

DRAFT ENVIRONMENTAL IMPACT STATEMENT

HARBORFIELD ESTATES

Change of Zone Application
#96-ZM-290

Greenlawn, Town of Huntington
Suffolk County, New York

Volume 1 of 2
Main Text & Appendices A-H

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DRAFT ENVIRONMENTAL IMPACT STATEMENT

HARBORFIELD ESTATES CHANGE OF ZONE APPLICATION #96-ZM-290

**Greenlawn, Town of Huntington
Suffolk County, New York**

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SUMMARY

SUMMARY

DESCRIPTION OF THE PROPOSED ACTION

The proposed project involves a change of zone from R-40 to R-20 for the purpose of constructing a 59-lot subdivision on 39.3 acres of land. The site is located east of the Lake Road/Pulaski Road intersection on the north side of Pulaski Road. The project will be known as Harborfield Estates. The project sponsor is Evergreen Homes.

Each lot in the proposed design conforms to the 20,000 square foot minimum lot size for developments under the R-20 zoning classification. The proposed design includes a loop road with a single access point on Pulaski Road. Two cul-de-sac streets would extend to the western portion of the site from the loop road. A neighborhood park would be created on the west end of the property at the intersection of Lake Road and Pulaski Road. The proposed park would total five (5) acres and would include a walking trail and benches in the southern portion of the property.

This document is a Draft Environmental Impact Study (DEIS) submitted pursuant to an anticipated positive declaration from the Town Board of the Town of Huntington.

SIGNIFICANT BENEFICIAL AND ADVERSE IMPACTS

The proposed Harborfield Estates subdivision will provide a broad range of benefits to the Town of Huntington and the local project vicinity in terms of planning and environmental considerations, community services and housing. These potential benefits include:

- Construction of fifty-nine (59) new homes that will expand local housing opportunities while furthering local planning objectives. The proposed project will provide housing at a reasonable density to protect groundwater and other environmental resources.
- An increase in the revenues generated to the local taxing jurisdictions. The revenue impact resulting from the proposed project represents a \$565,967 increase in tax dollars relative to the current revenues generated, and a \$290,004 increase over the funds generated if the property were developed under the existing zoning. As a result, the project will create available funds to underwrite the public services provided by municipal government, lessening the tax burden on local taxpayers.
- Development of a five-acre, open space and recreation area which will provide recreational opportunities for residents of the project and neighboring areas.

The DEIS provides a thorough analysis of the potential environmental impacts of the proposed project. These impacts will be minimized where possible, but the following impacts may still exist for which no mitigation is available:

- Potential fugitive dust and construction noise resulting from construction of the project.
- Minimal grading and filling of portions of the site, which will permanently alter the natural topography. This will include construction of a recharge pond on site.
- Increase in the concentration of nitrogen in recharge as compared to current vacant site nitrogen load.
- Increase in the quantity of recharge entering the site as compared to the current site recharge.
- Clearing of much of the vegetation on the site.
- Although clearing will be minimized, there will be some displacement and/or loss of wildlife species, particularly and those species unable to adapt to human activity, if present.
- Increase in traffic generation and vehicle trips on area roadways as a result of use of vacant land will occur, but the impacts can be minimized through proper planning.

MITIGATION MEASURES

The DEIS identifies viable measure, conditions, or techniques which can be employed to reduce the level of impact of the proposed project upon the natural and human environmental resources identified in this document. These measures are as follows:

- Excavation will occur in a manner that will avoid off site runoff.
- Excavated material will be used on site for filling and compaction of depressions where necessary to achieve a suitable grade for the intended use.
- Topsoil will be stockpiled during grading and utilized in the landscaped portions of the site following construction.
- Grading will be minimized as much as possible in connection with site development and construction. Vegetation will be left on the perimeter of the site within buffers and in the five acres intended to be used for the park/recharge area.
- Excavation, grading and establishment of future groundcover will occur as rapidly as possible to minimize loss of soils.
- A water tank truck should be available on-site during construction to wet excessively dry soils. Gravel strips can be utilized at site access points to clean truck tires and minimize tracking of sediments onto the highway.
- The combined sanitary flow from the individual lots should not exceed the maximum flow of 23,580 gallons allowed under Article 6 of the Suffolk County Sanitary Code. Design of the individual sewage disposal systems on site will also comply with regulations within Article 6 and design standards for on-site residential systems.
- Buffer zones on the perimeter of the site should be retained as natural areas. The subdivision will be landscaped in accordance with Town design specifications. The park area and buffers will be landscaped with indigenous species.
- Native and near native species which provide food and shelter to wildlife should be utilized in the landscaped areas where possible. This may encourage ongoing use of the site by avian species which would otherwise abandon the site. Species which might be utilized include the following: serviceberry, hackberry, dogwood, persimmon, American holly, red cedar, crabapple, mulberry, pin cherry, chokecherry, sassafras, mountain ash, devil's walkingstick, Russian olive, autumn olive, huckleberry, inkberry, juniper, honeysuckle, rye grass, redtop, and fescue.

- The proposed pond/recharge area could be planted using native and near native plant species if permitted by the Town Highway Department. This would provide additional wildlife habitat to help mitigate the proposed clearing. Facultative and obligate wetland species could be utilized if the pond were lined.
- The traffic generated by the proposed development will have an imperceptible impact on the overall operation at all of the study intersections, and thus, no mitigation is necessary.
- The proposed project will be designed to comply with local land use plans and the proposed R-20 zoning designation. The project provides a five-acre community park that addresses the comprehensive shortage of parkland in Greenlawn.
- The site development and landscaping of the proposed site will be both functional and visually appealing and should complement existing development in the area of the site.
- Tax revenues generated by the project development to the impacted developments will provide sufficient funds to reduce the burden on Town services, including fire and police protection.
- Security and fire alarm systems and sprinkler systems should be installed in the proposed buildings.
- Energy efficient design will be utilized where possible.
- Utility lines will be installed underground to minimize visual impacts within the interior of the site.
- Landscaping and site buffering will provide a visual buffer from adjacent roadways and uses. Site development will be appealing and will complement development in the area. Improvements to the site access road and park and buffer areas will include quality landscaping with statuary to provide visual focus and a unique setting.
- Construction and operation will occur during normal business hours to minimize noise impacts to surrounding areas.

ALTERNATIVES

The State Environmental Quality Review Act requires the investigation of alternatives to a proposed project in order to determine the merits of a proposed project as compared to other possible uses. The discussion should be at a level of detail sufficient to allow for the comparison of various impact categories, for consideration by the decision-making agencies. The following alternatives were analyzed in the DEIS:

- **No Action**

If the proposed action is not approved, the site would remain as presently zoned, and the subject land would likely remain in a dormant state for the indefinite future, since the current zoning does not allow for a marketable housing development. This observation is supported by the fact that the property has remained undeveloped under the R-40 designation for many years, while housing has been developed throughout the area.

In this alternative, in the short term the site would remain vacant and provide a location for unauthorized dumping and use by all-terrain vehicles. The property may eventually be developed for residential purposes under existing zoning with one acre lots, or be subject to potential zone change applications for non-residential uses. Due to constraints on site use resulting from the mixed land use pattern in the area and the adjacent LIRR track line, it is likely that future

proposals will be made for non-residential uses. In addition, the no-action alternative would not allow the objectives of the project sponsor to be met, and the economic and land use planning benefits presented in this DEIS document would not be realized.

- **Development per Existing Zoning**

In summary, the R-40 plan would result in similar environmental impacts associated with the physical disturbance of the site. However, the R-40 alternative does not have the positive impacts associated with the preservation of larger contiguous buffer, though the open space and park areas in this alternative are similar to those in the proposed project. As a result, the current proposal offers similar characteristics as the proposed in terms of meeting the open space needs in the Greenlawn community and preserving habitats for wildlife and revegetation. However, relative to the current proposal, the R-40 alternative offers less in terms of revenues generated to support local government functions.

- **R-20 Subdivision**

In summary, this alternative would result in additional environmental impacts associated with the physical disturbance of the site. However, this alternative does not have the positive impacts associated with the preservation of larger contiguous buffer areas as contained in the current proposal. As a result, the proposed project offers more in terms of meeting the needs of open space in the Greenlawn community and preserving habitats for wildlife and revegetation. Further, relative to the current proposal, this alternative offers more in terms of revenues generated to support local government functions. This is a benefit to all jurisdictions, with the exception of schools.

- **Mixed Detached and Attached Units**

In summary, this alternative would result in increased environmental impacts associated with the physical disturbance of the site. However, this alternative does include positive impacts associated with the preservation of larger contiguous buffer areas as compared to the current proposal. As a result, the proposed project offers less in terms of meeting the needs of open space in the Greenlawn community and preserving habitats for wildlife and revegetation. Further, relative to the current proposal, this alternative offers more in terms of revenues generated to support local government functions. This is a benefit to all jurisdictions, including the Harborfields Central School District.

- **Setasides for Affordable Units**

This alternative is identical to the proposed project, with the exception that 10% of the units (6) have been reserved for households with an income considered “low” and 10% (6) have been reserved for “moderate” income households, based upon the regional median household income. These 12 units would be indistinguishable in style and construction from the remainder of the units. There would be no physical differences between this alternative and the proposed project, and the only differences in impacts would be related to differences in taxes.

PERMITS AND APPROVALS REQUIRED

This DEIS is intended to provide the Town of Huntington Town Board with the information necessary to render a decision on the proposed Harborfield Estates Zone Change. This document is also intended to comply with the SEQR requirements as administered by the Town of Huntington. Once accepted, the DEIS will be subject to public review, followed the preparation of a Final Environmental Impact Statement (FEIS). Subsequent to completion of the FEIS, the Town Board will be responsible for the preparation of a Statement of Findings and Facts, which will form the basis for the final decision on the project.

Following this process, should the Town Board receive this application favorably, the following additional approvals would have to be obtained prior to commencement of project construction.

- Town of Huntington Planning Board subdivision approval.
- Suffolk County Department of Health Services approval of a Realty Subdivision in accordance with Article 6 of the Suffolk County Sanitary Code.
- Suffolk County Department of Health Services approval of plans and construction for sewage disposal systems for single family residences under Article 6 of the Suffolk County Sanitary Code.
- Suffolk County Department of Health Services approval of modification of water supply system under Article 4 of the Suffolk County Sanitary Code.
- Suffolk County Department of Public Works approval for curb cut and road work to Pulaski Road (CR 11).

SECTION 1.0

DESCRIPTION OF THE PROPOSED ACTION

1.0 DESCRIPTION OF THE PROPOSED ACTION

The proposed project involves a change of zone from R-40 to R-20 for the purpose of constructing a 59-lot subdivision on 39.3 acres of land. The site is located east of the Lake Road/Pulaski Road intersection on the north side of Pulaski Road. The project will be known as **Harborfield Estates**. The project sponsor is Evergreen Homes, whose current Change of Zone application before the Huntington Town Board has been designated #96-ZM-290.

This document is a Draft Environmental Impact Statement (DEIS) submitted pursuant to an anticipated Positive Declaration from the Huntington Town Board.

1.1 PROJECT PURPOSE, NEED AND BENEFITS

1.1.1 Background and History

The subject site formerly was occupied by the Greenlawn Pickle Works, a late 19th to early 20th century transitional industry that played an important part in the economic history and development of the central area of the Town. The site contained farming-related structures including buildings and a rail spur until they were removed in the late 1960s. Based upon analysis of aerial photographs, farming continued on the site until at least 1984; anecdotal information provided by the Applicant indicates that farming ceased on the site by 1988. The site has remained unoccupied by buildings since the removal of the Greenlawn Pickle Works. The site has maintained a low-density residential zoning designation for over twenty (20) years. Although no structures remain on the subject site, some land disturbance has occurred in the past in the form of dirt paths through the center and northeastern portions of the site.

A previous rezone application (designated #89-ZM-255) had been submitted to the Town Board for this site in May of 1989 (see **Appendix A-1**). Following review by the Town Planning Department staff (see Appendices **A-2**, **A-3** and **A-4**), and Resolution for a Positive Declaration by the Town Planning Board (see **Appendix A-5**), a Positive Declaration (see **Appendix A-6**) was issued by the Town Board as “Lead Agency” under the NYS Environmental Quality Review Act (SEQRA). However, this application was later withdrawn.

1.1.2 Public Need and Municipal Objectives

The public need for the project is related to the benefits to be derived if the project is implemented. The applicant has designed the proposed project to achieve the highest and best use of the site based on its residential zoning and market trends.

The project site lies along a major transportation corridor, Pulaski Road, in the Town of

Huntington. Planning documents and public policy initiatives of the Town recognize the site and area as a mixed-use corridor, providing locations for industrial, residential, business and institutional uses. The project area reflects a mature, suburban land use pattern, with few remaining properties available for development. The proposed project will provide for the development of a permanent use on a property whose capacity to attract a quality use is otherwise minimal. The circumstances that limit the utilization of the site include the Long Island Railroad (LIRR) tracks located along the northern perimeter of the site, and the mix of land uses that surround the site. The proposed residential project will provide a permanent use of a vacant property in conformance with the Town of Huntington's comprehensive planning goals and objectives.

In addition, the proposal will address the municipal objective to increase recreation and open space areas in the Greenlawn hamlet. This municipal objective has been included in various Town planning documents, and was recommended in the Town's 1993 Comprehensive Plan Update. The proposal will provide a five-acre open space, available for passive recreation that will be accessible to various residential areas in close proximity to the project site. It is also significant to note that the proposal will also address the public need for real property tax revenues to support municipal services. The development of the property will increase the revenues generated to taxing jurisdictions, and will result in some corresponding demand for services.

In conclusion, the Harborfield Estates subdivision application will provide an opportunity for viable residential growth within an area of the Town of Huntington well-suited to accommodate such growth. The proposal will promote the development of a vacant property in accordance with local comprehensive planning goals, which will result in an increase in property tax revenues to taxing jurisdictions, without a significant burden on services or an undue increase in the need for public expenditures. Further, the project will address the public need for expanded open space and recreation areas in a section of the Town of Huntington that is currently underserved.

1.1.3 Objectives of the Project Sponsor

The objectives of the project sponsor are well established. The sponsor intends to construct a residential subdivision that attracts potential homebuyers from the Long Island market interested in quality low to moderate density residential housing with the amenities provided to its location in the Town of Huntington.

The objectives of the project sponsor are therefore as follows:

- Obtain a zone change from R-40 to R-20 (Residence), and ultimately receive subdivision approval in accordance with the existing Town of Huntington Zoning Code.
- Provide an opportunity for residential growth and expand housing opportunities for low to moderate density, quality, single-family housing.

- Receive a reasonable economic return on land owned by the project sponsor, and achieve its highest and best use.

1.1.4 Benefits of the Proposed Action

The proposed Harborfield Estates subdivision will provide a broad range of benefits to the Town of Huntington and the local project vicinity in terms of planning and environmental considerations, community services and housing. The project benefits may be quantified with respect to tax revenues and community services, and the support of locally adopted planning objectives.

The proposed project will provide for an additional fifty-nine (59) new homes to the community that will expand local housing opportunities in an aesthetically pleasing form. The development will further local planning objectives by providing housing at a reasonable density to protect groundwater and other environmental amenities, while strengthening the suburban character of this portion of the Town. By conforming to the guidelines of the 1993 Comprehensive Plan Update, the proposal will foster the effectiveness of the Town's long-term planning efforts. Further, the protection offered to the environment by the proposed subdivision design will become a permanent attribute of the community and thereby prevent potential environmental problems on the subject site in the future.

The benefits of the project may be viewed in terms of its contribution to the social and economic well being of the residents of the local community. The project will increase the revenues generated to the taxing jurisdictions, relative to both the current vacant status, and development of the property under the existing zoning. Currently the subject site is generating \$18,351 in tax revenue; it is projected that if the property is developed under the current R-40 zoning, the completed project will generate approximately \$294,314 in revenues to taxing jurisdictions. The proposed project will generate an estimated total of \$584,318 to the local taxing districts. The revenue impact resulting from the proposed project represents a \$565,967 increase in tax dollars relative to the current revenues generated, and a \$290,004 increase over the funds generated if the property were developed under the existing zoning. There will not be a corresponding appreciable incremental increase in the demand for services or public expenditures due to the existing network of services already existing in the locality. As a result, the project will create available funds to underwrite the public services provided by municipal government, lessening the tax burden on local taxpayers.

A significant social and community benefit will be realized via the development of a community park in association with the project. The proposed five-acre open space and recreation area will provide recreational opportunities for residents of the project, and those from neighboring areas. Further, the project will offer outstanding landscaping amenities along the site boundaries that will contribute to the attractiveness of the community.

1.2 LOCATION

1.2.1 Site Location

The 39.3-acre subject site is located in the hamlet of Greenlawn, in the Town of Huntington, Suffolk County, New York. The project site's northern perimeter of 1,975.02 linear feet is bounded by the LIRR tracks servicing the Port Jefferson branch, as well as towers carrying LIPA transmission lines. North of the railroad line the project is bounded by a significant open space buffer and the Lake Ridge Estates residential development. Currently, directly to the northwest of the project site a single family residential subdivision, the Estates at Trafalgar Court, is being developed on 0.5 acre lots. The western boundary of the project site has a frontage of 932.79 linear feet along Lake Road. The property west of the project site along Lake Road is occupied by a major Long Island Power Authority (LIPA) operations and maintenance facility. The southern boundary of the project site has a 1,938.73 linear frontage along Pulaski Road (CR 11). The land use south of the project site is generally characterized by low-density residential development. The eastern perimeter of the site measures 765.88 linear feet and is bounded by industrial property owned and operated by GEC-Marconi Hazeltine Corporation. The project site can be further defined as Suffolk County Tax Map parcel 0400-105-2-29. **Figure 1-1** is provided as a general location map for the subject site.

1.2.2 Site Access

The subject site is located at the intersection of Pulaski Road and Lake Road, in the hamlet of Greenlawn. The project site has frontage along the north side of Pulaski Road and the east side of Lake Road. The proposed development would be served by a loop road with a single access point on Pulaski Road, opposite Tulane Road. The access road from Pulaski Road will enter approximately 1,733 feet east of the Lake Road/Pulaski Road intersection. If an additional site access is deemed necessary (by the Town and/or SCDPW), this can be accomplished by extending the southerly cul de sac internal roadway westward to Lake Road.

1.2.3 Existing Zoning

The subject site is located within the "R-40 Residence District" as depicted on the *Town of Huntington Zoning Map*. Permitted uses in the R-40 Residence District include single family residences with a minimum area per dwelling of one (1) acre, farms, nurseries, truck gardens, country estates, churches, schools, libraries, museums, parks and recreation areas, municipal parking fields, fire stations, and municipal water supply reservoirs. Buildings in the District are limited to a maximum height of 35 feet or 2.5 stories. Dimensional restrictions for building setbacks are as follows: front yard setback, 50 feet; side yard setback, 25 feet; and rear yard setback, 50 feet. **Plate 1** presents Yield Map for the site in its existing R-40 zone, which indicates a yield of 29 units on 40,000 SF lots, a 3.67-acre park, 0.96-acre recharge basin and vehicle access to Lake Road.

1.3 DESIGN AND LAYOUT

The project sponsor is seeking a zone change from R-40 (Residence) to R-20 (Residence), the proposed subdivision design is based on the zoning requirements for the R-20 District. **Plates 2 and 3** present Yield Maps for the site under the proposed R-20 zone: **Plate 2** depicts 70 lots, a recharge basin and two access points onto Lake Road, while **Plate 3** depicts 61 lots, a 3.9-acre Park, a recharge basin and one access onto Lake Road. The proposed subdivision includes fifty-nine (59) lots; however, the Town Planning Board, during its review of the subsequent Site Plan application, will determine the number of units (lots) appropriate for this site under R-20 zoning. The project will conform to the standards contained in the Town document, "Town of Huntington Subdivision Regulations and Site Improvement Specifications".

1.3.1 General Site Description

The 39.3-acre site is presently unimproved and is covered by various overgrown grasses. The project sponsor intends to subdivide the site into fifty-nine (59) lots for single family residential use. The Applicant does not propose to set aside any units for purchase by low and/or moderate-income housing ("affordability"). Following is a listing of the numbers of units having 3, 4 and 5 bedrooms, along with estimated square footages of each:

3-bedroom units	6 units	2,400 SF/1 story
4-bedroom units	50 units	3,600 SF/1-1/2 stories
5-bedroom units	3 units	4,800 SF/2 stories

Each lot in the proposed design conforms to the 20,000 square foot (SF) minimum lot size for developments under the R-20 zoning classification. The proposed design includes a loop road with a single access point on Pulaski Road. Two cul-de-sac streets would extend to the western portion of the site from the loop road. As per Town Code, 10% of the site will be set aside for a neighborhood park on the west end of the property at the intersection of Lake Road and Pulaski Road. The proposed park would total five (5) acres and would include a walking trail, pond/recharge area and benches.

Plate 4 depicts the location of the proposed access and loop road, lot layout, and park and landscaped buffers. Access to future lots will be provided via driveways originating from the loop road and cul-de-sac roads.

Plate 5 details the pond/recharge area within the park. Approximately 0.8 acres will be incorporated into a landscaped berm along the eastern boundary of the park. The landscaped berm will be approximately fifty (50) feet wide and will provide a permanent vegetated screen between the lots and park. A 20' deep buffer along Pulaski Road and rear-yard buffers in lots along the LIRR tracks will provide noise reduction for vehicle traffic and trains, respectively.

To provide a means for evaluation of development impacts, site coverage quantities have been

estimated. These estimated site quantities are based on the typical residential properties currently being constructed on 20,000 SF residential lots in the Town of Huntington. The estimated areas include road construction, areas dedicated for landscaped buffers, the neighborhood park and a pond/recharge basin. The site coverage quantities are conservative, as they represent full development of the subject site. The conservative site coverage quantities are intended to provide the Town of Huntington Town Board with a worst-case development scenario by which impacts may be assessed and a decision rendered. Although site coverage and layout will be determined as the site is developed on a lot by lot basis, actual site coverage quantities are anticipated to be less intense than those presented in **Table 1-1**.

TABLE 1-1
SITE COVERAGE QUANTITIES

Land Use	Existing		Proposed	
	Acres	Percent	Acres	Percent
Buildings	0	0%	2.44	6%
Roads	0	0%	2.75	7%
Driveways	0	0%	1.02	3%
Lawn/Landscaping/Natural	0	0%	27.29	69%
Landscaped Buffer	0	0%	0.80	2%
Park/Recharge Pond	0	0%	5.0	13%
Overgrown Field	39.3	100%	0	0%
Totals	39.3	100%	39.3	100%

1.3.2 Road System

A single road access will be provided near the eastern side of the subject site opposite Tulane Place. A thirty (30) foot wide subdivision road would be provided within a Town-standard 50 foot right-of-way. This would enter the site and extend westward, with two legs of the road having cul-de-sacs near the west side of the site. The cul-de-sacs would be connected in the mid-western part of the site.

These roads would be constructed to relevant Town specifications subsequent to engineering and drainage review as part of the subdivision process, including drainage, right-of-way width, road width, curbing, lighting, sidewalks, and right-of-way landscaping. The subject application is for a change of zoning, and therefore, final road design will be dependent upon Planning Board review subsequent to the change of zone. Plans have been submitted by the Applicant to the SCDPW; if that agency has comments in regard to vehicle access and roadways, these will be addressed during preparation of the Final EIS.

1.3.3 Recharge and Drainage

The proposed project involves establishment of roads for access to proposed residential homesites. The additional paved road surfaces necessitate storage and recharge of stormwater. Runoff must be contained for the road surface area, as well as for contributing areas based on a coefficient of runoff as per Town of Huntington Subdivision regulations.

The Town of Huntington Subdivision regulations require storage for stormwater for a nine (9) inch storm event in situations where no positive water overflow is provided. The required storage is determined by the site area (in acres) times a factor of 8175. For the subject site, the total storage required would be 321,278 cubic feet.

The conceptual layout plan provides a five (5) acre park area on the west side of the project site. Some portion of the land will be used for the recharge of stormwater. Several possible methods of handling stormwater may be employed for the project and are described below.

A pond/recharge area could be constructed where a minimum water elevation would be maintained by a liner. Additional storage capacity would be provided above the liner to a level established at the top of the slope, referred to as "freeboard". The amount of storage needed could be reduced by reducing paved surface area, and by providing leaching catch basins in the street to store approximately two (2) inches of precipitation. The overflow from the catch basins would be conveyed to the pond/recharge area to provide the needed storage. The necessary freeboard would be in the range of five (5) feet under this scenario, with side slopes of approximately 1:4. The actual development plan would be similar to that shown on **Plate 5**. The pond/recharge area would be an amenity as part of the park setting and would enhance the visual and aesthetic qualities of the site. Low fencing (3-4 feet in height) and landscaping could be provided in order to limit access and reduce liability. Walking trails and benches would be provided to enhance the utility of the park. The minimum surface area of the pond/recharge area would be approximately 1.1 acres, with side slopes and landscaping surrounding this feature. This would provide a total of five (5) acres for the park, of which approximately 1.5 acres would be occupied by the pond/recharge area. The design would have to meet Town Engineering review requirements, and if the roads and recharge systems are offered for dedication to the Town, certain design requirements may be imposed.

The recharge generated from the construction of paved surface areas could easily be accommodated by a standard recharge basin of approximately 1.1 acres (see **Plate 6**). This would not require extensive storage using catch basins in the street. The recharge basin would be part of the plan, but would be fenced and surrounded by landscaped vegetation. This is a more traditional method of runoff storage, and would be expected to meet Town standards for dedication. This scenario would provide nearly 3.9 acres for park use on the west side of the site, and the recharge area would be made attractive through the use of landscaping. The design would be similar to that shown in **Plate 4**, with extensive landscaping surrounding the recharge basin.

The proposed project is for a change of zone, therefore it is not appropriate to engage in significant engineering and drainage design. The design concepts have been considered and provide an adequate basis for impact analysis based upon the design parameters noted above. Refinements to this design can be incorporated into the environmental review process. In addition, should the zone change be received favorably by the Town Board, a subdivision application with complete grading and drainage review will be necessary before subdivision approval and construction. This DEIS considers the recharge system to be part of the overall park/open space setting, with between 1 and 1.5 acres devoted to recharge (with a possible pond) and the remaining area devoted to landscaping, trails, sitting areas and open space.

1.3.4 Sanitary System

Wastewater will be generated as a result of the proposed use of the site as a residential development. All sanitary wastewater effluent is proposed to be disposed of via individual on-site sanitary waste disposal systems. This form of disposal is acceptable provided the projected wastewater design flow does not exceed standards established by the Suffolk County Department of Health Services (SCDHS).

Article 6 of the Suffolk County Sanitary Code (SCSC) 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 **SCDHS (1987-1)**. 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 may be used, provided individual systems comply with the current design standards and no community sewerage system is available or accessible (**SCDHS, 1987-1**). No community sewerage system exists in the vicinity of the subject site.

The project site is located within Groundwater Management Zone I as defined by the SCDHS (**SCDHS, 1987-2**). Based on the requirements of Article 6, no more than 600 gallons may be discharged per acre on a daily basis within this zone. The site acreage used for determining this Population Density Equivalent must not include wetlands, surface waters, or land in flood zones. The subject site is 39.3 acres in size and does not contain surface waters or wetlands. Thus, the Population Density Equivalent (total allowable flow) on the subject site is calculated as:

$$39.3 \text{ acres} \times 600 \text{ gpd} = 23,580 \text{ gallons per day (gpd)}$$

The project sponsor intends to utilize conventional subsurface sewage disposal systems on site, therefore, the total design flow must not exceed the Population Density Equivalent calculated above.

The current design sewage flow standard for single family residential units applied by the SCDHS is 300 gpd. Therefore, it is estimated that the fifty-nine (59) proposed residences will generate approximately 17,700 gpd of sewage flow. This is 5,880 gpd less than allowed by the SCDHS under its current regulations, therefore, conventional on-site sanitary systems may be used for this development.

1.4 CONSTRUCTION

The installation of the subdivision road and associated recharge basin will involve routine construction practice. Building permits and plot plan review will be required for the proposed homes. Extensive grading will not be required, as the topography of the site is relatively flat. Slopes created on the site will not exceed 1:3 and disturbed areas will be stabilized with landscape material as soon as practically feasible following disturbance. As the site had been in agricultural use for a long period of time, analysis of the surface soils was undertaken to determine the presence and potential impact of agricultural chemicals (e.g., fertilizers, herbicides, pesticides and fungicides). The results of this testing program (see **Appendix B**) indicates the presence of several substances, though only arsenic was detected at levels for which further testing is appropriate. Therefore, in addition to performing this additional testing, and as a precautionary measure, the Applicant will have the topmost 6 inches of soil removed from those portions of the site which will be in lawn areas of lots. This material will be used within the site as roadbed, in the landscaped berm, drainage areas and/or other areas of the site not anticipated to come into contact with residents. Completion of subdivision roads will include installation of available utilities. Utilities such as LIPA electrical service, LIPA gas service, Greenlawn Water District water main extension and NYNEX telephone service will be installed at that time. In addition, the proposed recharge basin will be completed in order to receive stormwater runoff from the subdivision road and other impervious surfaces. Material excavated from this site will be used on site for grading if needed, or will be removed from site if excess fill is not required. The existing grades are such that extensive excavation is not required to complete the subdivision, thereby providing the ability to balance cut and fill. Only those areas involved in subdivision improvement construction will be disturbed during this phase.

Construction of each individual site will begin with excavations for foundations and footings. House construction will commence along with utility connection, drainage/sanitary system installation and lighting installation. Following completion or near completion of the building, final site grading and the installation of landscaping will occur.

It should be noted that this discussion is provided as an overview of possible project construction, and actual implementation will be under further review at the time of subdivision and site plan review. The Town of Huntington may require bonding or other assurances at the time of project review and approval in order to protect the interests of the Town. In addition, actual site improvements will be carried out under the direction of the applicant or a designated project manager. Specific improvements will be made under the supervision of construction contractors

for the site infrastructure improvements and under the supervision of the selected contractors for building and other improvement.

Operation of the site will be in a manner consistent with other residential subdivisions in the Town of Huntington. Subsequent to subdivision approval, road construction will be bonded, and once completed, the road as well as recharge facilities will be dedicated to the Town of Huntington. At that point, plowing and maintenance will be the responsibility of the Town. The proposed uses will generate tax revenue, a portion of which is allocated through tax distribution to offset the impact of additional road maintenance on the Town Highway Department. Individual site plans and uses, once constructed, will be the responsibility of private owners.

1.5 PERMITS AND APPROVALS REQUIRED

This DEIS is intended to provide the Town of Huntington Town Board with the information necessary to render a decision on the proposed Harborfield Estates Zone Change application. This document is also intended to comply with the SEQRA requirements as administered by the Town of Huntington. Once accepted, the DEIS will be subject to public review, followed the preparation of a Final Environmental Impact Statement (FEIS). Subsequent to completion of the FEIS, the Town Board will be responsible for the preparation of a Findings Statement, which will form the basis for the final decision on the project.

Following this process, should the Town Board receive this application favorably, the following additional approvals would have to be obtained prior to commencement of project construction.

- Town of Huntington Planning Board subdivision approval.
- Suffolk County Department of Health Services approval of a Realty Subdivision in accordance with Article 6 of the Suffolk County Sanitary Code.
- Suffolk County Department of Health Services approval of plans and construction for sewage disposal systems for single family residences under Article 6 of the Suffolk County Sanitary Code.
- Suffolk County Department of Health Services approval of modification of water supply system under Article 4 of the Suffolk County Sanitary Code.
- Suffolk County Department of Public Works approval for curb cut and road work to Pulaski Road (CR 11).

SECTION 2.0
ENVIRONMENTAL SETTING



2.0 ENVIRONMENTAL SETTING

This section characterizes the natural and human resources of the proposed project site so that the impacts of a proposed project can be determined. Included is a baseline of information on the natural and human resources present on site. **Section 3.0** will utilize this information in analyzing the potential environmental impacts of the proposed project.

2.1 GEOLOGY

The following section describes surface, subsurface and topographic features of the subject parcel. Information for this discussion was obtained from on site observations and from the Suffolk County Soil Survey (**Warner et al., 1975**), topographic maps various studies/reports and on-site field inspections. This section will provide an overview of the geologic history and conditions in the area of the site.

2.1.1 Geologic History and Stratigraphy

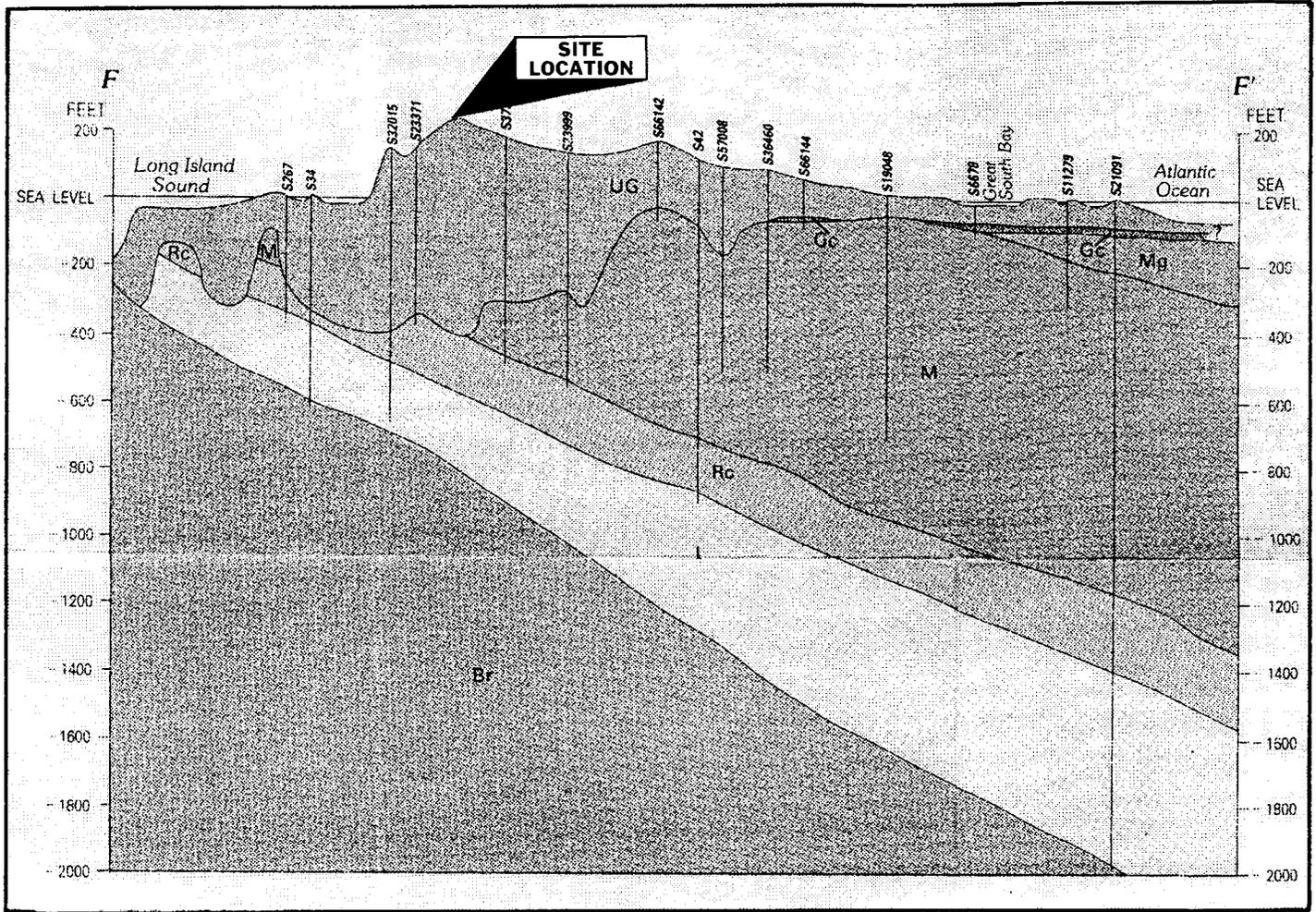
Long Island is located within the Atlantic Coastal Plain, a general physiographic province in which substantial sediment deposits overlie the base, or bedrock (**Fuller, 1914**). The surface topography of the island is primarily a product of glacial history and subsequent human activity. Understanding 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. This section provides a brief summary of Long Island geology.

The bedrock which underlies Long Island slopes south and east at a rate of 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 the bedrock is approximately 975 feet below sea level 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. These Cretaceous sediments contain three major aquifers: the Lloyd, Magothy and Upper Glacial. **Figure 2-1** provides a cross section of Long Island for a profile running from the north shore to the south shore to the east of the site.

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 impermeable Raritan Clay (**Suter et al., 1949; Jensen and Soren, 1974**). The upper altitude of the Lloyd sand member is approximately 800 feet below sea level in the vicinity

FIGURE 2-1

GEOLOGIC CROSS SECTION



	HYDROGEOLOGIC UNIT		Magothy aquifer	<p>WELL AND NUMBER—Vertical line indicates depth of borehole or well. Prefix letter (K, Q, N or S) indicates Kings, Queens, Nassau or Suffolk County.</p> <p>— Hydrogeologic Contact</p>
	Gardiners Clay		Raritan confining unit	
	Jameco aquifer		Lloyd aquifer	
	Monmouth greensand		Bedrock	

0 5 10 MILES
 0 5 10 KILOMETERS
 VERTICAL SCALE IS GREATLY EXAGGERATED
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

Source: USGS, 1989

of the site, indicating a thickness of 175 feet, and the top of the Raritan clay is approximately 650 feet below sea level, indicating a thickness of 150 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 550 feet below sea level, indicating a thickness of 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 Pleistocene epoch of the 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, form the Upper Glacial Aquifer. The Ronkonkoma and Harbor Hills Terminal Moraines were deposited 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 sediments of the moraines typically consist of unsorted and unstratified clay, silt, sand, gravel, and boulders but can also include crudely to well sorted, stratified glacial drift. In contrast, the glaciofluvial sediments of the outwash plains consist of fine to coarse sand and gravel.

The project site is situated on undifferentiated outwash deposits between the Ronkonkoma Terminal Moraine and the Harbor Hills Terminal Moraine (**Jensen and Soren, 1974**). The surface elevation of the project site ranges from about 208 to 228 feet, and the thickness of the Upper Glacial Aquifer is approximately 750 feet beneath the site. The Upper Glacial Aquifer also has localized clay lenses within the coarser sediments of the unit.

2.1.2 Topography

The subject site is located on the outwash plain south of the Harbor Hills terminal moraine. There is relatively little natural topographic variation, the property slopes gently and regularly from the northeast to the southwest. The surface elevation ranges from a high of 228 feet along the northeastern border of the site to a low of 208 feet in the southwestern corner. The project site slopes from its highpoint to its lowpoint at a grade of about two (2) percent. An embankment of soil and discarded debris is found about one hundred feet south of and parallel to the LIRR right of way. Dirt trails were cleared at some time in the past, apparently the result of motor bikes

utilizing the site. There are no slopes in excess of two (2) percent on the property. A topographic map is included in **Figure 2-2**.

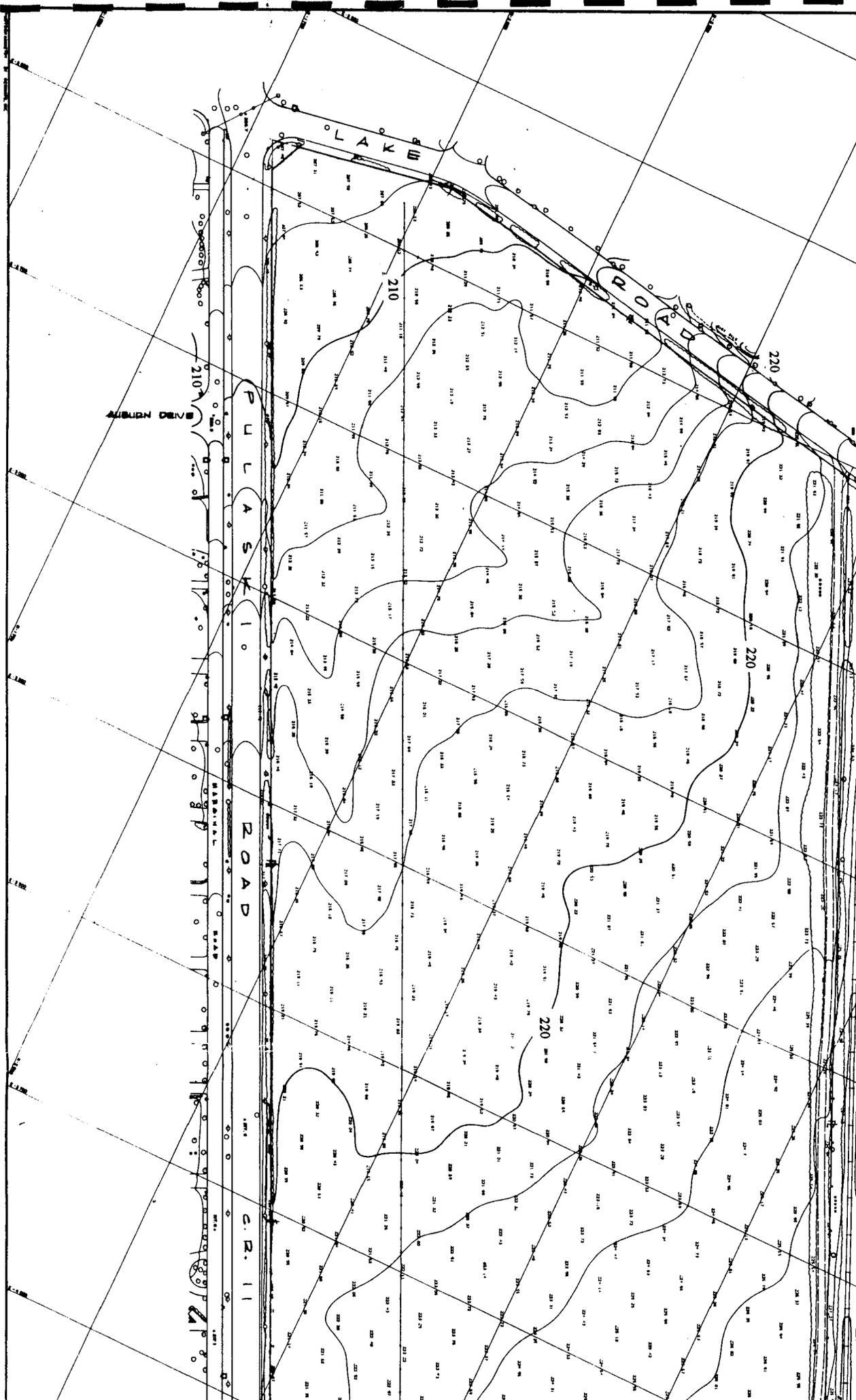
2.1.3 Soils

The USDA Soil Survey of Suffolk County, New York (**Warner et al., 1975**) provides a complete categorization, mapping and description of 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 soil survey identifies this site as lying within the area characterized by Haven-Riverhead Association soils. Haven soils are deep, nearly level to gently sloping, well-drained, medium-textured and moderately coarse textured soils on outwash plains. These soils are mainly found in the northern part of the county, most areas lie between the two terminal moraines. Slopes range from 0 to 12 percent, but they generally are 2 to 6 percent. Within this association, one specific soil series is identified on site: Haven loam. This soil (HaA) has slopes in the range of 0 to 2 percent and has a profile representative of the Haven-Riverhead Association. These slope identifiers are generalized based upon regional soil types and the more detailed section on Topography should be consulted for analysis of slope constraints. Specific description of the soils found on site follows (**Warner et al., 1975**):

Haven soils - The Haven series consists of deep, well-drained, medium textured soils that formed in a loamy or silty mantle over stratified coarse sand and gravel. These soils are present throughout the county, but most areas are on outwash plains between the two terminal moraines. Haven soils have high to moderate available moisture capacity. Internal drainage is good, with moderate to very rapid permeability. Natural fertility is low.

The constraints on development posed by these soils are summarized in **Table 2-1**. Due to the medium textured nature of most of the soils and the gentle slopes on site, the only development constraint is associated with potential groundwater contamination due to permeability. Development of the site should take these soil conditions into consideration in project design and planning.



Source: Geomaps, Inc.
Scale: 1" = approximately 180'

MPGW
NELSON, POPE & VOORHIS, LLC
ENVIRONMENTAL • PLANNING • CONSULTING

TABLE 2-1

SOIL LIMITATIONS

Constraints	HaA
Sewage Disposal	Slight (1)
Homesites	Slight
Street & Parking	Moderate
Lawns & Landscaping	Slight

Source: Adapted from Warner et. al., 1975

Legend: 1) Possible pollution to lakes, springs, and shallow wells due to permeability of soils

Appendix B contains the results of a soil testing program undertaken by the Applicant to determine the presence and concentration of agricultural chemicals. Following is a brief description of the soil sampling and testing program, as well as the Conclusions:

The New York State Department of Health (NYSDOH) provides guidance for such soil sampling through the SCDHS. Soil samples were collected in accordance with the recommendations of the NYSDOH, noted as follows:

- samples were collected at depths of 0-3 inches and 3-6 inches.
- samples were directed toward those areas likely to have accumulated the highest contaminant levels.
- samples were analyzed for lead, arsenic and DDT and its metabolites.

Consistent with the NYSDOH letter, if elevated levels of lead and arsenic were found in the 0-3 inch range, the sample collected from the 3-6 inch range was then tested to determine the depth of occurrence and vertical mixing. Since the proposed property will be used for a residential subdivision, the concentrations of lead and arsenic are an important issue.

In accordance with NYSDOH recommendations, the sampling and analysis program was intended to determine:

- if site activities had caused degradation of soil quality on site;
- if soil mitigation is appropriate, given the concentration of contaminants and the intended use of the site.

The following presents an evaluation of the results of this investigation.

1. Soil samples were collected and analyzed. These samples were analyzed for the presence of arsenic, lead and pesticides. The laboratory analysis revealed that all of the analyzed constituents were below the NYSDEC TAGM 4046 standards and the USEPA Health

Based Carcinogens, except chlordane which exceeded the USEPA standards in the off-site sample. Lead was within the soil background levels for Suffolk County. Arsenic exceeded the TAGM 4046 standard, as well as the SCDHS standard of 25 ppm at locations 1, 2 and 4 (off-site). The 3-6 inch samples from locations 1 and 2 will be tested for arsenic, to determine the depth of penetration of this contaminant.

2. Since arsenic exceeded the regulatory standard, it is recommended that the topmost 6 inches of soil be removed from those areas of the site within lots that are anticipated to be located within front, side and rear yards. This material may be used elsewhere on the site, as fill for roadbeds, within the landscaped berm or in drainage areas. It may be prudent to run additional samples from depths of 9-12 inches and 15-18 inches to confirm that removal of 6 inches is appropriate. Depth samples from location 2 are expected to be sufficient.

2.2 WATER RESOURCES

The site does not contain any natural surface water features, therefore, the following section will provide a complete understanding of the groundwater resources at the site.

2.2.1 Hydrogeology

Groundwater on Long Island is 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. This level is referred to as the water table. The major water bearing units beneath the subject site are the Upper Glacial, Magothy and Lloyd Aquifers (**Jensen and Soren, 1974; Smolensky et al., 1989**). The groundwater table coincides with 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 in a direction perpendicular to the contour lines of equal elevation (**Freeze and Cherry, 1979**).

The major water bearing units beneath the subject site include the Upper Glacial aquifer, whose top altitude averages about 200 feet above msl (**SCDHS, 1992**); the Magothy aquifer, top altitude 550 feet below msl (**Koszalka, 1984**); the Raritan clay, top altitude 650 feet below msl; and the Lloyd aquifer, top altitude 800 feet below msl (**Jensen and Soren, 1974; Koszalka, 1984**). Bedrock is present at a depth of about 950 feet below msl. Therefore, the aquifers beneath the subject site have the following approximate thickness: Upper Glacial aquifer, 750 feet; Magothy aquifer, 100 feet; Lloyd aquifer, 750 feet (**Jensen and Soren, 1974; Koszalka, 1984**).

The Long Island Regional Planning Board, in conjunction with other agencies, prepared a management plan for Long Island groundwater resources in 1978 in accordance with 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). The subject site is located in Groundwater Management Zone I as delineated by the SCDHS for the purpose of 208 recommendation implementation (SCDHS, 1985). Zone I is a primary source of drinking water for much of Long Island, and protection of water quality is imperative. The management recommendations of the 208 study will be discussed in detail in the Land Use section of this document. Based on the configuration of the water table, the horizontal movement of groundwater beneath the site appears to be northward toward Huntington Bay. Water from this system is ultimately discharged into the Long Island Sound.

2.2.2 Depth to Groundwater and Groundwater Flow

The SCDHS, in conjunction with other agencies maintains a network of observation wells for the purpose of determining the elevation of groundwater throughout the county, and maps groundwater levels on an annual basis. Figure 2-3 shows the configuration of the water table in the area of the site based on the most recent map (SCDHS, 1997).

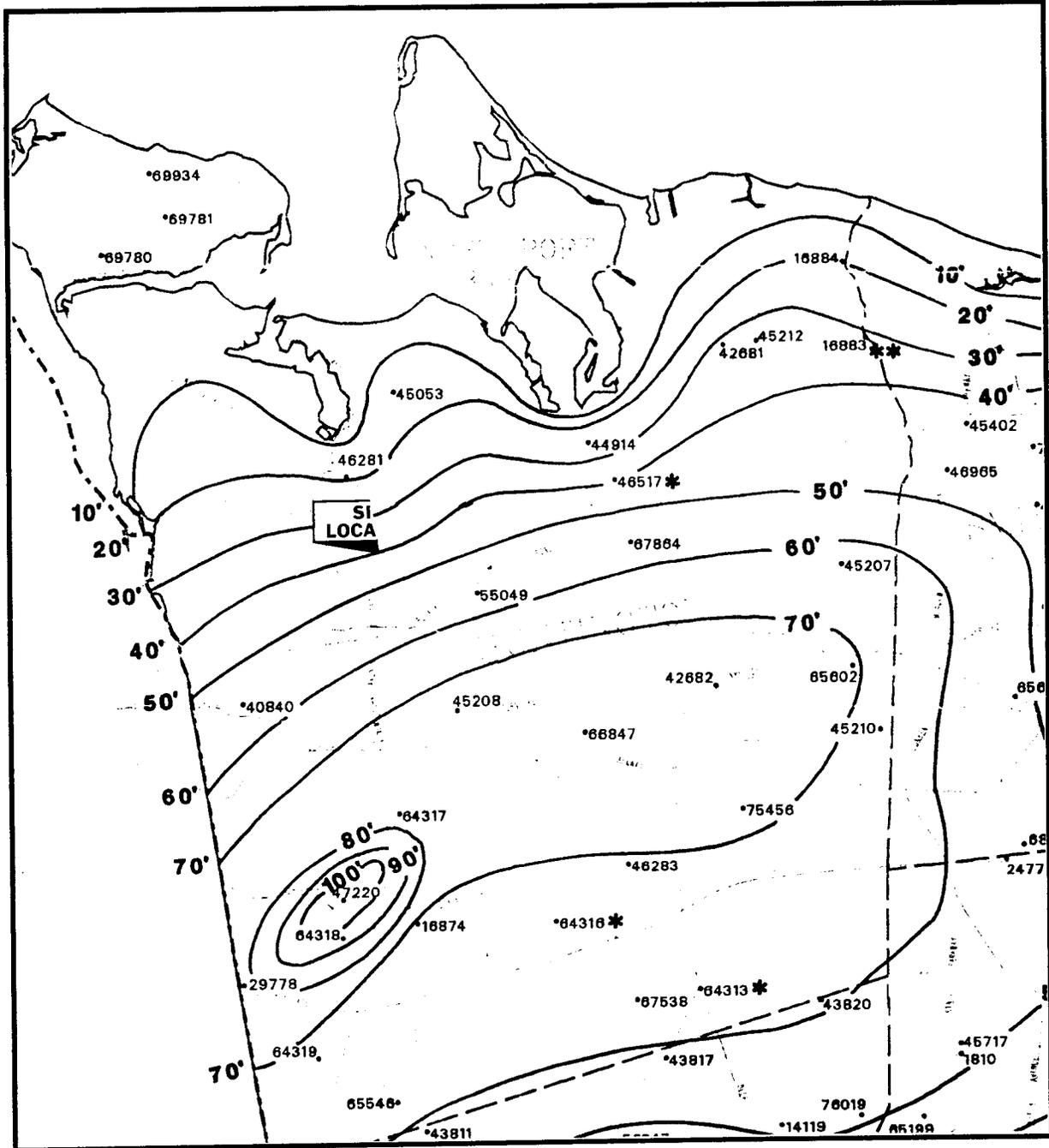
Using the most recent groundwater map, the elevation of groundwater at the site was approximately 53 feet in 1997 (SCDHS, 1997), although levels would be expected to vary slightly between years and on a seasonal basis. The highest surface elevation at the site is 228 feet in the northeastern portion of the property, and the lowest surface elevation is 208 feet in the southwestern corner. Thus, the maximum depth to groundwater on site should be approximately 175 feet in the northern portion of the site; and the minimum depth to groundwater should be approximately 155 feet in the southwestern corner of the site. The depth to groundwater is more than adequate for leaching of recharge, construction of foundations and basements, and similar activities to allow development of the site, even during high groundwater years.

Geographical differences in elevation of the groundwater table create a hydraulic gradient which causes groundwater to flow in a direction perpendicular to the contour lines of equal elevation (Freeze and Cherry, 1979). Contour lines are lines of equal elevation of groundwater as inferred between observation well points mapped by the SCDHS. The lines of equal elevation assist in determining the generalized direction of groundwater flow in the water table aquifer. In an isotropic aquifer (an aquifer where the conductivity is the same in the horizontal and vertical directions), groundwater moves perpendicular to the contour lines (Freeze and Cherry, 1979). Although the hydrogeologic units are not isotropic on Long Island, this principle may be used to approximate the direction of groundwater flow. The configuration of the water table and the location of the groundwater divide will change as groundwater elevations fluctuate.

The site is located approximately two and a half miles north of the regional groundwater divide, and there is a groundwater mound associated with the divide to the southwest in the Melville area. To the north, Huntington Bay and Northport Bay both influence the direction of

FIGURE 2-3

1997 GROUNDWATER CONTOURS



Source: SCDHS, 1997

Scale: 1" = 2 miles

groundwater flow. Based upon the SCDHS Map (SCDHS, 1997) shown in **Figure 3-1**, horizontal movement of groundwater beneath the site appears to be to the northwest.

2.2.3 Groundwater Quality

The Suffolk County Comprehensive Water Resources Management Plan (SCDHS, 1987-2) provides information on water quality from 0 to 100 feet below the water table based on observation wells as well as public and private water supply and well monitoring. With respect to nitrate-nitrogen at a depth into the aquifer of between 0 and 100 feet, the Plan shows the subject site as lying within an area of marginal water quality (6 to 10 mg/l of nitrogen), with a localized areas of poor groundwater (greater than 10 mg/l) immediately to the north (SCDHS, 1987-2; **Plate 4**). Insufficient nitrate-nitrogen concentration information is available for depths of 100 to 400 feet beneath the site, although nearby samples indicate ambient to good water quality with respect to nitrogen. The shallow nitrogen contamination is most likely due to residential development and past agricultural activities in the area.

The Plan also provides information regarding concentrations of Volatile Organic Compounds (VOC) in groundwater. Groundwater quality in the vicinity of the site is good (less than 60% of applicable guidelines) at a depth of 0 to 100 feet (SCDHS, 1987-2; **Plate 6**), with respect to organic compounds. Insufficient water quality information is available from the area of the site for water at a depth of 100 to 400 feet, although the nearest samples have non-detectable or good levels of VOC's. VOC's are synthetic organic compounds such as degreasers, oil additives, solvents and pesticides. They are typically introduced to groundwater through chemical manufacturing, dry cleaning, fuel spills, agricultural practices and improper disposal of both household and industrial wastes.

Appendix A-7 contains correspondence with the GWD in regard to the quality of the groundwater provided to customers by the GWD. The data indicate that all standards were met for which testing was performed. In particular, the average nitrate concentration in water supplied in the District is 0.5 mg/l.

The groundwater budget for an area is expressed in the hydrologic budget equation, which states that recharge equals precipitation minus evapotranspiration plus overland runoff (SCDHS, 1987-2; p. 5-29). This indicates that not all rain falling on the land is recharged to groundwater. Loss in recharge is represented by the sum of evapotranspiration and overland runoff. The equation for this concept is expressed as follows:

$$R = P - (E + Q)$$

where: **R** = recharge
P = precipitation
E = evapotranspiration
Q = overland runoff

Nelson, Pope & Voorhis, LLC has exclusive use of a microcomputer model developed for the purpose of predicting both the water budget of a site and the concentration of nitrogen in recharge. The model, referred to as SONIR (Simulation of Nitrogen in Recharge), utilizes a mass-balance concept to determine nitrogen 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 basis for this method of nitrogen budget analysis is well established, and 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 (BURBS A simulation of the Nitrogen Impact of Residential Development on Groundwater; **Hughes et al., 1985**). The SONIR model includes four (4) sheets of computations: 1) Data Input Field; 2) Site Recharge Computations; 3) Site Nitrogen Budget; and, 4) Final Computations. 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 has been run for water budget and nitrogen parameters for the existing site conditions. The results are presented in **Appendix C-2**. The site currently generates a total recharge volume of 17.84 inches per year, or 19.04 million gallons per year (MGY).

A more detailed assessment of the existing site conditions in regard to the quality of its groundwater resources can be made by calculating the total nitrogen input to groundwater, diluted by the total volume of recharge water. The resulting figure indicates the expected nitrogen concentration in recharge. SONIR was utilized to determine the present recharge and nitrogen entering the site; it estimates that a nitrogen concentration of 0.02 mg/l recharge enters the groundwater underlying the site.

2.3 ECOLOGICAL RESOURCES

The subject parcel is characterized by successional old field vegetation, and appears to have been an agricultural field at one time. The site is now overgrown, with a variety of herbaceous species and scattered shrubs. The surrounding lands contain a mix of industrial, commercial and residential lands, with small, interspersed areas of open space and agricultural uses. The parcels immediately east and west of the site are occupied by office/industrial uses, and the area to the south is predominantly single family homes on half acre lots. The Long Island Railroad right of way runs along the northern border of the site, and development further to the north is predominantly single family homes on one acre lots. Immediately north of the tracks is a clustered residential subdivision which includes a small pond with a narrow vegetated buffer and a large a large, mown common area. In addition, there is a Town operated community garden to the north of the residential cluster. The following text will discuss both the vegetation and wildlife found on or expected at the site.

2.3.1 Vegetation

The subject property is 39.3 acres in size, and consists entirely of successional old field habitat as defined within classification system developed by the NYS Department of Environmental Conservation (**Reshcke, 1990**). Successional hardwood forest, shrubland and old field habitats are stages in the process of secondary succession. Secondary succession is the process by which an area which has been cleared or otherwise disturbed reverts to the original vegetational community. The first species to colonize a cleared area are generally herbaceous weeds and other plants with wide seed dispersal. These early successional species are replaced first by woody shrubs, then by saplings of tree species which seed in from adjacent wooded habitat or nearby cultivars. As time progresses, the trees dominate in both abundance and height, and light penetration is reduced. The tree and shrub species which first colonized the area are then replaced by more shade tolerant species. The resulting forest generally resembles the original forest, although there may be differences in species composition, particularly if non-native species have been introduced in the surrounding area. This final habitat is referred to as climax community.

Successional old field is the initial stage in the process of succession, which is the reversion of disturbed habitats to climax forest. The habitat generally supports a wide variety of weedy species that colonize readily, including goldenrods, grasses, timothy, ragweed and asters. **Reschke (1990)** defines an old field as "*a meadow dominated by forbs and grasses that occurs on sites that have been cleared or plowed, and then abandoned*". Woody species may be present, but coverage by shrubs is less than 50 percent.

The old field area on the project site is dominated by ragweed, with areas of partially exposed soils and dumped landscaping debris. A dirt trail runs from west to east the northern portion of the site, forming a loop near the eastern border. There are scattered shrubs on the parcel which are most abundant to the southwest. Common herbaceous species include a variety of grasses, including bluestem, timothy and poverty grass, common ragweed, giant ragweed, goldenrod, and clovers. Species which are also present include yarrow, asters, Queen Anne's lace, chichory, hawkweed, plantain, pokeweed, dandelion, common milkweed, dock, thistles, and dogbane. Shrubs and tree seedlings are present throughout the southern portion of the site, but occupy less than 50 percent of the canopy. Bayberry, sumacs, multiflora rose, and pasture rose, are most common, but crab apple, dogwood, oriental bittersweet, birch, meadowsweet, hawthorne, black pine, honey locust autumn olive, Norway maple, scarlet oak, and red cedar were also observed. These species have likely seeded in from the adjacent residential areas and road right of way.

Table 2-2 is a list of plant species found on site or expected to be on site given the habitat present. This list is not meant to be all inclusive but was prepared as part of field inspections to provide a detailed representation of what is found on site. Care was taken to identify any species

TABLE 2-2

PLANT SPECIES LIST

Woody Species

- * Norway maple
- tree-of-heaven
- devils-club
- * white birch
- * gray birch
- * Asiatic bittersweet
- * hawthorne
- silverberry
- * autumn olive
- forsythia
- * eastern red cedar
- * flowering dogwood
- privet
- honeysuckle
- * crab apple
- common apple
- mulberry
- * crab apple
- * bayberry
- * bigtooth aspen
- * black cherry
- * choke cherry
- * scarlet oak
- * multiflora rose
- * pasture rose
- * black locust
- * sumacs
- brambles
- sassafras
- greenbriar
- common nightshade
- * meadowsweet
- poison-ivy
- grape

- Acer platanoides*
- Alianthus altissima*
- Aralia spinosa*
- Betula papyrifera*
- Betula alleghaniensis*
- Celastrus orbiculata*
- Craetagus sp.*
- Elaeagnus commutata*
- Elaeagnus umbellata*
- Forsythia sp.*
- Juniperus virginiana*
- Cornus florida*
- Ligustrum vulgare*
- Lonicera spp.*
- Malus coronaria*
- Malus pumila*
- Morus alba*
- Malus coronaria*
- Myrica pensylvanica [p]*
- Populus grandidentata*
- Prunus serotina*
- Prunus virginiana*
- Quercus coccinea*
- Rosa multiflora*
- Rosa sp.*
- Robinia psuedo-acacia*
- Rhus sps.*
- Rubus sps.*
- Sassafras albidum*
- Smilax sp.*
- Solanum nigrum*
- Spirea sp.*
- Toxicodendron radiacans*
- Vitis spp.*

Herbs and Groundcovers

- redtop
- * little bluestem grass
- pigweed
- * ragweed
- * asters
- * yarrow
- cress
- * dogbane
- * milkweed
- yellow rocket

- Agrostis gigantea*
- Andropogon scoparius*
- Amaranthus sp.*
- Ambrosia artemisiifolia*
- Aster sps.*
- Achillia millefolium*
- Arabis sp.*
- Apocynum androsaemifolium*
- Asclepias syriaca*
- Barbarea vulgaris*

* poverty grass	<i>Danthonia spicata</i>
sedge	<i>Carex sp.</i>
spotted knapweed	<i>Centurea maculosa</i>
* chicory	<i>Cichorium intybus</i>
* thistle	<i>Cirsium sp.</i>
crown vetch	<i>Coronilla varia</i>
broom	<i>Cytisus scoparius</i>
* Queen Anne's lace	<i>Daucus carota</i>
cypress spurge	<i>Euphorbia cyparissias</i>
common strawberry	<i>Fragaria virginiana</i>
ground ivy	<i>Glechoma hederaceae</i>
avens	<i>Geum sp.</i>
* hawkweed	<i>Hieracium sp.</i>
common St. Johnswort	<i>Hypericum perforatum</i>
* rye grass	<i>Lolium sp.</i>
evening primrose	<i>Oenothera biennis</i>
panic grass	<i>Panicum sp.</i>
* poke weed	<i>Phytolacca americana</i>
* plantain	<i>Plantago sp.</i>
* bluegrass	<i>Poa spp.</i>
cinquefoils	<i>Potentilla spp.</i>
buttercup	<i>Ranunculus acris</i>
common dewberry	<i>Rubus flagellaris</i>
black-eyed Susan	<i>Rudbeckia hirta</i>
* dock	<i>Rumex crispus</i>
bouncing bet	<i>Saponaria officinalis</i>
white campion	<i>Lychnis alba</i>
* goldenrod	<i>Solidago spp.</i>
* common dandelion	<i>Taraxacum officinale</i>
* clover	<i>Trifolium sp.</i>
* common mullein	<i>Berbasicum thapsus</i>
cocklebur	<i>Xanthium chinense</i>

[p] - NYS Exploitably Vulnerable Protected Plant Species
* Species observed on site by NP&V staff, December, 1997

that might be unusual for the area. No rare, threatened or endangered plants were observed on site. The N.Y. Natural Heritage Program (ECL 9-1503) was contacted to determine if there is any record of rare plants or wildlife in the vicinity. The response from the Natural Heritage Program is appended (**Appendix D-1**). There are no recent records of rare species or significant habitats in the vicinity of the property.

Bayberry and crab apple are the only "exploitably vulnerable" species that was identified on the property. "Exploitably vulnerable" plants are species which are not currently threatened or endangered, but which are commonly collected for flower arrangements or other uses. The bayberry and crab apple will be removed following development. Regardless, under ECL 1503.3, no person may "knowingly pick, pluck, sever, damage by the application of herbicides or defoliant or carry, without the consent of the owner thereof, protected plants". (NYSDEC, 1975). As per this section of the ECL the project sponsor (i.e. owner) would not be restricted in

utilizing the site for the intended purpose. Therefore, the presence of protected plants would not restrict use of the site under the NYS Environmental Conservation Law.

2.3.2 Wildlife

The successional vegetation found on site should provide habitat for several wildlife species, although few were observed during the late October and November field visits. Most wildlife species found in early successional habitats adjust well to human activity, and the small size of the site, adjacent railroad, and surrounding development make it unlikely that area-sensitive grassland species are present. Thus, the species present on site are likely to be relatively common suburban species. **Appendix D-2** presents a computer generated list of species expected on site given the habitat available. This list is provided as a supplement to site specific discussions included herein, and also includes information on the biological needs of each species. The model was developed by Nelson, Pope & Voorhis, LLC, as a tool to supplement site specific inventory and discussions, and is described more fully in the introductory statements contained in **Appendix D-2**. The following paragraphs describe in detail the wildlife observed or expected on site.

Birds

Seed-eating birds, including grosbeaks, finches, towhees, juncos, and sparrows, are expected to be relatively common on site (**Bent, 1968, 1968**). The most common sparrow which breeds on Long Island is the song sparrow, and the introduced house sparrow is also abundant. Both species are found in forest openings, suburban areas and overgrown field habitats, and are expected on site. The house sparrow is an introduced old world species which often nests on buildings, and is considered a pest. It is likely to be present in the area. The chipping sparrow was observed on site and field sparrow is also expected, as they prefer overgrown brushy areas. The related northern junco, fox sparrow, white-throated sparrow and white-crowned sparrows are common winter visitors on Long Island, and are expected during the colder months. Several northern juncos were observed during a November field inspection. The vesper, Savannah and grasshopper sparrows are area-sensitive grassland species. They are not expected on site given the existing development in the surrounding area and small size of the property.

The American goldfinch, northern cardinal and house finch are the most likely finches to breed on the property. The goldfinch and house finch are most likely to be present, as they prefer suburban and edge habitats. The northern cardinal, as well as the related rufous-sided towhee and rose-breasted grosbeak prefer woodlands with dense understory or hedgerows, but might occasionally be present on site. The indigo bunting might also be present, although it prefers open landscapes with dense cover and isolated tall trees, which are not present in the area.

A variety of larger birds are commonly found in a suburban and early successional habitats, including the thrashers, the orioles and blackbirds, and the doves (**Bent, 1964, 1965**). Corvids which are common on Long Island include the American crow and blue jay, and the fish crow is

also abundant in areas near the shore. The common crow was observed on site, and the blue jay is expected. The brown thrasher and gray catbird are thrasher species that might be found on site, as this group generally prefers more open habitats (Andrle and Carroll, 1988). The catbird and the northern mocking bird were observed on the property. The American robin is a thrush, but has similar habitat requirement as the thrashers, as does the introduced European starling. These species are common in fields and suburban areas, and both are expected on site, although the American robin was the only species observed. The European starling is an introduced species and often considered a pest, as it will often nest on buildings, air conditioning vents, etc. and has also proven detrimental to other hole nesting species (Andrle and Carroll, 1988). These species feed primarily on insects and fruits.

Birds from the oriole and blackbird family also feed on a mix of insects, seeds, fruit and aquatic fauna. The grackle, brown-headed cowbird, and eastern meadowlark might be expected on site (Andrle and Carroll, 1988), and several grackles were observed. These birds generally prefer open woodlands and field habitats, and are probably common throughout the area, as they are relatively tolerant of development. The cowbird is a nest parasite which lays eggs in the nests of other birds. The northern oriole might occasionally forage on site, although it generally prefers to nest in taller trees in open areas, and there are no tall trees on site.

Two doves are found on Long Island, including the mourning dove and the introduced rock dove, also known as the domestic pigeon. Both are common in suburban areas, parks, cultivated fields and along roadsides. The mourning dove typically nests in overgrown areas and tangled vines, while the rock dove prefers to nest on buildings and other structures (Andrle and Carroll, 1988) and are considered pests in many towns and urban areas. Many attempts have been made to control populations of the rock dove because of accumulations of droppings around roosting and nesting sites are messy and a potential health threat (Andrle and Carroll, 1988). Both are likely to breed in the local area and forage on site. Several mourning doves were observed.

A few smaller insect feeding birds are found in overgrown areas, including the wrens, titmice, and nuthatches. The house wren is the only wren expected on site, as it is commonly found in suburban areas and edge habitats as well as forest understory, where it feeds on insects. Titmice and nuthatches which might be found on site include the black-capped chickadee, tufted titmouse, and white-breasted nuthatch, all of which are year-round residents on Long Island (Bent, 1964). The nuthatch and titmouse typically breed in woodlands, but might be found foraging on site during the winter months, when they may forage in a wider variety of habitats.

Birds from the flycatcher and the swallow families feed on flying insects in woodlands, edge habitats and open areas. The eastern kingbird is the most common flycatcher in open areas on Long Island, although the great crested flycatcher might also be present (Bent, 1963; Andrle and Carroll, 1988). These flycatchers are summer visitors on Long Island. The willow flycatcher and least flycatcher are both quite rare on Long Island, but prefer open areas and might be present. Both are at the southern limit of their range on Long Island (Peterson, 1980). Common Long Island swallows include the barn swallow, tree swallow and purple martin, although only the barn

swallow might be expected to breed on site. A martin was observed overhead at the property. This species nests on barns and other buildings, but may use natural nest sites as well. The tree swallow and purple martin prefer wooded and wetland areas where insects are abundant, and are unlikely to be present. The cedar waxwing also occasionally feeds on flying insects, but is more commonly associated with orchards and suburban areas, where its diet consists primarily of fruit (Bull and Farrand, 1974). This species might be present on site.

The mix of open and shrubby habitats in the vicinity may provide habitat for game birds and similar species, including the killdeer, ring-necked pheasant, ruffed grouse and bobwhite. All four birds are year-round residents on Long Island, and are found in a mix of field and overgrown habitats (Bent, 1963; Andrie and Carroll, 1988). The horned lark is another grassland species which may be present, although it was not listed by the breeding bird survey. This species typically breeds in open areas with bare ground, and thus may be present on portions of the site.

The American woodcock is typically found in habitats with a mix of woodland and overgrown field, and prefers moist areas where earthworms are abundant. It may be present on site, although conditions are only marginally suitable. The nocturnal whip-poor-will feeds on moths and other insects, and prefers dry woods with adjacent fields. This species is unlikely to breed on site, but may forage in the area. The chimney swift also feeds on flying insects, and is found in a variety of habitats. Although it originally nested in cliffs and tree cavities, the species now is most commonly found nesting on buildings and other structures (Andrie and Carroll, 1988). It may also forage in the vicinity of the site, but is unlikely to breed on the property. The black billed and yellow billed cuckoos both breed in brushy pastures and feed on a variety of insects. They may be present on the site, but tend to avoid developed areas and thus are not expected.

Warblers also feed on a variety of insects, and although most are woodland species, a few are found in open habitats. Warblers which prefer more open habitats include the yellow warbler, common yellowthroat, prairie warbler, and yellow breasted chat. These species are generally found in dense undergrowth and shrubby habitats, although the former two species prefer areas near water. The chestnut-sided warbler is also found in open areas, although it avoids developed areas and is unlikely to be found on site. The site is only marginally suitable for these species.

The site and surrounding area is suitable for use by raptor and owl species for hunting, although they would not be expected to breed on site. A limited number may be present in the vicinity. Most raptors prefer to nest in high, forested areas away from humans, and suitable nesting sites are limited in the area. Owls and raptors prey primarily on small mammals, which are likely to be abundant in the area. Although none were seen and no signs were observed, the eastern screech owl and red-tailed hawk may occasionally be found on site. These species are relatively tolerant of humans and may also be found in suburban areas and city parks (Bent, 1961; Andrie and Carroll, 1988). The American kestrel is also relatively tolerant of humans, and may be present. The great horned owl and broad winged hawk are more susceptible to human disturbance and are likely to be present in the area (Andrie and Carroll, 1988).

Table 2-3 is a list of the bird species observed or expected on site given the habitats present; it is based upon field investigations conducted by NP&V. Due to time constraints for preparation of this document, only late fall site inspections were performed. Thus, relatively few avian species were sighted. Herring gulls were also observed overhead at the site, but are not listed as they are not expected to utilize the property. Additional information regarding these species and others can be found within Appendix D-2.

TABLE 2-3

AVIAN SPECIES LIST

red-winged blackbird	<i>Agelaius phoeniceas</i>
bobwhite	<i>Colinus virginianus</i>
indigo bunting	<i>Passerina cyanes</i>
northern cardinal	<i>Cardinalis cardinalis</i>
* gray catbird	<i>Dumetella carolinensis</i>
black capped chickadee	<i>Parus atricapillus</i>
yellow-breasted chat	<i>Icteria virens</i>
brown-headed cowbird	<i>Molothrus ater</i>
* American crow	<i>Corvus brachyrhynchos</i>
black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>
yellow-billed cuckoo	<i>Coccyzus americanus</i>
* mourning dove	<i>Zenaida macroura</i>
rock dove	<i>Columba livia</i>
American goldfinch	<i>Carduelis tristis</i>
house finch	<i>Carpodacus mexicanus</i>
common flicker	<i>Colaptes auratus</i>
great crested flycatcher	<i>Myiarchus crinitus</i>
least flycatcher	<i>Empidonax minimus</i>
willow flycatcher	<i>Empidonax traillii</i>
* common grackle	<i>Quiscalus quiscula</i>
ruffed grouse	<i>Bonasa umbellus</i>
rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>
red tailed hawk	<i>Buteo jamaicensis</i>
blue jay	<i>Cyanocitta cristata</i>
* northern junco	<i>Junco hyemalis</i>
American kestrel	<i>Falco sparverius</i>
killdeer	<i>Charadrius vociferous</i>
eastern kingbird	<i>Tyrannus tyrannus</i>
ruby-crowned kinglet	<i>Regulus calendula</i>
horned lark	<i>Eremophila alpestris</i>
* purple martin	<i>Progne subis</i>
eastern meadowlark	<i>Sturnella magna</i>
* northern mockingbird	<i>Mimus polyglottus</i>
white-breasted nuthatch	<i>Sitta carolinensis</i>
northern oriole	<i>Icterus galbula</i>
screech owl	<i>Otus asio</i>
ring-necked pheasant	<i>Phasianus colchicus</i>

American redstart	<i>Setophaga ruticilla</i>
American robin	<i>Turdus migratorius</i>
* chipping sparrow	<i>Spizella passerina</i>
fox sparrow	<i>Passerella iliaca</i>
field sparrow	<i>Spizella pusilla</i>
house sparrow	<i>Passer domesticus</i>
song sparrow	<i>Melospiza melodia</i>
white-crowned sparrow	<i>Zonotrichia leucophrys</i>
white-throated sparrow	<i>Zonotrichia albicollis</i>
European starling	<i>Sturnus vulgaris</i>
* barn swallow	<i>Hirundo rustica</i>
chimney swift	<i>Chaetura pelagica</i>
brown thrasher	<i>Toxostoma rufum</i>
tufted titmouse	<i>Parus bicolor</i>
rufous-sided towhee	<i>Pipilo erythrophthalmus</i>
chestnut-sided warbler	<i>Dendroica pensylvanica</i>
prairie warbler	<i>Dendroica discolor</i>
yellow warbler	<i>Dendroica petechia</i>
cedar waxwing	<i>Bombycilla cedrorum</i>
whip-poor-will	<i>Caprimulgus vociferous</i>
American woodcock	<i>Scolopax minor</i>
house wren	<i>Troglodytes aedon</i>
common yellowthroat	<i>Geothlypis trichas</i>

* Species observed on site by NP&V staff, Fall 1997 and 1998

Mammals

The project site should also support a limited number of mammal species. Small rodents and insectivores such as mice, shrews and voles are expected to be the most abundant mammals on site, but a small number of larger mammals may be present.

