Stage 1A Cultural Resources Investigation

Gratwick-Riverside Park Site
(NYSDEC Site No. 9-32-060)

City of North Tonawanda
Niagara County, New York

Prepared for Conestoga-Rovers & Associates

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Project Location: Niagara River shore in the northwestern section of the City of North Tonawanda, Niagara County, New York.

Project Description: Stage 1A Cultural Resources Investigation for the Gratwick-Riverside Park Site (NYSDEC Site No. 9-32-060).

Regulatory Agency: New York State Department of Environmental Conservation (NYSDEC).

Landform and Environment: The project area lies on the Niagara River shoreline and the Lake Tonawanda Plain, a subarea of the Huron Plain located on the Erie-Ontario Lowland. The Site has been heavily disturbed, primarily, as a result of industrial dumping. Residential neighborhoods border on the northwest and the River borders the Site on the southwest and west. A marina and River Road border the Site on the south and east, respectively. Parallel and adjacent to River Road on the east lie the Conrail tracks (active) and beyond them a mixture of sparse residential, light industrial and vacant land.

Work Completed: Research consisted of a records search, interviews, site walkover, and photography. No National or State Register eligible or listed properties are in the vicinity. Background research revealed no known archaeological properties within or immediately adjacent to the project area.

Results and Recommendations: The Site has been extensively disturbed as a result of a number of activities over the past 100 years. The most significant was the dumping of slag by the Tonawanda Iron & Steel Company. Remediation activities will cause no new impacts to the Site and, as planned, will have very little or a positive visual impact on the surrounding area. No additional cultural resources work is recommended.

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Introduction

The purpose of this Stage IA Cultural Resources Investigation is to determine whether the proposed remediation of the Gratwick-Riverside Park Site (# 9-32-060) will impact known cultural properties that may be listed on, or potentially eligible for listing on, the National Register of Historic Places. In addition, the impact area will be assessed for its potential to yield previously unrecorded cultural resources within the potential impact area. The areas of concern include direct impacts from construction activities and aesthetic or visual impacts resulting from the completed facility. This survey is being conducted for Conestoga-Rovers & Associates (CRA). Some material, when relevant, was adapted from a Stage 1A survey conducted for the Niagara County Refuse Disposal Site immediately north of the project area (Butterbaugh and Schieppati, 1995).

Remediation Project Description: The purpose of the remediation of the Gratwick-Riverside Park Site is to control, through the installation of a barrier wall and groundwater collection system, the off-site migration of chemicals to the Niagara River, thus providing for the protection of public health and the environment. The Site consists of a 53 acre parcel located between the Niagara River and River Road in the northwest section of the City of North Tonawanda, New York (Figures 1 and 2). Both industrial wastes and municipal trash were dumped at the Site until 1968 and the dumping may have begun as early as the turn of the century. Following Site closure, the northern section of the Site was graded and seeded, and reopened as a municipal park. The southern section of the Site remains vacant (URS, 1991; NYSDEC 1991).

The selected alternative consists of six primary elements (see Figure 3):

(1) Installation of an overburden groundwater collection system, connected by a force main, along a line adjacent and parallel to the River shoreline. The collected groundwater will be discharged to the North Tonawanda Waste Water Treatment Plant for treatment.
(2) A barrier wall installed along the entire length of River shoreline (ca. 4,900 ft). The barrier wall will reduce the hydraulic connection between the River and the Site overburden.
(3) Construction of sloped bank stabilization along the shoreline (ca. 4,900 ft) to prevent shoreline erosion.
(4) Placement of a permeable soil cap over the Site consisting of filter fabric, twelve inches of fill and six inches of soil capable of supporting vegetation. The permeable cap will promote flushing of chemicals into the groundwater which will be extracted and treated.
(5) Remediation of the pothole area by *in-situ* solidification.
(6) Remediation of three storm sewers traversing the site by lining.

This alternative will allow for the retention of some of the park's current elements while

eliminating contact with surface soils. The overburden groundwater gradient is to the River, promoting flow to the groundwater collection system.

