	0.94	0.94		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	7%	2%	2%	2%	2%	6%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%			0%	0%			
Shared Lane Traffic (%)								
Lane Group Flow (vph)	20	137	77	879	629	0		
Turn Type		custom	custom					
Protected Phases	4	5	5	2	6		1	3
Permitted Phases		3 4	2 3	3 5				
Detector Phase	4	5	5	2	6			
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	20.0	20.0		4.0	4.0
Minimum Split (s)	24.5	10.0	10.0	25.5	25.5		10.0	24.5
Total Split (s)	35.0	10.0	10.0	40.0	40.0	0.0	10.0	25.0
Total Split (%)	31.8%	9.1%	9.1%	36.4%	36.4%	0.0%	9%	23%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5		3.5	3.0
All-Red Time (s)	1.5	0.5	0.5	2.0	2.0		2.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.0	4.0	5.5	5.5	4.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lead		Lead	Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	Min	Min		None	None
Act Effct Green (s)	5.3	17.6	49.8	53.0	36.1			
Actuated g/C Ratio	0.08	0.28	0.79	0.84	0.57			
v/c Ratio	0.12	0.36	0.13	0.58	0.62			
Control Delay	31.4	19.4	0.8	2.9	15.3			
Queue Delay	0.0	0.0	0.1	0.7	0.0			
Total Delay	31.4	19.4	0.9	3.5	15.3			
LOS	C	B	A	A	B			
Approach Delay	20.9			3.3	15.3			
Approach LOS	C			A	B			
Queue Length 50th (ft)	7	40	1	24	142			
Queue Length 95th (ft)	23	59	m1	89	#399			
Internal Link Dist (ft)	299			133	434			
Turn Bay Length (ft)			68					
Base Capacity (vph)	931	385	605	1505	1021			
Starvation Cap Reductn	0	0	154	296	0			
Spillback Cap Reductn	0	0	0	0	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.02	0.36	0.17	0.73	0.62			

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 63.4
Natural Cycle: 125
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 9.2 — Intersection LOS: A
Intersection Capacity Utilization 55.6% — ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: High School Driveway & Elwood Road



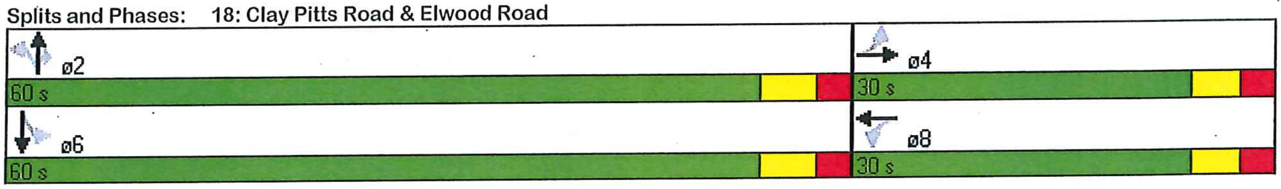
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	302	74	43	178	101	88	626	122	95	438	26
Satd. Flow (prot)	0	1809	0	1770	1762	0	1770	*1950	1583	1770	1846	0
Flt Permitted		0.911		0.410			0.332			0.173		
Satd. Flow (perm)	0	1658	0	764	1762	0	618	*1950	1583	322	1846	0
Satd. Flow (RTOR)		11			31				137		6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.91	0.91	0.91	0.89	0.89	0.89	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	451	0	47	307	0	99	703	137	108	528	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		18.0	18.0	18.0	18.0	18.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		24.5	24.5	24.5	24.5	24.5	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	60.0	60.0	60.0	60.0	60.0	0.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%	66.7%	66.7%	66.7%	66.7%	66.7%	0.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.5	6.5	6.5	6.5	6.5	4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Act Effct Green (s)		24.5		24.5	24.5		30.5	30.5	30.5	30.5	30.5	
Actuated g/C Ratio		0.36		0.36	0.36		0.45	0.45	0.45	0.45	0.45	
v/c Ratio		0.74		0.17	0.47		0.35	0.80	0.17	0.74	0.63	
Control Delay		30.9		20.8	20.2		15.2	23.1	2.4	46.7	17.2	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		30.9		20.8	20.2		15.2	23.1	2.4	46.7	17.2	
LOS		C		C	C		B	C	A	D	B	
Approach Delay		30.9			20.2			19.2			22.2	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		152		13	83		25	233	0	35	155	
Queue Length 95th (ft)		#405		47	204		56	341	22	#114	228	
Internal Link Dist (ft)		755			973			516			398	
Turn Bay Length (ft)				100			100		200	180		
Base Capacity (vph)		606		276	657		498	1570	1302	259	1488	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.74		0.17	0.47		0.20	0.45	0.11	0.42	0.35	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 67.7
Natural Cycle: 65
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 22.4 Intersection LOS: C
Intersection Capacity Utilization 107.9% ICU Level of Service G
Analysis Period (min) 15
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 18: Clay Pitts Road & Elwood Road



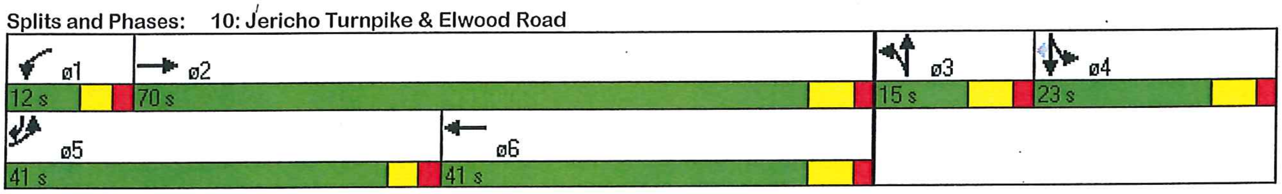
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	619	1689	65	25	1088	246	82	45	14	271	65	438
Satd. Flow (prot)	1770	*3000	0	1770	*4300	0	*2000	1815	0	*2400	*2300	1440
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	*3000	0	1770	*4300	0	*2000	1815	0	*2400	*2300	1440
Satd. Flow (RTOR)		5			43			10				
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.82	0.82	0.82	0.96	0.96	0.96
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	3%	1%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												44%
Lane Group Flow (vph)	673	1907	0	28	1498	0	100	72	0	282	269	255
Turn Type	Prot			Prot			Split			Split		pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases												4
Detector Phase	5	2		1	6		3	3		4	4	5
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		6.0	6.0		10.0	10.0	4.0
Minimum Split (s)	10.0	29.3		10.0	32.3		36.3	36.3		17.3	17.3	10.0
Total Split (s)	41.0	70.0	0.0	12.0	41.0	0.0	15.0	15.0	0.0	23.0	23.0	41.0
Total Split (%)	34.2%	58.3%	0.0%	10.0%	34.2%	0.0%	12.5%	12.5%	0.0%	19.2%	19.2%	34.2%
Yellow Time (s)	3.0	4.3		3.0	4.3		4.3	4.3		4.3	4.3	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	6.3	4.0	5.0	6.3	4.0	6.3	6.3	4.0	6.3	6.3	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lead		Lag	Lag	Lead
Lead-Lag Optimize?												
Recall Mode	Min	C-Max		None	C-Max		None	None		Min	Min	Min
Act Effct Green (s)	36.7	69.3		6.0	34.7		8.5	8.5		16.3	16.3	59.2
Actuated g/C Ratio	0.31	0.58		0.05	0.29		0.07	0.07		0.14	0.14	0.49
v/c Ratio	1.24	1.10		0.31	1.18		0.71	0.52		0.87	0.86	0.36
Control Delay	149.0	80.9		64.0	125.1		80.7	60.3		76.5	76.8	20.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	149.0	80.9		64.0	125.1		80.7	60.3		76.5	76.8	20.6
LOS	F	F		E	F		F	E		E	E	C
Approach Delay		98.7			124.0			72.2			58.9	
Approach LOS		F			F			E			E	
Queue Length 50th (ft)	~643	~934		21	~501		77	47		216	216	124
Queue Length 95th (ft)	m#731	m#959		53	#589		#135	87		#359	#365	192
Internal Link Dist (ft)		214			401			45			654	
Turn Bay Length (ft)				200						475		475
Base Capacity (vph)	541	1735		103	1274		145	141		334	320	711
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.24	1.10		0.27	1.18		0.69	0.51		0.84	0.84	0.36

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 10 (8%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.24
Intersection Signal Delay: 99.1 — Intersection LOS: F
Intersection Capacity Utilization 100.7% — ICU Level of Service G
Analysis Period (min) 15
* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Jericho Turnpike & Elwood Road



14: Warner Road & Elwood Road
Lanes, Volumes, Timings

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	182	32	26	1027	908	98
Satd. Flow (prot)	1770	1794	1652	*1400	1801	1636
Flt Permitted	0.950		0.205			
Satd. Flow (perm)	1770	1794	356	*1400	1801	1636
Satd. Flow (RTOR)		32				105
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.95	0.95	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	209	37	27	1081	976	105
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.0	23.0	23.5	23.5	23.0	23.0
Total Split (s)	30.0	30.0	95.0	95.0	95.0	95.0
Total Split (%)	24.0%	24.0%	76.0%	76.0%	76.0%	76.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	19.4	19.4	93.6	93.6	93.6	93.6
Actuated g/C Ratio	0.16	0.16	0.75	0.75	0.75	0.75
v/c Ratio	0.76	0.12	0.10	1.03	0.72	0.08
Control Delay	68.2	17.2	6.2	53.8	13.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	66.8	1.1
Total Delay	68.2	17.2	6.2	53.8	80.2	2.3
LOS	E	B	A	D	F	A
Approach Delay	60.5			52.7	72.6	
Approach LOS	E			D	E	
Queue Length 50th (ft)	163	3	5	~941	384	0
Queue Length 95th (ft)	232	32	17	#1237	628	16
Internal Link Dist (ft)	786			511	145	
Turn Bay Length (ft)		100	150			
Base Capacity (vph)	340	370	267	1049	1349	1252
Starvation Cap Reductn	0	0	0	0	493	974
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.10	0.10	1.03	1.14	0.38

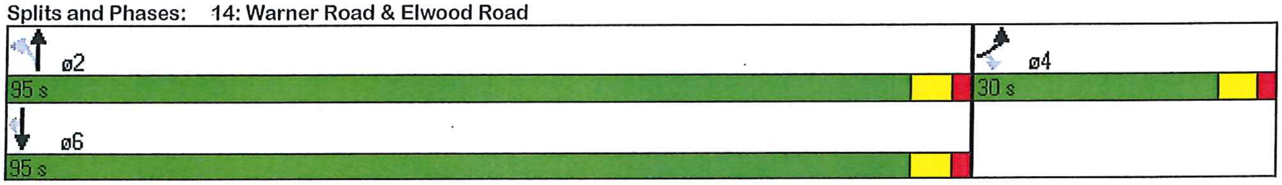
Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 80 (64%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 62.3 — Intersection LOS: E
Intersection Capacity Utilization 74.1% — ICU Level of Service D
Analysis Period (min) 15
* User Entered Value

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 14: Warner Road & Elwood Road



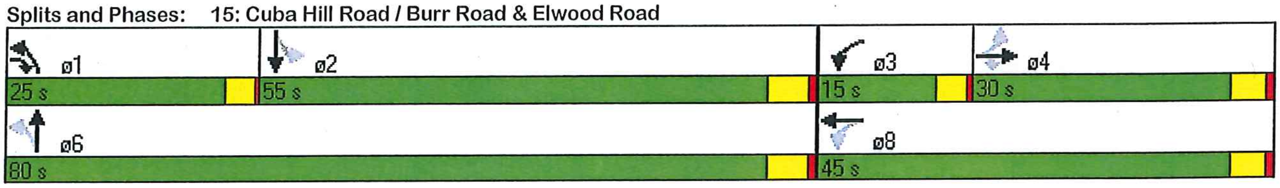
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	279	348	71	197	31	273	867	69	37	586	27
Satd. Flow (prot)	1652	1801	1478	1711	1765	0	1652	1781	0	1711	*1400	0
Flt Permitted	0.592			0.215			0.193			0.151		
Satd. Flow (perm)	1029	1801	1478	387	1765	0	*325	1781	0	272	*1400	0
Satd. Flow (RTOR)			213		7			6			2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.84	0.84	0.84	0.96	0.96	0.96	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	288	359	85	272	0	284	975	0	39	645	0
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		
Protected Phases		4	1	3	8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	3	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0	2.0	2.0	8.0		2.0	16.0		14.0	14.0	
Minimum Split (s)	22.5	22.5	12.0	11.5	26.5		12.0	23.0		28.0	28.0	
Total Split (s)	30.0	30.0	25.0	15.0	45.0	0.0	25.0	80.0	0.0	55.0	55.0	0.0
Total Split (%)	24.0%	24.0%	20.0%	12.0%	36.0%	0.0%	20.0%	64.0%	0.0%	44.0%	44.0%	0.0%
Yellow Time (s)	3.5	3.5	3.0	3.0	3.5		3.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	0.5	0.5	1.0		0.5	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	3.5	4.5	4.0	3.5	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		Min	Min	
Act Effct Green (s)	21.8	21.8	39.4	31.9	30.9		71.3	69.8		53.2	53.2	
Actuated g/C Ratio	0.20	0.20	0.36	0.29	0.28		0.65	0.63		0.48	0.48	
v/c Ratio	0.08	0.81	0.54	0.42	0.55		0.78	0.86		0.30	0.95	
Control Delay	40.4	62.0	14.2	35.8	37.2		27.1	28.2		30.8	56.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		1.2	68.1		0.0	0.0	
Total Delay	40.4	62.0	14.2	35.8	37.2		28.3	96.3		30.8	56.1	
LOS	D	E	B	D	D		C	F		C	E	
Approach Delay		35.6			36.9			80.9			54.7	
Approach LOS		D			D			F			D	
Queue Length 50th (ft)	10	206	81	46	164		91	589		18	463	
Queue Length 95th (ft)	31	#353	166	81	234		183	#991		59	#847	
Internal Link Dist (ft)		284			581			145			2110	
Turn Bay Length (ft)	100			175			150			100		
Base Capacity (vph)	243	425	767	253	665		474	1237		131	676	
Starvation Cap Reductn	0	0	0	0	0		64	385		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.07	0.68	0.47	0.34	0.41		0.69	1.14		0.30	0.95	

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 110.4
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 59.4 — Intersection LOS: E
Intersection Capacity Utilization 96.2% — ICU Level of Service F
Analysis Period (min) 15
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 15: Cuba Hill Road / Burr Road & Elwood Road



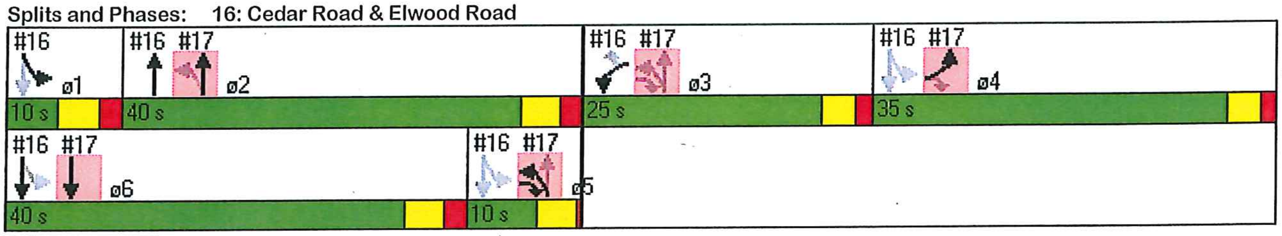
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT	ø4	ø5
Lane Configurations								
Volume (vph)	44	84	835	63	53	636		
Satd. Flow (prot)	1770	1531	1783	0	1770	1863		
Flt Permitted	0.950				0.108			
Satd. Flow (perm)	1770	1531	1783	0	201	1863		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.93	0.93	0.96	0.96	0.91	0.91		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Shared Lane Traffic (%)								
Lane Group Flow (vph)	47	90	936	0	58	699		
Turn Type		Perm			custom			
Protected Phases	3		2		1	6	4	5
Permitted Phases		3			4 5 6	1 4 5		
Detector Phase	3	3	2		1	6		
Switch Phase								
Minimum Initial (s)	4.0	4.0	20.0		4.0	20.0	4.0	4.0
Minimum Split (s)	24.5	24.5	25.5		10.0	25.5	24.5	10.0
Total Split (s)	25.0	25.0	40.0	0.0	10.0	40.0	35.0	10.0
Total Split (%)	22.7%	22.7%	36.4%	0.0%	9.1%	36.4%	32%	9%
Yellow Time (s)	3.0	3.0	3.5		3.5	3.5	3.0	3.5
All-Red Time (s)	1.5	1.5	2.0		2.0	2.0	1.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.5	5.5	4.0	5.5	5.5		
Lead/Lag	Lead	Lead	Lag		Lead	Lead	Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	Min		None	Min	None	None
Act Effct Green (s)	7.3	7.3	41.9		47.0	49.2		
Actuated g/C Ratio	0.12	0.12	0.66		0.74	0.78		
v/c Ratio	0.23	0.51	0.79		0.23	0.48		
Control Delay	29.4	37.9	21.5		5.0	3.0		
Queue Delay	0.0	0.0	0.0		0.0	0.5		
Total Delay	29.4	37.9	21.5		5.0	3.5		
LOS	C	D	C		A	A		
Approach Delay	35.0		21.5			3.6		
Approach LOS	D		C			A		
Queue Length 50th (ft)	16	32	282		3	44		
Queue Length 95th (ft)	50	83	#759		m7	67		
Internal Link Dist (ft)	328		1281			133		
Turn Bay Length (ft)	175				65			
Base Capacity (vph)	580	501	1180		262	1447		
Starvation Cap Reductn	0	0	0		0	336		
Spillback Cap Reductn	0	26	0		0	0		
Storage Cap Reductn	0	0	0		0	0		
Reduced v/c Ratio	0.08	0.19	0.79		0.22	0.63		

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 63.4
Natural Cycle: 135
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 15.1 — Intersection LOS: B
Intersection Capacity Utilization 61.3% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Cedar Road & Elwood Road



17: High School Driveway & Elwood Road
Lanes, Volumes, Timings

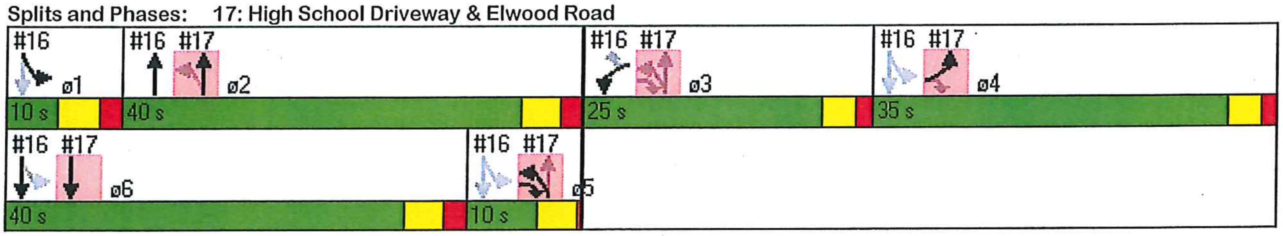
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR	ø1	ø3
Lane Configurations								
Volume (vph)	14	97	73	846	592	16		
Satd. Flow (prot)	1912	1372	1652	1801	1792	0		
Flt Permitted	0.950		0.356					
Satd. Flow (perm)	1912	1372	619	1801	1792	0		
Satd. Flow (RTOR)								
Confl. Peds. (#/hr)								
Confl. Bikes (#/hr)								
Peak Hour Factor	0.71	0.71	0.95	0.95	0.94	0.94		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	7%	2%	2%	2%	2%	6%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%			0%	0%			
Shared Lane Traffic (%)								
Lane Group Flow (vph)	20	137	77	891	647	0		
Turn Type		custom	custom					
Protected Phases	4	5	5	2	6		1	3
Permitted Phases		3 4	2 3	3 5				
Detector Phase	4	5	5	2	6			
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	20.0	20.0		4.0	4.0
Minimum Split (s)	24.5	10.0	10.0	25.5	25.5		10.0	24.5
Total Split (s)	35.0	10.0	10.0	40.0	40.0	0.0	10.0	25.0
Total Split (%)	31.8%	9.1%	9.1%	36.4%	36.4%	0.0%	9%	23%
Yellow Time (s)	3.0	3.5	3.5	3.5	3.5		3.5	3.0
All-Red Time (s)	1.5	0.5	0.5	2.0	2.0		2.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		
Total Lost Time (s)	4.5	4.0	4.0	5.5	5.5	4.0		
Lead/Lag	Lag	Lag	Lag	Lag	Lead		Lead	Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	Min	Min		None	None
Act Effct Green (s)	5.3	17.6	49.8	53.0	36.1			
Actuated g/C Ratio	0.08	0.28	0.79	0.84	0.57			
v/c Ratio	0.12	0.36	0.13	0.59	0.63			
Control Delay	31.4	19.4	0.8	3.0	15.8			
Queue Delay	0.0	0.0	0.1	0.7	0.0			
Total Delay	31.4	19.4	0.9	3.8	15.8			
LOS	C	B	A	A	B			
Approach Delay	20.9			3.6	15.8			
Approach LOS	C			A	B			
Queue Length 50th (ft)	7	40	1	24	148			
Queue Length 95th (ft)	23	59	m1	m92	#445			
Internal Link Dist (ft)	299			133	434			
Turn Bay Length (ft)			68					
Base Capacity (vph)	931	385	587	1505	1021			
Starvation Cap Reductn	0	0	145	299	0			
Spillback Cap Reductn	0	0	0	0	0			
Storage Cap Reductn	0	0	0	0	0			
Reduced v/c Ratio	0.02	0.36	0.17	0.74	0.63			