The masked shrew may be the most common mammal on Long Island. Although it is rarely seen, this small insectivore has been captured and identified in almost every type of habitat on Long Island (Connor, 1971). It will utilize any site with sufficient ground cover, including woods, fields, bogs and both marine and freshwater marshes. The short-tailed shrew also uses a variety of habitats, but on Long Island appears to be most common in deciduous woodlands (Connor, 1971; Godin, 1977). Both shrews feed on insects and other small invertebrates, and may be present on site.

Two larger insectivores, the eastern and star nosed moles, are also found on Long Island. The star nosed mole prefers wetlands and is not expected, but the eastern mole is likely to be present. The eastern mole is common in woodlands, fields and suburban lawns throughout Long Island, where they dig tunnels which are also used by mice and shrews. The species is probably most common in the rich soils of deciduous woodlands along the north shore. Its habitats also include pine barrens, dunes and salt marsh borders, but the species seems to avoid fresh water swamps

and marshes (Connor, 1971).

Several rodents would be expected on site. The white-footed mouse is found in a wide variety of habitats on Long Island, including wetlands, dry fields, woods and, occasionally, buildings (Connor, 1971). It is one of the most common mammals on Long Island, but local populations typically fluctuate greatly from year to year (Connor, 1971). The meadow mouse is very common in grasslands, including inland fields, dunes and marshes, but is not found in the dry woodlands found over most of Long Island (Connor, 1971). This species would be expected in small numbers on site, although it prefers areas with tall, thick grasses. The pine mouse is less abundant than the shrews and other mice discussed above, but it is found in fields and woods with light sandy soils away from the shore. It may be present on site, as it prefers more sparse grasslands than the meadow mouse. Mice are typically omnivorous, feeding on grasses, herbs, roots, tubers and, occasionally, small invertebrates. The house mouse and Norway rat are introduced European species which prefer to be near human structures and are considered pests. These two species are likely to be present on site and in the surrounding developed areas. Of the other large rodents, the eastern gray squirrel and chipmunk would not be expected on site due to the lack of larger trees.

The eastern cottontail is the most common rabbit on Long Island, and approximately nine rabbits were observed on site during the fall field visit. Cottontails occupy a variety of habitats, including both dry and swampy woods, fields, bogs, dunes and shrublands (Connor, 1971). They are also tolerant of humans and utilize suburban lawns and gardens extensively if food is available. The opossum is the only marsupial on Long Island, and makes use of a variety of habitats ranging from brushy woods to towns and urban areas with cover. It appears to be quite abundant, and is often killed on roadways. This species may be present in the area of the site, although suitable cover is limited. Bats typically prefer areas near water where there are abundant insects for feeding, and thus are not expected on site.

The only carnivore which might be present on site is the raccoon, although cover is limited on the property. The raccoon is relatively common throughout Long Island and is tolerant of humans. The species may become a pest, foraging in trash cans, gardens and agricultural fields. They will occasionally cause damage by denning in attics and other structures.

Table 2-4 is a list of the mammal species which are expected to occur in the study area because of existing conditions on site and in the surrounding area. This list is not meant to be all inclusive but is intended to provide a list of the most common species. Additional information regarding these species and others can be found within Appendix D-2.

TABLE 2-4

MAMMALIAN SPECIES LIST

* eastern cottontail	<i>Sylvilagus floridanus</i>
eastern mole	<i>Scalopus aquaticus</i>
house mouse	<i>Mus musculus</i>
white-footed mouse	<i>Peromyscus leucopus</i>
short-tailed shrew	<i>Blarina breuicauda</i>
masked shrew	<i>Sorex cinereus</i>
meadow vole	<i>Microtus pennsylvanicus</i>
pine vole	<i>Microtus pinetorum</i>
raccoon	<i>Procyon lotor</i>

* Species or sign observed on site by NP&V staff, Fall 1997 and 1998

Amphibians and Reptiles

No reptile or amphibian species were seen on the property, although the site may support a limited number of terrestrial species. The pond to the north would provide breeding habitat for species which require standing water for larval development, although individuals would have to cross the railroad right of way to reach the site.

Two toads are common on Long Island in the upland habitats. The spadefoot toad occurs in woods, shrublands and fields with dry, sandy loam soils, although it breeds in temporary pools (Behler and King, 1979). The Fowler's toad prefers to remain in sandy areas near marshes, irrigation ditches and temporary pools. These species are the most likely amphibians to be present on the site. Salamanders and frogs would not be expected on the property, as they typically require either moist woodland habitat or permanent pools.

Several species of reptiles might potentially be found on the property, including the eastern garter snake, eastern hognose snake, black racer and eastern milk snake (Wright, 1957). All of these species are terrestrial species found in a variety of habitats. The garter snake is relatively tolerant of human activity, but prefers moist soils and would be most likely to be present near the recharge basin to the north. The black racer and hognose snake prefer dryer soils and the milk snake is found in soils of varying moisture content. These snakes are all colubrid snakes, which feed on whole animals such as worms, insects or small amphibians (Behler and King, 1979). The larger milk snake, black racer and hognose snakes will also take small rodents and birds (Behler and King, 1979).

Table 2-5 is a list of amphibian and reptile species that might occur on site given the existing habitat. This list is not intended to be all inclusive but provides a detailed representation of what is present or is likely to be found on site.

TABLE 2-5

AMPHIBIAN AND REPTILE SPECIES LIST

Amphibians

Fowler's Toad
eastern spadefoot toad

Bufo woodhousei fowleri
Scaphiopus holbrooki

Reptiles

common garter snake
eastern hognose snake
eastern milk snake
racer

Thamnophis sirtalis
Heterodon platyrhinos [s]
Lampropeltis triangulum
Coluber constrictor

[s] NYSDEC special concern species

Of the wildlife species listed as being likely on the site, only the eastern hognose snake is identified as a special concern species. Special concern species are native species which 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 Environmental Conservation Law Section 11- 0535. This category is intended to enhance public awareness of those species which deserve additional attention. No threatened or endangered species were identified as potentially present on site.

2.4 TRANSPORTATION

A detailed Traffic Impact Study has been prepared for the proposed project by Nelson & Pope, LLP, and is contained in **Volume 2** of this document. The report outlines existing transportation systems, traffic flow conditions, and distribution of traffic, as well as the projected impact of the proposed subdivision on area roadways. This study should be consulted for details concerning the existing transportation systems, projected traffic impacts and mitigation measures. Portions of the study will be summarized here in order to provide a cohesive environmental document.

2.4.1 Transportation Systems in the Area

The subject property is located to the northeast of the intersection of Pulaski Road (CR 11) and Lake Road in Greenlawn, Town of Huntington, N.Y. The subject property has approximately 2,369 feet of frontage on Pulaski Road and approximately 881 feet of frontage on Lake Road. Pulaski Road is the primary east-west arterial in the vicinity of the project site, and the primary north-south arterial is Park Avenue (CR 35), which is approximately 2000 feet west of Lake Road. Both Pulaski Road and Park Avenue are major arterials under the jurisdiction of the Suffolk County Department of Public Works (SCDPW).

In the area of the site, Pulaski Road has one travel lane in each direction, with a one lane marginal road along the south side, which provides access to the residential developments to the south. Lake Road is a local road with one lane in each direction, and runs northeast-southwest. This roadway primarily serves the nearby residential areas to the north and south.

The Traffic Impact Study examined the following four intersections for the purpose of impact analysis, in addition to the proposed site access point.

- Pulaski Road (CR 11) at Park Avenue (CR 35)
- Pulaski Road (CR 11) at Lake Road
- Pulaski Road (CR 11) at Tulane Place
- Pulaski Road (CR 11) at Cuba Hill Road/Central Street

The intersections of Pulaski Road with Park Avenue, Lake Road and Cuba Hill Road/Central Street are signalized intersections. At each intersection, left turn lanes are provided from the eastbound and westbound lanes of Pulaski Road. Pulaski Road intersects both Cuba Hill Road (also known as Greenlawn Road) and Central Street approximately 2,500 feet to the east of the site at a 5-leg intersection controlled by a 4-phase traffic signal. Cuba Hill Road runs northwest-south east, crossing Pulaski Road, and Central Street begins at the intersection and runs northeast. The intersection of Pulaski Road at Tulane Place is an unsignalized, T-intersection. This intersection is located across from the southeastern corner of the site, and the proposed access

point will be located directly opposite Tulane Place. Under existing conditions, northbound traffic on Tulane Place is controlled with a stop sign. The geometric configuration and traffic control for each intersection are summarized more fully in the appended traffic report.

2.4.2 Traffic Volumes

In order to characterize the existing traffic conditions in the area of the site, traffic volumes on Pulaski Road (CR 11) were determined from field surveys. Traffic volume turning movement counts were collected during the weekday AM (7-9 A.) and PM (4-6 P.) commuter peak periods on November 18, 1997, and these traffic volumes were utilized to prepare a capacity analysis to determine operational levels for each intersection. The analyses were performed in accordance with guidelines set forth in the *Highway Capacity Manual, Special Report 209 (Transportation Research Board, 1994)*. Detailed results are presented in the appended report, and **Table 2-6** summarizes the results for each intersection.

The capacity of a signalized intersection is evaluated in terms of the ratio of demand flow rate to capacity (V/C ratio). The capacity is defined for each approach and measures the maximum rate of traffic flow through the intersection under prevailing traffic, roadway and signalization conditions. The level of service (LOS) of a signalized intersection is evaluated on the basis of average stopped delay measured in the units seconds per vehicle (sec/veh). Delay is a measure of driver discomfort, frustration, fuel consumption and lost travel time. For unsignalized intersections, the LOS is evaluated based on the availability of gaps in the traffic stream. For both types of intersections, the LOS ranges from A at an intersection with relatively little delay to F at an intersection with relatively long delays. The traffic study further defines LOS for both signalized and unsignalized intersections.

The intersection of Pulaski Road at Cuba Hill Road and Central Street is a complex 5-leg intersection. The HCS computer model does not have a specific methodology for calculation of the LOS at a 5-leg intersection. Therefore, separate analyses were performed for Pulaski Road at Cuba Hill Road and Pulaski Road at Central Street. These analyses were then combined and the *Highway Capacity Manual (Transportation Research Board, 1994)* methodology was utilized to calculate an overall intersection LOS.

Under existing conditions, the intersection of Pulaski Road at Park Avenue experiences operational difficulties during the peak hours surveyed (**Table 2-6**). The intersection of Pulaski Road at Lake Road operates at LOS B during both the A. and PM peak periods. The intersection of Pulaski Road at Greenlawn Road/Cuba Hill Road/Central Street operates at LOS E during the AM peak hour, and LOS C during the PM peak hour. Vehicles exiting Tulane Place onto Pulaski Road experience LOS of B during the AM peak hour and LOS C during the PM peak hour.

TABLE 2-6
EXISTING LEVELS OF SERVICE

Signalized Intersections

Intersection with Pulaski Road (CR 11)	AM			PM		
	LOS	Delay (sec/veh)	V/C Ratio	LOS	Delay (sec/veh)	V/C Ratio
Park Avenue (CR 35)	*	*	1.650	*	*	1.405
Lake Road	B	8.9	0.680	B	7.0	0.560
Cuba Hill Road/ Central Street	E	43.9	0.980	C	20.8	0.722

* Intersection Delay and LOS not meaningful when any V/C is greater than 1.2 or 1/PHF.

Unsignalized Intersection

Intersection with Pulaski Road (CR 11)	Lane Movement	AM			PM		
		LOS	Approach Delay (sec/veh)	Inters. Delay (sec/veh)	LOS	Approach Delay (sec/veh)	Inters. Delay (sec/veh)
Tulane Place	NB-LR	B	6.9		C	12.0	
	WB-L	A	3.3	0.1	B	6.0	0.2

2.4.3 Accident History

Accident summaries for the vicinity of the site were obtained from the SCDPW Traffic Accident Recording System, and the data is contained in the appended report. Based on the information obtained from the SCDPW, there are no indications that there are significantly high occurrences of traffic accidents in the vicinity of the proposed access to the subject property.

2.5 LAND USE AND ZONING

2.5.1 Land Use in the Vicinity

The subject property is located to the northeast of the Pulaski Road (CR 11)/Lake Road intersection and has frontage on both roadways. The site lies on the north side of Pulaski Road, with 1,938.73 feet (0.37 miles) of frontage on this roadway. In addition, the site has 932.79 feet of frontage on the east side of Lake Road. The project site is undeveloped and does not have any standing structures. The vegetation consists primarily of grasses, forbs and brush.

The land use pattern in the vicinity of the site is a mix of residential, commercial and industrial sites (**Figure 2-4**). The track bed of the LIRR Port Jefferson line bounds the northern perimeter, alongside which are LIPA transmission lines. Directly abutting the north side of the railroad tracks and transmission lines, opposite the project site, is a large open space under municipal ownership. This open space ranges in width from one hundred (100) feet to four hundred (400) feet west to east. This open space buffers the railroad line and the project site from adjacent residential uses to the north. The primary residential use north of the project site is the Lake Ridge Townhouse, a clustered residential development consisting of nine (9) duplexes totaling eighteen (18) housing units and three single-family houses. Further to the east, along the northern boundary of the project site, the corresponding residential development consists of low-density single-family residences.

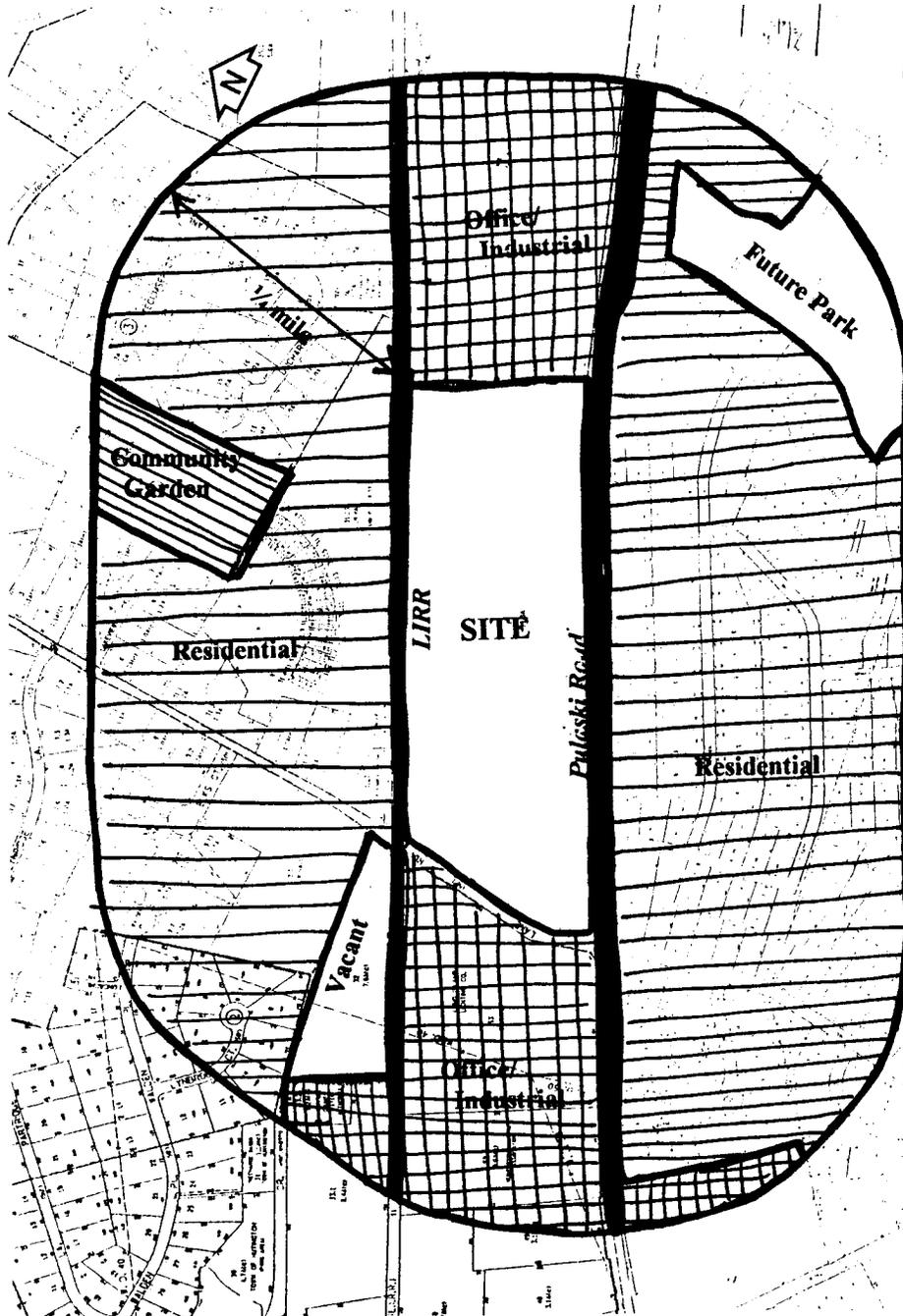
The land use pattern to the west of the project site, west of Lake Road, is dominated by the location of a LIPA transformer substation and service/dispatch facility with accessory outdoor truck storage. The operation of this utility facility on the adjoining property creates a commercial environment in the associated land use pattern. It is also significant to note from a land use perspective, the current residential development now underway north of the LIPA facility and the railroad line, on the west side of Lake Road. This project, directly to the northwest of the subject site, is known as the Estates at Trafalgar Court. This low to moderate density residential development will provide ten (10) single-family houses on 20,000 SF lots.

The land use pattern south of the project site, south of Pulaski Road is characterized by extensive, well-established low-density single family housing. The homes that comprise the residential neighborhoods to the south are developed for the most part on 20,000 SF lots in varying designs and styles.

Directly abutting the project site to the east, the land use is defined by the location of the GEC-Marconi Hazeltine industrial/office facility. A significant portion of this adjoining commercial use abutting the project site is maintained in its natural state, buffering it from the operations of the GEC-Marconi Hazeltine facility. This buffer measures approximately three hundred feet in width (300), and is situated between the project site and the industrial facility's parking lot. Further to the east of the GEC-Marconi Hazeltine facility,

FIGURE 2-4

LAND USE IN THE VICINITY



Source: Tax Map
Scale: Not to Scale

the land use pattern shifts to retail business at the Pulaski Road/Broadway intersection, along with a mix of medium and high-density residential housing.

2.5.2 Zoning in the Vicinity

The subject site is currently zoned "R-40 Residence District" as depicted on the *Town of Huntington Zoning Map*. The majority of the zoning in the project vicinity to the north also falls within the R-40 Residence District classification, with one significant exception. The Trafalger Estates development referred to earlier, situated to the northwest of the development site, is zoned "R-20". This designation resulted from a zone change on that property approved by the Town of Huntington in 1994. The zoning pattern to the west of the project site is varied. The zoning on the existing LIPA substation and service facility property is mixed. The area of the parcel fronting along Lake Road is zoned R-7 Residence District, the principle use for this classification is medium density single family use on lots with a minimum area of 7,500 SF. The section of the LIPA property fronting along Pulaski Road is designated as R-20 Residence District zoning for single family residential development. The remaining majority portion of the LIPA site is zoned I-5 (General Industry). The zoning further to the west of the LIPA site, north of Pulaski Road and extending to Park Avenue falls primarily within the I-2 (Light Industry) zoning classification.

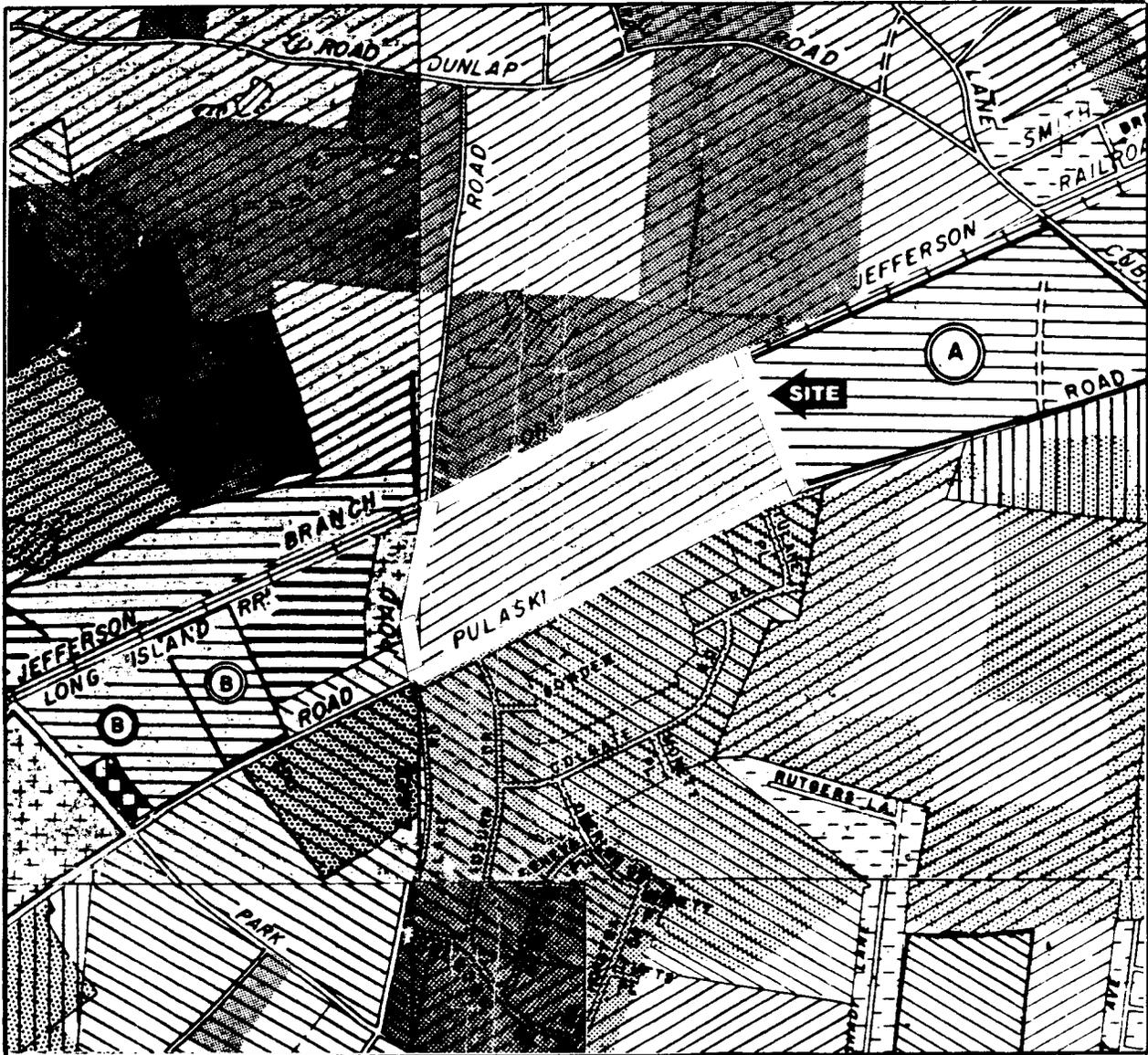
The zoning in the project vicinity south of Pulaski Road, extending southward approximately 2,000 feet (0.38 miles) falls within the R-20 Residence District for single family housing. This zoning pattern extends south of the project site, from Tulane Place westward to Park Avenue and beyond. To the south of Pulaski Road, and east of Tulane Place, the predominant zoning category is R-40.

The zoning directly to the eastern perimeter of the project site, occupied by the GEC-Marconi Hazeltine facility, is designated I-1 (Light Industry). The I-1 classification generally extends eastward for approximately 3,000 feet (0.57 miles) to the rear of the properties fronting on Broadway, a major north/south arterial roadway. Within this industrial zoning pattern there are two relatively small areas that have an I-5 (General Industry) and an I-2 (Light Industry) designation. The properties fronting on Broadway are zoned C-6 (General Business). The zoning of the site and area is illustrated in **Figure 2-5**.

The primary difference between the two dominant residential zones in the project vicinity, R-40 (Residence) and R-20 (Residence) is the minimum lot area per dwelling unit requirement. The R-40 District minimum lot area requirement is one (1) acre (43,560SF) as opposed to 20,000 SF in the R-20 District. Buildings in both residence districts are limited to a maximum height of 35 feet or 2.5 stories, minimum front yard setbacks of 50 feet; and minimum rear yard setbacks of 50 feet.

FIGURE 2-5

SITE AND AREA ZONING



Legend:

	R-40 Residence		I-1 Light Industry		I-6 General Industry
	R-20 Residence		I-2 Light Industry		C-6 General Business
	R-7 Residence		I-3 Light Industry		

Source: Town of Huntington Zoning Map
Scale: 1"=1000'



2.5.3 Land Use Plans

A number of local and regional studies and reports are available which address planning, zoning and environmental concerns associated with the project area. A brief discussion of each of these land use plans and relevancy towards the project site is provided in order to determine the project's compliance with these land use plans.

Town of Huntington Comprehensive Plan – 1993

The Town of Huntington adopted an update to the 1965-66 Town of Huntington Comprehensive Plan on April 21, 1993. The 1965 Plan was formulated in response to the growth that took place in the two decades following the Second World War. The 1993 Plan Update was prepared by the consultant firm of Abeles, Phillips, Preiss & Shapiro, New York, N.Y., in association with Cashin Associates, Plainview, N.Y. The Plan was prepared for the Town of Huntington Planning Board in cooperation with a Citizens Advisory Committee and the Town of Huntington Planning Department. The 1993 Update revised the former Plan to reflect the issues the Town must confront associated with further growth and development based on the limited supply of vacant land and related development constraints, transportation and environmental conditions. The Plan Update takes into consideration shifts in the Town's demographics, particularly the increases in single parent households, senior citizens and young singles. The document includes sections analyzing and offering recommendations related to the Town's Housing, Economic Development, Community Facilities, and Parks, Open Space, Historic & Cultural Resources. With respect to housing, the Plan Update establishes several goals relevant to the proposed single-family development. These goals are stated as follows:

- Minimize disruptions or alterations to established neighborhoods and development densities. This will help preserve property values in areas accommodating additional development.
- Limit increases in residential densities to projects that will provide a clear public benefit.
- Design new residential developments, which respect all environmental limitations.

The 1993 Comprehensive Plan Update designates the project area for low-density residential development. Generally, the residential land use designations within the project vicinity falls within the low-density classification. This land use density zoning designation has been implemented in the past in the Town of Huntington via three zone districts; R-80, R-40, and R-20.

In the "Parks, Open Space and Historic Resources Section" of the 1993 Plan Update, the document refers to a prior comprehensive Parks and Recreation Study completed by Vollmer Associates for the Huntington Town Board in 1988. Based on updates to the "Vollmer Study", 1993 Plan Update reports that the Town has one-hundred and five (105) parks that provide

almost 2,000 acres of recreational space, with the majority (58%) comprised of less than ten (10) acres, one-quarter to one-third (27%) between ten (10) and thirty (30) acres, and the remaining fifteen (15) percent over thirty (30) acres. The smaller parks (under ten acres) are generally designed to serve “the immediate community,” while the larger parks feature specialized facilities intended to meet the needs of the entire Town. The Town’s parks are augmented by approximately 650 acres of land owned by the eight independent school districts in Huntington. In addition to providing open space, the schools provide a variety of active recreational facilities to which the public has controlled access.

The 1993 Plan Update reports that the Town’s 2,000 acres of local parkland exceeds the 1,600 acre goal set for 1980 in the Town of Huntington’s 1965 Comprehensive Plan. These 2,000 acres meet the formerly accepted National Recreation Association’s (NRA) standard of ten (10) acres of local parkland per 1,000 residents. Also more than 3,300 acres of County, State and Federal parks within the Town generally meet the NRA standard for non-local parkland of fifteen (15) acres per 1,000 residents. Huntington’s local, County, State and Federal parks provide twenty-seven (27) acres of parkland per 1,000 residents, which is within the NRA’s combined standard of twenty-five (25) acres per 1,000 residents.

The 1993 Comprehensive Plan concluded, “the Town’s stock of active use parkland meets widely recognized and previously accepted standards”, however, the Plan recognizes that there is a shortage of neighborhood parks in higher density residential areas in Town. The Comprehensive Plan identifies Greenlawn, along with the nearby communities of East Northport, Huntington Station and South Huntington as areas with a shortage of neighborhood parks. **Table 2-7** presents the parkland and population for Greenlawn and its neighboring communities and the recreational acreage per 1,000 residents.

TABLE-2-7

PARKLAND BY COMMUNITY
 TOWN OF HUNTINGTON

Community(CDP)	1996 Population	Town Park Land Acreage	Town Park Acreage per 1,000 Residents
Centerport	5,308	60	11.3
East Northport	20,407	30	1.47
Elwood	10,768	65	6.04
Greenlawn	13,118	53	4.04
Huntington	18,243	172	9.43
Huntington Station	28,454	31	1.09
Town of Huntington	189,825	1,854	9.77

The Comprehensive Plan recommends that every effort should be made to increase the stock of active recreational space in these underserved communities, in accordance with an approved recreation plan, either through public acquisitions or through dedications in approving subdivision applications.

The project site is specifically discussed in the “Parks, Open Space and Historic Resources” section of the 1993 Update. The document references the “Vollmer Study” suggestion that the project site be acquired for public open space and/or active recreation. With respect to this suggestion, the 1993 Plan Update notes that “such a land use change would necessitate review and possibly require mitigation to preclude conflicts between active recreational use and protection of groundwater resources, community character, or other social, economic or environmental concerns”. The Plan further states with respect to this issue that, “Alternatively, lesser amounts of centrally located open space may be acquired to help address any shortages in locally available parkland. Such lands could be developed either for active or passive needs, as appropriate”.

208 Areawide Waste Treatment Management Study - 1978

The 208 Waste Treatment Management Study (208 Study) addresses some aspects of land use planning and environmental protection for the area of the project site. The purpose of the 208 Study was to investigate waste disposal options and best practice for ground and surface water protection. The 208 Study classified Hydrogeologic Zones by groundwater flow patterns and quality, for the purpose of regional water supply management. The subject site is located in Groundwater Management Zone I for the purposes of hydrogeologic characteristics and plan recommendations. Zone I exhibits the following characteristics (Koppleman, 1978):

- This zone is characterized by a deep flow system, which generally contributes water to the middle and lower portions of the Magothy aquifer.
- The system is characterized by deep recharge with vertical flow.
- This zone is the primary source of drinking water in both Nassau and Suffolk Counties.

The structural recommendations of the 208 Study for Zone I, are listed below:

- In developed areas presently not sewered or scheduled for sewerage, plans for collection and treatment where the current density is nine (9) or more persons (three dwelling units) per gross acre should be initiated.
- At densities less than nine (9) persons (three dwelling units) per gross acre, institute a monitoring program to determine the quality of the water table aquifer and the efficacy of the non-point source controls. Where area average nitrate-nitrogen levels are six milligrams per liter or greater or other contaminants are in excess of groundwater standards, and where the pollution may reasonably be expected to result from on-lot systems, provide collection and treatment.
- As currently vacant land is developed, provide collection and treatment at a density of approximately six (6) persons or two (2) units per gross acre.
- The 208 Study has not identified a need, within the twenty-year planning period, for groundwater recharge in this area for the purpose of preserving drinking water supply. However, the importance of maintaining the flow and water quality of streams may require action to mitigate the impact of reduced groundwater levels attributable to sewerage with marine discharge.
- In areas that are completely sewered, regulations mandating the hook-up of private disposal systems to district collection systems should be strictly enforced.

The non-structural recommendations pertinent to this type of land use are as follows:

- Minimize population density by encouraging large lot development (one dwelling unit/one or more acres), where possible, to protect the groundwater from future pollutant loadings.
- Control stormwater runoff to minimize the transport of sediments, nutrients, metals, organic chemicals and bacteria to surface and groundwaters.
- Provide for routine maintenance of on-site disposal systems.
- Reduce the use of fertilizers on turf. Promote the use of low-maintenance lawns.

- Prohibit the use of certain chemical cleaners in on-lot systems.

The above discussions provides an outline of the 208 Study conclusions and recommendations for land use within Zone I. These recommendations are essentially incorporated into the steps for approval of realty subdivisions, individual on-site sewage disposal systems, and lateral sewer extensions as administered by the SCDHS. Groundwater resources and the impact upon groundwater resources resulting from the proposed project, are discussed in the appropriate sections on Water Resources.

Town Open Space Index – 1974

The Huntington Conservation Advisory Council prepared an inventory and evaluation of undeveloped properties in the Town. The document contained policies and recommendations for open space preservation as it relates to the specific parcels included in the index. The Town of Huntington Town Board approved the Open Space Index in December, 1974.

The Open Space Index placed the subject property within the Northwest Quadrant of the Town and designated it as parcel NW-32. The Index ranked the undeveloped parcels from Priority 1 to Priority 6, with Priority 1 having the highest open space value and need for preservation. The project site was defined as “farmland” and received a Priority 6 ranking in terms of its value. The Priority 6 classification represents properties that are worthy of review with respect to preservation, but must be evaluated on a case by case basis.

2.6 COMMUNITY SERVICES

2.6.1 Tax Structure

The subject site consists of Suffolk County Tax Map parcel, 0400-105.00-02.00-29, and the total project site area equals 39.3 acres. To obtain the amount of revenue currently generated by the site, the 1996-97 tax bill for the parcel was reviewed. The current assessed value of the site totals \$12,000.

Table 2-8 provides a summary of the tax districts, tax rate and assessed valuation for the subject tax parcel. During the 1996-97 tax year the project generated a total of \$18,350.76 to the local taxing jurisdictions. The future taxes generated by the proposed project will be discussed in more detail in **Section 3.0** of this DEIS.

**TABLE 2-8
EXISTING SITE 1996-97 TAX GENERATION**

District	Rate/\$100	Assessed Valuation	Taxes Paid
Harborfields School/Library	98.826	\$ 12,000	\$ 11,859.12
Suffolk County (a)	25.812	\$ 12,000	\$ 3,097.44
Town of Huntington (b)	18.478	\$ 12,000	\$ 2,217.36
Greenlawn Fire District	7.433	\$ 12,000	\$ 891.96
Greenlawn Water District	2.374	\$ 12,000	\$ 284.88
Totals	152.92	\$12,000	\$ 18,350.76

Source: Town of Huntington Tax Bills

Note: (a) County District includes General and Police

(b) Town District includes Town, Highway and Lighting District

2.6.2 Education

The proposed project lies within the Harborfields Central School District. **Table 2-9** presents various educational indicators associated with the operation of the Harborfields Central School District. The administrative offices for the Harborfields Central School District are located on 2 Oldfield Road, New York 11740. The district has two (2) elementary schools, one (1) middle school, and one (1) high school. Correspondence with the District (see **Appendix A-8**) indicates a *current "... serious shortage of classroom space anticipated at the middle school [the Oldfield Middle School] within three years and at the high school [Harborfields High School] within five or six years. We are currently at maximum utilization in our K through 4 buildings [Taylor Avenue Early Childhood Center and Thomas J. Lahey Elementary School], and any significant*

increase in the population in those grade levels could exacerbate the space problems we are currently having as well.” The correspondence also states: “In addition to classroom space, we expect to have to hire additional staff (both professional and non-professional) and provide additional services (such as transportation and health services).”

TABLE 2-9

HARBORFIELDS CENTRAL SCHOOL DISTRICT - SUMMARY DATA

1994-1995 Fiscal Data	Dollars
Per pupil Expenditures	\$11,426
Per pupil Full Valuation	\$466,263

1995-1996 Demographics	Number/Ratio
Pupils	2,699
Teachers	169
Pupils per Teacher	16.0

Source: Long Island Almanac, 1997

In addition to local property taxes, the Harborfields Central School District receives significant financial aid to provide education services to the community. **Table 2-10** shows the total State aid the District received in the past two years. Trends in State financial support indicate that the State of New York will provide about twenty (20) percent of the per capita cost of education for the Harborfields Central School District.

TABLE 2-10

**NY STATE FINANCIAL AID
1996-1997**

Year	Total State Funds	Funds per Pupil
1996/97	\$6,026,336	\$2,233
1997/98	\$6,150,162	\$2,165

Source: NYS Education Department

Beyond the public school system, there are six colleges and universities that lie within close proximity to the project site. The six colleges and universities and their enrollment are shown in **Table 2-11**.

TABLE 2-11

COLLEGES AND UNIVERSITIES

Institution	Location	'94 Undergrad Enrollment	'94 Graduate Enrollment
SUNY @ Stony Brook	Stony Brook	11,095	5,552
SC Community College	Selden (a)	21,963	-
Polytech. University	Farmingdale	445	355
SUNY/Empire State	Old Westbury	645	-
NY Ins. of Technology	Westbury (b)	6,737	3,130
SUNY @ Farmingdale	Farmingdale	7,730	-

Source: Long Island Almanac, 1997

Notes: (a) Local campus is located in Brentwood.
(b) Local campus is located in Central Islip.

2.6.3 Police and Fire Protection

The project site lies within the protection area of the Suffolk County Police Department Second Precinct, with its headquarters located on Park Avenue in Huntington. Fire protection is provided by the Greenlawn Fire Department. The headquarters of the Greenlawn Fire District are located at 23 Boulevard, Greenlawn, New York. The headquarters is the nearest fire station to the project site, and is located less than 1 mile to the east of the proposed development. A second facility is located at Little Plains Road, approximately 3 miles away. Each of these facilities is equipped with an ambulance and heavy rescue truck, which are anticipated to provide adequate services.

Fire protection for the district is provided through the efforts of 125 volunteer fire fighters from within the community, of which approximately 60 are on the Rescue Squad. Enrollment is currently sufficient to man equipment and provide protection; however, if assistance is needed, aid from surrounding districts is available. Funding for fire protection is received through taxes placed on lands within the fire districts.

2.6.4 Health Care Facilities and Social Services

There are four major hospitals and health care facilities located within an eight (8) mile radius of the project site. Huntington Hospital is located closest to the project site, approximately 2.5 miles to the northwest. This facility provides 398 beds and has a present occupancy rate of fifty-five (55) percent. The next closest hospital is about four (4) miles east of the subject proposal, the Veteran's Administrative Medical Center in Northport. This hospital provides 474 beds and has an occupancy rate of seventy-five (75) percent. The third closest hospital to the project site is the

Sagamore Children's Psychiatric Center located approximately five (5) miles to the south in Melville. This facility provides sixty-nine (69) beds and has an occupancy rate of ninety-five (95) percent. The remaining hospital within eight (8) miles of the subject site is the North Shore University Hospital at Syosset located to the west. This hospital provides 204 beds and has an occupancy of fifty-two (52) percent (**Long Island Almanac, 1997**).

The SCDHS, with its main offices in Hauppauge, maintains extensive health care programs and informational services; including poison control, family planning and clinics for patient care services. Numerous other private and government health related facilities exist locally and within the region, including State facilities, nursing homes, ambulance services, and various medical practices of different disciplines.

2.6.5 Solid Waste Disposal

The Town of Huntington collects solid waste and transports it to the Huntington Resource Recovery Plant. The Town operates the plant under a cooperative agreement with the Town of Smithtown. The project site lies within established carting routes within the Town disposal system. Since the project site is currently undeveloped, it does not generate any solid waste. However, as a result of its current status, the property has been subject to the illegal dumping of debris.

2.6.6 Utilities

The proposed project is located within the service area of the Greenlawn Water District for supply of drinking water. The District maintains a water supply distribution system in the Greenlawn area. There is a 12-inch water main along the north side of Pulaski Road Highway, and a smaller 8-inch main located on the east side of Lake Road. Water supply is available to the subject site via this distribution system. **Appendix A-9** contains correspondence with the District which includes confirmation of Water Availability. Additional information on the water supply aspects of the project is provided in the Water Resources section of this report.

Electrical services in the area are provided by LIPA from its power generating station in Northport. Gas service in the area is also provided by LIPA. According to Mr. Charles Bishop of LIPA Gas Sales and Marketing, there is an inch cast iron gas line located along Pulaski Road that would provide service to the subject site.

The presence of LIPA electrical transmission lines (on towers) along the LIRR tracks on the site's northern boundary, as well as the LIPA transformer substation to the west (across Lake Road) and the GEC-Marconi/Hazeltine facility (to the east) may be a source of concern to the public, due to concerns over health effects of non-ionizing radiation. An Internet literature search (see **Appendix E**) did not indicate the existence of a definitive correlation between such

electromagnetic fields and health impacts. Research suggests that EMF's are no more dangerous than household AXC electrical current. In addition, existing power lines conform to recommendations to elevate transmission lines to increase setbacks and minimize potential exposure.

2.7 DEMOGRAPHY

The proposed project is located in the census-designated place (CDP) of Greenlawn. The Greenlawn census designated place is 3.7 square miles in area. This CDP is bounded on the north by Centerport, on the west by Huntington and Huntington Station, on the east by East Northport and on the south by Elwood.

The estimated population within the Greenlawn CDP as recorded in 1990 was 13,208 persons. The census population of Greenlawn in 1980 was recorded as 13,869 persons, representing about a five (%) percent decrease over a ten-(10) year period. **Table 2-12** compares the population density of Greenlawn with the five (5) CDPs located in the Town of Huntington that border the subject CDP. According to population data provided by LILCO for 1996, the hamlet of Greenlawn had an estimated population of 13,118. Based on its total of 3.7 square miles, the subject hamlet has a density of 3,545 persons per square mile. This existing residential density supports the need for controlled and orderly growth to occur within Greenlawn, with particular consideration given to providing infrastructure and compatible uses, which will enhance the community. The purpose of this Draft EIS is to analyze the proposed project as regards to these and other environmental parameters.

**TABLE 2-12
POPULATION DENSITIES FOR UNINCORPORATED
HAMLETS IN THE TOWN OF HUNTINGTON**

Hamlets	Density (persons/sq. mile)
Centerport	2,528
East Northport	4,001
Elwood	2,243
<i>Greenlawn</i>	<i>3,545</i>
Huntington	2,432
Huntington Station	5,269

Source: Long Island Almanac 1997

Table 2-13, provides additional insight into population characteristics of Greenlawn. This table compares median family income in Greenlawn to the five (5) neighboring hamlets. The Greenlawn community is recorded as having a median family income of \$75,353 annually in 1996, which is approximately twelve (12) percent below the Huntington townwide median family income of \$84,111. (Long Island Almanac, 1997).

TABLE 2-13

**MEDIAN INCOME FOR UNINCORPORATED
HAMLETS IN THE TOWN OF HUNTINGTON**

Hamlets	Annual Median Income
Centerport	\$ 82,763
East Northport	\$ 72,493
Elwood	\$ 85,715
<i>Greenlawn</i>	\$ 75,353
Huntington	\$ 90,929
Huntington Station	\$ 64,130

Source: Long Island Almanac 1997

2.8 CULTURAL RESOURCES

Cultural resources generally include the history and pre-history of a site, as well as characterization of noise and visual resources in an area. This section contains an outline of the history of these resources in the area of the site.

2.8.1 Visual Resources

The visual character of the project area may generally be described as a mixed-use suburban area that has reached a mature state of development. The commercial nature of the project vicinity results from the location of a major LIPA facility directly to the west of the project site, and the location of a large industrial/office facility occupied by GEC Marconi Hazeltine directly to the east. The residential visual character of the project vicinity is supported by the single-family neighborhoods established opposite the subject site, south of Pulaski Road, and the residential duplexes and detached single family residences across the LIRR tracks north of the site.

The majority of the individuals viewing the site are motorists traveling on Pulaski Road and residents living in homes on the south side of this roadway. In addition, motorists traveling on Lake Road and employees and visitors to the LIPA facility share similar views. The site appears

as a large open space with old field characteristics and associated vegetation from both Pulaski and Lake Road vantagepoints. However, the overgrown nature of the various grasses and site vegetation on the subject site limits the view of the interior of the property. From these locations the visual amenities in terms of natural vegetation and topographic variety afforded individuals viewing the site are limited.

Individuals viewing the site from both the north and west are limited due to land use and topographic considerations. There is a fairly steep ridge between the residential properties north of the project site and the LIRR tracks. The ridge tends to buffer the residential development north of the site and severely limits the view of the subject property. However, travelers riding the LIRR have a clear view of the subject site from the train. The visual character is similar to that experienced from the south side of the property. The view is of a large open field with little in terms of vegetative or topographic variation.

In relation to the previously discussed vantagepoints, the views of the subject site are limited most in terms of access from the GEC Marconi Hazeltine facility that borders the property to the east. The company maintains approximately a three hundred (300) foot wide buffer on its property between the facility's parking lot and the adjoining project site. As a result, the most likely viewers of the project site from the east are individuals utilizing the Hazeltine parking lot. Although the associated three hundred-foot buffer is only sparsely landscaped, the view from the parking lot is limited. The site appears as stated before, an old field open space with little variety in terms of vegetation and topographic features.

2.8.2 Noise

General Discussion of Noise Characteristics

Noise is defined as a sound that is generally unwanted by a receptor. Noise levels are typically measured in decibels. In order to quantify the impact of sound upon the human population, the decibel level is weighted as a function of frequency response. The A-weighted sound pressure level, referred to as dBA, is the most common weighting factor used in assessing ambient noise.

The decibel scale is logarithmic so that sound levels vary with the source and with the listener's distance from the source. Sound level decreases as a result of "spreading out", as predicted by the "inverse square law", which predicts a reduction of 6 dBA for each doubling of distance. This effect is due to natural dispersion only and is not a function of the presence of barriers or other objects (U.S. Department of Transportation, 1973). Vegetation provides a small but useful amount of attenuation. Dense wooded areas where no visual penetration exists are predicted to have an attenuation rate of 5 dBA for a 100-foot depth of woods. An additional 100-foot depth of woods will result in an additional attenuation of 5 dBA, up to a maximum of 10 dBA (U.S. Department of Transportation, 1973.) With regard to low density growth, the Department of

Transportation report (1973) indicates the following, "For low density growth, a token amount of attenuation, such as 2 or 3 dBA per 100 feet depth, might be permissible, but this is left to the judgment of the user". Depending upon the continuity, buildings and structures may provide equal or greater attenuation as compared to natural growth.

Certain noise environments are characterized in terms of ambient and peak noise levels. The level of noise is constantly changing as a result of natural influences (wind in trees, wildlife, flowing water, etc.), as well as human factors (aircraft, traffic, machinery, voices, etc). Several sources were consulted in order to document expected ambient noise levels in the area of the site. References indicate that a commercial area with heavy traffic at a distance of 300 feet is reported to have an outdoor noise level of 60 dBA, and a quiet urban area is reported to have an outdoor noise level of 50 dBA (U.S. Department of Transportation, 1973). Rau and Wooten (1980), report noise levels in an urban residential area to be between 48 and 59 dBA, and noise levels on a suburban, residential main street to be in the range of 40 to 55 dBA. A jet take-off at 100 feet is the loudest noise reported by Rau and Wooten (1980), although they note that aircraft noise is intermittent rather than continuous. Table 2-14 provides an illustration of typical noise levels of familiar activities with emphasis on commercial and urban based activities.

Noise Generation at the Project Site

Existing ambient noise sources at the subject site consist of for the most part, vehicular traffic utilizing Pulaski Road, and to a lesser extent Lake Road. Human activity associated with the residential development to the north and south of the project site, and activity associated with nearby commercial site uses may be expected to result in some level ambient noise. Further, the LIRR trains utilizing the tracks north of the site must be considered an ambient noise source.

The operation of diesel trucks and heavy equipment at the LIPA facility would tend to generate noise near the subject site in the range of 70 to 90 dBA, and traffic along Pulaski and Lake Roads would be expected to range between 40 and 70 dBA. These noises will have potentially higher peaks depending upon receptor location, and quiet periods during night and periods of inactivity. Other factors that affect the noise level are distance from the source, elevation of the receptor with respect to the source, and condition of the road surface. Noise in a commercial area with light to moderate traffic would be expected to range between 40 and 70 dBA.

The Environmental Protection Agency generally recommends a maximum indoor noise level of no more than 45 Ldn for residential uses, which translates to an outdoor noise level of approximately 60 Ldn (Rau and Wooten, 1980).

TABLE 2-14

COMMON INDOOR & OUTDOOR NOISE LEVELS

Common Outdoor Noises	dBA	Common Indoor Noises
Jet airplane takeoff at 100 feet	120	
Jet airplane takeoff at 400 feet	110	Rock band at 5 meters
Jackhammer, Jet airplane at ½ mile, Gas lawnmower at 1 meter	100	Inside New York City subway train
Diesel truck at 15 meters	90	Food blender at 1 meter, Garbage disposal at 1 meter
Freeway traffic, Noisy urban - daytime, Diesel truck at 15 meters	80	
Gas lawnmower at 30 meters	70	Shouting at 1 meter, Vacuum cleaner at 3 meters,
Commercial Area	60	Normal speech at 1 meter
Quiet urban area - daytime	50	Large business office, Dishwasher next room
Quiet urban area - nighttime	40	Small theater
Quiet suburban - nighttime	30	Large conference room (background), Library
Quiet rural – nighttime	20	Bedroom at night, Large concert hall (background)
	10	Broadcast and recording studio
	0	Threshold of hearing

The existing noise environment in the vicinity of the project site is influenced by passing vehicular traffic on both of these roadways, and from accelerating/decelerating vehicles at the intersection of the two roadways. In addition to the roadways, the LIRR tracks are located immediately north of the subject property. Thus, sounds associated with passing trains contribute another element to the factors which determine the existing noise environment. The noise levels will be variable at the project site and reflective of the traffic volumes, passing trains, and aircraft and other typical neighborhood sounds including barking dogs, motorized yard maintenance equipment etc.

Noise Measurements on the Project Site

To assess the noise impact on future homeowners at this location, the ambient noise environment was characterized. Actual measurements were collected at the site during a time period when residents of the future subdivision may be pursuing outside activities around their homes and may be most exposed to the noise generated by the surrounding uses. Measurements were collected at

two locations on the subject property on a Sunday afternoon beginning around 4:00 PM. This period was selected to reflect a typical afternoon when residents are most likely to be out of doors. In addition, this period was chosen because two trains were scheduled to pass, enabling the field staff to record maximum noise readings for these events. The day that the readings were taken was very cold and clear and there was no discernable wind action. Noise level measurements were collected using a SPER Scientific Model 8400029 Digital Sound Level Meter. The meter was calibrated both before and after every period of readings. Fifty noise readings were taken at 10-second intervals at each sampling station. Subsequent to the fieldwork, the data was entered into a Microsoft Excel spreadsheet and the L_{eq} calculated. (Because noise fluctuates, it is common to average noise levels over a period of time to describe the “equivalent continuous noise level” or L_{eq}). The common noise level associated with a suburban residential area adjacent to medium density transportation sources is 50 dBA. (NYSDOT, 1980 and White, 1975)

Station 1 is located in the northwest corner of the property approximately 100 feet of the LIRR tracks and approximately 50 feet east of Lake Avenue. The vegetation on the property is typical of a recently abandoned field; low vigor shrubs and grasses interspersed with large pioneer species such as red cedar. While forested areas have attenuating characteristics, an area of low growth will not provide any such benefit in reducing noise.

Typical values measured at Station 1 for a low volume period of traffic were approximately 50 dBA and it was observed that a car passing on Lake Avenue resulted in readings of approximately 58 dBA. In addition, the high reading for aircraft flying directly overhead was 63 dBA.

Station 2 is located approximately 500 feet east of Station 1 and is likewise approximately 100 feet south of the LIRR railroad tracks. The ambient levels for low volume of traffic were in the range of 48 dBA. It was noticed that there was no measurable difference in the sound level when a vehicle passed on Lake Avenue from Station 2. An aircraft flew overhead at this station during the measurement period and thus is incorporated into the L_{eq} ; the highest reading for a plane flying overhead was 59 dBA. The L_{eq} , high and low dBA readings for both stations are provided below. Full data and graphic plots are included in **Appendix F** of this document.

Station	Low	High	L_{eq}
1	45.9	59.7	53.0
2	47.7	63.4	52.2

These results are slightly higher than the common levels associated with this type of development which is to be expected, as noise levels measured incorporated various events, including aircraft, and train noise.

Train-Related Noise

The primary consideration related to noise impacts concerning the proposed subdivision is the location of the LIRR tracks. The current Port Jefferson train schedule indicates that the passage of commuter trains at the site occurs frequently. The site is located between Huntington and Greenlawn stations. The current weekday schedule indicates that there are a total of 20 eastbound trains that depart from Huntington, and 17 westbound trains leaving the Greenlawn station. The weekend schedules are reduced by approximately 75%. In addition, the LIRR tracks are leased by New York Atlantic Railways (NYAR) for freight trains. A spokesperson for NYAR commented that there is one round trip made on the Port Jefferson line, five days a week. This trip is generally made between 10 p.m. and midnight.

The LIRR Public Affairs Bureau was contacted regarding their policy on whistle blowing which is the single loudest noise source related to trains. Some municipalities in the US have adopted local ordinances which prohibit the use of the train whistles during evening and nighttime hours. However, these ordinances are only permissible for intrastate train routes. Since the LIRR is an interstate organization, they are regulated by the Federal Railroad Administration and must operate according to the Federal regulations. The FRA requires that whistles be blown before every road crossing and blind corner, in addition to any other area where the engineer believes that people may be congregating. The engineer is required to set the loudness and duration of the whistle in accordance with the distance that the sound must travel and the circumstances surrounding the particular area.

In addition to whistle blowing, engine noise and track noise generate the majority of noise of a passing train. The train tracks adjacent to the project site are not electrified and thus, all of the passing trains are diesel engine trains, which are generally noisier than electrified trains.

Noise readings for passing trains were measured at both stations to make observations regarding the range of noise for each station. The eastbound train that departed Huntington Station at 4:23 p.m. was measured from Station 1. Maximum measurements obtained include a whistle reading at a distance of approximately 500 feet (79 dBA) and engine and track noise from the train as it passed (86.4 dBA).

The westbound train leaving Greenlawn at 4:53 was measured from Station 2. The train's whistle could be heard at quite a distance, presumably at the next intersection to the east (which is Cuba Hill Road). The highest reading for the train as it passed the station was 86 dBA.

2.8.3 Historic and Archaeological Resources

A Stage IA Cultural Resources Assessment (CRA) was prepared for the subject project site by Archaeological Services, Inc., (ASI) of Rocky Point, New York in August 1994. The analysis of the subject parcel included the evaluation of historic maps, documents, archival information, and physical inspection to assess its potential for cultural sensitivity. The completed Stage IA CRA is contained

within **Appendix G** of this document. The following information was extracted from the assessment in order to outline the general findings of the analysis.

The Stage IA CRA found that the subject site's slope, soil character, disturbance levels and natural erosion processes are such that cultural materials could have been buried and preserved in its soils. The study also stated that the subject project site is located in proximity to a natural source of fresh water, which often suggests the potential for recovery of prehistoric materials. The site's general location and topographic situation is analogous to other known prehistoric sites in Suffolk County. Further, the CRA noted anecdotal evidence of prehistoric finds in the immediate vicinity of the subject property on record in the Town of Huntington archives. ASI concluded that the project site has a "mixed" potential for recovery of prehistoric evidences based on an analysis prepared by the New York State Museum.

With respect to historic resources, the Stage IA CRA reported that the subject parcel is in a historically sensitive corridor and immediately adjacent to a National Historic Register property known as the Ireland-Gardiner Farm. In addition, the subject parcel is the site of the Greenlawn Pickle Works, a late 19th to early 20th century transitional industry that played an important part in the economic history and development of the central area of the Town. The site contained related physical structures including buildings and a rail spur that remained on the site until they were removed in the late 1960s. This ASI assessment concluded that it is possible that surface or subsurface cultural evidences would be found on the project site. As a result of these findings, preparation of a Stage II CRA was recommended.

Following are the Conclusions of the Stage IB CRA prepared for the project site (see **Appendix H**):

A systematic surface and subsurface survey of the property at Pulaski and lake Road revealed no prehistoric evidences. Historic era recoveries were made in the subsurface tests over wide areas of the parcel. They were more common in the western end of the property which has been under cultivation for longer periods of time. Furthermore, surface indications in the form of lineaments and topographic manifestations were noted in the northwest corner of the property. These appear, after preliminary study, to be evidence of an early road and rail spur which served a number of buildings known to be on the site and which are dated to the late 19th century Alexander Gardiner occupation. A surface scatter of historic era cultural materials has also been reported in this area. In addition, shovel tests within this area revealed the presence of coal, cinders, glass, brick and metal concentrated in what may be two zones within the northwestern portion of the property. Further study would be necessary to determine the nature and significance of these finds and to properly map and document the surface features prior to their disturbance or obliteration by the proposed construction activity.

SECTION 3.0
SIGNIFICANT ENVIRONMENTAL IMPACTS

3.0 SIGNIFICANT ENVIRONMENTAL IMPACTS

This section has been prepared to address all significant environmental impacts which may occur as a result of the proposed project. The project involves a change of zone, therefore, once the zoning is changed, subdivision approval will be required from the Town Planning Board. A conceptual site design has been prepared as a basis for impact analysis. The conditions projected by the conceptual project design will be compared to the environmental conditions described in the setting section of this document in order to provide an objective assessment of anticipated effects. Where appropriate, impacts will be identified as adverse or beneficial, and short or long term.

3.1 GEOLOGY

Geologic impacts will depend to a large extent upon the ultimate site design. Primary impacts are related to topographic relief and surface/subsurface soils, and establishment of roads, recharge systems, homesites, foundations and sanitary system installation. No significant geological impacts are anticipated, as the site is relatively flat with soils which have only minimal constraints.

3.1.1 Topography

As was described in detail in the Environmental Setting section, the project site is quite flat and the topography of the site does not impose any constraints on development. There are no areas of steep slopes, and the topography ranges from 228 feet along the northeastern border of the site to a low of 208 feet in the southwestern corner. Only minimal grading will be necessary for either construction of the proposed roadway or development of the individual subdivision lots. Creation of steep slopes will not be necessary, and none will be present following construction of roads and homesites. The pond/recharge area will be excavated and side walls may have slopes in the range of 1:4. This area will be stabilized as “freeboard” for retention of stormwater in this recharge area. Thus, the potential for erosion or sediment transport will be minimal, and no significant loss of soils is expected.

3.1.2 Soils

The engineering properties of the surface soils found on the subject site are not expected to pose a significant constraint on the proposed development, based on review of soil constraints provided in the Suffolk County Soil Survey as described below. **Appendix B** contains a detailed description and discussion of the soil testing program undertaken by the Applicant, to determine the presence and concentration of agricultural chemicals on the site. The test results indicate the presence of elevated arsenic levels in portions of the site’s soils. This material will be excavated

and re-used in the roadbed, the landscaped berm, drainage areas and other appropriate areas, thereby minimizing the potential for adverse affects to residents from long term exposure to contaminated soils. The site is comprised of Haven-Riverhead association soils (HaA), which are deep, nearly level to gently sloping, and medium textured and well-drained soils.

The constraints associated with the soils on site were identified in **Table 2-1** and are predominantly minor. Constraints on the construction of sewage systems and homesites are slight. The Soil Survey notes that due to the rapid permeability of the soil site development may present potential pollution problems to lakes, springs and shallow wells. The depth to groundwater is more than adequate for leaching of sanitary waste in the vicinity of the site and there are no lakes, springs or shallow wells on or directly bordering the subject site. Thus, the permeability of the soils should not constrain development. Additional information concerning sanitary waste disposal and potential groundwater impacts is presented in **Section 3.2, Water Resources Impacts**. Constraints of the HaA soils on the construction of streets and parking are moderate. HaA soils have only slight constraints for landscaping and lawns. The establishment of homesites, streets and lawns is typical residential development for the area. Soil borings will be required during the subdivision process and for installation of sanitary disposal systems. There is no evidence that these soils will present a significant constraint.

3.2 WATER RESOURCES

The primary water resource impacts expected as a result of development of the project site involve changes in groundwater quality. There is no surface water on the site, and thus no impacts to surface water are expected. There is an existing pond to the north of the property, but the project site is not within the area which contributes run-off to the pond. Reduction of groundwater quality is typically a result of sanitary discharge and degradation of recharge on the site. An increase in the amount of water that is recharged is also expected as a result of the increase in impervious surfaces on site, although this will not result in a significant change in the regional hydrological regime. The following analyzes changes in water quality and quantity which may result from implementation of the proposed project.

3.2.1 Hydrologic Water Budget

The SONIR model has been run for water budget and nitrogen parameters for the proposed site conditions. The results of this analysis are presented in **Appendix C-3**. Site coverage quantities will be changed as a result of the proposed project. The reduction of natural area and replacement with impervious surfaces will have an effect on site recharge. In addition, the importation of water supply to the site, with on-site recharge as a result of the individual sanitary systems will also affect the quantity of recharge. Site coverage quantities are identified in **Table 1-3**, and are tabulated herein to establish coverages for input into the SONIR model (**Table 3-1**).

TABLE 3-1

RECHARGE/NITROGEN
SITE COVERAGE QUANTITIES

Cover Type	Acreage
Impervious Area	6.21
Lawn Area	28.09
Non-Fertilized Landscape and Natural Area	4.0
Pond/Recharge Area	1.0
Total	39.3

Note: Quantities from Table 1-3.

The site coverage quantities included in **Table 3-1** are multiplied by the percentage of the site which is comprised of the specific type of land cover, and then totaled to determine the cumulative water budget. The impact of this change on the hydrologic water budget for the proposed use is determined using the SONIR Model. The results indicate an increase of recharge from 17.84 inches/year to 30.13 inches/year, which is an increase of 12.29 inches/year. This equates to a change from 19.04 MGY to 32.15 MGY over the entire site, or an increase of 13.11 MGY in the quantity of water recharged on site. This 69% increase is not expected to cause a significant adverse impact, as the depth to groundwater beneath the site ranges from 155 to 175 feet. The projected increase in water recharge is caused primarily by the establishment of impervious surfaces on site.

Generally, there is sufficient water quantity available for drinking water purposes in the central portions of Long Island. Therefore, it is not so much the water quantity issues that are of importance as the quality of water which is recharged through a site (SCDHS, 1987-2). The next section deals in detail with the quality of water which is recharged at the site.

3.2.2 Water Quality

Nitrogen

The primary groundwater concern associated with development on Long Island is nitrogen loading due to on-site disposal of sanitary waste effluent and use of fertilizer for lawns and agricultural uses. Nitrogen, which is introduced to a site as a result of these sources, may impair the viability of groundwater for water supply.

Wastewater will be generated as a result of the proposed residential development of the site. All sanitary wastewater effluent is proposed to be disposed of via individual on-site sanitary waste disposal systems. This form of disposal is allowed provided the projected wastewater design flow does not exceed standards established by the SCDHS, which were developed to protect groundwater resources within the County. The proposed project will conform to SCDHS standards in order to limit the impact to groundwater quality, as is discussed below.

The project site is located within Groundwater Management Zone I as defined by the SCDHS (SCDHS, 1987-2). Based on the requirements of Article 6, no more than 600 gallons may be discharged per acre on a daily basis within this zone. The site acreage used for determining this Population Density Equivalent must not include wetlands, surface waters, or land in flood zones. The subject site is 39.3 acres in size and does not contain surface waters or wetlands. Thus, the Population Density Equivalent (total allowable flow) on the subject site is calculated as:

$$39.3 \text{ acres} \times 600 \text{ gpd} = 23,580 \text{ gpd}$$

The project sponsor intends to utilize conventional subsurface sewage disposal systems on site, therefore, the total design flow must not exceed the Population Density Equivalent calculated above.

The current design sewage flow standard for single family residential units applied by the SCDHS is 300 gpd. Therefore, it is estimated that the fifty-nine (59) proposed residences will generate approximately 17,700 gpd of sewage flow. This is 5,880 gpd less than allowed by the SCDHS under its current regulations, therefore, conventional on-site sanitary systems may be used for this development.

Using the site coverage quantities established in **Table 3-1** above, the SONIR model was run to determine the concentration of nitrogen in recharge which would be expected following residential development under the proposed density. The model accounts for the following primary nitrogen sources: precipitation, sanitary waste, fertilizer and water supply. In addition, the model accounts for recharge from the following sources: lawn and landscaped area recharge, natural area recharge, irrigation recharge, impervious area recharge, unvegetated area recharge and wastewater recharge. For the purposes of this analysis, it was assumed that the landscaped portion of each residential lot would be fertilized, but that the proposed park and buffer area would be naturalized with non-fertilizer dependent vegetation.

The results of the SONIR model for the proposed project are presented in **Appendix C-3**. The printout indicates that the concentration of nitrogen in recharge would be 5.08 mg/l under full build conditions, with the maximum sanitary flow allowed under Article 6. The predicted concentration is less than the drinking water standard of 10 mg/l, by 4.92 mg/l (NYSDEC, Undated). This concentration is also less than the more stringent 6 mg/l limit established for Pine Barrens areas. Elevated levels of nitrogen over the 10 mg/l standard were previously reported from groundwater in the vicinity (SCCWRMP, 1987-1), and past agricultural use of the site may have contributed to this problem. The proposed project will contribute higher levels of nitrogen to recharge than the existing fallow field, but levels are expected to be lower than in existing groundwater, and within stringent and acceptable standards, therefore, the proposed project is not expected to result in impacts to groundwater quality.

Stormwater

Stormwater runoff will be generated from impervious surfaces such as roads, parking areas,

roofs, sidewalks, and driveways. Runoff from some types of land uses may carry such pollutants as heavy metals, petroleum hydrocarbons, bacteria, and nitrogen. Extensive monitoring associated with the NURP Study (**Koppelman, 1982**) found a significant reduction in concentrations of heavy metals, hydrocarbons, and bacteria, in groundwater as compared with surface runoff, indicating that such contaminants are attenuated in soil or volatilized in stormwater transport (**Koppelman, 1982, p. 116**). The proposed project will utilize leaching pools and an on-site pond or recharge basin for recharge of stormwater, and therefore the findings of the NURP study are applicable to this project.

Under the NURP Study, a number of different land use sites were studied to determine the impact of stormwater recharge on groundwater, including: strip commercial development, a shopping mall parking lot, low density residential development (one acre lots), a major highway, and medium density residential development (quarter acre lots). The NURP Study results for the two residential land uses are shown in **Table 3-2**.

None of the parameters examined within the NURP Study exceeded standards for the reported constituents at either of the two sites, with the exception of turbidity at the medium density site. Thus, recharge of stormwater from residential development was not found to cause significant groundwater impacts. Hydrocarbons from automobile use are volatilized or of such low concentration as to not be significant, and metals such as lead are effectively attenuated in soils of typical residential drainage systems (**Koppelman, 1982**). In addition, the proposed recharge pond would also be expected to provide further attenuation of these compounds.

The proposed drainage and recharge system will be designed in accordance with best management practice based on the NURP Study (**Koppelman, 1982**) and the Non-Point Source Management Handbook (**Koppelman, 1984**). Design considerations were discussed in full in the Project Description section of this document.

TABLE 3-2
STORMWATER IMPACTS FROM
RESIDENTIAL LAND USE

Parameter	Low Density Residential	Medium Density Residential	Standard/ Guidance Value
Spec. Cond (umhos)	61	104	[n]
pH	6.1	5.1	6.5-8.5
Turbidity (NTU)	0.4	26	5
Hardness (mg/l)	15	16.5	[n]
Calcium (mg/l)	4.5	4.85	[n]
Magnesium (mg/l)	0.9	1.2	[n]
Sodium (mg/l)	3.7	4.25	20
Potassium (mg/l)	0.7	1.0	[n]
Sulfate (mg/l)	11.0	7.05	250
Flouride (mg/l)	0.1	0.1	1.5
Chloride (mg/l)	4.3	7.3	250
Nitrogen-Total (mg/l)	1.0	2.55	10
Phosphorus (mg/l)	0.01	0.01	20
Cadmium (ug/l)	1.0	8.5	10
Chromium (ug/l)	3.0	1.0	50
Lead (ug/l)	0.0	6.0	50
Arsenic (ug/l)	0.0	1.0	25
Coliform (MPN)	3	2	[n]
Coliform, fecal	13	3	[n]

Source: Koppelman, 1982, p. 26-29

Note: [n] - no standards for parameter

3.3 ECOLOGICAL RESOURCES

The impacts to the ecological resources of a project site are generally a direct result of clearing of natural vegetation and the resulting loss and fragmentation of wildlife habitat. The proposed project is a residential subdivision which will require clearing of the entire site, although a small park with a recharge pond will be constructed in the southwestern corner of the property. This park will provide mitigation for some species. In addition, the subject property is a former agricultural field, and the vegetation and wildlife species on site are expected to be relatively common, suburban species. Thus, no significant impacts are expected as a result of the proposed zoning change. The following sections examine in detail the impact of the proposed site use and development with regard to both vegetation and wildlife.

3.3.1 Vegetation

The subject property is 39.3 acres in size, and it is expected that the existing field vegetation would be predominantly cleared for development. Most of the property will be divided into residential lots with turf and landscaping, although landscaped buffers or open areas could also be created. The attached conceptual plan shows a 20 foot, landscaped buffer along the southern border of the property and suggests creation of a 5 acre park in the western portion of the site. This area would include a pond for stormwater detention, which would be incorporated as a feature of the proposed park. Naturalized landscaping, walkways, benches, and similar features could also be incorporated into such a design and would provide some mitigation of the impacts of the proposed project. If a pond is created, the use of wetland plantings would provide additional wildlife habitat on site.

Table 3-3 compares the existing and proposed habitats found on site. These figures assume that a park and southern landscaped buffer would be created as in the conceptual plan, and that these areas would be planted with native plant species to recreate some natural habitat. There will be a change in the ecological character of the site as a result of the proposed development; however, regional impacts are not expected to be significant. The property is dominated by native and non-native weedy species which recolonize readily, and there are other areas of old field vegetation within the area. The following section will investigate the wildlife response to habitat reduction.

TABLE 3-3

COMPARISON OF PROPOSED
 AND EXISTING HABITATS

Habitat Use	Existing	Proposed
Old Field	39.3	0.0
"Naturalized" Areas	0.0	5.8
Lawn/ Fertilized Landscaping	0.0	27.3
Buildings/Drives/Roads	0.0	6.2
Total	39.3	39.3

Source: Conceptual Plan prepared by N&P, LLP, 8-24-95

Note: "Naturalized" areas include southern buffer and proposed park and pond.

3.3.2 Wildlife

The early successional vegetation found on the project site provides habitat for several wildlife species which are tolerant of human activity. Most of these species will utilize a range of habitats, including suburban yards, and thus would be expected to utilize the newly landscaped portions of the site and proposed park to a limited degree. The subject property will be cleared, but as it represents only a small portion of the early successional habitat in the vicinity, impacts should not be significant. Species which avoid human activity or are particularly vulnerable to habitat fragmentation are not expected under existing conditions. Additionally, species which are tolerant of human development are likely to increase. A number of wildlife species which are well adapted to human activity can be considered pests for nesting in buildings, eating garbage and crops, or for roosting in such large numbers as to spread disease through accumulated fecal material. These species are discussed in further detail throughout this section of the document.

In determining impacts upon the existing wildlife populations, it can generally be assumed that an equilibrium population size is established in an area for each species as determined by availability of resources in the habitat. Thus, the removal of habitat resulting from the proposed project will cause a direct impact on the abundance and diversity of wildlife using the site. Although the assumption that species are at equilibrium is an oversimplification, it does provide a worst case scenario in determining the impact of habitat loss. In addition to this direct impact, the increased intensity of human activity on the site will cause an indirect impact on the abundance of wildlife which remain on the site and in the area, under post-development conditions.

In the short term, the proposed clearing of the site would be expected to displace individuals from the property onto adjacent lands. Ultimately, interspecific and intraspecific competition

should result in a net decrease in population size for most species within the area, with some species recovering slightly as landscaping becomes established and provides cover. Although local populations will be impacted, the overall effect on the density and diversity of regional populations should be minimal, as the area represents only a small portion of the early successional habitat available in the vicinity. The impacts of habitat losses are cumulative, however, and impacts need to be considered in light of regional planning. For example, the loss of old field habitat may displace individuals to similar or less preferred habitats. When a particular habitat becomes less available, some species may become concentrated in adjacent or nearby developed areas, where they are likely to be considered pests. Preservation of existing agricultural lands, retention of open space as part of site plan and subdivision design, and management of regional land use under existing comprehensive plans will provide a means to reduce long-term wildlife impacts.

Appendix D-3 includes the results of a microcomputer model used to establish baseline information of species associated with various habitats and their response to development impacts. The following text considers the site specific aspects of the proposed development in regard to individual species, and supplements the predictions of the more general model. In some cases the predicted response of a species at the site may differ from the general prediction of the model because of site-specific information.

Birds

Literature suggests that many avian species are able to adjust to both urban and suburban environments, and, as birds are typically mobile, direct losses during clearing are generally low. Birds such as the crows, doves, blue jay, American robin, northern mockingbird, brown thrasher, gray catbird, cedar waxwing, grackle, northern oriole, red-winged blackbird, European starling and cowbird are expected to be only minimally impacted by the proposed project, as they will use the proposed landscaped areas (**Andrle and Carroll, 1988; Bent, 1963, 1964, 1968**). Those species which prefer areas with dense, brushy cover are expected to suffer more substantial decreases in numbers, including the cedar waxwing, catbird, cowbird, oriole and mockingbird. As these species are expected to be abundant in the surrounding area, no significant regional impacts are expected. The red-winged blackbird prefers wetland habitats, and thus may increase on site if the proposed pond is constructed.

Specifically, the increase in the number of particular bird species on Long Island poses a concern. As stated in Section 2.3.2, rock doves, as well as the European starling, prefer to colonize buildings and become pests as the amount of noise and fecal material stained structures increases, of which the latter may cause a potential health risk. However, neither species is not protected by law, unlike the majority of bird species, and may be controlled accordingly. There are several methods of deterring, reducing, or eliminating this species before or as they become pests in urban areas. Whether "pest" species are a serious threat to society or not, the cumulative effects of the loss of old field and other habitat types, humans have created a habitat which reduces predators and increases food supply to support the increased numbers of these particular species.

Some smaller birds which also adapt well to development include the finches, towhees, juncos, and most sparrows. These seed-eating species are typically found in edges and buffer zones, and would be expected to utilize the landscaped areas, although preservation of a natural buffer along the western and northern borders of the site would provide additional cover. Species from these groups expected on site include the house sparrow, chipping sparrow, song sparrow, house finch, cardinal, goldfinch, rufous-sided towhee, and rose-breasted grosbeak. The northern junco, fox sparrow, white-throated sparrow and white-crowned sparrow are expected as winter visitors. Populations of the majority of these species are likely to remain fairly stable on a regional level. The introduced house finch may increase in numbers on site following development. This species is a pest which prefers to nest on buildings (**Bent, 1968**).

Other smaller, insect feeding birds such as the black-capped chickadee, tufted titmouse, and white-breasted nuthatch are also fairly tolerant of development as long as large trees with plenty of food sources remain (**Andrle and Carroll, 1988; Bent, 1964**). Numbers of these species in the area should remain stable, as the proposed landscaping will include more large trees than under existing conditions. The house wren is the only wren expected on site, and is very tolerant of development and may become a pest as it will nest in a variety of places. No significant impacts to these species are expected.

If present, the warblers would be expected to suffer localized declines, as most avoid developed areas, although a few may utilize the park area and landscaped buffer (**Andrle and Carroll, 1988; Bent, 1964, 1968**). The yellow throated warbler, chestnut-sided warbler, common yellowthroat warbler, prairie warbler, and yellow breasted chat were listed as potentially present on site. The cedar waxwing is found in a variety of habitats, but is most common in orchards and suburban areas (**Bull and Farrand, 1974**.) This species is also expected to decline in the area. Regional populations of these species should not be impacted significantly.