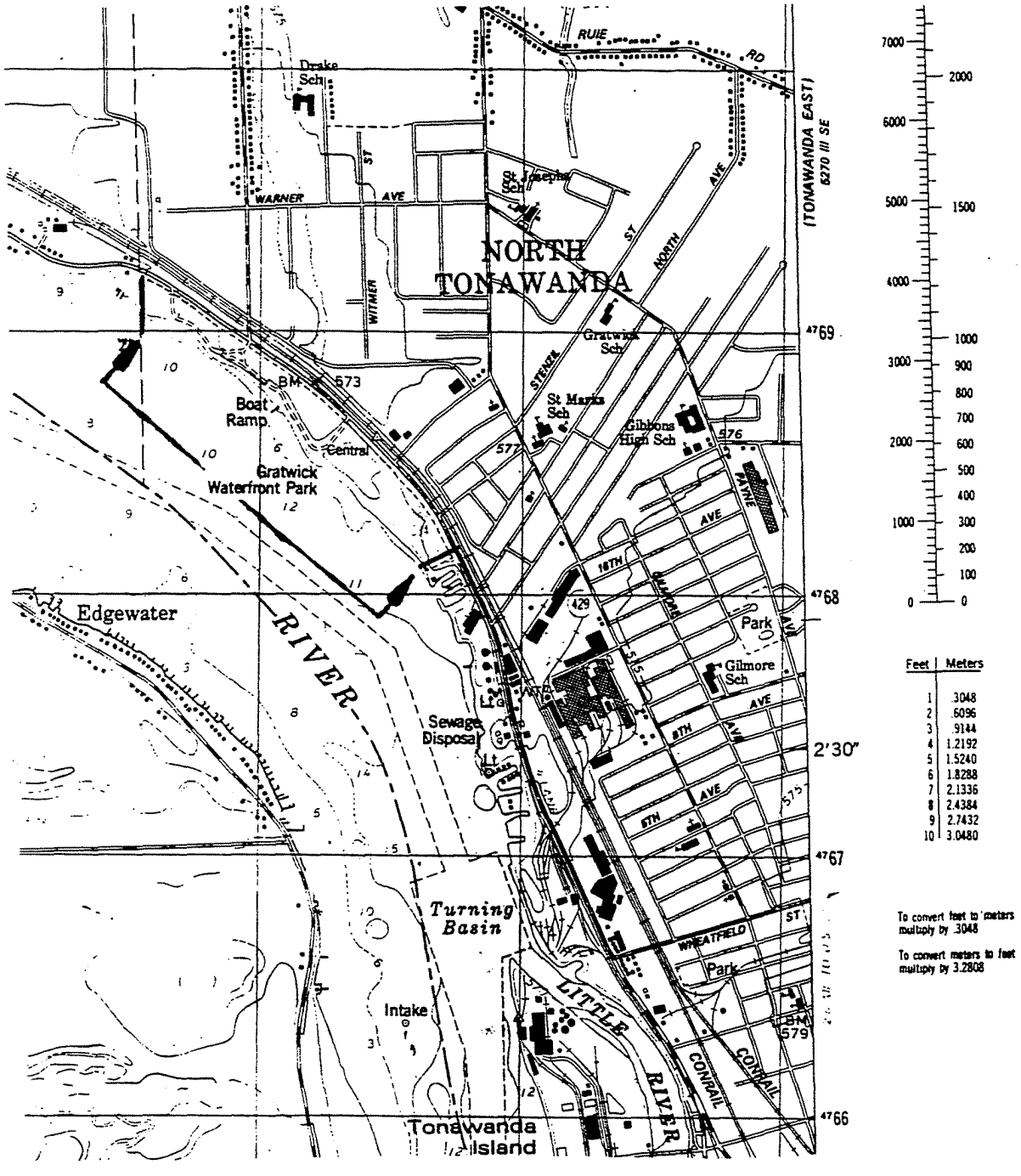

Figure 1 - Location of the Project Area on the Tonawanda West, N.Y., U.S.G.S. 7.5 Minute Quadrangle (1980). Scale is on right.

