SECTION II

INVENTORY AND ANALYSIS

II. INVENTORY AND ANALYSIS

A. OVERVIEW

The Town of North Greenbush has 1.9 miles of frontage on the Hudson River, situated between the cities of Rensselaer and Troy, and across the river from the City of Albany and the Village of Menands. This area is largely undeveloped today except for the Rensselaer County Sewage Treatment facilities. This stands in contrast to the riverfronts in the adjacent communities, which in many places consist of older industrial and urban development. The Town's waterfront consists of a flat river flood plain bordered by a steep escarpment on the western edge of a plateau where development in the Town has occurred. At the base of the slopes is a rail line serving industries between Rensselaer to the south and Troy to the north.

Physical barriers such as the railroad and the slopes have worked in the past to prevent the development of this area. Not surprisingly, less than a dozen individuals or organizations own the property in the study area. This group includes, public utilities, the Town, and a major university in the region, Rensselaer Polytechnic Institute. Current policies of the various landowners further limit legal riverfront access. Yet in spite of this, the riverfront is utilized for unauthorized recreation and for undesirable activities, such as dumping and all-terrain-vehicle operation.

Section B. below describes the various natural and man-made features of the coastal area and their implication for waterfront policy making. Section C highlights some major issues and opportunities which this Local Waterfront Revitalization Program will address.

B. INVENTORY AND ANALYSIS

Field surveys, published data and reports and previous studies, including the initial draft LWRP document prepared in 1984 were all used to assemble an inventory of existing conditions and features in the coastal area. The results of this inventory and analysis process are presented below and illustrated on Maps 3 through 6.

1. Existing Land and Water Use (See Maps 4 and 5)

a. Land Use Patterns

Land use along the North Greenbush waterfront principally reflects the effect of local topography on access to the river. The river flat, although it has been disturbed by various activities, is essentially undeveloped outside of the sewage treatment plant. The wetlands coupled with narrow sections of the river flat limit the overall

developable area. The escarpments, because of their generally unstable nature, are not suited for development and have acted as a barrier to river access. Only on the plateau are there ample amounts of level and stable, gently sloping land that can support the development that has occurred there. The study area consists primarily of vacant land, transportation and utility corridors and a sewage treatment plant.

Five principal landowners are located within the waterfront study area. The first of these is the Rensselaer County Sewer District. The District owns just over 34 acres along the northern 5,400 feet of the Town's riverfront, where its sewage treatment plant is located. The plant consists of a screening facility, four primary settling tanks, an aeration facility, four secondary settling tanks, two chlorine contact facilities, a sludge processing facility, and sludge disposal land fill, four pumping stations, an administrative and control building and related handling and maintenance structures. The plant serves the entire District, which encompasses North Greenbush, Rensselaer, Troy and parts of Brunswick, Sand Lake, and Schaghticoke. The need for additional land area off site to accommodate either expansion of the existing treatment plant or for sludge disposal is not anticipated by the Sewer District officials in the foreseeable future.

Following along the base of the escarpment is the Troy-Greenbush rail line. The 27 acre parcel of land on which the railroad is located is owned by Conrail. This rail line supports infrequent rail service from the industrial areas of South Troy to the main Conrail lines in Rensselaer. On occasion the question of abandonment of the sole remaining rail connection into Troy is raised, although it appears that this event is unlikely to occur in the near future. Parallel to the railroad, but still on the property is an unpaved access road. Beneath the access road is a 36" force sewer main of the County Sewer District.

The lands of the Niagara Mohawk Power Corporation nearly bisect the waterfront in a linear corridor which crosses the escarpment, and the river flat at the southern edge of the sewage treatment plant. This 40 acre parcel, about a quarter of which is within the waterfront area, is the right-of-way for the two 115 kilovolt transmission lines connecting the Reynolds Road substation on the plateau to substations in Menands and Colonie. No change in this use is anticipated in the future.

On the river flat immediately south of the Niagara Mohawk property is an 8.9 acre parcel of Town land. This property was deeded to the Town by the Rensselaer Polytechnic Institute (RPI) for future park development, as part of the approval process for development of the Rensselaer Technology Park upslope. This land is currently undeveloped and includes part of a State-designated wetland.

Adjacent to all of these properties in the waterfront area are the lands of RPI's Technology Park. The area of this property, consisting of two adjacent parcels, is 1,082 acres, of which 90 acres are located on the river flat, and close to 300 acres are on the escarpment. The balance is outside the waterfront area. Adjacent property in Rensselaer on the river flat and escarpment is also held by RPI. Development of the Technology Park has been proceeding on the plateau since 1981 for research, development and related light manufacturing facilities, in addition to a wide variety of technologies service operations. The escarpment and river flat areas of this property are currently undeveloped. The RPI Technology Park has put forth a proposal to develop offices, a hotel and conference center on this section of the property. These uses would change the present character of the waterfront, and were taken into consideration during development of the LWRP.

Upland from the river but in the waterfront area is the nearly 13 acre parcel of the New York National Guard Armory located near the western terminus of Glenmore Road. There are also portions of several smaller, privately held parcels in the waterfront area which have access onto Glenmore and Glenwood Roads.

Prior to adoption of the LWRP, the waterfront area lay within two zoning districts. The AR (Agricultural and Residential) zone encompassed most of the waterfront area. This district permits single family residences, agricultural uses, parks and reforestation areas, recreation clubs, and planned unit residential development. A portion of the waterfront area, about 1,200 to 1,600 feet upslope from the railroad, is zoned IG (Industry), to permit development of the Rensselaer Technology Park. This district prohibits residential uses.

Land adjacent to the waterfront area to the north in the City of Troy is zoned for heavy industry, while adjacent land to the south in the City of Rensselaer, including some 97 acres owned by RPI, is zoned LC (Land Conservation). Permitted uses under the LC classification

include farming--agricultural and horticultural activities; parks, athletic fields and open space; and golf courses.

The established zoning classification of the Town's waterfront area was inappropriate when viewed from either an agricultural or residential perspective. The land is principally either man-made (i.e., dredge disposal) or protected marsh, in each instance neither suitable nor utilized for productive agricultural use. As a flood-prone area, the land is also unsuited to residential development, in that the first habitable floor of residential structures must, in accordance with the provisions of the National Flood Insurance Program, be located above the 100-year flood elevation. Rezoning consistent with coastal policies and the "Proposed Land and Water Uses Plan" which follows in Section IV has been adopted (See Section V).

b. <u>Water-Dependent Uses</u>

Water-dependent uses in North Greenbush are extremely limited. There are no industrial or commercial water-dependent uses in the Town, nor has there been in the past. The Hudson River is used for treated effluent discharge from the sewage treatment plant. A seawall along most of the Town's riverfront, built during the 1930's, serves as an erosion control and flood protection structure. Recreational activities, particularly pleasure boating and fishing, are accommodated on the river, although there is currently no access on the riverfront. There are no water-enhanced uses along the riverfront.

c. **Vacant and Underutilized Sites**

Much of the North Greenbush waterfront is underutilized due to natural and artificial factors which limit access. The sewage treatment property on the river flat, while developed in part, is underutilized near the Troy city boundary. The Niagara Mohawk property serves as a utility corridor, but its river frontage is likewise underutilized. The Town and RPI parcels are totally undeveloped, although not in virgin condition due to human activity over the years. The State-designated wetland, located on parts of the RPI, Town and Niagara Mohawk properties should not be considered underutilized in terms of having development potential as it serves important ecological functions of floodwater control, water purification and habitat maintenance. Along the Troy-Greenbush rail line, there is evidence of garbage and debris dumping. The infrequent use of this line and

its physical condition, which are discussed later, seem to invite this sort of activity.

d. Recreation and Public Access

As a result of the access barriers created by the railroad and the escarpment, recreational facilities in the Town of North Greenbush are located on the plateau, away from the river. Athletic activities are accommodated at the Bucky Egan Memorial Field on Williams Road with other recreational opportunities at the Town Park east of Winter Street. Other facilities include the Wynantskill Union Free Elementary School property on White View Road and the Hudson Valley Community College.