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 63.4
Natural Cycle: 135
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 9.6 — Intersection LOS: A
Intersection Capacity Utilization 56.2% — ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: High School Driveway & Elwood Road



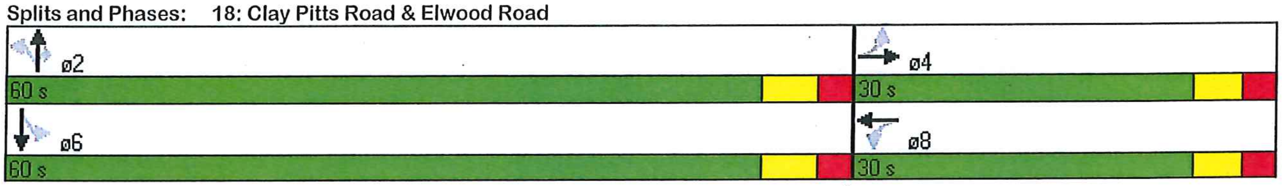
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	302	80	49	178	101	91	630	125	95	443	26
Satd. Flow (prot)	0	1805	0	1770	1762	0	1770	*1950	1583	1770	1848	0
Flt Permitted		0.912		0.403			0.330			0.173		
Satd. Flow (perm)	0	1656	0	751	1762	0	615	*1950	1583	322	1848	0
Satd. Flow (RTOR)		12			31				140		6	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.91	0.91	0.91	0.89	0.89	0.89	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	457	0	54	307	0	102	708	140	108	533	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Detector Phase	4	4		8	8		2	2	2	6	6	
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		18.0	18.0	18.0	18.0	18.0	
Minimum Split (s)	29.0	29.0		29.0	29.0		24.5	24.5	24.5	24.5	24.5	
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	60.0	60.0	60.0	60.0	60.0	0.0
Total Split (%)	33.3%	33.3%	0.0%	33.3%	33.3%	0.0%	66.7%	66.7%	66.7%	66.7%	66.7%	0.0%
Yellow Time (s)	3.5	3.5		3.5	3.5		4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.5	2.5		2.5	2.5		2.5	2.5	2.5	2.5	2.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.5	6.5	6.5	6.5	6.5	4.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	
Act Effct Green (s)		24.5		24.5	24.5		31.0	31.0	31.0	31.0	31.0	
Actuated g/C Ratio		0.36		0.36	0.36		0.45	0.45	0.45	0.45	0.45	
v/c Ratio		0.76		0.20	0.47		0.37	0.80	0.18	0.74	0.63	
Control Delay		31.9		21.6	20.5		15.4	23.0	2.4	45.7	17.1	
Queue Delay		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay		31.9		21.6	20.5		15.4	23.0	2.4	45.7	17.1	
LOS		C		C	C		B	C	A	D	B	
Approach Delay		31.9			20.6			19.1			21.9	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)		156		15	84		26	236	0	35	157	
Queue Length 95th (ft)		#416		53	205		57	344	22	#114	230	
Internal Link Dist (ft)		755			973			516			398	
Turn Bay Length (ft)				100			100		200	180		
Base Capacity (vph)		603		270	652		492	1561	1295	258	1480	
Starvation Cap Reductn		0		0	0		0	0	0	0	0	
Spillback Cap Reductn		0		0	0		0	0	0	0	0	
Storage Cap Reductn		0		0	0		0	0	0	0	0	
Reduced v/c Ratio		0.76		0.20	0.47		0.21	0.45	0.11	0.42	0.36	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 68.2
Natural Cycle: 65
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 22.5 — Intersection LOS: C
Intersection Capacity Utilization 108.4% — ICU Level of Service G
Analysis Period (min) 15
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 18: Clay Pitts Road & Elwood Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	1	23	5	1	11	35	875	8	6	639	24
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.92	0.94	0.94	0.91	0.91	0.91
Hourly flow rate (vph)	16	1	25	5	1	12	38	931	9	7	702	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1752	1744	715	1765	1753	935	729			939		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1752	1744	715	1765	1753	935	729			939		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	73	99	94	91	99	96	96			99		
cM capacity (veh/h)	61	82	430	59	81	322	875			730		

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	17	25	18	977	735
Volume Left	16	0	5	38	7
Volume Right	0	25	12	9	26
cSH	62	430	129	875	730
Volume to Capacity	0.28	0.06	0.14	0.04	0.01
Queue Length 95th (ft)	25	5	12	3	1
Control Delay (s)	83.9	13.9	37.4	1.2	0.2
Lane LOS	F	B	E	A	A
Approach Delay (s)	42.6		37.4	1.2	0.2
Approach LOS	E		E		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		

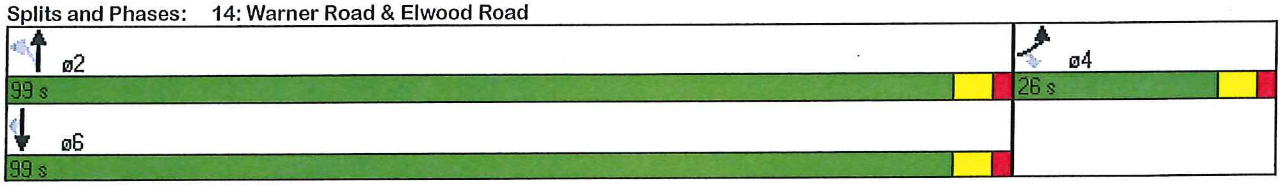
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	182	32	26	1027	908	98
Satd. Flow (prot)	1770	1794	1652	*1400	1801	1636
Flt Permitted	0.950		0.211			
Satd. Flow (perm)	1770	1794	367	*1400	1801	1636
Satd. Flow (RTOR)		30				105
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.87	0.87	0.95	0.95	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	209	37	27	1081	976	105
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Detector Phase	4	4	2	2	6	6
Switch Phase						
Minimum Initial (s)	8.0	8.0	15.0	15.0	15.0	15.0
Minimum Split (s)	23.0	23.0	23.5	23.5	23.0	23.0
Total Split (s)	26.0	26.0	99.0	99.0	99.0	99.0
Total Split (%)	20.8%	20.8%	79.2%	79.2%	79.2%	79.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)	18.2	18.2	94.8	94.8	94.8	94.8
Actuated g/C Ratio	0.15	0.15	0.76	0.76	0.76	0.76
v/c Ratio	0.81	0.13	0.10	1.02	0.71	0.08
Control Delay	75.2	19.9	5.3	49.2	12.1	0.9
Queue Delay	0.0	0.0	0.0	0.0	61.3	1.1
Total Delay	75.2	19.9	5.3	49.2	73.3	2.1
LOS	E	B	A	D	E	A
Approach Delay	66.9			48.1	66.4	
Approach LOS	E			D	E	
Queue Length 50th (ft)	163	5	5	~942	385	0
Queue Length 95th (ft)	#255	35	15	#1199	545	13
Internal Link Dist (ft)	786			511	145	
Turn Bay Length (ft)		100	150			
Base Capacity (vph)	283	312	278	1062	1366	1266
Starvation Cap Reductn	0	0	0	0	500	988
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.12	0.10	1.02	1.13	0.38

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 5.3 (4%), Referenced to phase 2:NBTL and 6:SBT, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 58.1 — Intersection LOS: E
Intersection Capacity Utilization 74.1% — ICU Level of Service D
Analysis Period (min) 15
* User Entered Value

~ **Volume exceeds capacity, queue is theoretically infinite.**
Queue shown is maximum after two cycles.
\# **95th percentile volume exceeds capacity, queue may be longer.**
Queue shown is maximum after two cycles.

Splits and Phases: 14: Warner Road & Elwood Road



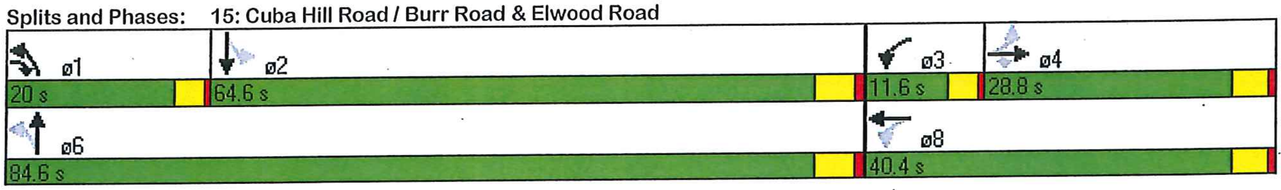
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	279	348	71	197	31	273	867	69	37	586	27
Satd. Flow (prot)	1652	1801	1478	1711	1765	0	1652	1781	0	1711	*1400	0
Flt Permitted	0.566			0.206			0.212			0.162		
Satd. Flow (perm)	984	1801	1478	371	1765	0	*325	1781	0	292	*1400	0
Satd. Flow (RTOR)			227		6			6			2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.84	0.84	0.84	0.96	0.96	0.96	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	288	359	85	272	0	284	975	0	39	645	0
Turn Type	Perm		pm+ov	pm+pt			pm+pt			Perm		
Protected Phases		4	1	3	8		1	6			2	
Permitted Phases	4		4	8			6			2		
Detector Phase	4	4	1	3	8		1	6		2	2	
Switch Phase												
Minimum Initial (s)	8.0	8.0	2.0	2.0	8.0		2.0	16.0		14.0	14.0	
Minimum Split (s)	22.5	22.5	12.0	11.5	26.5		12.0	23.0		28.0	28.0	
Total Split (s)	28.8	28.8	20.0	11.6	40.4	0.0	20.0	84.6	0.0	64.6	64.6	0.0
Total Split (%)	23.0%	23.0%	16.0%	9.3%	32.3%	0.0%	16.0%	67.7%	0.0%	51.7%	51.7%	0.0%
Yellow Time (s)	3.5	3.5	3.0	3.0	3.5		3.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0	0.5	0.5	1.0		0.5	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	3.5	3.5	4.5	4.0	3.5	5.0	4.0	5.0	5.0	4.0
Lead/Lag	Lag	Lag	Lead	Lead			Lead			Lag	Lag	
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None		None	Min		Min	Min	
Act Effct Green (s)	21.9	21.9	38.9	31.2	30.2		74.5	72.9		57.0	57.0	
Actuated g/C Ratio	0.19	0.19	0.34	0.28	0.27		0.66	0.65		0.50	0.50	
v/c Ratio	0.08	0.82	0.55	0.46	0.57		0.79	0.85		0.27	0.91	
Control Delay	42.4	65.7	14.7	40.6	40.8		27.8	25.5		25.0	46.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		2.0	46.3		0.0	0.0	
Total Delay	42.4	65.7	14.7	40.6	40.8		29.8	71.8		25.0	46.6	
LOS	D	E	B	D	D		C	E		C	D	
Approach Delay		37.5			40.8			62.3			45.3	
Approach LOS		D			D			E			D	
Queue Length 50th (ft)	10	216	77	49	173		90	583		17	459	
Queue Length 95th (ft)	32	#368	172	86	248		#177	834		50	#755	
Internal Link Dist (ft)		284			581			145			2132	
Turn Bay Length (ft)	100			175			150			100		
Base Capacity (vph)	218	400	710	201	582		414	1294		159	766	
Starvation Cap Reductn	0	0	0	0	0		47	401		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.07	0.72	0.51	0.42	0.47		0.77	1.09		0.25	0.84	

Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 112.9
Natural Cycle: 90
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 50.2 — Intersection LOS: D
Intersection Capacity Utilization 96.2% — ICU Level of Service F
Analysis Period (min) 15
* User Entered Value
\# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 15: Cuba Hill Road / Burr Road & Elwood Road



Attachment E
Accident Collision Diagrams

ACCIDENT DIAGRAM FROM FAIR OAKS COURT TO HAMMOND ROAD

VHB

FIGURE E-1

SYMBOLS		MANNER OF COLLISION	
MOVING VEHICLE	PARKED VEHICLE	REAR END	HEAD ON
M – MOTORCYCLE	P – PEDESTRIAN	OVERTAKE	LEFT TURN
BACKING VEHICLE	B – BICYCLE	OUT OF CONTROL	RIGHT TURN
STOPPED VEHICLE	FIXED OBJECT	SKIDDING	RIGHT ANGLE
TRAFFIC SIGNAL	FATALITY	OVERTURNED	SIDE SWIPE

ACCIDENT DIAGRAM FROM SOUTH SHELBY ROAD TO CEDAR ROAD

VHB

FIGURE E-2

APPENDIX E

ECOLOGY-RELATED DOCUMENTATION

Appendix E-1
NYS Breeding Bird Atlas Data

List of Species Breeding in Atlas Block 6352D

Common Name	Scientific Name	Behavior Code	Date	NY Legal Status
American Crow	*Corvus brachyrhynchos*	NY	8/12/2001	Game Species
American Goldfinch	*Spinus tristis*	FL	8/29/2001	Protected
American Redstart	*Setophaga ruticilla*	X1	6/11/2003	Protected
American Robin	*Turdus migratorius*	FY	7/25/2001	Protected
American Woodcock	*Scolopax minor*	X1	1/21/2003	Game Species
Baltimore Oriole	*Icterus galbula*	FL	7/12/2003	Protected
Barn Swallow	*Hirundo rustica*	X1	7/19/2001	Protected
Black-capped Chickadee	*Poecile atricapillus*	NY	5/17/2001	Protected
Blue Jay	*Cyanocitta cristata*	FY	8/10/2002	Protected
Brown-headed Cowbird	*Molothrus ater*	T2	6/20/2002	Protected
Canada Goose	*Branta canadensis*	FL	6/19/2001	Game Species
Carolina Wren	*Thryothorus ludovicianus*	FY	5/1/2002	Protected
Chipping Sparrow	*Spizella passerina*	FY	6/20/2002	Protected
Common Grackle	*Quiscalus quiscula*	FY	5/11/2002	Protected
Common Yellowthroat	*Geothlypis trichas*	T2	6/19/2001	Protected
Downy Woodpecker	*Picoides pubescens*	FL	6/5/2002	Protected
Eastern Kingbird	*Tyrannus tyrannus*	NE	6/19/2001	Protected
Eastern Screech-Owl	*Megascops asio*	P2	8/14/2003	Protected
Eastern Towhee	*Pipilo erythrophthalmus*	T2	7/19/2001	Protected
Eastern Wood-Pewee	*Contopus virens*	X1	6/20/2002	Protected
European Starling	*Sturnus vulgaris*	NY	6/20/2001	Unprotected
Field Sparrow	*Spizella pusilla*	FL	7/19/2001	Protected
Fish Crow	*Corvus ossifragus*	X1	6/20/2002	Protected
Gray Catbird	*Dumetella carolinensis*	FY	6/19/2001	Protected
Great Horned Owl	*Bubo virginianus*	P2	2/5/2003	Protected
Hairy Woodpecker	*Picoides villosus*	FL	7/12/2003	Protected
House Finch	*Carpodacus mexicanus*	FL	6/19/2001	Protected
House Sparrow	*Passer domesticus*	NY	5/17/2001	Unprotected
House Wren	*Troglodytes aedon*	NY	7/12/2001	Protected
Indigo Bunting	*Passerina cyanea*	X1	6/11/2003	Protected
Killdeer	*Charadrius vociferus*	X1	6/19/2001	Protected
Mallard	*Anas platyrhynchos*	P2	6/19/2001	Game Species
Mourning Dove	*Zenaida macroura*	FL	5/20/2002	Protected
Northern Cardinal	*Cardinalis cardinalis*	FY	6/19/2001	Protected
Northern Flicker	*Colaptes auratus*	FL	6/19/2003	Protected
Northern Mockingbird	*Mimus polyglottos*	FY	7/19/2001	Protected
Orchard Oriole	*Icterus spurius*	T2	6/19/2001	Protected
Red-bellied Woodpecker	*Melanerpes carolinus*	NY	7/12/2003	Protected
Red-eyed Vireo	*Vireo olivaceus*	T2	6/19/2001	Protected
Red-tailed Hawk	*Buteo jamaicensis*	FL	6/19/2001	Protected
Red-winged Blackbird	*Agelaius phoeniceus*	FY	8/12/2001	Protected
Rock Pigeon	*Columba livia*	FL	5/30/2002	Unprotected
Song Sparrow	*Melospiza melodia*	FL	8/29/2001	Protected
Tree Swallow	*Tachycineta bicolor*	X1	6/19/2001	Protected
Tufted Titmouse	*Baeolophus bicolor*	FY	6/15/2002	Protected

Common Name	Scientific Name	Behavior Code	Date	NY Legal Status
Warbling Vireo	*Vireo gilvus*	FL	6/19/2001	Protected
White-breasted Nuthatch	*Sitta carolinensis*	X1	6/25/2001	Protected
Wood Thrush	*Hylocichla mustelina*	P2	7/12/2003	Protected
Yellow Warbler	*Dendroica petechia*	FY	6/19/2001	Protected

Current Date: 2/24/2012

Appendix E-2
NYS Natural Heritage Program (NHP) Correspondence

NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING

February 1, 2012

Jean Petrusiak, Director
New York State Department of Environmental Conservation
Information Services
New York Natural Heritage Program
625 Broadway, 5th floor
Albany, NY 12233-4757

Re: Request for Natural Heritage Program File Review for a +/-37.05 acre site located at 544 Elwood Road (west side of Elwood Road, opposite Hammond Road), East Northport, Town of Huntington, Suffolk County, New York (NP&V #11157)

Dear Ms. Petrusiak:

My firm has been retained by the owner of the above-referenced parcel to investigate the environmental resources associated with this site for assessment under SEQR. The site is currently occupied by the Oak Tree Farm Dairy facility and the applicant is proposing construction of 482 senior condo units (in 36 multi-unit structures) as well as on-site amenities such as an 17,000 SF recreation building, dog run, tennis courts and outdoor pool/patio.

It would be beneficial to consult the Natural Heritage Program files for any information you may have regarding unique habitats, and/or species of vegetation and wildlife. Enclosed is a portion of the Greenlawn 7.5 minute quadrangles indicating the location of the project site. Please provide any information you may have on this specific site or other unique ecological features within the vicinity. Your attention to this request would be greatly appreciated. Please do not hesitate to call if you have any questions regarding this correspondence.