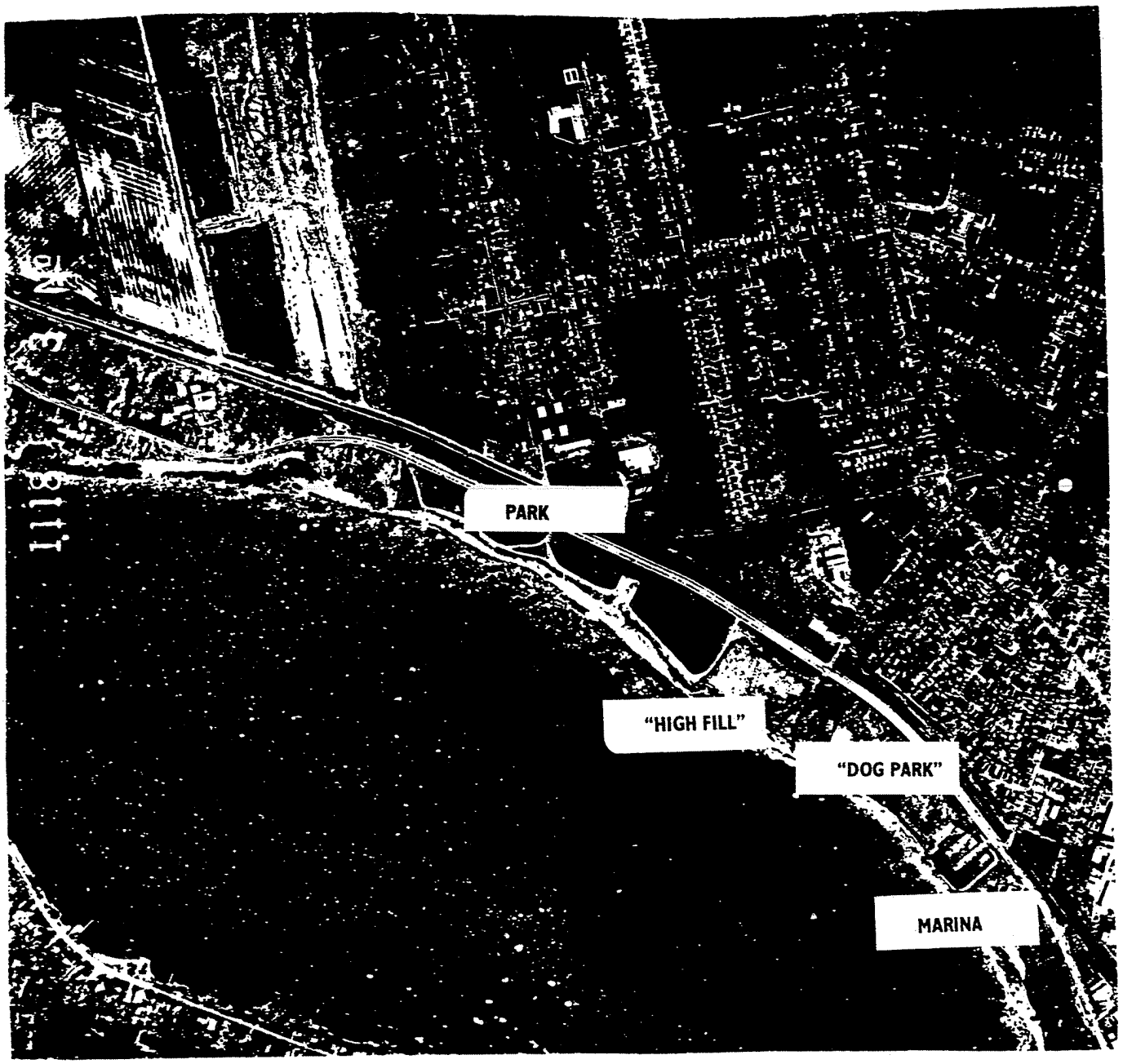

Figure 2 - Location of the Project Area on a 1990 aerial photograph indicating the locations of the park, high fill area, Dog Park, and marina.