The escarpment creates the principal natural access barrier between the plateau section of the town and the riverfront. Exacerbating this situation are artificial barriers such as the railroad, a physical barrier, and the legal access barriers of the sewage treatment plant and the transmission line corridor. River Road, extending between Rensselaer and the sewage treatment plant, is a combined physical and legal barrier as it is a private road, and is in a condition that deters some amount of vehicular traffic. A roadway along side the railroad, on the right-of-way, is filled with numerous potholes and mudholes which makes travel difficult. The paved sewage treatment plant road is restricted to most traffic and the entrance gates to it in Troy are often closed on weekends and evenings. Finally, the seawall prevents access to the shoreline from the river because of its design. The closest boat access location is about one mile south of the Town-City boundary in the City of Rensselaer. This boat launch, at the foot of Tracy Street, is maintained by Rensselaer County, and consists of an unpaved graded access ramp that was cut out of the seawall. There is also a boat launch in Albany, a short distance further south in the City's Corning Preserve which is more fully developed and has extensive parking facilities.

In spite of the access barriers discussed above, the North Greenbush waterfront is utilized for recreation, albeit unofficially. Such activities include jogging, dog walking, hunting and target shooting (as evidenced by empty shotgun shells along the railroad) plus the use of off-road or all-terrain vehicles.

2. Geology

a. Topography (see Map No. 3)

North Greenbush is situated within the Hudson River lowland physiographic province, west of the Taconic Highlands. The lowland is characterized by rolling plateau with isolated hills, reflecting the underlying bedrock geology. The Hudson River has cut a trench over a mile wide in this province, separated from the plateau by a sharp escarpment zone of approximately one quarter to one half mile in width, where elevations drop from around 150 to 200 feet on the plateau to sea level at the river. Slopes along the escarpment often exceed 25%. The escarpment is penetrated by several deep fingerlike ravines extending into the plateau area to the east and draining an area of approximately 1,850 acres in the gently sloping and rolling plateau areas. The river floodplain or "flat" is essentially level and ranges from 200 to 1,200 feet in width in the waterfront area. Much of the river flat in the Town, has been built up by deposition of dredge materials by the Army Corps of Engineers in its efforts to improve navigation and flood control along this reach of the Hudson River.

The topography has strongly influenced development patterns in the western portion of the Town. The escarpment has been a barrier to access along the river, and development has been concentrated on the plateau.

b. Bedrock Geology

Underlying the Town's waterfront area are shales, siltstones and greywackes of the Ordovician age. Evidence for this is based upon field investigation conducted by Elam in 1960, from isolated exposures found in the ravine walls, as much of the bedrock is buried under a thick mantle of more recent surficial deposits (see Map No. 3). The westernmost part of the waterfront, encompassing the river flat and parts of the escarpment, is underlain by the Taconic Melange, a chaotic mixture of sandstone, siltstone and limestone slide blocks in a pelitic (shaley and silty) matrix. Immediately east of the Taconic Melange and south of the Niagara Mohawk transmission lines, is a small area of the Austin Glen formation. This unit consists of greywackes and grey shales, and is exposed along the lower reaches of the Skipper Killitje. Most of the easterly reaches of the escarpment and ravines is underlain by the gray shales, siltstones and mudstones of the Normanskill Shale. Exposures of this unit are along the lower ravine wall

of the Snoeken Kill and the stream to the south (Hudson River tributary No. 229).

Surficial Geology

The North Greenbush waterfront area is characterized by an extensive cover of surficial deposits, of two types: alluvium and lacustrine, or lake deposited, clays. The lacustrine clays were deposited towards the end of continental glaciation during the Wisconsonian Stage retreat, between 15,800 and 12,450 years ago. As the ice sheet retreated northward drainage flowing from the de-glaciated areas east of North Greenbush fed into the Hudson River trench and adjacent lowlands, which had existed in a similar form in pre-glacial times. Due to extensive deposits to the south, and the retreating ice front to the north, melt-waters in the Hudson Valley formed glacial Lake Albany. Extensive amounts of clay, silt and beach ridge sand and gravel were deposited in this low energy environment, from Hyde Park north to Whitehall.

The "Lake Albany clay" deposits consist of blue-gray chocolate colored rhythmically bedded clays and silts, with numerous interbedded pebble gravels. These deposits have been observed to exceed 100 feet in places (La Fleur, 1965). A thin layer of sand and pebble silts, less than four feet thick, overlays the clay on the escarpment near the WRPI radio tower.

These clay deposits can pose a significant landslide hazard in areas having slopes greater than 12°(27%) and vertical relief greater than 40 feet (Robak & Fickies, 1983) (see Map No. 6). These conditions are particularly pronounced in the ravines. The clays become soft and plastic with increasing wetness and depth. Engineering and siting considerations should be taken seriously regarding development along the escarpment and ravines, as well as the upland plateau areas immediately adjacent to these steeply sloping areas.

In terms of stability, the bedrock exposures in the ravines present less problems as their slopes are considered to be more stable (RPI University Park Master Plan, 1981). But these exposures are extremely limited in size and location, and do not lessen the overall stability problems associated with the escarpment.

Along the river flat are the most recent deposits of alluvium and dredge sediments, with organic deposits occurring in the vicinity of the wetland.

3. Soils

The soils in the North Greenbush waterfront area can be divided into two groups; those in the river flat areas, and those along the escarpment and ravines.

The soils along the river flat consist primarily of dredge and fill material and alluvium, classified as "sandy udorthents". Organic deposits occur adjacent to the wetland. Adjacent to the south and north ends of the wetlands, but east of the railroad, is the Limerick Silty Loam, gentle slope (3-10%) variant. All these soils are subject to frequent flooding and have wetness problems which can impose severe restrictions on development. The Limerick soils are also subject to frost action.

The soils on the escarpments and ravines are predominantly Hudson Silt Loam, steep, 25 to 40% slopes, Hudson Silt Loam hilly, 10 to 30% slope and Hudson Silt Loam, 8 to 15% slopes. The Elmridge Fine Sandy Loam occurs on the top of the escarpment near the armory on Glenmore Road and between the Snoecken Kill and stream 229.

At the base of the escarpment are more gently sloping variants of the Hudson Silt Loam. Much of the Hudson Silt Loam soils are derived from the Lake Albany clays and silts described above. As a result, these soils pose severe problems for development because of wetness, low strength, high plasticity and potential for frost action. Special engineering considerations would be necessary for any successful development on these soils. The Elmridge fine sandy loam, formed also from underlying clay deposits is also problematic with regard to wetness, low strength, slope and frost action. This places severe restrictions for construction of pipelines and roads but only moderate restriction on construction of buildings and recreational facilities.

Most of the Hudson River shoreline in North Greenbush has been altered, principally through dredge spoil deposition by the Army Corps of Engineers in efforts to improve river navigation and flood control. The various tributaries of the Hudson deposit sediment from the plateau and escarpment areas during periods of high flow, particularly in the spring, into the river. Because of this, the Works Progress Administration (WPA) constructed the seawall found along the length of the Town's river shoreline during the 1930's, to assist in channelizing the navigable river. This seawall or revetment wall is maintained by the Corps.

4. Wildlife Resources

a. Significant Habitats

No Coastal Fish and Wildlife Habitats of Statewide Significance have been designated within North Greenbush's waterfront area. Nevertheless, the wetland discussed below and the river adjacent to the Town constitute an important wildlife habitat. Waterfowl, such as redhead ducks, canvasbacks and mallards, are present in the wetland during spring and fall migration, feeding and resting. Other species of marsh birds may also be present. The river waters within the waterfront area provides a spawning and nursery area for various fish species such as herring, white perch, shad and striped bass.

b. Wetlands (see Map No. 6)

The State Legislature has declared that it is "the public policy of the State to preserve, protect and conserve freshwater wetlands and the benefits derived therefrom" (Section 24-0103, Environmental Conservation Law). Accordingly, the Department of Environmental Conservation (DEC) is identifying and mapping all freshwater wetlands larger than 12.4 acres (final maps for Rensselaer County have been filed). Protected streams are those streams which are navigable and/or classified by the Health Department as C(T) or above. Under Articles 15 and 24 of the Environmental Conservation Law, any development of protected wetlands requires a "wetlands" or "stream protection" permit from DEC. Based on their evaluation of the permit application, DEC may limit development, require mitigative measures or prevent development.

One wetland has been designated in the waterfront area: TS-105, located immediately south of the Rensselaer County Sewage Treatment Plant, is shown on Map 6.

The TS-105 wetland is rated by DEC as a Class II wetland. It is a fresh water tidal marsh of 40-50 acres that collects drainage from several tributaries of Hudson Tributary stream No. 228, which includes the Skipper Killitje (228-1). In turn, this wetland drains into the Hudson River at its southwestern corner, through a culverted inlet underneath River Road. Wetland TS-105 is reputed to be the furthest inland tidal basin along the United States coast.