Of the flycatchers, kingbird and great-crested flycatcher were listed as most likely to be present. The kingbird prefers open edge habitats, and thus would use the proposed buffer or brushy landscaped areas. The great-crested flycatcher is more vulnerable to development and is expected to decline in numbers in the area. The barn swallow was also listed as potentially present on site and is tolerant of development, and the purple martin was seen overhead. The barn swallow often nests on buildings and other structures, although older buildings are more commonly used. These species are not expected to decrease significantly following development, as the property is only marginally suitable under existing conditions. Although it is not a swallow, the chimney swift has similar habitat requirements, and is also likely to remain stable following development. However, these species may be considered pests and control methods to reduce the number of these species nesting on the proposed structures may be applied if necessary.

The game birds, which prefer a mix of open fields and shrubby habitats, are expected to decline in numbers following construction, although suitable habitat will remain on the adjacent lands to the north. The killdeer, ring-necked pheasant, ruffed grouse and bobwhite may be present on the area, and will be displaced to the surrounding properties if present. The horned lark is also likely

to be impacted if present, as it is a grassland species which is not present in brushy or suburban habitats. There are limited areas of suitable habitat elsewhere in the area, and thus regional impacts should not be significant.

The American woodcock and whip-or-will both prefer a mix of woodland and overgrown field, and are somewhat sensitive to human activity. These species may decline locally following development, although they already may be absent due to the existing level of development in the area. The yellow-billed and black-billed cuckoos are also vulnerable to development, and are expected to abandon the site if they are present under existing conditions.

Other species of birds which prefer a mix of wooded edge and field habitat include owls and raptors. These species generally roost or nest in forested areas, hunting for rodents and other prey in adjacent open areas. The red-tailed hawk, kestrel and common screech owl are the most likely species to be present in the area. These species utilize large home ranges for hunting, and the site represents only a small portion of the old field habitat in the vicinity. Thus, any declines should not be significant.

Mammals

The mammalian fauna found on the site will also be impacted by the proposed clearing and resulting habitat loss, although numbers on site are expected to be low under existing conditions, and regional impacts will not be significant. As with avian species, some individuals are expected to relocate to adjacent open areas, and populations within the vicinity are expected to reach a slightly lower equilibrium population density. Displacement of species with little available old field habitat in the area may create undesirable concentrations of particular species in the nearby areas.

The masked shrew is present in a variety of habitats, but prefers mixed deciduous woods and red maple swamps (Connor, 1971). The short-tailed shrew is also most commonly found in woodlands, but can live in a variety of habitats and will use several different food sources. Both species are expected on site in small numbers. Although limited numbers of these species are expected to utilize the landscaped areas following construction, populations are likely to decrease on site (Godin, 1983). Regional population changes should not be significant, as the site represents only a small portion of the available habitat.

The eastern mole is commonly found in woodlands and field habitats with sandy or light loamy soils. They are also common in lawns and landscaped areas when their preferred habitat is destroyed or not available (Godin, 1983). The species may utilize the remaining edge habitat and turfed areas on site, but local impacts are expected.

The white-footed mouse prefers forest edge habitat and does not adjust well to development. Unlike other small mammals, it only rarely moves into nearby residential areas when pushed out of its preferred habitat (Godin, 1983). The population on site will be directly impacted, but suitable habitat will remain on the adjacent properties. Thus, local declines are expected, but

regional populations should remain stable. The meadow mouse is also expected on site, although the habitat is only marginally suitable, and the pine mouse may also be present. Neither mouse is expected to remain on site, and local impacts may be significant. The house mouse and Norway rat are introduced pests found near humans in field habitats, and the rat is also found in urban settings and prefers moist areas. They will eat almost anything and usually cause problems for homeowners (**Godin, 1983**). Populations may increase slightly subsequent to development.

Squirrels usually adjust quite easily to urban areas where larger trees remain for feeding and nesting, and are expected to use the landscaped areas and remaining buffers following development. Relocated squirrels have been known to cause extensive damage to houses by gnawing holes in roofs and eaves to gain access to shelter. Maintaining the buffer areas will help to reduce the impacts to this species, as well as their becoming a pest.

The eastern cottontail seems to do well in both suburban and natural habitat (**Connor, 1971**), which may be due in part to its variable home range, which varies from 1/2 acre up to 40 acres depending on conditions. It also has a large number of food sources that are available in almost any setting (**Godin, 1983**). Cottontails are present on site, and although the species is likely to remain in the area, local impacts are expected.

Development of the existing forest habitat will also have minimal impacts the raccoon and opossum populations, as the site is likely to represent only a small portion of the home range of individuals utilizing the site. Both species prefer wooded areas with brush and hollow logs to den in. The opossum has a home range of about 1/2 mile (**Godin, 1983**), while the raccoon has a variable home range of about one to two miles (**Burt and Grossenheider, 1976**). When natural habitat is removed, these species may become a nuisance, invading under buildings, attics and chimneys in search of places to den. Neither is social, and the two species are often involved in fights with family pets (**NYSDEC Wildlife Hotline, 1988**). Again, nuisance wildlife, such as the raccoon, opossum or squirrel, may be trapped and terminated by the property owner or trapped by a private licensed animal damage control contractor to be disposed of or relocated to an appropriate area. As these species may only be removed when physically causing a "nuisance", there are several deterrent methods which are available to avoid potential damage. In addition, the site is only marginally suitable for the species, no significant impacts are expected.

Amphibians/Reptiles

As was discussed in the setting section of this document, the incidence of reptile and amphibians on the site is expected to be low in both density and diversity. Although most of the herptile species which are found in field habitats adjust well to suburban areas, relatively little habitat will remain on site. In addition, these species are often less mobile than avian and mammalian species, and may suffer direct elimination during construction. The conceptual plan includes a stormwater detention pond, which could be designed to accommodate aquatic species. The wood frog and spring peeper would be the most likely species to colonize the pond, as these two species may move considerable distances from the breeding site after hatching. Stocking of the

pond with fish or other amphibians might also be considered.

Terrestrial amphibians which may be present include the eastern spadefoot toad and the Fowler's toad. Both toads are found in a variety of habitats, including brushy field areas (**Wright, 1949**). These species might utilize the buffer area adjacent to the existing recharge basin following development, but numbers on site are expected to decline. As the site is only marginally suitable for these species, regional impacts should not be significant.

Several species of snakes were identified as potentially present on site. The eastern garter snake, eastern hognose snake, eastern milk snake, and black racer may be present (**Wright, 1957**). Of these species, the eastern garter snake is the most tolerant of urbanization, and might utilize the remaining landscaped areas; however, even this species would be expected suffer temporary impacts due to direct loss during construction. Populations may partially recover after completion of the project, but local impacts to all four snake species would be expected. Regional impacts are not expected to be significant, as the site is relatively small and there is more suitable habitat elsewhere within the area.

3.4 TRANSPORTATION

Traffic impact analysis typically involves the comparison the projected future traffic volumes in the vicinity of a site with and without implementation of the proposed development. First, the existing traffic volumes are determined to provide a baseline for estimation of future volumes. Next, the traffic volumes under a “No-Build” scenario are estimated for a future target date, which is generally the anticipated completion date for the project. This step involves projection of the traffic to be generated by other pending projects in the local area, and application of a growth factor to existing traffic volumes. Then, trip generation from the proposed project is estimated, and the projected traffic volumes for both the “Build” and “No-Build” conditions are assigned to each intersection based the expected travel patterns. Finally, these projections are added to the existing traffic volumes, and a comparison is made between the future “Build” and “No-Build” scenarios. The ability of the existing street system to accommodate the projected traffic volumes is then evaluated.

Under the proposed plan, which was prepared by Nelson & Pope, LLP, the subject site will have a single access point located opposite Tulane Place near the southeastern corner of the property. The projected trip generation rate for the proposed project was determined using the Institute of Traffic Engineers Trip Generation Manual (ITE, 1997). The ITE manual provides peak hour trip generation rates and site arrival and departure percentages. The critical times for traffic impacts typically occur during the morning and evening commuter peak hours, when the combination of highway and site generated traffic are typically highest. The anticipated traffic generation of the proposed project is presented in **Table 3-4** for the AM and PM peak periods.

TABLE 3-4

PROJECTED TRIP GENERATION

Trips per Hour	AM Peak	PM Peak
Enter	13	43
Exit	38	24
Total	51	67

The future (year 2000) ambient traffic volumes were estimated by applying a 1.1% annual traffic growth rate, obtained from the SCDPW, to the existing peak hour traffic volumes at the study intersections. The projected traffic volumes generated by other planned developments in the area were then superimposed onto these volumes to estimate the future “No-Build” traffic conditions, and the traffic volumes to be generated by the proposed project were added to the “No-Build” scenario to predict the future “Build” conditions. Three planned residential developments in the area of the site were considered in projection of the future “No-Build” traffic conditions; Evergreen Homes at 5th Street, Greenbrush Hollow Homes and Wax Wing Estates. Also considered were the construction of a proposed CVS Pharmacy on an existing commercial

property in Greenlawn and the planned improvements to Pulaski Road. These projects are discussed in detail in the appended report.

Intersection capacity analysis was performed for each of the study intersections under the “Build” and “No-Build” traffic volumes to determine the expected level of service. **Table 3-5** summarizes the projected levels of service and delays for the analyzed intersections under both future “No-Build” and “Build” conditions. Based on this analysis, there will be no reduction in the level of service at any of the intersections under the proposed development scenario as compared with the projected future “No-Build” conditions. The existing operational difficulties will continue at the intersection of Park Avenue and Pulaski Road. In addition, during the AM peak, the intersection of Cuba Hill Road/Central Street and Pulaski Road will experience future operational difficulties whether or not the proposed project is implemented. The remaining study intersections will remain at their existing acceptable levels of service under both the “Build” and “No-Build” scenarios.

Vehicles exiting the site onto Pulaski Road will experience LOS D during both the morning and evening commuter peak hours; however, the delay experienced will be similar to the delay experienced on a side street approach at a traffic signal. In conclusion, the traffic generated by the proposed Harborfield Estates community will have an imperceptible impact on the overall operation at all of the study intersections, and no mitigation is considered necessary. Plans have been submitted by the Applicant to the SCDPW, for their review in regard to vehicle access and roadway impacts. Should that agency have comments, these will be addressed during preparation of the Final EIS.

TABLE 3-5

CAPACITY ANALYSIS SUMMARY

Signalized Intersections

Intersection with Pulaski Road and Scenario		AM			PM		
		LOS	Delay (sec/veh)	V/C	LOS	Delay (sec/veh)	V/C
Park Avenue (CR 35)	No-Build	*	*	1.820	*	*	1.239
	Build	*	*	1.828	*	*	1.268
Lake Road	No-Build	B	7.1	0.704	B	5.7	0.601
	Build	B	7.3	0.716	B	5.8	0.615
Cuba Hill Road and Central Street	No-Build	*	*	1.071	C	22.9	0.780
	Build	*	*	1.079	C	23.3	0.846

* Intersection Delay and LOS not meaningful when any V/C is greater than 1.2.

Unsignalized Intersections

Intersection with Pulaski Road and Scenario		AM			PM		
		LOS	Approach Delay (sec/veh)	Inter. Delay (sec/veh)	LOS	Approach Delay (sec/veh)	Inter. Delay (sec/veh)
Tulane Place and Site Access	No Build	B	7.1	0.1	C	13.1	0.2
	Build	D	25.1	0.8	D	27.7	0.7

3.5 LAND USE, ZONING AND PLANS

3.5.1 Land Use and Zoning Impacts

Section 2.5 provides a full description of the land use and zoning characteristics of the site and surrounding area. A qualitative discussion of the change in land use and zoning conditions is provided herein.

The existing site use is not considered to be in a permanent use, as the site is vacant. The site is presently zoned R-40 and has been zoned for residential use since the inception of the Zoning Code. As demonstrated in Section 2.5, the project site is located in a mixed land use area particularly along the Pulaski Road corridor. For the most part, residential development bounds the project site to the north and south, the primary difference is that the residential densities are generally lower to the north. There is a general commercial nature to the land use east and west of the project site due to the existing LIPA transformer substation and the GEC-Marconi Hazeltine industrial plant. The mixed land use pattern requires that the proposed use address the difficult circumstance of harmonizing with diverse surrounding activities. Evidence that the proposed use complements the existing land use and zoning patterns and principles, is as follows:

- The proposed zone change from R-40 to R-20 will increase the residential density of the project site, increasing the number of single-family homes from approximately thirty-three (33) to fifty-nine (59). The proposal will result in a zoning designation that has the potential to provide a permanent land use on the site in place of a dormant residentially zoned parcel. The proposed development will prevent future expansion of the commercial activities along a major commercial arterial, and protect the residential viability of homes north and south of the site. The development of a permanent use will have the added beneficial impact of eliminating the potential for future dumping of debris on the site, and the illegal use of the property by unauthorized all terrain vehicles.
- The project will provide a transitional use between the existing residential development to the north and south, without conflicting with the commercial properties to the east and west. The proposed R-20 designation, is an appropriate zoning for the property with respect to complementing both the neighboring commercial and residential land uses. The subject parcel is more closely identified from a geographical perspective with the R-20 residential development south of Pulaski Road, relative to the R-40 development north of the LIRR track bed. The R-40 development is separated from the project site by both a 300-foot wide open space buffer, and the LIRR tracks. Alternatively, the project site is clearly visible from the residential development south of Pulaski Road, and may be viewed as a continuation of this established neighborhood, and the property directly abuts the Pulaski Road mixed use corridor.

With respect to the commercial uses, the proposed R-20 zoning designation provides an opportunity to realize an economically viable use of the property. The smaller lot size allows for additional property to be placed in landscaped areas and park use, thereby affording the

project sponsor the ability to buffer the project from commercial related activities associated with uses to the east and west, and related traffic along Pulaski and Lake Roads.

- The increased density allows for an economically viable development to occur on the subject site, in light of the negative impact that the LIRR tracks have on the market value of new residential housing. The Town of Huntington Town Board has approved two zone changes in the recent past under similar circumstances, Trafalger Estates on Lake Avenue in March, 1994 and the Brand Nursery project on the north side of Pulaski Road in February, 1997. In both situations, the Town Board changed the zoning for these properties adjacent to the LIRR tracks to R-20 Residential.
- The Town of Huntington's 1993 Comprehensive Plan designates the subject property for low-density residential development, the proposed R-20 Residence zoning designation meets this criteria. Further, the proposed rezoning is not likely to set any zoning precedents due to the lack of undeveloped land in the project vicinity.

3.5.2 Land Use Plans

The land use plans, which may affect the manner in which the subject property is developed, have been discussed. This section will briefly determine if the subject application complies with the recommendations of these plans for those aspects, which are relevant to the proposed change of zone.

Town of Huntington Comprehensive Plan - 1993

The Town of Huntington Comprehensive Plan – 1993 designates the subject property for low-density residential development. The proposed R-20 Residential zoning is considered low to moderate in density, especially as compared to higher density residential districts. The project therefore conforms to the low-density residential development recommendation offered in the 1993 Comprehensive Plan. Further, the proposed development conforms with the housing goals incorporated into the 1993 Plan relevant to single-family development. The proposed development will “*minimize disruptions or alterations to established neighborhoods and development densities*” by providing residential development that allows for a harmonious transition between the lower density R-40 development north of the LIRR tracks, to the R-20 development to the south of Pulaski Road. It is appropriate for the subject site to share the same R-20 designation with the development south of Pulaski Road since they are geographically and visually interrelated, as opposed to the R-40 housing to the north. Further, the proposed R-20 designation allows for an economically viable residential site design on the subject property, despite the fact that it is bounded by properties that are commercial in nature to the east and west.

This development plan will foster the 1993 Comprehensive Plan goal to “*preserve property values in areas accommodating additional development*” by providing a permanent complementary residential use on a vacant property and thereby preventing its potential commercialization in the future.

Further, the proposal will “*provide a clear public benefit*” not only by providing a quality residential development that complements the existing land use pattern, but in addressing the shortage of open space and areas for recreation documented in the 1993 Comprehensive Plan, and other related Town planning studies. As demonstrated in the “Parks, Open Space and Historic Resources Section” of the 1993 Plan, there is a shortage of neighborhood parks [under ten (10) acres] in the higher density residential areas in Town. Greenlawn, the hamlet in which the proposed project lies, is amongst the six districts mentioned in the 1993 Plan with an inadequate amount of parkland. Based on this document, Greenlawn had 4.04 acres of parkland per 1,000 residents in 1993, while on a townwide basis, Huntington averaged 9.77 acres per 1,000 residents. The proposed five (5) acre open space/recreation area included in the conceptual plan addresses a public need and represents a significant amenity to the community.

208 Areawide Waste Treatment Management Study – 1978

The purpose of the 208 Study was to investigate wastewater disposal options and best practice for ground and surface water protection. The subject site is located in Hydrogeologic Zone I (or Groundwater Management Zone I). The SCDHS established a means of implementation of the basic land use density recommendations through Article 6 of the SCSC. The proposed project has an equivalent gross density, which is less than the recommended standard in the 208 Study for Zone I and Article 6 of the SCSC.

Based on SCSC, Article 6, no more than 600 gpd per acre may be discharged in Groundwater Management Zone I. The allowable flow for the site was determined to be 23,580 gpd. At full development, the flow from the subdivision will equal 17,700 gpd, 5,880 gpd less than Article 6 allows. This volume of sanitary wastewater can therefore be discharged via on-site septic tank-leaching pool disposal systems constructed in accordance with SCDHS requirements, and in conformance with the 208 Study. Other considerations including nitrogen load upon groundwater have been considered in the Water Resource impact section (Section 2.2).

Other 208 Study recommendations include plans for sewerage high density development areas, encouraging large lot development, controlling stormwater runoff, requiring routine sanitary system maintenance, reducing use of fertilizer, and prohibiting use of cesspool cleaners which may contaminate groundwater. The project is in the change of zone stage, and some of these issues will be addressed through the subdivision review processes. The project as conceived, is not in divergence with any of the 208 Study recommendations.

Town Open Space Index - 1974

The Open Space Index ranked undeveloped parcels from Priority 1 to Priority 6, with Priority 1 having the highest open space value and need for preservation. The Index classified the property as "farmland" with a Priority 6 and did not recommend it for public acquisition. The proposed development conforms to the recommended priority level and promotes the maintenance of open space by creating a permanent five (5) acre park.

2.6. COMMUNITY SERVICES

2.6.1 Tax Structure

The impact of the project upon the tax structure will be an increase in the amount of tax revenue generated from the subject parcel to taxing jurisdictions. The present taxes on the property, as well as the distribution of taxes, is described in the Environmental Setting section of this document. This fiscal analysis evaluates the impact of the subject zone change under various scenarios. In addition to the subject property's current tax generation as an undeveloped parcel, the analysis also evaluates the impact if the site is developed under the current R-40 and proposed R-20 residential zoning.

In order to quantify the tax impact of the development scenarios upon the Town tax structure, it is necessary to estimate the assessed value of the proposed residential units that would be constructed on site. The assessed value for residential units is determined by the Town Tax Assessor by adjusting a property's current market or sales value by a factor called the equalization rate. Theoretically, the equalization rate accounts for differences in property values due to sales dates occurring over a period of time, and "equalizes" values based on a set date in time. Currently, the equalization rate for the Town of Huntington is 1.93% (**Town of Huntington, Sole Assessor**).

Based on a review of current market sales completed by the project sponsor, it is anticipated that the proposed residential units for this particular site will have a sales price of \$325,000, including the land component. Adjusting the estimated market value by the current equalization rate yields an assessed value of \$6,273 (\$325,000 times 0.0193 equals \$6,273) per residential unit. Under the proposed R-20 development scenario, the project will be comprised of fifty-nine (59) units, thereby yielding a total assessed value of \$382,107 (\$6,273 times 59, plus \$12,000).

If the property were developed under the current R-40 zoning, it is estimated that thirty-three (33) residential units would be constructed on site. The total assessed value is estimated to equal \$219,009 (\$6,273 times 33, plus \$12,000) under this scenario, assuming a similar sales price. This seems reasonable as the market in this area is not expected to support home sales prices in excess of \$325,000.

Table 3-6 compares the existing tax revenues of the subject parcel to the total tax revenues that

may be anticipated from the proposed project and development under the existing R-40 residential zoning. The tax revenues are based on the current tax rates (Section 2.6.1) and the projected assessed values. The table details the revenue changes that will occur to the taxing jurisdictions as a result of the project.

TABLE 3-6
CHANGES IN TAX REVENUE

District	Rate/\$100	Existing (Undeveloped)	Proposed R-20 Development	Developed Under Current R-40
Harborfields School/Library	98.826	\$11,859	\$377,621	\$216,439
Suffolk County (a)	25.812	\$3,098	\$98,629	\$56,531
Town of Huntington (b)	18.478	\$2,217	\$70,605	\$40,468
Greenlawn Fire District	7.433	\$892	\$28,402	\$16,279
Greenlawn Water District	2.374	\$285	\$9,071	\$5,199
Total Taxes Generated	152.92	\$18,351	\$584,318	\$334,909

Source: Town of Huntington Assessor

Notes: (a) County District includes General and Police

(b) Town District includes Town, Highway and Lighting District

As demonstrated in **Table 3-6**, the proposed project will generate significantly more tax revenue to the impacted jurisdictions relative to the existing situation, and more importantly, if the site were developed under the current R-40 zoning designation. The proposed subdivision is projected to generate a total of \$584,318 in tax revenue, this is \$249,409 or approximately forty-four (44) percent more than it would generate if developed under the current R-40 zoning. This represents a significant positive impact on the affected taxing jurisdictions resulting from the development of the project. This must also be considered in view of the demand for services and the ability of service districts to serve the project and site population. These considerations are discussed for each service district below.

3.6.2 Education

The impact of any residential project upon the school district in which it is located depends on the number of school age children that will be generated, coupled with the ability of the school district to provide educational services for these children. In addition, the school tax generated by the project must be considered as a means of providing some of the funds for necessary improvements and expansion of the educational system. 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 revenue received for education from the State of New York and tax revenue generated from real property development.

The following fiscal analysis projects the costs associated for educating the school children for development of the subject property under the proposed R-20 zoning. The estimated education costs are then compared to the revenues that may be anticipated from both local and State sources under both development scenarios.

The number of school-age children generated by the project was estimated by using the methodology developed by the Western Suffolk BOCES-School Planning and Research Department. According to this method, which utilizes the number of bedrooms (233) and the number of school-age children per bedroom (0.47), the project is estimated to generate 110 school-age children. The correspondence with the school district (see **Appendix B**), indicates the following:

1. No impact to the established school attendance zones unless and until, at some point in the future, we [the HCSD] return to an organization structure that serves children in one grade level at several locations. This possibility, in my [Joseph C. Dragone, Assistant Superintendent for Business] opinion, highly unlikely.
2. The “serious shortage” of classroom space currently anticipated for the middle and high schools, as well as the current maximum utilization in two buildings, would be exacerbated by the estimated 110 school-age children generated by the proposed project.
3. As stated by the HCSD, *“An increase of 100 students [the number of school-age children estimated by the Applicant at the time the correspondence was prepared], when added to the increased enrollment we are experiencing due to spot-building and the increased desirability of Harborfields Public Schools, will impact the school district by placing a proportionately greater demand on the services we provide.”*

As presented in **Section 3.6.2**, the Harborfields Central School District currently spends approximately \$11,426 per capita to provide educational services in the district. Based on recent trends, it is expected that the State of New York will provide funding for approximately twenty (20) percent of the costs per pupil for education services in the Harborfields District. **Table 3-7** provides the costs and revenues associated with the proposed development scenario based on the preceding data.

TABLE 3-7

**COST/REVENUE ANALYSIS FOR DEVELOPMENT
UNDER PROPOSED ZONING**

Development Scenario	Costs for Education (1)	Revenues (2)	Net Benefit (Loss)
Proposed R-20 Zoning	\$1,005,488	\$348,715	\$(656,773)

- Notes:**
- 1) Assumes State of NY provides 20% of the cost of education per pupil.
 - 2) Based on 1997/98 School Tax – 91.2610

Based on the information provided in **Table 3-7**, it may be concluded that the proposed residential subdivision will result in education expenses that exceed the revenues generated. However, in consideration of the Harborfields Central School District's total 1997/98 budget of \$32,117,640, the net loss represents an insignificant impact (less than 2.1% of the overall budget) to the schools districts fiscal position. The information contained in this Draft EIS should be provided to the District to assist in planning to accommodate future school-aged children.

3.6.3 Police and Fire Protection

As indicated in the Setting Section, the project site is located within Suffolk County Second Police Precinct. The property is currently vacant, and therefore there is the potential for unauthorized use of the site, which may be a detriment and require police response. The proposed project will result in a permanent use of the site, which will result in occupancy of the site and improved site security. In addition, the additional taxes generated by the future residences will assist in offsetting demand for additional service that may result from land development. Based on current tax rates, it is estimated that the proposed development will generate an additional \$95,434 in tax revenue to Suffolk County, a portion of which will be earmarked to support the operations of the Police Department.

The Greenlawn Fire Department was contacted and it was confirmed that the proposed project will receive fire protection from this district. It was expressed that the Greenlawn Fire District has an outstanding capacity to provide fire protection services to the proposed project from the headquarters station located at 23 Boulevard, in Greenlawn.

In regard to the acceptability of one access into the site, the correspondence (see **Appendix A-9**) states:

As Fire Chief [David Caputo] I feel it would be to the fire departments and homeowners advantage to have a second access point on the west side of the property. For any number of reasons the primary access could be blocked, and in an emergency the responding vehicles would have to enter the development by this second access point.

The ambulance and heavy rescue truck assigned to each of the two facilities serving the site, as well as the estimated 60 department personnel assigned to the Rescue Squad, are anticipated to remain sufficient to provide such services to the proposed project.

Based on current tax rates, it is estimated that when the proposed project is completed, it will generate an additional \$27,481 in tax revenue to the Greenlawn Fire District. This projected revenue is expected to offset any anticipated increase in the fire district's expenditures to cover additional service needs associated with the project.

3.6.4 Health Care Facilities and Social Services

There are sufficient health care and social services provided by private hospitals and Suffolk County to service the anticipated one-hundred and seventy-seven (177) new residents expected to reside within the proposed development. Vacancies in the various local hospitals indicate the availability of health services. Further, it is estimated that the completed project will result in a net increase of \$163,747 annually, for general government functions at the Town and County level. A portion of this annuity may be used to enhance health and social services on a comprehensive basis, as necessary.

3.6.5 Solid Waste Disposal

The Town of Huntington has an effective solid waste management program, which includes a Resource Recovery Plant that is operated in cooperation with the Town of Smithtown. Presently, the plant does not have any problems accommodating additional waste capacity. It is anticipated that the proposal will increase the population of the Town of Huntington by one-hundred and seventy-seven (177) residents, or 0.1 percent of the Town's total population of 189,825. In terms of waste generation, it is estimated that seven pounds of solid waste per person per day will be generated by the proposed project. Based on these factors, it is estimated that the project will generate a total of 1,239 pounds of solid waste daily. This increase should not have an appreciable impact on the solid waste services provided by the Town of Huntington.

3.6.6 Utilities

The proposed project is located within the service area of the Greenlawn Water District for the supply of drinking water. Water service is available via a connection to an existing 12-inch water main along the north side of Pulaski Road, as well as a 12-inch main on Lake Road. **Appendix A-7** contains confirmation of Water Availability from the GWD. Further information will be provided to the Greenlawn Water District when fire and water supply demand is known.

Electrical services are provided in the project area by the LIPA. The area supervisor indicated that LIPA would provide service to the Pulaski Road/Lake Road project. Gas service in the area is also provided by LIPA. According to the LIPA Gas Sales and Marketing, there is a 12 inch cast iron gas line located along Pulaski Road. This gas line may be available to provide service to the site depending upon future expected gas loads which must be determined when exact uses and construction timing are known.

In regard to the potential health effects of non-ionizing radiation due to the LIPA transmission lines along the site's northern boundary, an extensive literature search (on the Internet) did not reveal the existence of any definitive correlation between health impacts and power lines. However, the research studied does recommend that distance between such fields and areas

subject to public use be maximized, and that the time span of such use be minimized, if abutting the EMF's. This is achieved through elevation of transmission lines on masts such as the present LIPA lines.

3.7 DEMOGRAPHY

The proposed Harborfield Estates project will increase the number of existing households in the Greenlawn CDP by fifty-nine. By applying the 1990 average household size of 3.0 in the Town of Huntington (1990 Census), it is estimated that the proposal will increase the Greenlawn population by 177. Based on the 1996 population estimate of 13,118 for Greenlawn, it is projected that the proposed project will increase the population of the CDP to 13,295, a one (1) percent increase. The additional 177 residents will increase the density (persons/sq. mile) to 3,593 from the current 3,545 persons per square mile. These increases are not expected to have an appreciable impact on the demographic characteristics or the suburban setting of Greenlawn hamlet.

3.8 CULTURAL RESOURCES

3.8.1 Visual Resources

The project area is currently an undeveloped lot situated along Pulaski Road, a major transportation arterial in a suburban setting. The view of the site from all observation points in the project vicinity is one of a large, overgrown, vacant lot. The visual character of the project site will be changed by the subdivision site improvements and the addition of fifty-nine (59) new homes. However, the potential impact on the visual character of the site as a result of the proposed development will be reduced due to the design and layout of the project, and the limited view of the site from most points surrounding the site.

The majority of individuals viewing the site observe it from the south, either as motorists traveling along Pulaski Road, or from the residential homes south of this roadway. The proposed project will result in an attractive residential development that conforms to the homes south of the subject site. In addition, there will be a landscaped buffer that extends the project's entire frontage along Pulaski Road that will provide a buffer between the site and vantagepoints from the south. As a result, the proposal will mitigate visual impact on individuals observing the site from the south.

The view of the site from the west is limited to individuals either traveling on or entering the LIPA facility from Lake Road. The proposal will not negatively impact the visual character for individuals viewing the site from the west, particularly since the project design includes a five-acre park/open space that fronts along Lake Road. The proposed development will provide a view from the west characterized by attractive landscaped amenities in association with planned open space. The residential development will occur to the east of the planned park/open space, and be partially visible from Lake Road.

The majority of the individuals that are able to view the subject site from the north are travelers on the LIRR, which passes along the track bed along the northern perimeter of the site. Due to existing topography and distance, the subject site is barely visible from the residential properties north of the LIRR track bed. Therefore, the ultimate development of the proposed residential development will not have any visual impact on the majority of individuals observing the property from the north. Passengers on the LIRR generally will be able to view the property as they pass by, however landscaping and buffer areas will limit their ability to view the property and the use will be consistent with the residential character of the area. There is a three hundred-foot wide buffer located between the project site and the adjacent GEC Marconi Hazeltine facility. The development of the site as a residential subdivision will have a minimal visual impact on individuals observing the property from the east due to the distance and depth of the buffer area, and the limited amount of individuals that actively utilize the impacted area.

In summary, the visual character of the site will be changed as a result of the proposed project; however, this change will be in keeping with the existing visual character of the area. In addition, natural vegetation and landscaping will help to minimize the visual change and enhance the site.

3.8.2 Noise-Related Impacts

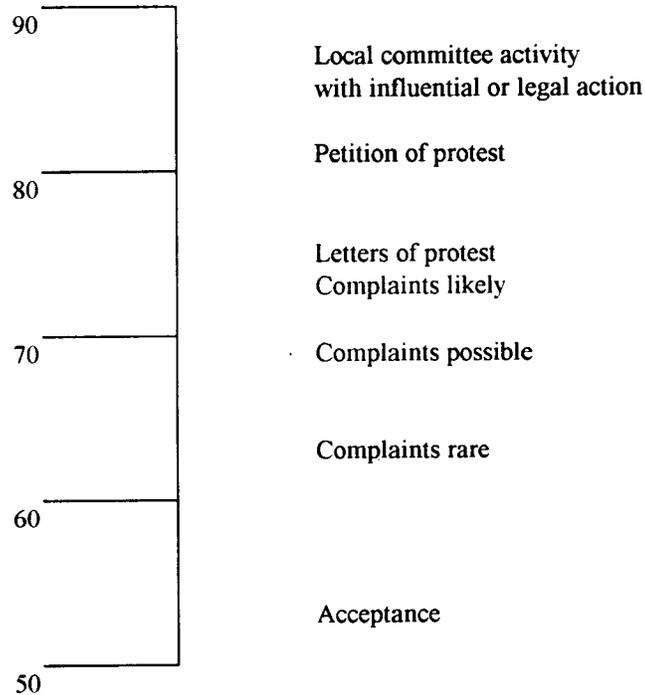
General Discussion of Noise Impacts

Noise may adversely affect human beings in a number of ways, including sleep disturbance, annoyance (interference with a broad range of human activities including normal and telephone conversation, concentration and relaxation) to more serious affects such as loss of hearing. The criteria by which to gauge the impact of noise includes the amount of annoyance based on noise level, the potential for interference with speech communication, and the probability of disturbed sleep due to noise (USEPA, 1981).

Actions related to noise impacts by residential communities are triggered by much lower levels than for those levels that may cause hearing damage. The trends in public reaction to peak noise near residences are illustrated in **Table 3-8** below.

Under existing conditions, the project site is subject to detectable noise levels generated by traffic on the surrounding roadways, particularly in the western portion of the property along Lake Avenue. Noise monitoring data within the site finds that the traffic along Pulaski Road and Lake Avenue generates the major source of residual noise. In addition, the event of a passing train increases the level of noise for approximately 45 seconds, with peak levels reaching more than 80 dBA. The intermittent levels of noise generated by trains do not present a health risk with regards to hearing loss however, noise levels in this range are considered an annoyance, since this level interferes with human activities (causing possible speech and sleep interference). According to the data presented in **Table 3-8**, this level, if persistent, would cause residents to protest against the source of noise.

TABLE 3-8
TREND OF PUBLIC REACTION TO PEAK NOISE NEAR RESIDENCES



Source: Rau, and Wooten, 1980

However, the fact remains that the presence of the railroad tracks is a feature of the existing landscape, which will be readily noticeable to any prospective homebuyer. The surrounding area is generally developed with numerous residential developments whose vacancy does not reflect an impact related to the presence of the railroad tracks. Thus, the presence of the LIRR tracks will merely be an additional factor for prospective homebuyers to consider before purchasing a home in this location.

Noise Impacts on the Proposed Project

The northernmost homes will be impacted most by noise associated with passing trains since there is no barrier to absorb or reflect noise. The worst condition will occur when residents are outside of their homes when a train passes, as the ambient noise level will increase from the ambient level

(± 53 dBA) to ±86 dBA based on observations and analysis. The houses further south will benefit from the location of the northerly homes, as these homes will create a partial sound barrier.

The project will involve the construction of an internal loop roadway with two cul-de-sacs, for use by the occupants of the dwellings. Vehicular use of the site will generate noise; however, the degree of impact is a function of the rate of speed of the vehicles. (**U.S. Department of Transportation, 1973**). Due to the direct relationship of speed to noise, it is expected that the slow moving vehicles within the site and area will not significantly increase noise levels in the community. This conclusion is based upon the fact that the noise level of a vehicle at 50 feet from the receptor, travelling at 30 miles per hour, is slightly above the noise levels expected at present and is within the range of a normal suburban setting. Further, the proposed landscaped buffer and park/open space that have been incorporated into the site design will provide for considerable noise retention, in accordance with the "*inverse square law*". It should also be noted that there are significant existing natural buffers that exist between the project site and uses north and east of the planned housing development.

The impact of site traffic upon the noise in the community is considered above. Other noise impacts associated with the residential use of the property would be related to the increase in the site activity and residential occupation of a currently vacant parcel. Some correlation of residential noise to density can be inferred through a general increase in noise levels when considering rural, suburban, and urban areas. The ambient noise levels between 30 and 40 dBA are consistent with a variety of residential densities. The density of the proposed development is consistent with other residential areas in the project vicinity.

Although the proposed project is expected to result in a greater degree of noise generated at the site, this noise is consistent with residential use, and is not expected to create a noise burden on the existing community.

Construction-Phase Noise

The noise impacts potentially associated with this project could include direct generation of noise on site from construction activities and increase in the usage of vehicles following construction. Construction noise will occur primarily on the interior of the site. Road construction will be short-term and will occur primarily during normal daytime, weekday hours.

3.8.3 Historic and Archaeological Impacts

Based upon the historic era subsurface evidences and surface indications found on the site, the Stage IB CRA recommends additional study, limited to the approximately 180' X 100' area at the extreme northwestern corner of the property. This study is intended to "*... determine the nature and significance of these finds and to properly map and document the surface features prior to their disturbance or obliteration by the proposed construction activity.*"

It should be noted that the majority of this recommended study area is located in the proposed park area, with the remainder in the side and rear yards of Lots 19 and 20. Subsurface investigation of these areas can be accommodated prior to or during the initial phases of construction.

3.9 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section of the DEIS is intended to identify those natural and human resources listed in the Environmental Setting section, which will be consumed, converted or made unavailable for future use, as a result of this project. The development of the proposed Harborfield Estates subdivision will result in irreversible and irretrievable commitment of resources. The importance of this commitment of resources is not anticipated to be significant, due to the fact that these losses do not involve any resources that are in short supply, semi-precious or precious to the community or region, or otherwise substantial.

It is difficult to quantify the exact commitment of resources, as the site will be subdivided and houses will be constructed at a later date according to demand. The following loss of irreversible and irretrievable resources is expected when the proposed project is implemented:

- Material used for construction on the site, including but not limited to: wood, asphalt, concrete, fiberglass, steel, aluminum, etc.
- Energy and resources used in the operation and maintenance of this project, including fossil fuels, electricity, water, etc.
- Commitment of natural habitat currently utilized by area wildlife for transient, hunting, foraging and nesting purposes.
- Commitment of land to a permanent land use that would preclude the use of the site as open space at a future date.
- Commitment of cultural resources including changes in visual character and traffic flow patterns.

3.10 GROWTH-INDUCING ASPECTS

Growth-inducing impacts promote further development in an area resulting from a specific project, or a combination of projects. A proposed project may result in direct impacts and/or secondary impacts. Projects which are likely to result in direct growth inducing impacts include those that are expected to cause a significant influx of customers to an area, the creation of a major employment center or institutional facility, installation of infrastructure improvements or the development of an industrial or retail center. Secondary impacts are considered those aspects of a project, which could act to stimulate growth or at least establish a precedent for present or

future growth in the area. Such impacts are considered as secondary because it represents the first step in the process, which could lead to growth in the future.

Based on the residential nature of the proposed project, and its location within an established, mature suburban area, it is not expected to directly or indirectly cause significant growth. There are not any remaining significant parcels available for development that will be impacted by the proposed project. The loop road system designed for the proposed project will be limited in terms of access, and will serve only the residences constructed in the subject subdivision. Therefore, future development will not be stimulated on abutting parcels. Further, the project does not result in the expansion of any new primary utility lines to property currently undeveloped.

It is also important to note that the project will generate an insignificant number of new residents, relative to the overall population of Greenlawn hamlet and the Town of Huntington. Further, the local community has established business districts that easily meet the needs of local consumers. As a result, new residents generated by the project will not increase the demand for new retail or local commercial service establishments in the local market area.

In conclusion, it is acknowledged that the approval of the proposed project will have certain potential on-site impacts, which have been discussed previously in this document. However, because of the project's location, the existing surrounding land use, and the size of the proposal, it is not anticipated that there will be any significant growth inducing impacts.

SECTION 4.0
MITIGATION MEASURES

4.0 MITIGATION MEASURES

This section is intended to identify viable measure, conditions, or techniques which can be employed to reduce the level of impact of the proposed project upon the natural and human environmental resources identified in previous sections of this report. The project involves first a change of zone, followed by subdivision approval to establish a road to homesites. The impacts of the subdivision have been analyzed, and several areas may present opportunities to further mitigate potential environmental impacts. The following provides a list of measures incorporated into the proposed project, as well as other measures that can be employed to reduce impacts.

4.1 GEOLOGY

- Excavation will occur in a manner that will avoid off site runoff.
- Excavated material will be used on site for filling and compaction of depressions where necessary to achieve a suitable grade for the intended use.
- Due to the presence of elevated arsenic levels in the topmost 6 inches of the site's soils, this layer will be removed in those areas anticipated to come into contact with residents. This material will be re-used in the roadbed, the landscaped berm and other appropriate areas. This will minimize the potential for adverse affects to residents from long term exposure to contaminated soils.
- Grading will be minimized as much as possible in connection with site development and construction. Vegetation will be left on the perimeter of the site within buffers and in the five acres intended to be used for the park/recharge area.
- Excavation, grading and establishment of future groundcover will occur as rapidly as possible to minimize loss of soils.
- A water tank truck should be available on-site during construction to wet excessively dry soils. Gravel strips can be utilized at site access points to clean truck tires and minimize tracking of sediments onto the highway.

4.2 WATER RESOURCES

- The combined sanitary flow from the individual lots should not exceed the maximum flow of 23,580 gpd allowed under Article 6 of the Suffolk County Sanitary Code. Design of the individual sewage disposal systems on site will also comply with regulations within Article 6 and design standards for on-site residential systems.

4.3 ECOLOGICAL RESOURCES

- Buffer zones on the perimeter of the site should be retained as natural areas. The subdivision will be landscaped in accordance with Town design specifications. The park area and buffers will be landscaped with indigenous species.
- Native and near native species which provide food and shelter to wildlife should be utilized in the landscaped areas where possible. This may encourage ongoing use of the site by avian species which would otherwise abandon the site. Species which might be utilized include the following: serviceberry, hackberry, dogwood, persimmon, American holly, red cedar, crabapple, mulberry, pin cherry, chokecherry, sassafras, mountain ash, devil's walkingstick, Russian olive, autumn olive, huckleberry, inkberry, juniper, honeysuckle, rye grass, redbud, and fescue.
- The proposed pond/recharge area could be planted using native and near native plant species if permitted by the Town Highway Department. This would provide additional wildlife habitat to help mitigate the proposed clearing. Facultative and obligate wetland species could be utilized if the pond were lined.

4.4 TRANSPORTATION

- The traffic generated by the proposed development will have an imperceptible impact on the overall operation at all of the study intersections, and thus, no mitigation is necessary.

4.5 LAND USE, ZONING AND PLANS

- The proposed project will be designed to comply with local land use plans and the proposed R-20 zoning designation. The project provides a five-acre community park that addresses the shortage of parkland in Greenlawn.
- The development and landscaping of the proposed site will be both functional and visually appealing and should complement existing development in the area of the site.

4.6 COMMUNITY SERVICES

- Tax revenues generated by the project development to the impacted developments will provide sufficient funds to reduce the burden on Town services, including fire and police protection.
- Security and fire alarm systems and sprinkler systems should be installed in the proposed buildings.
- Energy efficient design will be utilized where possible.

4.7 CULTURAL RESOURCES

- Utility lines will be installed underground to minimize visual impacts within the interior of the site. The separation distance between the proposed residences and the LIPA ROW is anticipated to be sufficient to minimize the potential for health impacts to residents, particularly as the NYSDOH recommendation refers to electromagnetic field strength at the ROW.
- Landscaping and site buffering will provide a visual buffer from adjacent roadways and uses. Site development will be appealing and will complement development in the area. Improvements to the site access road and park and buffer areas will include quality landscaping with statuary to provide visual focus and a unique setting.
- Construction and operation will occur during normal business hours to minimize noise impacts to surrounding areas. A few design details may be incorporated into the project to help mitigate the noise impact. For instance, construction materials which both deflect and absorb noise may be used in the northernmost homes. In addition, landscaping may be incorporated along the LIRR and property boundary. Over time, a row of mature evergreen trees may provide 2 to 3 dBA of noise attenuation. More importantly though, the incorporation of this wall of landscaping, (such as arborvitae or privet hedges) will provide a psychological benefit to the homeowners by creating a visual barrier between the property line and the railroad tracks. Otherwise, the presence of the tracks would be obvious as the homeowners make use of their rear yards.
- Additional study of a portion of the site has been recommended to determine the nature and significance of historic era cultural finds and to properly map and document other surface features prior to their disturbance or obliteration by construction. It should be noted that the majority of this recommended study area is located in the proposed park area, with the remainder in the side and rear yards of Lots 19 and 20. Subsurface investigation of these areas can be accommodated prior to or during the initial phases of construction.

SECTION 5.0
ADVERSE IMPACTS THAT CANNOT BE AVOIDED

5.0 ADVERSE IMPACTS THAT CANNOT BE AVOIDED

The site has been characterized, and the potential impacts to the existing site have been assessed. Some impacts may still exist for which no mitigation is available. The impacts themselves have been quantitatively and qualitatively discussed in previous sections. The impacts of the proposed project will be minimized where possible, but this section acknowledges those impacts that may still occur.

- Potential fugitive dust and construction noise resulting from construction of the project.
- Minimal grading and filling of portions of the site, which will permanently alter the natural topography. This will include construction of a recharge basin on site.
- Increase in the concentration of nitrogen in recharge as compared to current vacant site nitrogen load.
- Increase in the quantity of recharge entering the site as compared to the current site recharge.
- Clearing of much of the vegetation on the site.
- Although clearing will be minimized, there will be some displacement and/or loss of wildlife species, particularly those species unable to adapt to human activity, if present.
- Increase in traffic generation and vehicle trips on area roadways as a result of use of vacant land will occur, but the impacts can be minimized through proper planning.

SECTION 6.0
ALTERNATIVES

6.0 ALTERNATIVES

SEQRA requires the investigation of alternatives to a proposed project in order to determine the merits of a proposed project as compared to other possible uses. The discussion should be at a level of detail sufficient to allow for the comparison of various impact categories, for consideration by the decision-making agencies.

The project site is appropriate for discussion of several alternative plans, the analysis of these alternatives is presented in the following sections. **Plates 1, 2, 3, 6 and 7** have been utilized in the discussions of Alternatives 2, 3, 4 and 6. Each has been designed to be in conformance with standards contained in the Town document, "Town of Huntington Subdivision Regulations and Site Improvement Specifications".

6.1 ALTERNATIVE 1: NO ACTION

The No-Action Alternative is required under 6 NYCRR Part 617 SEQRA. If the proposed action is not approved, the site would remain as presently zoned, and the subject land would likely remain in a dormant state for the indefinite future, since the current zoning does not allow for a marketable housing development. This observation is supported by the fact that the property has remained undeveloped under the R-40 designation for many years, while housing has been developed throughout the area.

The anticipated recharge volume will continue to be 19.04 MG/yr, with a nitrogen concentration of 0.02 mg/l. The assessed value of the property will remain \$12,000, and the taxes generated by the site will continue to be \$18,351/yr (assuming the 1997-98 tax rates). Of this total, \$10,951/yr will be allotted to the Harborfields Central School District (HCSD). As no school-aged children will be generated by the site, there will be a net financial benefit to the HCSD of \$10,951/yr.

In this alternative, in the short term the site would remain vacant and provide a location for unauthorized dumping and use by all-terrain vehicles. The property may eventually be developed for residential purposes under existing zoning with one acre lots, or be subject to potential zone change applications for non-residential uses. Due to constraints on site use resulting from the mixed land use pattern in the area and the adjacent LIRR track line, it is likely that future proposals will be made for non-residential uses. In addition, the no-action alternative would not allow the objectives of the project sponsor to be met, and the economic and land use planning benefits presented in this DEIS document would not be realized.

6.2 ALTERNATIVE 2: DEVELOPMENT PER EXISTING ZONING

Development of the project site under the current zoning would result in the construction of 29 new residences (Plate 1), arranged along a single internal roadway connecting Pulaski Road and Lake Road. It is assumed that these would be market-rate units. The lots would average

TABLE 6-1
COMPARISON OF ALTERNATIVES

Parameter	Proposed Action	Existing Conditions and Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
General:						
Zoning	R-20	R-40	R-40	R-20	R-20	R-20
Yield (units)	59 (detached)	Vacant	29 (detached)	61 (detached)	70 (34 detached & 36 attached)	59 (detached)
Bedrooms	233	0	114	241	243	233
Coverages:						
Building (acres)	2.44	0	1.60	3.36	3.86	2.44
Impervious/Paved (acres)	3.77	0	2.23	4.50	4.41	3.77
Landscaped (acres)	28.09	0	30.83	26.44	26.03	28.09
Park/Pond (acres)	5.00	0	4.64	5.00	5.00	5.0
Natural Vegetation (acres)	0	39.3	0	0	0	0
Water Resources:						
Water Use/Wastewater Grntrn.(gpd)	17,700	0	8,700	18,300	21,000	17,700
Recharge Volume (MG/yr)	32.15	19.04	27.76	33.16	34.34	32.15
Nitrogen Concentration (mg/l)	5.08	0.02	3.94	4.96	5.28	5.08
Trip Generation:						
AM Peak Hour (vph)	51	0	25	53	61	51
PM Peak Hour (vph)	67	0	33	69	79	67
Miscellaneous:						
Solid Waste (lbs/day)	1,239	0	609	1,281	1,470	1,239
Residents (capita)	177	0	87	183	210	177
School-age children (capita)	110	0	54	113	114	110
Assessed Value (\$)	382,107	12,000	192,462	395,060	451,109	353,871
Cost for Education (\$/yr)	1,005,488	0	493,603	1,032,910	1,042,051	1,005,488
School Taxes (\$/yr)	348,715	10,951	175,643	360,536	411,687	322,946
Net Benefit (+/-\$/yr)	-656,773	+10,951	-317,960	-672,374	-630,364	-682,542
Taxes (\$/yr)	584,318	18,351	294,314	604,125	689,837	541,140

approximately one acre in area, in conformance with the R-40 designation. This alternative would include infrastructure including a recharge basin and Park area, though the park would be somewhat smaller than that of the proposed (3.67 acres vs. 3.9 acres). Slightly more acreage would be utilized for landscaping and buffers. This is a result of the greater individual lot sizes and their related capacity to provide private landscaped buffers. The depth of the rear yards for both the LIPA power lines (along the north property line), and Pulaski Road (along the southern property line), could allow for greater buffers.

The environmental impact of this reduced residential density alternative will vary insignificantly from the current proposal with respect to physical resources. The R-40 alternative would require less site clearance and disturbance for building, road and recharge basin construction (4.8 acres vs. 7.31 acres). With respect to the ecological resources on site, the standard R-40 subdivision would provide a similar amount of contiguous open space/park area for wildlife habitats and revegetation, relative to the proposed project (34.5 acres vs. 31.99 acres). The volume of recharge generated on the site will be increased by this alternative, due to the increases in impervious surfaces, the use of irrigation water and recharge of wastewater; a total of 27.76 MG/yr will be recharged. Nitrate/nitrogen concentration will be increased to 3.94 mg/l, which is not an excellence of NYSDEC standards.

In terms of traffic generation, the impact of the current proposed 59 lot subdivision was found to be imperceptible in the analysis conducted by Nelson & Pope. Since the R-40 alternative reduces the number of residences by thirty, this scenario should also not have an appreciable impact on local traffic conditions.

As is the case with the current proposal, the R-40 alternative would conform to the low-density land use recommendation contained in the Town of Huntington's 1993 Comprehensive Plan, and would be able to address the local need for additional recreational and open space areas in the local community. In terms of community services, as the assessed value of this alternative would be approximately half that of the proposed project, it would generate considerably fewer revenues to the impacted taxing jurisdictions. As the number of school-age children generated by this alternative would be 87, costs to the HCSD to educate these students would total \$493,603/yr. Since the school taxes paid by this alternative would be \$175,643/yr, there would be a net cost to the HCSD of \$317,960/yr.

The impact on cultural resources of the R-40 alternative would be similar to those described for the current proposal. From a visual perspective, the R-40 development would be observed in a similar fashion, with the exception of vantagepoints from the west and south. The open space and buffer areas along Pulaski Road and Lake Road would not be as extensive under the R-40 alternative, resulting in a less attractive site appearance and with unobstructed views of the development from the west and south. With respect to noise impacts, the lower density offered under the R-40 alternative would generate less ambient noise relative to the current proposal, however, there would be more retention of noise on site due to the increase in buffer and park areas. As stated earlier, site clearance and disturbance under the R-40 alternative would be similar as to that which would occur under the current proposal. As a result, the project site

would require the same additional studies and review to prevent negative impacts to historic resources.

In summary, the R-40 plan would result in similar environmental impacts associated with the physical disturbance of the site. However, the R-40 alternative does not have the positive impacts associated with the preservation of larger contiguous buffer, though the open space and park areas in this alternative are similar to those in the proposed project. As a result, the current proposal offers similar characteristics as the proposed in terms of meeting the open space needs in the Greenlawn community and preserving habitats for wildlife and revegetation. However, relative to the current proposal, the R-40 alternative offers less in terms of revenues generated to support local government functions.

6.3 ALTERNATIVE 3: R-20 SUBDIVISION

Plate 3 depicts a subdivision development of the site in accordance with R-20 zoning which would result in 61 residences, a 3.9-acre park and recharge basin. Vehicle access to Lake Road would be provided, and the Park would be located on the east side of the site, away from the noise and congestion along Lake Road. These would be market-rate units. The depth of the lots along the LIPA power lines and Pulaski Road would allow for greater buffers. This alternative would include similar infrastructure in terms of street improvements and a recharge basin as the proposed project, however less acreage would be dedicated to public open space, landscaping and buffers (31.44 acres vs. 33.09 acres). This is due to the two additional lots and additional vehicle access of this alternative.

The environmental impact of this increased residential density alternative will vary from the current proposal with respect to certain physical resources. This alternative would require additional site clearance and disturbance for lot development and site infrastructure (8.96 acres vs. 7.31 acres). With respect to the ecological resources on site, this alternative would not provide the extensive amount of contiguous open space/park area for wildlife habitats and revegetation, relative to the proposed project (30.34 acres vs. 31.99 acres). With respect to groundwater, this alternative would generate 33.16 MG/yr of recharge (slightly more than the proposed action), which will have the effect of slightly reducing the nitrate/nitrogen concentration, to 4.96 mg/l (despite the small increase in fertilized area in this alternative).

This alternative would result in approximately the same number of trips per day in terms of traffic generation, in comparison to the current proposal. As discussed in the Traffic Impact section of this document, an analysis conducted by Nelson & Pope found the traffic impact of the current proposal to be imperceptible. The addition of 2 homes most likely would not increase the traffic impact beyond the imperceptible range.

As is the case with the current proposal, this alternative would conform to the low-density land use recommendation contained in the Town of Huntington's 1993 Comprehensive Plan, though the density would be greater than either the proposed project or R-40 development. However,

this alternative would address the need for additional recreational and open space areas in the local community. In terms of community services, this alternative would generate more tax revenues to the impacted jurisdictions, relative to the current project. Net revenue gains would be realized with respect to all of the taxing jurisdictions, with the exception of the Harborfields School District. As a small increase in the number of school-age children would occur (113 vs. 110), the cost to the HCSD to educate these children would also be increased. Though the school district taxes paid by this alternative would be increased (\$360,536/yr vs. \$348,715/yr), this increase is not sufficient to offset the cost to educate these students: there will be a net cost to the HCSD of \$672,374/yr. In comparison to the proposed project, this alternative would result in a greater deficit in terms of revenues generated relative to associated costs of supplying education services to the development. This is a direct result of the projected increase in the number of school children that would be generated.

The impact on cultural resources for this alternative would be greater than those described for the current proposal. The open space and buffer areas along Pulaski Road and Lake Road would not be as extensive under this alternative, resulting in a less attractive site appearance with unobstructed views of the development from individuals viewing the site from the west and south. With respect to noise impacts, the higher density would generate additional ambient noise relative to the current proposal, and there would be less retention of noise on site due to the reduction in buffer areas. As stated earlier, site clearance and disturbance would be increased relative to that which would occur under the current proposal. As a result, the project site would require the same additional studies and review to prevent negative impacts to historic resources.

In summary, this alternative would result in additional environmental impacts associated with the physical disturbance of the site. However, this alternative does not have the positive impacts associated with the preservation of larger contiguous buffer areas as contained in the current proposal. As a result, the proposed project offers more in terms of meeting the needs of open space in the Greenlawn community and preserving habitats for wildlife and revegetation. Further, relative to the current proposal, this alternative offers more in terms of revenues generated to support local government functions. This is a benefit to all jurisdictions, with the exception of schools.

6.4 ALTERNATIVE 4: MIXED DETACHED AND ATTACHED UNITS

Plate 2 presents a Yield Map assuming the proposed R-20 zone, which results in 70 units for the site; no park would be provided, though a recharge basin would be present. **Plate 7** depicts clustered development of the site for this yield, using a mixture of attached townhouse (36 units) and detached single family units (34 lots). It is assumed that these would be market-rate units. Use of the cluster layout would enable inclusion of a park area, to be located along the westerly property line, near Lake Road. No vehicle access to Lake Road would be provided. These would be market-rate units. Fifty foot deep buffers along the LIPA power lines and Pulaski Road would allow for increased buffers on the north side of the site. This alternative would include similar infrastructure in terms of street improvements and a recharge basin as the proposed

project, however less acreage would be dedicated to public open space, landscaping and buffers (31.03 acres vs. 33.09 acres). This is due to the additional lots of this alternative.

The environmental impact of this increased residential density alternative will vary from the current proposal with respect to certain physical resources. This alternative would require additional site clearance and disturbance for lot development and site infrastructure (9.37 acres vs. 7.31 acres). With respect to the ecological resources on site, this alternative would not provide the extensive amount of contiguous open space/park area for wildlife habitats and revegetation, relative to the proposed project (29.33 acres vs. 31.99 acres). With respect to groundwater, this alternative would generate 34.34 MG/yr of recharge (slightly more than the proposed action), at a nitrate/nitrogen concentration of 5.28 mg/l (slightly more than the proposed project). This alternative would result in a somewhat increased number of trips per day in terms of traffic generation, in comparison to the current proposal.

This alternative would roughly conform to the low-density land use recommendation contained in the Town of Huntington's 1993 Comprehensive Plan, though the density would be greater than either the proposed project or R-40 development. However, this alternative would address the need for additional recreational and open space areas in the local community. In terms of community services, this alternative would generate significantly more tax revenues to the impacted jurisdictions, relative to the current project. Net revenue gains would be realized with respect to all of the taxing jurisdictions, including the HCSD. As a small increase in the number of school-age children would occur (114 vs. 110), the cost to the HCSD to educate these children would also be increased. Though the school district taxes paid by this alternative would be increased (\$411,687/yr vs. \$348,715/yr), this increase is not sufficient to offset the cost to educate these students: there will be a net cost to the HCSD of \$630,364/yr. In comparison to the proposed project, this alternative would result in a reduced deficit in terms of revenues generated relative to associated costs of supplying education services to the development. This is a direct result of the projected increase in school taxes paid outstripping the simultaneous increase in school district expenses for education of the students generated.

The impact on cultural resources for this alternative would be less than those described for the current proposal. The open space and buffer areas along Pulaski Road and Lake Road would be more extensive under this alternative, resulting in a more attractive site appearance with obstructed views of the development from individuals viewing the site from the west and south. With respect to noise impacts, while the higher density would generate additional ambient noise relative to the current proposal, the increased retention of noise on site due to the increase in buffer areas would provide an increased level of mitigation. As stated earlier, site clearance and disturbance would be increased relative to that which would occur under the current proposal. As a result, the project site would require the same additional studies and review to prevent negative impacts to historic resources.

In summary, this alternative would result in increased environmental impacts associated with the physical disturbance of the site. However, this alternative does include positive impacts associated with the preservation of larger contiguous buffer areas as compared to the current proposal. As a result, the proposed project offers less in terms of meeting the needs of open

space in the Greenlawn community and preserving habitats for wildlife and revegetation. Further, relative to the current proposal, this alternative offers more in terms of revenues generated to support local government functions. This is a benefit to all jurisdictions, including the HCSD. This project is not consistent with the objectives of the project sponsor, as the site owner is seeking to construct single family homes.

6.5 ALTERNATIVE 5: SETASIDES FOR AFFORDABLE UNITS

This alternative is identical to the proposed project, with the exception that 10% of the units (6) have been reserved for households with an income considered “low” and 10% (6) have been reserved for “moderate” income households, based upon the regional median household income. These 12 units would be indistinguishable in style and construction from the remainder of the units. There would be no physical differences between this alternative and the proposed project, and the only differences in impacts would be related to differences in taxes.

Because the assessed value of this alternative is somewhat reduced in comparison to the proposed project (\$353,871 vs. \$382,107), the taxes paid by this alternative will also be reduced (\$541,140/yr vs. \$584,318/yr). School taxes will be reduced (\$322,946/yr vs. \$348,715/yr) and, while the number of school-age children generated will be the same (110) and the cost to the HCSD to educate them will be the same, the net cost to the District will be greater (\$682,542/yr vs. \$656,773/yr).

**SECTION 7.0
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7.0 REFERENCES

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APPENDICES

**APPENDIX A
CORRESPONDENCE**

Appendix A-1
EAF Parts I, II & III

May 25, 1989

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 OLD FIELDS AT LAKE AND PULASKI			
LOCATION OF ACTION (Include Street Address, Municipality and County) NORTHEAST CORNER OF LAKE AND PULASKI ROADS; GREENLAWN, N.Y. DIST. 0400 - SECT. 105 - BLOCK 02 - LOT 29			
NAME OF APPLICANT/SPONSOR DICANIO ORGANIZATION		BUSINESS TELEPHONE (516) 366-4000	
ADDRESS 712 SMITHTOWN BYPASS			
CITY/PO SMITHTOWN,		STATE N.Y.	ZIP CODE 11787
NAME OF OWNER (if different)		BUSINESS TELEPHONE ()	
ADDRESS			
CITY/PO		STATE	ZIP CODE
DESCRIPTION OF ACTION ³⁴ CONSTRUCTION OF 36 SINGLE FAMILY RESIDENCES AND 36 ATTACHED RESIDENCES. OLD FIELD COMMUNITY WILL CONTAIN A CLUB HOUSE, OUTDOOR TENNIS COURTS AND A POOL. A RECHARGE BASIN WILL BE PROVIDED FOR ON SITE DRAINAGE. PROJECT WILL REQUIRE A REZONING FROM R-40 TO R-20.			

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 OLD FIELD

2. Total acreage of project area: 39.278 acres.

APPROXIMATE ACREAGE

Meadow or Brushland (Non-agricultural) _____ acres

Forested _____ acres

Agricultural (Includes orchards, cropland, ^{OLD FIELD} pasture, etc.) 75% 39.3 acres

Wetland (Freshwater or tidal as per Articles 24, 25 of ECL) _____ acres

Water Surface Area _____ acres

Unvegetated (Rock, earth or fill) RECHARGE BASIN ^{*} site manipulation _____ acres

Roads, buildings and other paved surfaces _____ acres

Other (Indicate type) LANDSCAPING _____ acres

PRESENTLY

AFTER COMPLETION

3. What is predominant soil type(s) on project site? H_aA- HAVEN LOAM

- a. Soil drainage: Well drained 100 % of site Moderately well drained _____ % 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 NY 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)

15% or greater _____ %

- 6. Is project substantially contiguous to, or contain a building, site, or district, listed on the State or the National Registers of Historic Places? Yes No
- 7. Is project substantially contiguous to a site listed on the Register of National Natural Landmarks? Yes No
- 8. What is the depth of the water table? 150± (in feet)
- 9. Is site located over a primary, principal, or sole source aquifer? Yes No
- 10. Do hunting, fishing or shell fishing opportunities presently exist in the project area? Yes No
- 11. Does project site contain any species of plant or animal life that is identified as threatened or endangered?
 Yes No According to NYS protected native plants
Identify each species NONE KNOWN
- 12. Are there any unique or unusual land forms on the project site? (i.e., cliffs, dunes, other geological formations)
 Yes No Describe _____
- 13. Is the project site presently used by the community or neighborhood as an open space or recreation area?
 Yes No If yes, explain _____
- 14. Does the present site include scenic views known to be important to the community?
 Yes No
- 15. Streams within or contiguous to project area: NONE
a. Name of Stream and name of River to which it is tributary _____
- 16. Lakes, ponds, wetland areas within or contiguous to project area:
a. Name UNKNOWN NAME (@ Lake Ridge) b. Size (In acres) 1.6 ±
- 17. 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
- 18. Is the site located in an agricultural district certified pursuant to Agriculture and Markets Law, Article 25-AA, Section 303 and 304? Yes No
- 19. 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? Yes No
- 20. 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 39.278 acres.
 - b. Project acreage to be developed: 30.00 acres initially; 30.0 acres ultimately.
 - c. Project acreage to remain undeveloped 9.3 acres. — *Doesn't match site description #A.1 - buffer area? park?*
 - 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 0; proposed 108±.
 - g. Maximum vehicular trips generated per hour 88 (upon completion of project)?
 - h. If residential: Number and type of housing units:

	One Family	Two Family	Multiple Family	Condominium
Initially	<u>36</u>	_____	<u>36</u>	_____
Ultimately	_____	_____	_____	_____
 - i. Dimensions (in feet) of largest proposed structure 2-STORIES height; 40' width; 50' length.
 - j. Linear feet of frontage along a public thoroughfare project will occupy is? 2,400 ft. ALONG PULASKI RD.
950 ft. ALONG LAKE RD.

3. Will disturbed areas be reclaimed? Yes No N/A
 - a. If yes, for what intended purpose is the site being reclaimed? _____
 - b. Will topsoil be stockpiled for reclamation? Yes No
 - c. Will upper subsoil be stockpiled for reclamation? Yes No *Doesn't match #A.1*
4. How many acres of vegetation (trees, shrubs, ground covers) will be removed from site? 30.0 acres.
5. Will any mature forest (over 100 years old) or other locally-important vegetation be removed by this project? Yes No
6. If single phase project: Anticipated period of construction 8 months, (including demolition).
7. If multi-phased: N.A.
 - a. Total number of phases anticipated _____ (number).
 - b. Anticipated date of commencement phase 1 _____ month _____ year, (including demolition).
 - c. Approximate completion date of final phase _____ month _____ year.
 - d. Is phase 1 functionally dependent on subsequent phases? Yes No
8. Will blasting occur during construction? Yes No
9. Number of jobs generated: during construction 20; after project is complete 5
10. Number of jobs eliminated by this project 0.
11. Will project require relocation of any projects or facilities? Yes No If yes, explain _____
12. Is surface liquid waste disposal 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 _____
13. Is subsurface liquid waste disposal involved? Yes No Type _____
14. Will surface area of an existing water body increase or decrease by proposal? Yes No
Explain _____
15. Is project or any portion of project located in a 100 year flood plain? Yes No
16. Will the project generate solid waste? Yes No *@ 6.36 lbs/cap./day @ 3 persons/hr*
 - a. If yes, what is the amount per month ~~20 tons~~ *20 tons/mo.* tons
 - b. If yes, will an existing solid waste facility be used? Yes No
 - c. If yes, give name TOWN LANDFILL; location EAST NORTHPORT
 - d. Will any wastes not go into a sewage disposal system or into a sanitary landfill? Yes No
 - e. If Yes, explain *Recycling prog!*
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) ELECTRICAL AND THERMAL
22. If water supply is from wells, indicate pumping capacity N.A. gallons/minute
23. Total anticipated water usage per day 21,600 gallons/day. *Doesn't include clubhouse or other amenities*
24. Does project involve Local, State or Federal funding? Yes No
If Yes, explain _____

- City, Town, Village Board Yes No
- City, Town, Village Planning Board Yes No
- City, Town Zoning Board Yes No
- City, County Health Department Yes No
- Other Local Agencies Yes No
- Other Regional Agencies SUFFOLK COUNTY Yes No
- State Agencies N.Y.S.D.E.C. Yes No
- Federal Agencies Yes No

ZONING CHANGE _____

SITE PLAN / SUBDIVISION _____

WATER AND SANITARY _____

SCDPW ROAD WORK, SCPC _____

S.P.D.E.S. PERMIT _____

L.I.R.R. should be contacted

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 REZONING
2. What is the zoning classification(s) of the site? R-40
3. What is the maximum potential development of the site if developed as permitted by the present zoning?

4. What is the proposed zoning of the site? R-20
5. What is the maximum potential development of the site if developed as permitted by the proposed zoning?

6. Is the proposed action consistent with the recommended uses in adopted local land use plans? Yes No
7. What are the predominant land use(s) and zoning classifications within a 1/4 mile radius of proposed action?
LAND USES- RESIDENTIAL AND COMMERCIAL / ZONING- C-1, C-12, R-20, R-40
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? 26 ~~28~~ ~~68~~ ~~61~~ ~~63~~
 a. What is the minimum lot size proposed? 15,000± (modified) *field study shows conforming R-20 lots*
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? *According to ?* 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

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 certify that the information provided above is true to the best of my knowledge.

Applicant/Sponsor Name _____ Date _____

Signature _____ Title _____

If the action is in the Coastal Area, and you are a state agency, complete the Coastal Assessment Form before proceeding with this assessment.

incomplete

ENVIRONMENTAL ASSESSMENT FORM
PART II & III

DICANIO RESIDENTIAL COMMUNITIES, INC.
CHANGE OF ZONE APPLICATION #89-ZM-255

SEQRA CLASSIFICATION:

Type I; pursuant to SEQRA [6 NYCRR 617.12(b)(3), 617.12(b)(5)(ii), 617.12(b)(9) and 617.12(b)(10)]; the action involves the granting of a zoning change, at the request of an applicant, for an action that meets or exceeds one or more of the Type I thresholds: action lies wholly within designated open space, exceeds 25 percent of the threshold of 50 units not to be connected (at commencement of habitation) to existing sewerage systems; and lies contiguous (was formerly part of) to a site that contains a historic building listed on the National Register of Historic Places. As a Type I action, a conditioned negative declaration per SEQRA 617.6(h)(1) may not be issued by the lead agency.

SEQR RECOMMENDATION: It is suggested that the DiCano Residential Communities, Inc. rezoning application be issued a positive declaration pursuant to SEQRA as it poses environmental impacts of a nature sufficient to warrant the preparation of an environmental statement to provide the additional information necessary to mitigate potential environmental impacts to the greatest extent practicable. As a Type I action for which coordinated review is required, the Planning Department distributed the necessary documentation to all involved agencies and the Town Board has since been duly established as lead agency for this review. This assessment considers the proposed action to entail both the requested zone change and the subdivision that would follow resulting in construction of residences. R. Caputi, representing the applicant, informed the Planning Director (2-23-90 letter) that experts had been retained and it was requested that the experts be given an opportunity to supplement the independent studies of the Planning Department staff. It is recommended that SEQRA provide the framework for such and that any additional information be presented in the form of a Draft Environmental Impact Statement in order to facilitate project review. The public hearing on the DEIS should provide the forum for any formal presentation to the involved agencies.

PROJECT DESCRIPTION:

The DiCano Residential Communities, Inc. application proposes a change in zoning for a 39.3-acre property from its current R-40 Residence District to R-20 Residence District. The subject site is bounded on the north by the L.I.R.R., on the west by Lake Road, on the east by lands owned and occupied by the Hazeltine Corporation, and on the south by Pulaski Road. The land is designated as parcel 0400-105-02-029 on the Suffolk County Tax Map. The proposed action is the development of residences at a density commensurate with R-

20 Residence District zoning. Of the two most recently-submitted yield studies prepared by Nelson and Pope, one shows 67 lots and a recharge basin; the other also includes a 10% parkland dedication and shows 61 lots. The applicant's consultant submitted Parts 1 and 2 for this SEQRA review. Part 2 is the responsibility of the lead agency and should not have been submitted. Corrections to the EAF Part 1 are noted thereon. Note the EAF specified 70 lots, while the applicant's more recent yield studies are for 61 and 67 lots.

The Planning staff reports attached hereto offer a detailed land use and zoning analysis for the site and discussion of environmental constraints, as well as a preliminary cultural resources assessment. Both are to be considered part of the EAF Part III. There are several other materials referenced that are relative to the SEQRA review.

Prior to the application for rezone to R-20, the applicant had requested an industrial rezoning. The site contains no structures but has been fraught by recent illegal dumping of construction, automotive, and household debris. The EAF Part I submitted by the applicant anticipates manipulation of 75% of the site. While the contrast between possible R-40 and R-20 development scenarios may not appear significant, development of 67 new homes in the manner proposed would cause a profound change to the condition of the land resource. Without more extensive study, the lead agency will not be able to qualify a lot yield determination. Such determination must be made by the lead agency upon finding that from among the reasonable alternatives thereto, the project is the one which minimizes or avoids adverse environmental effects to the maximum extent practicable. The Town Board does not ordinarily determine yield, the Planning Board does. However, in order for the Town Board to make a reasoned decision as required by SEQRA, a maximum dwelling yield must be known so as to weigh the alternatives.

NATURAL RESOURCE DESCRIPTION:

DiCanio Residential Communities, Inc. contains entirely successional (pioneering) meadow areas with some limited tree and shrub growth (scarlet oak, Norway maple, black cherry, autumn olive, flowering crabapple, bayberry, black locust, and smooth and winged sumac) mostly at its roadway perimeter and along the L.I.R.R. tracks, though young seedlings are pushing up throughout the field area. The predominant vegetation consists of herbaceous wildflowers and roadside weeds including, but not limited to: ragweed, daisy fleabane, yellow vetchling, cow vetch, hawkweeds, common milkweed, Indian hemp, spreading dogbane, field garlic, pokeweed, pasture rose, chicory, clovers (red, white, yellow

sweet), mayweed, common St. Johnswort, pale smartweed, tall and sow thistle, deptford pink, bindweed, toadflax, wild carrot, yarrow, spotted knapweed, English, common, and bracted plantain, curled dock, phragmites and gooseneck loosestrife. Grasses are interspersed throughout the site with the largest variety (timothy, downy brome, sweet vernal grass, etc.) existing within the path/dirt roadway along the L.I.R.R. line which contains small standing water segments. The land had been in agricultural use for many years with corn being the major crop, though it appears to have laid fallow for no more than five. From an aesthetic standpoint, the property provides an ever-changing palette of color as the field flowers blossom. Large numbers of ring-neck pheasant, barn swallows, crows, red-winged blackbirds, purple finches, field sparrows, mourning doves and rabbits were observed upon mid-day field visitation. Bob-white were heard, but not seen.

A 1.6 acre pond exists off-site to the immediate north of the L.I.R.R. line at the Lakeridge community. While the Lakeridge wetland is included on the tentative New York State Department of Environmental Conservation freshwater wetlands maps (see attached), and the pond is regulated by sections 137 (marine conservation law) and 171 (freshwater wetlands) of Town Code, the subject action should not affect the water resource directly. However, it is important to note that the proximity of the adjoining wetland area makes the old fields very attractive as a resting stop for migrating species, such as Canada geese.

IMPACT ON LAND:

1. Will the proposed action result in a physical change to the project site?

***Yes, Construction that will continue for more than 1 year or involve more than one phase or stage;**

The subject action is a rezoning that will result in close to a doubling in intensity of use. Planning staff study (7-90) has shown a potential yield at the existing R-40 zoning to be 29 lots; at R-20 to be 55 lots (though the applicant's studies show 61 and 67 lots). While the extent of physical alteration will be predicated not only on density, but also on design (scale, unit size, configuration, road layout), additional assessment is clearly necessary to confirm there is reasonable cause to amend the site zoning and that parameters may be established to diminish potential impacts. The anticipated raised yield would be corollary to expanded development with resultant increased: grading operations, disturbance to existing drainage patterns, imposition of impervious surface, loss of natural recharge area, removal of native vegetation,

effect to visual resources, higher traffic generation, and domestic wastewater impact to groundwater quality. All such impacts are likely to prove greater at a higher density use.

The applicant has proposed modified lots and attached units in a preliminary cluster plan at the proposed R-20 zoning. Planning Board policy dictates standards for cluster development in terms of set backs, separation of structures, drainage and grading. However, the SEQRA review must serve to establish special land features worthy of protection on properties proposed for subdivision. To protect significant elements to the greatest extent practicable, there is often the need to both restrict the lot sizes and to establish new standards that result in modified requirements.

Among the goals that should be tantamount to cluster development within Huntington is the maximization of common area retention. Two other cluster developments within Huntington, Hidden Ridge and Lake Ridge (both R-40) resulted in approximately 75% of the total site area being retained in common ownership. Hidden Ridge provided 46.25 by 96.67 feet (4,470.9 sf) lots; Lake Ridge provided 37.52 by 110 feet (4,127.2 sf) lots-- both being less than the minimum size proposed for the modified lots in the preliminary plans for the subject site. Both subdivisions were designed to effectively preserve the ecological integrity of the lands affected, while enabling the owner/developer reasonable use of property. While it may seem sizeable compared to the 10% setaside normally discussed by the Planning Board on subdivisions, the proposed 25% retention of common area/open space at the DiCanio Residential Communities, Inc. site is not in keeping with the examples set by either Hidden Ridge or Lake Ridge (50 feet north of the subject site across the L.I.R.R. line). The reviewer notes that these two cluster were not R-20 sites. For comparative purposes, there are no other R-20 clusters in the Town; therefore, the lead agency and the applicant will have to extrapolate the necessary correlations between unit size, lot size, and percentage of land reserved in common area to suit the site conditions and area needs.