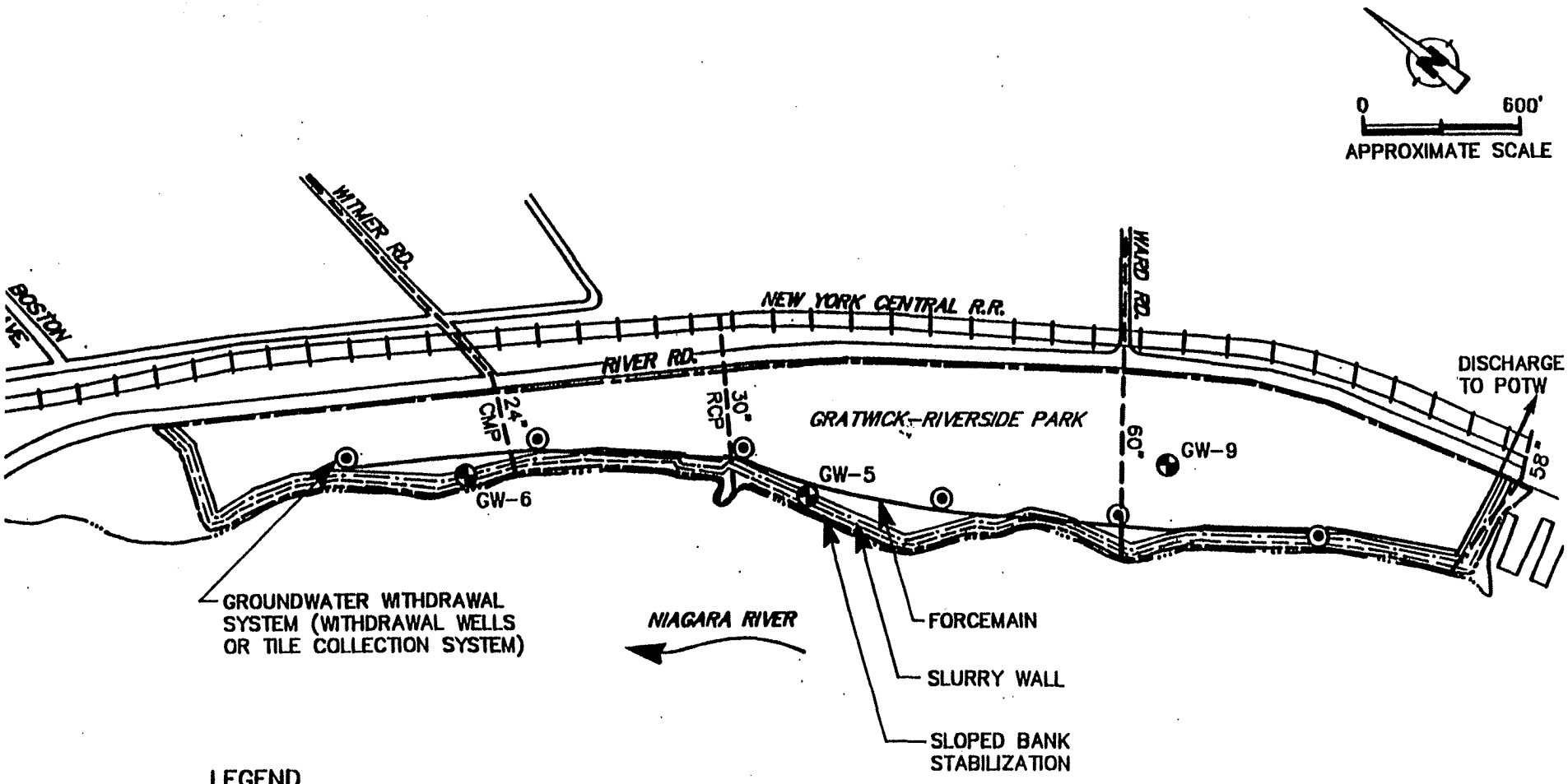

figure 2.4

CONCEPTUAL REMEDIAL ALTERNATIVE PLAN VIEW

Gratwick–Riverside Park

CRA

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Figure 3 - Conceptual remedial plan for the Gratwick-Riverside Park Site, North Tonawanda, NY.

Scope of Cultural Resources Work: Research, interviews, and field work were phased during this project to identify cultural resources, evaluate disturbances, document resources in the area, and generate sensitivity assessments in the two project components as follows:

Site: Since filling activities obviously have affected any cultural resources that might have been present, background research was conducted to identify any known cultural resources which may have existed previously and to assess the level and types of disturbance that occurred. Field work was then conducted to confirm, assess and document this disturbance and to produce a sensitivity assessment.

Viewshed: Analysis of historic maps, interviews, literature research and a computer search to identify any historic properties listed on or eligible for inclusion in the National Register of Historic Places were conducted to determine if any historic properties have a view of the Site. Following this phase, the limits of the Viewshed were field-checked to ensure that all relevant buildings or properties were included. Due to the nature and ultimate elevation of the remediation project, as presently planned, the viewshed does not extend beyond the Conrail tracks to the east and northeast of the project area. As can be seen in Photo 1, the Site is barely discernable from the Grand Island shore (the width of the River is ca. .6 mi). Visual concerns are thus restricted to impacts on River traffic, traffic on River Road, and public use of the Site following completion of the remediation project.