This wetland is separated from the Hudson River by a bank of dredge spoils that has developed over the years from channel dredging by the Corps of Engineers. The spoil

bank had subsequently been mined for sand and gravel up to 15 years ago. This mining has resulted in a gradual extension of the wetland in a southerly and westerly direction.

Wetland vegetation includes shallow freshwater marsh species such as purple loosestrife (Lysthrum saliciaria) and cattail (Typha augustfolia) and seasonally-flooded deciduous trees and shrubs. There is extensive plant cover on the water's surface.

The streams in the escarpment, discussed below, have not been classified by DEC as "protected". Thus, no permit is required for either constructing stream crossings or for discharge of storm drainage.

c. <u>Vegetation and Wildlife</u>

The North Greenbush waterfront area is characterized by extensive vegetation on the river flat and the escarpment. Hardwood species are predominant. The river flat area is characterized by mature cottonwoods present along the river shoreline and wetlands, with an understory of shrubs and herbaceous plant species common to gravel soils and wet areas, such as willows and poplars.

The escarpments and ravines in particular are more densely wooded than the river flat. Field studies (RPI University Park Master Plan, 1981) identified plant communities in various successional stages growing towards an oak-hickory forest. This is the typical forest composition in the Hudson Valley. While white oak (Quercus alba) is the dominant species in this community, beech (Fagus gradifolia) and chestnut oak (Quercus prinus) are abundant on the escarpments, with the eastern hemlock (Tsuga canadesis), eastern white pine (Pinus strobis) and basswood (Tillia americana) common on the moister sides of the ravines, particularly along the shaded slopes. Shagbark hickory (Carya ovata), red oak (Quercus rubra, var. borealis) and sugar maple (acer saccharum) also occur on the slopes. Also found on the more stable slope area were several species of herbaceous plants listed by the state as "Protected", such as maidenhair fern (Adiatum pedatum) and Trillium (Trillium ceruum). "Protected" designation (NYCRR 193.3) indicates that while not necessarily rare, these plants, because of their attractiveness, require permission of the property owner prior to transplanting or picking. Because of the present vegetative associations and the lack of specific and/or isolated habitats, no rare or endangered species have been found in the study area.

Wildlife in the study area is generally limited to small birds and mammals coincidental with the plant communities discussed above. Many species are characteristic of the transition between suburban and rural land use, and are mobile in utilizing the forested escarpment and ravines in addition to the woods and open vacant fields of the plateau. Biting insects, such as deer flies and mosquitos, are common to the wetlands and ravines. Birds identified in this area include ruffed grouse, pheasant, goshawk, hairy and downy woodpeckers, bank swallows, chickadees, catbirds, northern orioles, scarlet tanagers, eastern goldfinches and song sparrows. Along the river flat several species of ducks such as redhead and canvas-back are present as noted above. Woodchucks, raccoons, rabbits, squirrels, chipmunks are common in the wooded escarpment.

5. Hydrology and Water Quality

a. Drainage

The North Greenbush waterfront area lies within the Hudson River drainage basin. The Hudson River has a mean elevation of near zero (sea level). Since the river is an "estuary" or tidal river, its actual elevation fluctuates daily. The mean monthly tidal range is 4.6 feet on the Town's waterfront, based on data by the National Ocean Survey (NOAA, 1977). Discharge measurements are taken at the United States Geological Survey (USGS) gauging station across the river from Troy at Green Island, about three miles north of the Troy-North Greenbush boundary. The daily flow ranges from a minimum of 822 cubic feet per second on September 2, 1968, to 152,000 cubic feet per second on March 14, 1977, with a maximum instantaneous flow of 181,000 cubic feet per second on December 31, 1948, and an average flow of 13,700 cubic feet per second.

Seven streams drain from the plateau in ravines through the escarpment towards the Hudson with a west-northwesterly orientation. For statistical and regulatory purposes, these Hudson River tributary streams have been numerically coded by DEC in progression starting at the mouth of the river at New York Bay. Several of the streams also have historic Dutch names (see Map No. 3).

The three southerly streams are part of a tributary system to Stream 228, which empty into wetland TS-105, and thence into the Hudson. Stream 228-2 is identified from the tax maps as the "Skipper Killitie" (Killitje). Stream 228-1 drains a portion of the Town, although it principally flows within the City of Rensselear. Likewise, Stream 232 lies within the City of Troy along part of its length.

This stream, along with Stream 230 (the Snoeken Kill) and Stream 229, have no major tributaries and drain directly into the Hudson River. In total, these streams drain close to 2,700 acres of plateau and escarpment area. The largest flows on these streams generally occur during spring runoff.

There are a number of waterfalls and cascades on these streams up to 40 feet high which are most pronounced at this time.

b. **Flood Protection**

The Federal Emergency Management Agency has developed a flood insurance study and maps for the Town of North Greenbush that indicate flood events which are expected to be equalled or exceeded once during a 100 or 500 year period. The maps also show base flood elevation lines which indicate the anticipated water-surface elevation during a 100-year flood. Local planning requires that development must either be built above the base flood elevations or contain flood protection devices to this height. The 100-year flood plain area is shown on Map No. 6.

The 100-year flood plain area is generally coterminous with the "river flat" area described above. The 100-year flood elevation ranges from 22 feet above mean sea level at the boundary of the City of Rensselaer, to 24 feet at the boundary of Troy. This means that during a 100-year flood, the entire river flat area, including the wetland, the sewage treatment plant and its access roads, would be under water. The seawall and an earthen levee along the Town's waterfront provide protection during minor floods and high tides.

The 100-year flood elevation at the Albany gauging station, approximately two miles south of the Town of North Greenbush/City of Rensselaer boundary is estimated to be 21.0 feet. By way of historic comparison, the following "floods of record" have occurred at the Albany gauging station since 1900:

Year	Flood Elevation	Estimated Return Period
February 1900	20.4 feet	80 years
March 1902	19.0 feet	50 years
March 1913	21.4 feet	100+ years
March 1936	17.9 feet	33 years
January 1949	17.5 feet	30 years

Depending upon specific locations along the North Greenbush waterfront, these historic flood elevations at the Albany gauging station were presumably exceeded here by approximately 1 to 3 feet due to the upstream River gradient which occurs.

Interestingly, the 1936 and 1949 floods occurred after the Hudson-Black Regulatory District's construction of the Sacandaga Reservoir (Conklingville) Dam in 1930 which, though primarily designed to augment low flows in the Hudson during periods of little precipitation, does have incidental flood control benefits.

c. Surface Water Quality

Surface waters in the Town of North Greenbush are monitored by the DEC. DEC monitors the Hudson River for both conventional pollutants and toxic pollutants at the Niagara Mohawk Albany power plant at Glenmont, about 5 1/2 miles south of North Greenbush, and the federal lock and dam at Troy, over 3 1/2 miles to the north. Parameters for conventional pollutants such as coliform, fecal coliform, pH and dissolved oxygen are tested at these sites once every four weeks throughout the year except during January and February. Monitoring for toxic compounds is done twice during the spring, summer and fall seasons.

The quality of the Hudson River water has dramatically improved over the past several years, principally due to the development of sewage treatment facilities in Albany County in 1974 and in Rensselaer County in 1976, and also due to the cessation of PCB discharges by General Electric in 1977 at their Fort Edward plant. The Hudson River at North Greenbush is rated as Class "C" (i.e., freshwater suitable for the propagation and taking of fish, but not for water supply or primary contact recreation). The seven tributary streams are rated as Class "D", which indicates suitability for secondary contact, but not for fish propagation due to low water or intermittent flow conditions. Stream 228 has been recently recommended for upgrading to Class C, although its tributaries have not.

Effluent from sewage treatment is discharged at the Rensselaer County sewage treatment plant, the Albany County sewage treatment plant across the river, and at the East Greenbush treatment plant to the south.

d. Sewage

The North Greenbush waterfront currently has no local sewage service, as it is mostly undeveloped, nor is it in a local sewage collection district. However, the Town's waterfront is the site of the treatment facilities and interceptor mains of the Rensselaer County Sewer District No. 1. This system serves both residential and industrial customers in the urbanized areas of the District, which include Brunswick, North Greenbush, Rensselaer, Sand Lake, Schaghticoke and Troy. Interceptor mains extend along the east bank of the Hudson River between the Port of Rensselaer and the Lansingburgh section of Troy, beneath the railroad right-of-way, collecting wastewater from upland mains to the treatment facility.