Sincerely,

NELSON, POPE & VOORHIS, LLC

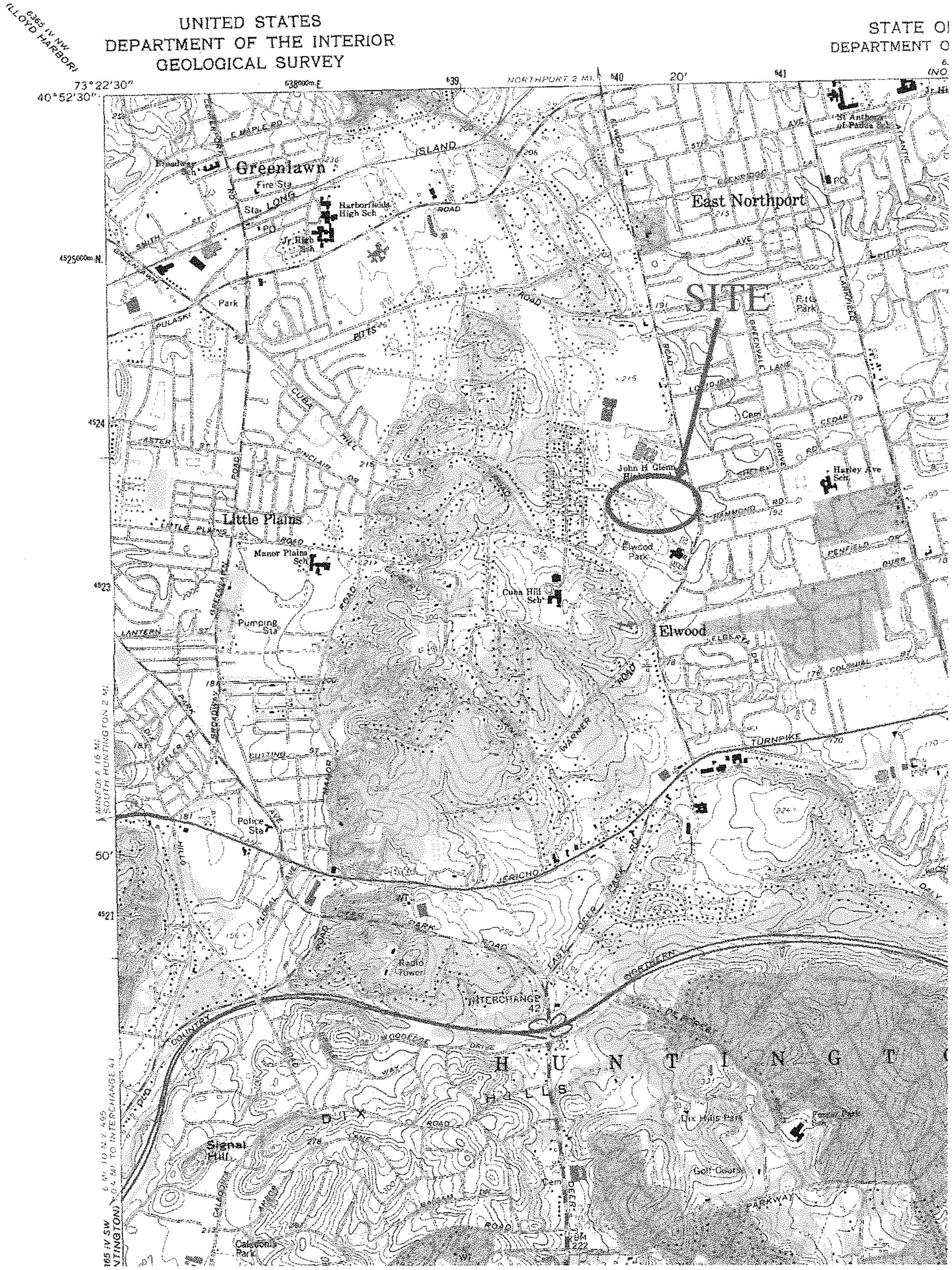
Lara Urbat

Lara Urbat
Environmental Analyst

Enc.: location map

572 WALT WHITMAN ROAD, MELVILLE, NY 11747 - 2188
(631) 427-5665 FAX (631) 427-5620 WWW.NELSONPOPE.COM

USGS TOPOGRAPHIC MAP
GREENLAWN QUADRANGLE



Last Revised 1979

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joe Martens
Commissioner

February 17, 2012

RECEIVED
Lara
FEB 21 2012
NELSON & POPE

Lara Urbat
Nelson, Pope & Voorhis
572 Walt Whitman Road
Melville, NY 11747

Dear Ms. Urbat:

In response to your recent request, we have reviewed the New York Natural Heritage Program database, with respect to an Environmental Assessment for the proposed Construction of Senior Condo Units – 37 Acre Parcel, site as indicated on the map you provided, Project # 111 57, located at 544 Elwood Road, in the Town of Huntington, Suffolk County.

We have no records of rare or state listed animals or plants, significant natural communities or other significant habitats, on or in the immediate vicinity of your site.

The absence of data does not necessarily mean that rare or state-listed species, natural communities or other significant habitats do not exist on or adjacent to the proposed site. Rather, our files currently do not contain information which indicates their presence. For most sites, comprehensive field surveys have not been conducted. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

This response applies only to known occurrences of rare or state-listed animals and plants, significant natural communities and other significant habitats maintained in the Natural Heritage Data bases. Your project may require additional review or permits; for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.html.

Sincerely,

Jean Pietrusiak

Jean Pietrusiak, Information Services
NYS Department Environmental Conservation

Enc.
cc: Region 1

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APPENDIX F

CORRESPONDENCE

NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING
572 WALT WHITMAN ROAD, MELVILLE, NY 11747 - 2188
(631) 427-5665 FAX (631) 427-5620
npv@nelsonpope.com

March 6, 2014

Mr. Peter Scordo
Superintendent of Schools
Elwood Union Free School District
100 Kenneth Avenue
Greenlawn, NY 11740-2900

Re: The Seasons at Elwood
Project Coordination
NPV #11157

Dear Mr. Scordo:

Nelson, Pope & Voorhis, LLC is an environmental and planning consulting firm located in Melville. We are currently preparing an Expanded Environmental Assessment Form (EEAF) for a proposed residential project located at 544 Elwood Road, on the west side of Elwood Road, opposite Hammond Road, in Elwood (see attached **Location Map**). The site is presently occupied by the Oak Tree Farm Dairy facility. The proposed project includes rezoning of the 37.05-acre site from R-40 to R-RM, followed by the construction of 360 senior condominium units (in 56 multi-unit structures) as well as on-site amenities such as a 17,000 SF recreation building, dog run, jacuzzi, and two outdoor pools/patio.

As the proposed project will include senior housing only, no school-age children will be added to the school district.

If you have any further input with regard to the ability to provide services to this project, please provide an explanation so that this may be considered in the review process. Your responses will be included in the EEAF for review by the Town of Huntington.

If you should have any questions or require additional information, please do not hesitate to contact me at (631) 427-5665 or pmalicki@nelsonpope.com.

Very truly yours,
NELSON, POPE AND VOORHIS, LLC

Phillip A. Malicki

Phillip A. Malicki, CEP, AICP, LEED® AP
Senior Environmental Planner

Enc. Location Map

NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING
572 WALT WHITMAN ROAD, MELVILLE, NY 11747 - 2188
(631) 427-5665 FAX (631) 427-5620
npv@nelsonpope.com

March 6, 2014

Suffolk County Police Department
Research and Development Section
Attn: William English
Principal Management Analyst
30 Yaphank Avenue
Yaphank, NY 11980

Re: The Seasons at Elwood
Project Coordination
NPV #11157

Dear Mr. English:

Nelson, Pope & Voorhis, LLC is an environmental and planning consulting firm located in Melville. We are currently preparing an Expanded Environmental Assessment Form (EEAF) for a proposed residential project located at 544 Elwood Road, on the west side of Elwood Road, opposite Hammond Road, in Elwood (see attached **Location Map**). The site is presently occupied by the Oak Tree Farm Dairy facility. The proposed project includes rezoning of the 37.05-acre site from R-40 to R-RM, followed by the construction of 360 senior condominium units (in 56 multi-unit structures) as well as on-site amenities such as a 17,000 SF recreation building, dog run, jacuzzi, and two outdoor pools/patio.

I am writing to obtain information regarding SCPD facilities and services which may be pertinent to the project. Specifically, I am requesting the following:

- Location of the stationhouse that would serve the site;
- Patrol sector assigned to the site.

If you have any further input with regard to the ability to provide services to this project, please provide an explanation so that this may be considered in the review process. Your responses will be included in the EEAF submitted for review by the Town of Huntington.

If you should have any questions or require additional information, please do not hesitate to contact me at (631) 427-5665 or pmalicki@nelsonpope.com.

Very truly yours,
NELSON, POPE AND VOORHIS, LLC

Phillip A. Malicki

Phillip A. Malicki, CEP, AICP, LEED® AP
Senior Environmental Planner

Enc. Location Map

NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING
572 WALT WHITMAN ROAD, MELVILLE, NY 11747 - 2188
(631) 427-5665 FAX (631) 427-5620

March 6, 2014

Greenlawn Fire District
23 Boulevard Ave.
Greenlawn, NY 11740

Re: The Seasons at Elwood
Project Coordination
NPV #11157

Dear Sir or Madame:

Nelson, Pope & Voorhis, LLC is an environmental and planning consulting firm located in Melville. We are currently preparing an Expanded Environmental Assessment Form (EEAF) for a proposed residential project located at 544 Elwood Road, on the west side of Elwood Road, opposite Hammond Road, in Elwood (see attached **Location Map**). The site is presently occupied by the Oak Tree Farm Dairy facility. The proposed project includes rezoning of the 37.05-acre site from R-40 to R-RM, followed by the construction of 360 senior condominium units (in 56 multi-unit two-story structures) as well as on-site amenities such as a 17,000 SF recreation building, dog run, jacuzzi, and two outdoor pools/patio (see attached **Site Development Plan O**).

I am writing to obtain information in regard to Greenlawn Fire Department facilities, services, and capabilities which may be pertinent to the project. Specifically, I am requesting the following:

- District boundaries served;
- The location of the stations and/or substation(s) which would serve the site;
- A listing of the major pieces of firefighting equipment at each facility;
- The number of firefighters assigned to each facility;
- Indicate any specialized firefighting capabilities of the District;
- Indicate whether the firefighters are volunteers or full-time;
- Any ambulance and/or EMT facilities or equipment relative to servicing the site.
- Annual operating budget.

If you have any further input with regard to the ability to provide services to this project, please provide an explanation so that this may be considered in the review process. Your responses will be included in the EEAF submitted for review by the Town of Huntington.

If you should have any questions or require additional information, please do not hesitate to contact me at (631) 427-5665 or pmalicki@nelsonpope.com.

Very truly yours,
NELSON, POPE AND VOORHIS, LLC

Phillip A. Malicki

Phillip A. Malicki, CEP, AICP, LEED® AP
Senior Environmental Planner

Enc. Location Map
Site Development Plan O

Greenlawn Fire District

23 BOULEVARD AVENUE
GREENLAWN, NEW YORK 11740
631-261-0475
FAX 631-261-3490
Email: secretaryglfd.optonline.net

RECEIVED
MAR 17 2014
NELSON & POPE

March 13, 2014

Nelson Pope & Voorhis, LLC
Mr. Phillip A. Malicki
572 Walt Whitman Road
Melville, NY 11747

Dear Mr. Malicki:

In regards to your letter dated, March 6, 2014 in regards to The Seasons at Elwood Project Coordination, NPV #11157, the Greenlawn Fire District is providing the following information.

- Our boundaries that serve this property are South to Jericho Turnpike, North to Greenlawn Road, West to Park Avenue and East to Elwood Road.
- Our Headquarter Building is located at 23 Boulevard Avenue and our Station 1 Building is located at 210 Little Plains Road.
- Our headquarter building holds one (1) Quint Truck (Ladder & Heavy Rescue), one (1) Brush Truck, one (1) Class "A" Pumper and two (2) Ambulances.
- Our Station 1 building holds one (1) Class "A" Pumper, one (1) 100' Ladder Truck, one (1) Heavy Rescue Truck and one (1) Ambulance.
- We currently have 56 Headquarter volunteer members and 65 Station 1 volunteer members.
- We have an annual call volume of 2100 alarms.
- We have employed paid Paramedics Monday to Friday from 6:00 AM to 6:00 PM. We have three (3) ALS equipped ambulances.
- Our annual 2014 operating budget is 2,747,100.00.

If there are any further questions you may have, please contact our District Office at (631)261-0475.

Sincerely,

David Caputo
Chairman, Board of Fire Commissioners
Greenlawn Fire District

NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING
572 WALT WHITMAN ROAD, MELVILLE, NY 11747 - 2188
(631) 427-5665 FAX (631) 427-5620
npv@nelsonpope.com

March 6, 2014

Greenlawn Water District
45 Railroad Street
Greenlawn, NY 11740

Re: The Seasons at Elwood
Project Coordination
NPV #11157

To Whom It May Concern:

Nelson, Pope & Voorhis, LLC is an environmental and planning consulting firm located in Melville. We are currently preparing an Expanded Environmental Assessment Form (EEAF) for a proposed residential project located at 544 Elwood Road, on the west side of Elwood Road, opposite Hammond Road, in Elwood (see attached **Location Map**). The SCTM No. for the property is 400-170-02-15.01. The site is presently occupied by the Oak Tree Farm Dairy facility. The proposed project includes rezoning of the 37.05-acre site from R-40 to R-RM, followed by the construction of 360 senior condominium units (in 56 multi-unit structures) as well as on-site amenities such as a 17,000 SF recreation building, dog run, jacuzzi, and two outdoor pool/patio (see attached **Site Development Plan O**). The estimated total daily water usage for the project is 99,275 gallons.

I am requesting the following information:

- The locations of the closest supply and/or monitoring wells which have the potential to serve the site;
- The location and size of the water distribution system serving the subject property and in the vicinity;
- Will the project require a new or extended supply line to serve the site?

If you have any further input with regard to the ability to provide services to this project, please provide an explanation so that this may be considered in the review process. Your responses will be included in the EEAF submitted for review by the Town of Huntington.

If you should have any questions or require additional information, please do not hesitate to contact me at (631) 427-5665 or pmalicki@nelsonpope.com.

Very truly yours,
NELSON, POPE & VOORHIS, LLC

Phillip A. Malicki

Phillip A. Malicki, CEP, AICP, LEED® AP
Senior Environmental Planner

Enc. Location Map
Site Development Plan O

NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING
572 WALT WHITMAN ROAD, MELVILLE, NY 11747 - 2188
(631) 427-5665 FAX (631) 427-5620
npv@nelsonpope.com

March 6, 2014

Town of Huntington
Department of Environmental Waste Management
100 Main Street
Huntington, New York 11743

Re: The Seasons at Elwood
Project Coordination
NPV #11157

To Whom It May Concern:

Nelson, Pope & Voorhis, LLC is an environmental and planning consulting firm located in Melville. We are currently preparing an Expanded Environmental Assessment Form (EEAF) for a proposed residential project located at 544 Elwood Road, on the west side of Elwood Road, opposite Hammond Road, in Elwood (see attached **Location Map**). The site is presently occupied by the Oak Tree Farm Dairy facility. The proposed project includes rezoning of the 37.05-acre site from R-40 to R-RM, followed by the construction of 360 senior condominium units (in 56 multi-unit structures) as well as on-site amenities such as a 17,000 SF recreation building, dog run, jacuzzi, and two outdoor pools/patio.

The proposed project will generate approximately 28.4 tons of solid waste per month, based on 3.5 pounds per capita, assuming 540 on-site residents. It is anticipated that a private hauler will be utilized for garbage pickup on the site. We are writing to obtain information in regard to the solid waste facilities which may be pertinent to the project. Specifically, I am requesting the following:

- The yearly tonnage of solid waste disposed of at the Town's facility
- The percentage or tonnage breakdown of waste disposition (i.e. recycled, incinerated, landfilled), and where is waste disposed of via these routes?
- Confirmation that the Town will accept waste from the project (should the private hauler choose to utilize the municipal facility);
- Are there any waste regulations specific to these uses which should be considered in connection with this application?

If you have any further input with regard to the ability to provide services to this project, please provide an explanation so that this may be considered in the review process. Your responses will be included in the EEAF submitted for review by the Town of Huntington.

If you should have any questions or require additional information, please do not hesitate to contact me at (631) 427-5665 or pmalicki@nelsonpope.com.

Very truly yours,
NELSON, POPE AND VOORHIS, LLC

Phillip A. Malicki

Phillip A. Malicki, CEP, AICP, LEED® AP
Senior Environmental Planner

Enc. Location Map

Phil Malicki

From: Audrey Gallo <AGallo@huntingtonny.gov>
Sent: Thursday, March 27, 2014 11:40 AM
To: Phil Malicki
Cc: Neal Sheehan; Matt Laux
Subject: The Seasons at Elwood

Importance: High

Mr. Malicki,

I am responding to your letter of March 6, 2014 regarding The Seasons at Elwood. The yearly tonnage of solid waste disposed of at the Town of Huntington Resource Recovery Facility (RRF) for 2013 was 109,984 tons. The 2013 disposal percentages were: 26.3% recycled (various private facilities), 73.2% incinerated (RRF), .6% landfilled (Town of Smithtown landfill). The Town typically accepts waste from residential dwellings as described in your letter, however the Town makes no guarantee as to the availability of disposal capacity at the RRF if the project will be serviced by a private carter. Depending on the class of property and construction type, this project may be part of the Town wide Residential Refuse District. When available, please provide us with a detailed site plan so a determination can be made. For further information on the Town of Huntington refuse and disposal regulations, you may consult the code of the Town of Huntington at www.HuntingtonNY.gov

If you have any questions, or concerns, please contact me at the number below.

Regards,

Audrey Gallo
Town of Huntington
Dept of Env. Waste Management
100 Main Street Rm 308
Huntington, NY 11743
631.351.3187
agallo@HuntingtonNY.gov

NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING
572 WALT WHITMAN ROAD, MELVILLE, NY 11747 - 2188
(631) 427-5665 FAX (631) 427-5620
npv@nelsonpope.com

March 6, 2014

PSE&G, Long Island
175 East Old Country Road
Hicksville, NY 11801
Attn..: Customer Order Fulfillment Center
1st Floor, Operations #2

Re: The Seasons at Elwood
Project Coordination
NPV #11157

To Whom It May Concern:

Nelson, Pope & Voorhis, LLC is an environmental and planning consulting firm located in Melville. We are currently preparing an Expanded Environmental Assessment Form (EEAF) for a proposed residential project located at 544 Elwood Road, on the west side of Elwood Road, opposite Hammond Road, in Elwood (see attached **Location Map**). The site is presently occupied by the Oak Tree Farm Dairy facility. The proposed project includes rezoning of the 37.05-acre site from R-40 to R-RM, followed by the construction of 360 senior condominium units (in 56 multi-unit structures) as well as on-site amenities such as a 17,000 SF recreation building, dog run, jacuzzi, and two outdoor pools/patio (see attached **Site Development Plan O**).

I am writing to obtain information in regard to electric service. Specifically, I am requesting the following:

- Whether electricity can be supplied to the site;
- If electricity can be supplied, the location(s) and sizes of the supply lines which would be used;
- Whether the amount of usage would significantly impact the ability of PSE&G to supply services to its other customers in the area; and,
- If electricity can be provided, please send a letter to my attention confirming that such service can be provided.

If you have any further input with regard to the ability to provide services to this project, please provide an explanation so that this may be considered in the review process. Your responses will be included in the EEAF submitted for review by the Town of Huntington.

If you should have any questions or require additional information, please do not hesitate to contact me at (631) 427-5665 or pmalicki@nelsonpope.com.

Very truly yours,
NELSON, POPE AND VOORHIS, LLC

Phillip A. Malicki

Phillip A. Malicki, CEP, AICP, LEED® AP
Senior Environmental Planner

Enc. Location Map
Site Development Plan O

PSEG LONG ISLAND

We make things work for you.

175 E. Old Country Road, Hicksville, NY 11801
Customer Order Fulfillment Department

PM

March 17, 2014

Nelson, Pope & Voorhis, LLC.
572 Walt Whitman Road
Melville, NY 11747-2188
Attn: Phillip A. Malicki, CEP, AICP, LEED AP

Re: Letter of Availability –
544 Elwood Road, Elwood, New York
PSEG Reference # T101585077

Dear Mr. Malicki:

As requested, please be advised that the PSEG will provide service to the above referenced project in accordance with our filed tariff and schedules in effect at the time service is required.

Please contact the PSEG Long Island Customer Order Fulfillment Department's office at 516-545-3789 if you require any further information.

Very truly yours,

Carolyn Mackin

Carolyn Mackin
Manager
Customer Order Fulfillment

CM/am

NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING
572 WALT WHITMAN ROAD, MELVILLE, NY 11747 - 2188
(631) 427-5665 FAX (631) 427-5620
npv@nelsonpope.com

March 6, 2014

National Grid
8302-8624 Ditmas Avenue
Building #31
Brooklyn, NY 11236
attn: Richard P. Petraglia, Lead Account Executive

**Re: The Seasons at Elwood
Project Coordination
NPV #11157**

Dear Mr. Petraglia:

Nelson, Pope & Voorhis, LLC is an environmental and planning consulting firm located in Melville. We are currently preparing an Expanded Environmental Assessment Form (EEAF) for a proposed residential project located at 544 Elwood Road, on the west side of Elwood Road, opposite Hammond Road, in Elwood (see attached **Location Map**). The site is presently occupied by the Oak Tree Farm Dairy facility. The proposed project includes rezoning of the 37.05-acre site from R-40 to R-RM, followed by the construction of 360 senior condominium units (in 56 multi-unit structures) as well as on-site amenities such as a 17,000 SF recreation building, dog run, jacuzzi, and two outdoor pools/patio (see attached **Site Development Plan O**).