Environmental Background

General Setting: The project area is located on the Lake Tonawanda Plain (D'Agostino 1958; Buehler and Tesmer 1963:9), a subarea of the Huron Plain (Higgins et al. 1972:1) which lies in the Erie-Ontario Lowland (Miller 1973:5). The Lake Tonawanda Plain is conspicuously different from the surrounding region, being virtually level as opposed to the rolling terrain which characterizes the general vicinity (D'Agostino 1958:1). The terrain immediately adjacent to the Site lies between 564 (approx. River level) and 580 feet (172 and 177 meters) above mean sea level (AMSL), while elevations within the Site range from 564 ft (172 m) at the River to 586 ft (179 m) AMSL at the high fill area (URS 1989). This latter figure could be somewhat higher

since the deposition of fill has continued since the topographic survey was performed.

Geology: Bedrock at the Site consists of Camillus Shale, which normally begins at about 550 ft AMSL, underlain by Lockport Dolomite (U.S. Army Corps of Engineers, 1973). The dolomite formation is typically 50 feet (15 meters) below original ground surface while the shale is around 30 feet (9 meters) below ground surface, when present. The ground surface and soils are the result of deposition of Wisconsin glacial till and sediments from late glacial and, in the case of the project area, Holocene lakes. From borings taken at the Site (URS, 1989), bedrock elevation ranges between 512 and 538 ft AMSL. Above the bedrock is a 25± ft layer of glacial till overlain by a thin layer of lacustrine silt and clay.

The history of the glacial lakes that affected the geological history of the Site is very complex, since a dozen or so late glacial lakes covered parts of western New York. Only a few of these lakes lasted long enough to deposit recognizable strandlines (Calkin and Miller 1977). All of northwestern New York was covered by ice during the latter part of the Pleistocene. Northwest air masses dominated the climate for most of the year and conditions were cold, snowy and relatively damp. At the end of the glacial period, westerly air masses from the Pacific Ocean began to dominate the continental climate, leading to a long period of rising temperatures with less precipitation (Eichenlaub 1979). This process lead to deglaciation of western New York, beginning approximately 17,000 years ago (Muller 1977:223). Final withdrawal of glacial ice north of the Niagara Escarpment was rapid, occurring sometime prior to 12,000 years ago and lasting no more than a thousand years (Miller 1973:9; Calkin and Miller 1977:302). At that time, the entire County was inundated by glacial Lake Lundy. As the ice continued to recede northward, new outlets allowed Lake Lundy to drain rapidly from an elevation of approximately 825 feet (251 meters) AMSL, forming proglacial Lake Iroquois north of the Niagara Escarpment, Early Lake Erie on the Erie Plain, and causing Lake Tonawanda to pond between the Niagara and Onondaga Escarpments at an initial elevation of 630 feet (192 meters) AMSL (D'Agostino 1958:5-7; Figure 4).