The plant, has a 24 million gallon per day (mgd) capacity of primary and secondary treatment. Prior to completion of this facility in 1976, raw sewage was discharged directly into the Hudson River.

Local sewage collection along the Town's waterfront would be possible through either creation of a new local collection district or extension of a special district formed in 1982 to service the Rensselaer Technology Park. Soil and hydrological conditions within the Town's waterfront area would preclude the use of septic systems for any development uses.

e. Toxic Waste

NYSDEC has no knowledge of any active or inactive hazardous waste disposal sites within the North Greenbush waterfront area.

f. Drinking Water and Groundwater

The Town of North Greenbush does not have a municipal water system. However, special assessment districts have been established at the Rensselaer Technology Park and the urbanized area east of North Greenbush Road (US 4). Along this road is a thirty-six inch main installed by the Rensselaer-East Greenbush Water District, which supplies this area. The waterfront area of the Town currently has no water service outside of a private system serving the county sewage plant. This system has very limited expansion potential.

The Rensselaer-East Greenbush Water District obtains water from the City of Troy. The City's principal source is the 11.7 billion gallon Tomhannock Reservoir located

in Pittstown, about 10 1/2 miles northeast of Troy. Estimated safe yield of the reservoir is 45.8 mgd. 7 mgd is provided to the water district by agreement with the City. Water is pumped from Burden Avenue in Troy along North Greenbush Road towards the reservoir on Partition Street Extension in the Town, adjacent to both Rensselaer and East Greenbush. Current water use for the entire district is about 3 mgd.

6. Air Quality and Climate

a. Air Quality

The New York State Department of Environmental Conservation follows the federal Environmental Protection Agency (EPA) quality standards for ambient air. Areas where the ambient concentration of a pollutant is greater than the standard for each major category of pollutant (total suspended particulates, carbon monoxide, sulphur dioxide, oxides of nitrogen and ozone) are considered to be in non-attainment for that pollutant, and areas where ambient concentrations are less than standard are considered in attainment.

The Town of North Greenbush and the adjacent surrounding area is currently classified as an attainment area for criteria pollutants. When considering the siting of a new facility or modification of an existing facility, the status of air quality at the facility and the magnitude of the projected annual emissions of criteria pollutants must be evaluated.

Of concern, however, are the intermittent odor impacts of both the Rensselaer County sewage treatment plant and the Albany County sewage treatment plant on the opposite shore of the river. These odors are reputedly under continuous monitoring by the respective plant operators and generally held to the minimum levels possible under in-place technology and the weather conditions experienced. Prevailing winds on the Hudson River somewhat mitigate the impact of these odors, providing for considerable air movement at the location.

b. Climate

The climate in the Town of North Greenbush is continental in character, subject to some modification from the maritime climate which prevails in the extreme southeastern portion of New York State. In the summer, temperatures rise rapidly during the daytime to moderate levels, although week long periods of oppressive heat occur occasionally. Winters are cold and occasionally

can be fairly severe, with nighttime temperatures frequently dropping to 10°F or lower. Snowfall is variable, but ranges up to 75 inches per year at nearby higher elevations. The annual average precipitation is about 33 inches distributed evenly throughout the year. Wind velocities in the area are moderate, with southerly winds predominating most of the year except during winter and early spring when west-northwesterly winds predominate. Average wind velocity is approximately 8 miles per hour in this area. The nearest first-order weather station to North Greenbush is located 6.5 miles to the northwest at the Albany County Airport.

c. Noise

The noise of truck and other vehicular traffic on the I-787 arterial across the Hudson River is quite noticeable from most points along the Town's waterfront, with the prevailing winds serving to carry these sounds across the River. In addition, the intermittent noise of aircraft taking off and landing at the Albany County Airport, and the less frequent noise of the railroad trains passing either through the site or to the south across Livingston Avenue Bridge between the cities of Albany and Rensselaer is experienced. Neither the noise of aircraft nor the railroad is, however, particularly sustained or troublesome at this location.

7. Cultural and Archaeological Resources

a. Cultural Resources

Prior to settlement by the Dutch, the area encompassed by the Town of North Greenbush was inhabited by the Mohican and Schaghticoke tribes in scattered villages.

The manor of Rensselaer was established in 1629 by Kilean Van Rensselaer and encompassed the western and southern areas of present-day Rensselaer County. The manor flourished as an example of the European medieval feudal system, even after the Revolution, as migrants from New England settled as tenants on the manor. But relations between the tenants and patroons (manor lords) subsequently deteriorated throughout the region, and between 1839 and 1850, battles of the Anti-Rent War took place in this area.

After 1850 , land-owning farmers expanded agricultural activity, and the hamlets of Wynantskill, Defreestville and Snyders Lake grew. In 1885, the Town was incorporated. Much of the Town's growth has come about within the last fifty years, a result of suburbanization

trends in the Capital District. Many residents work outside the Town for various businesses or industries in Troy, Rensselaer, Albany, or Colonie, or for the State of New York, the region's biggest employer.

Much of the growth and development of North Greenbush has been on the plateau. The riverfront and escarpment have remained essentially undeveloped over the years. The banks of the Hudson have been altered by dredge deposition and construction of the seawall in the 1930's. The Troy-Greenbush Conrail spur was built around 1845 to serve the burgeoning industrial activity in Troy and Rensselaer. The most recent development along the waterfront has been the construction of the Renssalaer County sewage treatment plant in the 1970's.

All historic sites in North Greenbush are located on the plateau, outside of the waterfront area amd some distance from the escarpment. Two important structures are worth noting: The Defreest Homestead, a structure located on Defreest Drive in the Rensselaer Technology Park, which is listed on the National Register of Historic Places, and the John E. Van Alen house on the south side of Washington Avenue Extension. Both structures date from the late 18th century.

b. Archaeologic Resources

Although there have been no detailed studies within the waterfront area, a prehistoric site has been identified by the New York State Museum along the riverfront and historic maps show several house sites on the river (see Exhibit A).

8. Transportation

Transportation in the North Greenbush waterfront area is by private vehicles, railroad, boat, off-road vehicle, or foot. However, legal and physical barriers restrict access to the waterfront by the general public.

Two roads extend from the sewage treatment plant along the east bank of the river. Extending southerly from the plant is a 1.7 mile long unpaved one-lane road, identified as "River Road" from tax maps which is in poor to impassible condition. It originally terminated at Forbes Avenue in Rensselaer, but has been abandoned between this point and the Patroon Island Bridge (I-90). River Road was built to provide equipment access during the sewage plant construction and during spoil bank excavation. Northward from the plant is a two lane paved road which is gated at its north end at the base of Water Street in Troy, at the Chevron Asphalt plant near the Troy-

Menands Bridge. This road is used for employee and service access for the plant, but closed to the general public.

A third road follows the Conrail line from Forbes Avenue in Rensselear to the paved sewage plant access road at a point roughly 800 feet north of the plant facilities. This road utilizes the portion of the Conrail right-of-way which at one time was used for a second track. It is in fair to poor shape, but in spite of potholes and mud holes, can be driven on. It is 10 to 11 feet wide, with a gravel and pebble base, although at some sections crossing the tributaries, the road consists of large stones, indicating repairs made to the entire right-of-way because of erosion of the original fill. In spite of this road being on Conrail property, it is used by vehicles, perhaps en route to trash dumping. Leading from the road up the hillsides are numerous foot paths and off-road or all-terrain vehicle tracks. This road also provides access to River Road under the Patroon Island Bridge.

On the plateau, the public street system has been more extensively developed, however there is no direct access from these streets to the river within the Town. Access to the two roads discussed above is either through Rensselaer or Troy, via North Greenbush Road (US4). North Greenbush Road is a State-maintained urban principal arterial serving Defreestville and other portions of western North Greenbush along its 3 1/2 mile north-south traverse of the Town. It links up with the Troy-Menands Bridge (NY 378), and Morrison Avenue in Troy, Hudson Valley Community College, the Rensselaer Technology Park, Washington Avenue Extension and various county facilities in the Town, and with I-90 in East Greenbush. To the south, US 4 also collects traffic from various side roads such as Williams Street (NY 136), Winter Street, Bloomingrove Drive and West Sand Road (NY 43), which in turn provides access to Wynantskill, Snyders Lake, and other areas in the eastern part of the Town, as well as to neighboring towns. Washington Avenue is an urban minor arterial providing direct access from the southern part of the Town with I-90. It is a county road in North Greenbush, but is City- maintained in Rensselaer. I-787, the Riverfront Arterial, follows the western shore of the Hudson in Albany County, and connects directly with I-90 and Troy Menands Bridge.