I am writing to obtain information in regard to gas service available to the site. Specifically, I am requesting the following:

- Whether natural gas can be supplied to the site;
- If natural gas can be supplied, the location(s) and sizes of the supply lines which would be used;
- Whether the amount of usage would significantly impact the ability of National Grid to supply services to its other customers in the area; and,
- If natural gas can be provided, please send a letter to my attention confirming that such service can be provided.

If you have any further input with regard to the ability to provide services to this project, please provide an explanation so that this may be considered in the review process. Your responses will be included in the EEAF submitted for review by the Town of Huntington.

If you should have any questions or require additional information, please do not hesitate to contact me at (631) 427-5665 or pmalicki@nelsonpope.com.

Very truly yours,
NELSON, POPE AND VOORHIS, LLC

Phillip A. Malicki

Phillip A. Malicki, CEP, AICP, LEED® AP
Senior Environmental Planner

Enc. Location Map
Site Development Plan O

APPENDIX G

PHASE I ARCHAEOLOGICAL INVESTIGATION

Tracker Archaeology Services, Inc.

March 2012

TRACKER
Archaeology Services, Inc.
Tracking the Footsteps of the Ancestors

REPORTS OF INVESTIGATIONS

Phase I Archaeological Investigation for the proposed The Seasons subdivision
Elwood, Town of Huntington Suffolk County , New York

March 2012

Prepared for:
Nelson, Pope & Voorhis, LLC. Melville, New York

Prepared by:

Alfred G. Cammisa
Felicia Cammisa, Alexander Padilla

Report #: 742

TRACKER ARCHAEOLOGY SERVICES, INC.
MONROE, NY 10950 • (845) 783-4082
NORTH BABYLON, NY 11703 • (631) 321-1380

MANAGEMENT SUMMARY

PR#:
none known

Involved agencies:
Town of Huntington

Phase:
Phase IA & IB

Location:
Elwood
Town of Huntington
Suffolk County

Survey Area:
Length: about 1875 feet (572 meters) north-south
Width: about 1275 feet (389m) north-south
Acres Surveyed: about 31 acres (12.5 hectares) out of about 37 acre dairy farm

USGS:
Greenlawn, NY

Survey overview:
ST no. & interval: 507 ST's at 50-25ft (15-7.5m) intervals.
Size of freshly plowed area: na
Surface survey transect interval: na

Results:
No prehistoric or historic remains

Results of Architectural Survey:
No. Of buildings/structures/cemeteries in project area: numerous, from past & present 20th century dairy farm operations
No. Of buildings/structures/cemeteries adjacent to project area: numerous 20th century
No. Of previously determined NR listed or eligible buildings/structures/cemeteries/districts: none
No. Of identified eligible buildings/structures/cemeteries/districts: none

Authors:
Alfred G. Cammisa, M.A./RPA
Alexander Padilla, B.A.
Felicia Cammisa, B.A.

Date of Report:
Report completed: March 2012

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF PHOTOGRAPHS

Photo 7 Panorama view of recharge beds from ST 489.

Photo 8 Looking west from near road.

INTRODUCTION

Between March 9 to 23, 2012, TRACKER Archaeology, Inc. conducted a Phase IA documentary study and a Phase IB archaeological survey for the proposed residences at The Seasons, Elwood, Town of Huntington, Suffolk County, New York.

The purpose of the Phase IA documentary study was to determine the prehistoric and historic potential of the property for the recovery of archaeological remains. This was accomplished by a review of the original and current environmental data, archaeological site files, other archival literature, maps, and documents.

A prehistoric site file search was conducted utilizing the resources of the New York State Historic Preservation Office - Field Services Bureau in Waterford, New York. Various historical and archaeological web sites were reviewed for any pertinent information.

The purpose of the Phase IB survey was to recover physical evidence for the presence or absence of archaeological sites on the property. This was accomplished through subsurface testing and ground surface reconnaissance.

The project area (APE) consists of the existing Oak Tree Farm Dairy, minus existing buildings, structures, waste ponds, and parking areas, approximately 31 acres from the 37 acre farm. The project area is located at 544 Elwood Road. It is bordered to the east by Elwood Road, to the north by private or County land, to the south by town or private land and to the west by Ciro Street, private property, or land belonging to the local school district.

The study was conducted by TRACKER Archaeology, Inc. of Monroe, New York. Prehistoric and historic research was conducted by Alfred Cammisa, M.A. Field work was conducted by field director Alexander Padilla, B.A., and field technicians, Alexander D'Amico, B.A., and Crista Mannino, B.A. Report preparation was conducted by Alfred Cammisa, Felicia Cammisa, B.A., and Alexander Padilla.

The work was performed for Nelson, Pope and Voorhis, LLC., Melville, New York.

ENVIRONMENT

Geology

The study area is located in the southeast portion of New York State, in the northwest part of Suffolk County. This portion of New York lies in the Atlantic Coastal Plains Physiographic Province. The coastal plain slopes gently eastward and is actually a strip of recently emerged sea bottom. The soils in this region consist largely of sand, clay and marl (a mixture of clay, finely fragmented shell and calcite). This area of Long Island appears to be situated just south of the Harbor Hill Moraine and along the north edge of Manetto Hills Interlobate Zone (Schuberth 1968:cover map, 9, 184-186; Jensen and Soren 1974; Sirkin 1996:41, 168).

Soils and Topography

Soils in the study area consist of:

NAME	SOIL HORIZON DEPTH in (cm)	COLOR	TEXTURE INCLUSION	SLOPE %	DRAINAGE	LANDFOR M
Carver	O=2-1(501) O=1-0(2-0) A1=0-3 (-8) A2=3-8(-20) B=8-14 (-36) B2=14-22 (-56)	leaves mull 10YR4/1 10YR6/1 7.5YR5/4 7.5YR5/6	Sa	15-35	excessive	moraines
Fill land, sandy	na	na	sandy fill	0-8	poor	wet areas
Haven	O 3.5-1.5in (9-3cm) 0 1.5-0 (-0) A 0-3 (-8) B 3-10 (-25) B2 10-19 (-48)	leaves organic 10YR4/3 7.5YR4/4 7.5YR5/6	Lo	0-2 & 2-6	well	outwash plains
Montauk	A= 0-2 (0-5) B= 2-17 (-43)	10YR4/3 10YR5/6	SiLo	8-15	well	moraines
Raynham	O=1-0(3-0) A=0-1(-3) B=1-5(-13)	mull 5YR3/1 10YR6/1	Lo	0-3	poor	marshes & creeks

(Warner 1975: map #52, pgs. 67, 70, 71-72, 73-75, 81).

KEY:
Shade: Lt=Light, Dk=Dark, V=Very
Color: Br=Brown, Blk=Black, Gry=Gray, Gbr=Gray Brown, StBr=Strong Brown, Rbr=Red Brown, Ybr= Yellow Brown
Soils: Si=Silt, Lo=Loam, Sa=Sand, Cl=Clay
Other: Sh=shale, M=Mottle, Gr=Gravelly, Cb=cobbles, Fi=Fine /=or

Elevations on the property range from approximately 192 to 226 feet above mean sea level.

Hydrology
The project area is approximately 2.7 miles southeast of Northport Harbor.

Vegetation
The predominant forest community inhabiting the Coastal Plain Physiographic Province in this vicinity (Cape Cod to the Carolinas) was the Northern Pine-Oak Forest. These forests are maintained largely by the effects of frequent fires. Were it not for the fires which the pine species have adapted to, these forests would slowly change to Mesic, dominated by oak, hickory and red maple. Northern Pine-Oak forests

occur on sandy, or otherwise poor soils that are overly dry. All coastal plains of eastern North America are Xeric (dry forest). They generally have lower species diversity than bottomland forests (Kricher 1988:16-17, 65-66). The reason the forest soils and surfaces are so dry in this moist region is due to the excessive drainage of overly sandy soils on the Coastal Plain.

At the time of the Phase IB survey, the area consisted of an open pasture with some overgrown fringes with developed areas for the dairy plant and associated buildings.

PREHISTORIC POTENTIAL

A prehistoric site file search was conducted at the New York State Historic Preservation Office (NYSHPO). Archaeological sites recorded within 1 mile of the study area included:

NYSM SITES	NYSHPO SITES	DISTANCE FROM APE ft (m)	SITE TYPE
	10304.0083D01	1238 (377)	no info.

Indian foot trails passed through the vicinity. One such trail traversed along or near Jericho Turnpike (Route 25). The foot trail along or near Jericho Turnpike has been documented in town documents and archaeological evidence shows the trail appears to have functioned since the Archaic Period (Stone nd: map, Cammisa et al 2000). Another trail traversed north-south from Northport Harbor to Jericho Turnpike near then project area (possibly along Stony Hollow Road) (Stone nd:map).

Assessing the known environmental and prehistoric archaeological data, we can summarize the following points:

-The project area is approximately 2.7 miles southeast of Northport Harbor.

-The project area contains level to steeply sloped topography with well and poorly drained soils. One area consists of fill soils.

-Indian foot trails passed very close to the project area.

-A prehistoric sites is recorded nearby.

In our opinion, the study area has a higher than average potential for the recovery of prehistoric archaeological remains.

HISTORIC POTENTIAL

Contact Period (Seventeenth Century)
At the time of European contact and settlement, this section of Long Island was occupied by the Matinnecock tribe (Bolton 1975:map, 53-54; Stone-Levine 1980:161). The nearest villages of the Matinnecock tribe were the Winnecomac and the Nesaquaque (Stone nd. map).

Indian foot trails passed through the vicinity near the project area. The foot trail along or near Jericho Turnpike has been documented in town documents and archaeological evidence shows the trail appears to have functioned since the Archaic Period (Stone nd: map; Cammisa et al 2000).

By 1650 the Matinnecock tribe consisted of only 30 families. This number was most likely greatly reduced from their pre-Contact population. At this time "great numbers of Indian plantations now lie waste and vacant" (Bolton 1975:54).

Between 1653 and 1654, the Matinnecock "sold" the last of traditionally occupied territory to the new European settlers (Bolton 1975:54).

Actually, the Matinnecock may have been pressured to "sell" their land. They were likely influenced by the now powerful (probably due to European influence) Wyandanch, chief of the Montauket tribe. Wyandanch denied the Matinnecock to any land between Cow Harbor (Northport Harbor) and the Nissequogue River which they sold to the settlers. Land in Huntington, including the present day Township of Babylon, was sold either by Wyandanch himself or under pressure from Wyandanch by the local villages (Street 1982:2-10; Thompson 1918: 386 Bolton 1975:46). Since hunter-gatherers are normally exogamous, and since the Long Island Indians also appeared to follow this custom, genealogical connections between individuals or villages may have also played a part in political influence between tribes.

The map of early settlements shows the project area near Old Fields in the first Purchase in 1653 and near Ten Farms (Figure 3).

Eighteenth Century

The old Indian trails became established roads used by settlers (Huntington Historical Society 1937:17).

Huntington, during this period, consisted of scattered settlements outside the village. Some of these localities were:

-Dix Hills - northern/upper Dix Hills, near Jericho Turnpike, was known as the Dumpling Hill section, a part of which is now called Elwood. South of the Turnpike was Caledonia Farms (named for their resemblance to the Scottish Highlands) owned by Gould. Land south of the turnpike and east of Deer Park Avenue was once owned by Major Timothy Carll during this century.

-Long Swamp - much of this locale is now called South Huntington. This area was surrounded by hills - the "swamp" probably resulted from runoff. Present day Depot Road (west branch of the Old Hollow Pond Road) trailed along the higher ground along the west side of the "long swamp" wetlands. The eastern branch of Old Hollow Pond Road (Lenox Road/Rogues Path) skirted the eastern (low ground) side of the "long swamp".

-West Hills,

-Winnecomack (Commack),

-Sweet Hollow (Melville),

-Half Way Hollow Hills,

-Old Field (Greenlawn),

-Clay Pitts (East Northport) (Bailey 1949:359; Hall 1949:341, 356; Thompson 1918:400; Bayles 1962:168; Huntington Historical Society 1937:198, 233, 235)

The Matinnecock tribe was nearly passed away by this time. Many scattered survivors of the tribe lived as servants to the European-Americans. Farming operations were in all parts of the Township and the associated buildings consisted of small, rude houses and barns with thatched roofs (Street 1982:36).

Nineteenth Century

About 1810 a movement to improve the old Indian trails (now established roads) spread to Long Island from upstate. Private companies were hired to improve road, build toll gates and levy tolls. These roads became known as turnpikes and were merely old dirt roads, in some cases straightened a bit, but worked into such shape that the road was raised toward the middle for better drainage with gutters along the edges. A toll gate along Jericho Turnpike was placed at Commack in the Huntington-Smithtown border (Huntington Historical Society 1937:17-18).

Farmers were principally engaged in raising wheat, rye and corn, and the raising of livestock, including horses, cattle and sheep. Only a limited amount of sheep were originally raised due to the ever present threat of wolves. As many as five flour mills were constructed (Street 1982:36).

Elwood was a scattered settlement of farms with about 259 people and 30 dwellings during the early part of this period. The hamlet had a steam powered grist mill at about this time. Due to the many hills of the two moraines farming was not as productive or perhaps not attempted in some of these areas (Bayles 1962:137,166 (Schuberth 1968:184-186).

A stagecoach line passed along Jericho Turnpike. A stage stop was located in Dix Hills at Carlls tavern (Huntington Historical Society 1937:234).

The 1858 Chace map shows no buildings on or immediately adjacent to the project area. However, a school house is nearby as are 2 houses across the road (Figure 4).

The 1896 Hyde atlas appears to depict the Beers building on the project area (Figure 5).

Twentieth Century

The 1903 U.S.G.S does not depict the aforementioned structure on the project area. That structure appears closer to Little Plains Road. However, another building is located on the project area but this one in a different location, along Elwood Road. It may be the dwelling which currently exists there (Figure 6).

An historic site file search was conducted at the New York State Historic Preservation Office (NYSHPO). Archaeological sites recorded within 1 mile of the study area included:

NYSM SITES	NYSHPO SITES	DISTANCE FROM AE ft (m)	SITE TYPE
	10304.0981	5287 (1611)	Nathaniel Buffet Farm: one of the largest farms in this area mostly for hay grazing and horses plus woodcutting, ca. 1875-1925

NYSHPO records show that several other archaeological surveys in the surrounding area came up negative.

Assessing the known environmental and historic archaeological data, we can summarize the following points:

-The project area is approximately 2.7 miles southeast of Northport Harbor.

-The project area contains level to steeply sloped topography with well and poorly drained soils. One area consists of fill soils.

-Indian foot trails passed nearby the project area.

-An historic site is recorded in the vicinity of the project area.

-An historic map documented structure appears possibly on the 1896 map but appears to be located off the project area on the 1903 map. An early twentieth century house appears on the project area along Elwood Road.

In our opinion, the study area has a higher than average potential for the recovery of early twentieth century sites. There is a moderate potential for the recovery of late nineteenth century sites associated with Beers house as well as historic aboriginal remains.

FIELD METHODS

Walkover-Reconnaissance
Exposed ground surfaces (70 to 100 percent visibility) were subjected to a close quarters walkover, at 3 to 5 meter intervals, to observe for artifacts. Covered ground terrain was reconnoitered at about 15 meter (50ft)intervals to observe for any above ground features, such as berms, depression, or rock configurations, which could be evidence for a prehistoric or historic site. Photographs were taken of the project area.

Shovel Testing
Shovel tests (ST's) were excavated at about 15 to 7.5 meter (50-25ft) intervals across the project area. The closer intervals were utilized around the 1903 dwelling.

Each ST measured about 30 to 40 cm. in diameter and was dug into the underlying subsoil (B horizon) 10 to 20 cm. when possible. All soils were screened through 1/4 inch wire mesh and observed for artifacts. Shovel tests and surface finds were flagged in the field. All ST's were mapped on the project area map at this time.

Soil stratigraphy was recorded according to texture and color. Soil color was matched against the Munsell color chart for soils. Notes were transcribed in a notebook and on pre-printed field forms.

FIELD RESULTS

Field testing of the project area included the excavation of 507 ST's across the project area. No prehistoric artifacts or features were encountered. No historic artifacts or features were encountered.

The property consists of the Oak Tree Dairy Farm. It is the only dairy farm left on Long Island and has been in operation since 1939. The cows have been moved to upstate but the packaging plant remains (www.oaktreedairy.com). The dairy farm property contained parking areas, recharge beds, and waste ponds. Numerous twentieth century buildings on the project area are related to the dairy farm past and present and include: an office and pasteurization buildings and a wood frame dwelling with brick foundation and concrete dressing, asphalt roofing, vinyl siding, and brick chimney. The house dates to 1903, according to property manager. This would be the previously cited building in Historic Potential.

Stratigraphy
Stratigraphy across the property consisted of the following:

A/O horizon - 0-6 cm thick of rootmat, leaves, and humus. This layer was often stripped away.

A horizon - 0 to 43 cm. thick of 10YR4/3 brown sandy loam numerous with rocks. This layer was at times stripped off or impeded due to the rocky nature of the soils. Other times it may be mottled with subsoil due to apparent grading activities.

B horizon - consisted of 0 to 20 cm. dug into of 10YR5/6 yellow brown sandy loam . At times this layer was impeded due to rocks.

CONCLUSIONS AND RECOMMENDATIONS

Based upon topographic characteristics, distance to other known prehistoric sites and an Indian trail, the property was assessed as having a higher than average potential for encountering prehistoric sites.

Based upon topographic characteristics, distance to historic map documented structures or sites, Indian trails or wigwams, the property was assessed as having a higher than average to moderate potential for encountering historic sites.

The field testing included the excavation of 507 ST's on the project area. No historic artifacts or features were encountered. No prehistoric artifacts or features were encountered. No further work is recommended.

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United States Geological Survey
1967 *Greenlawn, New York* quadrangle, 7.5 minute series.