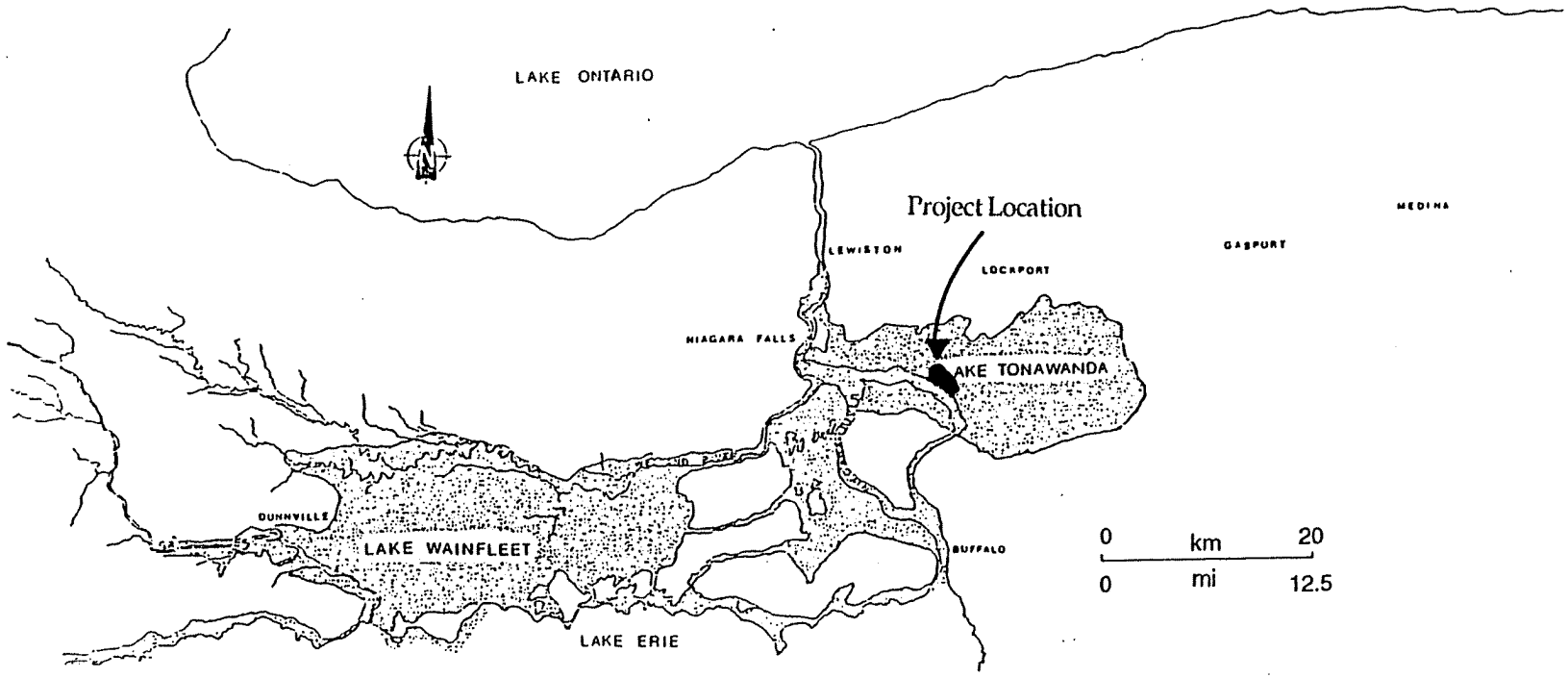

Figure 4 - Extent of Lakes Wainfleet and Tonawanda during the Nipissing I Episode (adapted from Pengelly 1990). Lake level approx. 591 ft (180 m) AMSL.

At its greatest extent Lake Tonawanda was approximately 6 miles (10 kilometers) wide (north-south) by 58 miles (93 kilometers) long. Immediately after glacial retreat, outflow from Lake Erie was through Lake Tonawanda and its five outlets over the Niagara Escarpment at Holley, Medina, Gasport, Lockport and Lewiston (i.e., the Niagara Gorge). By 10,900 B.P. isostatic rebound closed all but the Niagara Gorge outlet (Calkin and Brett 1978). Since no continuous beaches or strandlines were formed at 630 feet (192 meters) AMSL, the level of Lake Tonawanda must have lowered rapidly in its earliest stage. At the western end, in the vicinity of the project area, the shoreline of middle-stage Lake Tonawanda occurred at 580 feet AMSL (D'Agostino 1958:39). Therefore, the northern quarter of Grand Island and almost the entire project site and viewshed were covered by lake waters, as can be seen in Figure 4.

D'Agostino (1958:61-62) and others (e.g., Buehler and Tesmer 1963) assumed that Lake Tonawanda drained after a relatively short time, leaving behind remnants such as Oak Orchard Swamp, located well east of the project area. However, Pengelly (1990) and Tinkler and Pengelly (1990) have demonstrated that the Nipissing high water episode which occurred in the western Great Lakes from approximately 5,500 to 3,900 B.P. (Larsen 1985) also occurred in the Erie Basin. They have also found that the level of Lake Erie has oscillated substantially during the Holocene and has been markedly higher at times due to a complex series of events caused by isostatic rebound and the switch of Lake Erie's original controlling sill at the Niagara Gorge to the present sill at Fort Erie (Tinkler and Pengelly 1990). This is important to this study since Lake Erie and Lake Tonawanda had the same levels from the early postglacial era to around 2,600 B.P. (ibid.; D'Agostino 1958:58-60). Larsen (1985) and Pengelly (1990) found that four high water episodes occurred between approximately 7,000 and 3,500 B.P. This massive flood, caused by closing of the Nipissing outlet through North Bay and the Ottawa River from isostatic rebound, created Pengelly's inland Lake Wainfleet and re-created Lake Tonawanda (Figure 4). The increased flow through the Niagara River increased the recession rate of Niagara Falls, causing the Lyell/Johnson sill to erode to the same level as the Peace Bridge sill at the eastern end of Lake Erie. When the Falls breached the Lyell/Johnson ridge, the Fort Erie sill began to maintain Lake Erie near its present level while water levels between the sills dropped rapidly, draining Lakes Wainfleet and Tonawanda. However, rises in river levels occurred later. Given