Traffic congestion on North Greenbush Road/US 4 is quite pronounced during rush ("peak") hours, particularly due to Hudson Valley Community College, shopping centers in Troy, ongoing residential development in the Town, and more recently, the development of the RPI Technology Park. Continued residential growth and expansion of the Technology Park will add traffic to this artery, as well as Washington Avenue. As a response to this, studies have been conducted on handling what is seen to be primarily growth in automobile

traffic. A proposal has been made for a controlled access highway extending from I-90 in East Greenbush north through the RPI Technology Park, west of North Greenbush Road/US 4 and terminating on that road near the Glenmore Road/Williams Road intersection near Hudson Valley Community College. Studies have been conducted by the Capital District Transportation Committee (CDTC) and the New York State Department of Transportation (NYSDOT) recently, but funding for construction of this road is lacking at this time as most highway funds are currently earmarked for maintenance and rehabilitation of existing facilities. A cooperative effort by NYSDOT, the County, CDTC, and RPI would be necessary to provide funding, and such efforts could be problematic at this time. The only section of this proposed road that would be likely to be constructed in the near future would be a connector from I-90 to the Defreestville intersection of Washington Avenue, Best Road, West Sand Lake Road (NY 43) and US 4. This would alleviate a long-standing congestion problem on Washington Avenue. Nevertheless, right-of-way is being set aside in the RPI Technology Park for the northern section of the highway if it should be built at a later date.

Several roads traverse the plateau west of North Greenbush Road/US 4, including Jordan Road and Glenmore Road. Jordan Road serves as the principal interior access road of the Rensselaer Technology Park, and is the only road that connects the Technology Park with the outside street network at the present stage of development. Glenmore Road, sections of which are under county, Town and private jurisdiction, is the only road which extends towards the edge of the escarpment, terminating less than a quarter mile from the river. However, the steep escarpment creates an access barrier which is further compounded by the fact that this end of Glenmore Road is privately owned (by Rensselaer Polytechnic Institute) and closed to the public. Glenmore Road primarily serves the National Guard Armory and the WRPI radio tower facilities.

Bus service is available on the plateau by the Capital District Transportation Authority (CDTA). The No. 24 bus route serves North Greenbush along North Greenbush Road (US 4) on weekdays, connecting with Troy, Rensselaer, and other bus routes in the CDTA system at Albany. Regional and inter-state bus transportation is available at the Greyhound and Trailways bus stations in Albany.

Railroad service in the North Greenbush waterfront is restricted to freight operations along the single track Troy-Greenbush rail line, owned by Conrail but used jointly by Conrail and the Delaware and Hudson (D&H). There is generally one round trip per weekday by Conrail and one per month by the D & H. The physical conditions of the railbed and trackage ranges from marginal to highly deteriorated. This line serves

one customer in Rensselaer, the sewage treatment plant in the Town and several customers in the industrial area of Troy south of Adams Street, and connects with the Conrail main lines near the Amtrak station and facilities in Rensselaer. The Amtrak station provides the only passenger rail connections from Rensselaer County to Boston, Buffalo, and New York City. There was a proposal put forth recently by the Office of the Mayor of Albany to establish excursion passenger service between Albany and Troy, via Rensselaer. To do so would require a significant expenditure of funds to upgrade the line to Federal standards for passenger service, and this proposal seems unlikely to be realized.

The Hudson River serves the Capital District region as an important freight corridor. Much of the shipping activity terminates at the Port of Albany-Rensselaer facilities, about 3 1/2 miles south of the Town's waterfront. There is however, commercial barge and pleasure boat activity on this section of the river because of connections to the State's barge canal system at Troy and Cohoes. The Army Corps of Engineers maintains a 400 feet wide and 14 feet deep channel about 100 feet west of the seawall, although channel depths measured by the Corps in August and September 1983 along the Town's waterfront ranged from 15 1/2 to 16 1/2 feet. The presence of this channel so close to the seawall must be considered in the design of docking facilities for recreational boats on the Town's waterfront.

The nearest airline service is at the Albany County Airport in the Town of Colonie, roughly 6 1/2 miles northwest of the Town's waterfront area.

9. <u>Franchise and Other Community Services</u>

a. The western half of the Town, including the waterfront area, is served by the Niagara Mohawk Power Corporation. Two 115 kilovolt (kV) circuits traverse the waterfront upper plateau linking the Reynolds Road transmission substation on Bloomingrove Road with the Menands substation and the ALTech Specialty Company station in the Town of Colonie. The distribution system is absent along the waterfront, but exists on the plateau, following development. Primary distribution follows North Greenbush Road at 13.2 kV. in the north, serving Hudson Valley Community College and the RPI Technology Park from the Menands and Reynolds Road 115 kV stations and 4.8 kV in the vicinity of Defreestville from the Defreestville 34.5 kV station on Washington Avenue Extension. Currently, the only electric customer along the riverfront is the sewage treatment plant, which is supplied from the A.L. Tech-Reynolds Road 115 kV circuit. Further development of the waterfront and the RPI

Technology Park upslope would be served by additional substations on both 115 kV lines which Niagara Mohawk has deemed sufficient to meet primary electrical demands.

b. Gas

Natural gas services in the Town is also supplied by Niagara Mohawk. The Consolidated Gas Supply maintains a spur transmission line and metering (point-of-sales) station on Reynolds Road, south of the electric substation, from its principal transmission lines in Schodack. North of this point this 12 inch transmission line is owned by Niagara Mohawk and supplies gas to the Town, Troy and northern Albany County. A 12 inch branch line follows Glenmore Road and crosses under the Hudson to serve customers in Menands. Niagara Mohawk has adequate capacity for expansion and is presently accommodating new non-residential as well as residential users. Currently there are no natural gas customers on the Town's waterfront.

c. Telephone

Telephone service in the Town is from the New York Telephone Company, as part of the Troy exchange. Existing facilities are extendable and sufficient to meet anticipated demands. The sewage treatment plant is currently the only telephone customer in the waterfront. A submarine and underground cable parallels the north side of the Niagara Mohawk 115 kV transmission right-of-way.

d. Solid Waste

Currently, the Town of North Greenbush does not operate a municipal solid waste disposal service. Private haulers collect solid waste, much of which is disposed of in the Troy or East Greenbush sanitary landfills. The Town is eligible to utilize the Albany, New York Solid Waste Energy Recovery System (ANSWERS) at present time, but has not acted on this. There are no solid waste disposal sites located within the Town.

e. Fire, Police and Schools

The waterfront area is within the Defreestville Fire District, which is headquartered on North Greenbush Road. Additional support is provided from the Wynantskill Fire District and the Rensselaer and Troy Fire Departments. The Town has a full time police department headquartered on Snyders Lake Road. The waterfront area is in the Wynantskill Union Free School District.

10. Visual Resources

In spite of its location along the Hudson River, views from the plateau area of the Town to the river are non-existent. The generally level nature of the plateau in conjunction with the narrow river trench and the wooded, narrow escarpments combine to effectively obscure the river's visibility. What is visible is the escarpment on the western shore in Menands and Colonie. This area is quite urbanized, but with much green space. To the southwest are the high-rise buildings of downtown Albany.

The wooded escarpment and river flat are unto themselves a visual asset for observers on the Town's waterfront, in the river and from the western shore of the river. Aside from the sewage treatment plant, the power lines and the WRPI radio tower on Glenmore Road, the waterfront area is undeveloped. Its emerging vegetation provides visual relief to motorists on I-787 or boaters on the river, in contrast to the adjacent developed areas of Rensselaer and Troy. The river flat area aesthetics are enhanced by the backdrop of the wooded escarpment. Site color provided by the vegetation, particularly that on the river flat, is subdued during the warmer months, but is somewhat stark in the winter. A greater variety of hardwood tree species on the escarpment in conjunction with scattered evergreens, provides greater color variety, particularly during autumn. The ravines are visually worthy, as well, as they provide a visual complement to the steep slopes and associated forest cover.

Minor negative visual elements are the power lines, the sewage treatment plant facilities, and the radio tower. But these features are outweighed by the overall visual character of an undeveloped waterfront.