1903 Northport, *New York* quadrangle, 15 minute series.

APPENDIX 1

Figure 1

Portion of the Greenlawn, NY USGS

TRACKER
Archaeology Services, Inc.
Tracking the Footsteps of the Ancestors

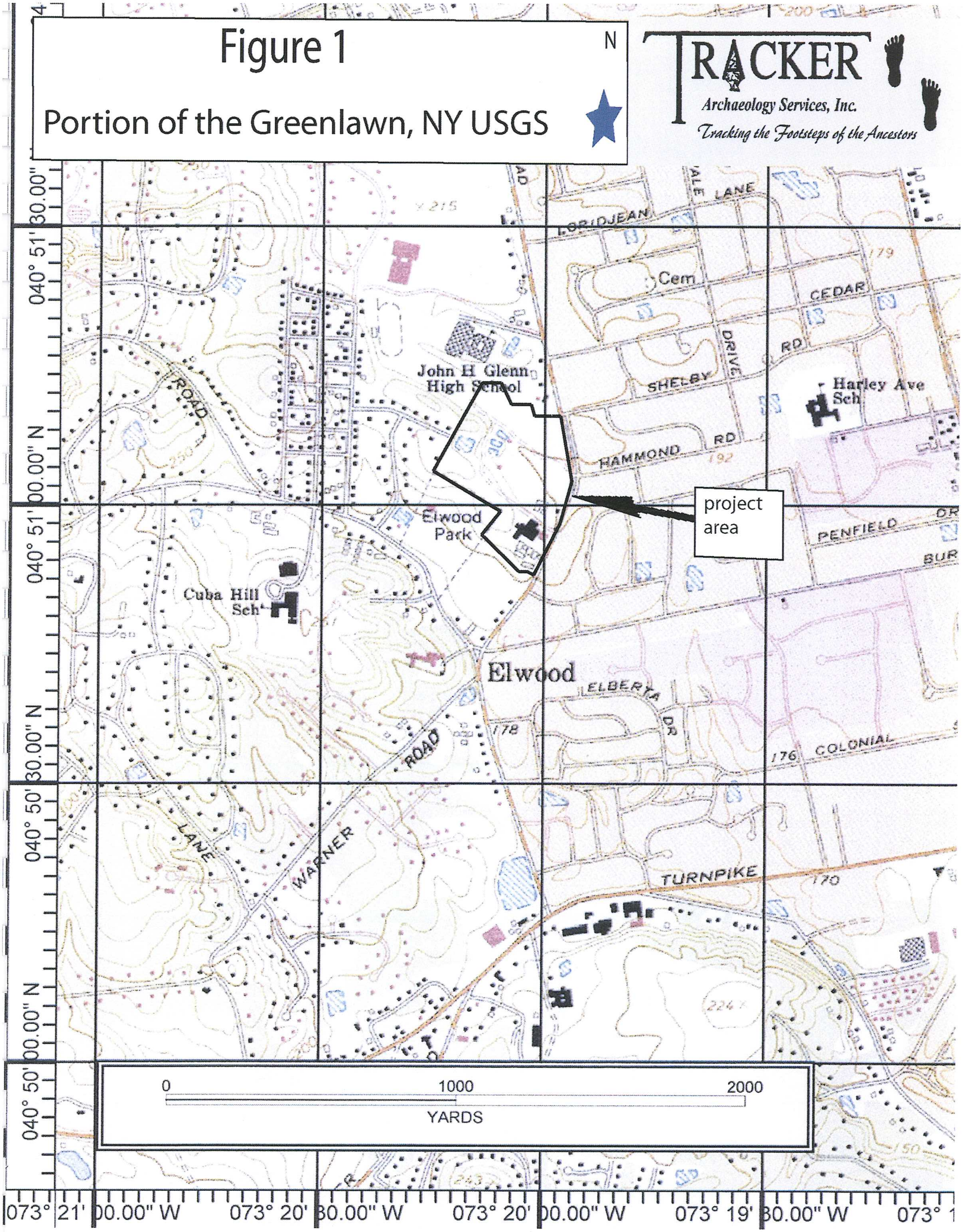


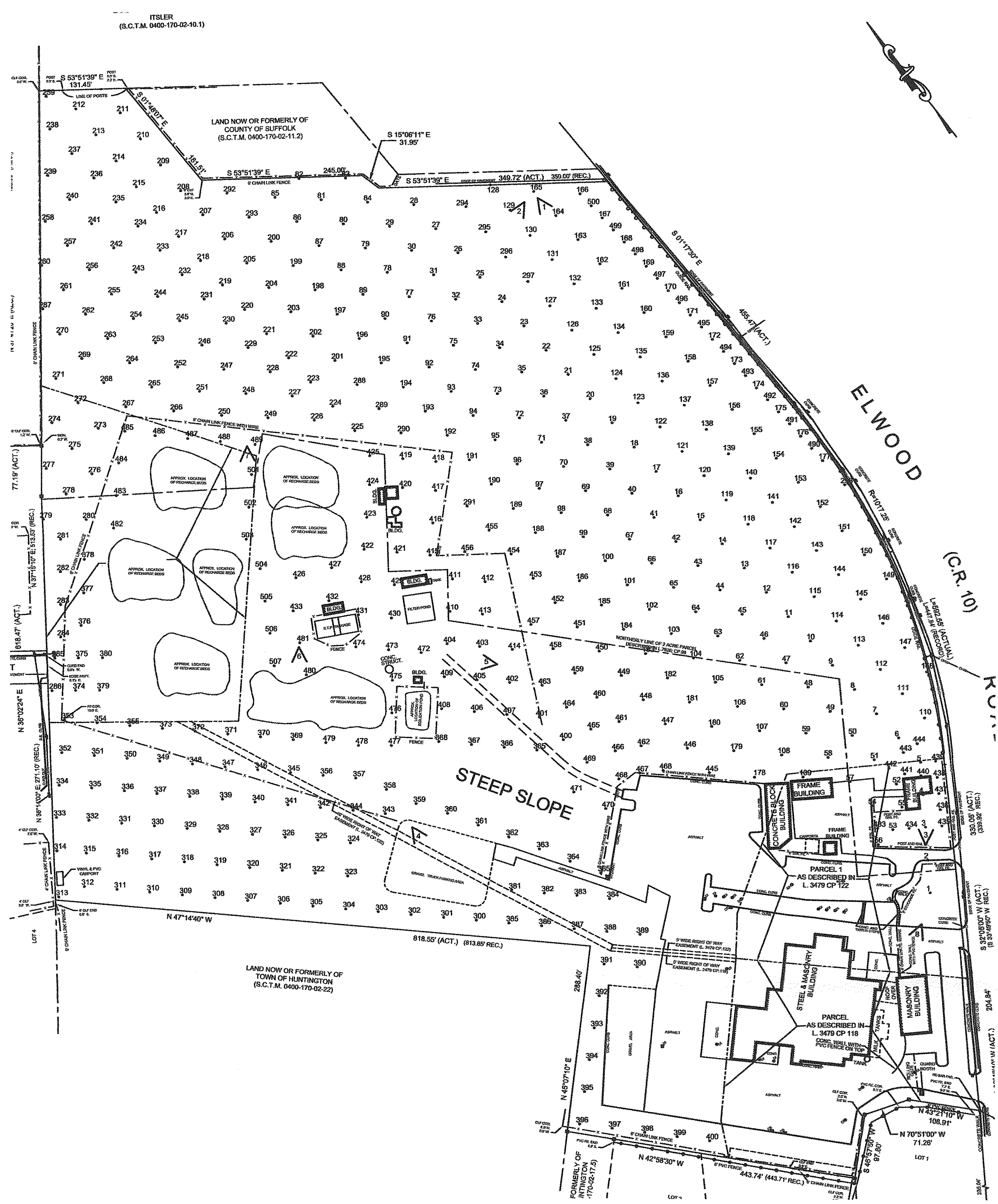
FIGURE 2: LOCATION OF SHOVEL TESTS

V PHOTO ANGLE

• NEGATIVE SHOVEL TEST

PROJECT NAME: ELWOOD

TRACKER
Archaeology Services, Inc.
Tracking the Footsteps of the Ancestors



SCALE: 1 INCH = 150 FEET

300' 225' 150' 75' 0 150' 300'