For comparative purposes, the applicant must look at the nearby planned Huntington Glen and I.S.C. clusters. The 10-unit Huntington Glen cluster development will result in attached units on lots in two sizes: four internal units on 2,158 sf each and six end units on 3,237 sf each. Of the 2.488-acre parcel to be occupied, 1.735 acres (70%) will be held as common area. The I.S.C. (Timber Ridge Town Homes) change of zone allowed no more than 109 units on a 29.6-acre

parcel; unit sizes were not defined. The Timber Ridge Town Homes pre-application, prepared by Nelson and Pope and now undergoing review by the Planning Department, depicts end units sized at approximately 1,500 sf and internal units at about 1,250 sf. The FEIS for ISC (Table 28) approximated that 59.3% of the site would remain in common area and an additional 10% would be donated as parkland -- again, 70% not to be built on.

The argument is likely to be made that there is no single significant feature on the subject site requiring preservation as was the case with Lakeridge (pond) and Hidden Ridge (state-rare oak brush plains habitat). However, the subject site represents the last vestige of cropland/old field along the Pulaski Road corridor from Oakwood Road on the west to the eastern Town line. There are smaller sites now in nursery use and the Gildersleeve land (fallow far longer and well into woody growth) of note; however, the subject property is a highly visible remnant of a use that once dominated the landscape in the immediate site vicinity and along the Pulaski Road corridor. Meadows have clearly become the fastest disappearing habitat type in Huntington, the crop lands from which they sprung being nearly extirpated. Their significance in supporting local birds (especially ground-nesting species), insects, and small mammals is notable.

Section 281 of Town Law enables and encourages "flexibility of design and development of land in such a manner as to promote the most appropriate use of land, to facilitate the adequate and economical provision of streets and utilities, and to preserve the natural and scenic qualities of open lands." SEQR (617.3(b) "provides all involved agencies with the authority...to impose substantive conditions upon an action."

The proposed design concept of attached units and detached units on modified lots is being pursued elsewhere in Huntington (Hunting Hollow Farm) to save critical features. Any DEIS prepared should evaluate the grounds for such mixed use at the subject site. There are identifiable advantages of clustering and the pattern for attached cluster development (Huntington Farms/Huntington Glen, Lake Ridge, ISC/Timber Ridge Town Homes) and modification of lots (Timber Ridge) is consistent in the area. However, in the interest of best buffering development from the existing surrounding built community and the external influences that bear on the site (the L.I.R.R., the electrical transmission lines, the heavily-travelled Pulaski Road, the adjoining industrial uses), fully

attached cluster development should be considered among the reasonable alternatives to the proposed mix of modified lots less than 20,000 square feet in size and attached units.

The physical change to the site will ultimately be determined by the residential yield to be placed on the site. The applicant has submitted yield studies for consideration; however, the Planning Board has not yet confirmed the yield for the site and such is to be a critical determinant in SEQRA review. Of the 39.3 acres of naturally vegetated area on the site, the EAF Part 1 corresponding to the initially proposed yield of 70 units specifies a loss of 30 acres, with 2.0 acres to be used for a recharge basin, imposition of 8.7 acres of impervious surfaces and 19.3 acres of manipulated landscape.

The applicant should be required to present a Draft Environmental Impact Statement which includes a plan that clearly defines the area that must be disturbed (grading to provide usable back yards, front yards, driveways, as well as berms) to best accomplish the intended plan (limits of clearing) and alternatives to such plan diminishing impacts must be shown. Results of the floral study should include mapping the location of any protected species encountered. Measures to insure the perpetuation of connected wildlife corridors must be evaluated. The entire drainage shed providing water to and within the subject site must be mapped and volumes calculated to insure on-site stormwater control and avoidance of off-site impacts (i.e. runoff, erosion, etc.)

Prior to enabling any direct impact to the site, the applicant must prove that the action proposed will result in minimum feasible alteration or impairment of the natural contour, natural vegetation, wildlife resources, or the existing drainage circulation. Cluster development (attached or detached residences) within a specific sector of the site is an alternative likely to be more protective of sensitive areas than conventional development and should be encouraged.

2. Will there be an effect to any unique or unusual land form(s) found on the subject site? (i.e: cliffs, dunes, etc.)

*No

IMPACT ON WATER:

3. Will the proposed action affect any body of water designated as protected under Articles 15,24,25 of the NYS Environmental Conservation Law or Town of Huntington Marine Conservation Law?

*Possibly. The pond at the Lakeridge community, immediately north of the LIRR tracks, is a state-regulated wetland (#H-15). Any development of the DiCano site will not pose an opportunity for direct surface water runoff or siltation thereto due to the existing topographic conditions and elevated nature of the LIRR line which serves as buffer. However, there is a concern that development of the site, given the early successional nature of the vegetation, will raise substantial air-borne dust that may affect the conditions of the Lakeridge pond and the Town Organic Garden's ponds (also state-regulated) further north. The proposed action may have the secondary effect of construction resulting in siltation or other discharge into an existing body of water unless ample natural buffer zones are provided upon future subdivision and mitigating measures for control of fugitive dust are implemented.

4. Will proposed action affect any non-protected existing or new body of water?

*No

5. Will the proposed action affect surface or groundwater quality or quantity?

***Yes, Proposed action will require a discharge permit;
Proposed Action requires use of a source of water that does not have approval to serve proposed (project) action;
Proposed Action will adversely affect groundwater;
Proposed Action would use water in excess of 20,000 gallons per day;
Proposed Action will likely cause siltation or other discharge into an existing body of water to the extent that there will be an obvious visual contrast to natural conditions.**

*At the proposed density groundwater will be adversely affected. The proposed action lies within Hydrogeologic Management Zone I (providing significant recharge to the middle and lower portions of the Magothy aquifer), though not within a proposed special groundwater protection area or within the Core Watershed Corridor delineated by the Suffolk County Water Authority (SCWA). The FEIS prepared for the ISC Change of Zone Application indicates that the water table elevation at the DiCano site is approximately 65 feet above mean high water. Thus, depth to groundwater is approximately 160 feet. Predominant direction of horizontal groundwater flow in the vicinity is northward toward the Harbor.

There are well sites situated to the northwest (SCWA - Arnold Drive), due south across Pulaski Road (Greenlawn Water District which would likely serve the site), and due north (Greenlawn Water District - Buttercup Lane) of the DiCanio site. Whether these are public supply or monitoring wells should be determined in a DEIS. The Arnold Drive site appears to be most likely affected at only 1,200 feet downgradient from the subject site which may lie within the zone of capture/contribution for the supply well. Volume of sanitary disposal, direction of groundwater flow (both vertical and horizontal), soil geology, and depth and yearly pumping rate of wells possibly impacted must be assessed. Although the site lies within the supply area of the Greenlawn Water District, the Suffolk County Water Authority must be considered an interested agency and allowed an opportunity to comment on potential effects to their wells.

The proposed action may adversely affect surface (see above) and groundwater quality. The greater density residential use of the land will increase groundwater consumption and wastewater discharge thereto over development at the existing zoning and significantly more than the existing vacant site condition. In either scenario, the plans may be in conformance with the density equivalent of the Suffolk County Department of Health Services (SCDHS); however, it is not clear whether the wastewater generation denoted on the EAF (21,600 gpd) anticipates the full additional loading from the tennis courts, pool and small club house. Connected natural buffer zones, in concert with the recharge basin, should be planned to assure the retention of aquifer recharge area.

There are at least three approved SPDES (State Pollution Discharge and Elimination System) discharges within a half-mile radius of the subject site -- two from sewage treatment plants (Carillon Nursing Home and Paumanok Village), and one for the Hazeltine industrial complex neighboring the DiCanio property's east flank. The applicant should prove that the requested rezoning will not result in further degradation to the underlying hydrological resource supplying public water to the area and/or that measures can/will be taken to insure that impacts do not exceed conventional or cluster development of the site at existing zoning. Several measures were recommended by the Suffolk County Water Authority (W. Hazlitt, 12-1-89) for incorporation into any development of the ISC site. Although the site lies within the purview of the Greenlawn Water District, these parameters would appear equally applicable to future construction at the subject site:

"The use of fertilizers and pesticides on landscaped areas should be strictly controlled, if not eliminated all together, due to the close proximity of the project to the Broadway well field.

The use of potable water supplied by the SCWA for non-potable uses, such as landscape, irrigation or pond augmentation should not be allowed. Instead, the developer should be required to install a small well of his own for these purposes. This well could be sampled prior to the beginning of construction, then periodically afterward for Nitrates or any other contaminants so that the impact of this development on water quality in the area can be assessed.

Low flow plumbing fixtures and other applicable water-conserving devices should be fully utilized."

A recent Newsday article reported that the Greenlawn Water District is operating at diminished capability due to repair work in progress at some of its well sites and that it is advocating voluntary conservation measures, particularly relative to watering of lawns. Personal communication (R. Santoriello, 7-9-90) indicates that there is no supply problem and that the requested public cooperation is simply a matter of good judgement. The Greenlawn Water District should be requested to comment on not only whether the proposed action can be served, but also, what specific mitigation may be required to reduce water quality and quantity impacts of any development of the site. It should be determined whether the site may contain any abandoned irrigation well(s) that might be subject to removal or possibly, future reuse.

Residential use of the lands involved in the subject action may alleviate some existing threat to groundwater quality from any continued intensive agricultural usage of the site. Fertilizer application loadings are highest for agricultural crops and turf (i.e. sod farming). The LIRPB's "Nonpoint Source Management Handbook" indicates that approximately 25 percent of the nitrogen in fertilizer applied to agricultural crops leaches to groundwater. However, as proposed, the project will involve the maintenance of 19 acres of landscaped area which, without proper control, could be more detrimental. Certainly, any chemical usage in maintenance of ornamental plantings or lawn will differ from those materials used previously. Although there is scattered waste material dumped across the site, the Suffolk County Department of Health Services (J. Pim, personal communication, 6-20-90) informs

that the site is not noted on the Inventory of Potential Hazardous Dump Sites in Suffolk County.

The overall density of development at both the existing and the proposed zoning appears to be in conformance with Article 6 of the Suffolk County Sanitary Code. SCDHS' review (Wastewater Management and Office of Ecology) and approval of in-ground sewage disposal systems will seek to minimize impact. As an involved agency, the SCDHS shall be requested to participate in the scoping process to assure that all data necessary to weigh alternatives and make appropriate findings is forthcoming.

6. Will proposed action alter drainage flow or patterns of surface water run-off?

***Yes, Proposed Action would change flood water flows; Proposed Action may cause substantial erosion; Proposed Action is incompatible with existing drainage patterns.**

The proposed action is incompatible with existing drainage patterns. The proposed cluster and yield plans indicate a recharge basin at the southwest corner of the site. Pending impacts are to be directly related to the actual yielding and placement thereof. Upon such determination, potential impacts to area drainage will be mitigated by formal review and approval of grading and drainage and erosion control plans proposed for the subject property by the Engineering and Environmental Divisions of the Planning Department. Such review shall insure provision of adequate buffer area for natural recharge about the site and enable appropriate storm water collection (to include recharge basins) and return as required by Town Code and the Subdivision and Site Improvement Regulations.

It is significant to note that review of the Lakeridge and Timber Ridge subdivision files indicates the prevalence of hardpan soils in the area and clay lenses within close proximity of the subject property. There are indications of moist conditions along the northern portion of the site; however, this may be associated with runoff from the LIRR. The occurrence of clay lenses on the DiCano property may affect leaching capability of the soils relative to proper drainage for stormwater and sanitary disposal management. If there is an underground relation to the Lakeridge pond, excavation at the DiCano site may affect the quality of that resource and/or could cause drainage effect (localized

flooding) within the surrounding community. Hydrological analysis should be considered.

IMPACT ON AIR:

7. Will proposed action affect air quality?

*No; however, subsequent property development may pose minor, temporary impact to air resources through dust loading.

IMPACTS ON PLANTS AND ANIMALS:

8. Will the proposed action affect any threatened and/or endangered species? (as per Federal or State Law)

*Yes, Reduction of one or more species listed on the New York or Federal list, using the site, over or near site or found on the site;

Removal of any portion of a critical or significant wildlife habitat.

The native and naturalizing habitat at DiCano Residential Communities, Inc. is important not only in its immediate context, but also in its relation to other surrounding large open space parcels (Lake Ridge community common area, Town Organic Garden, Timber Ridge Park-Preserve) and vacant lands surrounding (west side of Lake Road, Hazeltine buffer area, and along the L.I.R.R.). Several visits to the site have not revealed a diverse avian population; however, all such inspections have been at mid-day. An early morning survey is likely to prove more productive. It is probable that the woody edge along the L.I.R.R. provides attractive habitat area that should be retained.

It is recommended that a site survey (inventory and mapping) be conducted by a botanist familiar with herbaceous species. As these figure most prominently on the revised state protected native plants listing, they should be searched for first. While only two state-protected species were noted during preliminary investigation (flowering crabapple and bayberry), additional protected plants may exist on site and it is recommended that a vegetative assessment be conducted during the late summer months. The existence of rare or unusual occurrences of botanical species (if identified) and the importance of the areas as a natural feeding or breeding area for local wildlife must be considered. Such evaluation should also serve to identify the local rarity of the individual habitat type (and the particular association thereof) at DiCano Residential Communities, Inc., and within Huntington Township, and whether suitable mitigation can be

incorporated to maintain a viable range of components of the habitat area while providing interconnected wildlife corridors with adjoining and nearby protected lands (common areas, designated buffers, recharge basins, schools, municipal garden, parks).

9. Will proposed action substantially affect non-protected, non-threatened or non-endangered species?

Yes, Proposed Action requires the removal of more than 10 acres of ... locally important vegetation.

The EAF Part I specifies that of the 39.3 acres presently in old field cover, only 9.3 acres will remain at project completion -- a 76% reduction of a single on-site cover type in a community nearly developed to the full capacity of its existing zoning. The DEIS must evaluate means by which this proposed loss can be mitigated, including, but not limited to alternative design (size of units, attached cluster, cluster on modified lots) and internal regulation (clearing limitations, restrictive covenants, scenic easements, etc.). Maintenance of a meadow component of the land, especially in tandem with the L.I.R.R. woodedge, would be desirable from a community ecology perspective. This would require a long-term commitment from the planned community, however, in terms of periodic mowing to control invasive successional species.

IMPACT ON AGRICULTURAL LAND RESOURCES:

10. Will the proposed action affect agricultural land resources?

***Yes, The proposed action would sever, cross or limit access to agricultural land ;
Construction activity would excavate or compact the soil profile of agricultural land;
The proposed action would irreversibly convert more than 10 acres of agricultural land;**

The site does not lie within a designated agricultural district nor is it in active cultivation. However, its soil classifications clearly indicate prime agricultural capabilities. The EAF Part 1 indicates HaA-Haven loam (0-2% slopes) which is clearly dominant. The Suffolk County Soil Survey indicates small segments of RhB-Riverhead and Haven soils (graded 0-8% slopes) and MfB-Montauk fine sandy loam (3-8% slopes) in association. The Haven-Riverhead association, located on outwash plains, comprises the largest area of farmland in the County. The eastern portion of the subject

site lies just south of a small area active agricultural land (north of L.I.R.R., west of Lake Ridge). Once the subject site is yielded for residential use, continuance of any farming operation might be viewed as a dual use of the land resource and therefore, precluded. The only feasible way to preserve the soil component of the site is to restrict clearing and maintain open areas on the parcel. Clustering can foster such preservation.

IMPACT ON AESTHETIC RESOURCES:

11. Will proposed action affect aesthetic resources?

*Yes, Proposed land uses, or project components obviously different from or in sharp contrast to current surrounding land use patterns, whether man-made or natural;
Proposed land uses, or project components visible to users of aesthetic resources which will eliminate or significantly reduce their enjoyment of the aesthetic qualities of that resource;
Project components that will result in the elimination or significant screening of scenic views known to be important to the area.

Direct impact will be determined by yield confirmation as the result of further analysis. The preservation of natural growth, and supplemental landscaping thereto, within the project's buffers will serve to maintain some of the ambiance of the existing view corridor. A 50-foot buffer is depicted between the modified lots and the LIRR property line; however, only 40 feet is depicted between the closest attached cluster. During review of the ISC project, the NYSDOT (J. Falotico, 9-19-89) advised that a "variable 40 feet - 80 feet wide tapered clear zone be reserved along the 1700 foot of tracks, which would accommodate future temporary railroad detour tracks and embankment slopes." Whether any similar need exists for the subject site or any LIRR improvements are planned should be investigated.

The size of the units anticipated and the existing gradient of the terrain virtually mandate the artificial manipulation of the site topography to provide suitable buffering. Berms with landscape plantings have been used successfully in the immediate area for such purpose (Huntington Glen, Lake Ridge). The future view corridors into and out of the site should be carefully assessed in design of the proposed project.

IMPACT ON HISTORIC AND ARCHAEOLOGICAL RESOURCES:

12. Will the proposed action impact any site or structure of

historic, prehistoric or paleontological importance?

***Yes, Proposed Action occurring wholly or partially within or substantially contiguous to any facility or site listed on the State or National Register of Historic Places.**

See attached Memorandum (C. Bolton, 5-14-90) regarding preliminary Cultural Resources Assessment. A Cultural Resources Assessment, "sufficient to rule out the occurrence of such resources [prehistoric aboriginal evidence]" should be conducted in accord therewith.

Review of the Lakeridge file reveals a letter from a local resident (12-27-82) inquiring: "Has the Planning Board ever looked into the history of this piece of property pertaining to Indian artifacts which have been found around the Lake and farm itself?" The basis for such query should be investigated for personal experience of community residents, to include the neighbor residing at 863 Lake Road. In an appointment with the Planning Board (see 1-5-83 minutes) "Mr. Hamilton advised that on a spot in back of the lake, they found a large amount of arrowheads, and he suggested that someone should investigate this who is knowledgeable about Indian artifacts to determine if there was an Indian village located here."

In recognition of the former Lake Road pickle works, a permanent marker should be installed on Lake Road with text defined by the Greenlawn-Centerport Historical Association.

IMPACT ON OPEN SPACE AND RECREATION:

13. Will the proposed action affect the quantity or quality of existing or future open spaces or recreational opportunities?

***Yes, The permanent foreclosure of a future recreational opportunity;**

A major reduction of an open space important to the community.

The subject site contains 39.3 acres and is included on the Huntington Open Space Index in its entirety (OSI #NW-32). A 10% parkland setback is specified on an amended yield plan; however, not on the proposed cluster plan. The Parks Department has indicated (R. Ford, personal communication, 4-18-89) that there is a need for at least a 10% park setback for future recreational playing fields suitably located on the subject site contiguous to the Hazeltine land for any proposed subdivision of the property. No impervious surfaces are anticipated relative to recreational use of a park area. Any DEIS prepared should include discussion of parks and recreation needs in the Greenlawn area. As a property

DiCanio Residential Communities, Inc. Rezoning

included on the Town Open Space Index. The Conservation Board should be considered a relative to SEQRA and given ample opportunity.

The Deputy Director of the Parks Department specifically noted that area should be set aside for playing fields that will not be lighted. C could be bermed (similar to the Lake Ridge community). From the planned and existing community, it should be little parking facilities, there should be little surrounding neighborhood. All alternative the DEIS should depict a 10% setback.

The subject site has an open space relationship park and "quasi-park" properties in the immediate area. It was shown in any DEIS prepared should depict. It was shown in the Comprehensive Parks Planning Study conducted by Vollmer Associates (1988) and recommended Board by Vollmer Associates (1988) and recommended acquisition as a potential regional active facility in its entirety.

The analysis prepared by Abeles, Phillips, and Partners to become the back-up documentation for the Comprehensive Update recognized a disparity between the share of parkland in Greenlawn, with only 6.5 acres of parkland provided per 1,000 residents, 3.5 acres per 1,000 residents. Among the recommendations contained within the Comprehensive Update is to encourage additions to the Town's parkland through the land use review process, particularly in underserved communities such as those identified in the Comprehensive Update, which also represent the older population centers.

When the applicant had previously applied for a subdivision of the site, in his 3-31-88 letter (file) Mr. DiCanio had corresponded that: "The DiCanio Organization would like to donate seven (7) acres of parcel in question to the Town of Huntington for development of soccer fields and or recreation and will grade said property for that express purpose. We are certain that the construction of soccer fields would benefit many Huntington Town residents..". T. M. Schiavone, Construction Administration of the DiCanio Organization (10-6-89) indicates that the lack of any parkland setback "stems from concerns of the residents that a park or soccer fields at this location would not be appropriate. These concerns were expressed at several meetings our organization has had with residents."

surrounding community and civic organizations."

The subject site has open space/recreational potential and the record already contains recommendations for park use thereof as an active recreational area (ball fields). Should there be sufficient community opposition to an active use area as represented by the DiCano Organization it would still be highly desirable to obtain a park setaside for passive purposes, essentially as a meadow area to be maintained for its wildlife value, contribution in natural recharge facilitation, and community buffering quality.

Although the Suffolk County Department of Public Works has recommended access to the site development from Lake Road, access to a public park setaside may need to be segregated and from Pulaski Road. If the SCDPW allows an access on Pulaski Road (possibly aligned with Tulane Place), this roadway may well serve as a dividing line between the planned housing community and recreational land. While neither the nearby Timber Ridge nor Lakeridge subdivisions involved a 10% land setaside in accordance with section 277 of Town Law, they did involve preservation of significant land components. There is a recent precedent (ISC - Timber Ridge Town Homes) in the relative vicinity of the subject site to require the 10% setaside and to allow the provision of private recreational amenities (pool, tennis court, clubhouse) to serve the immediate needs of the new development.

IMPACT ON TRANSPORTATION:

14. Will there be an effect to existing transportation systems?

***Yes, Alteration of present patterns of movement of people and/or goods.**

Although the difference in traffic impact of property development at the existing and proposed zoning is anticipated in the EAF Part I to be of small to moderate extent with the existing road sufficient to handle the additional project traffic, traffic generation from the 70 proposed new homes was anticipated as 88 new vehicular trips per hour. The location of proposed curb cuts/access roadways may prove a significant environmental issue. Sight distance must be evaluated, with the cooperation of the Traffic Safety Department, to provide the safest access to the property given the vertical alignment of Lake Road with the raised elevation of the L.I.R.R. (if a roadway is planned to originate thereon as shown on the applicant's intended plan). Tom Mazzola has commented on several rezoning requests that "In general, any rezoning which results in greater intensification of land use is detrimental

to the overall efficiency of our transportation network." The Suffolk County Department of Public Works has commented that "all access to this proposed development should be by way of Lake Road and not the more heavily travelled Pulaski Road. The Lake Road intersection with Pulaski Road is signalized and provides a safer access for the public." In his memorandum of 8-2-89, M. Paul Campagnola, Junior Civil Engineer, SCDPW, specified that a 17-foot dedication for future widening is requested along the entire frontage of the parcel on Pulaski Road and that all internal site improvements be with respect to the proposed widened line. Visual and noise mitigation and safety measures should be incorporated adjacent to C.R. 11." A 20-foot widening along Pulaski Road was included on the Huntington Glen plan.

Laura Palmer of the SCDPW (personal communication, 7-2-90) offered the following accident numbers for Pulaski Road's major intersections in the vicinity of the subject site: Lake Road 1987 - 3, 1988 - 3; Park Avenue 1987 - 26, 1988 - 17; Greenlawn/Cuba Hill Road 1878 - 6, 1988 - 13; and Broadway 1987 - 12, 1988 - 14. No accidents resulted in fatalities in any of the reported accidents at the four intersections. Given proper consideration to access placement (i.e. possible alignment with LILCO's access drive to provide maximal separation from the LIRR raised grade crossing), Lake Road should provide safe entry.

The FEIS for the ISC Rezoning (East Fifth Street, Huntington Station) analyzed several Pulaski Road intersections including Lake Road. The data presented therein showed overall level of service (LOS) of B and that 1992 projected volumes would carry an overall LOS degrading slightly to C with the pending action (ISC) included therein. Morning peak hour showed a total volume of 2,239 vehicles; afternoon peak hour a total volume of 2,319 vehicles. While any DEIS prepared will anticipate the volume of traffic to be generated by the proposed action in comparison to present conditions (no action), development as zoned (R-40), and other alternatives, it is also requisite that this evaluation consider the cumulative effects of other actions pending within the relative vicinity of the site -- ISC (a.k.a. Timber Ridge Town Homes), Hazeltine, Huntington Glen, etc. The provision of orderly and safe access for existing and prospective residents, ample parking to serve the needs of future residents, and emergency vehicle passage thereto, must also be closely evaluated. The impact statement should focus on not only differing residential design scenarios, but also, on reasonable alternative access provision as recommended.

The L.I.R.R. and L.I.L.C.O. must be requested to comment on future maintenance needs (access, possible easement area) along the railroad corridor.

IMPACT ON ENERGY:

15. Will the proposed action have an adverse effect on the communities sources of fuel or energy supply?

***Yes, Proposed Action will require the creation or extension of an energy transmission or supply system to serve more than 50 single or two family residences or to serve a major commercial or industrial use.**

The extent of impact will be determined by the eventual yield determination. Availability of supply must be confirmed by L.I.L.C.O.

NOISE AND ODOR IMPACTS:

16. Will there be objectionable odors, noise or vibration as a result of proposed action?

***Yes -- other impact -- site serves as a sensitive noise receptor due to adjoining rail and road traffic.**

Only temporary objectionable noise will be caused on-site during construction; however location of the site alongside the Long Island Rail Road tracks and Pulaski Road, subjects the property to serve as a sensitive noise receptor. The recent ISC FEIS stated that existing intermittent railroad traffic exhibited noise levels in the low 80's dBA range. The partially elevated nature of the railroad tracks along the northern portion of the property makes it difficult to significantly reduce on-site noise levels from the railroad. Noise levels may be reduced somewhat once the L.I.R.R. line is electrified to Greenlawn. The M.T.A. should be contacted to see if any relevant noise studies have been conducted.

Attenuation measures such as berming and specialized buffer plantings along this northern property edge, similar to those used at the berm and recharge basin at Lake Ridge (forsythia, black pine, hemlock, arborvitae, rugosa rose), should be evaluated. In concert with barrier measures to be implemented at the LIRR edge, placement of homes as far away from the railroad as is possible, can alleviate some of the railroad noise impact to be experienced by prospective homeowners. The development of the site will likely serve to attenuate some existing LIRR noise from homes across Pulaski Road. Barrier and/or vegetative measures should also be considered for

placement along Pulaski Road.

IMPACT ON PUBLIC HEALTH:

17. Will proposed action adversely affect public health and safety?

*Proposed Action may cause a risk of explosion or release of hazardous substances (i.e. oil, pesticides, chemicals, radiation, etc.) in the event of accident or upset conditions, or there may be a chronic low level discharge or emission;

Radiation

The subject property is surrounded on every perimeter by an existing or proposed generator of low-level frequencies that produce nonionizing radiation (the electromagnetic radiation resulting from transmission of a signal at frequencies between 30Hz and 300GHz). Rail electrification may be a further contributor. Nonionizing radiation is not benign; laboratory studies have shown a definite correlation to frequencies and health risks. There are tall power lines on all sides of the site (extremely high towers along the LIRR) and possibly underground lines along the LIRR (as LILCO manhole covers were noted in the dirt drive). LILCO's Greenlawn Operations Center (substation/office/warehouse/garage/storage area) is located immediately across Lake Road from the proposed development and Hazeltine (as publicized recently in Newsday) is proposing a new radar-testing laboratory for the facility just east of the subject site. Additional study is needed to ascertain the potential vulnerability of future site residents due to external influences (possibly beyond the control of the applicant). Assistance (data, standards, mitigation) should be sought from the U.S. Environmental Protection Agency.

Residual Agrichemicals

Within the past four years the Town has required soil analyses for all of the larger developments proposed on agricultural lands (former Wicks Farm, Froehlich Farm, DeLea-Ellgreen Sod Farm, McGovern Sod Farm, etc.) to ascertain the presence of residual farm chemicals. Prior to such investigation, site histories are sought to determine what was grown and what farm chemicals are likely to have been applied, thus to guide the probe. Such study (history and soil analyses) is recommended for the subject site to evaluate the persistence of residual pesticides and other agrichemicals in the upper soil strata. Rather than conduct an overall grid analysis; it is recommended that no more than six borings to a depth of 4 to

6 feet be taken at locations determined by the Environmental Review Division staff in cooperation with the Suffolk County Department of Health Services and the consulting archaeologist. Should testing of the soil samples identify any potentially significant health threat, mitigation measures must be considered to best avoid human contact. Additionally, such information can assist landscaping review later on as some persistent chemicals affect specific species and may actually contribute a lowered natural successional diversity on the property. No sampling of the site is recommended until the preliminary archaeological report is complete.

IMPACT ON GROWTH AND CHARACTER OF COMMUNITY OR NEIGHBORHOOD:

18. Will the proposed action affect the character of the existing community?

***Yes, Proposed Action will conflict with officially adopted plans or goals;**

Proposed Action will cause a change in the density of land use;

Proposed Action will replace or eliminate existing facilities, structures or areas of historic importance to the community;

Development will create a demand for additional community services (e.g. schools, police and fire, etc.);

Proposed Action will set an important precedent for future projects;

Proposed Action will create or eliminate employment.

See Planning staff report (attached) establishing that there are valid planning criteria to substantiate further consideration of the rezoning proposal. It is considered that the proposed action may provide a transition area to bridge the existing higher density zoning (R-20 and R-10) to the south and industrial zoning to the west and east with the lower density zoning (R-40) to the north. Any DEIS prepared for the subject site should include an aerial photo with zoning and land use information superimposed.

19. Is there, or is there likely to be, public controversy related to potential adverse environmental impacts that may result if the proposed action is implemented?

***Yes, there is considerable public controversy over the proposed action.**

Petitions in opposition to the requested rezoning carrying the signatures of over 330 Town residents have been submitted on behalf of the Old Field Home Security Council and Civic

DiCanio Residential Communities, Inc. Rezoning (#89-ZM-255) - SEQRA

Association, Inc. Additionally, there are citizens requests that previous letters of opposition to the earlier industrial rezoning application be transferred to the present file and reconsidered.

Signed: _____, Senior Environmental Analyst
Date: July 12, 1990

**Appendix A-2
Town Planning Department memo**

May 14, 1990

TOWN OF HUNTINGTON
PLANNING DEPARTMENT

Inter-Office Memorandum

DATE: May 14, 1990

TO: Margo S. Myles, Senior Environmental Analyst,
Environmental Review Division

FROM: Charla Bolton,  Planner, Planning Division

RE: **DI CANIO ZONE CHANGE--SEQRA Review**
Preliminary Cultural Resources Assessment

The information below concerns the cultural significance of the Di Canio property. The sources upon which the information is based are property atlases dated 1858, 1873, 1909 and 1917 and the U. S. Coast Survey (T-45) Central Long Island dated 1836-1838.

The Di Canio property lies contiguous to the National Register Ireland-Gardiner farm which is north of the Long Island Railroad tracks on the east side of Lake Road . A portion of the property listed on the National Register is now developed with the Lakeridge condominium complex. The attached map shows the boundaries of the property listed on the National Register. Prior to 1868, when the railroad ran through to Greenlawn, the Ireland-Gardiner farm and the Di Canio property shared a common property line. According to the New York State Building-Structure Inventory Form, in 1868 Alexander S. Gardiner purchased the Ireland -Gardiner farm, forming a single holding of over 600 acres extending from the Lakeridge property on the north to Little Plains Road on the south. The Ireland farm was later devised to a Mrs L. Colyer (a Gardiner) and is still owned by a member of the Gardiner family. Although physically separated from the National Register assemblage by the Lakeridge development, historically, there is both contiguity and common ownership with the Di Canio property.

According to the 1909 and 1917 E. Belcher Hyde property atlases the Di Canio property was the site of the Greenlawn Pickle Works, established by Alexander S. Gardiner in the late 1870's. From the latter half of the Nineteenth Century until the 1920's the growing of cucumbers and cabbages for pickling was a major local cash crop, and undoubtedly the processing of pickles employed a large number of area residents. The pickle works on Lake Road are a significant part of Huntington's agricultural and economic history, and is one of the earliest industries to emerge with the coming of the railroad and the opportunities for transport that it afforded. Relying as it did on agricultural output, pickle processing was transitional in an economic sense between the previous agriculturally based economy, and later non-land dependent economic activities. The 1917 atlas shows a railroad spur from the

DI CANIO ZONE CHANGE
Preliminary Cultural Resources Assessment
May 14, 1990
Page Two

main track bed which runs along the length of the pickle works buildings. This spur is physical evidence of the dependence on the railroad for transporting processed pickles to market.

The growth and development of the Greenlawn Village Business District is in part due to the thriving of the pickle industry during the late decades of the 19th century and the early decades of the 20th Century. One of the early developers of Greenlawn was Samuel Ballton, a black man and former slave, who initially amassed his income by growing cucumbers for the pickle industry. Three of the houses he later built on speculation still stand in Greenlawn Village.

The pickle works were located south of and contiguous to the railroad tracks, just east of Lake Road. The 1909 atlas shows four structures on the DiCanio property. The 1917 atlas shows the footprints of three structures and the aforescribed rail spur. The attached drawing, dated about 1880, and photograph obtained from the Greenlawn Centerport Historical Association depict several of the structures associated with the pickle works. These structures were taken down probably in the 1940's, well after the pickle works had ceased to operate.

Since there are drawings and photographs, as well as historical accounts of the pickle industry in Greenlawn at this site as well as elsewhere, there is of limited utility to order a cultural resources assessment to provide further historical information regarding the pickle works. However, I believe it would be a contribution to the cultural enrichment of the citizens of the Town of Huntington, and especially the residents of Greenlawn, for the developer to provide for a permanent marker at the site describing its significance. The marker should be the same as other Town historical markers and the text should be prepared with the advice of the Greenlawn-Centerport Historical Association.

Based on the prehistoric findings at Timber Ridge, an inland, dry, flat, heavily cultivated site with no archaeological site files near it, and the relatively higher probability of finding prehistoric remains at the Di Canio property due to the presence of a significant surface water body (the lake on the Lakeridge property) nearby, I suggest that a cultural resources assessment sufficient to rule out the occurrence of such resources be conducted on the Di Canio property. During the subsurface survey, if significant historic resources are encountered, these should be included in the archaeologist's evaluation. *

cc: Jack Condon, Deputy Director of Planning

From Days Gone By

The prevalent use of brass utensils to give pickles a fine colour" caused concern as to contamination of pickle products with copper. Stone jars were recommended as best and the suggestion made to avoid "this pernicious custom. . . by heating the liquor and keeping it in a proper degree of warmth before it is poured upon the pickles to aid in retention of preferred color.

Test to detect copper in pickles:

"Put some of pickle cut small into a phial with 2-3 rachms of liquid ammonia, diluted with 1/2 quantity of water. Shake. If copper is present, the liquid will turn fine blue color."

From MacKenzie's 5000 Receipts in all the Useful and Domestic Arts, 1831

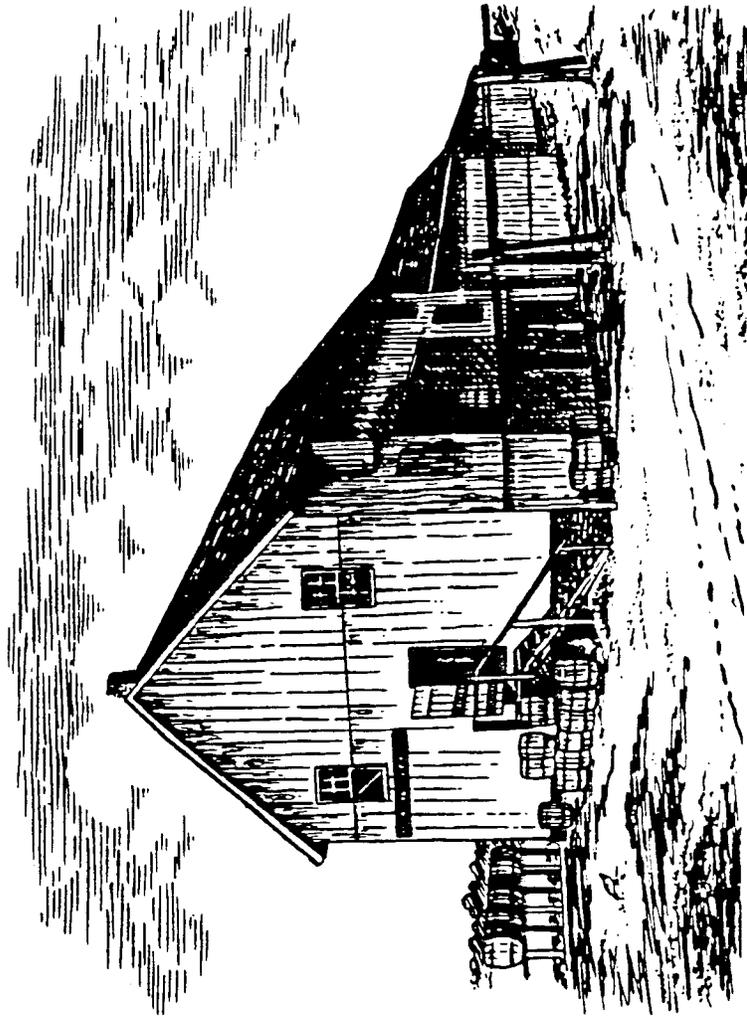
"The manufacturers say so little copper. . . now enters the pickles that there is no danger to a moderate consumption of them from its use. Uncolored pickles also find a ready market."

Long Islander, 1883



Compiled and written by the
Greenlawn-Centerport Historical Association
1977

THE PICKLE INDUSTRY in GREENLAWN Including Old Family Recipes



Greenlawn Pickle Works near Lake Road, c. 1880

HUNTINGTON HISTORICAL SOCIETY
HUNTRINGTON, L. I., NEW YORK

the history of the country, processors arriving by Long Island Railroad to vacation at the popular summer resorts and boarding houses of Centerport were welcomed to Greenlawn Station by redolent odors from the local pickle works. At that time, "pickles" (i.e., cucumbers 4" in length) and cabbages were lucrative cash crops for the local farmers, and several processing plants were located along the railroad tracks in Greenlawn. Although urban development has replaced the pickle and cabbage fields, and the pickle works have been long demolished, the industry is still vividly remembered by many local people. Their recollections, which follow, provide a discriminating chapter of local history.

Before the railroad was extended through Greenlawn in 1888, the pickle and cabbage farmers of this area had to ship their produce to Hicksville or further west. It was probably in the 1870's that processing plants were opened at Huntington Station (then called Fairgrounds). In the early 1880's, Mr. Alexander Gardiner, whose farmhouse was on Park Avenue near Lake Road, built several buildings on property along the south side of the railroad just west of Lake Road. In these, he rented space to several processors of pickles and cabbage. Among these were Caplin Post, the Demain Bros., and several others. These processors would, in some cases, contract with the farmers in the Spring for purchase of their crops at a set price. Those farmers not wishing to contract in advance would sell their produce at the price in effect at time of delivery.

In Greenlawn Village, the pickle works (built near the current location of the oldest Hazeltime plant) was first operated by Alart and McGuire, who also had a plant at Riverhead. Later, Abraham Golden came here from Brooklyn, and for a short time operated at Lake Road and then took over the Greenlawn Village operation. This was enlarged, and after Golden's death, his son Hyman continued the business.

The pickles were picked in mid-July through late August and were delivered to the processing plants by the farmers. They were sold at a fixed price-per-thousand, and while the farmers made an actual count before delivery (large wooden barrels), the full wagons were weighed at the pickle works and weighed again after unloading to determine the net weight of the pickles. In this way, the

processors could determine the approximate number of pickles in each load. In the early 1900's, the price paid the farmer varied from \$1.50 to \$2.75 per thousand in most years. The pickles were put through different brining processes depending on whether they were to be made into dill pickles, sweet pickles, sour pickles, etc. Then they were shipped to New York and Brooklyn in heavy wooden casks.

The cabbage season came later, and the cutting of the heads of cabbage in the fields started in late September and continued into October. The farmer carted the cabbage to the plants in farm wagons fitted with special cabbage racks. Heads of cabbage were sold by the hundred and also by weight. In the early 1900's the price paid to the farmer ranged from \$2.00 per 100 head and up, occasionally going as high as \$6.00. At the plant, the cabbage was cored, sliced, and put into large wooden vats where it was salted and brined, and trampled by workers into sauerkraut.

In the 1920's, a disease called 'white pickle' afflicted the Long Island crop. The pickle would grow to only about 2-1/2 inches in length, then turn white and become very hard. Since no remedy could be found, the farmers had to stop planting, and that marked the end of pickle growing in this area. Although the processing plants continued to make sauerkraut for a few years, this operation was discontinued in the 1930's, and the local processing plants were abandoned.

"Firm of Alart and McGuire are having three more large tanks built, to accommodate 2 million more pickles than last season."

from the Long Islander July 28, 1888

...the great secret in growing cucumbers consists in this shortening of the main vine and the encouragement of the laterals." The main vines bear male or staminate flowers which are barren of fruit. The side branches bear pistillate or productive flowers.

From How the Farm Pays

by William Crozier & Peter Henderson 1902

BUYHOOD RECOLLECTIONS OF PICKLE FARMING

From an interview with Russell Brush

es: How was the field prepared for planting?
ss: You had to put manure on the fields first. And then plow them. And then harrow them. Smooth off the furrows, and then when planting things like pickles, you marked out the rows. You had a long marker, just a wooden thing with six runners on the bottom that made rows [in a grid pattern]. These were set at the right distance for the things you were going to plant, so that wherever the two rows met, that's where your plant went, so you didn't have to do any measuring when you were out there. So when the seeds came up, they had to be cultivated every few days. All the work on our farm was done by horse. We never had a tractor, and cultivating was a one-horse job. It pulled this cultivator; you put the reins around your back and held on to the handles and saw to it that it didn't take out the plants, but it was walking up one row and down the next, down the next, all day long.

es: The seeds for the pickles - were they planted by hand?

ss: Yeah, they were. We carried a bag over our shoulder; it was a cloth bag. You'd reach in, take a handful, and you'd go along, and in the spot that was marked, you'd make a little hole with your foot and drop in about six seeds, kick in the dirt with your foot and just stamp on it, then move on to the next mark; they were usually 2-1/2 feet apart. That was the only thing that was planted that way, actually was pickles, as I recall.

es: Then you fertilized while they were growing?

ss: Then you fertilized; that was the next procedure. Of course, you kept cultivating all the time, because the weeds always grew faster than the plants. But we used to have to go to the railroad siding to get the manure. It came forty tons to a car from the stables and streets of New York City, and a farmer would order a whole car load, and you'd have

to go by farm wagon, take a load home, spread it in the fields, go back for another load. Sometimes it would take three or four days just to unload a freight car.

Ques: Did you have any bugs that would eat the crops?

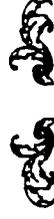
Russ: Some things had to be sprayed. Pickles had to be sprayed. Blue vitriol spray - that was poison to insects that got on the pickle plants. They were sprayed about three times during the growing season.

Ques: Were there different kinds of pickles you raised?

Russ: Just one kind. The pickles were picked when they were about four inches long, and they were sold by the thousand. They were picked from the vines, in half-bushel baskets, and carried up to the end of the rows and dumped in piles. And when we finished the picking, we would sit down along side these piles with the same baskets again and bring the wagon in with about sixteen wooden barrels on it, and we would count them by fives. We would pick up three in one hand and two in the other hand and dump them in the barrel when you got your basket full. You always knew [how many] because you put your count with chalk on the side of the barrel.

Ques: I suppose you hoped you had a hired-hand during the picking season.

Russ: Oh, that was more or less normal work on a farm—picking things like that. I never minded that—picking pickles or cutting cabbage. It was always stoop-over work. You were always bent over; you hardly ever straightened up as you went down the row of pickles.



PICKLE SEED

The subscriber offers for sale 100 pounds of choice Green Prolific Pickle Seed. Guaranteed true to name. Grown by me for four successive seasons.

ALEXANDER S. GARDINER

ALEXANDER S. GARDNER
GREENLAWN'S PICKLE PIONEER

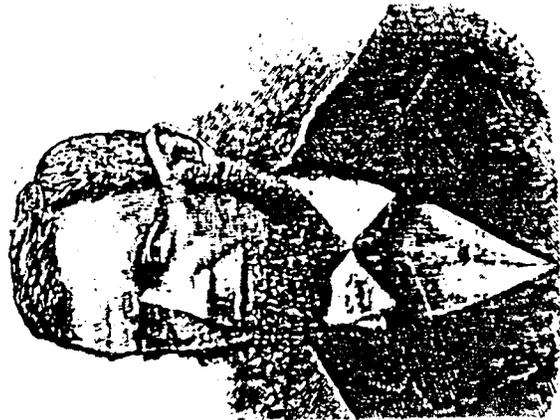
(1835 — 1914)

One of the first area farmers to see the advantages of "pickles" as a cash crop was Alexander Gardiner, whose estate, "Gardiner's Lake," at one time comprised 600 acres west of Greenlawn village. This energetic and interesting man brought to pickle growing the same enthusiasm that marked his varied career.

A descendant of the Gardiner family of the East End of Long Island, Alexander Gardiner was born on March 4, 1835, to Joel Gardiner and Fannie Smith of Greenlawn.

When he was fourteen, his father died, leaving young Alexander to go to school in the winter and work on the farm during the summer. From his early years, he was endowed with tools of all kinds. While yet a boy, he had a blacksmith shop which he expanded as he got older, gradually learning to make and repair the different parts of all farming implements.

Married at age twenty-three, Gardiner bought eighty acres of undeveloped land from his mother, cleared it, and began farming on a small scale. During the early years of the Civil War, he built a cider mill which was, at one time, the largest on Long Island, and in 1864, he built a mill capable of turning out large quantities of oak and stunted lumber for boat building. The sawmill proved to be so profitable that he began to furnish shipbuilders with take an interest in the vessels as part of his payment, tinuing, meanwhile, to expand his farming operation by purchasing land which ran north to the railroad tracks and



In 1874, Gardiner's barns and mills were destroyed by a fire which the newspapers of the day called "the largest destruction of farm property by fire ever known on the island." The burned buildings covered over 8,000 square feet of ground and incurred a loss of \$12,000, of which only \$3,000 was covered by insurance. Undaunted, Gardiner had rebuilt everything before six months had elapsed.

Still expanding his ventures, in 1880, Gardiner purchased two-hundred acres on Long Island Sound, and taking advantage of the fact that the lands were rich in clay and moulding sand, he built a brickyard which operated for many years. The pickle works, which he built on his property adjacent to the railroad, processed not only the pickles which were grown on the Gardiner farm but also the pickles grown on many of the neighboring farms.

Additional Gardiner ventures included a gristmill, an ice-cutting and storage operation, and a windmill, making Alexander Gardiner seem to be a rural "Renaissance Man."

SAMUEL BALLTON

THE PICKLE KING OF GREENLAWN



Samuel Ballton (1838-1917), successful farmer, astute businessman, believer in progressive ways, and promoter of Greenlawn, earned the title "Greenlawn Pickle King" when he raised 1,500,000 pickles in one season.

He was born a slave on a plantation in Westmoreland, Virginia. In 1861 he married a slave on a neighboring plantation, and when the Civil War broke out, the thought of freedom for himself and his wife became "uppermost in his mind." However, Ballton, with other able-bodied slaves, was

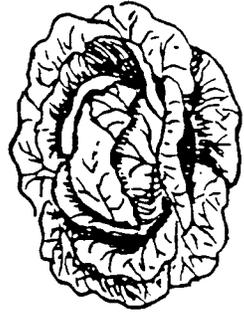
He went out to work as a section-hand on the Virginia Central Railroad in the Blue Ridge Mountains. Managing to escape, he obtained a job as a cook with a Northern regiment. So great was his desire to see his wife that he risked capture and stole back to see her. Meeting up with rebels, "he put on a bold face and told the rebels he had been captured by the Yankees, but had escaped and was going back to his 'old massa.'" Although unable to take his wife with him, he escaped North a second time, but returned to her again soon after. This time he told her, "Rebecca, I'm going to take you to freedom." They walked 50 miles in 14 hours to Fredricksburg and freedom. Later, Ballton enlisted in a Massachusetts regiment and saw action at many key battles.

Ballton came to Greenlawn in 1873, taking a job as a farmer with Charles D. Smith. Later Ballton sharecropped on the Alexander Gardiner farm and was highly successful as a grower of pickles and cabbages. Working for a while as a buying agent for a large Boston pickle house, Ballton earned 10¢ per thousand for all he purchased and was able to acquire some capital.

Always ambitious, "possessed of a competence. . . acquired by hard knocks and. . . good common sense," Ballton began to develop land and build houses locally. He tried to encourage the development of Greenlawn, an area which he characterized as the most beautiful village along the North Shore railroad tracks. He borrowed money from local farmers, bought land, improved it, and sold it at a small profit. Ballton brought workers up from the South to work on the farms in summer and to build houses in the winter.

Still standing are several of the houses he built— at 77 Boulevard, on the NE corner of Gaines and Smith, and the first two houses on the north side of Smith Street, west of Broadway.

(Information for the articles was taken from materials in the Museum Archives.)



SALTED CUCUMBERS FOR FUTURE USE:

Cucumbers picked fresh from the vine, every day, be preserved in a strong salt brine and when wanted, be made into sweet, sour, or mixed pickles. Leave for 1/4 to 1/2 inch stem on cucumbers, wash carefully with removing prickles, put them, as they are gathered, in a large stone crock. Make enough brine to half-fill crock. Brine will completely cover the pickles. When ready to use soak in cold water until freshened.

Brine: For every 2 qts. of water, mix 2 cups salt (or enough salt to float an egg). Boil, then skim un- clear. Cool.

PICKLING TIPS: Use fresh, unwaxed, cucumbers. Use only pickling or kosher (un-iodized) salt. Do not use aluminum utensils.

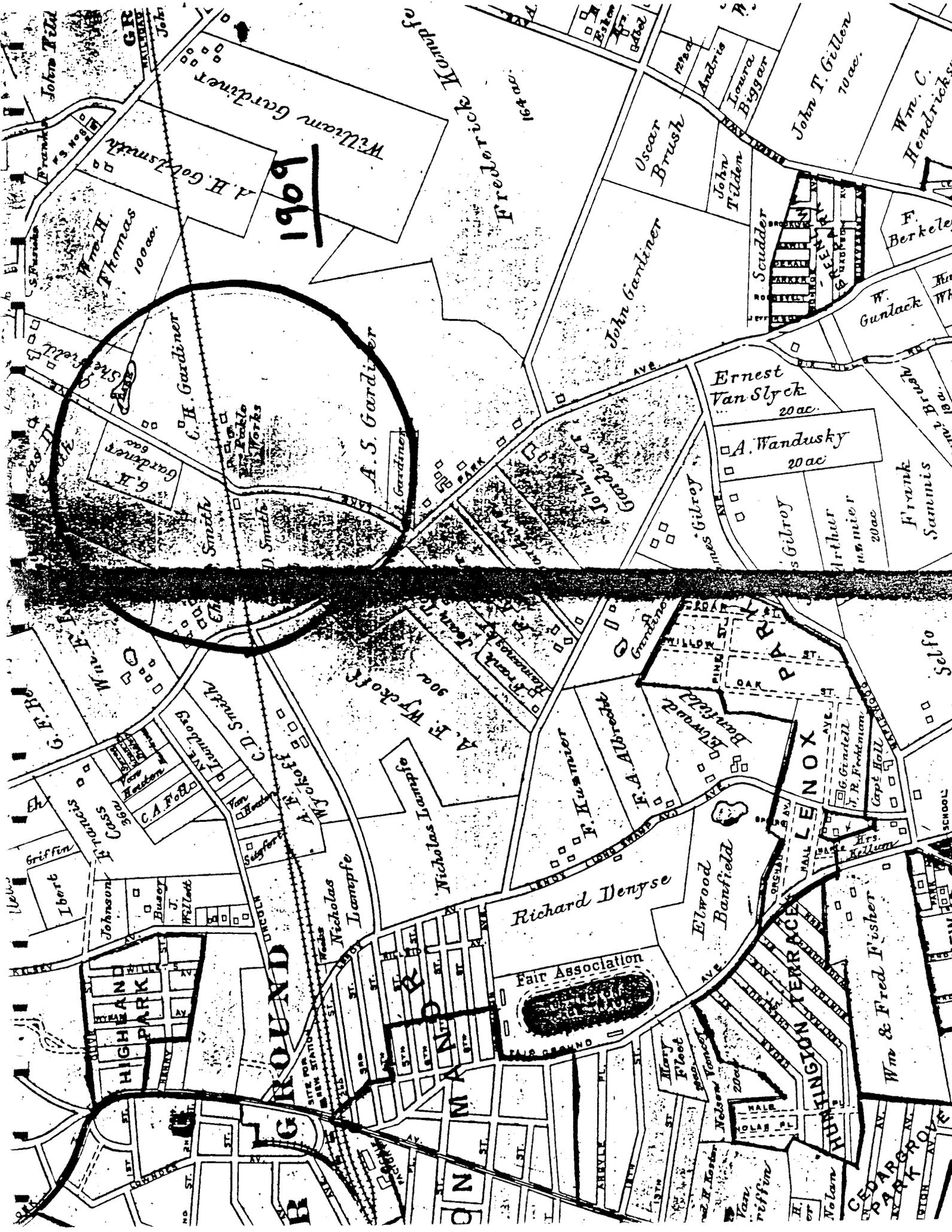
RECIPES

SPICED BEETS

submitted by Helen M. Tuthill

1 qt. of cider vinegar	1 tsp. colves
2 cups of sugar	1 tsp. salt
1 Tbsp. of cinnamon	1 onion grated
1 Tbsp. white mustard seed	2 lbs. small beets

Cook ingredients above, until sugar is dissolved and ingredients blended. Have ready 2 lbs. of small beet cut up (can be canned or fresh. If fresh, pressure to make tender). Soak overnight for use the next day. Or, pack and seal hot in jars to preserve.



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DICANIS

273 140

TOWN OF

HUNTINGTON

SUFFOLK

Scale 200 Rods to an Inch

LONG ISLAND NEW YORK

From Recent Actual Surveys
Under the Supervision of
F. W. BEERS
PUBLISHED BY
BEERS, COMSTOCK & CO.
40 Vesey Street, NEW YORK
1873.



LA
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S Co
Denton
East Beach

HUNTINGTON
W. H. Woods
HUNTINGTON
P.O.
S.C. Rogers
Manny
W. Keiser

EAST NECK
MIDDLE NECK
CENTRAL PORT
DIST. NO. 27
DIST. NO. 3
DIST. NO. 28
DIST. NO. 1
SCHOOL NO. 27
SCHOOL NO. 3
SCHOOL NO. 28

ORTHPORT
SMITH TOWN
VERNON VALLEY
SCHOOL NO. 18
SCHOOL NO. 19
SCHOOL NO. 20



COLD SPRING HARBOR

NORTH HARBOR

Great Neck

COLD SPRING

Hudson River

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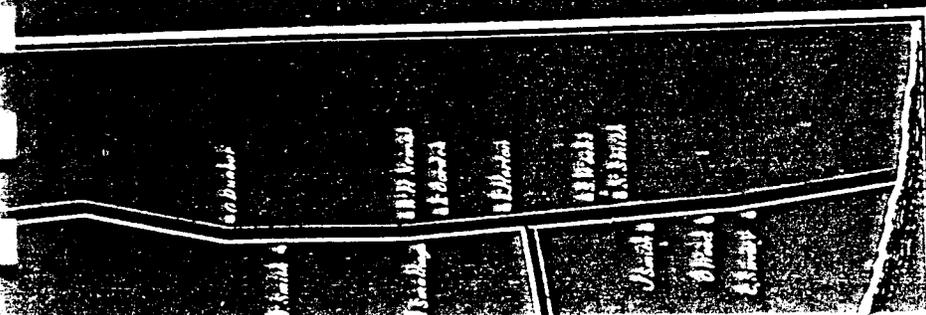
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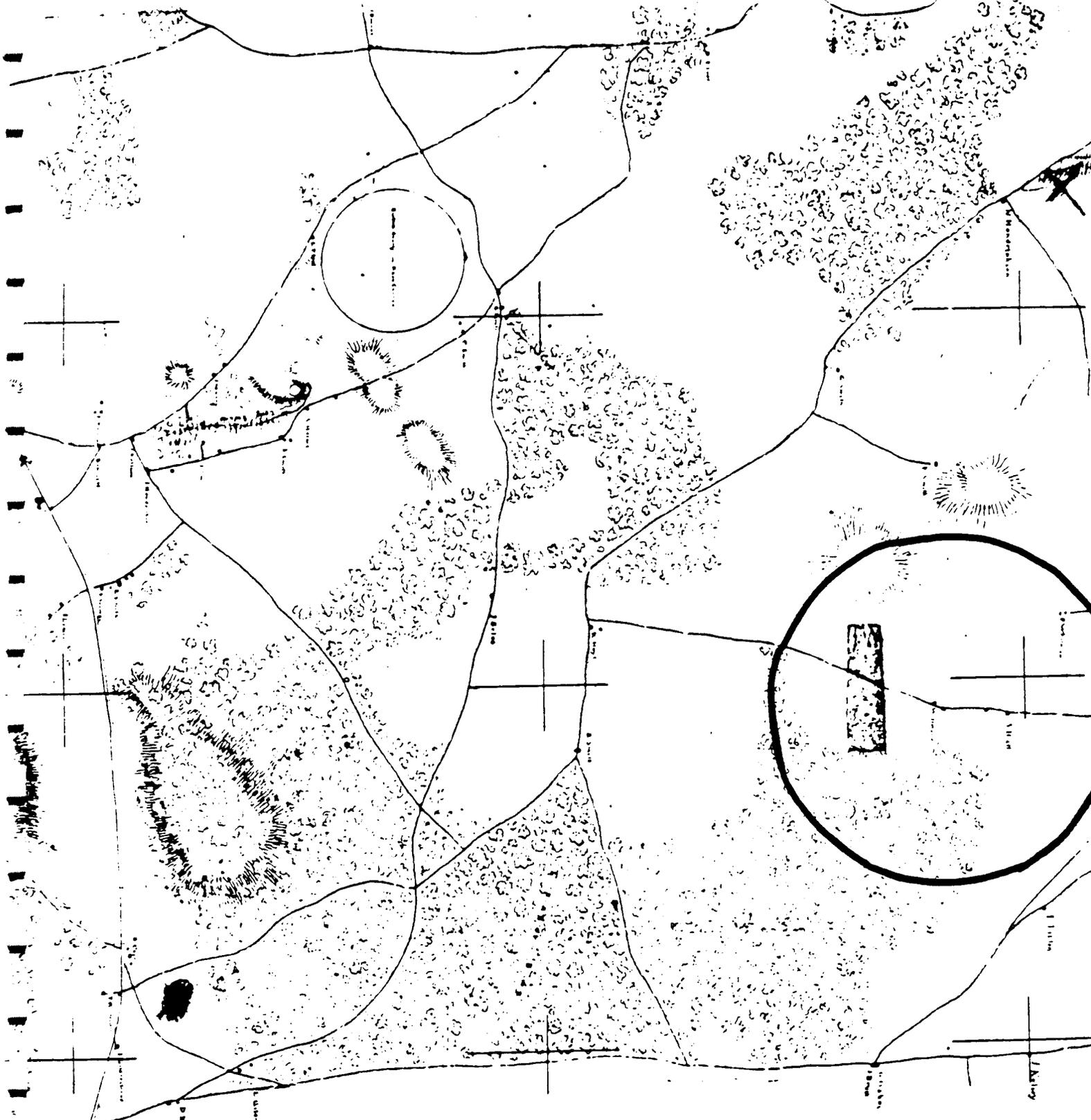
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7-14

U.S. Coast Survey (45)
Central Long Island

W. Island farm & surroundings -

DICANIO

BUILDING-STRUCTURE INVENTORY FORM

DIVISION FOR HISTORIC PRESERVATION
NEW YORK STATE PARKS AND RECREATION
ALBANY, NEW YORK (518) 474-0479

FOR OFFICE USE ONLY

UNIQUE SITE NO. _____
QUAD _____
SERIES _____
NEG. NO. _____

GC 67

YOUR NAME: Town of Huntington DATE: Summer/79

YOUR ADDRESS: Town Hall Main St. Hunt. TELEPHONE: 421-1000

ORGANIZATION (if any): Community Development Agency

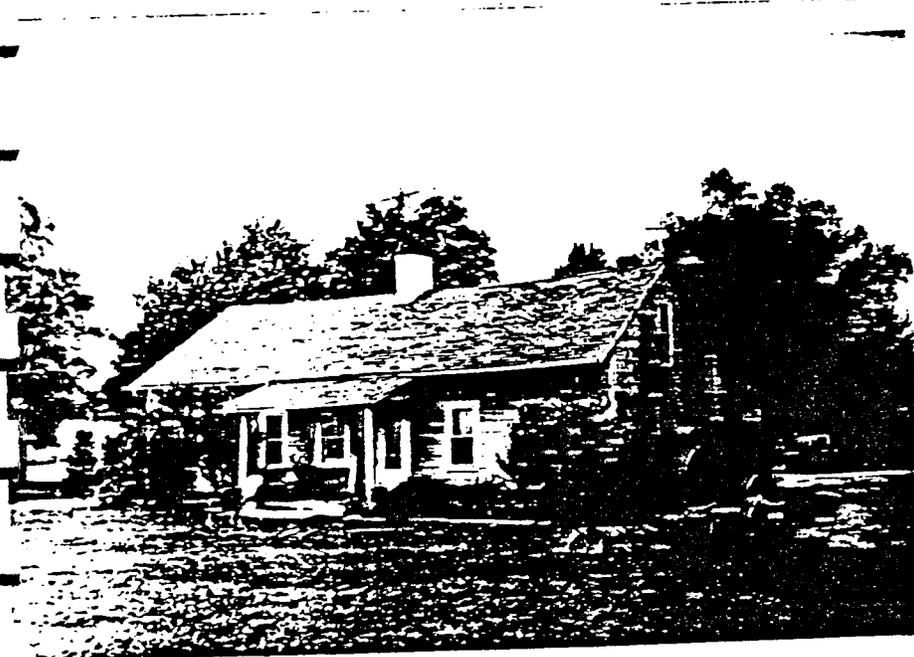
IDENTIFICATION

1. BUILDING NAME(S): Ireland-Gardiner Farm
2. COUNTY: Suffolk TOWN/CITY: Huntington VILLAGE: _____
3. STREET LOCATION: 863 Lake Road
4. OWNERSHIP: a. public b. private
5. PRESENT OWNER: Bernice Gardiner ADDRESS: 863 Lake Road
Present: residence
6. USE: Original: residence Present: _____
7. ACCESSIBILITY TO PUBLIC: Exterior visible from public road: Yes No
Interior accessible: Explain by app't. only

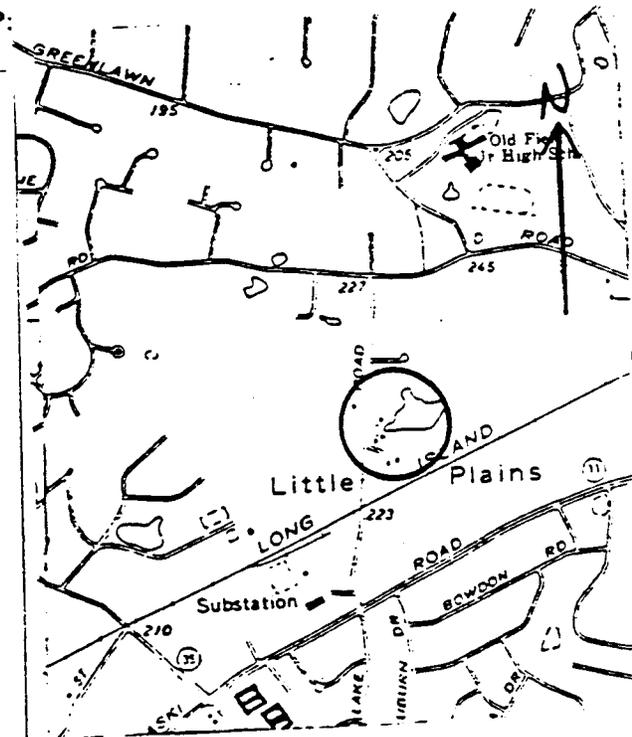
DESCRIPTION

8. BUILDING MATERIAL: a. clapboard b. stone c. brick d. board and batten
e. cobblestone f. shingles g. stucco other: _____
9. STRUCTURAL SYSTEM: (if known) a. wood frame with interlocking joints
b. wood frame with light members
c. masonry load bearing walls
d. metal (explain) _____
e. other _____
10. CONDITION: a. excellent b. good c. fair d. deteriorated
11. INTEGRITY: a. original site b. moved if so, when? _____
c. list major alterations and dates (if known): _____

12. PHOTO:



13. MAP:



14. THREATS TO BUILDING: a. none known b. zoning c. roads
 d. developers e. deterioration
 f. other: _____
15. RELATED OUTBUILDINGS AND PROPERTY:
 a. barn b. carriage house c. garage
 d. privy e. shed f. greenhouse
 g. shop h. gardens
 i. landscape features: 24.3 acres of farmland
 j. other: _____
16. SURROUNDINGS OF THE BUILDING (check more than one if necessary):
 a. open land b. woodland
 c. scattered buildings
 d. densely built-up e. commercial
 f. industrial g. residential
 h. other: small lake

17. INTERRELATIONSHIP OF BUILDING AND SURROUNDINGS:
 (Indicate if building or structure is in an historic district)

Lake Road is a short road connecting Greenlawn and Pulaski Roads. This early farm still sits among undeveloped land in agricultural use.

18. OTHER NOTABLE FEATURES OF BUILDING AND SITE (including interior features if known):

1 1/2 story gable roofed 6 bay house with a salt box profile and 2/2 windows, central chimney. Rambling 2 1/2 story hip roofed house with deep overhanging eaves and a porch on 2 sides. Large 2 1/2 story gable roofed barn complex. Flat roofed shed and small gable roofed shed. Small 1 1/2 story cottage with central chimney 3 bay center entrance.

SIGNIFICANCE

19. DATE OF INITIAL CONSTRUCTION: c. 1775; 2nd house, c. 1900; for Jacob Ireland

ARCHITECT: _____

BUILDER: _____

20. HISTORICAL AND ARCHITECTURAL IMPORTANCE:

The first house on the property was built by Jacob Ireland around 1775. He was married in Huntington 9-12-1775, to Elizabeth Kelsey. Later the farm was owned by his son, Walter and after that by Walter's son, Jacob. In 1868, Mr. Gardiner's great grandfather Alexander, bought this farm from Jacob Ireland. It was left to Mr. Collier (A gardiner) and still remains in the Gardiner family today. The second house on the farm was built c. 1900 and is a good example of the period. The barn complex dates in large part from the 18th century. The 1 1/2 story cottage was for workmen, and is known locally as "the slave cabin." The farm is a remarkable survival from the early agricultural days on Long Island.
Ownership: 1837-W. Ireland; 1858-W. Ireland; 1873-J. Ireland; 1909-G.H. Gardiner
 1917-Mrs. L. Collier

21. SOURCES:
 Interview with Mrs. Gardiner, 7/79.
 Greenlawn-Centerport Historical Society Archives.
U.S. Coast Survey (1836), Rockville, Md., National Ocean Survey.

22. THEME:

Ireland-Gardiner Farm
863 Lake Road

The western half of this one and a half house with integral lean-to was built in a manner characteristic of many Long Island farmhouses of the mid-eighteenth century

The low pitch of the north and south roof slopes would certainly put the date of this structure well into the eighteenth century.

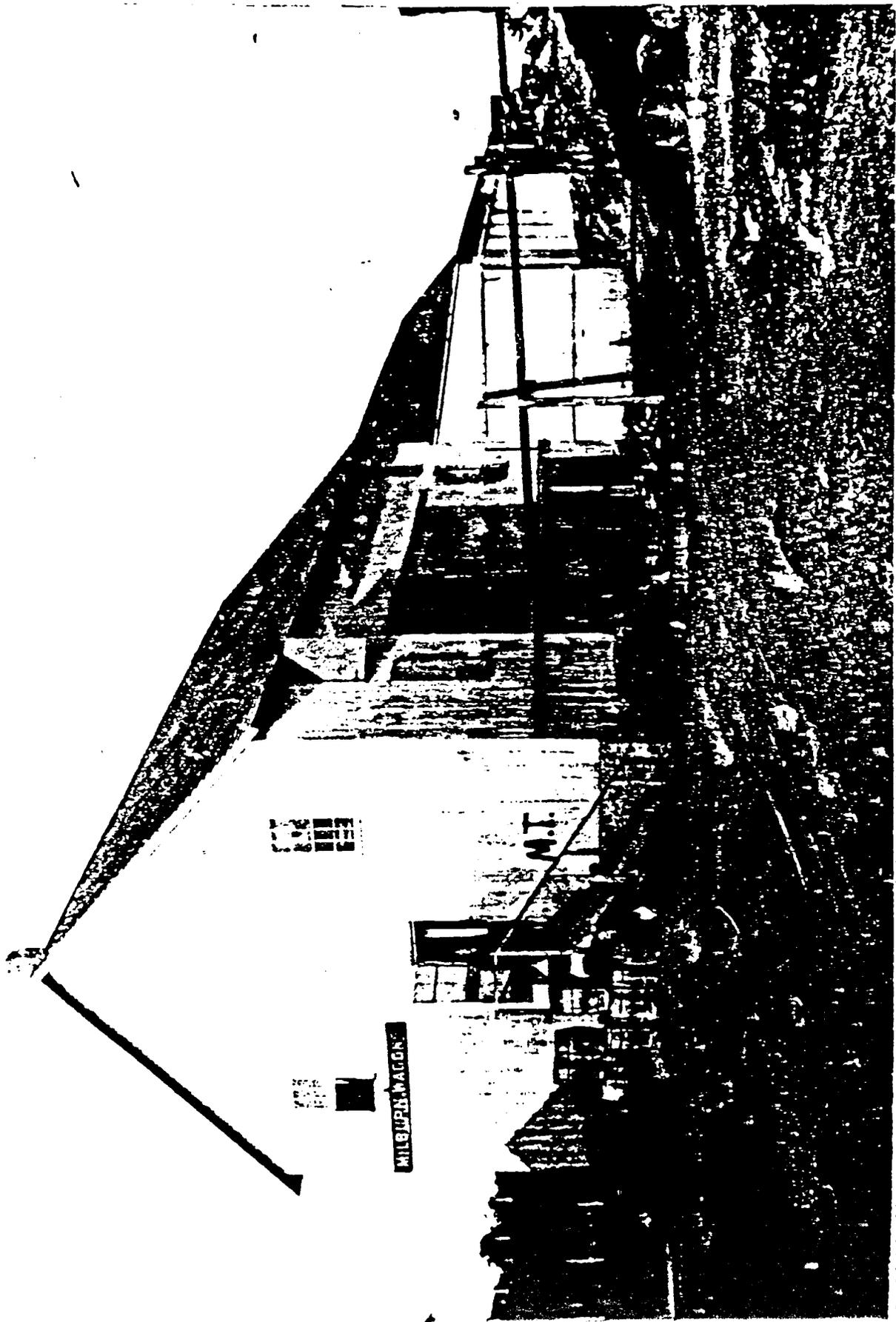
The eastern addition could have been added with ⁱⁿ a decade or two. However, the lean-to for this portion was either added later or rafters sufficiently long for an integral lean-to system were not obtainable.

Drastic alterations have left this simple farmhouse denuded of most of its eighteenth century details.

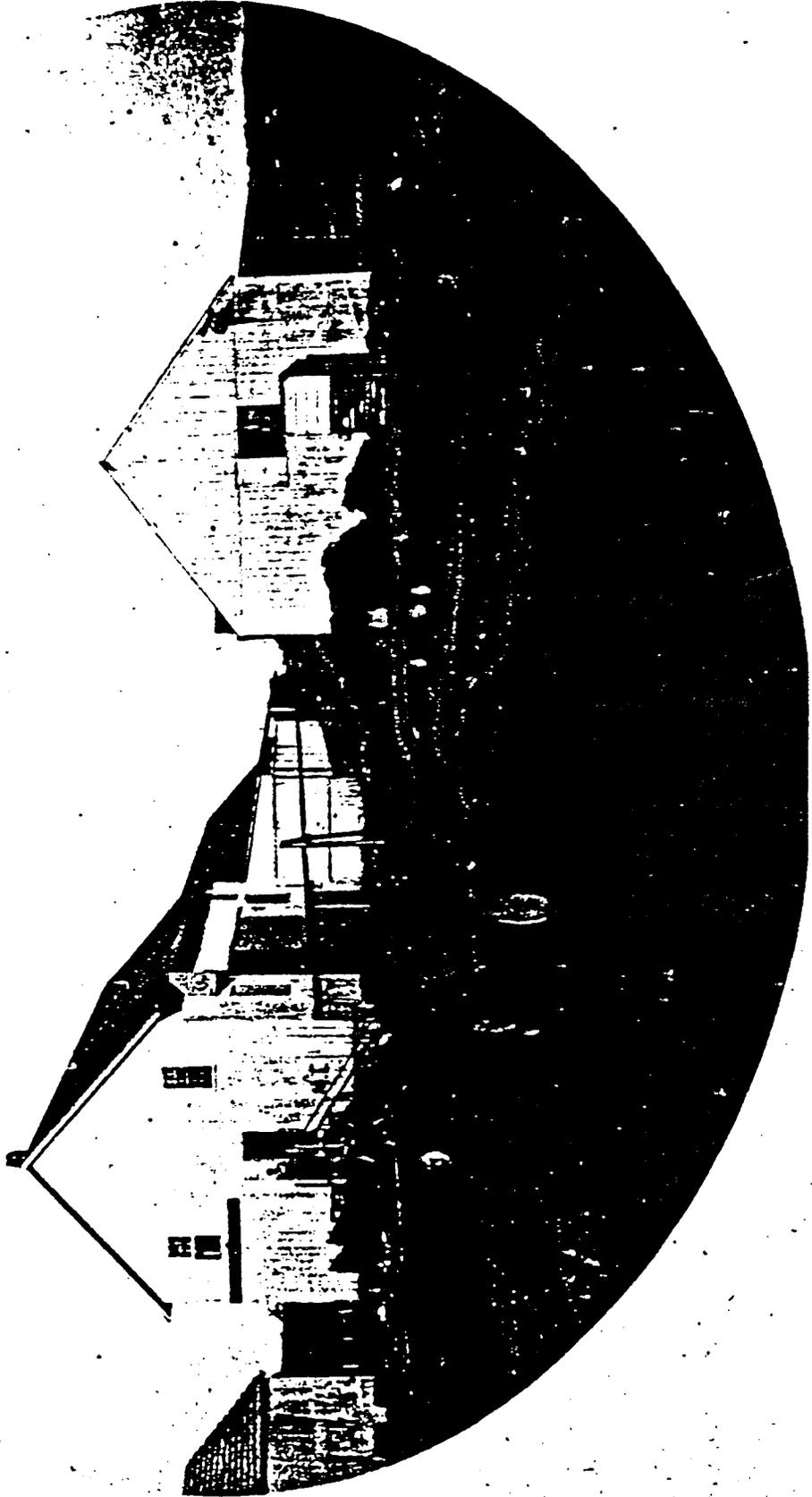
Attention should be given to the small one and a half story "slave cabin". Further study of this building is required for dating purposes.

The great barn complex should be investigated thoroughly. One of the large barns could possibly be from the same period of the construction of the main house. Some effort should be made to survey and document this barn complex. It is an extremely interesting survival of a Long Island farm group.