C. DEVELOPMENT ISSUES

The primary issue in the North Greenbush waterfront is to establish guidelines for access to and use of the riverfront in a way that protects the riverfront environment. More specifically, the following concerns must be addressed:

1. Encouraging More Active Use of the Waterfront in Light of the Difficulty of Access and the Sensitive Environment.

Despite having two miles of river frontage, the Town of North Greenbush and its residents receive no benefits from it. The riverfront north and south of the town is devoted to industrial uses. Although there are obstacles to be overcome, as described above, the opportunities that will result from use of the riverfront warrant the effort to do so, if carefully planned.

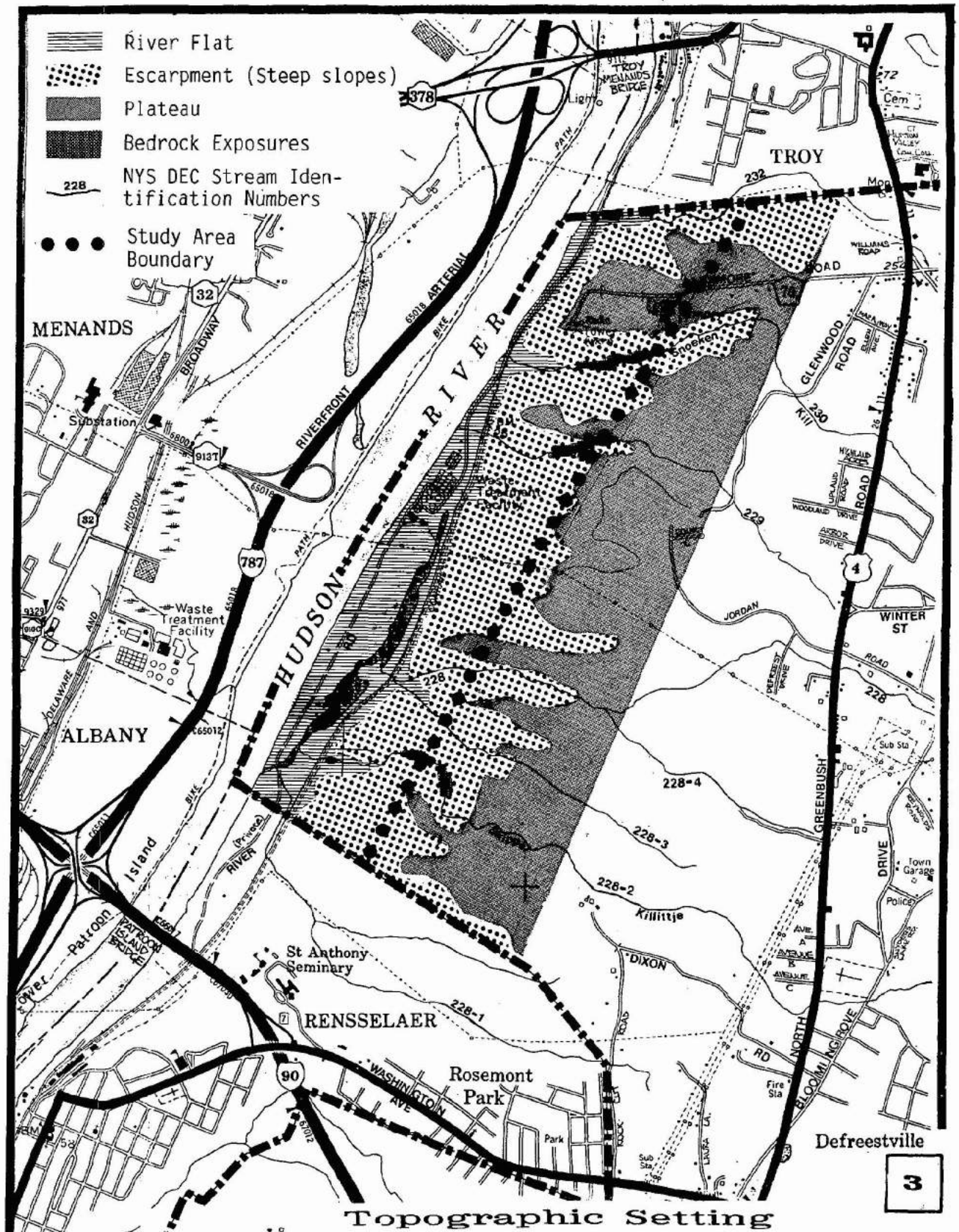
Although there are obstacles to be overcome, as described above, the opportunities that will result from use of the riverfront warrant the effort to do so, if carefully planned.

2. Appropriate Design of Riverfront Access

The fragile soils of the escarpment must be recognized in the design of an access road to the river. The location of such a road must consider the unstable conditions, steep grades and existing vegetation.

3. Guidelines for Land Use in the Waterfront Area

Because of the ownership pattern, access limitations, and environmental limitations, the type and intensity of use must be carefully controlled. The benefits of waterfront development providing access and recreation opportunities must be balanced against the potential damage to the environment.



Source: LaFleur (1965)
RPI University Park Master Plan (1981)
North Greenbush LWRP Prelim. Draft (1984)

3

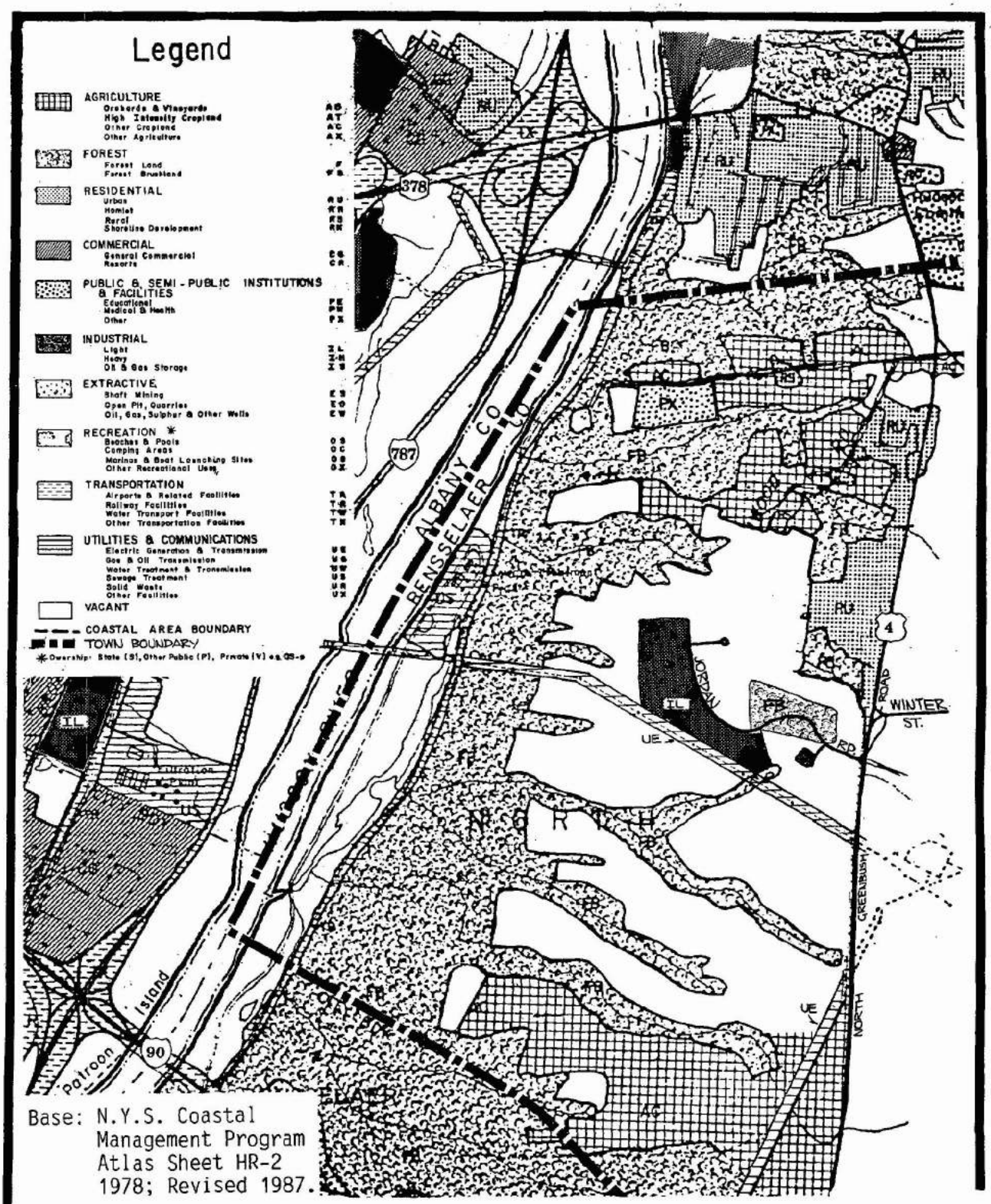
Topographic Setting

LOCAL WATERFRONT REVITALIZATION PROGRAM

TOWN OF NORTH GREENBUSH

Shuster Associates

Planning Consultants



Base: N.Y.S. Coastal Management Program Atlas Sheet HR-2 1978; Revised 1987.