the fact that the water table in the Site is presently somewhere above 565 feet (172 meters) AMSL (URS, 1989), the area must have remained rather wet, even during low water episodes, due to the slow drainage properties of the native soils (Higgins et al. 1972).

Soils: The project area lies in a general area of soils of the Canandaigua-Raynham-Rhineback association: Deep, somewhat poorly drained soils which formed in lake-laid silts and fine sands (Higgins et al. 1972). As shown in Figure 5, the following soils are currently present in the Project area to some extent and occupied the Site prior to landfill operations (ibid.):

- Canandaigua silt loam, a deep, poorly to very poorly drained soil formed in lacustrine deposits of silt, very fine sand and clay. These soils are level and depressional, susceptible to ponding, receives run-off from surrounding areas, and tends to drain slowly. The soil can have a mucky or sandy surface layer.

- Raynham silt loam, a deep, somewhat poorly drained, medium textured soil formed from sediments deposited in Lake Tonawanda.

It is assumed that the soil survey extrapolated the project area for these soils since, as will be discussed, the presence of native soils may be spotty at best. The Canandaigua and Raynham soils occupy the northern and midsection of the project area, respectively. Soils in the southern section were undifferentiated by the soil survey.

Surface Hydrology: The full length of the project area abuts the Niagara River and natural drainage of the Site is to the River. In the last century, there is evidence from atlases (Beers, 1875) that a small stream or drainage extended to the River from the northeast, through the midsection of the present park area.

Flora and Fauna: Vegetation present on the Site includes annual and perennial grasses and pioneering herbs, shrubs, and trees. Dry shrub grasslands, which include annual and perennial herbs, grasses and a number of trees, are also present in this area.

Paleoenvironment: The general trend from deglaciation to 1,500 years ago has been one of gradually rising temperatures, while precipitation has remained relatively stable over the