Daniel M. C. Hopping
Jan. 7, 1980

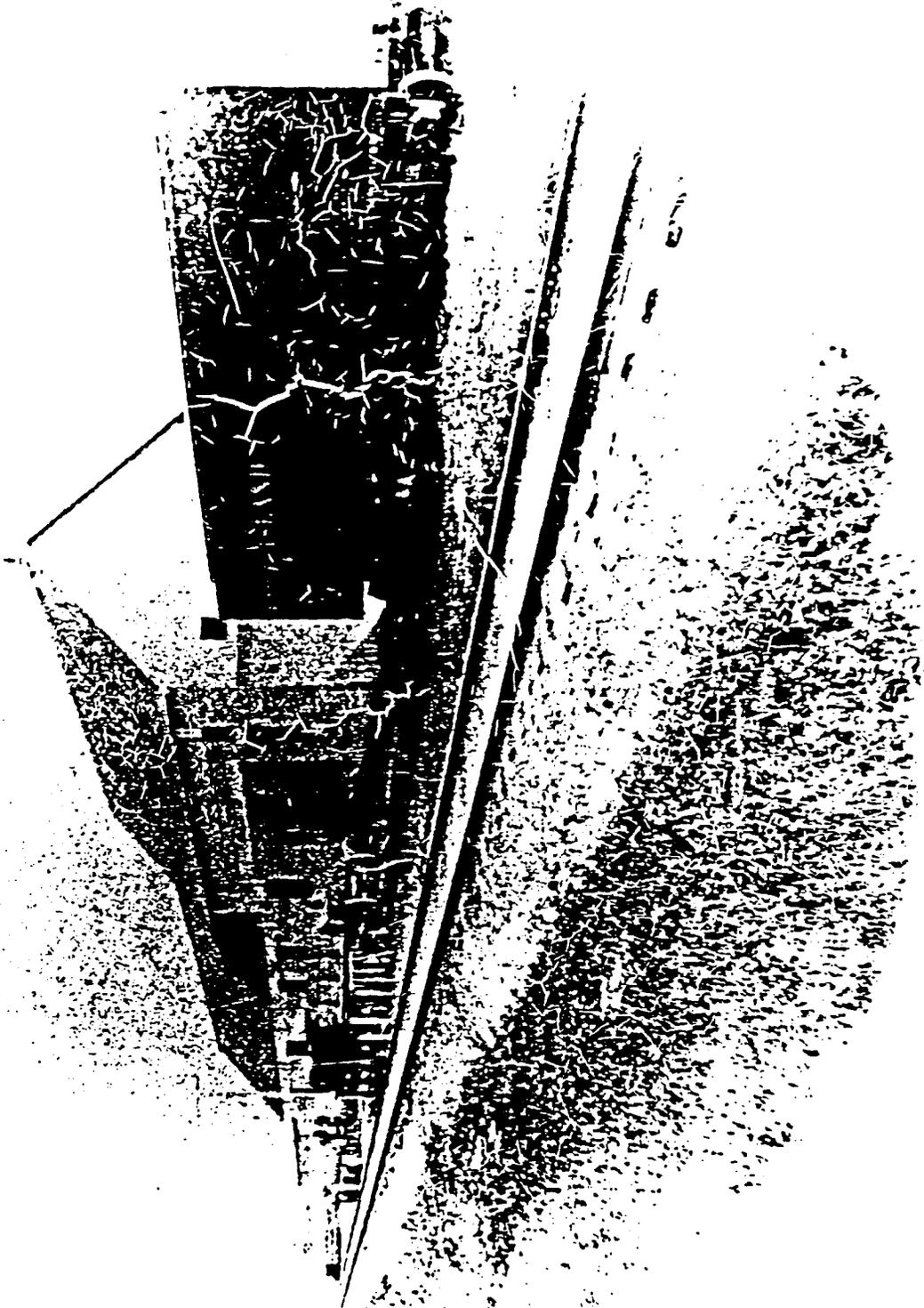


Pickle works built by Alexander Gardner
on his property. Feb. Road, Greenham c 1880
Alexander Gardner is shown standing
The Milburn Wagon business enterprise in the building



with woods on A. Gardner's Estate
Leak Road

A. Gardner in photograph c. 1880

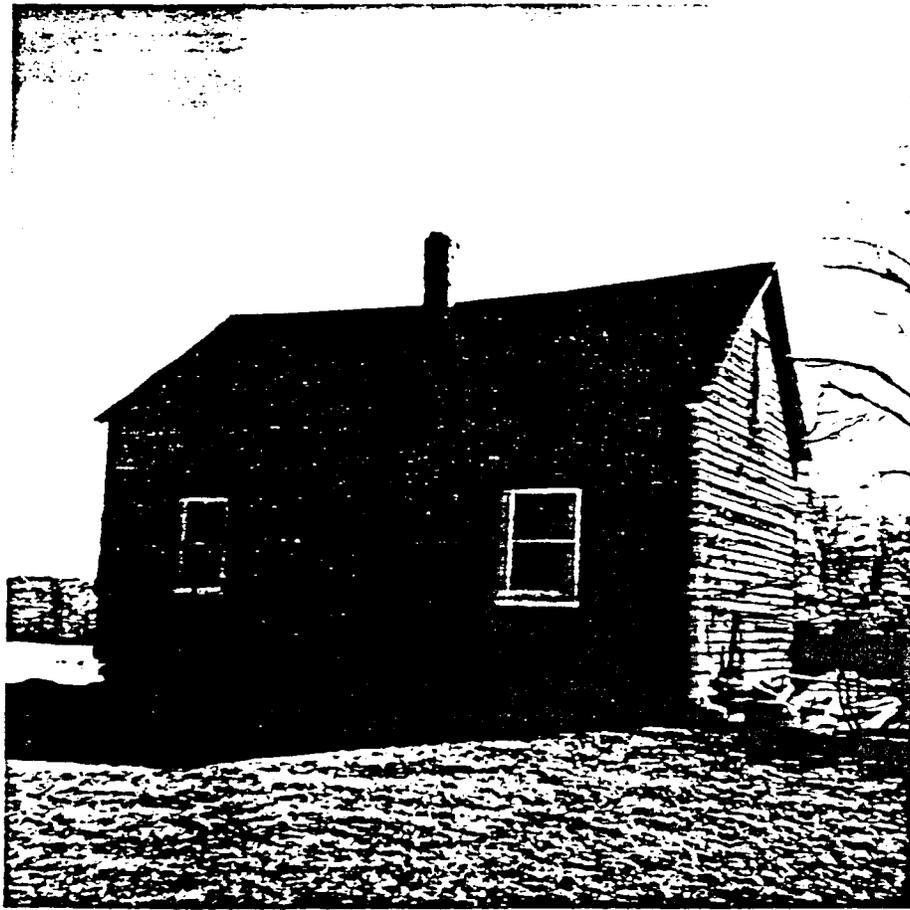


Pickler walls c. 1900

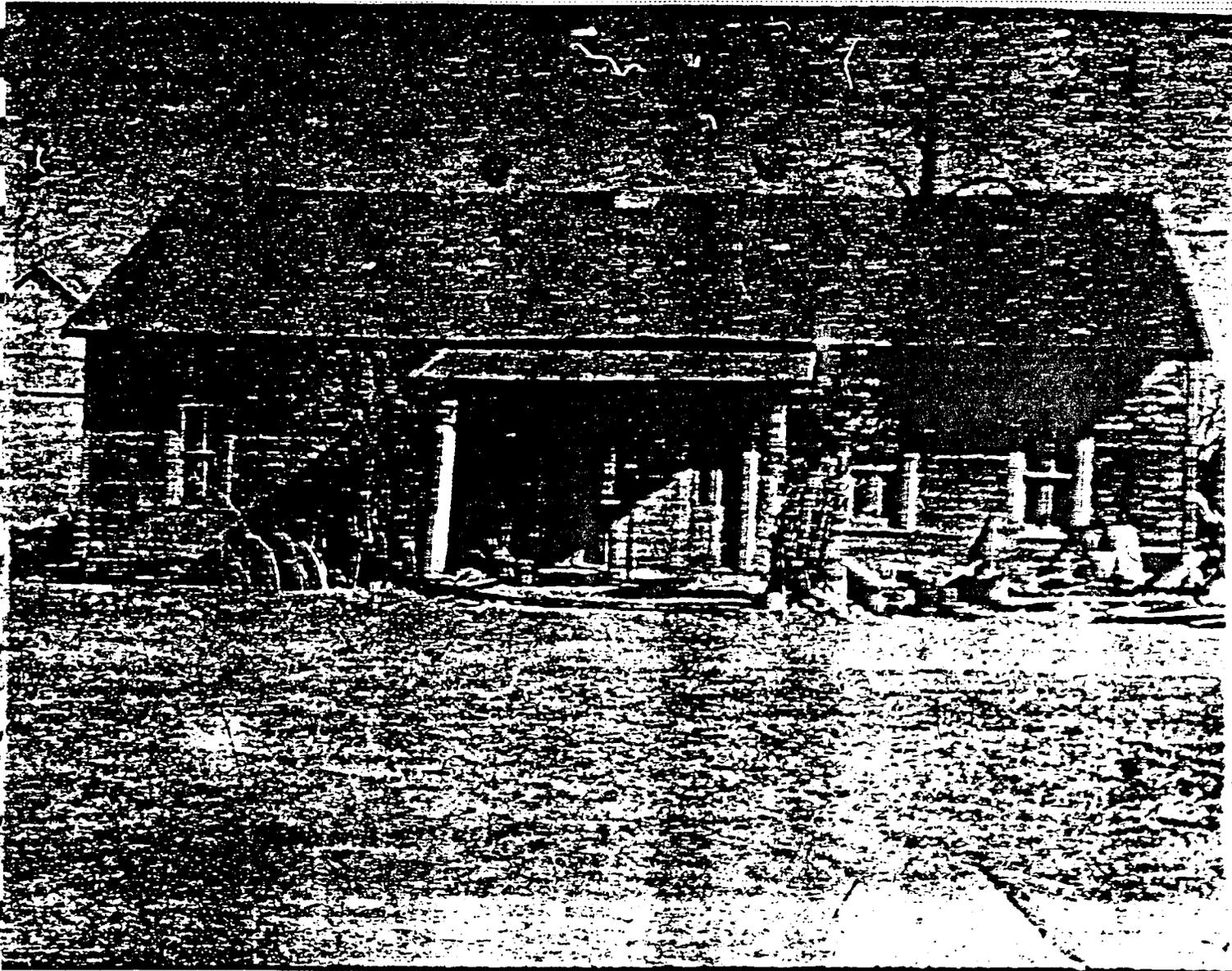
John Hill in Hill

Swamp - Co.
P. 85

0067



GC67



Appendix A-3
Town Planning Department memo

July 16, 1990

HUNTINGTON TOWN PLANNING DEPARTMENT
Intra-Office Memo

Date : July 16, 1990
To: Richard Machtay, Director of Planning
From: John Condon, Deputy Director
Re: Application for Rezoning #89-ZM-225
DiCanio Residential Communities
SCTM 0400-105-02-029

Application

The DiCanio Organization requests a rezoning of a 39.278 acre parcel of land from R-40 Residential to R-20 Residential. The subject parcel is located on the northeast corner of Pulaski Road (County Road 11) and Lake Road in the unincorporated community of Greenlawn in the Town of Huntington.

The applicant is requesting the change of zone for the purpose of subdividing the property and developing the site with a combination of attached and detached single-family residential structures. A modified subdivision permissible pursuant to Section 281 of Town Law will be required in conjunction with the change of zone to accomplish the goals of this application. The applicant's description of the proposal includes the preservation of 9.3 acres of land that will remain undeveloped. The applicant proposes to erect 70 dwelling units on thirty (30.00) acres of land. Dwelling yield for the proposal is yet to be determined and will remain so until the completion of the required review pursuant to the New York State Environmental Quality Review Act.

Location

The subject parcel is bounded on the south by and has approximately 2,400 feet of frontage on Pulaski Road. On the west the subject parcel has approximately 950 feet of frontage on Lake Road. It is bounded on the north by the Port Jefferson Branch of the Long Island Railroad and on the east by the property of the Hazeltine Corporation, a local research and development firm. The former farmland or "Old Field" is a "flat" piece of property, rectangular in shape, that is currently unused and overgrown with natural ground cover.

Surrounding Land Use

South of the subject parcel, across Pulaski Road, the land is developed with lots that are generally 20,000 square feet in area (half-acre). One subdivision identified as "Sunrise Farms" Section 1 was developed with modified R-40 lots. Although the zoning is R-40, permission was granted by the Huntington Town Planning Board in 1964 to modify lots to an approximate area of 20,000 square feet for the purpose of maintaining a large portion of property in the center of the neighborhood as open space. East of "Sunrise Farms" there is a developed residential area that is zoned "R-10" Residential.

East of the subject site, sharing a common boundary, is property owned and developed by the Hazeltine Corporation. A change of zone from "R-40" and "R-10" Residential to "I-1" Light Industry was granted in 1969 for this property by the Huntington Town Board. The change of zone was granted subject to covenants and restrictions that included the following limitations:

(1) No structure shall be erected on the property closer than 200 feet from the present northerly boundary of Pulaski Road.

(2) There shall be erected buildings; the floor space in its entirety of all buildings together shall not exceed 400,000 square feet, until whichever is sooner, (a) Pulaski Road between Lake Avenue and Cuba Hill Road is improved to become a four lane roadway or (b) eight (8) years shall pass.

(3) Hazeltine will improve Pulaski Road.

The forty-three and one-half (43 .5) acre parcel is currently improved with a two-story office building that has a total gross floor area of approximately 290,000 square feet. Hazeltine has improved Pulaski Road and eight years have passed. Possibilities in the potential expansion of the facility must be considered for the future of the Hazeltine site and the effects of potential development on the subject property.

West of the subject property, across Lake Road and south of the LIRR, there is a Long Island Lighting Company (LILCO) building with a substation and outside truck storage. West of the LILCO property and extending west to Park Avenue are a series of light industrial and office uses, permitted in the "I-2" Light Industrial Zone.

Beyond the LIRR, north of the subject property is a large expanse of land that is zoned "R-40" and developed as such. Most of the development is traditional one-acre lots improved with single-family dwellings. In the Spring of 1990, the Planning Board made a recommendation to the Town Board to deny a request made by DICANIO

Simonson Realty Corp. & Simonson Company for a change of zone for approximately 13 acres of land north of the LIRR and east of the subject property. The applicant intended to construct 146 one-bedroom, clustered housing units in a series of two-story structures exclusively for senior citizens. The Planning Department Staff report identified the LIRR as a dividing line and:

"the boundary between the largely low-density single-family residential community to the north and the I-1 light Industrial zoning and development south of the tracks." (p.3)

As noted in the Staff report, both the Lakeridge and the Timber Ridge properties on the west side of Lake Road, north of the tracks, were the subjects of zone change applications. Both applications for higher densities were denied by the Town Board and both properties were subsequently developed pursuant to R-40 zoning. Lakeridge Estates, received final approval from the Planning Board in February, 1984 and eighteen (18) units were developed in attached clusters.

1965 Comprehensive Plan

The 1965 Comprehensive Plan identified a "belt" of industrial land in Huntington that included the subject parcel. The industrial "belt" was bounded on the north by the Port Jefferson Branch of the Long Island Railroad and on the south by Pulaski Road. The "belt" extended from a triangular shaped parcel at Greenlawn Road/Broadway in the east to an area east of the Long Island Railroad Station in Huntington Station. The "belt" fanned in a northerly direction just west of Lake Road running along the southerly fringe of the low-density residential area to the intersection of Broadway and Park Avenue. From this intersection the industrial area continued westerly along the south side of Broadway to the Huntington Railroad Station.

The proposed industrial area depicted in the 1965 Plan was bounded on the north in Greenlawn by the commercial district and the established high-density residential neighborhood. Westerly from Cuba Hill Road a large area was identified for use by schools, libraries and parks (Harborfields High School) and low-density residential development. Further west there remains an established medium-density residential area, the westerly boundary of which is Park Avenue. West of Park Avenue to the end of the industrial area and continuing to Route 110/New York Avenue the proposed land use plan showed a commercial strip along the north frontage of Broadway. Beyond the strip along Broadway, to the north is an established high-density residential development.

South of Pulaski Road from the intersection of Cuba Hill Road

in the east to the end of the proposed industrial area in the west, the plan called for medium and high-density residential development.

The 1965 Plan recognized the growth of employment opportunities on Long Island and in Huntington Town. Reference was made to a net gain in manufacturing employment in the 1950's. Suffolk County gained an average of 92 new industrial plants per year from 1958 to 1965. The Melville area was the scene of industrial expansion and there was a trend toward a stable local economy with greater opportunities in basic job activities. There was good reason to set aside large tracts of land, in close proximity to the railroad and major roadways, for industrial uses. Employment opportunities and a strong base for the local economy were recognized by the Planning Board for the important role they would play in the future of Huntington.

Moratorium Study

In June, 1988 the Town of Huntington released a study entitled An Assessment of Conditions In Areas Affected By The Huntington Comprehensive Planning Law of 1987. The report was prepared for the town by Abeles Schwartz Associates, Inc. of New York. The purpose of the study was to assess the needs and planning objectives for particular areas of town. While planning studies were conducted and analyzed, development of commercial and industrial properties was curtailed in the specific areas. One of the specified areas was Pulaski Road in Greenlawn. The Executive Summary of the report provided a synopsis of the thought behind actions under consideration. It stated:

"The Pulaski Road area never experienced industrial development to the extent envisioned in the 1965 Comprehensive Plan. It is necessary to re-evaluate the land use plan for this area in light of present day conditions. In particular, the development of certain large vacant parcels must be examined in terms of both Town-wide open space needs and impacts on Pulaski Road's ability to function as an effective alternate route to the Town's more congested principal arterials." (P. 3).

The Moratorium Study Action Plan (Table I) called for immediate action regarding rezoning of land in close proximity to the DiCanio property (Lake Road Associates parcel and the ISC parcel) from I-4 and I-1 to medium and/or medium or high density residential. Retention of R-40 zoning on the "Old Fields Commons" parcel and the "DiCanio" parcel was recommended. Future adverse impacts resulting from anticipated trip generation and traffic impacts were the main reasons for this shift in policy. The report called for an evaluation of traffic improvement measures. These

planning recommendations were made in direct opposition to proposals under review at the time to develop the subject parcel, and others in close proximity, with a variety of industrial, office, warehouse and multiple-family uses.

The recommendation for the DiCanio parcel in the Moratorium Study (Table 6; Recommendations P. 54) was not crystal clear in establishing a goal to retain residential zoning. The primary recommendation was made for the retention of R-40 zoning and public acquisition of open space. The alternative to one-acre residential development was low-density industrial development requiring maximum heights for buildings combined with generous setbacks, buffers, landscaping and adequate parking. No alternative residential density was presented as an option even though the plan stated:

"Development of the 39-acre "DiCanio" parcel...is considered to be particularly critical to overall future conditions within the Pulaski Road Study Area, given the size and prominent location..." (P.56).

Given the concerns of traffic impact, potential trip generation is identified as a driving force in analysis of land use throughout the town. This area in particular was of major concern due to potential adverse impacts of intense development on the arterial roadway. In retrospect, alternatives could have been presented along a decreasing scale of potential traffic impact. The ends of the spectrum of trip generation of low-density residential versus industrial development should not have been presented as the only choices. The traffic section of this report will attempt to provide insight in this regard.

Comprehensive Plan Update

The 1965 Comprehensive Plan is in the process of being updated. The update should be finalized in the near future. The updated plan will recognize the loss of industrial space throughout the town to the higher and more attractive demands of the office market. The regional market has encouraged a pattern of use and re-use of industrial land and structures for office space. This is especially true in the Melville area where the demand for office space has been high.

The updated plan specifically refers to the industrial uses along the LIRR as "typically unattractive" and a "nuisance" to the prevailing residential uses that surround them. The prediction made in the 1965 Plan of the attraction of proximity to the LIRR for industrial users was not realized. The expectations of the planners did not develop. The use of the truck as a favored vehicle combined with convenient access to the Long Island

Expressway encouraged expansion of industrially development in Melville at the expense of such development along the railroad. In turn, the attraction of Melville as a corporate office center pushed industrial users further east on Long Island to points along the Long Island Expressway, not north to the LIRR.

The Updated Plan will call for a "balance" that will allow existing industrial uses along the LIRR to remain while vacant industrially-zoned land will be redesignated for other uses. Simply maintaining industrial development along the railroad is difficult considering the economic competition of immediate access to the LIE and local resentment toward "obnoxious" uses. The proposed land use plan for the Comprehensive Plan Update identifies the subject parcel for use as low-density (two or less units per acre) residential. The proposal to be made in the Updated Plan is based on a combination of recognition of existing zoning, the need for housing and compatibility of proposed uses with the surrounding land use.

Previous Application

In March, 1987 the applicant petitioned the Town of Huntington to change the zoning classification on the subject property from "R-40" Residential (1-acre) to "I-2" Light Industry. The intent was to rezone the property and create ten (10) 3.5 acre sites and one (1) 4.6 acre industrial site. The applicant made the request based on the recommendation of the 1965 Comprehensive Plan, consideration of current adjacent land use, and existing zoning pattern to the east and west of the subject property south of the railroad. As previously mentioned, this type of request and recognized potential development in the area was the reason why the town chose to establish a moratorium and reconsider its land use plan. Development along the scale of that proposed for office and industrial uses was not considered to be in the best interest of the town. Such development would result in negative impacts on the roadways and neighboring communities. The request was withdrawn by the applicant upon the filing of the present application.

If the land were to be rezoned to "I-2" Light Industry and developed to the limits of existing zoning there could have been ten lots developed at 33.3% coverage with buildings as high as 45 feet. At maximum potential this could have resulted in a high of 1.7 million square feet of industrial floor space (39.6 acres x .333 coverage x 3 stories). If nine (9) acres were dedicated for recreational purposes, as was proposed, and the remaining thirty (30) were intensely developed, there could have been 1.3 million square feet of industrial/office space developed. Even with generous setbacks and requirements for landscaping and parking such development would still have a serious impact on the surrounding community and roadways. For the purpose of analyzing the potential

traffic impact, and comparing the potential of various development possibilities, a line has been added to the chart in the traffic analysis for the 1987 proposal. A figure of 1 million square feet of space of industrial space is used as an estimate.

Traffic Analysis

The 1965 Comprehensive Plan estimated that by 1980 Pulaski Road would require six (6) lanes to accommodate anticipated volumes of traffic. The 1987 area study considered intersection conditions at Pulaski Road/Park Avenue, the major intersection west of the subject site and Pulaski Road/Cuba Hill Road the major intersection east of the subject site. The conclusion of the intersection capacity analysis was that:

"The current traffic conditions at each of these two intersections indicate that they are presently operating below reasonable levels of service and, consequently, are causing undue delay and stress to motorists..."

During peak hours of the morning and evening, both intersections were operating at an "oversaturated" condition.

The intersection of Lake Road and Pulaski Road was not studied in detail in 1987. There was, however, a study conducted in 1987 by Vincent E. Donnelly in conjunction with an application to erect an office/warehouse north of the LIRR west of Lake Road. The study identified the intersection of Lake Road and Pulaski Road as operating at a Level of Service B in the a.m. and p.m. peak hours. Level of Service B is described as experiencing slight delay and providing good service.

The intersection of Lake and Pulaski is signalized. The signal favors the east-west flow of the major arterial. The 1987 study identified a peak two-directional flow along Pulaski of 1,428 vehicles from 5:00 p.m. to 6:00 p.m.. The major one-directional flows were identified as a.m. westbound and p.m. eastbound. The Lake Road intersection functions effectively because of the limited north/south flow of traffic opposing the east/west flow and generous separation from the at-grade railroad crossing to the north.

Trip generation is a guiding factor in the future use of the subject property. In reviewing the subject property to determine anticipated trip generation the following chart is utilized. The factor used in residential development is a rule of thumb yield expectancy of developable, flat, land when considering the necessity of improvements such as roads and recharge basins. These factors are not to be employed in determining actual yield of a parcel of land. All figures are based on 40 acres of land to

simplify calculations. The calculations for commercial/office/industrial uses are based on floor area ratios (FAR) developed in the Melville Generic Environmental Impact Statement. The use of FARs in these calculations simplifies calculations and would result in less intensive development than that expected in the Industrial Zoning Classifications of the Huntington Town Zoning Ordinance.

Based upon estimated trip generation, the lowest impact on the surrounding roadways will result from low density residential development. As shown in the chart, the impact will be less than that anticipated from commercial/industrial development on a weekday and peak hour basis.

<u>Land Use</u> Residential	<u>ITE Trip Generation</u> Trips Per Unit			<u>Anticipated Trip Generation</u>		
	Average	Peak A.M.	P.M.	Weekday	A.M.	P.M.
Factor						
R-40 (.85)	10	.76	.37	340	27	13
R-20 (1.8)	Same			720	55	27
R-10 (3.5)	Same			1,400	106	52
R-5 (6.0)	Same			2,400	182	89
Commercial/ Office (.2 FAR)	17.7 (per 1,000 sq. ft. GFA)	2.92	2.84	6,195	1,022	994
Industrial (.33 FAR)	5.43 (per 1,000 sq. ft. GFA)	.97	.84	3,122	558	483
1987 Application 1 Million sq.ft.	Same			5,430	970	840

SEQRA

The subject application will be reviewed by the Huntington Town Board pursuant to the requirements of the New York State Environmental Quality Review Act (SEQRA). The proposal is a Type I Action pursuant to section 617.12(3), (5ii), because it involves the granting of a zone change involving the subsequent construction

of 50 or more residential units not connected to a sewerage system. It also lies wholly within designated open space (#NW-32 on Town of Huntington Open Space Index). The SEQRA Review will assess the magnitude of anticipated development including but not limited to the following:

- Traffic.
- Open space and Parkland.
- Ground water and water supply.
- Surface runoff and drainage.
- Vegetation.
- Aesthetic resources.
- Existing character of the community.
- Other.

Based upon the nature and scope of the proposal, it is likely that the lead agency will determine that project impacts are potentially significant and thus warrant an environmental impact statement. Alternative development scenarios must be presented and mitigative measures must be explored by the applicant to identify and minimize potential adverse effects that could result from development on the site.

Yield Study/Parkland

The yield map submitted by the applicant does not indicate a 10% parkland setback as provided for pursuant to Section 277 of New York State Town Law and the Huntington Town Planning Board Subdivision Regulations. The subject site is included in the Town Open Space Index and the Town Parks Department is facing a shortage of recreational fields (soccer fields predominantly). Following discussions with the Parks and Recreation Department (M. Myles and R. Ford 4-18-90) a 10% parkland (3.93 acres) setback should be shown. The preferred location of the setback is adjoining the Hazeltine Corporation property. This location will best avail the site for public recreational purposes at least municipal cost. A potential use agreement between Hazeltine and the town for parking purposes can be sought. Direct accessibility from Hazeltine's parking lot will yield the maximum use of the dedication and limit the cost of improvements.

If the application for rezoning is looked upon favorably by the Town Board, then dwelling yield must be proven utilizing a combination of layout analysis with consideration given to other planning issues. The findings of the SEQRA process will weigh heavily upon the final determination of dwelling units for this application. Although the applicant's plans show 70 dwelling units, preliminary in-house Staff studies that include a 3.9 acre park determine expected yield to be somewhat less if a zone change is granted.

Affordable Housing Issue

The Suffolk County Department of Planning has requested municipalities to address the issue of affordable housing in all subdivisions.

It is not safe to conclude that doubling density will result in a proportional decrease in prices for plots and dwellings. Land and property values are affected by many factors. Determination of value and affordability is not limited to a simple equation based upon lot area.

Land and housing values are affected by location of the community in relation to the region, location of the site in relation to the community and location of structure in relation to an individual site. Value will also be affected by community character and a long, expandable and in many respects, personal list of objective and subjective factors. The "same" house on the "same" lot in two different communities might have a significant difference in market value based upon one or more subjective factors. For example, an individual may be willing to pay a premium for a home in a neighborhood viewed as "prestigious."

A change of zone from one-acre to half-acre residential by itself will not have a drastic effect on the potential affordability of housing on the subject site. More influential, visible and objective factors in creating affordability are those of combining clustering of units with reduction of floor area of the units. Presumably, by clustering and attaching units there will be a reduction in improvement costs and future service costs. Limiting floor area reduces construction costs and future maintenance costs. The key to "affordability" is the reduction of costs of purchase, construction and anticipated maintenance.

A change of zone to less than half-acre will create a distortion affecting affordability because of Suffolk County Health Department requirements for liquid sanitary waste disposal. Article VI of the Suffolk County Health Code requires that new subdivisions in non-sewered areas have lots no less than 20,000 square feet in size. The costs of installing and maintaining small sewer plants will most likely negate any advantages sought in development at greater densities. The half-acre or "R-20" zoning will be the greatest density permitted without providing for extraordinary improvements and altering the general character of the area. The question of affordability can be more adequately addressed with thought given to total clustered development of the site.

Conclusion

The Huntington Town Board should hold a public hearing to

consider the applicant's request for the rezoning of the subject property from "R-40" to "R-20" Residential based on the following:

-The surrounding land use to the south, east and west of the subject parcel does not promote a compatible setting with one-acre building lots. A view of the subject property from either Lake or Pulaski Roads to the north and northeast provides a vision of open space. From this perspective, one might question the validity of the request for the change of zone. An enlightening perspective results when viewing the property from within.

A view from within the parcel to the south, east and west reveals the intensity of neighboring development. Looking east one sees the massive Hazeltine office complex while immediately to the west there is a LILCO maintenance yard. To the south one sees Pulaski Road, a heavily trafficked highway and single-family homes established on half-acre lots. On the north are the railroad tracks. The intensity of development is magnified by the telephone and electrical wires strung along three separate lines of poles; one north of the tracks and two along Pulaski Road.

Residential development found north of the tracks is affected by the proximity of the LIRR and the LILCO lines that run along the tracks. However, they are not surrounded by "nuisances" and effectively utilize the existence of the tracks as a line of demarcation. The Lakeridge development is protected from adverse influences of the LIRR through the use of clustered construction and a well landscaped berm. If the subject property were to develop pursuant to current zoning, the "nuisances" in existence south of the tracks would adversely effect market values of properties located there in comparison to the one-acre parcels found north of the tracks. A developed piece of property, one-acre in size, south of the tracks, could not be readily substituted for a developed one-acre piece of property on the north side of the tracks.

-The LIRR tracks along the north edge of the subject property are a recognized dividing line between neighborhoods and land uses in the area.

- Modified attached cluster development of the site will allow for the productive use of the land while promoting innovation in terms of preservation of open space and building design. Reduction of construction and future maintenance costs should result and so, "affordability" can be addressed in plans for development.

- Almost four (4) acres of active parkland can be acquired by the Town of Huntington in an area that is in need of recreational facilities. A modified cluster development will result in greater preservation and possible dedication of open space. With the anticipated cooperation of the adjacent land owner (Hazeltine Corp.) none of the dedicated parkland will have to be paved or utilized for parking.

JC/

Appendix A-4
Town Planning Department memo

July 20, 1990

TOWN OF HUNTINGTON, N. Y.
PLANNING DEPARTMENT

Inter-Office Memorandum

Date: July 20, 1990

To: William Byrne, Chairman, and
Members of the Planning Board

From: Richard Machtay, Director of Planning

Re: DiCanio Residential Communities, Inc. -
Change of Zone Application

Attached hereto are the SEQRA review and staff reports regarding the above-referenced action. The staff indicates that there may be a rationale for rezoning the subject property as a transitional area; however, recognizes that such intensification of use must be carefully considered and that alternatives to such action must be weighed via further SEQRA evaluation. The staff recommends that the Planning Board advise the Town Board that the rezoning proposal has sufficient merit to issue a positive declaration and require the applicant to prepare a Draft Environmental Impact Statement, in order to provide more information and hold a public hearing.

The Planning Board has the option to recommend that the Town Board not entertain the application and therefore, further SEQRA investigation need not be pursued. There is considerable public opposition to the proposal which is not compatible with the Town Master Plan consultant's preliminary recommendation for the site.

The Director's recommendation to the Planning Board is that the merits of the rezoning be determined by the SEQRA process, following the preparation and acceptance of an environmental impact statement and findings statement thereon. A resolution recommending that the application be entertained is presented for your consideration. Because an EIS would have to be prepared, a recommendation that the action be entertained by the Town Board should not be viewed as considering any part or all of the proposed project favorably.

Appendix A-5
Town Planning Board Resolution

August 1, 1990

HUNTINGTON TOWN PLANNING BOARD

MEETING OF AUGUST 1, 1990

The following resolution was offered by **V. Earing**

and seconded by **R. Hennessey**

WHEREAS, DICANIO RESIDENTIAL COMMUNITIES, INC., 712 Smithtown By-Pass, Smithtown, New York 11787, has submitted an amended application #89-ZM-255 for a change of zone from R-40 Residence District to R-20 Residence District for property located on the northeasterly corner of Lake Road and Pulaski Road (C.R. 11), containing 39.3 acres, and designated 0400-105-02-029 on the Suffolk County Tax Map, and

WHEREAS, pursuant to section 198-127 of the Town Code the subject application was sent to the Planning Board for evaluation and to further elicit a recommendation from that board to the Town Board, and

WHEREAS, the Town Board has been established as lead agency for the purpose of SEQR review of the subject action, and

WHEREAS, the staff of the Environmental Division of the Planning Department has determined that the action proposed is a Type I action pursuant to section [6 NYCRR 617.12 (b) (3), (5) (ii), (9), (10)] of the SEQR regulations and the staff has studied all pertinent data including the Environmental Assessment Form (EAF) Part I and prepared the EAF Parts II & III on behalf of the Town Board, and

WHEREAS, the staff of the Planning Division of the Planning Department has prepared a Planning Study that evaluates land use and other pertinent issues that influence the subject property, and

WHEREAS, the Planning Board has evaluated this data, and now therefore be it

RESOLVED, that the Planning Board finds as follows:

1. That the requirements of SEQRA have been met thusfar and will further be met with the issuance of a positive declaration:

2. That several of the criteria considered indicators of significant effects on the environment SEQRA [6 NYCRR 617.11(a)] are likely to occur as listed:

- "a substantial adverse change in existing air quality, ground or surface water quality or quantity, traffic or noise levels; a substantial increase in potential for erosion, flooding, leaching or drainage problems;"

- "the removal or destruction of large quantities of vegetation or fauna";

- "significant adverse effects to natural resources";
- "the creation of a material conflict with a community's current plans or goals as officially approved or adopted";
- "the impairment of the character or quality of important historical, archaeological, architectural, or aesthetic resources or of existing community or neighborhood character";
- "a substantial change in the use, or intensity of use, of land including agricultural, open space or recreational resources, or in its capacity to support existing uses"; and be it further

RESOLVED that the Huntington Town Planning Board hereby recommends to the Town Board that the proposed action will have a significant effect on the environment , and be it further

RESOLVED that the Planning Board further recommends that the Town Board should evaluate all of the pertinent data prepared by the staff of the Planning Department, including the Planning Study and the EAF Parts II & III, and that after doing so, it is further recommended that the proposed action be issued a Positive Declaration pursuant to the SEQR regulations, and be it further

RESOLVED, that upon issuance of a Positive Declaration the Environmental Review Division of the Planning Department shall be thereby directed to file notice of determination of significance in accordance with SEQR (617.10), and be it further

RESOLVED, that simultaneous with such determination of significance the applicant shall be directed to prepare a draft environmental impact statement, and be it further

RESOLVED, that the draft environmental impact statement shall be scoped within 30 days of the Town Board's determination of significance, in order to identify and focus the scope of issues to be addressed in the draft environmental impact statement, and be it further

RESOLVED, that the Planning Board recommends that the data provided thus far indicates that the application has sufficient merit to be heard at a public hearing and that should the Draft Environmental Impact Statement further substantiate this recommendation that simultaneous with a public hearing on the Impact Statement the Town Board should hold a public hearing on the application to rezone the subject property.

VOTE: 6

AYES: 6

NOES: 0

ABSENT: W. Byrne, Chairman

The resolution was thereupon declared to be duly adopted.

Appendix A-6
Town Board Resolution

September 10, 1990

dd.

RESOLUTION ISSUING A POSITIVE DECLARATION PURSUANT TO THE SEQR REGULATIONS, ON THE REZONE APPLICATION (#89-ZM-255) KNOWN AS DICANIO RESIDENTIAL COMMUNITIES INC. , AND INSTRUCTING THE APPLICANT TO PREPARE A DRAFT ENVIRONMENTAL IMPACT STATEMENT.

Resolution for the Town Board meeting dated: September 10, 1990

The following resolution was offered by **COUNCILMAN HACKELING**

and seconded by **SUPERVISOR FERRARO**

WHEREAS, DICANIO RESIDENTIAL COMMUNITIES, INC., 712 Smithtown By-Pass, Smithtown, New York 11787, has submitted an amended application #89-ZM-255 for a change of zone from R-40 Residence District to R-20 Residence District for property located on the northeasterly corner of Lake Road and Pulaski Road (C.R. 11), containing 39.3 acres, and designated 0400-105-02-029 on the Suffolk County Tax Map, and

WHEREAS, pursuant to section 198-127 of the Town Code the subject application was sent to the Planning Board for evaluation and to further elicit a recommendation from that board to the Town Board, and

WHEREAS, the Town Board has been established as lead agency for the purpose of SEQR review of the subject action, and

WHEREAS, the staff of the Environmental Division of the Planning Department has determined that the action proposed is a Type I action pursuant to section [6 NYCRR 617.12 (b) (3), (5) (ii), (9), (10)] of the SEQR regulations and the staff has studied all pertinent data including the Environmental Assessment Form (EAF) Part I and prepared the EAF Parts II & III on behalf of the Town Board, and

WHEREAS, the staff of the Planning Division of the Planning Department has prepared a Planning Study that evaluates land use and other pertinent issues that influence the subject property, and

WHEREAS, the Planning Board has evaluated the Staff studies and has recommended by resolution of August 1, 1990 that:

1. That the requirements of SEQRA have been met thus far and will further be met with the issuance of a positive declaration;
2. That several of the criteria considered indicators of significant effects on the environment SEQRA [6 NYCRR 617.11(a)] are likely to occur as listed:
 - "a substantial adverse change in existing air quality, ground or surface water quality or quantity, traffic or noise levels; a substantial increase in potential for erosion, flooding, leaching or drainage problems;"

DiCanio Residential Communities (89-ZM-255) - SEQRA Resolution

- "the removal or destruction of large quantities of vegetation or fauna";
- "significant adverse effects to natural resources";
- "the creation of a material conflict with a community's current plans or goals as officially approved or adopted";
- "the impairment of the character or quality of important historical, archaeological, architectural, or aesthetic resources or of existing community or neighborhood character";
- "a substantial change in the use, or intensity of use, of land including agricultural, open space or recreational resources, or in its capacity to support existing uses"; and be it further

RESOLVED that the Huntington Town Planning Board also recommended to the Town Board that the proposed action will have a significant effect on the environment , and be it further

RESOLVED that the Town Board has evaluated all of the pertinent data prepared by the staff of the Planning Department, including the Planning Study and the EAF Parts II & III, and the recommendations of the Planning Board and after giving due consideration to the facts hereby issues a positive declaration pursuant to the SEQR regulations and hereby directs the applicant to prepare a Draft Environmental Impact Statement, and be it further

RESOLVED, that upon passage of this resolution the Environmental Review Division of the Planning Department shall be thereby directed to file notice of determination of significance in accordance with the SEQR regulations (section 617.10), and be it further

RESOLVED, that scoping shall take place within 30 days of the Town Board's determination of significance, in order to identify and focus on the issues to be addressed in the draft environmental impact statement, and be it further

RESOLVED, that the Town Board, in evaluating the Staff reports and considering the recommendations of the Planning Board, finds that the information provided thus far indicates that the application has sufficient merit to be heard at a public hearing and that should the Draft Environmental Impact Statement further substantiate this recommendation that simultaneous with a public hearing on the Impact Statement the Town Board should hold a public hearing on the application to rezone the subject property.

VOTE: AYES: 5 NOES: 0

The resolution was thereupon declared to be duly adopted.

617.21

Appendix E

POSITIVE DECLARATION
Notice of Intent to Prepare a Draft EIS
Determination of Significance

Project Number 89-ZM-255Date September 11, 1990

This notice is issued pursuant to Part 617 of the implementing regulations pertaining to Article 8 (State Environmental Quality Review Act) of the Environmental Conservation Law.

The Huntington Town Board, as lead agency, has determined that the proposed action described below may have a significant effect on the environment and that a Draft Environmental Impact Statement will be prepared.

Name of Action: DiCano Residential Communities, Inc.

SEQR Status: XXX Type I
 ___ Unlisted

Description of Action:

The proposed action is a change of zone from R-40 Residence District (one acre minimum lot size) to R-20 Residence District (20,000 square foot lot size) to accommodate the construction of new attached and detached residences on 39.3 acres of fallow farmland. Two yield studies were submitted; one for 61 lots, a recharge basin, and a 10% parkland setback, the other for 67 lots without a park setback. Proposed access to the site is from Lake Road.

The subject property lies within dedicated open space (OSI #NE-22 on Huntington Open Space Index) and is contiguous to the National Register Ireland-Gardiner Farm.

Location: (Include street address and the name of the municipality/county. A location map of appropriate scale is also recommended.)

Northeasterly corner of Lake Road and Pulaski Road (C.R. 11) in the Hamlet of Greenlawn, Huntington Township, Suffolk County
S.C.T.M. #0400-105-02-029

Reasons Supporting This Determination:

Several of the criteria considered indicators of significant effects on the environment in SEQRA [6 NYCRR 617.11(a)] are likely to occur as listed:

"a substantial adverse change in existing air quality, ground or surface water quality, traffic or noise levels; a substantial increase in potential for erosion, flooding, leaching or drainage problems";

"the removal or destruction of large quantities of vegetation or fauna";

"significant adverse effects to natural resources";

"the creation of a material conflict with a community's current plans or goals as officially approved or adopted";

"the impairment of the character or quality of important historical, archaeological, architectural, or aesthetic resources or of existing community or neighborhood character";

"a substantial change in the use, or intensity of use, of land including agricultural, open space or recreational resources, or in its capacity to support existing uses".

For further information:

Contact Person: Richard Machtay, Director of Planning, or
Margo Myles, Environmental Review Division

Address: 100 Main Street, Huntington, NY 11743

Telephone Number: 516/351-3196

A Copy of this Notice Sent to:

XX Commissioner, Department of Environmental Conservation, 50
Wolf Road, Albany, New York 12233-0001

XX Appropriate Regional Office of the Department of Environmental
Conservation -- Region I

XX Office of the Chief Executive Officer of the political
subdivision in which the action will be principally located -
- Supervisor Ferraro and Town Board Members

XX Applicant - DiCanio Residential Communities, Inc.

Other involved agencies (if any):

- XX Suffolk County Department of Health Services, Wastewater Management Division
- XX Suffolk County Dept. of Public Works
- XX Greenlawn Water District
- XX Huntington Planning Board

Interested agencies (if any):

- XX Suffolk County Planning Commission
- XX Suffolk County Water Authority
- XX Huntington Conservation Board

cc: Town Attorney
Town Clerk
R. Caputi

Appendix A-7
Greenlawn Water District letter

November 19, 1998



GREENLAWN WATER DISTRICT

45 RAILROAD STREET
GREENLAWN, NEW YORK 11740-1297

COMMISSIONERS

EDWARD R. FROHLICH

516/261-0926

JOHN T. McLAUGHLIN

516/261-0874

WILLIAM M. WILCK

November 19, 1998

Ms. Shana M. Lacey
Environmental Scientist
Nelson, Pope & Vorrhis, LLC
572 Walt Whitman Road
Melville, NY 11747

NOV 20 1998 SL

Re: Harborfields Estates
SCTM 0400 105 02 29

Dear Shana,

This is to advise that water is available and can be adequately supplied to the project referenced above, subject to District review and approval.

A copy of our Annual Water Supply Statement is enclosed for your information, which should address your concerns regarding quality and source of supply.

Please feel free to contact me if you require further information.

Very truly yours,

GREENLAWN WATER DISTRICT

Robert Santoriello
Superintendent

RS:mh
Enc.

GREENLAWN WATER DISTRICT
1997 ANNUAL WATER SUPPLY STATEMENT

The annual water supply statement is issued in compliance with Title III, Sections 1160-1163 of the New York State Public Health Law. The law requires that certain information be published relative to water quality, quantity and conservation measures.

The Greenlawn Water District's source of supply is solely from an aquifer underlying Long land known as the Magogy formation. The water drawn from this formation is generally very good to excellent in quality with localized areas of some contamination.

Greenlawn Water District services an area of 13 square miles with a population of approximately 42,000. In 1997, the total amount of water withdrawn from the aquifer was 1,817,648,000 gallons. Approximately 93 percent of the total was billed directly to consumers. The balance, or approximately 12 percent, was used for fire fighting purposes, hydrant use by Town trucks for street watering, licensed tree spraying contractors with permits, distribution system leaks, and irrigated use, etc.

Treatment to improve water quality is provided prior to distribution to the system. Sodium hydroxide (an alkali) is added to adjust the pH of the well water which is naturally acidic. This reduces the instance of corrosion in system piping and internal home plumbing. Presently, twelve of the District's sixteen wells have this added treatment. An air stripping tower is located at Well #12 (Huntman La.) for removal of V.O.C.'s Granulated Activated Carbon (G.A.C.) treatment is located at Well #8 (Durr Rd.) for V.O.C. removal.

The District Wells (1,3, & 7) have been removed from service on approaching maximum contaminant levels as established by federal and state health agencies:

Well #1 (25A, Conterport) - Removed from service 4/92 upon routine sample results indicating single organic chemical detection nearing the maximum level permitted (5 ppb). Presently no plans to return this well to service.

Wells #3 & #7 (Park Ave. & Hedgerow Lane) - In January, 1989, new State Health Department regulations became effective as pertaining to volatile organic compounds (V.O.C.'s). These new standards adopted maximum contaminant levels tenfold more stringent than the preceding year.

Anticipation of the new standards, both wells, having had routine sampling results showing concentrations of organic chemicals and nitrates, were voluntarily removed from service prior to January, 1989. Present treatment technology for nitrate removal is very costly and has, to date, not been used on these wells to service.

Standby diesel and natural gas engines are installed at eight pumphouses to provide normal operation of the system during periods of power outages.

Each one of us should be cognizant of and implement conservation measures to ensure protection of the quantity of our source of supply. Such measures, such as installing low flow faucet aerators and showerheads, automatic irrigation rain sensors, locating leaks and prompt repair of leaks, etc., will save costs to consumers not only on water bills, but also energy bills (hot water heaters). Our water rate structure is designed to promote conservation; the more you use, the more you pay. The average consumer pays a minimum quarterly charge of \$6.00 for 8,000 gallons and \$6.65 per thousand for the next 60,000 gallons. Large users who pay \$8.65 for the next 10,000 gallons and \$1.05 over 100,000 gallons are therefore encouraged to lower their consumption at the same time, their household costs. Literature concerning water conservation is available at the District office and helpful hints will be published in our Spring and Fall newsletters, along with announcements of any water restrictions.

New York State law requires water suppliers to notify their customers about the risks of cryptosporidiosis and giardiasis. Cryptosporidiosis and giardiasis are intestinal illnesses caused by microscopic parasites. Cryptosporidiosis can be very serious for people with weak immune systems such as chemotherapy, dialysis or transplant patients, and people with Crohn's disease or HIV infection. People with weakened immune systems should discuss with their health care providers the need to take extra precautions such as boiling water, using a certified bottled water or a specially approved home filter. Individuals who think they may have cryptosporidiosis and urinate should contact their health care provider immediately. To date, there are no known cases of cryptosporidiosis and giardiasis linked to the water supply in Nassau or Suffolk counties. For additional information on Cryptosporidiosis and giardiasis, please contact Mr. Paul Ponturo of the Suffolk County Health Department at (516) 863-3192.

ANALYTICAL TESTING RESULTS

Table with 2 columns: Parameter and Result. Includes items like Arsenic (N/S), Barium (N/D), Cadmium (ppb), Chloride (ppm), etc.

The supplement of analytical results from samples taken at all pumping stations is available at the District office and the Harborfields Public Library (31 Broadway, Greenlawn).

A new rule was enacted in June, 1991 by the U.S.E.P.A. involving additional monitoring requirements for lead and copper. The regulation required samples to be taken at the consumers' kitchen faucet/bath faucet. Specific sites and conditions were targeted which appeared to be at the highest risk. The rule also replaced the former maximum contaminant level (MCL/50ppb) with an Action Level (AL/15ppb) for lead. If these levels are exceeded, it will be necessary to install treatment systems and provide for public education on the adverse health effects of lead. Sampling rounds conducted for lead and copper to date have met all federal and state requirements.

Following is a list of 1997 Monitoring Requirements and New York State Department of Environmental Conservation standards and Guidelines:

CHEMICAL ANALYSIS - INORGANIC

Table listing inorganic chemical analysis parameters and their standards, such as Arsenic (50.1 ug/l), Barium (2.0 mg/l), Cadmium (5.0 ug/l), etc.

BACTERIOLOGICAL - Total Coliform.../P/A. No more than 5% positive of monthly samples.

VOLATILE ORGANIC COMPOUNDS (NYS LIMIT - ug/l) REGULATED VOC'S

Table listing volatile organic compounds and their regulated VOC status, including Benzene, Vinyl chloride, Carbon tetrachloride, etc.

*Iron & manganese combined should not exceed 0.6 milligrams per liter.
+Moderately restricted sodium diet should not exceed 270 mg/l.
Severely restricted sodium diet should not exceed 20 mg/l.
*Limit established for total trihalomethanes is 100 ppb.
All distribution samples analyzed for Volatile Organic Compounds had nondetectable results.

Table with columns: PARAMETERS, 1997 STANDARD OR GUIDELINE, TESTING DETECTION LIMITS, ACTUAL TESTS (MAX, AVG, MIN).

All employees have been instructed to direct all questions on this report to the superintendent and/or the Board of Commissioners. You can help by addressing all questions by mail or telephone to the superintendent or the Board of Commissioners.

In summary, your Water District is providing you with pure water that meets or exceeds all Federal, State and local Health Department standards.

GREENLAWN WATER DISTRICT
Board of Water Commissioners
William W. Wieck, Chairman
John T. McLaughlin, Treasurer
Edward R. Froehlich, Secretary

March 19, 1998

J-26-IT-

DEADLINE
FOR LEGAL NOTICES
IS
MONDAY AT NOON
Mail to 322 Main Street
Huntington New York 11743 or
Fax to (516) 427-5820

**Appendix A-8
Harborfields Central School District letter**

November 23, 1998



Harborfields Central School District

2 OLDFIELD ROAD, GREENLAWN, NEW YORK 11740-1200
(516) 754-5300 FAX (516) 754-5318

Cramer Harrington
Superintendent of Schools

November 23, 1998

Joseph C. Dragone
Assistant Superintendent
for Business

Shana M. Lacey
Nelson, Pope & Voorhis, LLC
572 Walt Whitman Road
Melville, NY 11747-2188

NOV 23 1998 SL

Dear Ms. Lacey:

Superintendent of Schools Cramer Harrington has referred your letter of November 14, 1998 to me for response. We are aware of the proposal to develop this parcel of land for residential use. You have asked three specific questions:

1. Analyze anticipated project impacts with regards to redistricting. The Harborfields Central School District is currently organized for instruction in four locations, each of which serves the entire population at specified grade levels.

K-1 at Taylor Avenue Early Childhood Center
2-4 at Thomas J. Lahey Elementary School
5-8 at Oldfield Middle School
9-12 at Harborfields High School

There will, therefore, be no impact on the school attendance zones unless and until, at some point in the future, we return to an organization structure that serves children in one grade level at several locations. This possibility is, in my opinion, highly unlikely.

2. Is there a projected lack of classroom space? Yes. A serious shortage of classroom space is anticipated at the middle school within three years and at the high school within five or six years. We are currently at maximum utilization in our K through 4 buildings, and any significant increase in the population in those grade levels could exacerbate the space problems we are currently having as well.
3. How a new influx of school-age children, double the number at existing zoning, will impact the school district? An increase of 100 students, when added to the increased enrollment we are experiencing due to spot-building and the increased desirability of Harborfields Public Schools, will impact the school district by placing a proportionately greater demand on the services we provide. In addition to classroom space, we expect to have to hire additional staff (both professional and non-professional) and provide additional services (such as transportation and health services).

If there is any further information you may need in order to prepare the Draft Environmental Impact Statement, please feel free to contact me.

Sincerely,

Joseph C. Dragone
Assistant Superintendent for Business

JCD/sw

cc: Cramer Harrington

Appendix A-9
Greenlawn Fire District letter

November 18, 1998

Office of the Chief
GREENLAWN FIRE DEPARTMENT
23 Boulevard
Greenlawn, New York 11740
Phone: (516) 261-9103 / FAX (516) 261- 9856

November 11, 1998

Wilson, Peter / Norman, M
578 Walt Whitman Road
Islipville, NY 11740-4148

11/11/98 SL

Dear Shana M. Lucey:

This letter is in response to your request concerning the fire protection services of the Greenlawn Fire Department in the vicinity of construction of the Hammondsfield Estates, 102 Center on Pillsbury Road, off Lake Road.

I have put together the following information for you:

The Greenlawn Fire Department Headquarters is less than 1 mile away from the above mentioned site. The headquarters is located on 23 Boulevard Avenue where we have the following equipment:

- a One Ambulance
- a One Engine
- a One Engine/Heavy Rescue Truck
- a One Aerial
- a One Brush Truck

The Greenlawn Fire Department Sub-Station is located on Little Plains Road, less than 3 miles away. We have the following equipment located there:

- a One Ambulance
- a Two Engines
- a One Heavy Rescue Truck

The Greenlawn Fire Department is manned by 117 volunteer members of which approximately 60 members are on our Rescue Squad. As far as the amount of men available to respond, depends on the time of day. If we need assistance, we call for mutual aid from surrounding departments.

Our department is funded through property taxes.

As First Chief I feel it would be to use your experience and knowledge
advantage to have a second access point to the various of law
territory. For the number of reasons the primary access point is
backed up as an emergency the primary access point is not always
enter the environment by the second access point.

If you have any other concerns, please contact me at [redacted]
[redacted].

Sincerely,



David S. [redacted]
Chief, Operations, F.O.

APPENDIX B
SOIL TEST RESULTS

1.0 INTRODUCTION AND PURPOSE

Nelson, Pope & Voorhis, LLC has been directed to test the soils present on the subject property. This report is intended to document the presence and concentration of lead, arsenic, and pesticides (including PCB's, DDT and its metabolites, and chlordane), because these substances (particularly lead, arsenic, and DDT) were widely used for weed and pest control on Long Island. The subject site was used for agricultural purposes in the past, though the site has lain fallow and unused since at least 1988.

This document will be used to assist in evaluating the environmental and/or public health implications regarding the presence and current concentrations of agricultural chemicals in on-site soils.

The project site is located in the Hamlet of Greenlawn, Town of Huntington, Suffolk County, New York. It is located on the north side of Pulaski Road, east of Lake Street. The subject property is a 39.3 acre parcel of land which is identified on the Suffolk County Tax Map as: District 0400-Section 105-Block 2-Lot 29.

The sampling program was designed and supervised by NP&V. Laboratory data was analyzed by Long Island Analytical Laboratories, Inc. The protocol used to direct this investigation is based upon the guidance offered by the New York State Department of Health (NYSDOH) Bureau of Toxic Substance Assessment to the local health department in particular, with general consideration of sampling and analysis protocol as documented in New York State Department of Environmental Conservation (NYSDEC) Documents, Technical Administrative Guidance Manual (TAGM) # 4046 Determination of Soil Cleanup Objectives and Cleanup Levels and Suffolk County Department of Health Services (SCDHS) SOP-0-95. The following sections detail the site and area characteristics, sampling program, protocol and quality assurance, lab analysis and results.

In accordance with comments received from the Town of Huntington Division of Planning, the soil was sampled and analyzed for the presence of pesticides, lead and arsenic. The soil sampling revealed that elevated levels of some analyzed constituents were identified. The concentrations are typical of fields which have been used for agricultural purposes. In accordance with the NYSDOH letter, it is recommended that mitigation of the contaminated soils be undertaken in order to safeguard the health of the future residents. This report recommends mitigation and identifies the necessary steps that are required.

2.0 SAMPLING AND ANALYSIS PROGRAM

2.1 SAMPLE COLLECTION

A total of eight (8) soil samples were collected; two samples from each of four (4) sample points were taken on October 21, 1998. The soil samples were collected at depths of 0-3 inches and 3-6 inches. The subject property is generally flat with a slight downward slope from northeast to southwest. One sample point was located within the low area near the southwestern corner of the site (SS-3), one was located in an intermediate elevation near the southeasterly portion, near the southern property line (SS-2), and one was located in the site's high area, near the northeastern corner (SS-1), in order to provide an accurate representation of the site's soils. A fourth sample (SS-4) was collected from off-site, on property opposite the site's northwestern corner, along the west side of Lake Street.

The sampling scheme employed was consistent with guidance available from the NYSDOH. A stainless steel hand spade (decontaminated between uses, see Section 4.0) was used to extract all of the soil samples from the subject property.

2.2 SAMPLING PROGRAM RATIONALE

The NYSDOH provides guidance for such soil sampling through the Suffolk County Department of Health Services (SCDHS). Soil samples were collected in accordance with the recommendations of the NYSDOH, noted as follows:

- samples were collected at depths of 0-3 inches and 3-6 inches.
- samples were directed toward those areas likely to have accumulated the highest contaminant levels.
- samples were analyzed for lead, arsenic and DDT and its metabolites.

Consistent with the NYSDOH letter, if elevated levels of lead and arsenic were found in the 0-3 inch range, the sample collected from the 3-6 inch range was then tested to determine the depth of occurrence and vertical mixing. Laboratory analysis results are discussed in Section 3.0. Since the proposed property will be used for a residential subdivision, the concentrations of lead and arsenic are an important issue.

In accordance with NYSDOH recommendations, the sampling and analysis program was intended to determine:

- if site activities had caused degradation of soil quality on site;
- if soil mitigation is appropriate, given the concentration of contaminants and the intended use of the site.

The following section provides the laboratory analysis for the site samples, including test methods and analytical results.

3.0 LABORATORY ANALYSIS

3.1 ANALYTICAL TEST METHODS

The soil samples were transported to a New York State Certified Commercial ELAP Laboratory for analysis. Selection of the analytical test methods for soil samples was based on the NYSDOH recommended soil sampling parameters for agricultural soils on Long Island. Analysis includes organo-chlorine pesticides based on USEPA Test Method 8080 (including PCBs, DDT and its metabolites and chlordane), as well as total lead and arsenic.

3.2 ANALYTICAL RESULTS

The results of the samples collected on 10/21/98 indicated that elevated levels of some of the analyzed constituents were identified. These results are indicative of the previous use of the subject property. Refer to **Table 1** for laboratory results and **Attachment A** for the laboratory data sheets. The original laboratory analysis sheets as provided by Long Island Analytical Laboratories, Inc. are presented in **Attachment A** of this document.

TABLE 1
DETECTED PESTICIDE/HERBICIDE CONTAMINANTS

Constituent	Sample 1	Sample 2	Sample 3	Sample 4	NYSDEC TAGM 4046	USEPA Health Based Carcinogens
<i>γ</i> -BHC (Lindane)	<2	<2	<2	<2	N/A	N/A
Heptachlor	<2	<2	<2	<2	100	160
Aldrin	<2	<2	<2	<2	500	41
Heptachlor epoxide	<2	<2	<2	24	20	77
4,4-DDE	190	210	140	430	4,400	2,100
Dieldrin	46	40	28	150	100	44
Endrin	<2	<2	<2	<2	100	N/A
4,4 DDD	120	150	78	160	7,700	2,900
4,4-DDT	420	530	280	560	2,500	2,100
Chlordane	<8	<8	<8	650	2,000	540
Toxaphene	<40	<40	<40	<160	N/A	N/A
Endrin aldehyde	<12	<12	<12	<12	N/A	N/A
<i>α</i> -BHC	<2	<2	<2	<2	200	111
<i>β</i> -BHC	<2	<2	<2	<2	200	3890
<i>δ</i> -BHC	<2	<2	<2	<2	300	N/A
Endosulfan I	4	5.2	6	<4	900	N/A
Endosulfan II	20	31	16	<4	900	N/A
Endosulfan sulfate	70	93	82	<12	1,000	N/A
Arsenic	35	47	24	33	7.5 or SB/25	N/A
Lead	23	23	19	57	SB/100	N/A

Note: TAGM levels are for groundwater protection and are not intended to address public health issues.

TAGM levels are noted for reference purposes only.

USEPA Health Based Carcinogens referenced for comparison from TAGM 4046.

All pesticide results in micrograms/kilogram (ug/kg) or parts per billion (ppb).

All elements are in milligrams/kilogram (mg/kg) or parts per million (ppm).

SB - Site Background; Levels from SCDHS SOP 9-95.

N/A - indicated no standard/guidance.

Bold - exceeds TAGM Soil Guidance for Groundwater Protection.

Italics - exceeds TAGM USEPA Health Based Carcinogens.

4.0 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES (QA/QC)

Sampling protocol was conducted in accordance with USEPA accepted sampling procedures for hazardous waste streams (Municipal Research Laboratory, 1980, Sampling and Sampling Procedures for Hazardous Material Waste Streams, USEPA, Cincinnati, Ohio EPA- 600\280-018) and ASTM Material Sampling Procedures. All samples were collected by or under the auspices of USEPA trained personnel having completed the course Sampling of Hazardous Materials, offered by the Office of Emergency and Remedial Response. Separate QA/QC measures were implemented for each of the instruments used in soil-gas and soil sampling.

Separate QA/QC measures were implemented for each of the instruments used in the Sampling and Analysis Program. Sampling instruments included a stainless steel hand spade and sample vessels.

Prior to arrival on the subject property and between sample locations, the hand auger was decontaminated by washing with a detergent (alconox/liquinox) and potable water solution with distilled water rinse. All sample vessels were "level A" certified decontaminated containers. Samples were placed into vessels consistent with the analytical parameters. After acquisition, samples were preserved in the field. All containerized samples were refrigerated to 4^o C during transport.

A sample represents physical evidence, therefore, an essential part of liability reduction is the proper control of gathered evidence. To establish proper control, the following sample identification and chain-of-custody procedures were followed:

Sample Identification

Sample identification was executed by use of a sample tag, log book and manifest. Documentation provides the following:

1. Project Code
2. Sample Laboratory Number
3. Sample Preservation
4. Instrument Used for Source Soil Grabs
5. Composite Medium Used for Source Soil Grabs
6. Date Sample was Secured from Source Soil
7. Time Sample was Secured from Source Soil
8. Person Who Secured Sample from Source Soil

Chain-of-Custody Procedures

Due to the evidential nature of samples, possession was traceable from the time the samples were collected until they were received by the testing laboratory. A sample was considered under custody if:

- It was in a person's possession, or
- It was in a person's view, after being in possession, or
- It was in a person's possession and they were to lock it up, or
- It is in a designated secure area.

When transferring custody, the individuals relinquishing and receiving signed, dated and noted the time of the Chain-of- Custody Form.

Laboratory Custody Procedures

A designated sample custodian accepted custody of the shipped samples and verified that the information on the sample tags matched that on the Chain-of-Custody records. Pertinent information as to shipment, pick-up, courier, etc. was entered in the "remarks" section. The custodian then entered the sample tag data into a bound logbook which was arranged by project code and station number.

The laboratory custodian used the sample tag number or assigned an unique laboratory number to each sample tag and assured that all samples were transferred to the proper analyst or stored in the appropriate source area.

The custodian distributed samples to the appropriate analysts. Laboratory personnel were responsible for the care and custody of samples from the time they were received until the sample was exhausted or returned to the custodian.

All identifying data sheets and laboratory records were retained as part of the permanent site record. Samples received by the laboratory were retained until after analysis and quality assurance checks were completed.

5.0 SUMMARY AND CONCLUSION

This investigation was completed to address issues outlined in a letter from the Town of Huntington Division of Planning which requested soil sampling to determine the concentration of certain pesticide-related compounds in the soil due to past agricultural uses on the subject property. A sampling and analysis program was designed to determine the concentrations of lead, arsenic and DDT and its metabolites in the soil in accordance with recommendations of the NYSDOH. The sampling program consisted of collection of discreet soil samples at depths of 0-3 inches and 3-6 inches in locations expected to yield "worst case" results. Laboratory analysis of the soil samples were performed using analytical test methods consistent with expected parameters and NYSDOH guidance. The following presents an evaluation of the results of this investigation.

1. Soil samples were collected and analyzed. These samples were analyzed for the presence of arsenic, lead and pesticides. The laboratory analysis revealed that all of the analyzed constituents were below the NYSDEC TAGM 4046 standards and the USEPA Health Based Carcinogens, except chlordane which exceeded the USEPA standards in the off-site sample. Lead was within the soil background levels for Suffolk County. Arsenic exceeded the TAGM 4046 standard, as well as the SCDHS standard of 25 ppm at locations 1, 2 and 4 (off-site). The 3-6 inch samples from locations 1 and 2 will be tested for arsenic, to determine the depth of penetration of this contaminant.
2. Since arsenic exceeded the regulatory standard, it is recommended that the topmost 6 inches of soil be removed from those areas of the site within lots that are anticipated to be located within front, side and rear yards. This material may be used elsewhere on the site, as fill for roadbeds, within the landscaped berm or in drainage areas. It may be prudent to run additional samples from depths of 9-12 inches and 15-18 inches to confirm that removal of 6 inches is appropriate. Depth samples from location 2 are expected to be sufficient.

6.0 REFERENCES

New York State Department of Environmental Conservation (NYSDEC), 1992, Sampling Guidelines and Protocols, Technology Background and Quality Control/Quality Assurance for NYSDEC Spill Response Program, NYSDEC, Albany, New York.

NYSDEC, 1994, Technical Administrative Guidance Memorandum, HWR-94-4046, Determination of soil cleanup objectives and cleanup levels, Division of Hazardous Waste Remediation, Albany, New York.

NYSDOH, 1996, letter dated July 15, 1996 from Edward Horn, Ph.D., Director Bureau of Toxic Substance Assessment to Frank Randall, Chief, Inspection Services Bureau SCDHS.

ATTACHMENT A
LABORATORY DATA SHEETS



November 5, 1998

Steve McGinn
Nelson, Pope & Voorhis
572 Walt Whitman Road
Melville, New York 11747

Re: Harborfield Estates, Greenlawn

Dear Mr. McGinn:

Enclosed please find the Laboratory Analysis Report(s) for sample(s) received on October 21, 1998. Long Island Analytical Laboratories analyzed the samples on November 3, 1998 for the following:

CLIENT ID	ANALYSIS
Harborfield Estates, Greenlawn- SS-1 (0'-3)	EPA 8080 (pest), Total Lead & Arsenic
Harborfield Estates, Greenlawn- SS-2 (0'-3)	EPA 8080, (pest) Total Lead & Arsenic
Harborfield Estates, Greenlawn- SS-3 (0'-3)	EPA 8080, (pest) Total Lead & Arsenic
Harborfield Estates, Greenlawn- SS-4 (0'-3)	EPA 8080, (pest) Total Lead & Arsenic

If you have any questions or require further information, please call at your convenience. Long Island Analytical Laboratories would like to thank you for the opportunity to be of service to you.

Best Regards,

Long Island Analytical Laboratories

Client: Nelson, Pope & Voorhis	Client ID: Harborfield Estates, Greenlawn (See Below)
Date received: 10/21/98	Laboratory ID: See Below
Date extracted: 11/3/98	Matrix: Soil
Date analyzed: 11/3/98	ELAP #: 10320

ANALYTICAL REPORT

Lab ID #	Client ID	Lead Results	Arsenic Results
9814137	SS-1 {0'-3'}	23 mg/kg	35 mg/kg
9814138	SS-2 {0'-3'}	23 mg/kg	47 mg/kg
9814139	SS-3 {0'-3'}	19 mg/kg	24 mg/kg
9814140	SS-4 {0'-3'}	57 mg/kg	33 mg/kg

Performed by SW-846 Method 6010

Michael Venezia

Laboratory Director



**LONG
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ANALYTICAL
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Client: Nelson, Pope & Voorhis	Client ID: Harborfield Estates, Greenlawn (SS-1 {0'-3'})
Date received: 10/21/98	Laboratory ID: 9814137
Date extracted: 11/3/98	Matrix: Soil
Date analyzed: 11/3/98	ELAP #: 10320

PESTICIDES EPA METHOD 8080

COMPOUND	CAS No.	RESULTS ug/kg
γ - BHC (Lindane)	58-89-9	<2
Heptachlor	76-44-8	<2
Aldrin	309-00-2	<2
Heptachlor epoxide	1024-57-3	<2
4,4'-DDE	72-55-9	190
Dieldrin	60-57-1	46
Endrin	72-20-8	<2
4,4'-DDD	72-54-8	120
4,4'-DDT	50-29-3	420
Chlordane	12789-03-6	<8
Toxaphene	8001-35-2	<40
Endrin aldehyde	7421-93-4	<12
α - BHC	319-84-6	<2
β - BHC	319-85-7	<2
δ - BHC	319-86-8	<2
Endosulfan I	959-98-8	4
Endosulfan II	33212-65-9	20
Endosulfan sulfate	1031-07-8	70

Michael Venezia

Laboratory Director



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Client: Nelson, Pope & Voorhis	Client ID: Harborfield Estates, Greenlawn (SS-2 {0'-3'})
Date received: 10/21/98	Laboratory ID: 9814138
Date extracted: 11/3/98	Matrix: Soil
Date analyzed: 11/3/98	ELAP #: 10320

PESTICIDES EPA METHOD 8080

COMPOUND	CAS No.	RESULTS ug/kg
γ - BHC (Lindane)	58-89-9	<2
Heptachlor	76-44-8	<2
Aldrin	309-00-2	<2
Heptachlor epoxide	1024-57-3	<2
4,4'-DDE	72-55-9	210
Dieldrin	60-57-1	40
Endrin	72-20-8	<2
4,4'-DDD	72-54-8	150
4,4'-DDT	50-29-3	530
Chlordane	12789-03-6	<8
Toxaphene	8001-35-2	<40
Endrin aldehyde	7421-93-4	<12
α - BHC	319-84-6	<2
β - BHC	319-85-7	<2
δ - BHC	319-86-8	<2
Endosulfan I	959-98-8	5.2
Endosulfan II	33212-65-9	31
Endosulfan sulfate	1031-07-8	93

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Client: Nelson, Pope & Voorhis	Client ID: Harborfield Estates, Greenlawn (SS-3 {0'-3'})
Date received: 10/21/98	Laboratory ID: 9814139
Date extracted: 11/3/98	Matrix: Soil
Date analyzed: 11/3/98	ELAP #: 10320

PESTICIDES EPA METHOD 8080

COMPOUND	CAS No.	RESULTS ug/kg
γ - BHC (Lindane)	58-89-9	<2
Heptachlor	76-44-8	<2
Aldrin	309-00-2	<2
Heptachlor epoxide	1024-57-3	<2
4,4'-DDE	72-55-9	140
Dieldrin	60-57-1	28
Endrin	72-20-8	<2
4,4'- DDD	72-54-8	78
4,4'-DDT	50-29-3	280
Chlordane	12789-03-6	<8
Toxaphene	8001-35-2	<40
Endrin aldehyde	7421-93-4	<12
α - BHC	319-84-6	<2
β - BHC	319-85-7	<2
δ - BHC	319-86-8	<2
Endosulfan I	959-98-8	6
Endosulfan II	33212-65-9	16
Endosulfan sulfate	1031-07-8	82

Michael Versaldi

Laboratory Director



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Client: Nelson, Pope & Voorhis	Client ID: Harborfield Estates, Greenlawn (SS-4 {0'-3'})
Date received: 10/21/98	Laboratory ID: 9814140
Date extracted: 11/3/98	Matrix: Soil
Date analyzed: 11/3/98	ELAP #: 10320

PESTICIDES EPA METHOD 8080

COMPOUND	CAS No.	RESULTS ug/kg
γ - BHC (Lindane)	58-89-9	<2
Heptachlor	76-44-8	<2
Aldrin	309-00-2	<2
Heptachlor epoxide	1024-57-3	24
4,4'-DDE	72-55-9	430
Dieldrin	60-57-1	150
Endrin	72-20-8	<2
4,4'-DDD	72-54-8	160
4,4'-DDT	50-29-3	560
Chlordane	12789-03-6	650
Toxaphene	8001-35-2	<160
Endrin aldehyde	7421-93-4	<12
α - BHC	319-84-6	<2
β - BHC	319-85-7	<2
δ - BHC	319-86-8	<2
Endosulfan I	959-98-8	<4
Endosulfan II	33212-65-9	<4
Endosulfan sulfate	1031-07-8	<12

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APPENDIX C
SONIR COMPUTER MODEL RESULTS

Appendix C-1
Introduction

APPENDIX C-1

SONIR MODEL USER GUIDE

for
Harborfield Estates

Greenlawn, Huntington, New York

Simulation of Nitrogen in Recharge (SONIR)
Microcomputer Model

INTRODUCTION

SONIR is a microcomputer model developed by Charles Voorhis 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 which 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 tabulation 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**):

$$R = P - (E + Q)$$

when

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 landcover 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) which is capable of recharging precipitation is entered in this data cell. For sites which include tidal wetlands, the area which is inundated by tidal waters should be excluded, as recharge from these areas should not be considered in the context of nitrogen simulation.
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.

For the Harborfield Estates parcel, the Mineola station is nearest the site, therefore a rate of 43.65 inches per year is used.

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 which 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:

<u>Location</u>	<u>Soil Type</u>	<u>Vegetation</u>	<u>ET(in)</u>	<u>ET(%)</u>
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

For the project site, evapotransportation was as follows: 23.80 for lawn areas.

6. *Runoff from Lawn* - Runoff is the quantity of water which 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 Lawn by dividing the lawn 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 Town Code Subdivision Regulations for determined leaching pool capacity.
10. *Runoff from Impervious* - The approximation of Evaporation from impervious would indicated 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 higher end of the range (0.7 to 2.1 percent of precipitation) are 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 unvegetated 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 which 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 unvegetated 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 unvegetated 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 unvegetated 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 which 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 unvegetated 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 unvegetated 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. 10) have indicated that lawn irrigation is estimated to be about 5.5 inches per year. This value is entered in Data Cell 28 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 which 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 SCDHS design flow criteria used in determining wastewater discharge. Residential dwellings have a design flow of 300 gallons per day (SCDHS, 1982; p. 4).
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 SCDHS 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 which 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 which 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 which 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 upon the 1991 LILCO Population Survey, the Suffolk County average number of persons per household 3.04 persons and the Nassau County average is 2.94 persons. Smithtown is 3.06 persons per household. The data input can be refined based upon the community and project, if necessary.
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 does not necessary have to be 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 Nonpoint Source Management Handbook (**Koppelman, 1984; Chapter 5, p.6**):

Residential	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 3 times per year, and 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 2.1 pounds per 1000 square feet. This 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 Nonpoint Source Management Handbook indicates that application rates as low as 1.0 lbs/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 percent 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 which 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 which 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 27 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**) indicate that "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 Suffolk County (**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 which 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 15 mg/l in weak effluent; 40 mg/l in medium strength effluent, and 60 mg/l in strong effluent (**Canter and Knox, 1985; p. 47**). 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 which 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 which 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

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NAME OF PROJECT

Harborfield Estates

DATA INPUT FIELD

Existing Conditions

SHEET 1

A	Site Recharge Parameters	Value	Units
1	Area of Site	39.30	acres
2	Precipitation Rate	43.65	inches
3	Acreage of Lawn	0.00	acres
4	Fraction of Land in Lawn	0.000	fraction
5	Evapotranspiration from Lawn	23.80	inches
6	Runoff from Lawn	0.31	inches
7	Acreage of Impervious	0.00	acres
8	Fraction of Land Impervious	0.000	fraction
9	Evaporation from Impervious	4.37	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	20.00	inches
14	Runoff from Unvegetated	0.7	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)	0.00	inches
19	Acreage of Natural Area	39.30	acres
20	Fraction of Land Natural	1.000	fraction
21	Evapotrans. from Natural Area	25.50	inches
22	Runoff from Natural Area	0.31	inches
23	Acreage of Other Area	0.00	acres
24	Fraction of Land Other Area	0.000	fraction
25	Evapotrans. from Other Area	23.80	inches
26	Runoff from Other Area	0.31	inches
27	Acreage of Land Irrigated	0.00	acres
28	Fraction of Land Irrigated	0.000	fraction
29	Irrigation Rate	5.50	inches
30	Number of Dwellings	0	units
31	Water Use per Dwelling	300	gal/day
32	Wastewater Design Flow	0	gal/day
33	Commercial /STP Design Flow	0	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	0.00	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	3.00	lbs/1000 sq ft
9	Fertilizer Nitrogen Leaching Rate 2	14	percent
10	Pet Waste Application Rate	3.19	lbs/pet
11	Pet Waste Nitrogen Leaching Rate	50	percent
12	Area of Land Irrigated	0.00	acres
13	Irrigation Rate	5.50	inches
14	Irrigation Nitrogen Leaching Rate	15	percent
15	Nitrogen in Precipitation	1.50	mg/l
16	Precipitation Nitrogen Leaching Rate	15	percent
17	Nitrogen in Water Supply	0.00	mg/l
18	Nitrogen in Commercial/STP Flow	0.00	mg/l

C	Comments
1)	Please refer to user manual for data input instructions.