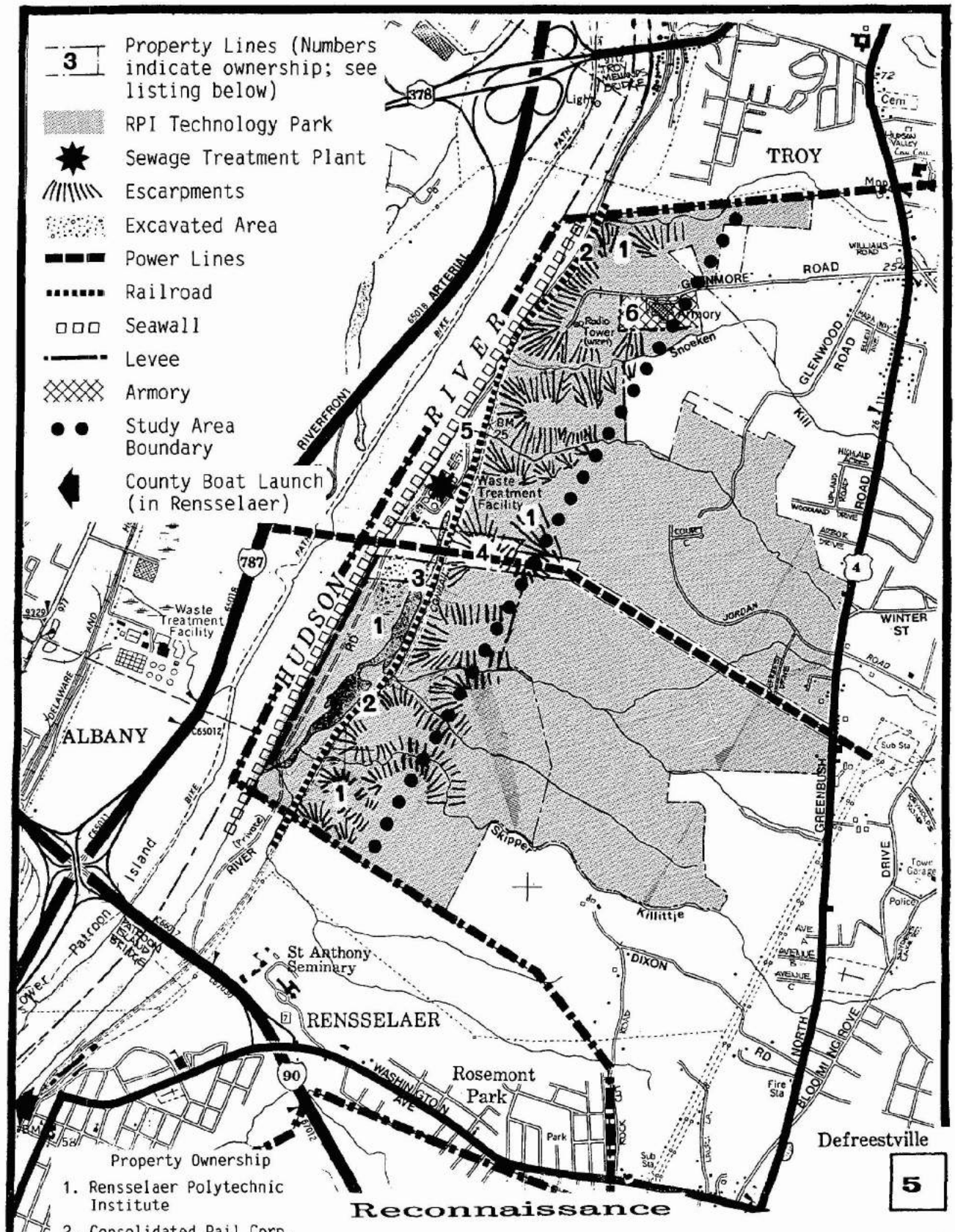
4

Existing Land and Water Use

LOCAL WATERFRONT REVITALIZATION PROGRAM

TOWN OF NORTH GREENBUSH

Shuster Associates Planning Consultants



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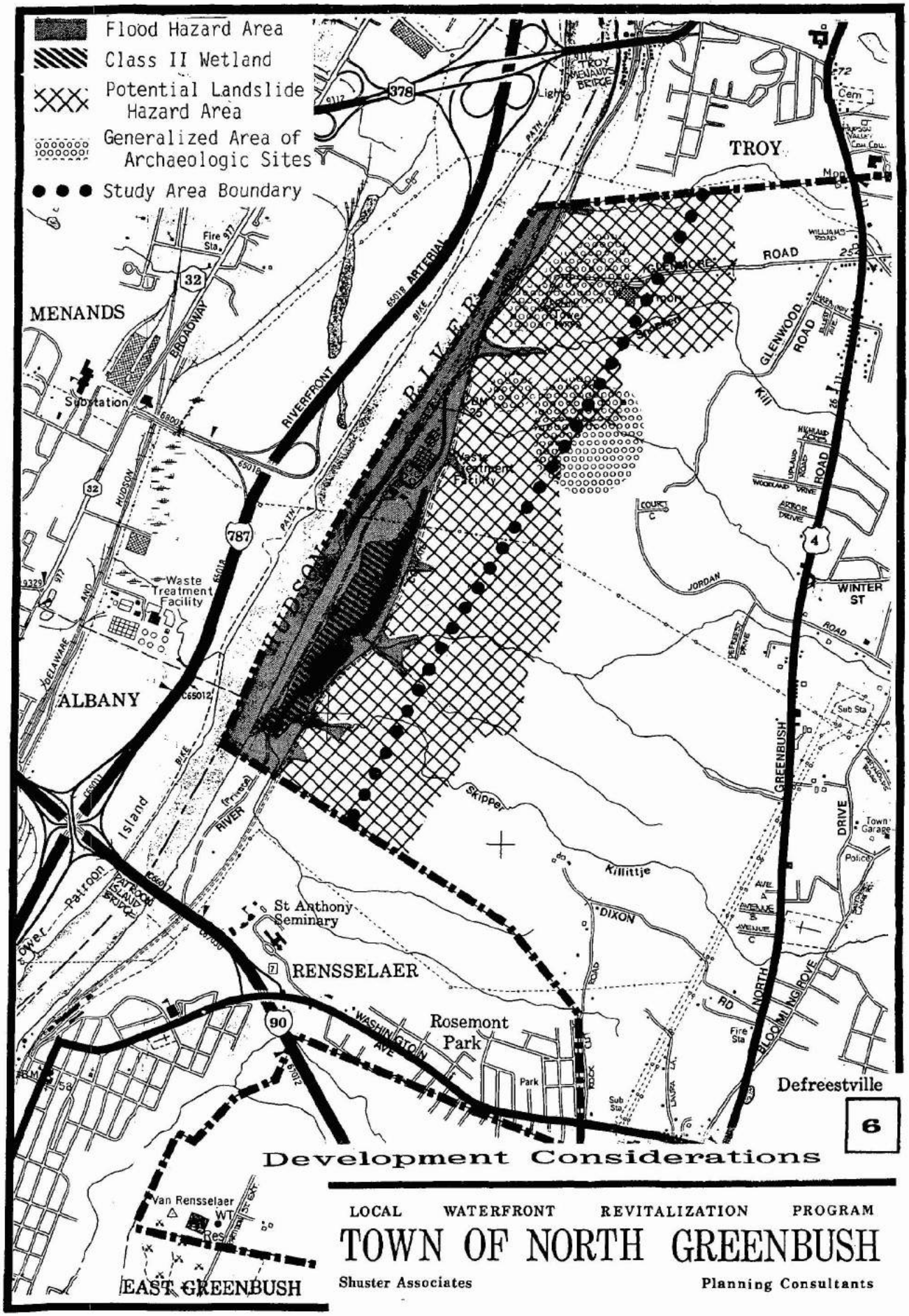