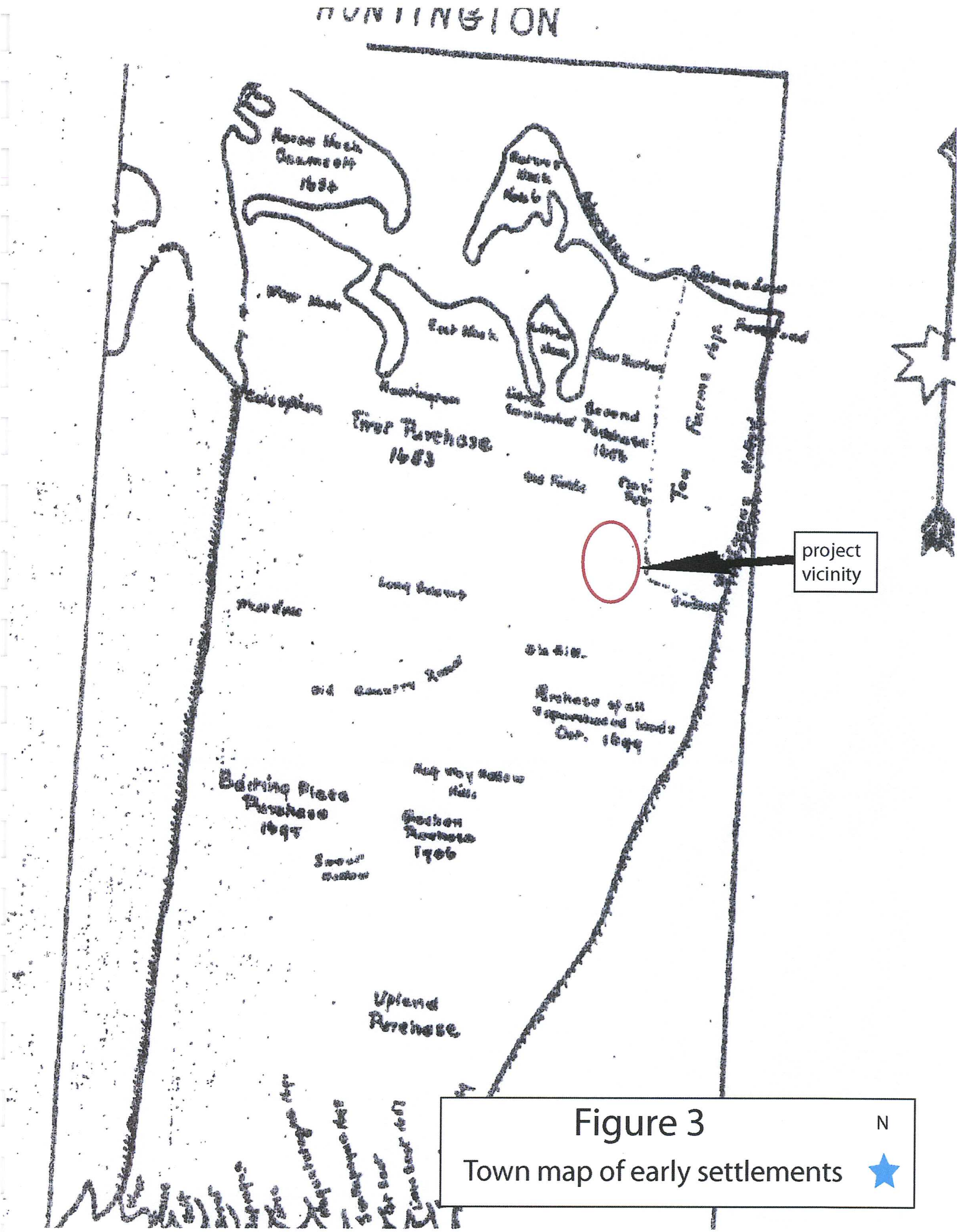


Figure 3

Town map of early settlements

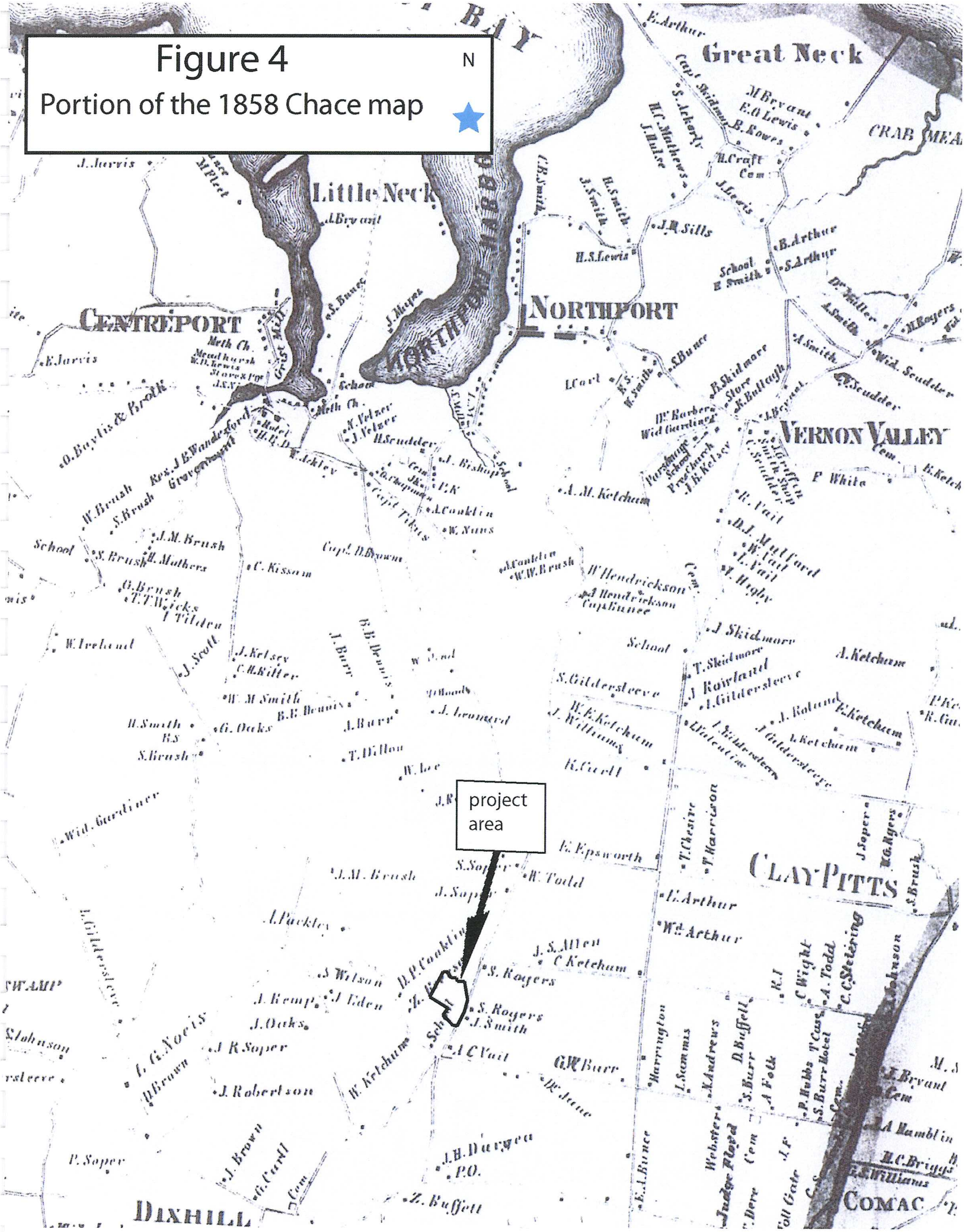


Figure 4
Portion of the 1858 Chace map

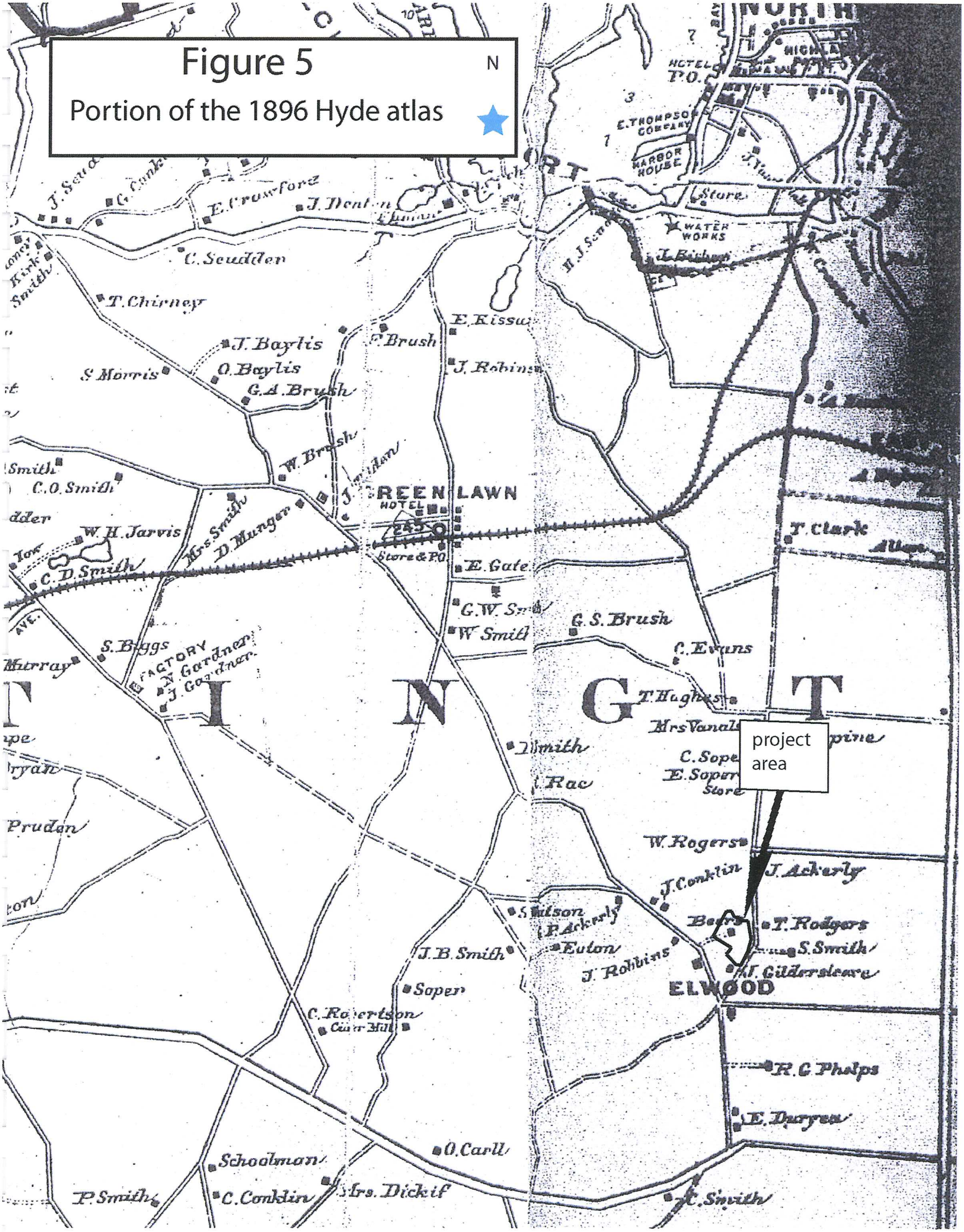


Figure 5
Portion of the 1896 Hyde atlas

Figure 6

Portion of the 1903 USGS

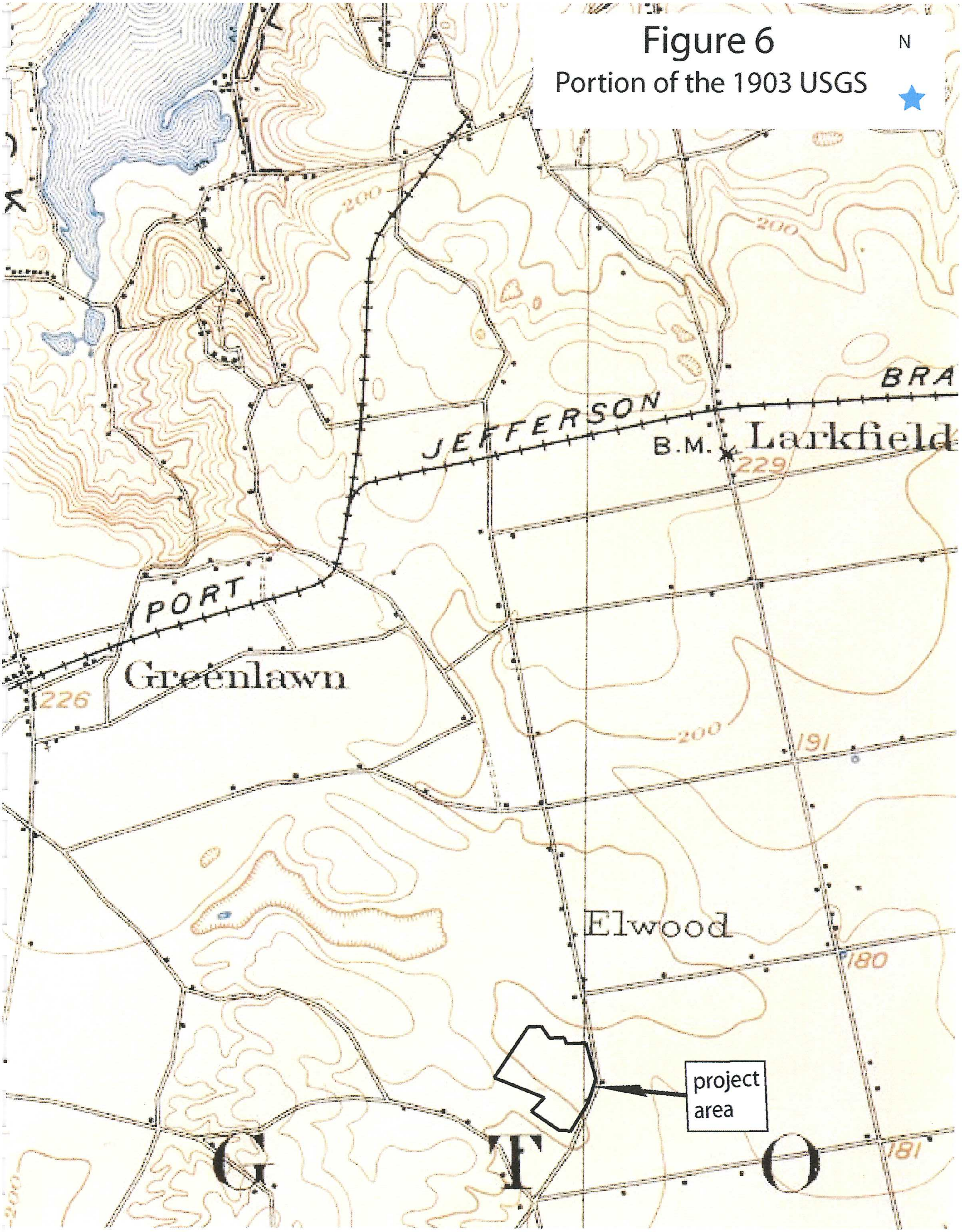


Figure 7

Portion of the County Soil Survey


Photo 1
Looking south from ST 164


Photo 2
Looking west from ST 129


Photo 3
Looking NE from ST 3

Photo 4
Looking south at gravel parking area

Photo 5

Looking west from ST 405


Photo 6
Looking SW from ST 481 at recharge bed

Photo 7

Panorama view of recharge beds from ST 489

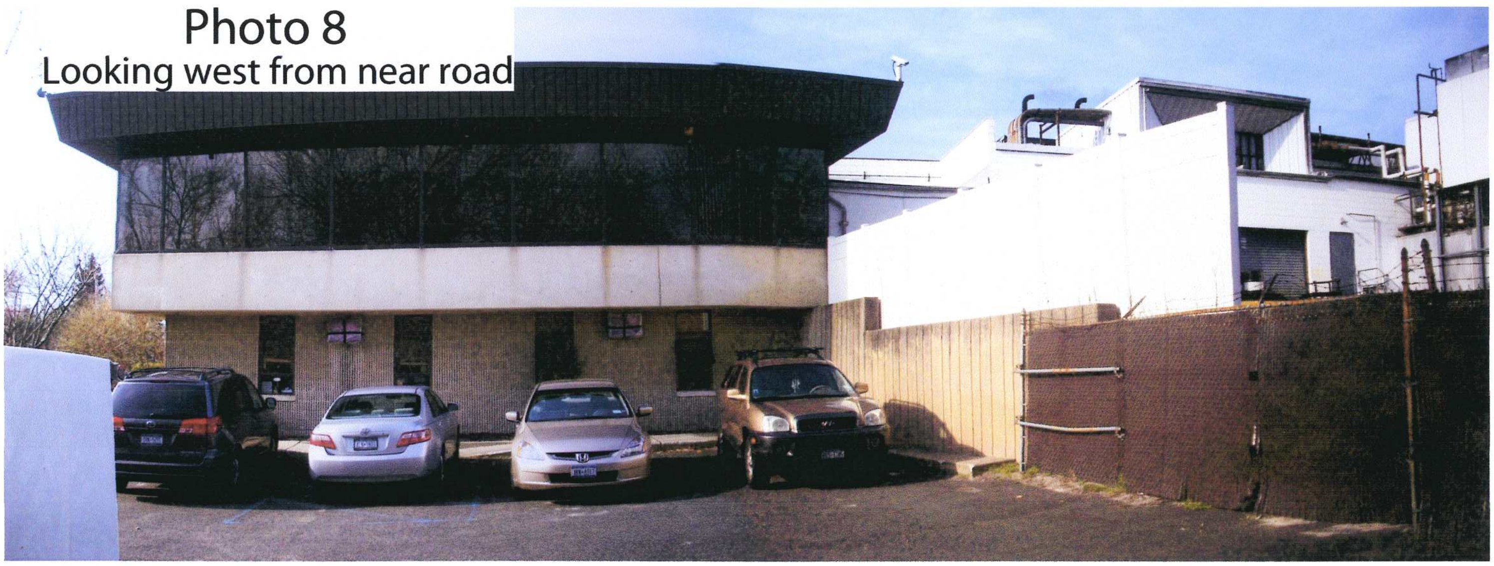


Photo 8
Looking west from near road

APPENDIX 2

SHOVEL TESTS

STP	LV	DEPTH(CM)	TEXTURE	COLOR	HOR	COMMENT
1	1	0-3	rootmat,leave,humus		A/O	NCM
	2	3-26	GrSaLo	10YR4/3-5/6	A	NCM
	3	26-39	SaLo	10YR5/6	B	NCM
2	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-22	GrSaLo	10YR4/3-5/6	A	NCM
	3	22-34	SaLo	10YR5/6	B	NCM
3	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	GrSaLo	10YR4/3-5/6	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
4	1	0-10	rootmat,leaves,humus		A/O	NCM
	2	10-29	GrSaLo	10YR4/3-5/6	A	NCM
	3	29-39	SaLo	10YR5/6	B	NCM
5	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-23	SaLo	10YR4/3	A	NCM
	3	23-36	SaLo	10YR5/6	B	NCM
6	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-30	SaLo	10YR4/3	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
7	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	SaLo	10YR4/3	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
8	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-33	SaLo	10YR4/3	A	NCM
	3	33-43	SaLo	10YR5/6	B	NCM
9	1	0-3	rootmat,leave,humus		A/O	NCM
	2	3-39	SaLo	10YR4/3	A	NCM
	3	39-49	SaLo	10YR5/6	B	NCM
10	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-23	SaLo	10YR4/3	A	NCM
	3	23-33	SaLo	10YR5/6	B	NCM
11	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-37	SaLo	10YR4/3	A	NCM
	3	37-47	SaLo	10YR5/6	B	NCM
12	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-40	SaLo	10YR4/3	A	NCM
	3	40-50	SaLo	10YR5/6	B	NCM
13	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-37	SaLo	10YR4/3	A	NCM
	3	37-48	SaLo	10YR5/6	B	NCM

14	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	SaLo	10YR4/3	A	NCM
	3	37-47	SaLo	10YR5/6	B	NCM
15	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-23	SaLo	10YR4/3	A	NCM
	3	23-rock				
16	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-27	SaLo	10YR4/3	A	NCM
	3	27-rock				
17	2	0-13	SaLo	10YR4/3	A	NCM
	3	13-23	SaLo	10YR5/6	B	NCM
18	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	SaLo	10YR4/3	A	NCM
	3	30-rock				
19	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-18	SaLo	10YR4/3	A	NCM
	3	18-rock				
20	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-29	SaLo	10YR4/3	A	NCM
	3	29-39	SaLo	10YR5/6	B	NCM
21	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	SaLo	10YR4/3	A	NCM
	3	27-38	SaLo	10YR5/6	B	NCM
22	1	0-2	rootmat,leave,humus		A/O	NCM
	2	2-31	SaLo	10YR4/3	A	NCM
	3	31-40	SaLo	10YR5/6	B	NCM
23	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-32	SaLo	10YR4/3	A	NCM
	3	32-42	SaLo	10YR5/6	B	NCM
24	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-31	SaLo	10YR4/3	A	NCM
	3	31-41	SaLo	10YR5/6	B	NCM
25	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-34	SaLo	10YR4/3	A	NCM
	3	34-44	SaLo	10YR5/6	B	NCM
26	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	5-27	SaLo	10YR4/3	A	NCM
	3	27-40	SaLo	10YR5/6	B	NCM
27	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-35	SaLo	10YR4/3	A	NCM
	3	35-45	SaLo	10YR5/6	B	NCM

28	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-24	SaLo	10YR4/3	A	NCM
	3	24-37	SaLo	10YR5/6	B	NCM
29	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-rock				
30	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	SaLo	10YR4/3	A	NCM
	3	36-46	SaLo	10YR5/6	B	NCM
31	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-32	SaLo	10YR4/3	A	NCM
	3	32-42	SaLo	10YR5/6	B	NCM
32	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-36	SaLo	10YR4/3	A	NCM
	3	36-46	SaLo	10YR5/6	B	NCM
33	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-31	SaLo	10YR4/3	A	NCM
	3	31-41	SaLo	10YR5/6	B	NCM
34	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	SaLo	10YR4/3	A	NCM
	3	33-43	SaLo	10YR5/6	B	NCM
35	1	0-2	rootmat,leave,humus		A/O	NCM
	2	2-26	SaLo	10YR4/3	A	NCM
	3	26-36	SaLo	10YR5/6	B	NCM
36	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-36	SaLo	10YR4/3	A	NCM
	3	36-48	SaLo	10YR5/6	B	NCM
37	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-21	SaLo	10YR4/3	A	NCM
	3	21-32	SaLo	10YR5/6	B	NCM
38	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-39	SaLo	10YR4/3	A	NCM
	3	25-49	SaLo	10YR5/6	B	NCM
39	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-35	SaLo	10YR4/3	A	NCM
	3	35-47	SaLo	10YR5/6	B	NCM
40	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	5-35	SaLo	10YR4/3	A	NCM
	3	35-45	SaLo	10YR5/6	B	NCM
41	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-31	SaLo	10YR4/3	A	NCM
	3	31-41	SaLo	10YR5/6	B	NCM

42	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-29	SaLo	10YR4/3	A	NCM
	3	29-40	SaLo	10YR5/6	B	NCM
43	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-36	SaLo	10YR4/3	A	NCM
	3	36-46	SaLo	10YR5/6	B	NCM
44	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-39	SaLo	10YR4/3	A	NCM
	3	39-40	SaLo,gravel	10YR5/6	B	NCM
45	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-32	SaLo	10YR4/3	A	NCM
	3	32-42	SaLo	10YR5/6	B	NCM
46	2	0-32	SaLo	10YR4/3	A	NCM
	3	32-42	SaLo	10YR5/6	B	NCM
47	2	0-40	SaLo	10YR4/3	A	NCM
	3	40-50	SaLo	10YR5/6	B	NCM
48	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-40	SaLo	10YR4/3	A	NCM
	3	40-50	SaLo	10YR5/6	B	NCM
49	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-33	SaLo	10YR4/3	A	NCM
	3	33-44	SaLo	10YR5/6	B	NCM
50	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-36	SaLo	10YR4/3	A	NCM
	3	36-46	SaLo	10YR5/6	B	NCM
51	2	0-20	SaLo	10YR4/3	A	NCM
	3	20-rock				
52	2	0-25	SaLo	10YR4/3	A	NCM
	3	25-35	SaLo	10YR5/6	B	NCM
53	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-30	SaLo	10YR4/3	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
54	2	0-30	SaLo	10YR4/3	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
55	2	0-24	SaLo	10YR4/3	A	NCM
	3	24-34	SaLo	10YR5/6	B	NCM
56	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-25	SaLo	10YR4/3	A	NCM
	3	25-35	SaLo	10YR5/6	B	NCM

57	2	0-23	SaLo	10YR4/3	A	NCM
	3	23-32	SaLo	10YR5/6	B	NCM
58	2	0-30	SaLo	10YR4/3	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
59	2	0-17	SaLo	10YR4/3	A	NCM
	3	17-27	SaLo	10YR5/6	B	NCM
60	2	0-26	SaLo	10YR4/3	A	NCM
	3	26-36	SaLo	10YR5/6	B	NCM
61	2	0-20	SaLo	10YR4/3	A	NCM
	3	20-31	SaLo	10YR5/6	B	NCM
62	2	0-17	SaLo	10YR4/3	A	NCM
	3	17-30	SaLo	10YR5/6	B	NCM
63	2	0-26	SaLo	10YR4/3	A	NCM
	3	26-36	SaLo	10YR5/6	B	NCM
64	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-28	SaLo	10YR4/3	A	NCM
	3	28-38	SaLo	10YR5/6	B	NCM
65	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-32	SaLo	10YR4/3	A	NCM
	3	32-42	SaLo	10YR5/6	B	NCM
66	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-18	SaLo	10YR4/3	A	NCM
	3	18-30	SaLo	10YR5/6	B	NCM
67	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	SaLo	10YR4/3	A	NCM
	3	30-32,rock	SaLo	10YR5/6	B	NCM
68	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-28	SaLo	10YR4/3	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM
69	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-47	SaLo	10YR4/3	A	NCM
	3	47-57	SaLo	10YR5/6	B	NCM
70	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-40	SaLo	10YR4/3	A	NCM
	3	40-50	SaLo	10YR5/6	B	NCM
71	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	6-28	SaLo	10YR4/3	A	NCM
	3	28-30,rock	SaLo	10YR5/6	B	NCM

72	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-29	SaLo	10YR4/3	A	NCM
	3	29-30,rock	SaLo	10YR5/6	B	NCM
73	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-33	SaLo	10YR4/3	A	NCM
	3	33-45	SaLo	10YR5/6	B	NCM
74	2	0-26	SaLo	10YR4/3	A	NCM
	3	26-36	SaLo	10YR5/6	B	NCM
75	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-33	SaLo	10YR4/3	A	NCM
	3	33-rock				
76	1	0-1	rootmat,leaves,humus		A/O	NCM
	2	1-30	SaLo	10YR4/3	A	NMC
	3	30-rock				
77	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-40	SaLo	10YR4/3	A	NCM
	3	40-50	SaLo	10YR5/6	B	NCM
78	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-38	SaLo	10YR4/3	A	NCM
	3	38-49	SaLo	10YR5/6	B	NCM
79	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-38	SaLo	10YR4/3	A	NCM
	3	38-48	SaLo	10YR5/6	B	NCM
80	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-34	SaLo	10YR4/3	A	NCM
	3	34-rock				
81	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-40	SaLo	10YR4/3	A	NCM
	3	40-50	SaLo	10YR5/6	B	NCM
82	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-27	SaLo	10YR4/3	A	NCM
	3	27-39	SaLo	10YR5/6	B	NCM
83	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-35	SaLo	10YR4/3	A	NCM
	3	35-45	SaLo	10YR5/6	B	NCM
84	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-33	SaLo	10YR4/3	A	NCM
	3	33-45	SaLo	10YR5/6	B	NCM
85	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-42	SaLo	10YR4/3	A	NCM
	3	42-rock				

86	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-35	SaLo	10YR4/3	A	NCM
	3	35-rock				
87	1	0-3	rootmat,leave,humus		A/O	NCM
	2	3-37	SaLo	10YR4/3	A	NCM
	3	37-47	SaLo	10YR5/6	B	NCM
88	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	SaLo	10YR4/3	A	NCM
	3	30-41	SaLo	10YR5/6	B	NCM
89	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-13	SaLo	10YR4/3	A	NCM
	3	13-24	SaLo	10YR5/6	B	NCM
90	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-35	SaLo	10YR4/3	A	NCM
	3	35-45	SaLo	10YR5/6	B	NCM
91	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-39	SaLo	10YR4/3	A	NCM
	3	39-49	SaLo	10YR5/6	B	NCM
92	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	SaLo	10YR4/3	A	NCM
	3	26-rock				
93	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-34	SaLo	10YR4/3	A	NCM
	3	34-rock				
94	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-29	SaLo	10YR4/3	A	NCM
	3	29-39	SaLo	10YR5/6	B	NCM
95	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-20	SaLo	10YR4/3	A	NCM
	3	20-43	SaLo	10YR5/6	B	NCM
96	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-25	SaLo	10YR4/3	A	NCM
	3	25-45	SaLo	10YR5/6	B	NCM
97	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	SaLo	10YR4/3	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
98	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-32	SaLo	10YR4/3	A	NCM
	3	32-43	SaLo	10YR5/6	B	NCM

99	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-15	SaLo	10YR4/3	A	NCM
	3	15-rock				
100	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-40	SaLo	10YR4/3	A	NCM
	3	40-50	SaLo	10YR5/6	B	NCM
101	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-40	SaLo	10YR4/3	A	NCM
	3	40-51	SaLo	10YR5/6	B	NCM
102	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-33	SaLo	10YR4/3	A	NCM
	3	33-43	SaLo	10YR5/6	B	NCM
103	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	SaLo	10YR4/3	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
104	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-40	SaLo	10YR4/3	A	NCM
	3	40-50	SaLo	10YR5/6	B	NCM
105	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-37	SaLo	10YR4/3	A	NCM
	3	37-47	SaLo	10YR5/6	B	NCM
106	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	SaLo	10YR4/3	A	NCM
	3	37-49	SaLo	10YR5/6	B	NCM
107	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-35	SaLo	10YR4/3	A	NCM
	3	35-45	SaLo	10YR5/6	B	NCM
108	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-15	SaLo	10YR4/3	A	NCM
	3	15-rock				
109	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-22	SaLo	10YR4/3	A	NCM
	3	22-32	SaLo	10YR5/6	B	NCM
110	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-40	SaLo	10YR4/3	A	NCM
	3	40-51	SaLo	10YR5/6	B	NCM
111	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-38	SaLo	10YR4/3	A	NCM
	3	38-50	SaLo	10YR5/6	B	NCM

112	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-41	SaLo	10YR4/3	A	NCM
	3	41-59	SaLo	10YR5/6	B	NCM
113	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-28	SaLo	10YR4/3	A	NCM
	3	28-43	GrSaLo	10YR5/6	B	NCM
114	1	0-6	rootmat,leave,humus		A/O	NCM
	2	6-42	SaLo	10YR4/3	A	NCM
	3	42-53	SaLo	10YR5/6	B	NCM
115	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-37	SaLo	10YR4/3	A	NCM
	3	37-49	SaLo	10YR5/6	B	NCM
116	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-35	SaLo	10YR4/3	A	NCM
	3	35-47	SaLo	10YR5/6	B	NCM
117	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-33	SaLo	10YR4/3	A	NCM
	3	33-43	SaLo	10YR5/6	B	NCM
118	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-40	SaLo	10YR4/3	A	NCM
	3	40-51	SaLo	10YR5/6	B	NCM
119	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-39	SaLo	10YR4/3	A	NCM
	3	39-50	SaLo	10YR5/6	B	NCM
120	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-35	SaLo	10YR4/3	A	NCM
	3	35-47	SaLo	10YR5/6	B	NCM
121	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-39	SaLo	10YR4/3	A	NCM
	3	39-50	SaLo	10YR5/6	B	NCM
122	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-29	SaLo	10YR4/3	A	NCM
	3	29-39	SaLo	10YR5/6	B	NCM
123	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-44	SaLo	10YR4/3	A	NCM
	3	44-56	SaLo	10YR5/6	B	NCM
124	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-40	SaLo	10YR4/3	A	NCM
	3	40-50	SaLo	10YR5/6	B	NCM

125	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-28	SaLo	10YR4/3	A	NCM
	3	28-39	SaLo	10YR5/6	B	NCM
126	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-44	SaLo	10YR4/3	A	NCM
	3	44-56	SaLo	10YR5/6	B	NCM
127	1	0-3	rootmat,leave,humus		A/O	NCM
	2	3-29	SaLo	10YR4/3	A	NCM
	3	15-43	SaLo	10YR5/6	B	NCM
128	1	0-6	rootmat,leave,humus		A/O	NCM
	2	6-15	SaLo	10YR4/3	A	NCM
	3	15-rock				
129	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-35	SaLo	10YR4/3	A	NCM
	3	35-47	SaLo	10YR5/6	B	NCM
130	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-15	SaLo	10YR4/3	A	NCM
	3	15-30	SaLo	10YR5/6	B	NCM
131	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-37	SaLo	10YR4/3	A	NCM
	3	37-49	SaLo	10YR5/6	B	NCM
132	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-35	SaLo	10YR4/3	A	NCM
	3	35-46	SaLo	10YR5/6	B	NCM
133	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	SaLo	10YR4/3	A	NCM
	3	30-41	SaLo	10YR5/6	B	NCM
134	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	SaLo	10YR4/3	A	NCM
	3	27-49	SaLo	10YR5/6	B	NCM
135	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-44	SaLo	10YR4/3	A	NCM
	3	44-56	SaLo	10YR5/6	B	NCM
136	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-40	SaLo	10YR4/3	A	NCM
	3	40-57	SaLo	10YR5/6	B	NCM
137	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-34	SaLo	10YR4/3	A	NCM
	3	34-45	SaLo	10YR5/6	B	NCM

138	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-40	SaLo	10YR4/3	A	NCM
	3	40-56	SaLo	10YR5/6	B	NCM
139	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-37	SaLo	10YR4/3	A	NCM
	3	37-49	SaLo	10YR5/6	B	NCM
140	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	SaLo	10YR4/3	A	NCM
	3	37-47	SaLo	10YR5/6	B	NCM
141	1	0-2	rootmat,leave,humus		A/O	NCM
	2	2-33	SaLo	10YR4/3	A	NCM
	3	33-48	SaLo	10YR5/6	B	NCM
142	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-30	SaLo	10YR4/3	A	NCM
	3	30-42	SaLo	10YR5/6	B	NCM
143	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-22	SaLo	10YR4/3	A	NCM
	3	22-35	SaLo	10YR5/6	B	NCM
144	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-33	SaLo	10YR4/3	A	NCM
	3	33-48	SaLo	10YR5/6	B	NCM
145	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-41	SaLo	10YR4/3	A	NCM
	3	41-52	SaLo	10YR5/6	B	NCM
146	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-28	gravel,SaLo	10YR4/3	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM
147	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-38	SaLo	10YR4/3	A	NCM
	3	38-48	SaLo	10YR5/6	B	NCM
148	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-31	SaLo	10YR4/3	A	NCM
	3	31-43	SaLo	10YR5/6	B	NCM
149	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	SaLo	10YR4/3	A	NCM
	3	30-43	SaLo	10YR5/6	B	NCM
150	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-24	SaLo	10YR4/3	A	NCM
	3	24-37	SaLo	10YR5/6	B	NCM