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

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SITE RECHARGE COMPUTATIONS

Existing Conditions

SHEET 2

A	<i>Lawn Area Recharge</i>	Value	Units
1	A = Fraction of Land in Lawn	0.000	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evapotranspiration Rate	23.80	inches
4	Q = Runoff Rate	0.31	inches
5	$R(I) = P - (E + Q)$	19.54	inches
6	$R(L) = R(I) \times A$	0.00	inches

B	<i>Impervious Area Recharge</i>	Value	Units
1	A = Fraction of Land in Impervious	0.000	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evapotranspiration Rate	4.37	inches
4	Q = Runoff Rate	0.00	inches
5	$R(i) = P - (E + Q)$	39.29	inches
6	$R(I) = R(i) \times A$	0.00	inches

C	<i>Unvegetated Area Recharge</i>	Value	Units
1	A = Fraction of Land Unveg.	0.000	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evapotranspiration Rate	0.70	inches
4	Q = Runoff Rate	0.00	inches
5	$R(u) = P - (E + Q)$	42.95	inches
6	$R(U) = R(u) \times A$	0.00	inches

D	<i>Water Area Loss</i>	Value	Units
1	A = Fraction of Site in Water	0.000	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evaporation Rate	30.00	inches
4	Q = Runoff Rate	0.00	inches
5	M = Makeup Water	0.00	inches
6	$R(w) = \{P - (E+Q)\} - M$	13.65	inches
7	$R(W) = R(w) \times A$	0.00	inches

E	<i>Natural Area Recharge</i>	Value	Units
1	A = Fraction of Land in Natura	1.000	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evapotranspiration Rate	25.50	inches
4	Q = Runoff Rate	0.31	inches
5	$R(n) = P - (E + Q)$	17.84	inches
6	$R(N) = R(n) \times A$	17.84	inches

F	<i>Other Area Recharge</i>	Value	Units
1	A = Fraction of Land in Other	0.000	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evapotranspiration Rate	23.80	inches
4	Q = Runoff Rate	0.31	inches
5	$R(o) = P - (E + Q)$	19.54	inches
6	$R(O) = R(o) \times A$	0.00	inches

G	<i>Irrigation Recharge</i>	Value	Units
1	A = Fraction of Land Irrigated	0.000	fraction
2	I = Irrigation Rate	5.50	inches
3	E = Evaptranspiration Rate	3.00	inches
4	Q = Runoff Rate	0.31	inches
5	$R(irr) = I - (E + Q)$	2.19	inches
6	$R(IRR) = R(irr) \times A$	0.00	inches

H	<i>Wastewater Recharge</i>	Value	Units
1	WDF = Wastewater Design Flow	0	gal/day
2	WDF = Wastewater Design Flow	0	cu ft/yr
3	A = Area of Site	1,711,908	sq ft
4	$R(ww) = WDF/A$	0.00	feet
5	R(WW) = Wastewater Recharge	0.00	inches

Total Site Recharge		
R(T) =	$R(L) + R(I) + R(U) + R(W) + R(N) + R(O) + R(IRR) + R(WW)$	
R(T) =	17.84	inches



SIMULATION OF NITROGEN IN RECHARGE (SONIR)

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SITE NITROGEN BUDGET

Existing Conditions

SHEET 3

A	Sanitary Nitrogen-Residential	Value	Units
1	Number of Dwellings	0	units
2	Persons per Dwelling	0.00	capita
3	P = Population	0.00	capita
4	N = Nitrogen per person	10	lbs
5	LR = Leaching Rate	50	percent
6	N(S) = P x N x LR	0.00	lbs
7	N(S) = Sanitary Nitrogen	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/STP)	Value	Units
1	CF = Commercial/STP Flow	0	gal/day
2	CF = Commercial/STP Flow	0	liters/yr
3	N = Nitrogen in Commercial	0.00	mg/l
4	N(S) = CF x N	0	milligrams
5	N(S) = Sanitary Nitrogen	0.00	lbs

D	Water Supply Nitrogen	Value	Units
1	WDF = Wastewater Design Flow	0	gal/day
2	WDF = Wastewater Design Flow	0	liters/yr
3	N = Nitrogen in Water Supply	0.00	mg/l
4	N(WW) = WDF x N	0	milligrams
5	N(WW) = Wastewater Nitrogen	0.00	lbs

E	Fertilizer Nitrogen 1	Value	Units
1	A = Area of Land Fertilized 1	0	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	0.00	lbs
5	N(F1) = Fertilizer Nitrogen	0.00	lbs

F	Fertilizer Nitrogen 2	Value	Units
1	A = Area of Land Fertilized 2	0	sq ft
2	AR = Application Rate	3.00	lbs/1000 sf
3	LR = Leaching Rate	14	percent
4	N(F2) = A x AR x LR	0.00	lbs
5	N(F2) = Fertilizer Nitrogen	0.00	lbs

G	Precipitation Nitrogen	Value	Units
1	R(n) = Natural Recharge (feet)	1.49	feet
2	A = Area of Site (sq ft)	1,711,908	sq ft
3	R(N) = R(n) x A	2,545,037	cu ft
4	R(N) = Natural Recharge (liter)	72,075,435	liters
5	N = Nitrogen in Precipitation	1.50	mg/l
6	LR = Leaching Rate	15	percent
7	N(ppt) = P(S) x N x LR	1,621,697	milligrams
8	N(ppt) = Precipitation Nitrogen	3.58	lbs

H	Irrigation Nitrogen	Value	Units
1	R = Irrigation Recharge (inches)	2.19	inches
2	R = Irrigation Rate (feet)	0.18	feet
3	A = Area of Land Irrigated	0	sq ft
4	R(I) = R(irr) x A	0	cu ft
5	R(I) = Site Precipitation (liters)	0	liters
6	N = Nitrogen in Water Supply	0.00	mg/l
7	LR = Leaching Rate	15	percent
8	N(irr) = R(I) x N x LR	0	milligrams
9	N(irr) = Irrigation Nitrogen	0.00	lbs

Total Site Nitrogen		
N=	N(S) + N(P) + N(WW) + N(F1) + N(F2) + N(ppt) + N(irr)	
N=	3.58	lbs



SIMULATION OF NITROGEN IN RECHARGE (SONIR)

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NAME OF PROJECT

Harborfield Estates

Existing Conditions

FINAL COMPUTATIONS

SHEET 4

A	<i>Nitrogen in Recharge</i>	<i>Value</i>	<i>Units</i>
1	N = Total Nitrogen (lbs)	3.58	lbs
2	N = Total Nitrogen (milligrams)	1,623.433	milligrams
3	R(T) = Total Recharge (inches)	17.84	inches
4	R(T) = Total Recharge (feet)	1.49	feet
5	A = Area of Site	1,711,908	sq ft
6	R = R(T) x A	2,545,037	cu ft
7	R = Site Recharge Volume	72,075,435	liters
9	NR = N/R	0.02	mg/l

FINAL CONCENTRATION OF
NITROGEN IN RECHARGE

0.02

B	<i>Site Recharge Summary</i>	<i>Value</i>	<i>Units</i>
1	R(T) = Total Site Recharge	17.84	inches/yr
2	R = Site Recharge Volume	2,545,037	cu ft/yr
3	R = Site Recharge Volume	19,038,197	gal/yr
4	R = Site Recharge Volume	19.04	MG/yr

<i>Conversions used in SONIR</i>
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 Conditions**

SIMULATION OF NITROGEN IN RECHARGE (SONIR)

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Harborfield Estates

DATA INPUT FIELD

Proposed Conditions

SHEET 1

A	Site Recharge Parameters	Value	Units
1	Area of Site	39.30	acres
2	Precipitation Rate	43.65	inches
3	Acreage of Lawn	28.09	acres
4	Fraction of Land in Lawn	0.715	fraction
5	Evapotranspiration from Lawn	23.80	inches
6	Runoff from Lawn	0.31	inches
7	Acreage of Impervious	6.21	acres
8	Fraction of Land Impervious	0.158	fraction
9	Evaporation from Impervious	4.37	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	20.00	inches
14	Runoff from Unvegetated	0.7	inches
15	Acreage of Water	1.00	acres
16	Fraction of Site in Water	0.025	fraction
17	Evaporation from Water	30.00	inches
18	Makeup Water (if applicable)	0.00	inches
19	Acreage of Natural Area	0.00	acres
20	Fraction of Land Natural	0.000	fraction
21	Evapotrans. from Natural Area	25.50	inches
22	Runoff from Natural Area	0.31	inches
23	Acreage of Other Area	4.00	acres
24	Fraction of Land Other Area	0.102	fraction
25	Evapotrans. from Other Area	23.80	inches
26	Runoff from Other Area	0.31	inches
27	Acreage of Land Irrigated	28.09	acres
28	Fraction of Land Irrigated	0.715	fraction
29	Irrigation Rate	5.50	inches
30	Number of Dwellings	59	units
31	Water Use per Dwelling	300	gal/day
32	Wastewater Design Flow	17,700	gal/day
33	Commercial /STP Design Flow	0	gal/day

B	Nitrogen Budget Parameters	Value	Units
1	Persons per Dwelling	2.92	persons
2	Nitrogen per Person per Year	10.0	lbs
3	Sanitary Nitrogen Leaching Rate	50	percent
4	Area of Land Fertilized 1	28.09	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	3.00	lbs/1000 sq ft
9	Fertilizer Nitrogen Leaching Rate 2	14	percent
10	Pet Waste Application Rate	3.19	lbs/pet
11	Pet Waste Nitrogen Leaching Rate	50	percent
12	Area of Land Irrigated	28.09	acres
13	Irrigation Rate	5.50	inches
14	Irrigation Nitrogen Leaching Rate	15	percent
15	Nitrogen in Precipitation	1.50	mg/l
16	Precipitation Nitrogen Leaching Rate	15	percent
17	Nitrogen in Water Supply	1.00	mg/l
18	Nitrogen in Commercial/STP Flow	0.00	mg/l

C	Comments
	1) Please refer to user manual for data input instructions.
	2) Persons per household based on LI Almanac, 1997
	3) Acreage of Other Area, is non-fertilized, landscaped or natural.



SIMULATION OF NITROGEN IN RECHARGE (SONIR)

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SITE RECHARGE COMPUTATIONS

Proposed Conditions

SHEET 2

A	Lawn Area Recharge	Value	Units
1	A = Fraction of Land in Lawn	0.715	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evapotranspiration Rate	23.80	inches
4	Q = Runoff Rate	0.31	inches
5	R(I) = P - (E + Q)	19.54	inches
6	R(L) = R(I) x A	13.97	inches

B	Impervious Area Recharge	Value	Units
1	A = Fraction of Land in Impervious	0.158	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evapotranspiration Rate	4.37	inches
4	Q = Runoff Rate	0.00	inches
5	R(i) = P - (E + Q)	39.29	inches
6	R(I) = R(i) x A	6.21	inches

C	Unvegetated Area Recharge	Value	Units
1	A = Fraction of Land Unveg.	0.000	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evapotranspiration Rate	0.70	inches
4	Q = Runoff Rate	1.00	inches
5	R(u) = P - (E + Q)	41.95	inches
6	R(U) = R(u) x A	0.00	inches

D	Water Area Loss	Value	Units
1	A = Fraction of Site in Water	0.025	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evaporation Rate	30.00	inches
4	Q = Runoff Rate	0.00	inches
5	M = Makeup Water	0.00	inches
6	R(w) = {P - (E+Q)} - M	13.65	inches
7	R(W) = R(w) x A	0.35	inches

E	Natural Area Recharge	Value	Units
1	A = Fraction of Land in Natura	0.000	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evapotranspiration Rate	25.50	inches
4	Q = Runoff Rate	0.31	inches
5	R(n) = P - (E + Q)	17.84	inches
6	R(N) = R(n) x A	0.00	inches

F	Other Area Recharge	Value	Units
1	A = Fraction of Land in Other	0.102	fraction
2	P = Precipitation Rate	43.65	inches
3	E = Evapotranspiration Rate	23.80	inches
4	Q = Runoff Rate	0.31	inches
5	R(o) = P - (E + Q)	19.54	inches
6	R(O) = R(o) x A	1.99	inches

G	Irrigation Recharge	Value	Units
1	A = Fraction of Land Irrigated	0.715	fraction
2	I = Irrigation Rate	5.50	inches
3	E = Evaptranspiration Rate	3.00	inches
4	Q = Runoff Rate	0.31	inches
5	R(irr) = I - (E + Q)	2.19	inches
6	R(IRR) = R(irr) x A	1.57	inches

H	Wastewater Recharge	Value	Units
1	WDF = Wastewater Design Flow	17,700	gal/day
2	WDF = Wastewater Design Flow	863,769	cu ft/yr
3	A = Area of Site	1,711,908	sq ft
4	R(ww) = WDF/A	0.50	feet
5	R(WW) = Wastewater Recharge	6.05	inches

Total Site Recharge		
R(T) =	R(L) + R(I) + R(U) + R(W) + R(N) + R(O) + R(IRR) + R(WW)	
R(T) =	30.13	inches



SIMULATION OF NITROGEN IN RECHARGE (SONIR)

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SITE NITROGEN BUDGET

Proposed Conditions

SHEET 3

A	Sanitary Nitrogen-Residential	Value	Units
1	Number of Dwellings	59	units
2	Persons per Dwelling	2.92	capita
3	P = Population	172.28	capita
4	N = Nitrogen per person	10	lbs
5	LR = Leaching Rate	50	percent
6	N(S) = P x N x LR	861.40	lbs
7	N(S) = Sanitary Nitrogen	861.40	lbs

B	Pet Waste Nitrogen	Value	Units
1	AR = Application Rate	3.19	lbs/pet
2	Human Population	172	capita
3	Pets = 17 percent of capita	29	pets
4	N(p) = AR x pets	93.43	lbs
5	LR = Leaching Rate	50	percent
6	N(P) = N(p) x LR	46.71	lbs
7	N(P) = Pet Waste Nitrogen	46.71	lbs

C	Sanitary Nitrogen (Commercial/STP)	Value	Units
1	CF = Commercial/STP Flow	0	gal/day
2	CF = Commercial/STP Flow	0	liters/yr
3	N = Nitrogen in Commercial	0.00	mg/l
4	N(S) = CF x N	0	milligrams
5	N(S) = Sanitary Nitrogen	0.00	lbs

D	Water Supply Nitrogen	Value	Units
1	WDF = Wastewater Design Flow	17,700	gal/day
2	WDF = Wastewater Design Flow	24,452,993	liters/yr
3	N = Nitrogen in Water Supply	1.00	mg/l
4	N(WW) = WDF x N	24,452,993	milligrams
5	N(WW) = Wastewater Nitrogen	53.92	lbs

E	Fertilizer Nitrogen 1	Value	Units
1	A = Area of Land Fertilized 1	1,223,600	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	394.00	lbs
5	N(F1) = Fertilizer Nitrogen	394.00	lbs

F	Fertilizer Nitrogen 2	Value	Units
1	A = Area of Land Fertilized 2	0	sq ft
2	AR = Application Rate	3.00	lbs/1000 sf
3	LR = Leaching Rate	14	percent
4	N(F2) = A x AR x LR	0.00	lbs
5	N(F2) = Fertilizer Nitrogen	0.00	lbs

G	Precipitation Nitrogen	Value	Units
1	R(n) = Natural Recharge (feet)	1.88	feet
2	A = Area of Site (sq ft)	1,711,908	sq ft
3	R(N) = R(n) x A	3,211,274	cu ft
4	R(N) = Natural Recharge (liter)	90,943,276	liters
5	N = Nitrogen in Precipitation	1.50	mg/l
6	LR = Leaching Rate	15	percent
7	N(ppt) = P(S) x N x LR	2,046,224	milligrams
8	N(ppt) = Precipitation Nitrogen	4.51	lbs

H	Irrigation Nitrogen	Value	Units
1	R = Irrigation Recharge (inches)	2.19	inches
2	R = Irrigation Rate (feet)	0.18	feet
3	A = Area of Land Irrigated	1,223,600	sq ft
4	R(I) = R(irr) x A	223,424	cu ft
5	R(I) = Site Precipitation (liters)	6,327,364	liters
6	N = Nitrogen in Water Supply	1.00	mg/l
7	LR = Leaching Rate	15	percent
8	N(irr) = R(I) x N x LR	949,105	milligrams
9	N(irr) = Irrigation Nitrogen	2.09	lbs

Total Site Nitrogen		
N=	N(S) + N(P) + N(WW) + N(F1) + N(F2) + N(ppt) + N(irr)	
N=	1362.64	lbs



SIMULATION OF NITROGEN IN RECHARGE (SONIR)

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Harborfield Estates

Proposed Conditions

SHEET 4

FINAL COMPUTATIONS

<i>A</i>	<i>Nitrogen in Recharge</i>	<i>Value</i>	<i>Units</i>
1	N = Total Nitrogen (lbs)	1362.64	lbs
2	N = Total Nitrogen (milligrams)	618,637.016	milligrams
3	R(T) = Total Recharge (inches)	30.13	inches
4	R(T) = Total Recharge (feet)	2.51	feet
5	A = Area of Site	1,711.908	sq ft
6	R = R(T) x A	4,298,467	cu ft
7	R = Site Recharge Volume	121,732.574	liters
9	NR = N/R	5.08	mg/l

FINAL CONCENTRATION OF
NITROGEN IN RECHARGE

5.08

<i>B</i>	<i>Site Recharge Summary</i>	<i>Value</i>	<i>Units</i>
1	R(T) = Total Site Recharge	30.13	inches/yr
2	R = Site Recharge Volume	4,298,467	cu ft/yr
3	R = Site Recharge Volume	32,154,765	gal/yr
4	R = Site Recharge Volume	32.15	MG/yr

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
WILDLIFE-RELATED DOCUMENTS

Appendix D-1
Correspondence with Natural Heritage Program

New York State Department of Environmental Conservation
Wildlife Resources Center
700 Troy-Schenectady Road
Latham, New York 12110-2400
(518) 783-3932



John P. Cahill
Commissioner

October 22, 1997

Nikki Coffey Tousley
Nelson, Pope & Voorhis
572 Walt Whitman Road
Melville, NY 11747

Dear Ms. Tousley:

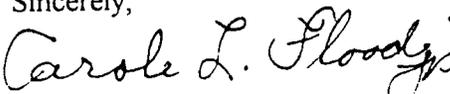
We have reviewed the New York Natural Heritage Program files with respect to your recent request for biological information concerning the proposed 39 acre Residential Development, NE of intersection of Pulaski Road and Lake Avenue, site as indicated on your enclosed map, located in the Town of Huntington, Suffolk County.

We did not identify any potential impacts to endangered, threatened, or special concern wildlife species, to rare plant, animal, or natural community occurrences, or to other significant habitats.

The absence of data does not necessarily mean that rare or endangered elements, natural communities or other significant habitats do not exist on or adjacent to the proposed site, but rather that our files currently do not contain any information which indicates the presence of these. Our files are continually growing as new habitats and occurrences of rare species and communities are discovered. In most cases, site-specific or comprehensive surveys for plant and animal occurrences have not been conducted. For these reasons, we cannot provide a definitive statement on the presence or absence of species, habitats or communities. This information should not be substituted for on-site surveys that may be required for environmental assessment.

This response applies only to known occurrences of rare animals, plants and natural communities and/or significant wildlife habitats. Please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the address enclosed for information regarding any regulated areas or permits that may be required (e.g., regulated wetlands) under State Law.

If this proposed project is still active one year from now we recommend that you contact us again so that we can update this response.

Sincerely,

Carole L. Flood
Information Services
NY Natural Heritage Program

Enc.
cc: Reg. 1, Wildlife Mgr



NELSON, POPE & VOORHIS, LLC

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• VICTOR BERT, PE • JOSEPH R. EPIFANIA, PE • ROBERT G. NELSON, JR., PE
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October 8, 1997

Jean Petrusiak, Director
Informational Services
NYSDEC Significant Habitat Unit
New York State Department of Environmental Conservation
Wildlife Resources Center
700 Troy-Schenectady Road
Latham, New York 12110-2400

Re: Significant Habitat Program/Natural Heritage Program File Review for a 39.3 acre site to the northeast of the intersection of Pulaski Road and Lake Avenue in Greenlawn, Town of Huntington, Suffolk County, N.Y.

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. The proposed project is a 59 unit single family residential development. It would be beneficial to consult the Significant Habitat Program and Natural Heritage Program files for any information you may have regarding unique habitats, and/or species of vegetation and wildlife.

Enclosed please find a portion of the Huntington 7.5 minute quadrangle with the location of the project site superimposed. Please provide any information you may have on this specific site or other unique ecological features within the vicinity.

Your prompt attention to this request would be greatly appreciated. Please do not hesitate to call if you have any questions regarding this correspondence.

Thank you,

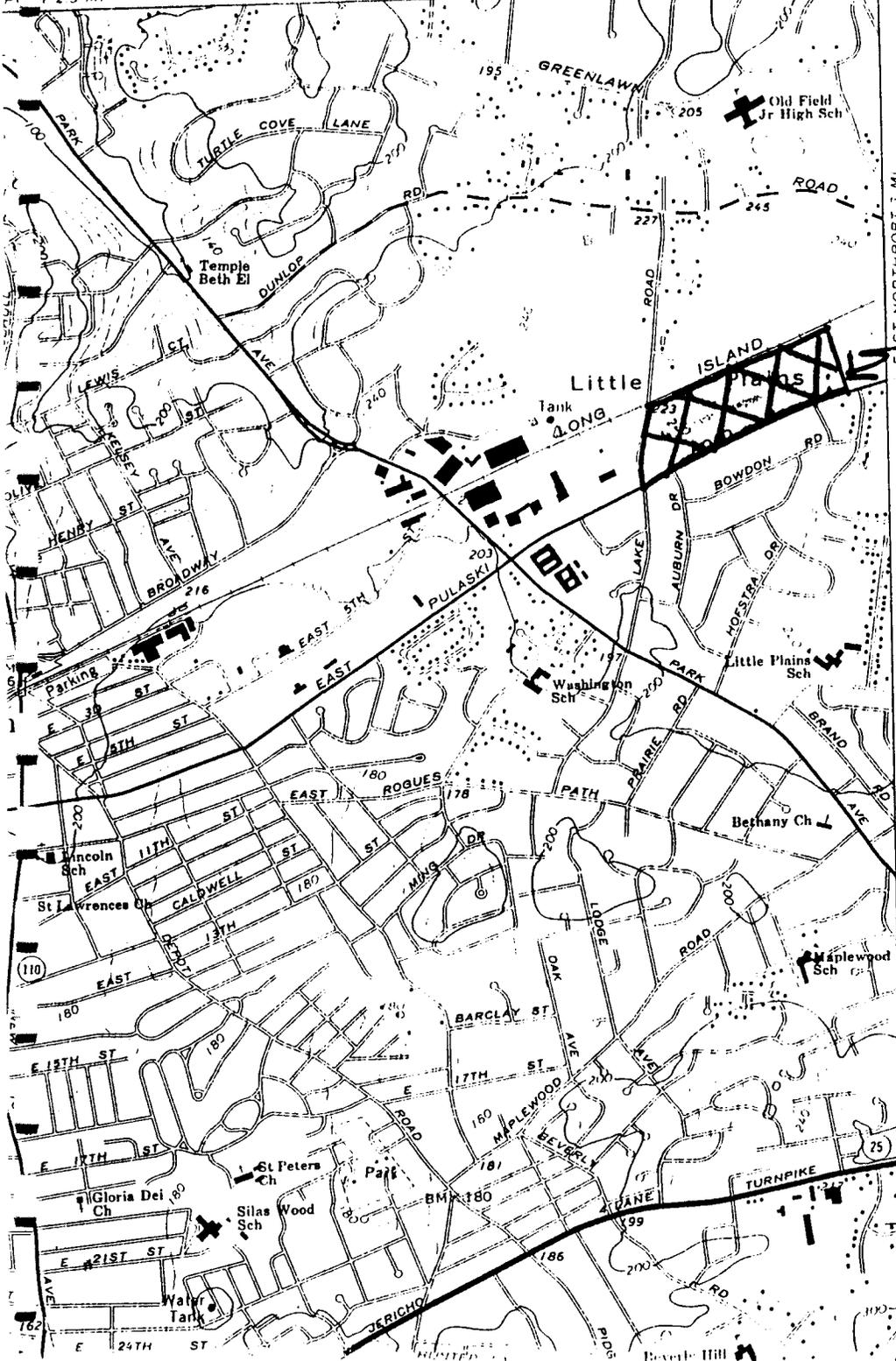
Nikki Coffey Tousley

enc.:map

HUNTINGTON QUADRANGLE
NEW YORK
7.5 MINUTE SERIES (TOPOGRAPHIC)

6365 IV NE
(NORTHPORT)

45 MI
7 2 3 MI
635
636 | 2 170 000 FEET
73° 22' 30"
40° 52' 30"



EAST NORTHPORT 3 MI
KINGS PARK 7 MI

SITE

4524
230 000
FEET

4523

COMMAK 4 4 MI

50'
4521

Appendix D-2
Species List

**PROJECTION OF WILDLIFE ECOLOGICAL RESPONSE (POWER)
NELSON, POPE & VOORHIS, LLC, MICROCOMPUTER MODEL**

SPECIES LIST

Appendix A-2

INTRODUCTION

This appendix has been included to present the results of a computer model used to investigate the various wildlife species which can be expected to be found on the site considering the habitats established. This model was developed by for use by Nelson, Pope & Voorhis, LLC using available information and references for the various species. The model utilizes the Lotus 1-2-3 spreadsheet to identify wildlife species commonly found in various Long Island habitats, based upon thorough research of available literature. The habitat investigated was "Successional Old Field". Some of the species listed in this model would not be expected on the property given the surrounding development, but are present in old field habitats.

The first column identifies the common name of the species, presented with the main common name in alphabetical order (for example: red-tailed hawk would come before blue jay). The scientific name of particular species is in second column. The third column shows the legal status of the species, of which there are four possible entries (Endangered, Threatened, Special Concern and Local Concern). The fourth column indicates the seasons during which the species might be expected to be present and the and fifth column, of particular importance to the environmental setting, contains information on frequency of the species in the habitat (abundant, common, rare and non expected); the species activity in the habitat (nesting, hunting and resting). References are provided with the reference list provided at the end of the appendix. The printout contained in this appendix, coupled with the discussions provided in the main body of the report, provides significant information of the wildlife found, or expected to be found on site.

Successional Old Field Species - Inventory and Characteristics

Common Name	Scientific Name	Status	Found During			Fall	Frequency/ Habitat Use	References
			Winter	Spring	Summer			
Birds								
red-winged blackbird	<i>Agelaius phoeniceus</i>	none		X	X	Early	C/N,F	4 6
Eastern bluebird	<i>Sialia sialis</i>	special concern		X	X	Early	R/N,F	4 7
common bobwhite	<i>Colinus virginianus</i>	none	X	X	X	X	C/N,F	4 8
indigo bunting	<i>Passerina cyanea</i>	none		Late	X	Early	C/N,F	4 20
Northern cardinal	<i>Cardinalis cardinalis</i>	none	X	X	X	X	C/N,F	4 20
gray catbird	<i>Dumetella carolinensis</i>	none		Late	X		A/N,F	4 9
black capped chickadee	<i>Parus atricapillus</i>	none	X	X	X	X	C/ H	4 11
brown-headed cowbird	<i>Molothrus ater</i>	none	X	X	X	Early	A/ H	4 6
American crow	<i>Corvus brachyrhynchos</i>	none	X	X	X	X	A/ H	4 11
black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	none		Late	X		C/N,F	4 11
yellow-billed cuckoo	<i>Coccyzus americanus</i>	none		Late	X		C/N,F	4 12
mourning dove	<i>Zenaida macroura</i>	none	X	X	X	X	A/N,H	4 8
rock dove	<i>Columba livia</i>	none	X	X	X	X	A/N,F	4 8
American goldfinch	<i>Carduelis tristis</i>	none		X	X	X	C/N,F	4 20
house finch	<i>Carpodacus mexicanus</i>	none		X	X	X	A/N,F	4 20
common flicker	<i>Colaptes auratus</i>	none	X	X	X	X	C/N,F	4 14
least flycatcher	<i>Empidonax minimus</i>	none		Late	X		R/N,F	4 15
willow flycatcher	<i>Empidonax traillii</i>	none		Late	X		C/N,F	4 15
common grackle	<i>Quiscalus quiscula</i>	none	X	X	X	X	A/N,F	4 6
ruffed grouse	<i>Bonasa umbellus</i>	none	X	X	X	X	C/N,F	4 8
rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	none		Late	X	Early	C/N,F	4 20
Northern harrier	<i>Circus cyaneus</i>	threatened	X	X	X	X	R/ H	4 16
Cooper's hawk	<i>Accipiter cooperii</i>	special concern		X	X		N/N,H	4 17
red-tailed hawk	<i>Buteo jamaicensis</i>	none	X	X	X	X	C/ H	4 16
sharp-shinned hawk	<i>Accipiter striatus</i>	none	X	X	X	X	N/N,F	4 16
blue jay	<i>Cyanocitta cristata</i>	none	X	X	X	X	A/N,F	4 10
Northern (dark-eyed) junco	<i>Junco hyemalis</i>	none	X	X	X	Early	R/N,F	4 21
American kestrel	<i>Falco sparverius</i>	none	X	X	X	X	C/ H	4 17
Eastern kingbird	<i>Tyrannus tyrannus</i>	none		X	X	Early	A/N,F	4 15
Eastern meadowlark	<i>Sturnella magna</i>	none		Late	X		C/N,F	4 6
Northern mockingbird	<i>Mimus polyglottos</i>	none	X	X	X	X	A/N,F	4 9

Common Name	Scientific Name	Status	Found During			Frequency/ Habitat Use	References
			Winter	Spring	Summer		
common nighthawk	<i>Chordeiles minor</i>	special concern			X	R/N,F	4 12
barn owl	<i>Tyto alba</i>	special concern	X	X	X	R/ H	4 17
great-horned owl	<i>Bubo virginianus</i>	none	X	X	X	C/N,H	4 17
ring-necked pheasant	<i>Phasianus colchicus</i>	none	X	X	X	C/N,F	4 8
American robin	<i>Turdus migratorius</i>	none			Early	A/N,F	4 7
chipping sparrow	<i>Spizella passerina</i>	none	X	X	X	C/N,F	4 21
fox sparrow	<i>Passerella iliaca</i>	none	X	X	X	C/ F	20 21
field sparrow	<i>Spizella pusilla</i>	none			X	C/N,F	4 21
grasshopper sparrow	<i>Ammodramus savaannarum</i>	special concern			X	C/N,F	4 20
house sparrow	<i>Passer domesticus</i>	none	X	X	X	C/N,F	4 20
Savannah sparrow	<i>Passerculus sandwichensis</i>	none			Early	C/N,F	4 20
song sparrow	<i>Melospiza melodia</i>	none	X	X	X	R/N,F	4 21
swamp sparrow	<i>Melospiza georgiana</i>	none	X	X	X	A/N,F	4 22
white-crowned sparrow	<i>Zonotrichia leucophrys</i>	none	X	X	X	C/N,F	4 22
European starling	<i>Sturnus vulgaris</i>	none	X	X	X	C/ F	22 32
barn swallow	<i>Hirundo rustica</i>	none	X	X	X	A/N,F	4 23
brown thrasher	<i>Toxostoma rufum</i>	none			Late	C/N,F	4 15
rufous-sided towhee	<i>Pipilo erythrophthalmus</i>	none			X	C/N,F	4 9
black-and-white warbler	<i>Mniotilta varia</i>	none			Early	A/N,F	4 20
blue-winged warbler	<i>Vermivora pinus</i>	none			Early	R/N,F	4 18
chestnut-sided warbler	<i>Dendroica pensylvanica</i>	none			X	C/N,F	4 14
prairie warbler	<i>Dendroica discolor</i>	none			X	R/N,F	4 19
yellow warbler	<i>Dendroica petchia</i>	none			X	C/N,F	4 19
cedar waxwing	<i>Bombicilla cedrorum</i>	none			X	R/N,F	4 18
whip-poor-will	<i>Caprimulgus vociferous</i>	none			X	C/N,F	4 23 32
American woodcock	<i>Philhela minor</i>	none			Late	C/ F	4 12
red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	none			X	C/N,F	4 30
house wren	<i>Troglodytes aedon</i>	none			X	C/N,F	4 14
common yellowthroat	<i>Geothlypis trichas</i>	none			Late	C/N,F	4 9
Mammals					X	C/N,F	4 19
Eastern chipmunk	<i>Tamias striatus</i>	none	X	X	X	C/N,F	1 29
Eastern cottontail	<i>Sylvilagus floridanus</i>	none	X	X	X	A/N,F	1 29
white-tailed deer	<i>Odocoileus virginianus</i>	none	X	X	X	C/ F	1 25 29
red fox	<i>Vulpes vulpes</i>	none	X	X	X	C/ H	1 29

Common Name	Scientific Name	Status	Found During			Frequency/ Habitat Use	References
			Winter	Spring	Summer		
Eastern mole	<i>Scalopus aquaticus</i>	none	X	X	X	C/N,F	1 29
house mouse	<i>Mus musculus</i>	none	X	X	X	R/N,F	1 29
meadow-jumping mouse	<i>Zapus hudsonicus</i>	none	X	X	X	R/N,F	1 29
white-footed mouse	<i>Peromyscus leucopus</i>	none	X	X	X	C/N,F	1 29
Virginia opossum	<i>Didelphis virginiana</i>	none	X	X	X	C/N,F	1 29
raccoon	<i>Procyon lotor</i>	none	X	X	X	C/ F	1 29
black rat	<i>Rattus rattus</i>	none	X	X	X	R/N,F	1 29
Norway rat	<i>Rattus norvegicus</i>	none	X	X	X	C/N,F	1 29
least shrew	<i>Cryptotis parva</i>	none	X	X	X	N/N,F	1 29
short-tailed shrew	<i>Blarina breuicauda</i>	none	X	X	X	A/N,F	1 29
striped skunk	<i>Mephitis mephitis</i>	none	X	X	X	N/N,F	1 29
meadow vole	<i>Microtus pennsylvanicus</i>	none	X	X	X	C/N,F	29 45
pine vole	<i>Microtus pinetorum</i>	none	X	X	X	C/N,F	1 29
long-tailed weasel	<i>Mustela frenata</i>	none	X	X	X	R/N,H	1 29
woodchuck	<i>Marmota monax</i>	none	X	X	X	R/N,F	1 29
Herptiles							
Eastern garter snake	<i>Thamnophis sirtalis</i>	none	X	X	X	C/N,F	38 40
eastern hognose snake	<i>Heterodon platyrhinos</i>	special concern	X	X	X	R/N,H	38
eastern milk snake	<i>Lampropeltis d. triangulum</i>	none	X	X	X	C/N,F	38 39
Fowler's toad	<i>Bufo woodhousei fowleri</i>	none	X	X	X	C/ F	33 37

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5	Pontin, A.J. 1982. Competition an Advanced Publishing Program, Boston, Massachusetts.	11	Bent, A.C. 1964. Life Histories of North American Jays, Crows, and Titmice, pt. 2. Dover Pub., NY
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**Appendix D-3
Species Adaptability**

PROJECTION OF WILDLIFE ECOLOGICAL RESPONSE (POWER)

NELSON, POPE & VOORHIS, LLC, MICROCOMPUTER MODEL

SPECIES LIST

Appendix A-3

This portion of the appendix has been included to present the results of a computer program to identify "Species Adaptability". This list is another component of the program developed for use by Nelson, Pope & Voorhis, LLC used for the preparation of **Appendix A-2**, however, in this application the "Adaptability" of the observed and expected species are shown. The "adaptability" as indicated in the table, refers to whether an individual species may potentially benefit from (+) a habitat change from natural to urban/suburban setting; or, be impacted (-), or remain constant (=), as a result of this change. These values are not intended to represent the dynamics of actual species on the subject site under post-development conditions. The column entitled "Comments" provides relevant information which was obtained from the literature, as regards special habits of the particular species, such as adaptability, nesting, food, etc. This column is particularly important in assessing the potential impacts to the species as a result of the proposed project. The preceding text considers the site specific aspects of the proposed development in regard to individual species. This Appendix is included to provide the reader with the benefit of what the literature which was consulted in connection with the Habitat Suitability Model suggests, in terms of generalized species dynamics resulting from land use. References are those used in previous appendix.

Successional Old Field Species - Adaptability and Comments

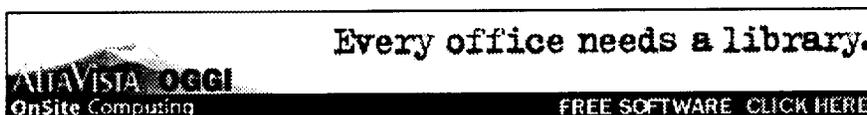
Common Name	Scientific Name	Adapt.	Comments	References
Birds				
red-winged blackbird	<i>Agelaius phoeniceus</i>	=	needs water	4 6
Eastern bluebird	<i>Sialia sialis</i>	-	found almost entirely in nesting boxes, extremely rare in wild	4 7
common bobwhite	<i>Colinus virginianus</i>	-	somewhat tolerant of humans during spring and summer months	4 8
indigo bunting	<i>Passerina cyanea</i>	-	inhabits open woodlands with dense thickets for cover	4 20
Northern cardinal	<i>Cardinalis cardinalis</i>	=	found around gardens, yards, parks	4 20
gray catbird	<i>Dumetella carolinensis</i>	=	abundant around parks, urban and suburban areas	4 9
black capped chickadee	<i>Parus atricapillus</i>	=	abundant around parks, urban and suburban areas	4 11
brown-headed cowbird	<i>Molothrus ater</i>	=	lays eggs in other bird's nests; some stay during winter	4 6
American crow	<i>Corvus brachyrhynchos</i>	=	extremely adaptable; omnivorous	4 11
black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	-	avoids human activities	4 11
yellow-billed cuckoo	<i>Coccyzus americanus</i>	-	avoids heavy urban areas; prefers wooded open or edges for nests	4 12
mourning dove	<i>Zenaida macroura</i>	=	abundant around parks, urban and suburban areas	4 8
rock dove	<i>Columba livia</i>	+	nests almost entirely on buildings; considered a pest species	4 8
American goldfinch	<i>Carduelis tristis</i>	=	prefers diet of thistles and dandelions	4 20
house finch	<i>Carpodacus mexicanus</i>	+	nests almost entirely on buildings; considered a pest species	4 20
common flicker	<i>Colaptes auratus</i>	=	abundant around parks, suburban and urban areas	4 14
least flycatcher	<i>Empidonax minimus</i>	=	prefers open areas and woodland borders; uncommon on Long Island	4 15
willow flycatcher	<i>Empidonax traillii</i>	-	found mostly on south shore and western north shore areas	4 15
common grackle	<i>Quiscalus quiscula</i>	=	adapts well to urban and suburban habitats	4 6
ruffed grouse	<i>Bonasa umbellus</i>	-	prefers dense cover, thick woods; avoids humans	4 8
rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	=	mainly found on north shore	4 20
Northern harrier	<i>Circus cyaneus</i>	-	avoids humans; extremely protective of nests	4 16
Cooper's hawk	<i>Accipiter cooperii</i>	-	no atlas sightings (non-breeder) on LI; needs extensive woodland	4 17
red-tailed hawk	<i>Buteo jamaicensis</i>	-	needs 100 foot radius undisturbed area for nest	4 16
sharp-shinned hawk	<i>Accipiter striatus</i>	-	avoids humans; nests in heavily forested areas	4 16
blue jay	<i>Cyanocitta cristata</i>	=	extremely adaptable to human activity and other stresses	4 10
Northern (dark-eyed) junco	<i>Junco hyemalis</i>	-	prefers forested area with elevation >300 meters; no LI atlas record	4 21
American kestrel	<i>Falco sparverius</i>	-	adaptable; prefers open areas and parks; will nest near humans	4 17
Eastern kingbird	<i>Tyrannus tyrannus</i>	=	very adaptable to human activities; prefers open areas	4 15
Eastern meadowlark	<i>Sturnella magna</i>	-	found in marshes during winter months	4 6
Northern mockingbird	<i>Mimus polyglottos</i>	+	prefers to nest near humans	4 9

Common Name	Scientific Name	Adapt	Comments	References
common nighthawk	<i>Chordeiles minor</i>	=	primarily a grassland specie; will nest in burnt areas and roofs	4 12
barn owl	<i>Tyto alba</i>	=	hunts in open areas, nests in man made structures and hollow trees	4 17
great-horned owl	<i>Bubo virginianus</i>	-	nocturnal; rare in wooded areas of less than 20 acres	4 17
ring-necked pheasant	<i>Phasianus colchicus</i>	-	needs fields with cover along edge	4 8
American robin	<i>Turdus migratorius</i>	=	very adaptable; abundant in parks; nests in man-made structures	4 7
chipping sparrow	<i>Spizella passerina</i>	+	abundant around man made structures	4 21
fox sparrow	<i>Passerella iliaca</i>	-	boreal species, winters here in edge, thickets, brushy areas	20 21
field sparrow	<i>Spizella pusilla</i>	-	associated with grasslands, fields and brushy wooded edges	4 21
grasshopper sparrow	<i>Ammodramus savannarum</i>	-	requires grasslands	4 20
house sparrow	<i>Passer domesticus</i>	+	prefers buildings, urban, suburban, gardens; considered a pest	4 20
Savannah sparrow	<i>Passerculus sandwichensis</i>	-	found in shore areas; not expected inland	4 21
song sparrow	<i>Melospiza melodia</i>	=	common to most habitats except deep forest, open field and marsh	4 22
swamp sparrow	<i>Melospiza georgiana</i>	-	prefers fresh water marshes; may be found in weedy fields, parks	4 22
white-crowned sparrow	<i>Zonotrichia leucophrys</i>	=	often found in suburban areas and city parks	22 32
European starling	<i>Sturnus vulgaris</i>	+	extremely adaptable to human activity; considered a pest	4 23
barn swallow	<i>Hirundo rustica</i>	+	nests almost entirely on buildings	4 15
brown thrasher	<i>Toxostoma rufum</i>	=	common in parks and suburban areas, wooded edges and dry open ar	4 9
rufous-sided towhee	<i>Pipilo erythrophthalmus</i>	=	may be present year round on Long Island	4 20
black-and-white warbler	<i>Mniotilta varia</i>	-	builds nests under shrubs and/or trees	4 18
blue-winged warbler	<i>Vermivora pinus</i>	-	primarily abandoned and overgrown field, and thickets	4 14
chestnut-sided warbler	<i>Dendroica pensylvanica</i>	-	prefers first growth woods, with some open brush area	4 19
prairie warbler	<i>Dendroica discolor</i>	-	prefers scrub fields and open pine barrens habitat	4 19
yellow warbler	<i>Dendroica petchia</i>	=	rare breeder on LI, winter sps, abundant in parks & yards	4 18
cedar waxwing	<i>Bombycilla cedrorum</i>	+	prefers open woodlands, orchards and residential areas	4 23 32
whip-poor-will	<i>Caprimulgus vociferous</i>	-	nocturnal; prefers open woods with adjacent fields	4 12
American woodcock	<i>Philhela minor</i>	-	prefers moist woodland and thicket near open fields	4 30
red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	=	prefers open woodlands, parks and suburban areas	4 14
house wren	<i>Troglodytes aedon</i>	=	found in suburban areas and gardens; nests in crevices of buildings	4 9
common yellowthroat	<i>Geothlypis trichas</i>	=	found in all open brushy wet areas	4 19
Mammals				
Eastern chipmunk	<i>Tamias striatus</i>	=	prefers open woods, thickets, and rocky areas	1 29
Eastern cottontail	<i>Sylvilagus floridanus</i>	=	will adapt to suburban areas, if there is sufficient cover	1 29
white-tailed deer	<i>Odocoileus virginianus</i>	-	requires range of one-half square mile	1 25 29
red fox	<i>Vulpes vulpes</i>	-	builds den in wooded areas with loose-sandy soil and good drainage	1 29
Eastern mole	<i>Scalopus aquaticus</i>	=	tunnels underground	1 29
house mouse	<i>Mus musculus</i>	+	lives in association with man, not expected away from buildings	1 29

Common Name	Scientific Name	Adapt.	Comments	References
meadow-jumping mouse	<i>Zapus hudsonicus</i>	=	found around water in pine barrens; prefers open areas with grasses	1 29
white-footed mouse	<i>Peromyscus leucopus</i>	=	common to most all habitats; does not adapt well to human activity	1 29
Virginia opossum	<i>Didelphis virginiana</i>	=	common in suburban areas, as well as woods, marsh and coastal area	1 29
raccoon	<i>Procyon lotor</i>	+	nocturnal; very adaptive; found in urban and forest areas	1 29
black rat	<i>Rattus rattus</i>	=	lives in association with man, mainly city water front buildings	1 29
Norway rat	<i>Rattus norvegicus</i>	+	nocturnal; usually associated with human activity	1 29
least shrew	<i>Cryptotis parva</i>	-	not commonly documented on Long Island	1 29
short-tailed shrew	<i>Blarina brevicauda</i>	=	tunnels underground; abundant in a variety of habitats	1 29
striped skunk	<i>Mephitis mephitis</i>	=	prefers mixed wood & brush within 2 miles of water; not expected on LI	1 29
meadow vole	<i>Microtus pennsylvanicus</i>	=	tunnels underground; prefers open woodland	29 45
pine vole	<i>Microtus pinetorum</i>	=	tunnels underground; prefers sandy soil in woods and field; can swim	1 29
long-tailed weasel	<i>Mustela frenata</i>	-	prefers dense wood, but may appear in all land habitats near water	1 29
woodchuck	<i>Marmota monax</i>	-	appears primarily in scrub woods and brushy areas; not common on LI	1 29
Herptiles				
Eastern garter snake	<i>Thamnophis sirtalis</i>	=	occupies a variety of habitats	38 40
eastern hognose snake	<i>Heterodon platyrhinos</i>	=	sandy soil and sunny roadside; feeds on herptiles and insects	38
eastern milk snake	<i>Lampropeltis d. triangulum</i>	=	occupies a variety of habitats	38 39
Fowler's toad	<i>Bufo woodhousei fowleri</i>	-	found in suburban areas, gardens; breeds in shallow permanent ponds	33 37

APPENDIX E

**INTERNET SEARCH, NON-IONIZING RADIATION AND
HEALTH EFFECTS**



Search and Display the Results

Tip: To use all these apples: +apple pie tart cookie torte muffin

Word count: health electromagnetic fields: about 16

Documents 1-10 of 14 matching the query, best matches first.

Lycos search: EMF Health

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http://www.physics.brocku.ca/faculty/black/2P01/EMF_Health.html - size 28K - 2 Dec 96

Electromagnetic Fields And Your Health

Electromagnetic Fields And Your Health. Electromagnetic Fields (EMF's) have been linked to various different illnesses in over 75 studies. Now, there is...

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<http://omega.albany.edu:8008/EMF.html> - size 6K - 11 May 94

Audio

Medical Audio Recordings. the R.A.L.E. Repository (Lung Sounds), Hans Pasterkamp, MD, FRCPC, Respiration Acoustics Laboratory, Dept. of Pediatrics and...

<http://rezso.sote.hu/audio.htm> - size 16K - 1 Dec 96

'Magnetically induced currents in the human body an IEC Technology Tren

Clinical Engineering Update. No. 22 March 1996. Newsletter of the Clinical Engineering Division of the International Federation for Medical &...

<http://www.iee.org.uk/publish/ifmbelmar1996/iec.html> - size 4K - 5 Jun 96

IEC Report Concludes

IEC Report Concludes Electromagnetic Fields Do Not Pose Short-Term Risks. A new Technology Trend Assessment (TTA) report published by the Inter-national...

<http://stdsbbs.ieee.org/products/SB/Jan96/iec.html> - size 3K - 22 May 96

Health & Safety Related Internet Resources - WWW & Gopher - E

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X | Y | Z | E. E. D. Bullard Co. (1996...

<http://www.ccohs.ca/resources/wwwwe.htm> - size 13K - 6 Nov 96

REX - The Environment

Register with Skyline. REX - Resource EXchange. Message Bases - Registered Users. Horizons Interactive Magazine. Chesapeake Travel Magazine. Boom Town -...

<http://rex.skyline.net/html/nature.environment.html> - size 25K - 4 Dec 96

Electromagnetic Fields (EMF'S) - Sustainable Building Sourcebook

Electromagnetic fields (EMFs) are created by electric power charges. There are two types of fields - electric fields which result from the strength

<http://www.greenbuilder.com/Sourcebook/Emf.html> - size 13K - 4 Dec 96

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alta Vista
"health electromagnetic fields"
powerline

IEC Report Concludes Electromagnetic Fields Do Not Pose Short-Term Risks

A new Technology Trend Assessment (TTA) report published by the International Electrotechnical Commission (IEC) concludes that electromagnetic fields associated with domestic appliances and overhead power lines do not in the normal course of events pose any short-term biological problem for the general public. Hutzler and Baraton are the authors of the report, which is entitled "Magnetically induced currents in the human body."

IEC Technology Trend Assessments (TTAs) are a response to the need for global collaboration on standardization questions in the early stages of technological innovation, and are designed to show the state of the art or trends in emerging fields of technology.

The report states that among the physical agents to which human beings are exposed and that may influence health, electromagnetic fields are of particular interest. They are also the subject of a worldwide controversy, because science is at present unable to clarify all the biological effects that such fields may have.

The report categorizes the types of possible effects as short-term and long-term. Short-term effects are actually quite well known and are generally described as a function of the current density within the human body. Long-term effects cannot be so clearly described. Indeed, the report says that at present it is not even possible to prove their existence, although research continues in this area.

The specific aim of this well illustrated report is to present methods for calculating the electric fields and associated current densities induced in the human body by externally applied magnetic fields.

The first part of the report presents the computation method used by the authors, which is then validated by comparisons using configurations in which analytical solutions are actually available. The second part describes results obtained in three cases where the calculations are applied to a human being, namely a man standing in a uniform magnetic field, a live-line worker, and someone using a hair dryer. The third part is a sensitivity analysis of the various parameters, combining the computer program and basic physical laws.

For more information on the report, please contact the IEC Central Office, 3 rue de Varembe, PO Box 131, CH-1211, Geneva 20, Switzerland; Phone +41 22 919 0211 or Fax: +41 22 919 0300. *

Electromagnetic Fields and Your Health

Are the electromagnetic fields generated by power lines, TVs ham radio gear and hundreds of other devices bathing us in damaging radiation? The jury is still out, but you can take steps to protect yourself from danger--real and potential.

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By Wayne Overbeck, N6NB

There is a growing public debate about the safety of electric power lines and the electrical equipment that we use every day in our homes and workplaces. Not long ago, a lawsuit was filed alleging that a Florida woman's brain cancer was caused by electromagnetic radiation from a hand-held cellular telephone. Although the filing of a lawsuit proves nothing (thousands are filed every week, and this one was promptly dismissed by a court), the lawsuit made national headlines for weeks and caused cellular telephone industry stock prices to decline on Wall Street.

The news media regularly cover many facets of the controversy over the possible health effects of electromagnetic fields (EMFs). In addition to stories about lawsuits, there have been numerous media accounts of medical research concerning EMFs--some of them confusing and seemingly contradictory. And there have been news stories about activist groups fighting the construction of new power lines or cellular telephone towers in their neighborhoods.

This intense publicity has alarmed many people, prompting them to worry about the safety of their homes, neighborhoods, schools and workplaces. There is a growing concern that the electromagnetic fields produced by power lines and everyday household appliances may be hazardous. As the tension mounts, more and more hams are faced with this difficult question: *Is your Amateur Radio station hazardous to our health?*

Fortunately, enough research has now been done that we know most Amateur Radio activities are quite safe. In fact, scientists from the Federal Communications Commission and the Environmental Protection Agency conducted a field survey of EMFs at typical Amateur Radio stations in 1990. They concluded that most amateur operations do not produce EMFs strong enough to pose any health hazard. And for many years, the American Radio Relay League's Board of Directors has also been monitoring the ongoing research about EMFs and health through a board-appointed Committee on the Biological Effects of RF Energy.¹ There is extensive coverage of the issue of EMFs and health in both *The ARRL Handbook* and *The ARRL Antenna Book*--with recommendations for safe Amateur Radio operating practices.

Amateur Radio is a hobby that can be pursued safely, provided everyone observes a few simple precautions. This article was written to summarize what we know about EMFs and health, and to suggest safe operating practices.

Scientific Background

When scientists talk about electromagnetic fields, they're talking about several very different forms of energy. Low frequency or "power-line frequency" fields are produced by electric power lines and appliances, typically operating at a frequency of 60 Hz. Much research is now underway concerning the health effects of 60-Hz fields--the kind of EMFs found in virtually every home and workplace. Additional research is being done to investigate the possible health effects of *radio frequency* (RF) energy, which is much higher in frequency than the electric energy in power lines. RF energy is produced by radio and television transmitters, radar installations, cellular and cordless telephones, microwave ovens and even remote controls for garage door openers.

Low-frequency and RF energy are forms of *nonionizing radiation*: The frequency is too low to produce enough photon energy to ionize atoms. In contrast, *ionizing radiation*--which is *not* produced by power lines or radio transmitters--can cause severe and well-documented health hazards. Nuclear weapons produce enormous amounts of ionizing radiation, while small, carefully controlled doses of ionizing radiation are used in medical X-ray equipment, for example.

The present controversy concerns nonionizing radiation, including power-line frequency and RF energy. Much is now known about the biological effects of this kind of energy, but there is much more that we do not yet know. Before World War II, scientists knew that non-ionizing radiation could produce thermal (heating) effects. At sufficiently high power levels, EMFs can cause body heating, which may result in health hazards such as blindness or sterility. Most ordinary household appliances and transmitted radio signals produce EMFs far weaker than those required to produce thermal effects. On the other hand, microwave ovens *do* generate EMFs strong enough to produce thermal effects: That's precisely why they can heat and cook food. The trick is to keep the EMFs safely inside the oven--away from people. For obvious reasons, microwave ovens must meet strict safety standards.

In recent years, a new element in the debate over EMFs and health has been the finding that even at *athermal levels*--energy levels too low to cause body heating--electromagnetic energy appears to have various effects on the human body. The first scientists whose work in this area gained widespread media publicity were *epidemiologists*--medical researchers who look at the health patterns of large groups of people, using statistical methods.

Over the last two decades, a number of epidemiological studies have found that electrical workers have higher-than-normal death rates from certain cancers, including leukemia, lymphatic cancer and brain cancer. Other epidemiological studies have shown that children living near some types of power lines have higher-than-normal rates of leukemia. Still other studies have concluded that persons exposed to certain chemical agents such as solder fumes in addition to high EMFs have up to 10 times the normal rate of certain cancers.

All of these studies involved groups of people who were not ordinarily exposed to EMFs strong enough to cause body heating. Thus, their health patterns suggested that low-level EMFs may pose health hazards.

There have been other epidemiological studies, however, that did not confirm some of these findings. And still other researchers have concluded that environmental factors such as the alignment of the earth's natural magnetic field may interact with man-made EMFs to alter these health effects. (The earth's magnetic field is stronger than many man-made fields, but it is a *static, direct-current field*. Most man-made EMFs are *alternating-current fields* operating at a variety of frequencies and power levels.)

There are other dimensions to this problem, too. Some of the research that failed to confirm a correlation between EMF exposure and health was funded by industry groups that have a financial stake in the outcome of the research. Critics have challenged the credibility of some of the research for that reason. Moreover, epidemiological research only reveals health patterns; it does not prove what caused those health patterns. If electrical workers have an abnormally high rate of certain cancers, that may result from their occupation--or it could result from something else. In short, the work of epidemiologists shows *correlations* without proving *causation*. That raises troubling questions without providing definitive answers.

Responding to the questions raised by epidemiologists, a number of medical researchers have launched laboratory based studies of the effects of EMFs on living tissue. There has been an explosion of knowledge about molecular biology and the related field of genetics in recent years, and one of the focal points of this research has been the role of electromagnetic signals at the molecular level. Among other things, there have been studies suggesting that certain types of electromagnetic fields may alter the body's genetic makeup, causing chromosome damage.

It is also known now that some EMFs may disrupt the flow of vital chemical and electrical signals between cells in the human body. EMFs appear to alter the passage of chemical and electrical signals through the cell membrane (the thin layer of material that covers each cell). This has caused some scientists to conclude that EMFs may sometimes affect the work of the body's immune system in fighting cancer.

If the body's cancer-fighting T-cells fail to detect that a particular cell has become cancerous because cell-to-cell communication is disrupted by EMFs, that would increase the risk of a tumor developing. There is also laboratory research indicating that EMFs may inhibit the body's cancer-fighting ability in other ways.

Researchers have found that certain EMFs reduce the activity of messenger enzymes called *protein kinases* and also affect the way cell growth is regulated. There is also evidence, now confirmed through research in several countries, that EMFs sometimes work together with cancer-promoting chemicals to increase the risk of cancer beyond that associated with either the chemicals or EMFs alone.

EMFs also appear to change the body's rate of production of certain hormones that have cancer-inhibiting effects, such as melatonin. Some studies have found that persons sleeping under electric blankets have lower-than-normal levels of melatonin production *when the blanket is operating*, but their melatonin production returns to normal when the blanket is switched off. Some scientists think the effect of EMFs on melatonin production may explain many of the apparent health effects of exposure to low-level fields.

As with the epidemiological studies, laboratory research has raised questions and stirred controversy. Some laboratory studies have been difficult to *replicate*: Other researchers have not always observed the same results when they attempted to repeat some experiments. There appear to be other variables that affect the outcome of research on the biological effects of EMFs.

For example, there is evidence that low-level EMFs have significant biological effects only at certain frequencies and intensities--and not at other frequencies or intensities. There is a general rule about toxic and cancer-causing chemicals: If some is bad, more is worse. That rule may not necessarily apply to EMFs, however: Some studies have detected biological effects of low-level EMFs--but not when the

field is stronger.

There are also studies showing health effects at certain frequencies but not at adjacent frequencies. And there are studies suggesting that a radio signal modulated by certain low frequencies, or a signal that is keyed or pulsed, has more harmful effects than an unmodulated, steady carrier. Scientists call these kinds of phenomena *window effects*, and they greatly complicate any attempt to understand the relationship between EMFs and health.

There is an unfortunate footnote to this research on window effects: Much research seems to indicate that there is a window at 50 or 60 Hz--the exact frequency of the electric energy traveling through millions of miles of in-home wiring in the US and many other countries: EMFs at higher and lower frequencies may not have the same health effects as 60-Hz fields. And yet, the financial and technical obstacles that would stand in the way of changing the frequency of ordinary household ac current--should that prove to be desirable--are staggering.

Safe Operating Practices

After reading this far, if you are uncertain about the possible health effects of EMFs, you're not alone: The scientific community itself does not agree about this issue. In fact, medical doctors, biologists, physicists and other scientific researchers are engaged in an intense, sometimes-emotional debate about the health effects of EMFs. There is a computer bulletin board system for scientists concerned about this issue; messages posted there range from esoteric discussions of these complex issues to personal attacks on some scientists who espouse views not shared by others!

If the experts don't always agree, how can the rest of us know what is safe and what isn't? The American National Standards Institute (ANSI), a private body that sets voluntary standards for industry, has had guidelines for exposure to EMFs for many years. In fact, the ANSI guidelines have been revised downward repeatedly to reduce the recommended safe levels of EMF exposure.

ANSI adopted its latest guidelines in 1992, *but many health scientists have questioned whether even the newest guidelines are adequate to protect public health*. Recently, the Environmental Protection Agency publicly questioned the adequacy of the 1992 ANSI standards in an official statement to the Federal Communications Commission.

Some scientists challenge the newest ANSI standard on several grounds. For one thing, it's primarily intended to prevent exposure to EMFs strong enough to cause thermal effects, not exposure to weaker EMFs that may cause athermal effects. Nor does the ANSI standard take into account the effects of modulation. And the ANSI standard applies only to RF energy, not to low-frequency EMFs that are so central to public debate these days.

There is no generally accepted standard in America for exposure to the low-frequency fields produced by power lines or home appliances. And in general, there is considerable uncertainty about what level of electromagnetic energy should be considered safe.

Another problem is that RF fields are difficult to measure. The price of a professional quality RF power density meter runs well into four figures, and low-cost meters for home use are often grossly inaccurate. Even the best meters may not be accurate in the *near field*, the area close to an antenna where the potential for hazardous RF energy levels is greatest.

Field strengths can be calculated using mathematical formulas, but that, too, fails to take into account the random hot spots that often exist in the near field. Fortunately, the low-frequency fields from power lines and appliances are easier to measure than RF power densities.

If there is no consensus about safe energy levels, and if EMFs are difficult to measure, what can we do to minimize the potential health hazards of EMFs?

Several years ago, Professor M. Granger Morgan of Carnegie Mellon University offered a simple proposal: practice *prudent avoidance*. Dr Morgan said we should avoid unnecessary exposure to EMFs as a common-sense response to potential--but not yet proven--health hazards. He didn't suggest that we all abandon our electric appliances and go off to live in the woods in cabins without electricity, but he did suggest that we minimize exposure to EMFs when it's practical to do so.

He said, in essence, to avoid electromagnetic fields strong enough that they *may have* adverse health effects. The League has adopted Dr Morgan's approach: The RF safety sections of major ARRL publications urge radio amateurs to practice prudent avoidance wherever possible.

Which amateur operating practices are clearly safe, and which ones might be hazardous? Here are some suggestions based on guidelines developed by the League's Bio-Effects Committee:

- Transmitting antennas should be mounted well away from living areas. If medium or high transmitter power (100 watts or more) is to be used, antennas should be mounted on a mast or tower at least 35 feet above any populated area if possible. The FCC/EPA study indicated that with an antenna that high, there is little RF energy where people are.
- Because feed lines can radiate in some cases, when installing open-wire line (or even coaxial cable if the SWR on the line is high), it's best to route it away from areas where people will be spending a lot of time.
- When using a ground-mounted or mobile antenna, be careful not to transmit when anyone is near the antenna. A good rule of thumb is to avoid transmitting when anyone is within three feet of a car-mounted 2-meter FM whip if you're using a typical 25-watt transceiver. With a 100-watt amplifier, don't transmit when anyone is within five or six feet of a whip antenna. If you're using a beam antenna and 100 watts or more, follow the 35-foot rule: Don't transmit when anyone is within 35 feet of the *front* of the antenna (the direction where the antenna is pointed). It may be safe to transmit when people are a little closer to the antenna if everyone is below it or behind it, not in front of it.
- Exercise particular care when using indoor antennas, including those mounted in attics, because in some situations they can generate substantial RF fields. As much as possible, try to locate indoor antennas as far from people as possible. Use low power (10 watts output or less), and keep your transmissions short when someone might be near the antenna.
- Never use a power amplifier that has its metal cover removed. The cover provides shielding, keeping the RF energy inside the unit--not out in the room.
- If you're going to experiment with UHF or microwave equipment, or do moonbounce communications, discuss your installation with experienced operators before getting on the air.

UHF and microwave antennas and waveguides--as well as high-gain moonbounce antennas--may produce hazardous levels of RF energy and must be installed carefully so that no person is in the line of fire. Never look into an activated waveguide or stand in front of a high-gain VHF-UHF antenna when the transmitter is on.

- When using a hand-held transceiver, use the lowest power possible and keep the antenna as far from your head as possible. Within the scientific community, there is disagreement about the safety of "handy talkies." Most hand-helds have been exempt from the ANSI standard because their power output is too low to produce significant whole-body heating. However, there is growing evidence that even one- or two-watt hand-held radios may produce significant EMFs within the user's head, with possible health effects that are not yet fully understood. (The potential for a health hazard is greatly reduced when a hand-held radio is used in its low-power position, with only a fraction of a watt of output power.)
- Be aware that low-frequency fields exist in your home. If possible, avoid being within 24 inches of any electric motor or power transformer while it is turned on. Hair dryers, ac-operated hand drills and other electric devices that are held close to the body when in use often expose users to stronger EMFs than those produced by Amateur Radio equipment. Nevertheless, it is a good idea to stay about 24 inches away from the fans and power transformers found in high-power amplifiers and 12-volt power supplies, for example.

Further Information

The issue of electromagnetic fields and health is as complex as it is controversial. It isn't possible to cover this topic fully in a short article such as this one. A more detailed and technically-oriented treatment of the subject appears in the **RF Safety** sections of current editions of *The ARRL Handbook* and *The ARRL Antenna Book*. The bibliography there lists some of the major scientific works in this field.

¹As *ARRLWeb* reprints this article in 1996, the ARRL Board's RF Safety Committee is the direct descendant of this body.

Wayne Overbeck, N6NB, holds PhD and JD degrees and is a Professor of Communications at California State University, Fullerton. He first became interested in this subject because his own operating activities--VHF DXing and contesting with high power portable stations on mountaintops--require special precautions to minimize EMF exposure.

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Special Report: U.S. study finds no proof of electromagnetic peril

By John D. Cox

Bee Staff Writer

(Published Nov. 1, 1996)

■ A committee of the National Research Council said Thursday its review of more than 500 scientific studies conducted over nearly 20 years found "no conclusive and consistent evidence" that electromagnetic fields harm humans.

Commissioned by Congress, the three-year investigation evaluated virtually every study of household exposure to so-called EMFs that has been undertaken since electrical wiring was first linked to a higher incidence of childhood leukemia in 1979.

"Research has not shown in any convincing way that electromagnetic fields common in homes can cause health problems," said Dr. Charles F. Stevens, a neurobiologist and chairman of the panel, "and extensive laboratory tests have not shown that EMFs can damage the cell in a way that is harmful to human health."

Electromagnetic fields are generated anytime electricity passes through a wire, and so are the ether of modern culture. They emanate from television tubes, computer monitors, electric blankets, electrical appliances of all kinds, cellular telephones and power transmission lines.

Concern over EMFs has become such a mainstay of urban life that power utilities such as the Sacramento Municipal Utility District routinely sponsor public workshops on the subject.

Antonio Sastre, an independent biomedical researcher from Kansas City, Mo., invited to conduct three such workshops for SMUD on Wednesday, said the report should allay the fears of many people about EMFs.

While the finding may not persuade those who have formed strongly held views on an issue that has been debated so long, Sastre said it probably will affect the course of future research.

"One would be very hard-pressed to spend limited resources on re-examining yet again something like that when there are many other more pressing public health issues that could profit from that money," he said.

The prestigious panel, composed of several scientists who have pursued research in the area, including epidemiologist David A. Savitz at the University of North Carolina, urged that future research focus on a few lingering questions.

Specifically, the scientists singled out what researchers in the field refer to as the "wire code paradox" that grew out of the first study on the incidence of child leukemia in Denver by epidemiologist Nancy Wertheimer.

Unable to actually measure the level of electromagnetic fields in the houses of the Denver leukemia victims, Wertheimer's researchers devised an elaborate system that standardized and ranked the extent of electrical wires observed around and near a house.

That 1979 report, which launched a virtual industry of research, found that children who had childhood leukemia were more likely to live in homes that they had labeled as "high wire code" than "low wire code."

In 1987, Savitz repeated the study, using the wire code but also adding a device that made a spot measurement of EMFs inside the houses. This study found no correlation between childhood leukemia and the EMF measurements, but again confirmed the relationship of the disease to the high wire code ranking.

Again in 1991, a University of Southern California study used the wire code but also employed a more sophisticated measuring device that recorded EMF levels in houses over a period of hours and stored the readings in computer memory. And again, that study found no relation between leukemia and the actual EMF readings, but found an association between the disease and the wire code.

The NRC committee's report Thursday called for further research into "a weak but statistically significant correlation between the incidence of childhood leukemia, which is rare, and wire configurations." The results so far, it said, "have been inconsistent and contradictory and do not constitute reliable evidence of an association."

Although her work was the focus of recommendations for more research, Wertheimer expressed disappointment in Thursday's report.

"I think it will discourage funding," she said. "My main concern is not that we have skeptics out there, that's a great part of science, but that apparently these days science is so institutionalized that you can't do it unless you bring in a lot of money."

The committee also called for more research to test laboratory work done in Germany that showed laboratory rats exposed to cancer-causing chemicals had a greater chance of contracting breast cancers if they also were exposed to heightened levels of electromagnetic fields.

The National Research Council is the principal operating arm of the National Academy of Sciences. The study was financed by the U.S. Department of Energy.

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POWERLINES: NO PROOF OF LINK WITH CANCER

Recent media speculation has increased public concern about a possible link between electricity and cancer. A paper from Bristol University by Professor Henshaw which was the subject of a Channel 4 Dispatches programme in February has led to claims that a mechanism for linking electricity with cancer has been established.

The Institution of Electrical Engineers (IEE) has a responsibility to its members and to the public to inform them of important matters related to electrical science and engineering. The IEE set up a Working Group in 1992 to remain abreast of current scientific knowledge on the effects of electromagnetic fields and to monitor all published literature in which the possibility of a link between electricity and cancer has been discussed. They have examined over 2,000 published papers from all over the world, and continue to review reports as they appear.

The IEE has concluded that there is no firm evidence of low-level low-frequency electromagnetic fields having any biological effects. Nor do we know of any mechanism which could produce such effects.

Q. Didn't the Channel 4 programme prove that power lines can cause cancer?

A. No. Professor Henshaw's paper and the Channel 4 programme made it clear that electromagnetic fields were not the cause of cancer.

Q. What are electromagnetic fields (EMFs), and what is their relationship to electric fields?

A. When electricity flows along a wire, a magnetic field surrounds it - the bigger the current, the bigger the field. This is how electromagnets work. When a wire is connected to a power source, an electric field is also set up. The field will be there, whether the current flows or not. The size of the field is determined by the voltage, or electrical pressure. We all encounter EMFs and electric fields from power lines and from electrical appliances. For example, if you plug in an electric kettle to the mains, there will be an electric field surrounding the wire to the kettle, even if the kettle itself is switched off. When the kettle is on, both the electromagnetic and the electric fields will be present. When the current is switched off, provided the switch at the mains is still on, the electric field will remain, but the electromagnetic field will disappear.

Q. Okay, so the electromagnetic field can't cause cancer. What about the electric field?

A. No reliable epidemiological studies have been published linking electric fields with cancer.

Q. What is epidemiology?

A. Epidemiology is the study of disease in the population, and the factors which influence it.

Q. Does the IEE have epidemiologists on its Working Party?

A. Yes. The Working Party includes renowned specialists from universities, hospitals and research departments covering health physics, epidemiology and leukaemia research, as well as power engineers, physicists and an expert on radiological protection.

Q. What papers has it studied?

A. The Working Group has examined over 2000 published papers from all over the world. Some useful work has been done in the Scandinavian countries, to try and establish a link between overhead lines and childhood cancers. However, these studies taken as a whole produced inconsistent results. All of the studies involved relatively small populations and were based on very small numbers of cases. We therefore need to be cautious in interpreting these results.

Q. So what was the Channel 4 programme saying?

A. Professor Henshaw's work at Bristol, and the Channel 4 programme, investigated the effects of electric fields on radon. They concluded that EMFs are not the cause of cancer; in fact the cancer-causing agent was identified as radon.

Q. What is radon? Is it a man-made substance?

A. No. Radon is a naturally occurring gas. It has no chemical properties, being totally inert. But it is radioactive, and is produced within the earth by the breakdown of radioactive minerals. Everyone is exposed to a natural background radiation, and radon is one of the factors contributing to this radiation. In some areas, particularly in houses built on granite, the concentration rises and this can be harmful, though simple steps can be taken in susceptible areas to remove it.

Q. What is the effect of the electric fields?

A. It is well known that electric fields can attract small particles. Just look at your TV screen and see how much dust it collects. But just because radioactive particles are attracted by the electric field this does not necessarily provide a mechanism by which electric fields might increase the amount of radon, which might be inhaled.

Q. If neither electric fields nor electro-magnetic fields can cause cancer, why has this scare arisen?

A. The IEE Working Group accepts that there is some epidemiological evidence for an association between exposure to low-level, low-frequency EMFs and certain cancers. "Association" means that events occur at the same time, but association is not the same as cause and effect. To take a domestic example: "It rains everytime I hang out the washing". These events are associated, but it didn't rain because I hung out the washing, which would be cause and effect.

The small increase in the incidence of cancer reported in some studies has yet to be shown to be due to cause and effect, and other factors continue to be a possible explanation of their findings.

Q. Some people are afraid of buying a house near a power line. What would you say to them?

A. Because we have been unable to find any credible link between electricity and cancer, we know of no reason to have any fears about buying such a house.

Q. So can you be certain that no link exists between electricity and cancer?

A. No scientist would ever express himself with that degree of certainty; they would always add the proviso that this is according to the current state of knowledge. It is very difficult to prove a negative in a way which holds for all circumstances, however remote and however far in the future. On this basis we

have to say that there may be a tiny element of risk to a degree that we all live with - after all, no-one can ever say for certain that an event won't happen. Whenever you leave home in the morning, there is always a possibility, however small, that you won't return.

What we are saying is that we are satisfied that nothing which has been published to date has provided reliable evidence of a link between electricity and cancer. However, our Working Group will continue its assessment. If in the future anything occurs to make us change our minds, we will not hesitate to make the information public.

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April 1996



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BIOLOGICAL EFFECTS OF POWER LINE FIELDS

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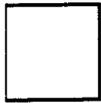
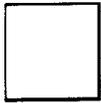
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No Adverse Health Effects Seen From Residential Exposure to Electromagnetic Fields

WASHINGTON -- No clear, convincing evidence exists to show that residential exposures to electric and magnetic fields (EMFs) are a threat to human health, a committee of the National Research Council has concluded in a new report. After examining more than 500 studies spanning 17 years of research, the committee said there is no conclusive evidence that electromagnetic fields play a role in the development of cancer, reproductive and developmental abnormalities, or learning and behavioral problems.

"The findings to date do not support claims that electromagnetic fields are harmful to a person's health," said committee chair Charles F. Stevens, investigator, Howard Hughes Medical Institute, and professor, Salk Institute, La Jolla, Calif. "Research has not shown in any convincing way that electromagnetic fields common in homes can cause health problems, and extensive laboratory tests have not shown that EMFs can damage the cell in a way that is harmful to human health."

Concern about the health effects from EMFs arose in 1979 when researchers showed that children living close to high concentrations of certain types of electrical wires were 1.5 times more likely to develop leukemia. Because it is difficult, time-consuming, and expensive to measure electric fields in a home over a long period of time, researchers relied on a substitute to estimate the levels of electromagnetic fields to which residents may have been exposed. Using factors such as the size of wires going past the home and distance between the home and power lines, researchers estimated the fields inside.

The Research Council committee's report says that studies in the aggregate show a weak but statistically significant correlation between the incidence of childhood leukemia, which is rare, and wire configurations. It never has been demonstrated that this apparent association was caused by exposure to electromagnetic fields, however. Outside wiring correlates poorly with measurements of actual fields inside the home, in that it accounts for only a fraction of the fields inside. Scientists have tried unsuccessfully to link leukemia to EMFs by measuring fields inside of homes of children who had the disease. The results "have been inconsistent and contradictory and do not constitute reliable evidence of an association," the report says.

The weak link shown between proximity to power lines and childhood leukemia may be the result of

factors other than magnetic fields that are common to houses with the types of external wiring identified with the disease. These possible factors include a home's proximity to high traffic density, local air quality, and construction features of older homes that fall into this category, the committee said.

Cells, Tissues Unaffected

To try to explain and expand on the knowledge gained from early epidemiologic studies, researchers have studied the potential effects of EMFs on individual human cells or tissues, and on animals. To date, they have found no evidence to show that EMFs can alter the functions of cells at levels of exposure common in residential settings. Only at levels between 1,000 and 100,000 times stronger than residential fields have cells shown any reaction at all to EMF exposure, and even these changes -- mainly in the chemical signals that cells send to each other -- are not a clear indication of the potential for adverse health effects. In fact, exposure may actually help the body in some subtle ways, for example by speeding up the healing process after a bone is broken.

Most important, there has been no case in which even tremendously high exposure to EMFs has been shown to affect the DNA of the cell, damage to which is believed to be essential for the initiation of cancer. Similarly, no animal experiments have shown that EMFs, even at high doses, can act as a direct carcinogen or can affect reproduction, development, or behavior in animals.