6

Development Considerations

LOCAL WATERFRONT REVITALIZATION PROGRAM

TOWN OF NORTH GREENBUSH

Shuster Associates

Planning Consultants

INVENTORY AND ANALYSIS EXHIBIT

WATERFRONT ARCHAEOLOGICAL RESOURCES

ARCHEOLOGICAL AND HISTORICAL SURVEY

OF RPI'S

NORTH GREENBUSH PROPERTY

Field Survey

Prepared by

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July 1980

ABSTRACT

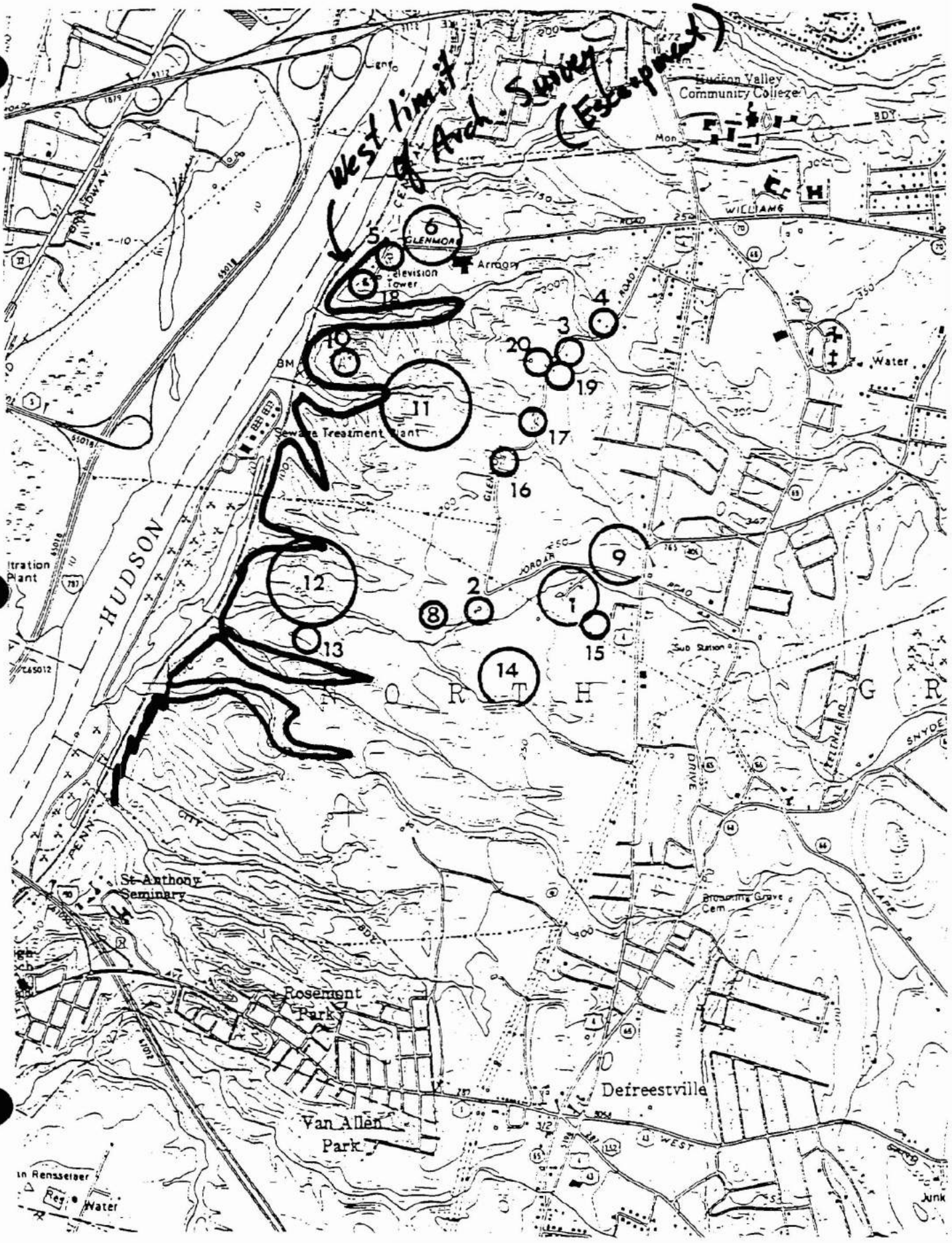
This report details the archeological field study of the proposed Technology/University Park in North Greenbush, Rensselaer County, New York. The literature review and background study has been previously submitted.

Twenty historic and prehistoric sites ranging from the Late Archaic period (c. 2000 B.C.), including early historic 18th century settlements and 19th century farms, to modern dwellings were located in this survey.

Nine sites (three historic and six prehistoric) are within areas of planned development. One of these (Site 1) is already listed on the National Register of Historic Places. Another three prehistoric and two historic sites may be preserved by avoidance, since they are in areas of secondary development.

If these sites are not avoided by the proposed development, additional archeological investigation is recommended in order to determine if these sites are eligible for inclusion in the National Register of Historic Places.

Map 2: Archeological and Historical Site Locations



Standing structures outside of the project, area, but near the boundaries (sites 3,4, 19, 20) were photographed and recorded on inventory forms of the New York State Department of Parks and Recreation, Division for Historic Preservation. Identification of these structures was primarily based upon correlations with historic maps and other references.

The field survey, directed at site location, did not involve large area excavations at any single location. Subsurface tests were excavated in the vicinity of previous tests that located early historic or prehistoric material. These tests attempted to delineate the size of the archeological site, as well as its depth and content. However, it should be noted that minimal excavation was conducted in high artifact density areas within these sites, since the objective was primarily to locate and delimit areas of archeological deposits. This method has resulted in generally low numbers of artifacts from these sites. This cannot be considered representative of the actual artifact content at these sites.

The following report will focus on those subsurface tests that yielded prehistoric or early historic items and have been considered archeological sites. The large number of tests which did not produce material evidence were recorded and located. The field records from these tests are on file in the archeology lab at R.P.I.

The sites located during this survey include:

1. The Defreest Homestead - National Register Historic Places District

2. J. Manville House Site (possibly 18th century Marte Defreest House Site)

3. Gardner House (M. Bloomingdale) (off R.P.I. property)

4. G.P. Bloomingdale House (off R.P.I. property)

5. Haydock House Foundation (19th century)

6. Radio Tower Area Prehistoric Site (vicinity of Tests 960, 975)

7. (Parker Site not located in field - see Literature Review)

8. Manville Field Prehistoric Site - west of Site 2 (vicinity of Tests 135, 160)

9. Alfalfa Field and Pasture Prehistoric Site (vicinity of Tests 736, 812, 815)

10. Prehistoric Site (vicinity of Test 998)

11. Prehistoric Site (vicinity of Test 1005)

12. Prehistoric Site (vicinity of Tests 1070 and 1072)

13. Prehistoric Site (vicinity of Test 1114)

14. Prehistoric Site, field south of P. Defreest House (Site 1)

15. Prehistoric Site, field west of Dudley Heights Road.

16. G. Manville House Site (Late 19th century)

17. Prehistoric Site and 18th century House Site

18. Church Property (20th century)

19. C. Slitter House (east side of Glenwood Road) (off R.P.I. property)

20. Slitter House (west side of Glenwood Road) (off R.P.I. property)

The locations of these sites are shown on Map 2.

SITE 1

The National Register of Historic Places lists the Philip Defreest House and surrounding grouds as part of the Historic Defreest Homestead District (Map 3). The previously submitted Literature Review included the National Register Nomination form and boundaries for this District.

The site, as shown on the project map (Map 4), consisted of a house (Photo 1), garages (Photo 2), two barns, (Photo 3), and several sheds.

Table 19

Age Estimates for Prehistoric Occupation

Site	Point Type	Period	Approximate Dates
1	"narrow-stemmed"	Late Archaic	2000 - 1900 B.C.
	Susquehanna Broad	Late Archaic	1500 - 1000 B.C.
6	"narrow-stemmed"	Late Archaic	2000 - 1500 B.C.
11	"narrow-stemmed"	Late Archaic	2000 - 1500 B.C.
14	Levanna	Late Middle to Late Woodland	850 - 1400 A.D.