151	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-36	SaLo	10YR4/3	A	NCM
	3	36-49	SaLo	10YR5/6	B	NCM
152	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	SaLo	10YR4/3	A	NCM
	3	30-4	SaLo	10YR5/6	B	NCM
153	1	0-7	rootmat,leaves,humus		A/O	NCM
	2	7-28	Lo	10YR4/3	A	NCM
	3	28-43	Lo	10YR5/6	B	NCM
154	1	0-6	rootmat,leave,humus		A/O	NCM
	2	6-13	SaLo	10YR4/3	A	NCM
	3	13-rock				
155	1	0-6	rootmat,leave,humus		A/O	NCM
	2	6-32	SaLo	10YR4/3	A	NCM
	3	32-43	SaLo	10YR5/6	B	NCM
156	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-18	SaLo	10YR4/3	A	NCM
	3	18-32	SaLo	10YR5/6	B	NCM
157	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-31	SaLo	10YR4/3	A	NCM
	3	31-41	SaLo	10YR5/6	B	NCM
158	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-29	SaLo	10YR4/3	A	NCM
	3	30-46	SaLo	10YR5/6	B	NCM
159	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-30	SaLo	10YR4/3	A	NCM
	3	30-46	SaLo	10YR5/6	B	NCM
160	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-28	SaLo	10YR4/3	A	NCM
	3	28-38	SaLo	10YR5/6	B	NCM
161	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-29	SaLo	10YR4/3	A	NCM
	3	29-443	SaLo	10YR5/6	B	NCM
162	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-30	SaLo	10YR4/3	A	NCM
	3	30-47	SaLo	10YR5/6	B	NCM
163	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-13	SaLo	10YR4/3	A	NCM
	3	13-28	SaLo	10YR5/6	B	NCM

164	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-35	SaLo	10YR4/3	A	NCM
	3	35-48	SaLo	10YR5/6	B	NCM
165	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-23	SaLo	10YR4/3	A	NCM
	3	23-39	SaLo	10YR5/6	B	NCM
166	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-25	SaLo	10YR4/3	A	NCM
	3	25-35	SaLo	10YR5/6	B	NCM
167	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-31	SaLo	10YR4/3	A	NCM
	3	31-43	SaLo	10YR5/6	B	NCM
168	1	0-2	rootmat,leave,humus		A/O	NCM
	2	2-40	SaLo	10YR4/3	A	NCM
	3	20-51	SaLo	10YR5/6	B	NCM
169	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-39	SaLo	10YR4/3	A	NCM
	3	22-49	SaLo	10YR5/6	B	NCM
170	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-21	SaLo	10YR4/3	A	NCM
	3	21-rock	gravel fill			
171	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	SaLo	10YR4/3	A	NCM
	3	27-38	SaLo	10YR5/6	B	NCM
172	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-18	SaLo	10YR4/3	A	NCM
	3	18-gravel fill				
173	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-25	SaLo	10YR4/3	A	NCM
	3	25-37	SaLo	10YR5/6	B	NCM
174	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-24	SaLo	10YR4/3	A	NCM
	3	24-38	SaLo	10YR5/6	B	NCM
175	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-33	SaLo	10YR4/3	A	NCM
	3	33-43	SaLo	10YR5/6	B	NCM
176	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-20	SaLo	10YR4/3	A	NCM
	3	20--35	SaLo	10YR5/6	B	NCM

177	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-24	SaLo	10YR4/3	A	NCM
	3	24-35	SaLo	10YR5/6	B	NCM
178	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-28	SaLo	10YR4/3	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM
179	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-20	SaLo	10YR4/3	A	beer glass
	3	20-31	SaLo	10YR5/6	B	NCM
180	1	0-7	rootmat,leaves,humus		A/O	NCM
	2	7-24	SaLo	10YR4/3	A	beer glass
	3	24-35	SaLo	10YR5/6	B	NCM
181	1	0-3	rootmat,leave,humus		A/O	NCM
	2	3-24	SaLo	10YR4/3	A	NCM
	3	24-35	SaLo	10YR5/6	B	NCM
182	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	SaLo	10YR4/3	A	NCM
	3	30-47	SaLo	10YR5/6	B	NCM
183	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-24	SaLo	10YR4/3	A	NCM
	3	24-35	SaLo	10YR5/6	B	NCM
184	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-30	SaLo	10YR4/3	A	NCM
	3	33-42	SaLo	10YR5/6	B	NCM
185	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-32	SaLo	10YR4/3	A	NCM
	3	32-48	SaLo	10YR5/6	B	NCM
186	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-28	SaLo	10YR4/3	A	NCM
	3	28-39	SaLo	10YR5/6	B	NCM
187	1	0-4	rootmat,leave,humus		A/O	NCM
	2	4-20	SaLo	10YR4/3	A	NCM
	3	20-rock				
188	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-34	SaLo	10YR4/3	A	NCM
	3	40-52	SaLo	10YR5/6	B	NCM
189	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-37	SaLo	10YR4/3	A	NCM
	3	37-49	SaLo	10YR5/6	B	NCM

190	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	SaLo	10YR4/3	A	NCM
	3	30-45	SaLo	10YR5/6	B	NCM
191	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-21	SaLo	10YR4/3	A	NCM
	3	21-rock				
192	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-24	SaLo	10YR4/3	A	NCM
	3	24-48	SaLo	10YR5/6	B	NCM
193	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-23	SaLo	10YR4/3	A	NCM
	3	23-45	SaLo	10YR5/6	B	NCM
194	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-39	SaLo	10YR4/3	A	NCM
	3	39-49	SaLo	10YR5/6	B	NCM
195	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-41	SaLo	10YR4/3	A	NCM
	3	41-53	SaLo	10YR5/6	B	NCM
196	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-29	SaLo	10YR4/3	A	NCM
	3	29-43	SaLo	10YR5/6	B	NCM
197	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-39	SaLo	10YR4/3	A	NCM
	3	39-49	SaLo	10YR5/6	B	NCM
198	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-28	SaLo	10YR4/3	A	NCM
	3	28-45	SaLo	10YR5/6	B	NCM
199	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-24	SaLo	10YR4/3	A	NCM
	3	24-40	SaLo	10YR5/6	B	NCM
200	1	0-6	rootmat,leave,humus		A/O	NCM
	2	6-25	SaLo	10YR4/3	A	NCM
	3	25-37	SaLo	10YR5/6	B	NCM
201	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-38	SaLo	10YR4/3	A	NCM
	3	38-50	SaLo	10YR5/6	B	NCM
202	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-37	SaLo	10YR4/3	A	NCM
	3	37-49	SaLo	10YR5/6	B	NCM

203	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-29	SaLo	10YR4/3	A	NCM
	3	29-41	SaLo	10YR5/6	B	NCM
204	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-41	SaLo	10YR4/3	A	NCM
	3	41-51	SaLo	10YR5/6	B	NCM
205	1	0-3	rootmat,leaves,humus		A/O	NCM
		3-38	SaLo	10YR4/3	A	NCM
	3	38-50	SaLo	10YR5/6	B	NCM
206	1	0-3	rootmat,leave,humus		A/O	NCM
	2	3-42	SaLo	10YR4/3	A	NCM
	3	42-53	SaLo	10YR5/6	B	NCM
207	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-39	SaLo	10YR4/3	A	NCM
	3	39-49	SaLo	10YR5/6	B	NCM
208	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-28	SaLo	10YR4/3	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM
209	1	0-4	rootma,leave,humus		A/O	NCM
	2	4-18	SaLo	10YR4/3	A	NCM
	3	18-30	SaLo	10YR5/6	B	NCM
210	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-19	SaLo	10YR4/3	A	NCM
	3	19-31	SaLo	10YR5/6	B	NCM
211	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	SaLo	10YR4/3	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
212	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	SaLo	10YR4/3	A	NCM
	3	30-43	SaLo	10YR5/6	B	NCM
213	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-13	SaLo	10YR4/3	A	NCM
	3	13-rocks.				
214	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-29	SaLo	10YR4/3	A	NCM
	3	29-41	SaLo	10YR5/6	B	NCM
215	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-34	SaLo	10YR4/3	A	NCM
	3	34-48	SaLo	10YR5/6	B	NCM

216	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-36	SaLo	10YR4/3	A	NCM
	3	36-49	SaLo	10YR5/6	B	NCM
217	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-27	SaLo	10YR4/3	A	NCM
	3	27-39	SaLo	10YR5/6	B	NCM
218	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	SaLo	10YR4/3	A	NCM
	3	30-53	SaLo	10YR5/6	B	NCM
219	1	0-2	rootmat,leave,humus		A/O	NCM
	2	2-44	SaLo	10YR4/3	A	NCM
	3	44-56	SaLo	10YR5/6	B	NCM
220	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-34	SaLo	10YR4/3	A	NCM
	3	34-48	SaLo	10YR5/6	B	NCM
221	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-26	SaLo	10YR4/3	A	NCM
	3	26-38	SaLo	10YR5/6	B	NCM
222	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-31	SaLo	10YR4/3	A	NCM
	3	31-43	SaLo	10YR5/6	B	NCVM
223	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-36	SaLo	10YR4/3	A	NCM
	3	36-48	SaLo	10YR5/6	B	NCM
224	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	SaLo	10YR4/3	A	NCM
	3	27-39	SaLo	10YR5/6	B	NCM
225	1	0-3	rootmat,leave,humus		A/O	NCM
	2	3-44	SaLo	10YR4/3	A	NCM
	3	44-56	SaLo	10YR5/6	B	NCM
226	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-20	SaLo	10YR4/3	A	NCM
	3	20-roots.				
227	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	SaLo	10YR4/3	A	NCM
	3	30-43	SaLo	10YR5/6	B	NCM
228	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	SaLo	10YR4/3	A	NCM
	3	26-37	SaLo	10YR5/6	B	NCM

229	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-25	SaLo	10YR4/3	A	NCM
	3	25-37	SaLo	10YR5/6	B	NCM
230	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-23	SaLo	10YR4/3	A	NCM
	3	23-38	SaLo	10YR5/6	B	NCM
231	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-20	SaLo	10YR4/3	A	NCM
	3	20-40	SaLo	10YR5/6	B	NCM
232	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-38	SaLo	10YR4/3	A	NCM
	3	38-50	SaLo	10YR5/6	B	NCM
233	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-29	SaLo	10YR4/3	A	NCM
	3	29-48	SaLo	10YR5/6	B	NCM
234	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-29	SaLo	10YR4/3	A	NCM
	3	29-39	SaLo	10YR5/6	B	NCM
235	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-29	SaLo	10YR4/3	A	NCM
	3	29-41	SaLo	10YR5/6	B	NCM
236	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-33	SaLo	10YR4/3	A	NCM
	3	33-45	SaLo	10YR5/6	B	NCM
237	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-22	SaLo	10YR4/3	A	NCM
	3	22-35	SaLo	10YR5/6	B	NCM
238	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-28	SaLo	10YR4/3	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM
239	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-23	SaLo	10YR4/3	A	NCM
	3	23-33	SaLo	10YR5/6	B	NCM
240	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-33	SaLo	10YR4/3	A	NCM
	3	33-43	SaLo	10YR5/6	B	NCM
241	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	SaLo	10YR4/3	A	NCM
	3	26-38	SaLo	10YR5/6	B	NCM

242	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-28	SaLo	10YR4/3	A	NCM
	3	28-39	SaLo	10YR5/6	B	NCM
243	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-15	SaLo	10YR4/3	A	NCM
	3	15-rock.s				
244	1	0-3	rootmat,leaces,humus		A/O	NCM
	2	3-37	SaLo	10YR4/3	A	NCM
	3	37-48	SaLo	10YR5/6	B	NCM
245	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-35	SaLo	10YR4/3	A	NCM
	3	35-47	SaLo	10YR5/6	B	NCM
246	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-45	SaLo	10YR4/3	A	NCM
	3	45-55	SaLo	10YR5/6	B	NCM
247	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	SaLo	10YR4/3	A	NCM
	3	37-49	SaLo	10YR5/6	B	NCM
248	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-33	SaLo	10YR4/3	A	NCM
	3	33-43	SaLo	10YR5/6	B	NCM
249	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-18	SaLo	10YR4/3	A	NCM
	3	18-roots.				
250	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-35	SaLo	10YR4/3	A	NCM
	3	35-48	SaLo	10YR5/6	B	NCM
251	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	SaLo	10YR4/3	A	NCM
	3	27-37	SaLo	10YR5/6	B	NCM
252	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-18	SaLo	10YR4/3	A	NCM
	3	18-30	SaLo	10YR5/6	B	NCM
253	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-31	SaLo	10YR4/3	A	NCM
	3	31-43`	SaLo	10YR5/6	B	NCM
254	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-36	SaLo	10YR4/3	A	NCM
	3	36-48	SaLo	10YR5/6	B	NCM

255	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-27	SaLo	10YR4/3	A	NCM
	3	27-39	SaLo	10YR5/6	B	NCM
256	1	0-4	rootmat,leave,humus		A/O	NCM
	2	4-27	GrSaLo	10YR4/3	A	NCM
	3	27-39	GrSaLo	10YR5/6	B	NCM
257	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-21	SaLo	10YR4/3	A	NCM
	3	21-31	SaLo	10YR5/6	B	NCM
258	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-22	SaLo	10YR4/3	A	coal
	3	22-32	SaLo	10YR5/6	B	NCM
259	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-18	SaLo	10YR4/3	A	NCM
	3	18-30	SaLo	10YR5/6	B	NCM
260	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-16	SaLo	10YR4/3	A	NCM
	3	16-27	SaLo	10YR5/6	B	NCM
261	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-23	SaLo	10YR4/3	A	NCM
	3	23-33	SaLo	10YR5/6	B	NCM
262	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-27	SaLo	10YR4/3	A	NCM
	3	27-37	SaLo	10YR5/6	B	NCM
263	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-33	SaLo	10YR4/3	A	NCM
	3	33-43	SaLo	10YR5/6	B	NCM
264	1	0-3	rootmat,leave,humus		A/O	NCM
	2	3-25	SaLo	10YR4/3	A	NCM
	3	25-37	SaLo	10YR5/6	B	NCM
265	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-23	SaLo	10YR4/3	A	NCM
	3	23-35	SaLo	10YR5/6	B	NCM
266	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-20	SaLo	10YR4/3	A	NCM
	3	20-31	SaLo	10YR5/6	B	NCM
267	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-17	SaLo	10YR4/3	A	NCM
	3	17-rock				

268	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-33	SaLo	10YR4/3	A	NCM
	3	33-43	SaLo	10YR5/6	B	NCM
269	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-22	SaLo	10YR4/3	A	NCM
	3	22-32	SaLo	10YR5/6	B	NCM
270	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-18	SaLo	10YR4/3	A	NCM
	3	18-30	SaLo	10YR5/6	B	NCM
271	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-21	SaLo	10YR4/3	A	NCM
	3	21-31	SaLo	10YR5/6	B	NCM
272	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-21	SaLo	10YR4/3	A	NCM
	3	21-32	SaLo	10YR5/6	B	NCM
273	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-20	SaLo	10YR4/3	A	NCM
	3	20-31	SaLo	10YR5/6	B	NCM
274	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-28	SaLo	10YR4/3	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM
275	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-23	SaLo	10YR4/3	A	NCM
	3	23-33	SaLo	10YR5/6	B	NCM
276	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-24	SaLo	10YR4/3	A	NCM
	3	24-35	SaLo	10YR5/6	B	NCM
277	1	0-2	rootmat,leave,humus		A/O	NCM
	2	2-29	SaLo	10YR4/3	A	NCM
	3	29-41	SaLo	10YR5/6	B	NCM
278	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-25	SaLo	10YR4/3	A	NCM
	3	25-37	SaLo	10YR5/6	B	NCM
279	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-21	SaLo	10YR4/3	A	NCM
	3	21-31	SaLo	10YR5/6	B	NCM
280	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-23	SaLo	10YR4/3	A	NCM
	3	23-33	SaLo	10YR5/6	B	NCM

281	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	5-24	SaLo	10YR4/3	A	NCM
	3	24-35	SaLo	10YR5/6	B	NCM
282	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	SaLo	10YR4/3	A	NCM
	3	26-39	SaLo	10YR5/6	B	NCM
283	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-24	SaLo	10YR4/3	A	NCM
	3	24-37	SaLo	10YR5/6	B	NCM
284	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-25	SaLo	10YR4/3	A	NCM
	3	25-38	SaLo	10YR5/6	B	NCM
285	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-23	SaLo	10YR4/3	A	NCM
	3	23-35	SaLo	10YR5/6	B	NCM
286	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-25	SaLo	10YR4/3	A	NCM
	3	25-36	SaLo	10YR5/6	B	NCM
287	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-28	SaLo	10YR4/3	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM
288	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-27	SaLo	10YR4/3	A	NCM
	3	27-41	SaLo	10YR5/6	B	NCM
289	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-29	SaLo	10YR4/3	A	NCM
	3	29-43	SaLo	10YR5/6	B	NCM
290	1	0-4	rootmat,leave,humus		A/O	NCM
	2	4-18	SaLo	10YR4/3	A	NCM
	3	18-30	SaLo	10YR5/6	B	NCM
291	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-26	SaLo	10YR4/3	A	NCM
	3	26-38	SaLo	10YR5/6	B	NCM
292	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-21	SaLo	10YR4/3	A	NCM
	3	21-32	SaLo	10YR5/6	B	NCM
293	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-25	SaLo	10YR4/3	A	NCM
	3	25-37	SaLo	10YR5/6	B	NCM

294	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	SaLo	10YR4/3	A	NCM
	3	27-39	SaLo	10YR5/6	B	NCM
295	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-11	SaLo	10YR4/3	A	NCM
	3	11-21	SaLo	10YR5/6	B	NCM
296	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	SaLo	10YR4/3	A	NCM
	3	26-36	SaLo	10YR5/6	B	NCM
297	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-17	SaLo	10YR4/3	A	NCM
	3	17-29	SaLo	10YR5/6	B	NCM
298	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-19	SaLo	10YR4/3	A	NCM
	3	19-29	SaLo	10YR5/6	B	NCM
299	2	0-3	SaLo	10YR4/3	A	NCM
	3	3-21	SaLo,gravel	10YR5/6	B	NCM
300	2	0-6	SaLo	10YR4/3	A	NCM
	3	6-18	SaLo	10YR5/6	B	NCM
301	2	0-21	SaLo	10YR4/3	A	NCM
	3	21-31	SaLo	10YR5/6	B	NCM
302	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-28	SaLo	10YR4/3	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM
303	2	0-27	SaLo	10YR4/3	A	NCM
	3	27-fill				
304	2	0-25	SaLo	10YR4/3	A	NCM
	3	25-35	SaLo	10YR5/6	B	NCM
305	2	0-25	SaLo	10YR4/3	A	NCM
	3	25-rocks.				
306	2	0-27	SaLo	10YR4/3	A	NCM
	3	27-37	SaLo	10YR5/6	B	NCM
307	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-12	SaLo	10YR4/3	A	NCM
	3	12-22	SaLo	10YR5/6	B	NCM
308	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	SaLo	10YR4/3	A	NCM
	3	30-41	SaLo	10YR5/6	B	NCM

309	1	0-1	rootmat,leaves,humus		A/O	NCM
	2	1-24	SaLo	10YR4/3	A	NCM
	3	24-34	SaLo	10YR5/6	B	NCM
310	2	0-19	SaLo	10YR4/3	A	NCM
	3	19-31	SaLo	10YR5/6	B	NCM
311	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-13	SaLo	10YR4/3	A	NCM
	3	13-rocks.				
312	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-32	SaLo	10YR4/3	A	NCM
	3	32-42	SaLo	10YR5/6	B	NCM
313	2	0-13	SaLo	10YR4/3	A	NCM
	3	13-25	SaLo	10YR5/6	B	NCM
314	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-14	SaLo	10YR4/3	A	NCM
	3	14-roots.				
315	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-19	SaLo	10YR4/3	A	NCM
	3	19-roots				
316	2	0-20	SaLo	10YR4/3	A	NCM
	3	20-31	SaLo	10YR5/6	B	NCM
317	1	0-4	fill			
	2	4-17	SaLo	10YR4/3	A	NCM
318	2	0-19	SaLo	10YR4/3	A	NCM
	3	19-21,rocks	SaLo	10YR5/6	B	NCM
319	2	0-14	SaLo	10YR4/3	A	NCM
	3	14-25	SaLo	10YR5/6	B	NCM
320	2	0-15	SaLo	10YR4/3	A	NCM
	3	15-rocks.				
321	2	0-24	SaLo	10YR4/3	A	NCM
	3	24-34	SaLo	10YR5/6	B	NCM
322	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-22	SaLo	10YR4/3	A	NCM
	3	22-33	SaLo	10YR5/6	B	NCM
323	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-35	SaLo	10YR4/3	A	NCM
	3	35-45	SaLo	10YR5/6	B	NCM