Future Research

Electromagnetic fields are generated by wires or electrically powered devices, and dissipate quickly, like light. When assessing potential impact of EMFs on health, scientists focus mainly on magnetic fields produced by power lines and electric appliances, which can pass through the body and generate small electric currents. Unlike magnetic fields, electric fields themselves lose most of their strength when they pass through metal, wood, or even skin. In fact, the strongest of either fields that the body encounters are the electric currents produced naturally when the heart beats, or as nerves and muscles function, the report says.

The committee focused on the health studies of low-frequency electric and magnetic fields common in homes. Sources of exposure include transmission and distribution lines and electric appliances, including shavers, hair dryers, video display terminals, and electric blankets. The committee did not study in detail occupational exposures, such as those experienced by electrical workers close to higher-frequency power lines.

New research is needed to answer some of the questions that linger after nearly two decades of intensive research, the committee said. Most compelling is the need to pinpoint the unexplained factor or factors causing a small increase in childhood leukemia in houses close to power lines. The precise factors that are related to an increased number of childhood leukemia cases need to be identified.

The committee also called for more research into the relationship between high exposures to EMFs and breast cancer in animals already exposed to other carcinogens, and on reasons why electromagnetic fields seem to affect the levels of the hormone melatonin in animals, an effect not reproduced in humans.

This congressionally requested study by the National Research Council was sponsored by the U.S. Department of Energy. The National Research Council is the principal operating arm of the National

Academy of Sciences and the National Academy of Engineering. It is a private, non-profit institution that provides science and technology advice under a congressional charter.

Pre-publication copies of *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields* are available from the National Academy Press at the mailing address in the letterhead; tel. (202) 334-3313 or 1-800-624-6242. The cost of the report is \$45.00 (prepaid) plus shipping charges of \$4.00 for the first copy, and \$.50 for each additional copy. Reporters may obtain pre-publication copies from the Office of News and Public Information at the letterhead address (contacts listed above).

[This news release is available on the World Wide Web at <<http://www2.nas.edu/whatsnew/>>.]
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Commission on Life Sciences

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National Research Council (National Academy of Sciences) Report: Possible Health Effects Of Exposure To Residential Electric And Magnetic Fields

Last revised October 31, 1996

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News story: San Francisco Examiner 10/31/96

POSSIBLE HEALTH EFFECTS OF EXPOSURE TO RESIDENTIAL ELECTRIC AND MAGNETIC FIELDS

Committee on the Possible Effects of Electromagnetic Fields on Biologic Systems

Board on Radiation Effects Research

Commission on Life Sciences

National Research Council

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EXECUTIVE SUMMARY

CHARGE TO THE COMMITTEE

Public concern regarding possible health risks from residential exposures to low-strength, low-frequency electric and magnetic fields produced by power lines and the use of electric appliances has generated considerable debate among scientists and public officials.. In 1991, Congress asked that the National Academy of Sciences (NAS) review the research literature on the effects from exposure to these fields and determine whether the scientific basis was sufficient to assess health risks from such exposures. In response to the legislation directing the U.S. Department of Energy to enter into an agreement with the NAS, the National Research Council convened the Committee on the Possible Effects of Electromagnetic Fields on Biologic Systems. The committee was asked "to review and evaluate the existing scientific information on the possible effects of exposure to electric and magnetic fields on the incidence of cancer, on reproduction and developmental abnormalities, and on neurobiologic response as reflected in learning and behavior." The committee was asked to focus on

exposure modalities found in residential settings. In addition, the committee was asked to identify future research needs and to carry out a risk assessment in so far as the research data justified this procedure. Risk assessment is a well-established procedure used to identify health hazards and to recommend limits on exposure to dangerous agents.

CONCLUSIONS OF THE COMMITTEE

Based on a comprehensive evaluation of published studies relating to the effects of powerfrequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects.

The committee reviewed residential exposure levels to electric and magnetic fields, evaluated the available epidemiologic studies, and examined laboratory investigations that used cells, isolated tissues, and animals. At exposure levels well above those normally encountered in residences, electric and magnetic fields can produce biologic effects (promotion of bone healing is an example), but these effects do not provide a consistent picture of a relationship between the biologic effects of these fields and health hazards. An association between residential wiring configurations (called wire codes, defined below) and childhood leukemia persists in multiple studies, although the causative factor responsible for that statistical association has not been identified. No evidence links contemporary measurements of magnetic-field levels to childhood leukemia.

STUDY FINDINGS

Epidemiology

Epidemiologic studies are aimed at establishing whether an association can be documented between exposure to a putative disease-causing agent and disease occurrence in humans. The driving force for continuing the study of the biologic effects of electric and magnetic fields has been the persistent epidemiologic reports of an association between a hypothetical estimate of electric- and magnetic-field exposure called the wire-code classification and the incidence of childhood leukemia. These studies found the highest wire-code category is associated with a rate of childhood leukemia (a rare disease) that is about 1.5 times the expected rate.

A particular methodologic detail in these studies must be appreciated to understand the results. Measuring residential fields for a large number of homes over historical periods of interest is logistically difficult, time consuming, and expensive, so epidemiologists have classified homes according to the wire code (unrelated to building codes) to estimate past exposures. The wirecode classification concerns only outdoor factors related to the distribution of electric power to residences, such as the distance of a home from a power line and the size of the wires close to the home. This method was originally designed to categorize homes according to the magnitude of the magnetic field expected to be inside the home. Magnetic fields from external wiring, however, often constitute only a fraction of the field inside the home. Various investigators have used from two (high and low) to five categories of wire-code classifications. The following conclusions were reached on the basis of an examination of the epidemiologic findings:

- Living in homes classified as being in the high wire-code category is associated with about a 1.5-fold excess of childhood leukemia, a rare disease.
- Magnetic fields measured in the home after diagnosis of disease in a resident have not been found to be associated with an excess incidence of childhood leukemia or other cancers. The link between wire-code rating and childhood leukemia is statistically significant (unlikely to have arisen from chance) and is robust in the sense that eliminating any single study from the group does not alter the conclusion that the association exists. How is acceptance of the link between wire-code rating and leukemia consistent with the overall conclusion that residential electric and magnetic fields not been shown to be hazardous? One reason is that wire-code ratings correlate with many factors—such as age of home, housing density, and neighborhood traffic density—but the wire-code ratings exhibit a rather weak association with measured residential magnetic fields. More important, no association between the incidence of childhood leukemia and magnetic-field exposure has been found in epidemiologic studies that estimated exposure by measuring present-day average magnetic fields.
- Studies have not identified the factors that explain the association between wire codes and childhood leukemia.

Because few risk factors for childhood leukemia are known, formulating hypotheses for a link between wire codes and disease is very difficult. Although various factors are known to correlate with wire-code ratings, none stands out as a likely causative factor. It would be desirable for future research to identify the source of the association between wire codes and childhood leukemia, even if the source has nothing to do with magnetic fields.

· In the aggregate, epidemiologic evidence does not support possible associations of magnetic fields with adult cancers, pregnancy outcome, neurobehavioral disorders, and childhood cancers other than leukemia.

The preceding discussion has focused on the possible link between magnetic-field exposure and childhood leukemia because the epidemiologic evidence is strongest in this instance; nevertheless, many epidemiologists regard such a small increment in incidence as inherently unreliable. Although some studies have presented evidence of an association between magnetic field exposure and various other types of cancer, neurobehavioral disorders, and adverse effects on reproductive function, the results have been inconsistent and contradictory and do not constitute reliable evidence of an association.

Exposure Assessment

The purpose of exposure assessment is to determine the magnitudes of electric and magnetic fields to which members of the population are exposed.

The electromagnetic environment typically consists of two components, an electric field and a magnetic field. In general, for time-varying fields, these two fields are coupled, but in the limit of unchanging fields, they become independent. For frequencies encountered in electric-power transmission and distribution, these two fields can be considered independent to an excellent approximation. For extremely-low-frequency fields, including those from power lines and home appliances and wiring, the electric component is easily attenuated by metal elements in residential construction and even by trees, animals, and people. The magnetic field, which is not easily attenuated, is generally assumed to be the source of any possible health hazard. When animal bodies are placed in a time-varying magnetic field (as opposed to remaining stationary in the earth's static magnetic field), currents are induced to flow through tissues. These currents add to those that are generated internally by the function of nerve and muscle, most notably currents detected in the clinically useful electroencephalogram and the electrocardiogram. The currents produced by nerve and muscle action within the body have no known physiologic function themselves but rather are merely a consequence of the fact that excitable tissue (such as nerve and muscle) generate electric currents during their normal operation.

General conclusions from the review of the literature involving studies of exposure assessment and the physical interactions of electric and magnetic fields with biologic systems are the following:

· Exposure of humans and animals to external 60-hertz (Hz) electric and magnetic fields induces currents internally.

The density of these currents is nonuniform throughout the body. The spatial patterns of the currents induced by the magnetic fields are different from those induced by the electric fields. Electric fields generally are measured in volts per meter and magnetic fields in microtesla (uT) or milligauss (mG) (1 uT = 10 mG).

· Ambient levels of 60-Hz (or 50-Hz in Europe and elsewhere) magnetic fields in residences and most workplaces are typically 0.01-0.3 uT (0.1-3 mG).

Higher levels are encountered directly under high-voltage transmission lines and in some occupational settings. Some appliances produce magnetic fields of up to 100 uT (1 G) or more in their vicinity. For comparison, the static magnetic field of the earth is about 50 uT (500 mG). Magnetic fields of the magnitude found in residences induce currents within the human body that are generally much smaller than the currents induced naturally from the function of nerves and muscles. However, the highest field strengths to which a resident might be exposed (those associated with appliances) can produce electric fields within a small region of the body that are comparable to or even larger than the naturally occurring fields, although the magnitude of the largest locally induced fields in the body is not accurately known.

· Human exposure to a 60-Hz magnetic field at 0.1 uT (1 mG) results in the maximum current density of about 1 microampere per square meter ($\mu\text{A}/\text{m}^2$).

The endogenous current densities on the surface of the body (higher densities occur internally) associated with electric

activity of nerve cells are of the order of 1 mA/m^2 . The frequencies associated with those endogenous currents within the brain range from less than 1 Hz to about 40 Hz, the strongest components being about 10 Hz. Therefore, the typical externally induced currents are 1,000 times less than the naturally occurring currents.

- Neither experimental nor theoretic data on locally induced current densities within tissues and cells are available that take into consideration the local variations in the electric properties of the medium.

Because the mechanisms through which electric and magnetic fields might produce adverse health effects are obscure, the characteristics of the electric or magnetic fields that need to be measured for testing the linkage of these fields to disease are unclear. In most studies, the root mean square (rms) strength of the field, an average field-strength parameter, has been measured on the assumption that this measurement should relate to whatever field characteristics might be most relevant. As noted earlier, wire-code categories have been used in many epidemiologic studies as a surrogate measurement of the actual exposure.

- Exposure levels of electric fields and other characteristics of magnetic fields (harmonics, transients, spatial, and temporal changes) have received relatively little attention. Very little information is available on the ambient exposure levels to environmental electric fields other than the rms measurements of field strength. Those might vary from 5 to 10 volts per meter (V/m) in a residential setting to as high as 10 kilovolts per meter (kV/m) directly under power transmission lines. Likewise magnetic-field exposures are generally characterized only in terms of their rms field strengths with little or no information on such characteristics as the frequency and magnitude of transients and harmonics. Residential exposures to power-frequency electric and magnetic fields are generally on the order of a few milligauss.

- Indirect estimates of human exposure to magnetic fields (e.g., wiring configuration codes, distance to power lines, and calculated historical fields) have been used in epidemiology.

These estimates of magnetic fields correlate poorly with spot measurements of residential 60Hz magnetic fields, and their reliability in representing other characteristics of the magnetic field has not been established. Because of the many factors that affect exposure levels, great care must be taken in establishing electric- and magnetic-field exposures.

- Unless exposure systems and experimental protocols meet several essential requirements, artifactual results are likely to be obtained in laboratory animal and cell experiments. Many of the published studies either have used inferior exposure systems and protocols or have not provided sufficient information for their evaluation.

In Vitro Studies on Exposure to Electric and Magnetic Fields

The purpose of studies of in vitro systems is to detect effects of electric or magnetic fields on individual cells or isolated tissues that might be related to health hazards. The conclusions reached after evaluation of published in vitro studies of biologic responses to electric- and magnetic-field exposures are the following:

- Magnetic-field exposures at 50-60 Hz delivered at field strengths similar to those measured for typical residential exposure (0.1-10 mG) do not produce any significant in vitro effects that have been replicated in independent studies.

When effects of an agent are not evident at low exposure levels, as has been the case for exposure to magnetic fields, a standard procedure is to examine the consequences of using higher exposures. A mechanism that relates clearly to a potential health hazard might be discovered in this way.

- Reproducible changes have been observed in the expression of specific features in the cellular signal-transduction pathways for magnetic-field exposures on the order of 100 uT and higher.

Signal-transduction systems are used by all cells to sense and respond to features of their environments; for example, signal-transduction systems can be activated by the presence of various chemicals, hormones, and growth factors. Changes in signal transduction are very common in many experimental manipulations and are not indicative per se of an adverse effect. Notable in the experiments using high magnetic-field strengths is the lack of other effects, such as damage to the cell's genetic material. With even higher field strengths than those, a variety of effects are seen in cells.

- At field strengths greater than 50 uT (0.5 G), credible positive results are reported for induced changes in intracellular

calcium concentrations and for more general changes in gene expression and in components of signal transduction. No reproducible genotoxicity is observed, however, at any field strength. Again, effects of the sort seen are typical of many experimental manipulations and do not indicate per se a hazard. Effects are observed in very high field strength exposures (e.g., in the therapeutic use of electromagnetic fields in bone healing).

The overall conclusion, based on the evaluation of these studies, is that exposures to electric and magnetic fields at 50-60 Hz induce changes in cultured cells only at field strengths that exceed typical residential field strengths by factors of 1,000 to 100,000.

In Vivo Studies on Exposure to Electric and Magnetic Fields

Studies of in vivo systems aim to determine the biologic effects of power-frequency electric and magnetic fields on whole animals. Studies of individual cells, described above, are extremely powerful for elucidating biochemical mechanisms but are less well suited for discovering complicated effects that could be related to human health. For such extrapolation, animal experiments are more likely to reveal a subtle effect that might be relevant to human health. The obvious experiment is to expose animals, say mice, to high levels of electric or magnetic fields to observe whether they develop cancer or some other disease. The experiments of this sort that have been done have demonstrated no adverse health outcomes. Such experiments by themselves are inadequate, however, to discount the possibility of adverse effects from electric and magnetic fields, because the animals might not exhibit the same response and sensitivities as humans to the details of the exposure. For that reason, a number of animal experiments have been carried out to examine a large variety of possible effects of exposure. On the basis of an evaluation of the published studies in this area, the committee concludes the following:

- There is no convincing evidence that exposure to 60-Hz electric and magnetic fields causes cancer in animals.

A small number of laboratory studies have been conducted to determine if any relationship exists between power-frequency electric- and magnetic-field exposure and cancer. In the few studies reported to date, consistent reproducible effects of exposure on the development of various types of cancer have not been evident. One area with some laboratory evidence of a health-related effect is that animals treated with carcinogens show a positive relationship between intense magnetic-field exposure and the incidence of breast cancer.

- There is no evidence of any adverse effects on reproduction or development in animals, particularly mammals, from exposure to power-frequency 50- or 60-Hz electric and magnetic fields.

- There is convincing evidence of behavioral responses to electric and magnetic fields that are considerably larger than those encountered in the residential environment; however, adverse neurobehavioral effects of even strong fields have not been demonstrated.

Laboratory evidence clearly shows that animals can detect and respond behaviorally to external electric fields on the order of 5 kV/m rms or larger. Evidence for animal behavioral response to time-varying magnetic fields, even up to 3 uT, is much more tenuous. In either case, general adverse behavioral effects have not been demonstrated.

- Neuroendocrine changes associated with magnetic-field exposure have been reported; however, alterations in neuroendocrine function by magnetic-field exposures have not been shown to cause adverse health effects.

The majority of investigations of magnetic-field effects on pineal-gland function suggests that magnetic fields might inhibit nighttime pineal and blood melatonin concentrations; in those studies, the effective field strengths varied from 10 uT (0.1 G) to 5.2 mT (52 G). The experimental data do not compellingly support an effect of sinusoidal electric field on melatonin production. Other than the observed changes in pineal function, an effect of electric and magnetic fields on other neuroendocrine or endocrine functions has not been clearly shown in the relatively small number of experimental studies reported.

Despite the observed reduction in pineal and blood melatonin concentrations in some animals as a consequence of magnetic-field exposure, studies of humans provide no conclusive evidence to date that human melatonin concentrations respond similarly. In animals with observed melatonin changes, adverse health effects have not been shown to be associated with electric- or magnetic-field-related depression in melatonin.

There is convincing evidence that low-frequency pulsed magnetic fields greater than 5 G are associated with bone-healing responses in animals.

Although replicable effects have been clearly demonstrated in the bone-healing response of animals exposed locally to magnetic fields, the committee did not evaluate the efficacy of this treatment in clinical situations.

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NAS Press Release: October 31, 1996

NO ADVERSE HEALTH EFFECTS SEEN FROM RESIDENTIAL EXPOSURE TO
ELECTROMAGNETIC FIELDS

WASHINGTON -- No clear, convincing evidence exists to show that residential exposures to electric and magnetic fields (EMFs) are a threat to human health, a committee of the National Research Council has concluded in a new report. After examining more than 500 studies spanning 17 years of research, the committee said there is no conclusive evidence that electromagnetic fields play a role in the development of cancer, reproductive and developmental abnormalities, or learning and behavioral problems.

"The findings to date do not support claims that electromagnetic fields are harmful to a person's health," said committee chair Charles F. Stevens, investigator, Howard Hughes Medical Institute, and professor, Salk Institute, La Jolla, Calif. "Research has not shown in any convincing way that electromagnetic fields common in homes can cause health problems, and extensive laboratory tests have not shown that EMFs can damage the cell in a way that is harmful to human health."

Concern about the health effects from EMFs arose in 1979 when researchers showed that children living close to high concentrations of certain types of electrical wires were 1.5 times more likely to develop leukemia. Because it is difficult, time-consuming, and expensive to measure electric fields in a home over a long period of time, researchers relied on a substitute to estimate the levels of electromagnetic fields to which residents may have been exposed. Using factors such as the size of wires going past the home and distance between the home and power lines, researchers estimated the fields inside.

The Research Council committee's report says that studies in the aggregate show a weak but statistically significant correlation between the incidence of childhood leukemia, which is rare, and wire configurations. It never has been demonstrated that this apparent association was caused by exposure to electromagnetic fields, however. Outside wiring correlates poorly with measurements of actual fields inside the home, in that it accounts for only a fraction of the fields inside. Scientists have tried unsuccessfully to link leukemia to EMFs by measuring fields inside of homes of children who had the disease. The results "have been inconsistent and contradictory and do not constitute reliable evidence of an association," the report says.

The weak link shown between proximity to power lines and childhood leukemia may be the result of factors other than magnetic fields that are common to houses with the types of external wiring identified with the disease. These possible factors include a home's proximity to high traffic density, local air quality, and construction features of older homes that fall into this category, the committee said.

CELLS, TISSUES UNAFFECTED

To try to explain and expand on the knowledge gained from early epidemiologic studies, researchers have studied the potential effects of EMFs on individual human cells or tissues, and on animals. To date, they have found no evidence to show that EMFs can alter the functions of cells at levels of exposure common in residential settings. Only at levels between 1,000 and 100,000 times stronger than residential fields have cells shown any reaction at all to EMF exposure, and even these changes -- mainly in the chemical signals that cells send to each other -- are not a clear indication of the potential for adverse health effects. In fact, exposure may actually help the body in some subtle ways, for example by speeding up the healing process after a bone is broken.

Most important, there has been no case in which even tremendously high exposure to EMFs has been shown to affect the DNA of the cell, damage to which is believed to be essential for the initiation of cancer. Similarly, no animal experiments have shown that EMFs, even at high

doses, can act as a direct carcinogen or can affect reproduction, development, or behavior in animals.

FUTURE RESEARCH

Electromagnetic fields are generated by wires or electrically powered devices, and dissipate quickly, like light. When assessing potential impact of EMFs on health, scientists focus mainly on magnetic fields produced by power lines and electric appliances, which can pass through the body and generate small electric currents. Unlike magnetic fields, electric fields themselves lose most of their strength when they pass through metal, wood, or even skin. In fact, the strongest of either fields that the body encounters are the electric currents produced naturally when the heart beats, or as nerves and muscles function, the report says.

The committee focused on the health studies of low-frequency electric and magnetic fields common in homes. Sources of

exposure include transmission and distribution lines and electric appliances, including shavers, hair dryers, video display terminals, and electric blankets. The committee did not study in detail occupational exposures, such as those experienced by electrical workers close to higher-frequency power lines.

New research is needed to answer some of the questions that linger after nearly two decades of intensive research, the committee said. Most compelling is the need to pinpoint the unexplained factor or factors causing a small increase in childhood leukemia in houses close to power lines. The precise factors that are related to an increased number of childhood leukemia cases need to be identified.

The committee also called for more research into the relationship between high exposures to EMFs and breast cancer in animals already exposed to other carcinogens, and on reasons why electromagnetic fields seem to affect the levels of the hormone melatonin in animals, an effect not reproduced in humans.

This congressionally requested study by the National Research Council was sponsored by the U.S. Department of Energy. The National Research Council is the principal operating arm of the National Academy of Sciences and the National Academy of Engineering. It is a private, non-profit institution that provides science and technology advice under a congressional charter.

Pre-publication copies of POSSIBLE HEALTH EFFECTS OF EXPOSURE TO RESIDENTIAL ELECTRIC AND MAGNETIC FIELDS are available from the National Academy Press at the mailing address in the letterhead; tel. (202) 334-3313 or 1-800-624-6242. Reporters may obtain pre-publication copies from the Office of News and Public Information at the letterhead address (contacts listed above).

###

[This news release is available on the World Wide Web at

<<http://www2.nas.edu/whatsnew/>>.]

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Press Release Issued by Three BEMS Presidents Who Were Also on the NRC Committee, October 31, 1996:

NAS REPORT CONFIRMS NEED FOR EMF RESEARCH, SAY SCIENTISTS

Frederick, MD, October 31, 1996 -- The president of the Bioelectromagnetics Society, Dr. Richard Luben, today welcomed the release of the official report of a National Research Council - National Academy of Sciences Committee, entitled "Possible Health Effects of Exposure to Residential Electric and Magnetic Fields" (released by NRC-NAS at 11:00 am EST this date).

Dr. Richard Luben, a Biomedical Sciences professor at the University of California, Riverside and president of the Bioelectromagnetics Society, along with two past presidents of the Society, Dr. Maria Stuchly of the University of Victoria (Canada), and Dr. Larry Anderson of the Pacific Northwest National Laboratory in Richland, Washington, all served on the NRC-NAS committee which compiled the report. They stated that "The most important aspect of this report is that it establishes that even under the strictest possible standards of proof, there is a reliable, though low, statistical association between power lines and at least one form of cancer. This fact in itself shows that we need to do more to find out why this relationship exists."

The NRC-NAS report concludes that although a statistical association can be shown between measurements of the current-carrying ability of power lines near residences and the relatively rare blood cancer, childhood leukemia, proof that this association is due to the electric or magnetic fields from the power lines is still lacking. Epidemiologic studies cited in the report show that households in the "high-wire-code" categories, which have higher-capacity wiring or are closer to power

stations or high-energy transmission lines, show approximately a 1.5-fold increase in childhood leukemia over households with low capacity wiring or those farther away from power sources. In previous public statements, the Bioelectromagnetics Society has taken the position that more research is needed on the relationship between EMF exposure and cancer-like changes in cells, and on the possible mechanisms by which EMFs, perhaps in concert with other factors, may contribute to leukemia and other cancers in humans.

The report states on page 1 that "Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard." However, the report also concludes that "the energy policy act of 1992 is not anticipated to answer all the questions regarding the possible health effects..." and that "continued research is important..." It goes on to make several further points. To summarize some of these points, 1) a link appears to exist between distance to power lines and risk of at least childhood leukemia; 2) there are biological effects of magnetic fields down to at least 1 gauss [about twice the magnetic field of the Earth]; and 3) mammary [breast] tumor experiments need to be pursued. The concluding paragraph of the report indicates "continued research is important, however, because the possibility that some characteristic of the electric and magnetic field is biologically active at environmental strengths cannot be totally discounted. If ongoing or future research should uncover evidence of potential mechanisms that could lead to such a result, research should be continued to follow those leads and address that possibility."

Drs. Luben, Anderson and Stuchly agree with the report's key conclusions that the data are not convincing that there is a proven danger to the public from electromagnetic fields -- but also that EMF exposure does result in a number of biological effects. They caution against taking the attitude that a lack of confirmed proof at this point in the study of EMF effects means that the question can be ignored. They point out that even in the case of cigarette smoking, it took nearly 50 years after the demonstration of a statistical association with lung cancer for scientists to define a specific cellular mechanism by which compounds in smoke could definitely cause the cellular changes associated with lung cancer. They emphasize that, in the view of scientists, research is the only way to find the answers to unexplained observations such as the apparent link between EMF exposure and some forms of cancer.

"There are many factors contributing to all cancers," said Luben, "this report documents that EMF exposure produces a number of biological effects, both on cells in the laboratory and on animals, that could possibly play a role in cancer development." The report points out that none of these effects have been reliably demonstrated at the field strengths normally encountered as background levels in households, even those which may be at slightly higher risk for leukemia due to their "wire code" ratings. However, the three scientists emphasized that most of the studies published to date have been preliminary studies in which high "doses" of the suspected agent (EMF in these cases) are applied to demonstrate effects. More extensive studies are currently being funded by the National Institutes of Health, the Department of Energy, and companies in the energy and communications industries; results of these studies are scheduled to be evaluated and reported to Congress by NIEHS in 1998.

"In the final analysis," said Luben, "the approach taken by this Committee is the only way to answer the questions raised here or in any scientific disagreement. We looked at the available data with an objective, impartial attitude, asking what the data really showed and not what we wished it to show. We found a few answers, but there are still important questions that need to be addressed."

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San Francisco Examiner, Thursday afternoon, October 31, 1996 (page 1)

Power lines cleared as cause of cancer

Study finds no link to electromagnetic fields, but 3 of 23 scientists disagree

[NB- there were only 16 on the panel, others listed were NRC staff- RAL]

By Keay Davidson
Examiner science writer

After 17 years of controversy, the nation's most prestigious scientific panel has concluded there is no clear, convincing evidence that electromagnetic fields from power lines and appliances harm humans. The National Research Council's ruling, released Thursday, is likely to carry unusual weight because it is, in a sense, the Supreme Court of U.S. science. The council is the research arm of the congressionally chartered National Academy of Sciences.

But in an unusual step, three of the 23 panelists issued a separate statement emphasizing the report had by no means proved EMFs didn't cause cancer. The three cited "a reliable, though low, statistical association between power lines and at least one form of cancer."

Since the 1970s, critics have charged that radiation from power lines and other sources causes cancer and other woes. More than 500 studies of the alleged effects have been published since the late 1970s. In retrospect, however, "research has not shown in any convincing way that electromagnetic fields common in homes can cause health problems, and extensive laboratory tests have not shown that EMFs can damage the cell in a way that is harmful to human health," said panel leader Dr. Charles F. Stevens of Salk Institute in La Jolla, San Diego County.

The 314-page report came as depressing news to Aaron Simon, an Oakland lawyer who unsuccessfully sued on behalf of a San Diego girl who developed a rare kidney tumor after growing up near power lines. He still maintains numerous studies show a link between EMFs and cancer. "Negative studies don't disprove that (link). . . . There's something wrong with the (NRC) study," Simon charged.

Some activists worry the public will overreact to the report and quit worrying about EMFs. "As a society we're hiding our head in the sand if we say, "The physicists don't believe there is a link (between EMFs and health), so we won't study it anymore," " said an outspoken advocate of the EMF-illness link, Dr. David Carpenter, dean of the School of Public Health at the State University of New York at Albany.

Robert Becker, a retired medical professor from the State University of New York at Syracuse, has maintained for decades that EMFs affect the human body in negative and positive ways. "I paid dearly for being out there in the front line," Becker said. Critics "have never bothered to do accurate studies," he said. "I don't believe the (NRC) report. I don't care what your title is (or) what government agency you belong to; unfortunately, not every scientist is unbiased. I just don't want to mess with this thing anymore."

The EMF controversy began in 1979, when researchers reported that children who lived near concentrations of power lines were 1 times more likely to develop leukemia. Thursday's report acknowledged the leukemia-power line link was "weak but statistically significant." However, the report adds, EMFs as intense as those in residential areas failed to harm cells and tissue cultures in lab tests. Consequently, the leukemia-power line link may be indirect -- that is, the leukemia cases may result from other urban causes, such as pollutants. The power lines' presence may be just a coincidence, the result of other factors, such as a greater demand for electricity in urban areas.

In lab tests, "only at levels between 1,000 and 100,000 times stronger than residential (electromagnetic) fields have cells shown any reaction at all to EMF exposure," the report says. "In fact, exposure may actually help the body in some subtle ways, for example by speeding up the healing process after a bone

is broken.”

One panelist, Richard L. Garwin of IBM in Yorktown Heights, N.Y., said alleged links between EMFs and illness "are not statistically persuasive, and they (involve) rare diseases . . . so even if (the link) were true, there's no significant impact on the public health.”

Others aren't so sure. The three panelists who issued a separate statement remain deeply troubled by the statistical link between power lines and leukemia. "There is substantial documentation there is a linkage between power lines and childhood leukemia,” said one of the three, UC-Riverside scientist Richard A. Luben. "There is also substantial documentation . . . that at high doses or high concentrations or high field strengths, EMFs could be involved in the development of cancer.”

But Luben emphasized he and his two colleagues supported the council report's conclusions. Their separate press release shouldn't be regarded as a "minority report” or dissenting document, he said. Luben is president of the Bioelectromagnetics Society, a 700-member group that investigates EMF-biomedical links. The other two authors of the separate statement were Dr. Maria Stuchly of the University of Victoria in British Columbia, and Dr. Larry Anderson of Pacific Northwest National Laboratory in Richland, Wash.

PG&E spokesman Scott Blakey said the firm will continue to provide free home checks of EMF levels to customers who request it.

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This page is provided by the Division of Biomedical Sciences, University of California, Riverside. To provide comments or suggestions regarding this page, please contact either Richard Luben, BEMS President or Bill Wisecup, Executive Director.

APPENDIX F
AMBIENT NOISE DATA SHEETS

STATION 1

Date: November 29, 1998

Time: 4:15 pm

Interval: 10 sec

Location: 100' south of LIRR tracks

Weather: Cool and clear

Description: northeastern corner of proposed subdivision near Lake Avenue and LIRR crossing

Field Notes:

Background noise attributed to vehicles on Lake Avenue and Pulaski Street

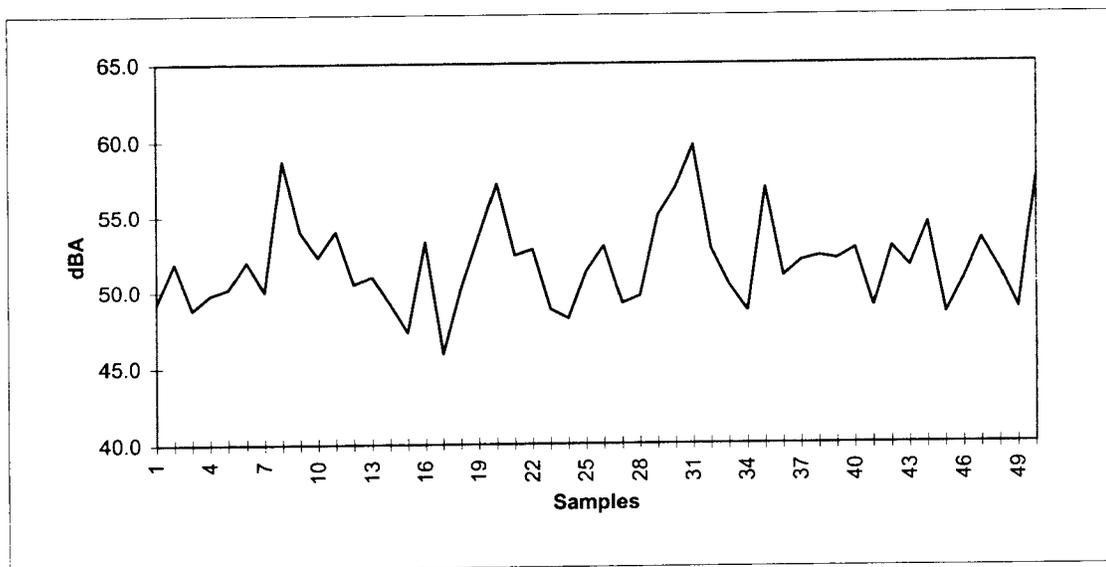
Key:

a: aircraft

cL: car on Lake Avenue

t: train

1	49.2	18	50.2	35	56.9 cL
2	51.9	19	53.7	36	51.0
3	48.8	20	57.2	37	52.0
4	49.8	21	52.4	38	52.3
5	50.2	22	52.8	39	52.1
6	52.0	23	48.8	40	52.8
7	50.0	24	48.2	41	49.0
8	58.7 cL	25	51.3	42	52.9
9	54.0	26	53.0	43	51.6
10	52.3	27	49.2	44	54.5 cL
11	54.0	28	49.7	45	48.5
12	50.5	29	55.0	46	50.8
13	51.0	30	56.9 a	47	53.4
14	49.2	31	59.7 a	48	51.3
15	47.3	32	52.8	49	48.8
16	53.3	33	50.4	50	57.5 cL
17	45.9	34	48.7	Leq: 53.0	



STATION 2

Date: November 29, 1998

Time: 4:15 pm

Interval: 10 sec

Location: 100' south of LIRR tracks

Weather: Cool and clear

Description: approximately 500' east of Station 1

Field Notes:

Background noise attributed to vehicles on Lake Avenue and Pulaski Street

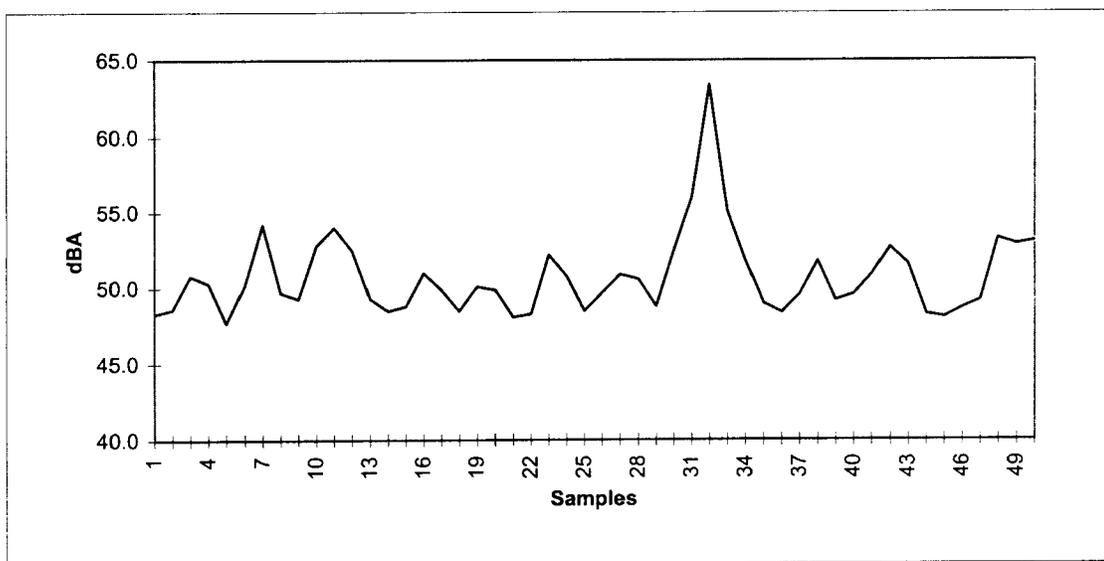
Key:

a: aircraft

cL: car on Lake Avenue

t: train

1	48.3	18	48.5	35	49.0
2	48.6	19	50.1	36	48.4
3	50.8	20	49.9	37	49.6
4	50.3	21	48.1	38	51.8
5	47.7	22	48.3	39	49.2
6	50.2	23	52.2	40	49.6
7	54.2	24	50.8	41	50.9
8	49.7	25	48.5	42	52.7
9	49.3	26	49.7	43	51.6
10	52.8	27	50.9	44	48.3
11	54.0	28	50.6	45	48.1
12	52.5	29	48.8	46	48.7
13	49.3	30	52.5	47	49.2
14	48.5	31	56.0 a	48	53.3
15	48.8	32	63.4 a	49	52.9
16	51.0	33	55.1	50	53.1
17	49.9	34	51.8	Leq:	52.2



APPENDIX G

CULTURAL RESOURCES ASSESSMENT, STAGE IA

Pulaski and Lake Roads Site, CRA Stage 1A, Greenlawn, New York

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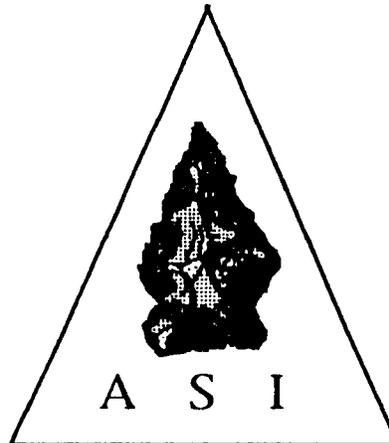
CULTURAL RESOURCES ASSESSMENT

STAGE IA

ARCHIVAL STUDY

PULASKI AND LAKE ROADS

GREENLAWN, NEW YORK



ARCHAEOLOGICAL SERVICES INC.
POB 1522, ROCKY POINT, NEW YORK
11778

ASI A1

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ABSTRACT

The Pulaski and Lake Roads parcel has been evaluated by means of a study of historic maps, documents, archival information, and physical inspection to assess its potential for cultural sensitivity. The evidence gathered by this study supports a recommendation of further assessment, in the form of a Stage IB study, to determine the actual presence or absence of significant cultural resources in the impact area.

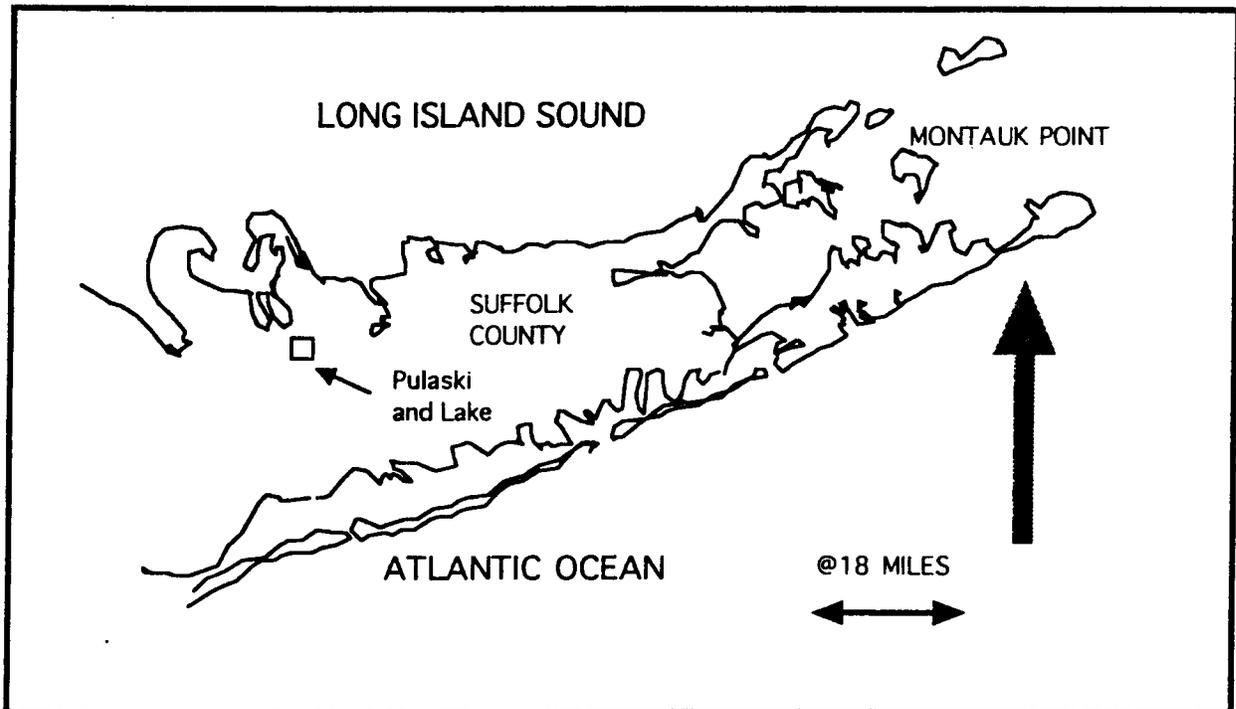


Figure 1. Project general location map.

Pulaski and Lake Roads Site, CRA Stage 1A, Greenlawn, New York

**PULASKI AND LAKE ROADS PARCEL
GREENLAWN, NEW YORK**

ARCHIVAL STUDY

Working date of this file: August 13, 1994

AUTHOR AND PRINCIPAL INVESTIGATOR: PROF. ROBERT J. KALIN

SIGNED: _____

DATE: _____

**ROBERT J. KALIN
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EXCEEDS U. S. NATIONAL PARK AND NEW YORK STATE STANDARDS,
NEW YORK STATE CERTIFIED**

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ARCHAEOLOGY SEAL

ASI A2

INTRODUCTION

The following report is the result of a cultural resources, archival search and field inspection study of the Pulaski and Lake Roads proposed development site, a thirty-nine acre former farm lot located north of Pulaski Road, east of Lake Road and south of the Long Island Railroad, in an area locally known as Little Plains, part of Greenlawn, Huntington Township, Suffolk County, New York.

OBJECTIVES

The objectives of this study are to identify known historic or prehistoric resources, determine the potential for cultural sensitivity and/or recovery of significant cultural resources, evaluate the differential sensitivity of any sites identified, and prepare options for further study, if warranted. These objectives are to be achieved by means of investigation of standard resources including historic maps, local archives, New York State and County records, Township and New York State prehistoric site-lists, and other sources such as oral histories of local residents.

DESCRIPTION OF PROJECT SITE

The Greenlawn, Huntington Township project site is an approximately 39.3 acre former agricultural parcel bounded on the east by Lake Road, Pulaski Road on the south, the Long Island Railroad on the north, while the land of the Hazeltine Corporation is to the east. The sparsely vegetated former farm lot slopes gently and regularly from the northeast to the southwest. An unsurfaced farm road arises in the west from Lake Road approximately 230 feet south of the railroad tracks and proceeds, parallel to the northern boundary, to the eastern end of the parcel. Along its course are areas defaced by recent dumping. On the north side of the farm road these dumped materials have been scraped by earth moving machinery into a low linear mound comprised of soil and debris arranged parallel to the northern boundary of the parcel.

DESCRIPTION OF PROPOSAL

The proposed use of the property is undefined at the date of this report.

ENVIRONMENTAL INFORMATION

Topography

The project area has a gently sloping and regular topography with relief of about 20 feet. The highest elevation, of more than 228 feet above mean sea level, occurs in the northeast and slopes from there to the southwest corner (at an elevation of 208 feet above msl) at a grade of about 2%. An embankment of soil and discarded debris is found about one hundred feet south of and parallel to the LIRR right of way.

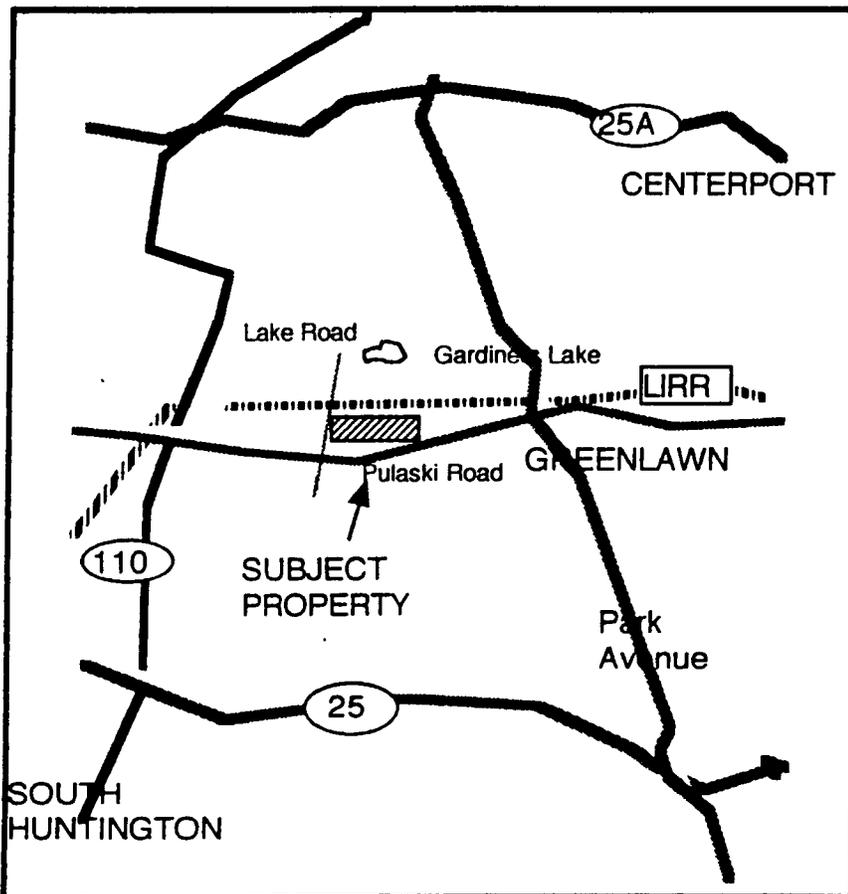


Figure 2. General site map and vicinity, DeLorme NYS Map and other sources.

Soils

The soils of the parcel reportedly belong to the Haven Series, which are deep well drained medium textured soils formed in a loamy mantle over stratified coarse sand and gravel. See Warner, et. al. page 71 and Sheet 51, 1975. Soil observations and tests made on site during the walk-over survey revealed a moderate yellowish brown gravelly-loam plow soil of about 10 inches in depth overlying a pale yellowish

orange gravelly-loam. The depth of the plow soil varied from 8 to 10 inches in the two subsurface tests. In some places gravel and exposed granitic cobbles were observed on the surface.

Drainage

The proposed construction area is well drained.

Vegetation

The parcel is cleared land presently thinly covered by grasses forbs and brush. An initial survey of vegetation revealed the presence of the following species and their relative abundance and distribution over the parcel.

SPECIES	ABUNDANCE	DISTRIBUTION
Bayberry	common	scattered
Birch	rare	restricted
Black Cherry	rare	restricted
Daisy Fleabane	common	scattered
Golden Rod	very common	throughout
Horseweed	common	scattered
Maple	rare	restricted
Multiflora Rose	common	restricted
Queen Anne's Lace	very common	throughout

Forest Zone

The original forest zone of the area was probably Northeastern Oak-Pine Forest (See Kuchler 1970).

Man-Made Features Observed During the Field Inspection.

The property has no standing structures. A former farm road, a system of all-terrane-vehicle or off-road vehicle dirt tracks, a linear mound of soil and dumped materials (apparently cleared from the surrounding farm land in recent years) and the ruin of an agricultural loading-platform were observed.

Alterations

The study area has been altered by forest clearing, past farming activities, waste dumping, and clearing these disposed materials and soil by heavy machinery into an elongate low mound parallel to the LIRR right of way.

Previous Field Reconnaissance Surveys

No previous CRA studies have been reported for this parcel.

EXISTING STRUCTURES

No existing structures.

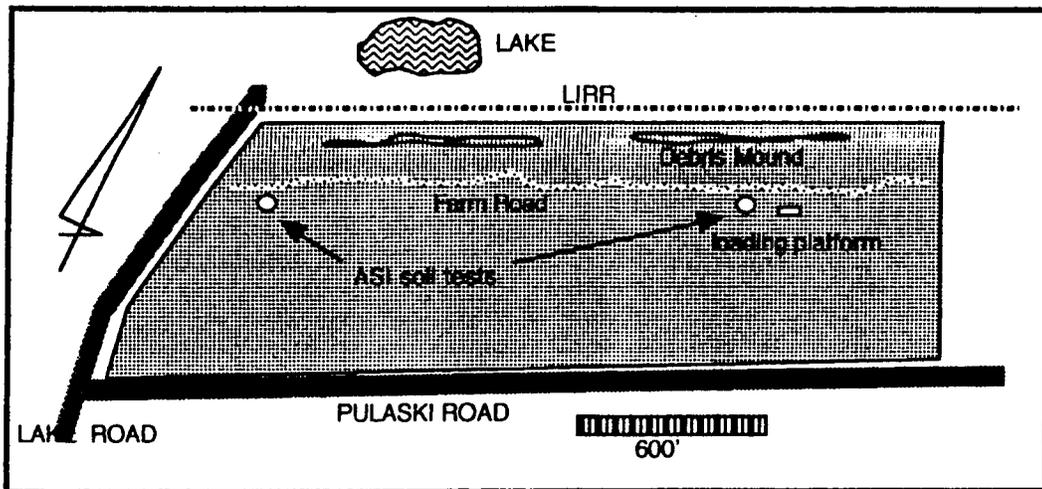


Figure 3. Sketch map of Pulaski and Lake Roads Site.

VISUAL INSPECTION

A visual inspection was conducted on 7-30-94 .

DOCUMENTARY RESEARCH

I. TEXTS

All major references were reviewed these included: W. Beauchamp (1900), A. C. Parker (1920), Ritchie (1969), Smith (1950), Ritchie and Funk (1973), and others.

II. REFERENCED MAPS:

1. Burr 1829
2. Colton Map 1836
3. Chase Map of 1858
4. Beers Map of 1873
5. Hyde and Belcher Hyde Series 1896
6. Colton 1901
7. USGS, Huntington 1901
8. USGS Northport 1903
9. Hyde 1906
10. Belcher Hyde 1917
11. Dolph and Stewart 1929
12. USGS Huntington Quadrangle, 1943
13. USGS Huntington Quadrangle, 1947
14. USGS Huntington Quadrangle, 1967

III. PREHISTORIC SITE FILES AND EARLY RESIDENCE SITES

(a) Prehistoric

1. A. C. Parker (1920) reports no sites in the immediate vicinity of the subject property. However, a village site and shell heap at Lloyds Neck were reported as were similar features near Cold Spring Harbor, and extensive shell heaps in Huntingdon (sic). These are all considerable distances from the subject property. Also see below.

2. Gonzales and Rutch (1979) categorize the region of the subject property as an area of "generalized aboriginal activity". (Gonzales and Rutch 1979:13).

3. Saxon (1973) reports the location, of an Archaic fluted-point site along the drainage of the Carlls River, in an area distant from the subject property.

4. The New York State OPRHP Archaeological Sensitivity Map (updated March 1986) indicates no reported prehistoric sites in the general area. However, see below.

5. A New York State OPRHP Archaeological Site File search has been requested but has not been received as of this writing. See attached letter.

6. A search of the Huntington Town archives revealed the report of prehistoric materials (arrowheads) located near the eastern portion of Gardiners Lake, immediately adjacent to the subject parcel. This site has not been professionally studied or reported upon. See Lakeridge SEQRA Report, January 5, 1983, statement of Mr. Kenneth C. Hamilton. Also see Hamilton interview in addendum.

(b) Historic

1. The New York State OPRHP Archaeological Sensitivity Map (updated March 1986) indicates a number of historic sites in the general vicinity of the subject property. Also see historic residences listed in Greenlawn. In the immediate vicinity of the subject parcel is the 1750 Jacob Ireland house (Wicks et. al.) and the 1775 Jacob Ireland house (B. Gardiner) as well as an associated barn and outbuildings.

2. The property is adjacent to the National Register Ireland-Gardiner farm which lies north of the railroad tracks and east of Lake Road. A portion of this parcel has been developed as the Lakeridge Condominium complex.

3. Late in the 1870s Alexander S. Gardiner developed the Greenlawn

Pickle Works on the subject property. This was one of the earliest industries in central Huntington and had a profound impact on Huntington's early economic development and transition to a modern non-agricultural based economy. Documentary evidences related to this industry include map references of a LIRR railroad spur and a series of structures formerly located in the northwestern corner of the subject property. These features were in existence from late in the nineteenth century to sometime prior to 1967 when they were removed.

(c) Oral reports from local residents indicate that Gardiner's Lake was a natural lake that was deepened and enlarged in the 19th century.

MAP ANALYSIS

1. Burr 1829.

The Burr map figures an area with few roads, prominent towns or villages. However, at this date, three centers of population occur in the township at: Huntington in the north, Dix Hills in the center, and Babylon in the south. The Pulaski and Lake Roads proposed project site is in an undeveloped area between the villages of Huntington and Dix Hills. There are no structures or residences noted in the general area of the subject property. See Map 1 in Addendum.

2. Colton Map of 1836

This map figures the locations major topographic features roads and villages such as: the village of Centerport, Dix Hills, and Huntington. The major roadways of the time are represented. There are, however, no indications on this map of roads or structures in the vicinity of the proposed Pulaski and Lake Roads project. See Map 2.

3. Chase Map of 1858.

Chase indicates residences and owners in the study area just after mid-19th century. At this date the primary traffic nodes, centers of population and commercial activity were at Huntington, Dix Hill (sic), and Centerport. The area that would later become the village of Greenlawn was a confluence of byways located to the southwest of Centreport (sic) around which the residences and farms of the Brush, Smith, Wicks, Ireland and Tilden families were clustered. There is no indication of Gardiner Lake on this map. The farm and residence attributed to *Wid. Gardiner* is indicated in the approximate vicinity of the subject parcel. It is probable that at this date the subject property which was probably located just north of the Gardiner residence was a part of that farm. Other than the Gardiner and W. Ireland residences, no structures are indicated in the study area. See Map 3.

4. Beers 1873 Map.

The Beers 1873 map represents southern Huntington Township in the latter part of the 19th century as a community in large part retaining its agricultural character. By this date the LIRR Wading River line had been extended through the region. The map indicates the village of Greenlawn, School District and School No. 6, the L.H. Brush farm, the A. Gardiner residence, the J. Ireland residence (with a suggestion of a lake), Lake Road, and the railroad line. The pattern of residences suggests that the subject property remained part of the Gardiner family holdings. See Map 4.

5. Belcher Hyde Series 1896

The 1896 Hyde Map reflects the growth of industry other than farming in the southern and central part of Huntington Township late in the 19th century. At this date a factory is noted at the corner of Lake and Park roads west of the N. and J. Gardner(sic) farms south of the subject property. The former Ireland property is at this date occupied by a Mrs. Smith. D. Munger resides to the east of the latter, on the north side of the rail line. The Gardiner Lake is not noted, though one is indicated to the west. See Map 5.

6. Colton 1901

The Colton map prominently figures "Gardiners Lake" just west of the Greenlawn Station, north of the LIRR Port Jefferson Branch. See Map 6.

7. USGS, Huntington Quadrangle, 1901

The Huntington Quadrangle 1901 (15 min. series) indicates the culture and topography of the area just after the turn-of-the-century. The Pulaski and Lake Roads parcel was at this period located within a level upland plain (Little Plains) between Dix Hills and the dissected coastal area comprised of West Neck, Great Neck and Little Neck, in a general area that remained largely devoted to agriculture. The map figures a structure and a lake north of the railroad, as well as the structures and residences noted in the 1896 map. No structures are indicated in the area of the subject parcel. See Map 7.

8. USGS Northport Quadrangle 1903

This map indicates few or no changes in the study area over the 1901 edition. Noteworthy is that the cartographers did not record the Gardiner Pickle Works structures at the northwest corner of the subject property. See Map 8.

9. Hyde 1906

The Hyde 1906 map appears to be a duplicate of the 1896 edition with little change represented in the study area. The factory on the east side of Lake Road is noted, the Gardner residences to its east are attributed to A.S. Gardner and J. Gardner. No structures are noted in the vicinity of the subject property. See Map 9.

10 Belcher Hyde 1917

The 1917 map reflects the fact that the area continued primarily as a farming district, however, large sectors of local wood lot or otherwise vacant land apparently had been planned or purchased for housing or commercial development. For example, this map lists developments such as: *Cedar Grove Terrace, Huntington Manor, Huntington Terrace, Lenox Park, Greenlawn Manor, and Locust Park*, all located south and southwest of the subject property. At this date the present-day Pulaski and Lake parcel was attributed to several owners, these being: Egbert Gardiner, Mrs. L. Colyer, and Mrs. William H. Thomas. Gardiner's holdings in the western end was the largest of the three. The factory noted on earlier maps of the Gardner property is not noted in this edition or at this date, though a structure is represented at that location. However, several substantial buildings are represented at the northwest corner of the Gardiner parcel; a rail road siding of the LIRR Wading River Branch served four structures which were represented as the "Pickle Works". A fifth structure was located west of Lake Road on the Chas. D. Smith property. See Map 10.

11. Dolph and Stewart, 1929 (Greenlawn)

By publication date of this map, the eastern section of the subject property, formerly attributed to Mrs. Thomas and Mrs. Colyer are assigned to the E. (Egbert ?) Gardiner holdings. A new resident, noted as *DeRiso* apparently owns 45 acres to the east of the Gardiner parcel. These two properties are surrounded on the south by parcels apparently planned for housing or commercial development and are noted as "Broadway Business Lots", "Willow Gardens", and "Bungalow Sites". See Map 11.

12. USGS Huntington Quadrangle, 1943

This map reveals that farms continued to operate along the level fertile lands north of Dix Hills at this date. Pulaski Road is noted and must have been constructed some time between 1929 and 1943. The Smith farm house, the Wicks house and two structures, one of which may be the ice house that has been reported (See W. Wicks interview in Addendum) are figured north of the railroad, as is Gardiner's Lake. Two elongate structures (or probably two series of structures) are located in the northwest corner of the subject property aligned parallel to the rail road in the location of the previously noted pickle works. Each of the structures (or series) are estimated to have been about 65 by 200 feet in extent and may have comprised about 26,000 square

Pulaski and Lake Roads Site, CRA Stage 1A, Greenlawn, New York

feet of floor space. No other features or structures are noted within the subject property. See Map 12.

13. USGS Huntington Quadrangle, 1947

This map reflects few or no changes from the previous edition of the same map. See Map 13.

14. USGS Huntington Quadrangle 1967

This map depicts many of the same elements of topography and culture noted in the previous USGS maps. Noteworthy is that the buildings noted in the northwest corner of the subject parcel (the Gardiner Pickle Works) have been removed by this date. North of the railroad on adjacent property, one of the twin structures (associated with the ice house?) has been removed or torn down. By this period the area south of Pulaski Road has become more urbanized. No structures are noted within the subject parcel. See map 12.

CHRONOLOGY OF EVENTS RELATING TO THE SUBJECT PROPERTY

In prehistoric times bands of native Americans may have exploited the series of ponds located just north of the subject property and the surrounding woodlands for game and other native foods. Evidences of their presence is indicated by reports of stone tools observed in the soils and recovered by local collectors.

The area around the pond was first cleared and farmed by Jacob Ireland who built a farmstead and another house on a site north of the subject property between 1750-1775. throughout this period and up to the 19th century the project site remained an undeveloped wooded area between the villages of Huntington and Dix Hills. By mid 19th-century roadway traffic nodes, small centers of population and commercial activity were located at Huntington, Dix Hills, and Centerport. About this time the area that would later become the village of Greenlawn was a confluence of unpaved byways, located to the southwest of Centerport, around which the residences and farms of the Brush, Smith, Wicks, Ireland and Tilden families were clustered. The earliest attribution of ownership for the subject property is the *Widow Gardiner*, who was the assigned proprietor of a large tract of land which would have probably included the subject property.

In the latter part of the 19th century (1868) the LIRR Port Jefferson Branch-line had been extended through the region. At this period there are evidences that the improvements in transportation had begun to stimulated local agriculture and investment in a variety of commercial ventures related to agriculture. Alexander Gardiner is indicated as the owner of the parcel which included the subject property. The J. Ireland farm, north of the railroad has a lake on its property which appears to have been exploited as a source of ice to pack agricultural products for transport and as a source of water for irrigation of surrounding farm lots. Ice was cut in winter on the lake and stored for sale in a near-by ice houses on the Ireland property. In the spring and summer the lake water was used for irrigation of near-by fields. Lake Road had been constructed about this time, and the subject property was included in School District No. 6.

Alexander S. Gardiner (1835-1914) a descendant of Lion Gardiner of eastern Long Island was one of the earliest Huntington entrepreneurs, who was involved involved in a wide variety of ventures including farming, blacksmithing, cider mills, grist mills, saw mills, brick works, boat building, ice cutting and ice storage. At one point Gardiner owned over 600 acres north of the rail line.

After the extension of the LIRR through Greenlawn in 1868 farmers found they could rapidly transport their perishable vegetable crops to populated markets in Brooklyn and New York City by trains which could cheaply transport bulk materials such fresh produce. However, a key factor in the economic calculus of the area, and

one to be quickly appreciated by the local farmers was the abundance of cheap animal wastes from NYC streets where horses were the mainstay of transportation. These materials, undesirable waste for NYC, were valuable sources of fertilizer to local farmers and were available to them for the cost of transport. With cheap fertilizer, available land, an abundant local labor entrepreneurs such as Alexander Gardiner were quick to see the potential of raising perishable crops with animal manures and quickly transporting them to the large population centers on the western end of the island where there was a great demand for fresh produce. Greenlawn, with its level sandy soils was an ideal place to grow cabbage and cucumbers. Both plants are heavy feeders and need abundant applications of well rotted manure. Furthermore, the local lakes could provide water for irrigation in summer droughts and ice cut in winter and stored in local ice houses could be used to pack other perishable crops for shipment in the harvest season.

The genius of Alexander Gardiner and others in Huntington at this time was to meet the gustatory demands of the burgeoning immigrant populations streaming into New York and Brooklyn from Central and Eastern Europe with a product that was of greater demand and less perishable than fresh produce. These of course were "pickled" foods such as brine preserved cucumbers and brined cabbage or sauerkraut. Thus, to exploit this market, in about 1880 Alexander Gardiner built several buildings (using wood from his own mills) on his property along the south side of the rail line east of Lake Road. In these he rented space, at one time amounting to more than 25,000 square feet of floor space, to pickle and cabbage processors, as well as others such as the Milburn Wagon manufactory. Gardiner provided the floor space, farm land, wood for barrels, and the transported manure for these operations. One of the earliest operators to rent space at Gardiner's place was the pickling firm of Alart and McGuire. They purchased cucumbers and cabbages from local farmers and prepared pickles and sauerkraut. Later, others such as Abraham and Hyman Golden from Brooklyn operated from this site. Enormous quantities of sauerkraut and pickles were grown and prepared on the site. At one point the *Long Islander* (July 28, 1888) reported that the firm of Alart and McGuire were increasing their pickle capacity by building three more tanks which would accommodate "two million more pickles than last season". The operation grew to such an extent from the decades between 1880 to 1920 that a special rail spur was constructed on Gardiner land to serve the Pickle Works. The operation employed hundreds of local farmers and laborers and pumped large amounts of capital into the local economy. The Works provided a stimulus to the local economy and acted as a seed industry which tended to spawn other ventures. Furthermore it provided an important transition economy between early subsistence agriculture, cash crop agriculture, and a non-agricultural economy.

In the 1920s a cucumber disease known as "white pickle" afflicted the Long Island crop. There was no known cure, and the growing of cucumbers for commercial pickling was over. Cabbage production for sauerkraut continued for some years, but

by the 1930s the scarcity of cheap animal manure, plant pests, economic depression and other factors soon caused this operation to be also discontinued. The railroad siding was removed in the late 1940s, but the structures continued in place for several decades and may have been put into use during the years of World War II when agricultural activity was temporarily spurred in the area. Finally sometime prior to 1967 they too were burned or torn down.

SENSITIVITY ASSESSMENT

Evidences gathered for this report indicate a potential for occurrence and recovery of prehistoric, and historic cultural material within the Pulaski and Lake Roads proposed construction site. ASI concludes that the subject property has a higher than average probability for recovery of historic materials in selected areas over the parcel, and an average probability of producing prehistoric materials. These latter evidences may have a higher than average potential for recovery in areas closer to the northern boundary of the parcel

CONCLUSIONS

1. Slope, soil character, disturbance levels, and natural erosion processes are such that cultural materials could have been buried and preserved in the soils of the Pulaski Road property.
2. The parcel is located in proximity to a natural source of fresh water, which often suggests the potential for recovery of prehistoric materials.
3. It is in a general location and topographic situation analogous to other known prehistoric sites in the County.
4. Anecdotal evidence of prehistoric finds in the immediate vicinity of the subject property are on record in Township archives.
5. It has an assessment of a "mixed" potential for recovery of prehistoric evidences prepared by the New York State Museum.
6. The parcel is in an historically sensitive corridor and immediately adjacent to a National Historic Register property known as the Ireland-Gardiner Farm.
7. The property is the site of the Greenlawn Pickle Works, a late 19th to early 20th century transitional industry that played an important part in the economic history and

Pulaski and Lake Roads Site, CRA Stage 1A, Greenlawn, New York

development of central Huntington Township. Aspects of the physical structures including buildings and a rail spur were mostly in place until the late 1960s when they were torn down. It is possible that surface or subsurface cultural evidences would be found on site.

RECOMMENDATIONS

A Stage IB, field reconnaissance study is recommended to assess presence or absence and significance of prehistoric or historic-era cultural resources as well as to physically document the cultural observations revealed by the archival and documentary research.

GOALS OF ADDITIONAL STUDIES

Based on the results of the Stage IA study, ASI recommends that a field reconnaissance study be performed to map and document all cultural features which may occur within the parcel including: early boundaries, roads, rail spur locations, and former structure sites. The study should also address the potential for recovery of prehistoric evidence by a standard program of subsurface tests and systematic surface observations .

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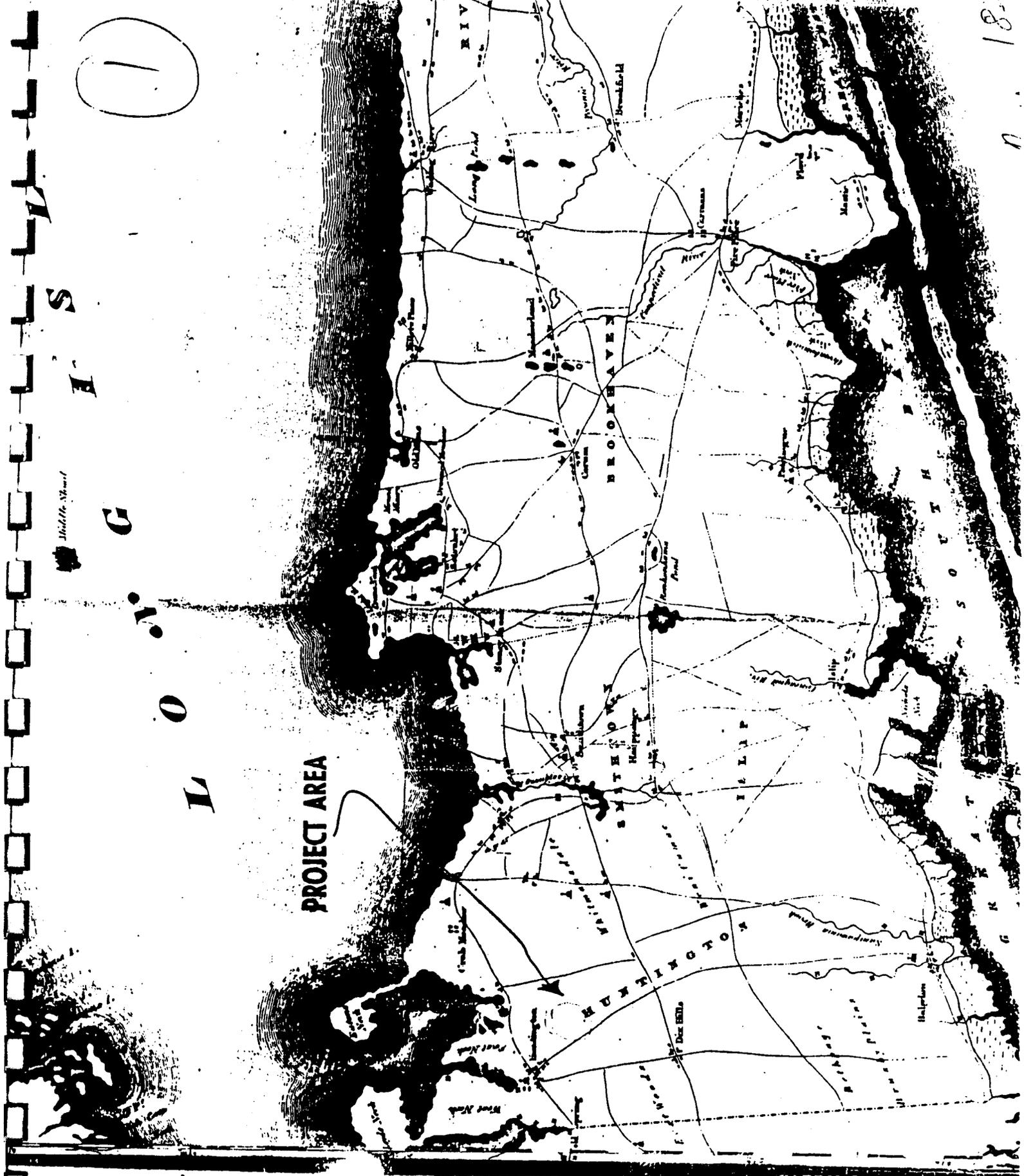
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Pulaski and Lake Roads Site, CRA Stage 1A, Greenlawn, New York

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ADDENDA



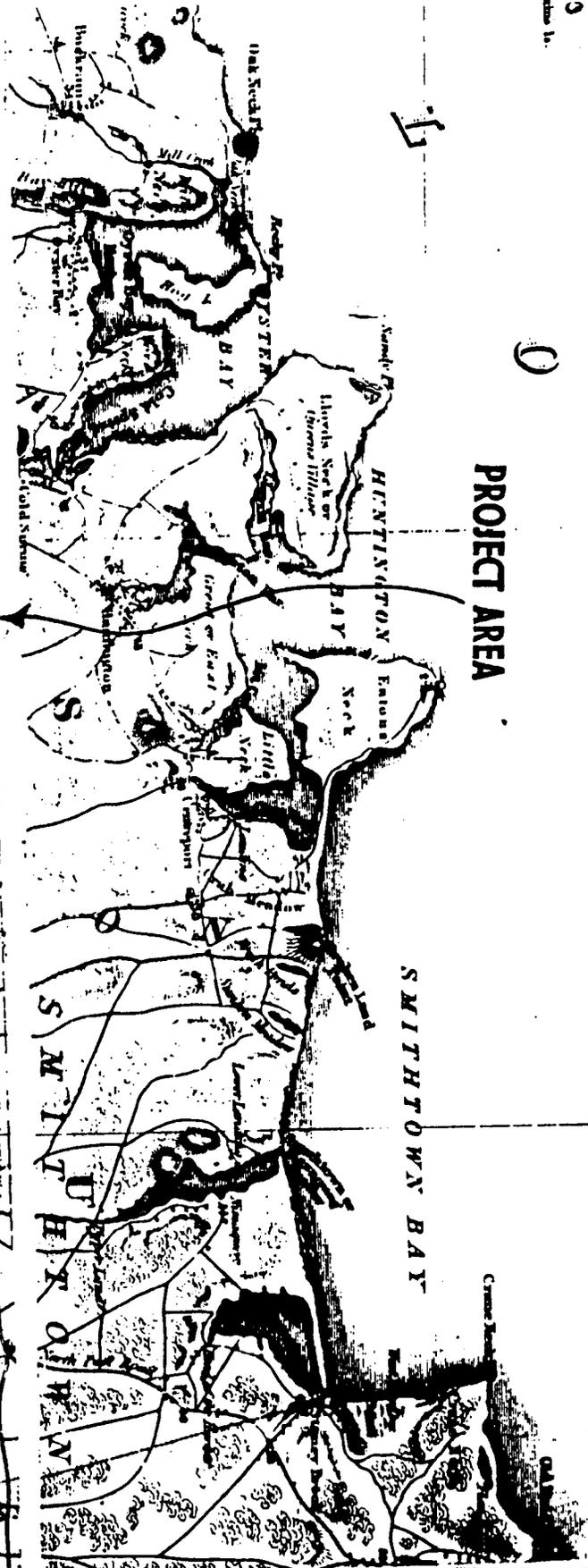
PROJECT AREA

BURR 1829
NAPI A23



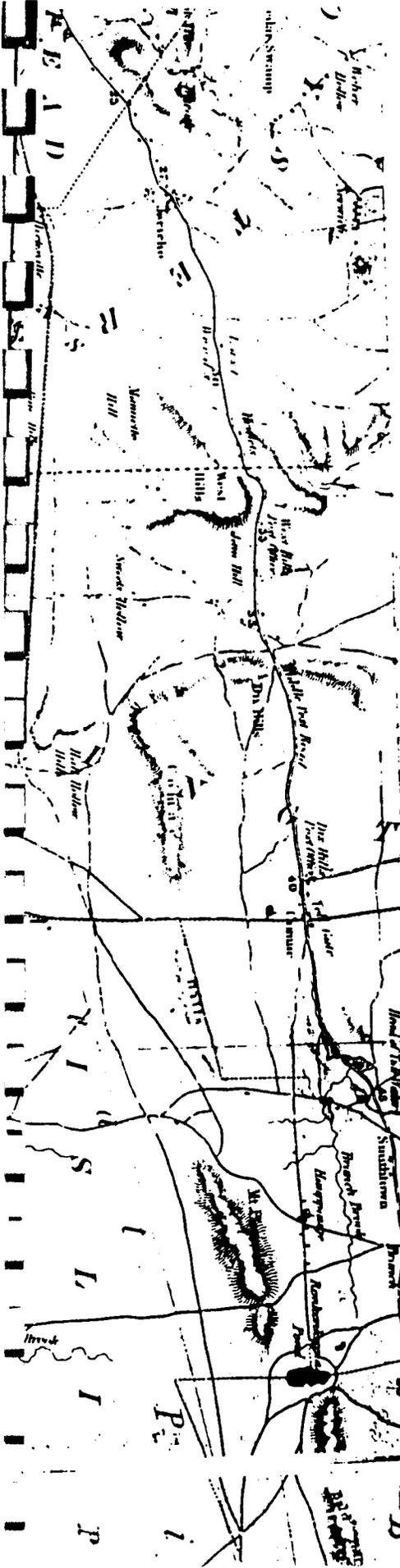
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PROJECT AREA



HUNTINGTON BAY
SMITHTOWN BAY

COLTON 1886
MAP 2 A24



HUNTINGTON BAY

SMITHTOWN BAY

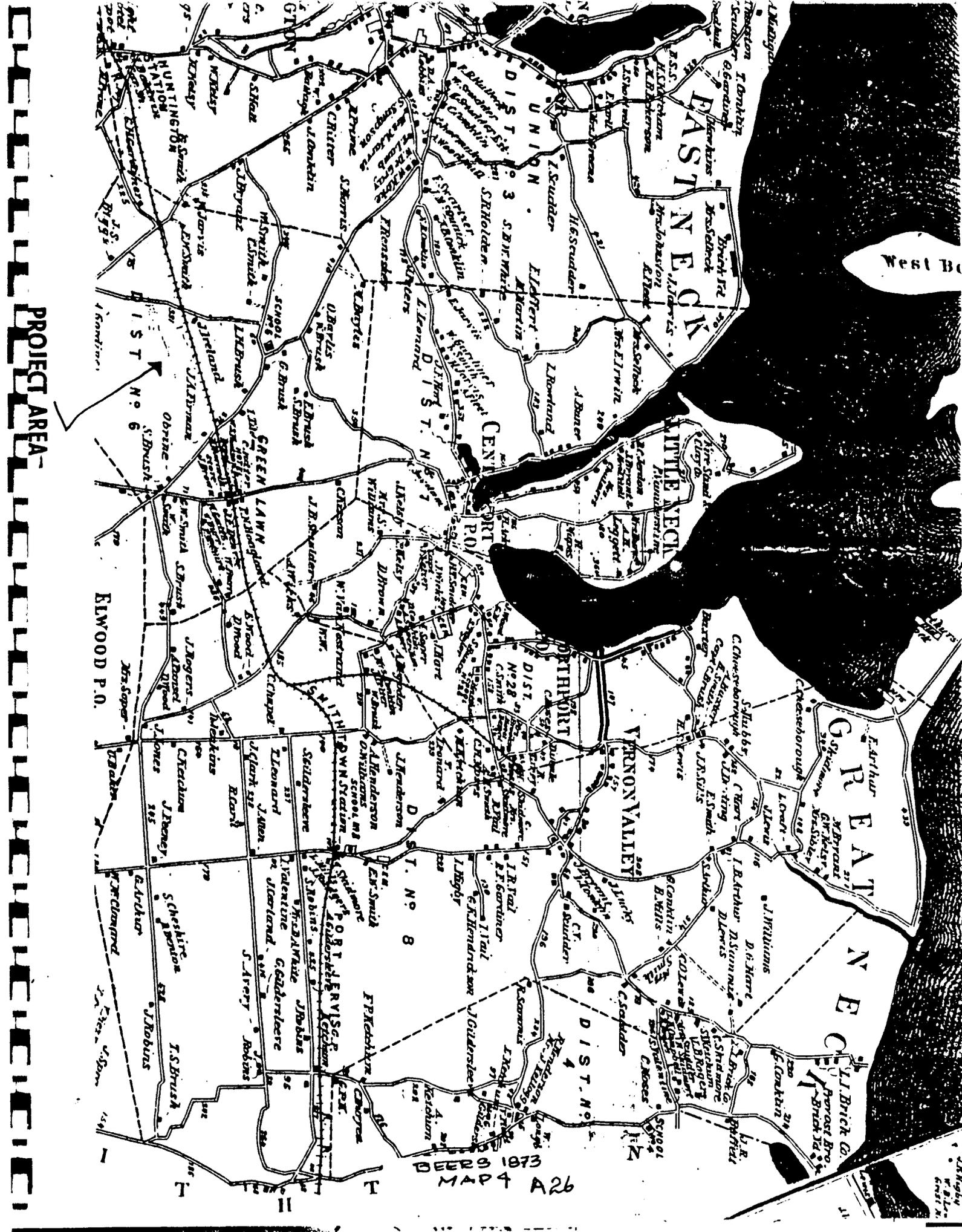
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Scale in Feet



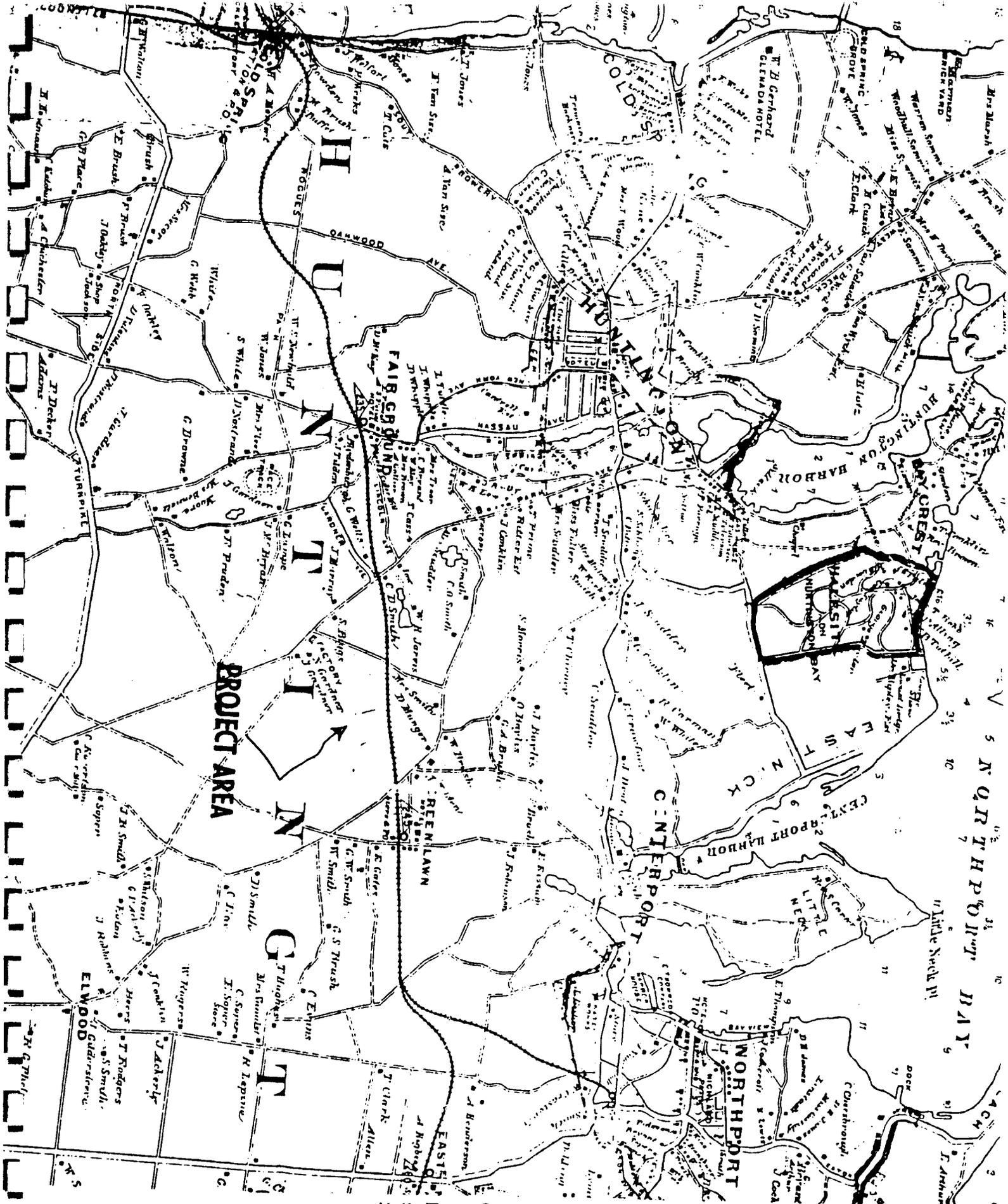
CHASE 1858
MAP 3 A25



PROJECT AREA

DEERS 1873
MAP 4 A26

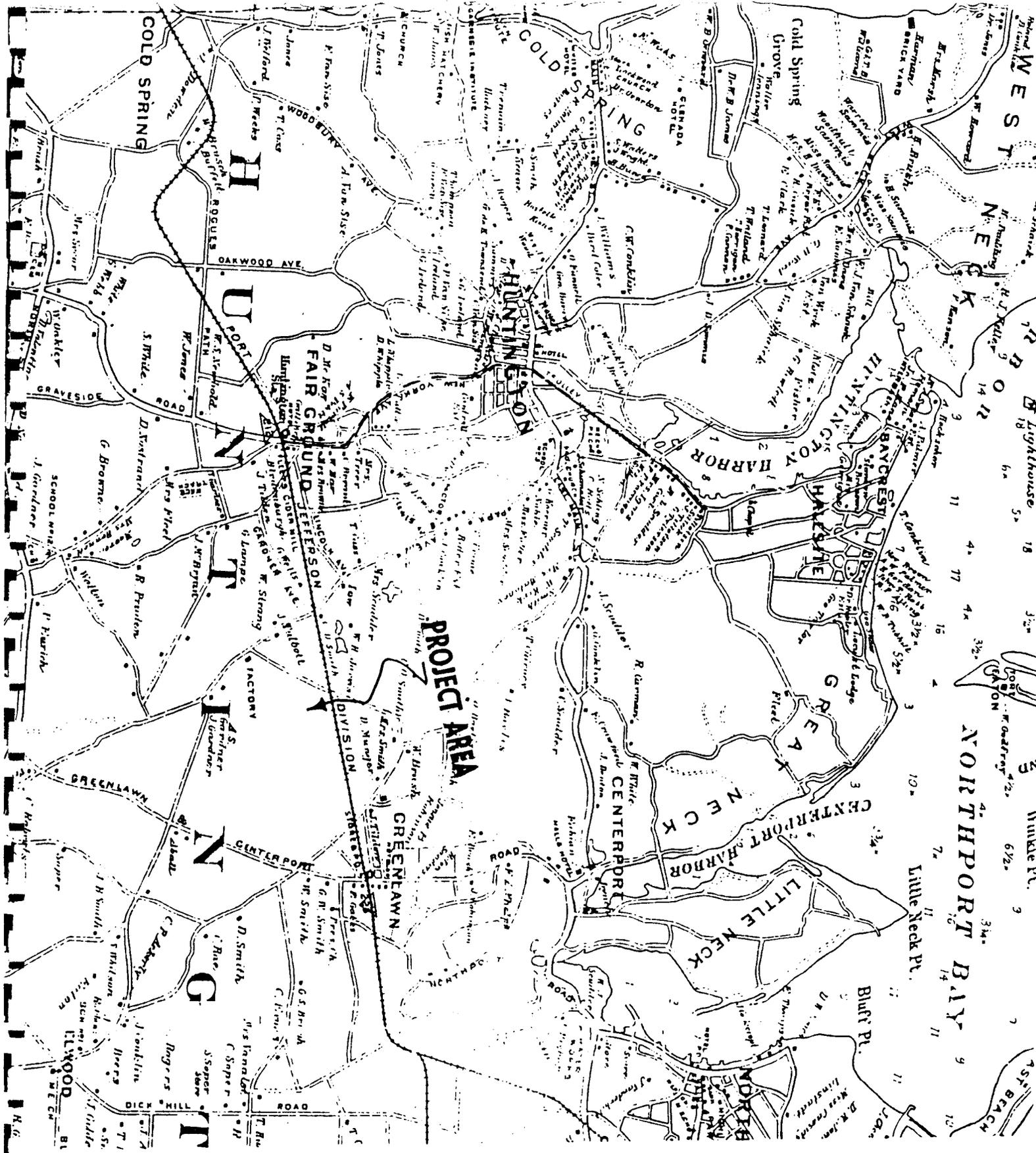
J. H. Knight
R. B. Lane
G. M. N.