324	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-18	SaLo	10YR4/3	A	NCM
	3	18-roots				
325	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-20	SaLo	10YR4/3	A	NCM
	3	20-31	SaLo	10YR5/6	B	NCM
326	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-18	SaLo	10YR4/3	A	NCM
	3	18-28	SaLo	10YR5/6	B	NCM
327	2	0-27	SaLo	10YR4/3	A	NCM
	3	27-rocks.				
328	2	0-10	SaLo	10YR4/3	A	NCM
	3	10-20	SaLo	10YR5/6	B	NCM
329	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-10	SaLo	10YR4/3	A	NCM
	3	10-20	SaLo	10YR	B	NCM
330	2	fill	SaLo	10YR4/3	A	NCM
331	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-15	SaLo	10YR4/3	A	metal wrapper
	3	15-rocks.				
332	2	0-23	SaLo	10YR4/3	A	NCM
	3	23-34	SaLo	10YR5/6	B	NCM
333	2	0-11	SaLo	10YR4/3	A	NCM
	3	11-rocks.				
334	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-18	SaLo	10YR4/3	A	NCM
	3	18-root				
335	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-17	SaLo	10YR4/3	A	NCM
	3	17-roots				
336	2	0-21	SaLo	10YR4/3	A	NCM
	3	21-32	SaLo	10YR5/6	B	NCM
337	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-27	SaLo	10YR4/3	A	NCM
	3	27-39	SaLo	10YR5/6	B	NCM
338	2	0-18	SaLo	10YR4/3	A	NCM
	3	18-roots				
339	2	0-19	SaLo	10YR4/3	A	NCM
	3	19-31	SaLo	10YR5/6	B	NCM

340	2	0-15	SaLo	10YR4/3	A	NCM
	3	15-rocks.				
341	2	0-16	SaLo	10YR4/3	A	NCM
	3	16-27	SaLo	10YR5/6	B	NCM
342	2	0-20	SaLo	10YR4/3	A	NCM
	3	20-31	SaLo	10YR5/6	B	NCM
343	2	0-13	SaLo	10YR4/3	A	NCM
	3	13-rocks.				
344	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-27	SaLo	10YR4/3	A	NCM
	3	27-37	SaLo	10YR5/6	B	NCM
345	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-22	SaLo	10YR4/3	A	NCM
	3	22-rocks.				
346	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-23	SaLo	10YR4/3	A	NCM
	3	23-33	SaLo	10YR5/6	B	NCM
347	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	SaLo	10YR4/3	A	NCM
	3	26-root				
348	2	0-10	SaLo	10YR4/3	A	NCM
	3	10-20	SaLo	10YR5/6	B	NCM
349	2	0-2	SaLo	10YR4/3	A	NCM
	3	2-rocks.				
350	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-20	SaLo	10YR4/3	A	NCM
	3	20-31	SaLo	10YR5/6	B	NCM
351	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-21	SaLo	10YR4/3	A	NCM
	3	21-43	SaLo	10YR5/6	B	NCM
352	2	0-14	SaLo	10YR4/3	A	NCM
	3	14-rocks.				
353	2	0-11	SaLo	10YR4/3	A	NCM
	3	11-22	SaLo	10YR5/6	B	NCM
354	2	0-4	SaLo	10YR4/3	A	NCM
	3	4-20	SaLo	10YR5/6	B	NCM
355	2	0-15	SaLo	10YR4/3	A	plastic
	3	15-gravel.				

356	2	0-27	SaLo	10YR4/3	A	NCM
	3	27-gravel				
357	2	0-2	SaLo	10YR4/3	A	NCM
	3	2-gravel, fence line				
358	1	0-5	rootma,leaves,humus		A/O	NCM
	3	5-20	SaLo	10YR5/6	B	NCM
359	2	0-17	SaLo	10YR4/3	A	NCM
	3	17-36	SaLo	10YR5/6	B	NCM
360	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-8	SaLo	10YR4/3	A	NCM
	3	8-28	SaLo	10YR5/6	B	NCM
361	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-10	SaLo	10YR4/3	A	NCM
	3	10-20	SaLo	10YR5/6	B	NCM
362	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-11	SaLo	10YR4/3	A	NCM
	3	11-22	SaLo	10YR5/6	B	NCM
363	2	0-30	SaLo	10YR4/3	A	NCM
	3	30-44	SaLo	10YR5/6	B	NCM
364	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-22	SaLo	10YR4/3	A	NCM
	3	22-rocks.				
365	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-20	SaLo	10YR4/3	A	NCM
	3	20-38	SaLo	10YR5/6	B	NCM
366	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-25	SaLo	10YR4/3	A	NCM
	3	25-38	SaLo	10YR5/6	B	NCM
367	2	0-11	SaLo	10YR4/3	A	NCM
	3	11-roots.				
368	2	0-18	SaLo	10YR4/3	A	NCM
	3	18-all sub				
369	2	0-17	GrSaLo	10YR4/3-5/6	A	NCM
	3	17-40	SaLo	10YR5/6	B	NCM
370	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-12	GrSaLo	10YR4/3-5/6	A	NCM
	3	12-roots.				
371	2	0-28	SaLo	10YR4/3	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM

372	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-25	SaLo	10YR4/3	A	NCM
	3	25-35	SaLo	10YR5/6	B	NCM
373	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-20	SaLo	10YR4/3	A	NCM
	3	20-sub				
374	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-12	GrSaLo	10YR4/3-5/6	A	NCM
	3	12-23	SaLo	10YR5/6	B	NCM
375	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-16	GrSaLo	10YR4/3-5/6	A	NCM
	3	16-26	SaLo	10YR5/6	B	NCM
376	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-12	GrSaLo	10YR4/3-5/6	A	NCM
	3	12-roots.				
377	2	0-20	SaLo	10YR4/3	B	NCM
378	1	0-1	rootmat,leaves,humus		A/O	NCM
	2	1-15	GrSaLo	10YR4/3-5/6	A	NCM
	3	15-26	SaLo	10YR5/6	B	NCM
379	2	0-28	GrSaLo	10YR4/3-5/6	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM
380	2	0-23	GrSaLo	10YR4/3-5/6	A	NCM
	3	23-39	SaLo	10YR5/6	B	NCM
381	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	SaLo	10YR4/3	A	NCM
	3	26-39	SaLo	10YR5/6	B	NCM
382	1	0-3	rootmat,leave,humus		A/O	NCM
	3	3-21	SaLo		A/O	NCM
383	1	0-4	rootmat,leave,humus		A/O	NCM
	3	4-20	SaLo	10YR5/6	B	NCM
384	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-29	SaLo	10YR4/3	A	NCM
	3	29-40	SaLo	10YR5/6	B	NCM
385	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	SaLo	10YR4/3	A	NCM
	3	30-41	SaLo	10YR5/6	B	NCM
386	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-17	SaLo	10YR4/3	A	NCM
	3	17-30	SaLo	10YR5/6	B	NCM

387	3	0-21	SaLo	10YR5/6	B	NCM
388	3	0-20	SaLo	10YR5/6	B	NCM
389	3	0-22	SaLo	10YR5/6	B	NCM
390	3	0-20	SaLo	10YR5/6	B	NCM
391	1	0-2	rootmat,leaves,humus		A/O	NCM
	3	2-30	SaLo	10YR5/6	B	NCM
392	3	0-24	SaLo	10YR5/6	B	NCM
393	2	0-18	SaLo	10YR4/3	A	NCM
	3	18-30	SaLo	10YR5/6	B	NCM
394	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-15	SaLo	10YR4/3	A	NCM
	3	15-27	SaLo	10YR5/6	B	NCM
395	2	0-4	SaLo	10YR4/3	A	NCM
	3	4-25	SaLo	10YR5/6	B	NCM
396	3	0-20	SaLo	10YR5/6	B	NCM
397	3	0-20	SaLo	10YR5/6	B	NCM
398	3	0-19	SaLo	10YR5/6	B	NCM
399	3	0-21	SaLo	10YR5/6	B	NCM
400	3	0-23	SaLo	10YR5/6	B	NCM
401	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-26	SaLo	10YR4/3	A	NCM
	3	26-38	SaLo	10YR5/6	B	NCM
402	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	SaLo	10YR4/3	A	NCM
	3	27-37	SaLo	10YR5/6	B	NCM
403	3	0-16	SaLo	10YR5/6	B	NCM
404	3	0-10	SaLo	10YR5/6	B	NCM
405	3	0-13	SaLo	10YR5/6	B	NCM
406	3	0-20	SaLo	10YR5/6	B	NCM
407	2	0-17	SaLo	10YR4/3	A	NCM
	3	17-27	SaLo	10YR5/6	B	NCM

408	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-33	Lo	10YR4/3	A	NCM
	3	33-43	Lo	10YR5/6	B	NCM
409	1	0-4	rootmat,leave,humus		A/O	NCM
	2	4-30	SaLo	10YR4/3	A	NCM
	3	30-42	SaLo	10YR5/6	B	NCM
410	1	0-3	rootmat,leave,humus		A/O	NCM
	2	3-18	SaLo	10YR4/3	A	NCM
	3	18-rocks.				
411	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-29	SaLo	10YR4/3	A	NCM
	3	29-39	SaLo	10YR5/6	B	NCM
412	2	0-21	SaLo	10YR4/3	A	NCM
	3	21-40	SaLo	10YR5/6	B	NCM
413	2	0-10	SaLo	10YR4/3	A	NCM
	3	10-22	SaLo	10YR5/6	B	NCM
414	2	0-8	SaLo	10YR4/3	A	NCM
	3	8-rocks.				
415	2	0-6	SaLo	10YR4/3	A	NCM
	3	6-rocks.				
416	2	0-19	SaLo	10YR4/3	A	NCM
	3	19-33	SaLo	10YR5/6	B	NCM
417	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-20	SaLo	10YR4/3	A	NCM
	3	25-37	SaLo	10YR5/6	B	NCM
418	2	0-9	SaLo	10YR4/3	A	NCM
	3	9-rocks.				
419	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-23	SaLo	10YR4/3	A	NCM
	3	23-34	SaLo	10YR5/6	B	NCM
420	2	0-12	SaLo	10YR4/3	A	NCM
	3	12-rocks.				
421	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-10	SaLo	10YR4/3	A	NCM
	3	10-23	SaLo	10YR5/6	B	NCM
422	3	0-22	SaLo	10YR5/6	B	NCM
423	2	0-7	GrSaLo	10YR4/3-5/6	A	NCM
	3	7-18	SaLo	10YR5/6	B	NCM

424	1	0-1	rootmat,leaves,humus		A/O	NCM
	2	1-13	GrSaLo	10YR4/3-5/6	A	NCM
	3	13-25	SaLo	10YR5/6	B	NCM
425	3	0-23	SaLo	10YR5/6	B	NCM
426	3	0-15	SaLo	10YR5/6	B	NCM
427	3	0-23	SaLo	10YR5/6	B	NCM
428	3	0-9	SaLo	10YR5/6	B	NCM
429	3	0-10	SaLo	10YR5/6	B	NCM
430	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-30	GrSaLo	10YR4/3-5/6	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
431	2	0-14	GrSaLo	10YR4/3-5/6	A	NCM
	3	14-rocks.				
432	2	0-9	GrSaLo	10YR4/3-5/6	A	NCM
	3	9-20	SaLo	10YR5/6	B	NCM
433	2	0-12	GrSaLo	10YR4/3-5/6	A	NCM
	3	12-roots				
433	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-20	SaLo	10YR4/3	A	beer glass
	3	20-35	SaLo	10YR5/6	B	NCM
434	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	GrSaLo	10YR4/3-5/6	A	beer glass
	3	28-39	SaLo	10YR5/6	B	NCM
435	1	0-6	rootmat,leave,humus		A/O	NCM
	2	6-30	SaLo	10YR4/3	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
436	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-22	SaLo	10YR4/3	A	NCM
	3	22-33	SaLo	10YR5/6	B	NCM
437	2	0-20	SaLo	10YR4/3	A	NCM
	3	20-roots.				
438	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-30	SaLo	10YR4/3	A	NCM
	3	33-45	SaLo	10YR5/6	B	NCM
439	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-17	SaLo	10YR4/3	A	NCM
	3	17-roots.				

440	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-23	SaLo	10YR4/3	A	brick,glass
	3	23-34	SaLo	10YR5/6	B	NCM
441	1	0-4	rootmat,leave,humus		A/O	NCM
	2	4-28	SaLo	10YR4/3	A	NCM
	3	28-40	SaLo	10YR5/6	B	NCM
442	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-14	SaLo	10YR4/3	A	NCM
	3	14-26	SaLo	10YR5/6	B	NCM
443	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-27	SaLo	10YR4/3	A	NCM
	3	27-41	SaLo	10YR5/6	B	NCM
444	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-34	SaLo	10YR4/3	A	NCM
	3	34-46	SaLo	10YR5/6	B	NCM
445	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-27	SaLo	10YR4/3	A	NCM
	3	27-39	SaLo	10YR5/6	B	NCM
446	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	SaLo	10YR4/3	A	NCM
	3	37-47	SaLo	10YR5/6	B	NCM
447	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-31	SaLo	10YR4/3	A	NCM
	3	31-43	SaLo	10YR5/6	B	NCM
448	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-18	SaLo	10YR4/3	A	NCM
	3	18-rocks.				
449	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-28	SaLo	10YR4/3	A	NCM
	3	28-39	SaLo	10YR5/6	B	NCM
450	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-23	SaLo	10YR4/3	A	NCM
	3	23-33	SaLo	10YR5/6	B	NCM
451	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-19	SaLo	10YR4/3	A	NCM
	3	19-rock				
452	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-28	SaLo	10YR4/3	A	NCM
	3	28-45	SaLo	10YR5/6	B	NCM

453	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-8	SaLo	10YR4/3	A	NCM
	3	8-rocks.				
454	1	0-6	rootmat,leave,humus		A/O	NCM
	2	6-37	SaLo	10YR4/3	A	NCM
	3	37-47	SaLo	10YR5/6	B	NCM
455	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-27	SaLo	10YR4/3	A	NCM
	3	27-39	SaLo	10YR5/6	B	NCM
456	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	SaLo	10YR4/3	A	NCM
	3	30-41	SaLo	10YR5/6	B	NCM
457	1	0-6	rootmat,leaves,humus		A/O	NCM
	2	6-16	SaLo	10YR4/3	A	NCM
	3	16-rocks.				
458	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-17	SaLo	10YR4/3	A	NCM
	3	17-30	SaLo	10YR5/6	B	NCM
459	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-14	SaLo	10YR4/3	A	NCM
	3	14-24	SaLo	10YR5/6	B	NCM
460	2	0-14	SaLo	10YR4/3	A	NCM
	3	14-rocks.				
461	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-25	SaLo	10YR4/3	A	NCM
	3	25-36	SaLo	10YR5/6	B	NCM
462	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-20	SaLo	10YR4/3	A	NCM
	3	20-rocks.				
463	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-25	SaLo	10YR4/3	A	NCM
	3	25-38	SaLo	10YR5/6	B	NCM
464	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-28	SaLo	10YR4/3	A	NCM
	3	28-39	SaLo	10YR5/6	B	NCM
465	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-30	SaLo	10YR4/3	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
466	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-25	SaLo	10YR4/3	A	NCM
	3	25-37	SaLo	10YR5/6	B	NCM

467	1	0-2	rootmat,leaves,humus		A/O	NCM
	2	2-35	SaLo	10YR4/3	A	NCM
	3	35-47	SaLo	10YR5/6	B	NCM
468	2	0-27	SaLo	10YR4/3	A	NCM
	3	27-39	SaLo	10YR5/6	B	NCM
469	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-34	SaLo	10YR4/3	A	NCM
	3	34-45	SaLo	10YR5/6	B	NCM
470	3	0-31	SaLo	10YR5/6	B	NCM
471	3	0-20	SaLo	10YR5/6	B	NCM
472	3	0-21	SaLo	10YR5/6	B	NCM
473	3	0-22	SaLo	10YR5/6	B	NCM
474	3	0-18	SaLo	10YR5/6	B	NCM
475	3	0-25	SaLo	10YR5/6	B	NCM
476	3	0-22	SaLo	10YR5/6	B	NCM
477	2	0-26	SaLo	10YR4/3	A	NCM
	3	26-39	SaLo	10YR5/6	B	NCM
478	1	0-3	rootmat,leaves,humus		A/O	NCM
	3	3-23	SaLo	10YR5/6	B	NCM
479	1	0-3	rootmat,leave,humus		A/O	NCM
	3	3-30	SaLo	10YR5/6	B	NCM
480	1	0-2	rootmat,leaves,humus		A/O	NCM
	3	2-24	SaLo	10YR5/6	B	NCM
481	1	0-3	rootmat,leaves,humus		A/O	NCM
	3	3-19	SaLo	10YR5/6	B	NCM
482	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-9	GrSaLo	10YR4/3-5/6	A	NCM
	3	9-23	SaLo	10YR5/6	B	NCM
483	1	0-2	rootmat,leaves,humus		A/O	NCM
	3	2-21	GrSaLo	10YR4/3-5/6	B	NCM
484	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-17	GrSaLo	10YR4/3-5/6	A	NCM
	3	17-30	SaLo	10YR5/6	B	NCM
485	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-11	GrSaLo	10YR4/3-5/6	A	NCM
	3	11-25	SaLo	10YR5/6	B	NCM

486	3	0-18	SaLo	10YR5/6	B	NCM
487	1	0-2	rootmat,leaves,humus		A/O	NCM
	3	2-20	SaLo	10YR5/6	B	NCM
488	3	0-26	SaLo	10YR5/6	B	NCM
489	2	0-12	SaLo	10YR4/3	A	NCM
	3	12-25	SaLo	10YR5/6	B	NCM
490	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-33	SaLo	10YR4/3	A	NCM
	3	33-45	SaLo	10YR5/6	B	NCM
491	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-29	SaLo	10YR4/3	A	NCM
	3	29-43	SaLo	10YR5/6	B	NCM
492	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	5-33	SaLo	10YR4/3	A	NCM
	3	33-45	SaLo	10YR5/6	B	NCM
493	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-36	SaLo	10YR4/3	A	NCM
	3	36-48	SaLo	10YR5/6	B	NCM
494	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-28	SaLo	10YR4/3	A	NCM
	3	28-44	SaLa	10YR5/6	B	NCM
495	1	0-4	rootmat,leaves,humus		A/O	NCM
	2	4-30	SaLo	10YR4/3	A	NCM
	3	30-41	SaLo	10YR5/6	B	NCM
496	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-37	SaLo	10YR4/3	A	NCM
	3	37-49	SaLo	10YR5/6	B	NCM
497	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-33	SaLo	10YR4/3	A	NCM
	3	33-45	SaLo	10YR5/6	B	NCM
498	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-37	SaLo	10YR4/3	A	NCM
	3	37-48	SaLo	10YR5/6	B	NCM
499	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-40	SaLo	10YR4/3	A	NCM
	3	40-53	SaLo	10YR5/6	B	NCM
500	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-27	SaLo	10YR4/3	A	NCM
	3	27-39	SaLo	10YR5/6	B	NCM

501	3	0-18	SaLo	10YR5/6	B	NCM
502	3	0-22	SaLo	10YR5/6	B	NCM
503	1	0-5	rootmat,leaves,humus		A/O	NCM
	2	5-30	GrSaLo	10YR4/3-5/6	A	NCM
	3	30-40	SaLo	10YR5/6	B	NCM
504	3	0-163	SaLo	10YR5/6	B	NCM
505	3	0-19	SaLo	10YR5/6	B	NCM
506	1	0-3	rootmat,leaves,humus		A/O	NCM
	2	3-9	GrSaLo	10YR4/3-5/6	A	NCM
	3	9-25	SaLo	10YR5/6	B	NCM
507	2	0-6	GrSaLo	10YR4/3-5/6	A	NCM
	3	6-20	SaLo	10YR5/6	B	NCM