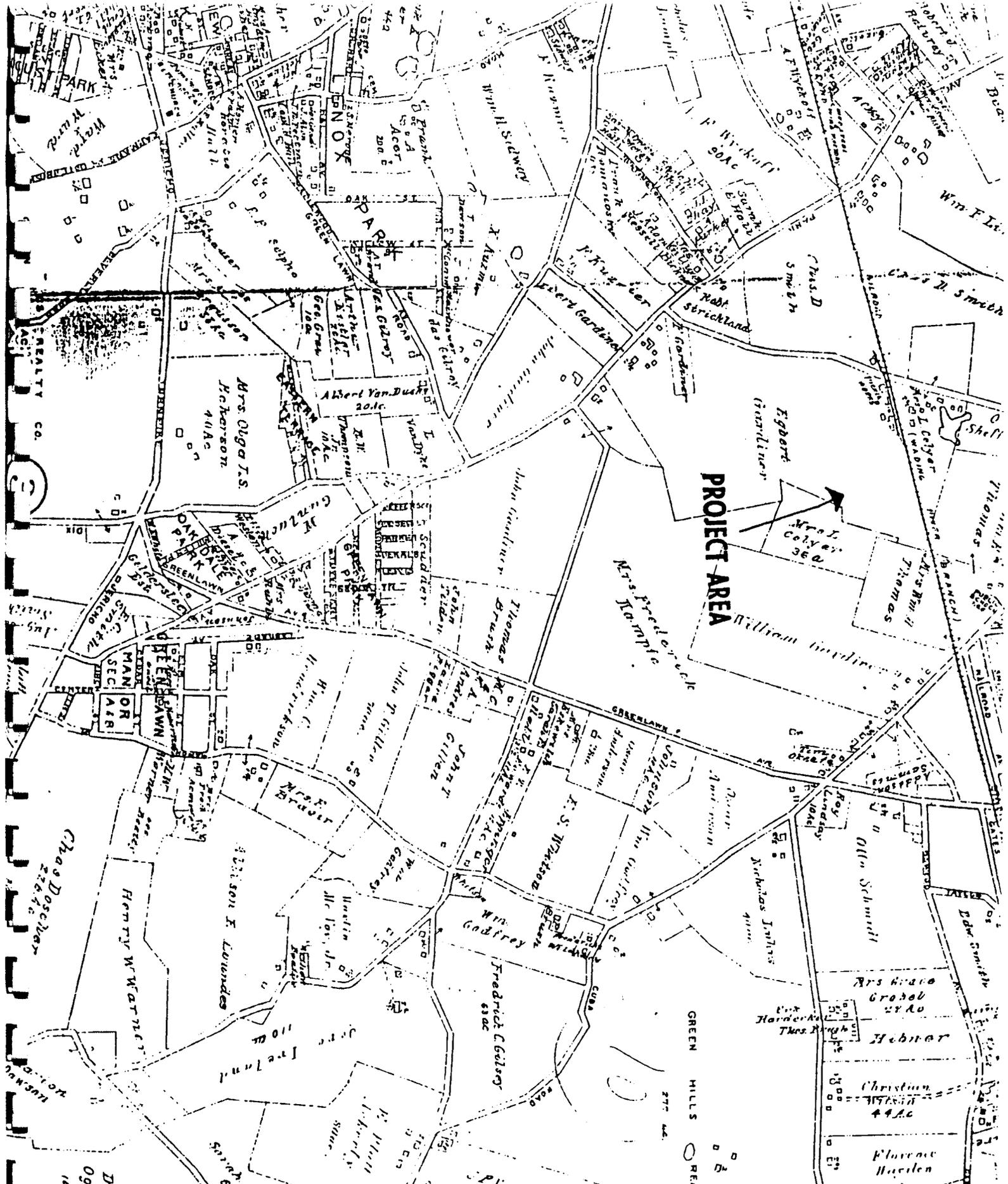
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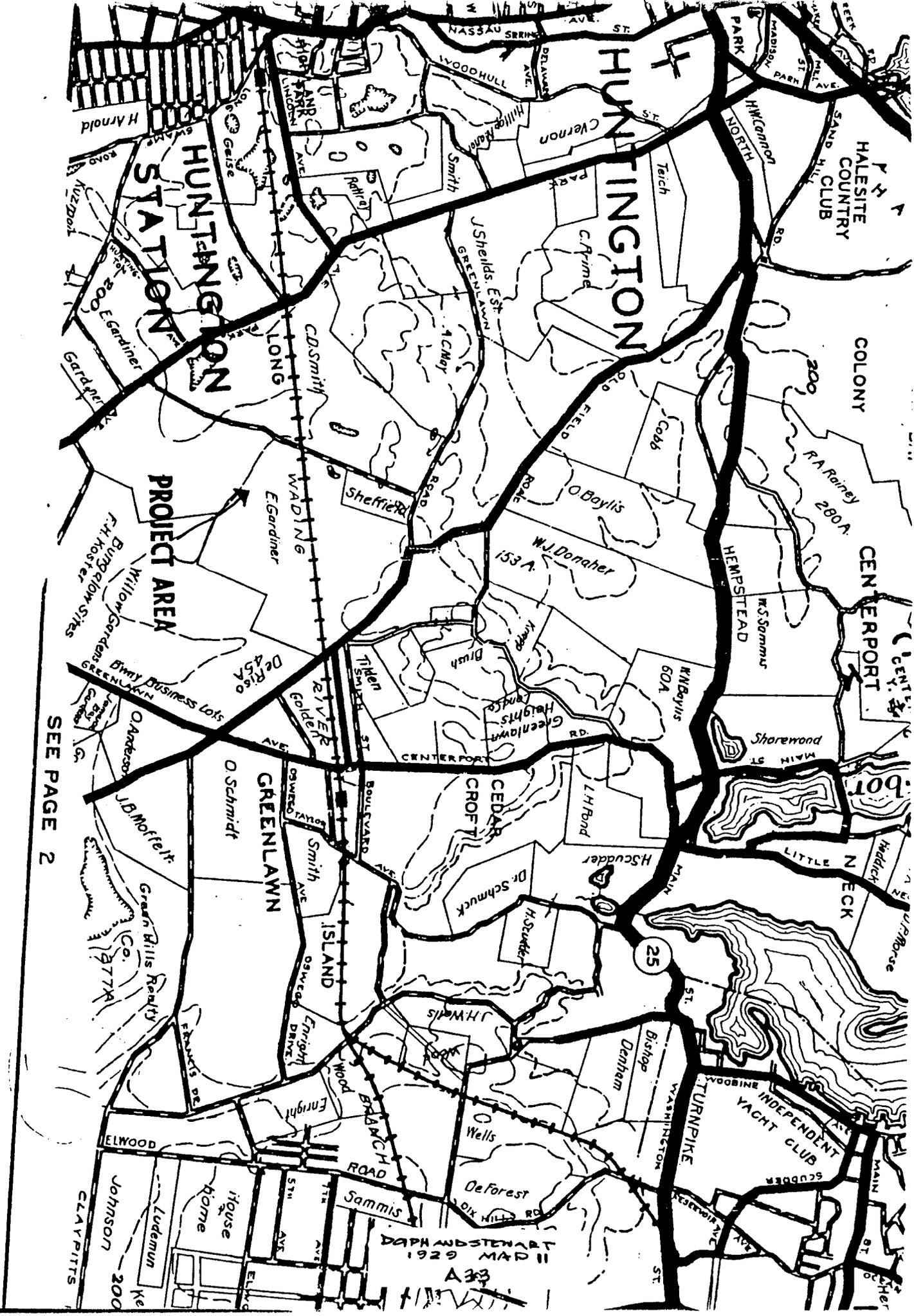
USGS 1903 NORTHPORT
MAP 8 A30



HYDE 1906
MAP 9 A31



Belchar-Hyde 1917
MAP 10 A32



SEE PAGE 2

DAPH AND STEWART
1929 MAP II
A33



USAC of E 1943
 HUNTINGTON MAP 12
 A34

HUNTINGTON QUADRANGLE
NEW YORK
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 NORTHPORT 15 QUADRANGLE

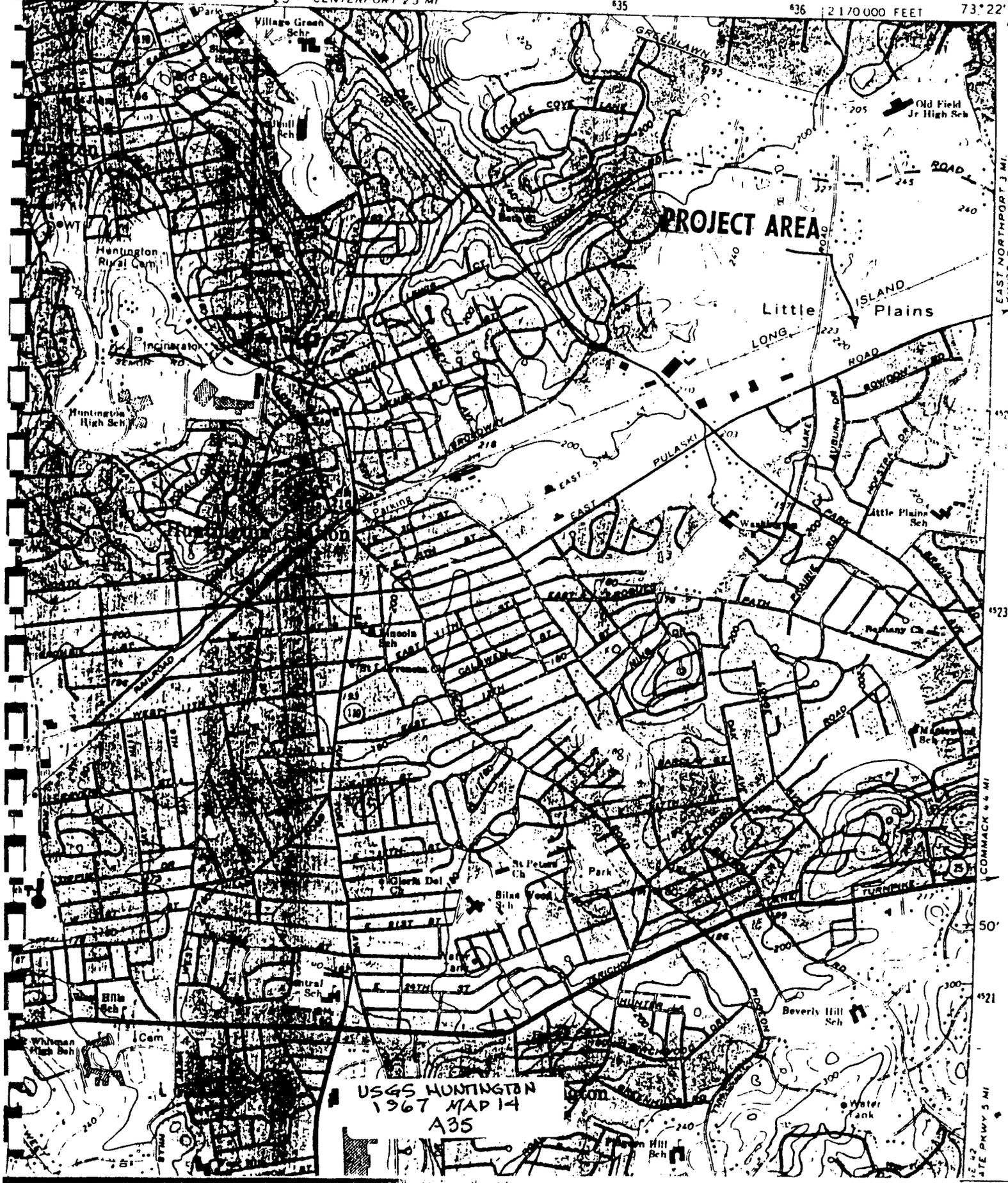
HALESITE 1 MI 633

25 RIVERHEAD 4.5 MI
CENTERPORT 2.3 MI

635

636 2 1/2 000 FEET

73° 22' 3 4



USGS HUNTINGTON
1967 MAP 14
A35

EAST NORTHPORT 3 MI
KINGS PARK 7 MI

632

631

50'

632

632
SITE PRWY 5 MI
COMMACK 4 MI



PROJECT AREA

HUNTINGTON

USGS HUNTINGTON 1947
MAP 13
A36

Chapel Mount
Cem

ARCHAEOLOGICAL SERVICES INCORPORATED

P.O.B. 1522, ROCKY POINT, NEW YORK 11778

TELEPHONE 516-331-5980/744-8047

FAX 516-744-6617

ROBERT J. KALIN,
NEW YORK STATE CERTIFIED ARCHAEOLOGIST
DIRECTOR OF ASI

NEW YORK STATE OFFICE OF PARKS,
RECREATION AND HISTORIC PRESERVATION
GOV. NELSON A. ROCKEFELLER EMPIRE STATE PLAZA
AGENCY BUILDING 1,
ALBANY, NEW YORK, 1223-0001

Copy

TO: Technical Staff

DATE: August 1, 1994

RE: Cultural resources assessment **prehistoric site file search** for
PULASKI AND LAKE ROAD proposed development site, located just north of
Pulaski Road, and east of Lake Road in **Greenlawn, Huntington Township,**
Suffolk County, New York.

SITE AND SEARCH AREA: One mile radius from project area center. Enclosed
please find copy of Delorme Map (1:150000) with location of project area noted.

TYPE OF DATA: Locational data on all prehistoric sites (and others if recorded)
located within the search area of Greenlawn area.

PURPOSE OF REQUEST: For environmental impact review and site planning
purposes.

DISTRIBUTION OF INFORMATION: Information will be released to the
owner developer, and the town or county planing and review agencies.

Yours truly,

[Signature]
Robert J. Kalin

*Mailed
Aug 1/94*

*Attached:
Delorme Map of Site -*

1

ARCHAEOLOGICAL SERVICES INCORPORATED

P.O.B. 1522, ROCKY POINT, NEW YORK 11778

TELEPHONE 516-331-5980/744-8047

FAX 516-744-6617

*Sent by FAX
@ 6:45 -
8-1-94*

ROBERT J. KALIN,
NEW YORK STATE CERTIFIED ARCHAEOLOGIST
DIRECTOR OF ASI

*with copy of
Delorme Map*

NEW YORK STATE MUSEUM
ARCHAEOLOGY SITE FILES
Room 3122
CULTURAL EDUCATION CENTER
GOV. NELSON A. ROCKEFELLER EMPIRE STATE PLAZA
AGENCY BUILDING 1,
ALBANY, NEW YORK, 12230

TO: Ms. Beth Wellman

DATE: August 1, 1994

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Yours truly,

[Handwritten signature]
Robert J. Kalin

*Attached
Delorme Map of Site - 1*



VIEW TO EAST

GARDINER PICKLE WORKS
GREENLAWN, N.Y. © 1880

TOTAL P. 01
COURTESY: C. BOLTON
PLANNING DEPT.
HUNTINGTON, N.Y.

NEW YORK STATE MUSEUM

3122 Cultural Education Center
Albany, NY 12230
518/474-5813 FAX 518/473-8496

Anthropological Survey

Page 1 of 2

DATE: 8/9/94

To:
ROBERT J. KALIN
ARCHAEOLOGICAL SERVICES INCORPORATED
P.O.B. 1522
ROCKY POINT, NY 11778

Proposed Project: PULASKI AND LAKE ROAD
7.5' U.S.G.S. Quad: GREENLAWN, HUNTINGTON TOWNSHIP, SUFFOLK CO.

In response to your request our staff has conducted a search of our data files for locations and descriptions of prehistoric archaeological sites within the area indicated above. The results of the search are given below.

If specific information requested has not been provided by this letter, it is likely that we are not able to provide it at this time, either because of staff limitations or policy regarding disclosure of archaeological site data.

Questions regarding this reply can be directed to the site file manager, at (518) 474-5813 or the above address. Please refer to the N.Y.S.M. site identification numbers when requesting additional information.

Please resubmit this request if action is taken more than one year after your initial information request.

[NOTE: Our files normally do not contain historic archeological sites or architectural properties. For information on these types of sites as well as prehistoric sites not listed in the N.Y.S.M. files contact The State Historic Preservation Office; Office of Parks, Recreation & Historic Preservation; Agency Building #1; Empire State Plaza; Albany, NY, 12238 at (518) 474-0479.

RESULTS OF THE FILE SEARCH:

Recorded sites ARE NOT located in or within one mile of the project area. If so, see attached list.

Code "ACP" = sites reported by Arthur C. Parker in The Archeology Of New York, 1922, as transcribed from his unpublished maps.

SEARCH CONDUCTED BY: BJA/(initials) Anthropological Survey, NYS Museum

cc: N.Y.S. OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION; HISTORIC PRESERVATION FIELD SERVICES BUREAU

8/9/94 To: ROBERT J. KALIN, ARCHAEOLOGICAL SERVICES INCORPORATED

Project: PULASKI AND LAKE ROAD Topo. Maps: GREENLAWN, HUNTINGTON TOWNSHIP, SUFFOLK CO.

BW (initials) Anthropological Survey, NYSM

New York State Museum Prehistoric Archaeological Site Files

EVALUATION OF ARCHAEOLOGICAL SENSITIVITY FOR PREHISTORIC (NATIVE AMERICAN) SITES
Examination of the data suggests that the location indicated has the following sensitivity rating:

MIXED PROBABILITY OF PRODUCING PREHISTORIC ARCHAEOLOGICAL DATA.

The reasons for this finding are given below:

- A RECORDED SITE(S) IS(ARE) INDICATED IN, ADJACENT TO, OR IN THE VICINITY OF THE LOCATION AND WE HAVE REASON TO BELIEVE IT(THEY) COULD BE IMPACTED BY THE PROPOSED ACTIVITY.
- A RECORDED SITE IS INDICATED IN THE GENERAL VICINITY OR SOME DISTANCE AWAY. DUE TO THE MARGIN OF ERROR IN THE LOCATION DATA IT IS POSSIBLE THE SITE ACTUALLY EXISTS IN OR IMMEDIATELY ADJACENT TO THE LOCATION.
- THE TERRAIN IN THE LOCATION IS SIMILAR TO TERRAIN IN THE GENERAL VICINITY WHERE RECORDED ARCHAEOLOGICAL SITES ARE INDICATED.
- THE PHYSIOGRAPHIC CHARACTERISTICS OF THE LOCATION SUGGEST A HIGH PROBABILITY OF PREHISTORIC OCCUPATION OR USE.
- THE PHYSIOGRAPHIC CHARACTERISTICS OF THE LOCATION SUGGEST A MEDIUM PROBABILITY OF PREHISTORIC OCCUPATION OR USE.
- THE PHYSIOGRAPHIC CHARACTERISTICS OF THE LOCATION SUGGEST A LOW PROBABILITY OF PREHISTORIC OCCUPATION OR USE.
- EVIDENCE OF CULTURAL OR NATURAL DESTRUCTIVE IMPACTS SUGGESTS A LOSS OF ORIGINAL CULTURAL DEPOSITS IN THIS LOCATION.
- THE PHYSIOGRAPHIC CHARACTERISTICS OF THE LOCATION ARE MIXED, A HIGHER THAN AVERAGE PROBABILITY OF PREHISTORIC OCCUPATION OR USE IS SUGGESTED FOR AREAS IN THE VICINITY OF EITHER PRESENT OR PREEXISTING BODIES OF WATER, WATERWAYS, OR SWAMPS. A HIGHER THAN AVERAGE PROBABILITY IS SUGGESTED FOR ROCK FACES WHICH AFFORD SHELTER OR FOR AREAS SHELTERED BY BLUFFS OR HILLS. AREAS IN THE VICINITY OF CHERT DEPOSITS HAVE A HIGHER THAN AVERAGE PROBABILITY OF USE. DISTINCTIVE HILLS OR LOW RIDGES HAVE AN AVERAGE PROBABILITY OF USE AS A BURYING GROUND. LOW PROBABILITY IS SUGGESTED FOR AREAS OF EROSIONAL STEEP SLOPE.
- PROBABILITY RATING IS BASED ON THE ASSUMED PRESENCE OF INTACT ORIGINAL DEPOSITS, POSSIBILITY UNDER FILL, IN THE AREA. IF NEAR WATER OR IF DEEPLY BURIED, MATERIALS MAY OCCUR SUBMERGED BELOW THE WATER TABLE.
- INFORMATION ON OTHER SITES MAY BE AVAILABLE IN A REGIONAL INVENTORY MAINTAINED AT THE FOLLOWING LOCATION(S).

COMMENTS:

cc: N.Y.S. OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION; H. P. FIELD SERVICES BUREAU

A 41

ARCHAEOLOGICAL SERVICES INCORPORATED

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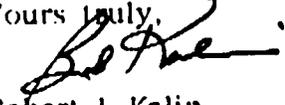
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Yours Truly,


Robert J. Kalin

Greenlawn 7.5 P. 10-11

41°00' 71°30'

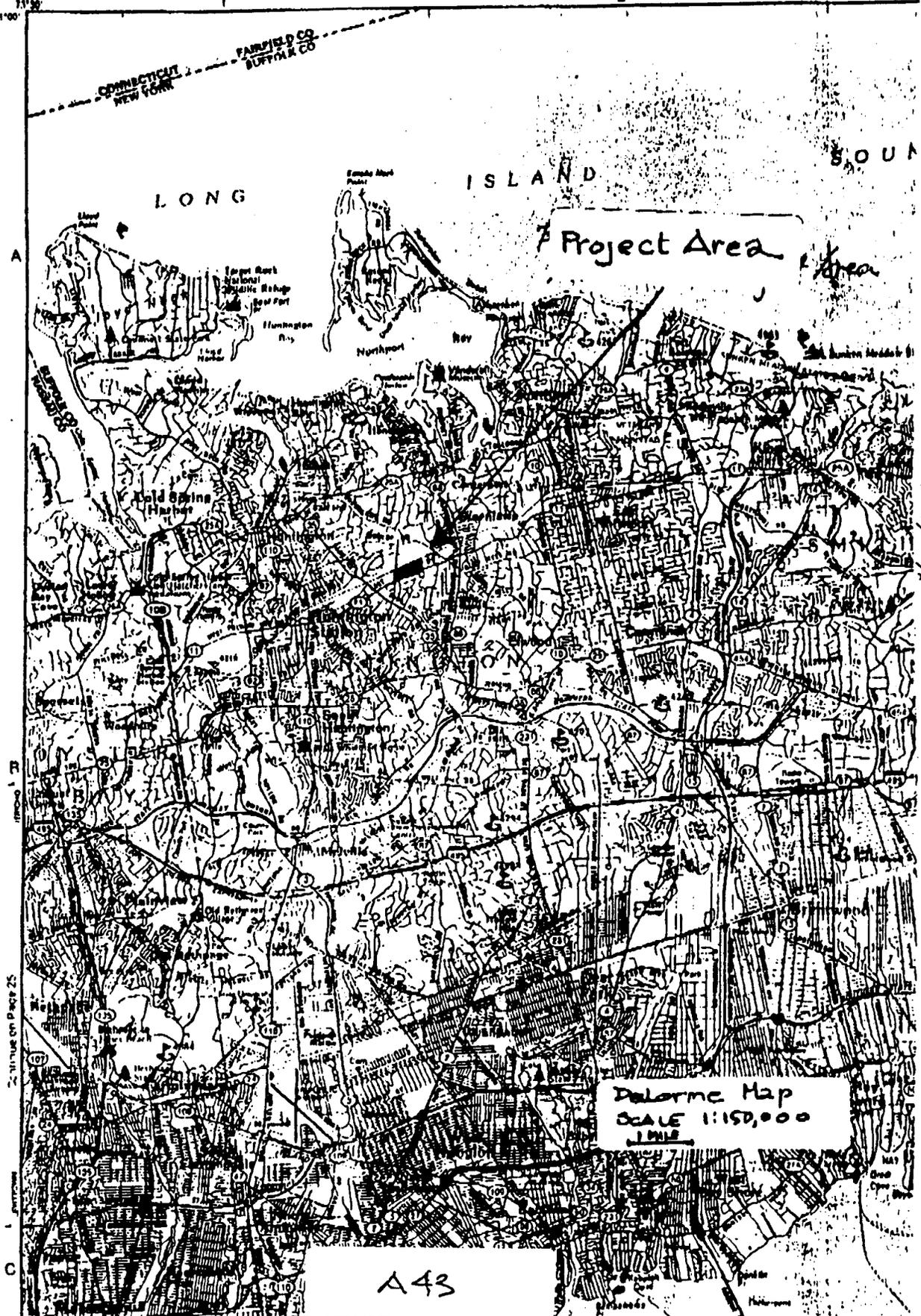
CONNECTICUT
NEW YORK
FARMFIELD CO
SUFFOLK CO

LONG

ISLAND

SOUTH

Project Area



Huntington 7.5 7.2

Delorme Map
SCALE 1:150,000
1962

A43

APPENDIX H
CULTURAL RESOURCES ASSESSMENT, STAGE IB



Pulaski and Lake Roads Parcel , Cultural Resources Assessment, Greenlawn, New York

CULTURAL RESOURCES ASSESSMENT

STAGE IB

FIELD RECONNAISSANCE

PULASKI AND LAKE ROADS

GREENLAWN, NEW YORK



ARCHAEOLOGICAL SERVICES INC.
POB 1522, ROCKY POINT, NEW YORK
11778

ASI B1

Pulaski and Lake Roads Parcel , Cultural Resources Assessment, Greenlawn, New York

PULASKI AND LAKE ROADS PARCEL
HUNTINGTON, NEW YORK

FIELD RECONNAISSANCE

Completion date of this file: August 24, 1994

AUTHOR AND PRINCIPAL INVESTIGATOR: PROF. ROBERT J. KALIN

SIGNED: *Robert Kalin*

DATE: *8-24-94*

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ABSTRACT

Pulaski and Lake Roads parcel, Greenlawn, Huntington Township, New York has been evaluated for presence or absence of cultural resources by means of a methodological surface examination and a subsurface protocol which included digging and analyzing a total of 70 tests revealed historic era features, and surface and buried cultural evidences. Further study is recommended.

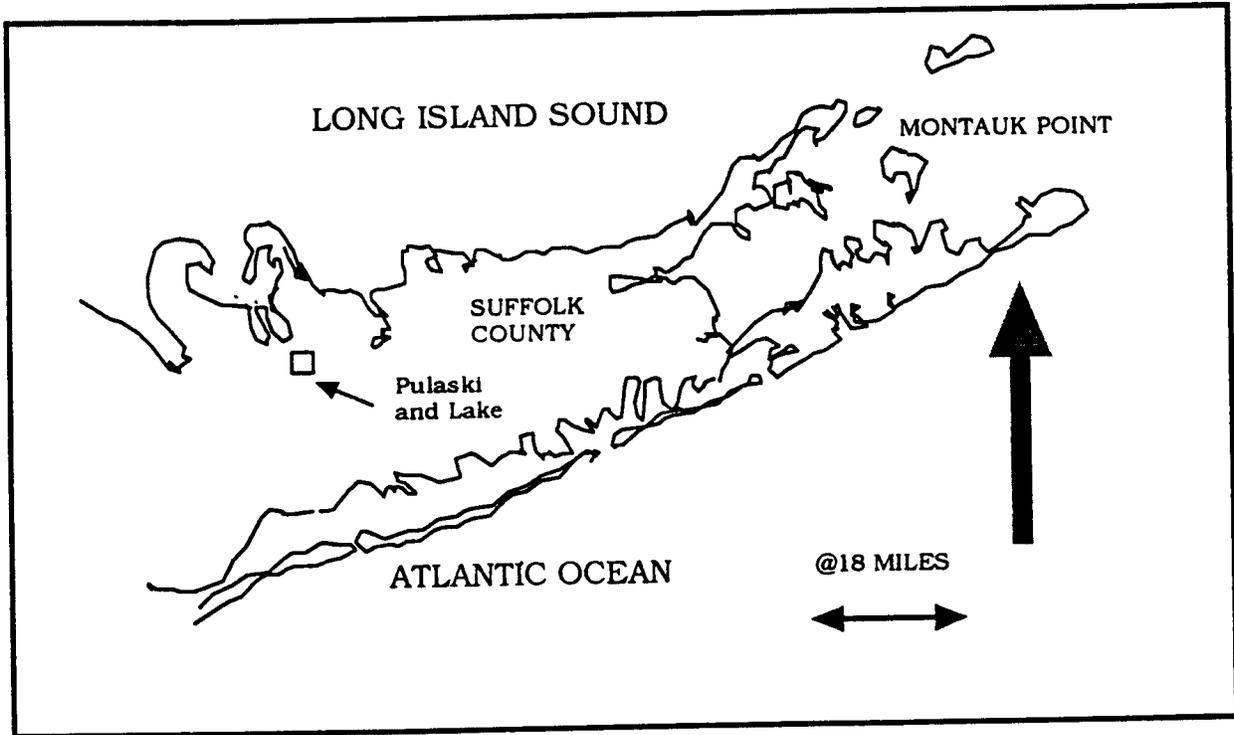


Figure 1. Map showing general location of the study area.

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INTRODUCTION

The following report is the result of a cultural resources, field reconnaissance study of the Pulaski and Lake Roads proposed development site, a thirty-nine acre former farm lot and commercial business site located north of Pulaski Road, east of Lake Road and south of the Long Island Railroad, in an area locally known as Little Plains, situated in Greenlawn, Huntington Township, Suffolk County, New York.

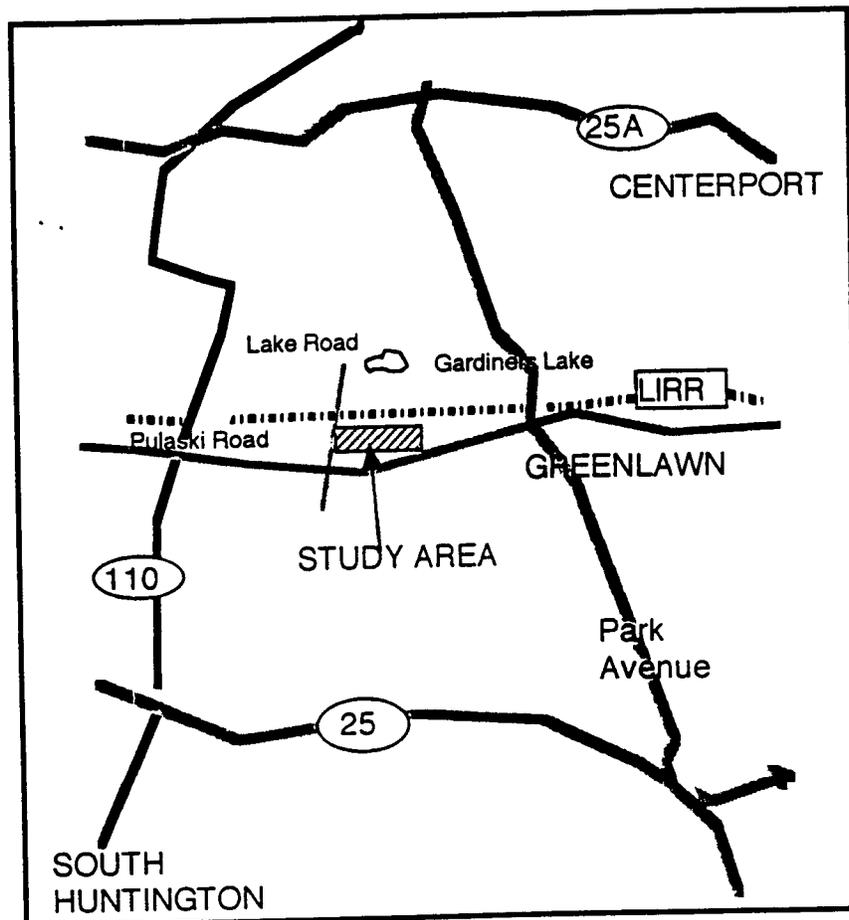


Figure 2. General map of the site and vicinity, after: DeLorme NYS Map and other sources.

OBJECTIVES

The objective of this study is to make an assessment, by means of surface observation and subsurface testing (shovel tests), regarding the *presence or absence* of significant cultural evidence within the subject parcel.

DESCRIPTION OF PROPERTY

The Greenlawn, Huntington Township project site is an approximately rectangular, elongate, east-west, 39.3 acre former agricultural parcel bounded on the east by Lake Road, Pulaski Road on the south, and the Long Island Railroad on the north, while the land of the Hazeltine Corporation is to the east. The sparsely vegetated former farm lot slopes gently and regularly from the northeast to the southwest. An unsurfaced farm road arises in the west from Lake Road approximately 230 feet south of the railroad tracks and proceeds, parallel to the northern boundary, to the eastern end of the parcel.

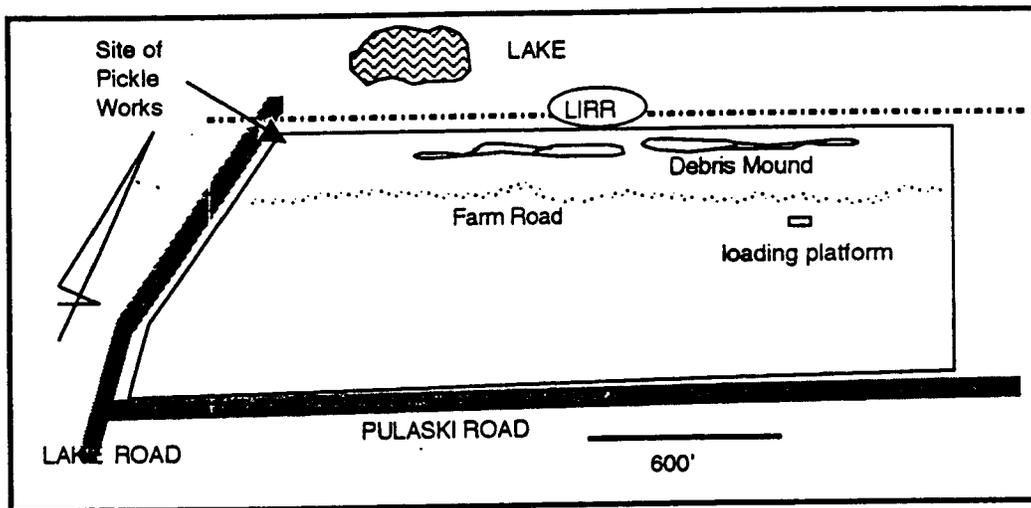


Figure 3. General map of Pulaski and Lake Roads property.

DESCRIPTION OF PROPOSAL

The proposed use of the property is undefined at the date of this report.

ENVIRONMENTAL INFORMATION

Topography

The project area has a gently sloping and regular topography with relief of approximately 20 feet. The highest elevation, of more than 228 feet above mean sea level, occurs in the northeast; the surface slopes from there to the southwest corner (with a reported elevation of 208 feet above msl) at a grade of about 2%. An embankment of soil and discarded debris is found about one hundred feet south of and parallel to the LIRR right of way. On close inspection, traces of former roads and road beds are discernible in the northwest corner of the parcel, the site of a nineteenth century commercial operation.

Soils

The soils of the parcel reportedly belong to the Haven Series, which are deep well drained medium textured soils formed in a loamy mantle over stratified coarse sand and gravel. See Warner, et. al. 1975, page 71 and Sheet 51. Soil observations and tests made on site during the walk-over survey revealed a moderate yellowish brown gravelly-loam plow soil of about 10 inches in depth overlying a pale yellowish orange gravelly-loam. The depth of the plow soil varied from 8 to 10 inches over most of the parcel. In some places gravel and exposed granitic cobbles were observed on the surface.

Drainage

The property is generally well drained.

Vegetation

The parcel is fallow farm land thinly covered by grasses, forbs, and brush. An initial survey of vegetation revealed the presence of the following plant species and their relative abundance and distribution over the parcel.

SPECIES	ABUNDANCE	DISTRIBUTION
Bayberry	common	scattered
Birch	rare	restricted
Black Cherry	rare	restricted
Daisy Fleabane	common	scattered
Golden Rod	very common	throughout
Horseweed	common	scattered
Maple	rare	restricted
Multiflora Rose	common	restricted
Queen Anne's Lace	very common	throughout

Forest Zone

The original forest zone of the area was probably Northeastern Oak-Pine Forest (See Kuchler 1970).

Man-Made Features Observed During the Field Inspection

The property has no standing structures. A former farm road, a system of all-terrane-vehicle or off-road vehicle dirt- tracks, a linear mound of soil and dumped materials (apparently cleared from the surrounding farm land in recent years) and the ruin of an agricultural loading-platform were observed during the surface inspection.

Alterations

The property has been altered by clearing, past farming activities, and waste dumping. Some areas have been subjected to soil disturbance as a result of mounding of disposed materials and surface soil by heavy machinery into an elongate low rise some distance south of and parallel to the LIRR right of way.

Previous Field Reconnaissance Surveys

No previous CRA studies have been reported for this parcel.

EXISTING STRUCTURES

The property has no standing structures.

FIELD SURVEY DATES AND CONDITIONS

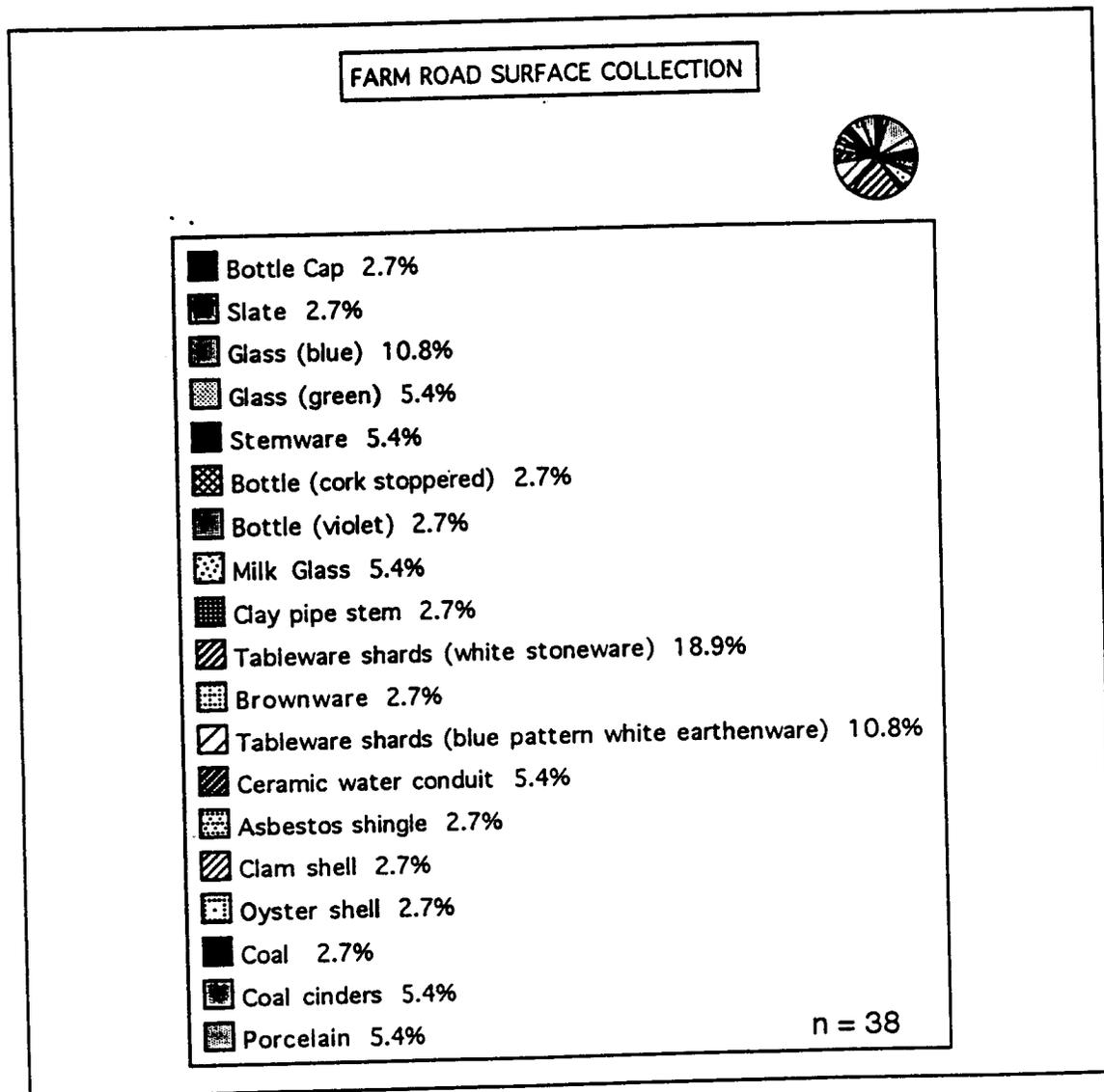
The field survey was conducted on 8-17-94 and 8-19-94. The general conditions were satisfactory throughout the study period.

FIELD TEAM

The survey team consisted of the author and principal investigator of this study, assisted by Mr. Carlton E. Welch, and Ms. Karole Kalin of ASI.

DISPOSITION OF ARTIFACTS OR OTHER EVIDENCES

Cultural materials removed from the property for further study or identification are temporarily stored at the ASI facility at Rocky Point, New York. If appropriate for preservation, they are submitted (with the permission of the owner) to the New York State Archaeological Association Museum, Southold, New York or other similar repository for conservation. At Pulaski Road no cultural materials were removed from the property, all materials were identified in the field, counted, and recorded on ASI field forms and then reinterred in the test hole from which they were removed.



Graph 1. Graphic representation of surface recoveries from walk-over survey of entire farm road.

GENERAL METHODS

A. SURFACE OBSERVATIONS:

Systematic observations of the surface were conducted by walking oriented transects along magnetic azimuths, each separated by 50 to 100 foot intervals. Close visual inspection was made of existing soil exposures in cleared areas, on roads, bald spots, foot path and off road vehicle tracks and other similar places where they occurred. Particular attention was directed to the exposed surfaces along the farm road and vehicle tracks.

1. RESULTS OF SURFACE OBSERVATIONS

Aside from the recent materials such as metal, aluminum, Styrofoam and plastic disposed of along and bordering the former farm road, the field walk-over survey revealed evidences of soil mounding, road and road bed traces, and associated surface scatters of brick, glass, wood and other materials. Also see Graph 1 page B10.

B. SUBSURFACE STUDY:

1. STRATEGY:

Soils evolve with the physical, climatic and human history of the parcel. Cultural and other evidences may be buried within the soil and preserved there. These materials, and the information they represent, can be retrieved by disinterment and disengagement from the soil by sieving, and cleaning. Subsequently, they are identified, counted, and recorded, and finally evaluated for cultural significance. For these purposes it is often impractical to test the entire soil mantle, thus, soil sampling is necessary. At the Pulaski and Lake Road property shovel probes were located within the area in such a way as to prevent test concentrations in areas possessing any particular characteristic of soil, topography, or disturbance level in preference to those lacking these characteristics. The test holes were randomly located on a grid system at predetermined 200 foot intervals. This strategy provided a random representation of the soil and subsoil and their cultural content--or lack of it. From these data information concerning the level of disturbance and presence or absence of significant cultural materials within the solum of the parcel may be generated.

2. FIELD METHODS

Field crew members followed designated transects along true azimuths by means of hand-held Suunto magnetic compasses. Distances were estimated by

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pacing and by chaining. Test holes were dug along each transect at two-hundred-foot intervals. Additional tests were dug at thirty-foot intervals in the northwestern corner of the parcel.

Standard shovel tests were dug to undisturbed, glacial, culturally barren sub-soil. At each hole the excavated soil was analyzed for cultural evidence by sieving and studying any residue retained on a 0.64 cm (1/4 inch) wire mesh screen. The volume of soil dug and screened was approximately consistent from hole to hole. The percent granular soil material coarser than 0.64 cm (1/4 inch) was estimated from the volume of material retained on the screen after sieving a standard volume of soil. These materials were characterized as to their mineralogy and texture. The soil stratigraphy exposed in the test side-walls was examined at each probe and a stratigraphic sketch made at selected tests. Counts were made of all cultural materials recovered or observed.

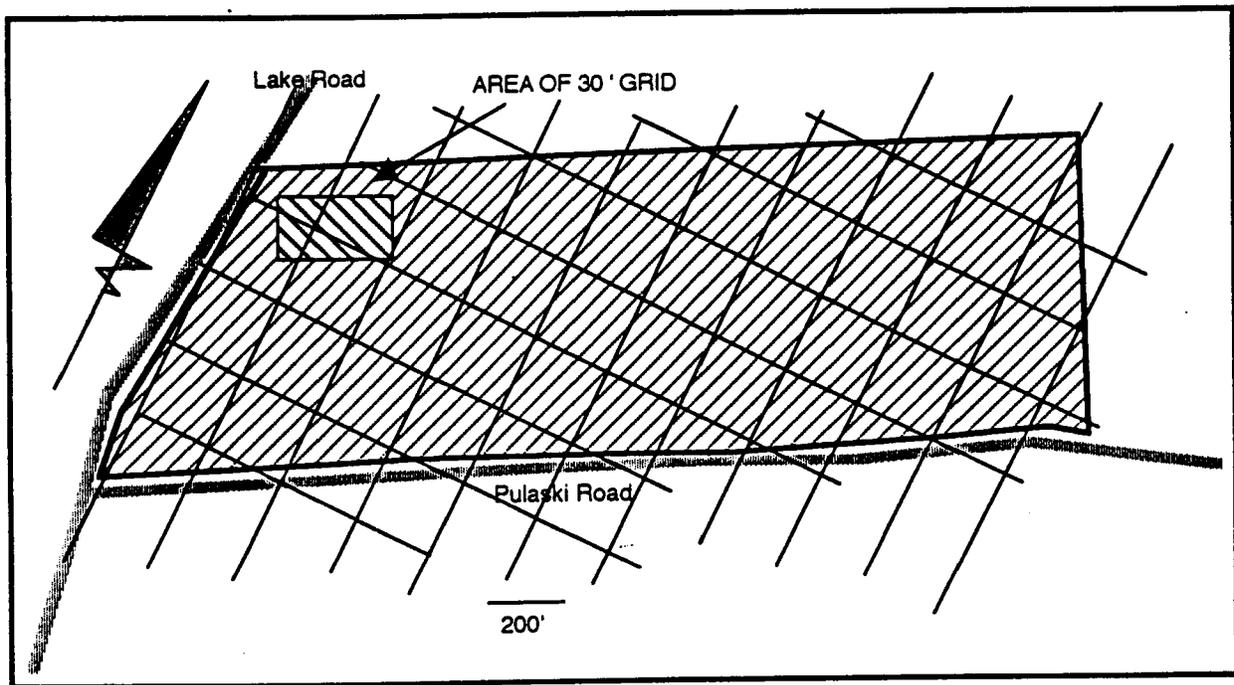


Figure 4. Map of Pulaski and Lake Roads property showing test grid.

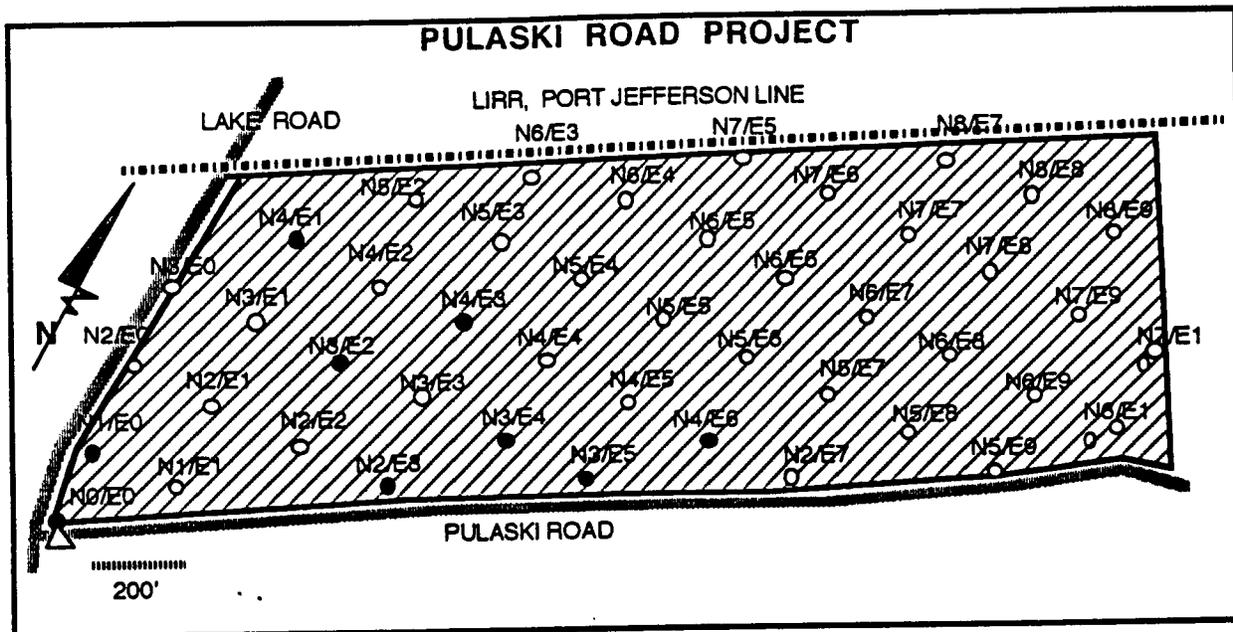
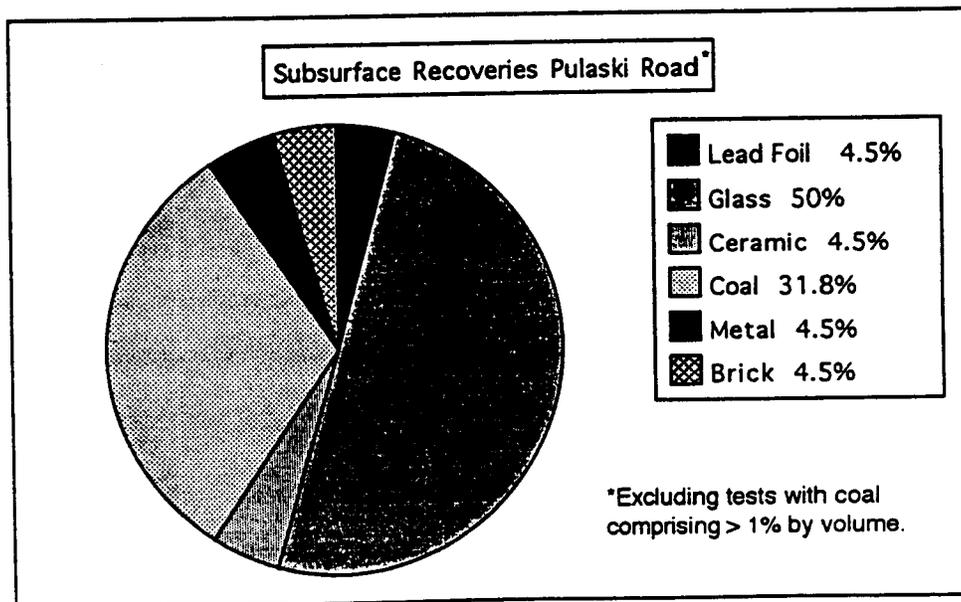


Figure 5. Map of Pulaski and Lake Roads property showing test holes and test designations.



Graph 2. Graphic representation of recoveries from shovel tests excluding those tests where coal was reported in excess of 1% by volume.

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TABLE 1

TH #	DESIGNATION	LOCATION	CULTURE	SOIL	REMARKS
1	N0/E0	NO/E0	1 Pb FOIL/1 GL	SAND FILL	DISTURBED SOIL
2	N1/E0	N200/E0	CN	PEBBLY SAND	NORM PROFILE
3	N1/E1	N200/E200	CN	SANDY	NORM PROFILE
4	N2/E0	N400/E0	1 COAL	SANDY	NORM PROFILE
5	N2/E1	N400/E200	CN	COBBLY	NORM PROFILE
6	N2/E2	N400/E400	CN	PEBBLY SAND	NORM PROFILE
7	N2/E3	N400/E600	1 GLASS	PEBBLY SAND	NORM PROFILE
8	N3/E0	N600/E0	CN	PEBBLY SAND	NORM PROFILE
9	N3/E1	N600/E100	CN	PEBBLY SAND	NORM PROFILE
10	N3/E2	N600/E400	1 GLASS	PEBBLY SAND	NORM PROFILE
11	N3/E3	N600/E600	CN	SANDY	NORM PROFILE
12	N3/E4	N600/E800	1 CO	PEBBLY SAND	NORM PROFILE
13	N3/E5	N600/E1000	1CE FRAG	PEBBLY SAND	NORM PROFILE
14	N4/E1	N800/E200	1IRON FRAG	PEBBLY SAND	NORM PROFILE
15	N4/E2	N800/E400	CN	PEBBLY SAND	NORM PROFILE
16	N4/E3	N800/E600	1 GLASS	PEBBLY SAND	NORM PROFILE
17	N4/E4	N800/E800	CN	PEBBLY SAND	NORM PROFILE
18	N4/E5	N800/E1000	CN	SANDY	NORM PROFILE
19	N4/E6	N800/E1200	1 GLASS	PEBBLY SAND	NORM PROFILE
20	N4/E7	N800/E1400	CN	PEBBLY SAND	NORM PROFILE
21	N5/E2	N1000/E400	CN	PEBBLY SAND	NORM PROFILE
22	N5/E3	N1000/E1200	CN	PEBBLY SAND	NORM PROFILE
26	N5/E7	N1000/E1400	CN	PEBBLY SAND	NORM PROFILE
27	N5/E8	N1000/E1600	CN	PEBBLY SAND	NORM PROFILE
28	N5/E9	N1000/E1800	CN	PEBBLY SAND	NORM PROFILE
29	N6/E3	N1200/E600	CN	PEBBLY SAND	NORM PROFILE
30	N6/E4	N1200/E800	CN	PEBBLY SAND	NORM PROFILE
31	N6/E5	N1200/E1000	CN	PEBBLY SAND	NORM PROFILE
32	N6/E6	N1200/E1200	CN	PEBBLY SAND	NORM PROFILE
33	N6/E7	N1200/E1400	CN	PEBBLY SAND	NORM PROFILE
34	N6/E8	N1200/E1600	CN	PEBBLY SAND	NORM PROFILE
35	N6/E9	N1200/E1800	CN	PEBBLY SAND	NORM PROFILE
36	N6/E10	N1200/E2000	CN	PEBBLY SAND	NORM PROFILE
37	N7/E5	N1400/E1000	CN	PEBBLY SAND	NORM PROFILE
38	N7/E6	N1400/E1200	CN	PEBBLY SAND	NORM PROFILE
39	N7/E7	N1400/E1400	CN	PEBBLY SAND	NORM PROFILE
40	N7/E8	N1400/E1600	CN	PEBBLY SAND	NORM PROFILE
41	N7/E9	N1400/E1800	CN	PEBBLY SAND	NORM PROFILE
42	N7/E10	N1400/E2000	CN	PEBBLY SAND	NORM PROFILE
43	N8/E7	N1600/E1400	CN	PEBBLY SAND	NORM PROFILE
44	N8/E8	N1600/E1600	CN	PEBBLY SAND	NORM PROFILE
45	N8/E9	N1600/E1800	CN	PEBBLY SAND	NORM PROFILE
46	VIC. N4.5/E1	N960/E260	2 CO/2 GLASS	PEBBLY SAND	NORM PROFILE
47	VIC. N4.5/E1	N960/E290	1 GI/ 1 CO	PEBBLY SAND	NORM PROFILE
48	VIC. N4.5/E1	N960/E320	CN	PEBBLY SAND	NORM PROFILE
49	VIC. N4.5/E1	N930/E200	3 GLASS	PEBBLY SAND	NORM PROFILE
50	VIC. N4.5/E1	N930/E230	CN	PEBBLY SAND	NORM PROFILE
51	VIC. N4.5/E1	N930/E260	CN	PEBBLY SAND	NORM PROFILE

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52	VIC. N4.5/E1	N930/E290	CN	PEBBLY SAND	NORM PROFILE
53	VIC. N4.5/E1	N930/E2320	CN	PEBBLY SAND	NORM PROFILE
54	VIC. N4.5/E1	N930/E350	BRICK/COAL	PEBBLY SAND	NORM PROFILE
55	VIC. N4.5/E1	N930/E380	CN	PEBBLY SAND	NORM PROFILE
56	VIC. N4.5/E1	N900/E200	COAL 30% VOL	PEBBLY SAND	NORM PROFILE
57	VIC. N4.5/E1	N900/E230	COAL 1% VOL	PEBBLY SAND	NORM PROFILE
58	VIC. N4.5/E1	N900/E260	2 COAL	PEBBLY SAND	NORM PROFILE
59	VIC. N4.5/E1	N900/E290	CN	PEBBLY SAND	NORM PROFILE
60	VIC. N4.5/E1	N900/E320	CN	PEBBLY SAND	NORM PROFILE
61	VIC. N4.5/E1	N900/E350	CN	PEBBLY SAND	NORM PROFILE
62	VIC. N4.5/E1	N900/E380	CN	PEBBLY SAND	NORM PROFILE
63	VIC. N4.5/E1	N870/E170	CN	PEBBLY SAND	NORM PROFILE
64	VIC. N4.5/E1	N870/E200	CN	PEBBLY SAND	NORM PROFILE
65	VIC. N4.5/E1	N870/E230	BRICK FRAGS	PEBBLY SAND	NORM PROFILE
66	VIC. N4.5/E1	N870/E260	CN	PEBBLY SAND	NORM PROFILE
67	VIC. N4.5/E1	N870/E290	1 COAL	PEBBLY SAND	NORM PROFILE
68	VIC. N4.5/E1	N870/E320	CN	PEBBLY SAND	NORM PROFILE
69	VIC. N4.5/E1	N870/E350	CN	PEBBLY SAND	NORM PROFILE
70	VIC. N4.5/E1	N810/E210	CN	CLAY LOAM	DISTURBED

IN FEET FROM DATUM AT WEST CORNER OF PROPERTY.

[Note: Ap = plow zone, CH = charcoal, Contemp = contemporary, Frags = fragments, CO = coal or coal cinder, Gl = glass, PCS = pieces, Peb = pebble, Plas = plastic, Strat = stratified]

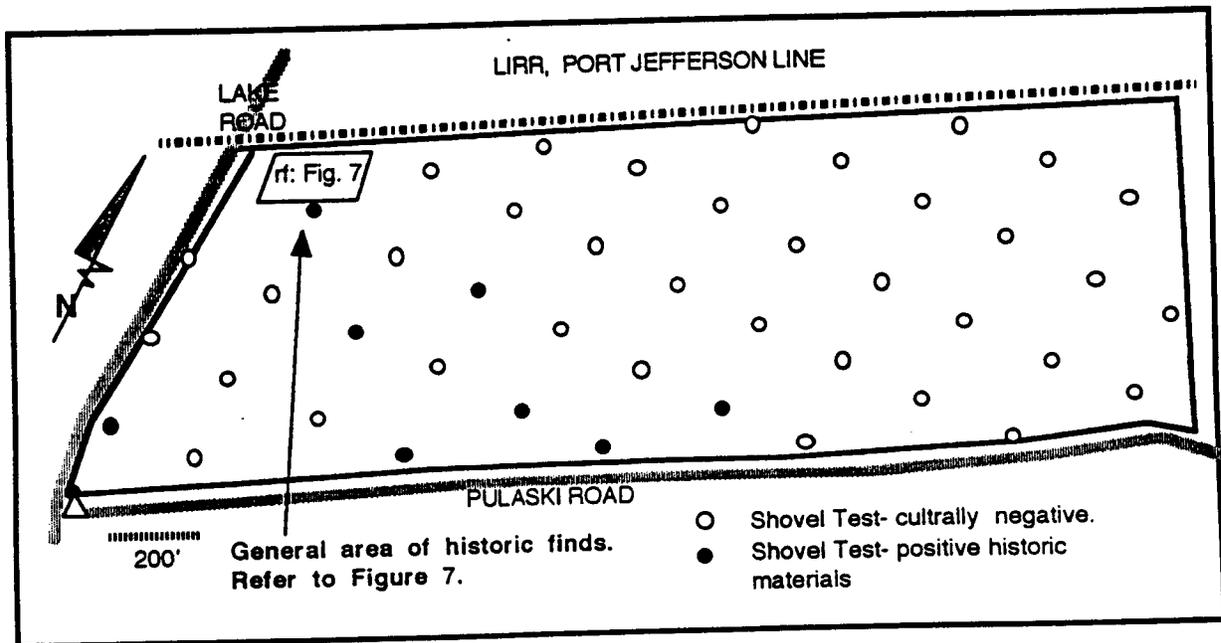


Figure 6. Map of Pulaski and Lake Roads property showing general area of historic features and recoveries relateable to the Gardiner Pickle Works. See Figure 7.

SUMMARY OF SUBSURFACE TESTS

During the subsurface test phase a total of 70 aligned shovel test probes were dug at two-hundred and at thirty foot intervals within a study wide two-hundred foot test grid; all tests were dug to culturally barren subsoil and thoroughly analyzed for presence of cultural materials. Of the 70 tests, 17 or more than 24% were found to have historic era cultural evidences such as coal, glass and metal. Regarding the materials recovered, coal and coal cinders (reported as coal) dominated the recoveries. Excluding coal found in large quantities and estimated by volume, individual recoveries indicate that glass was most common in this category comprising approximately 50% of the total count, while individual pieces of coal (in tests other than those noted above) embraced about 38% of the recoveries, while metal and ceramic represented the remainder. See Table 1, page B14 and Graph 1 page 13.

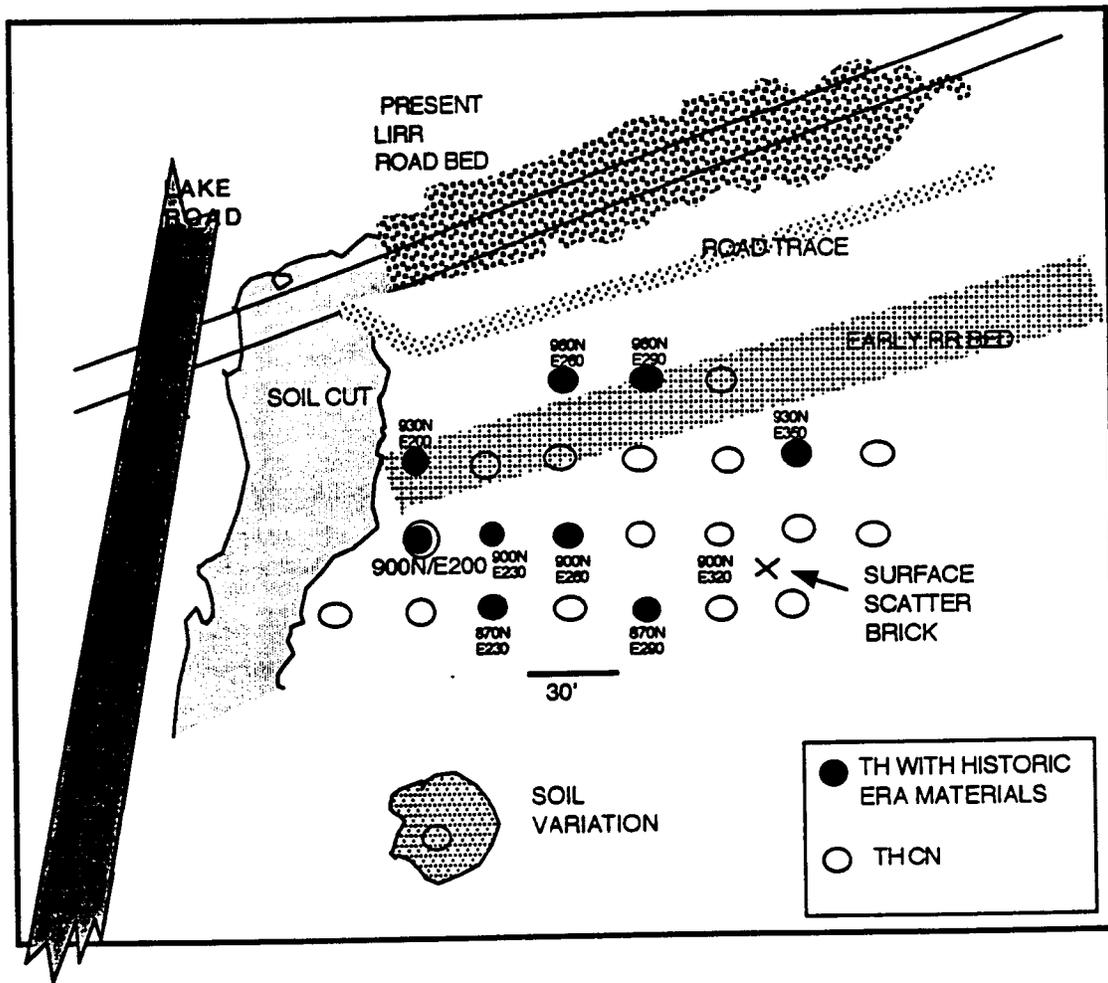


Figure 7. Map of northwest corner of the Pulaski and Lake Roads property showing 30' test holes, grid and test designations.

influenced its results.

FEATURES REPORTED

- Feature 1. Trace of an early road bed.
- Feature 2. Apparent bed of early spur rail line.
- Feature 3. Surface scatter of bricks and other materials.

See Figure 8.

CONCLUSIONS

A systematic surface and subsurface survey of the property at Pulaski and Lake Road revealed no prehistoric evidences. Historic era recoveries were made in the subsurface tests over wide areas of the parcel. They were more common in the western end of the property which has been under cultivation for longer periods of time. Furthermore, surface indications in the form of lineaments and topographic manifestations were noted in the northwest corner of the property. These appear, after preliminary study, to be evidences of an early road and rail spur which served a number of buildings known to be on the site and which are dated to the late 19th century Alexander Gardiner occupation. A surface scatter of historic era cultural materials has also been reported in this area. In addition, shovel tests within this area revealed the presence of coal, cinders, glass, brick and metal concentrated in what may be two zones within the northwestern portion of the property. Further study would be necessary to determine the nature and significance of these finds and to properly map and document the surface features prior to their disturbance or obliteration by the proposed construction activity.

RATIONALE

These conclusions are based upon a careful methodical surface inspection and a thorough systematic subsurface study of soil and subsoil (tested to well below plow zone); both aspects of this study revealed historic era cultural evidences.

GOALS AND SCOPE OF ADDITIONAL STUDIES

Further study of the northwestern section of the parcel, generally delineated by Figure 7 of this report, should be planned to fully document the features revealed to date and to assess the nature, historic association and significance of the findings of this study.

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