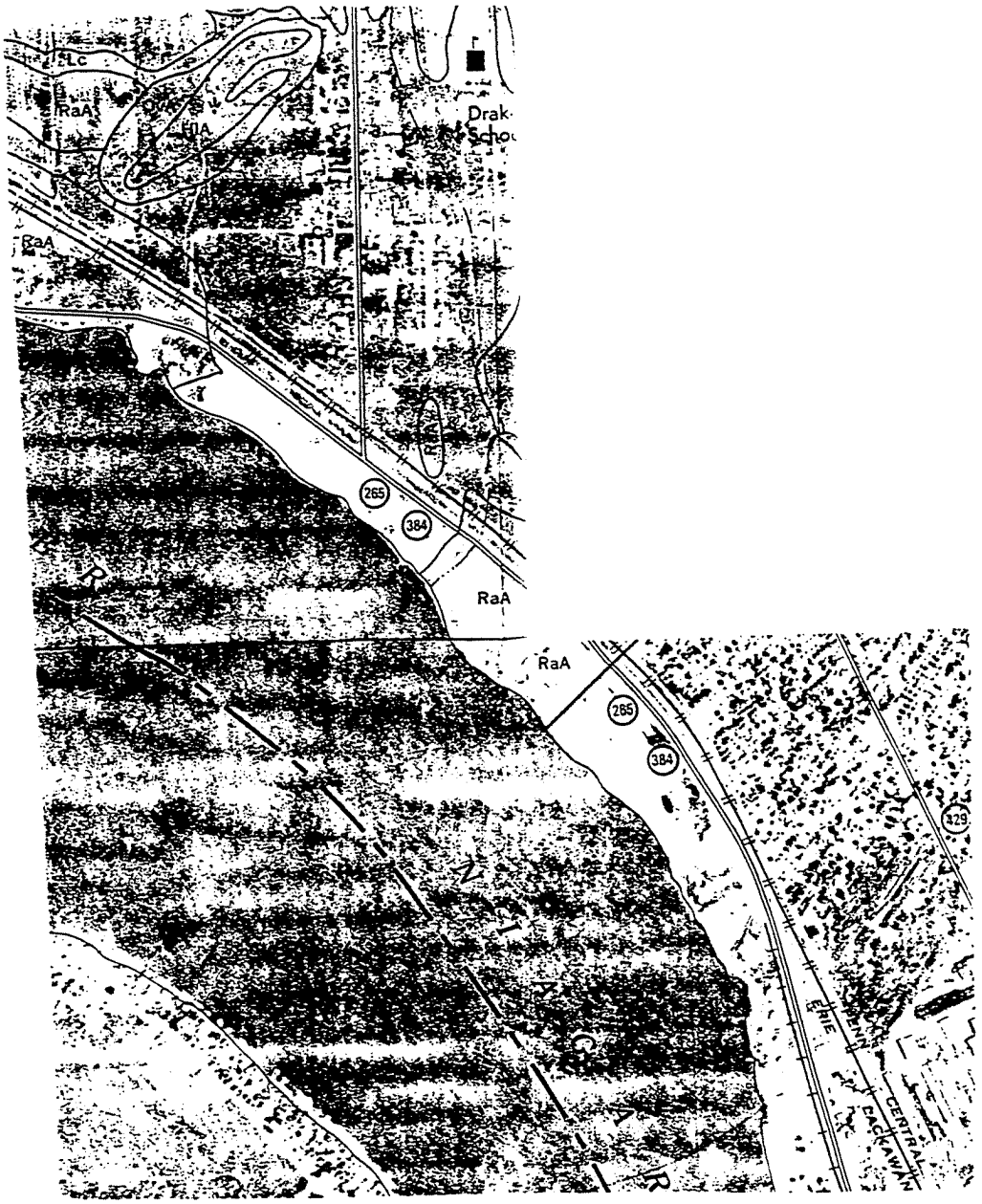

Figure 5 - Soils in the Project Area, Niagara County Soil Survey (1972)

last 8,000 years (Miller 1973). As noted previously, the project area was heavily influenced by the complex history of Lakes Erie, Wainfleet and Tonawanda. These water level changes would have had a greater influence in floral and faunal resources in the area during the Holocene than these general climatic trends.

The regional pattern of floral evolution has been addressed by Miller (1973), Calkin and Miller (1977), Muller (1977) Pengelly (1990), and Terasmae (1980). Numerous authors have constructed charts proposing correlations between environmental, chronological and cultural changes through the Holocene. One of these was published by Rippeteau (1977) and is reproduced as Figure 6. Although the chart was constructed for the Susquehanna Valley, it is useful for illustrating these trends through New York's prehistory. However, although many palynologists and archeologists use modern environments such as boreal forest now present in central Quebec as analogs for conditions in the past, these analogs are deficient and have biased interpretations of prehistory. Guilday (1974) has found that a greater number of micro habitats existed in the past than are now present, and that many species that can not compete now could compete in former times. Therefore, prehistoric environments were much more diverse than existing ones (ibid.; Lundelius 1974), something one must keep in mind while studying Figure 6 and reading the following synopsis.

Herb pollens indicative of open tundra appear immediately after deglaciation of the area, followed by a spruce pollen zone which lasts from 12,000 to 10,500 B.P. (Terasmae 1980). This open spruce woodland, which developed quickly on exposed surfaces as the proglacial lakes drained, was dominated by white and black spruce, but also included significant amounts of herbs and, at the end of this period, some jack pine, oak, fir, larch and birch (Calkin and Miller 1977:305; Muller 1977:229). The landscape near Lake Tonawanda at the end of this period (i.e., 10,500 B.P.) would have had this spruce-fir forest in higher areas some distance away from the shoreline, which would have had extensive meadows of grasses and sedges in lower areas; willow, alder and birch accompanied by a shrub border would occupy the intermediate area (Muller 1977:231; Calkin and Miller 1977:305). During the spruce woodland period, mammoths, mastodons, and caribou appear to have clustered in poorly drained lowland areas near Lake Iroquois and Lake Tonawanda and the existence of open swamp and meadow could easily sustain this herbivore population (Muller 1977:232; Calkin and Miller 1977:305, 308).

Terasmae (1980) stresses the dominance of pine after 10,500 B.P., proposing a marked increase in white pine which lasts until approximately 7,600 years ago. This early pine and pine-oak forest was believed by many archeologists (e.g., Ritchie 1969; Fitting 1968; Ritchie and

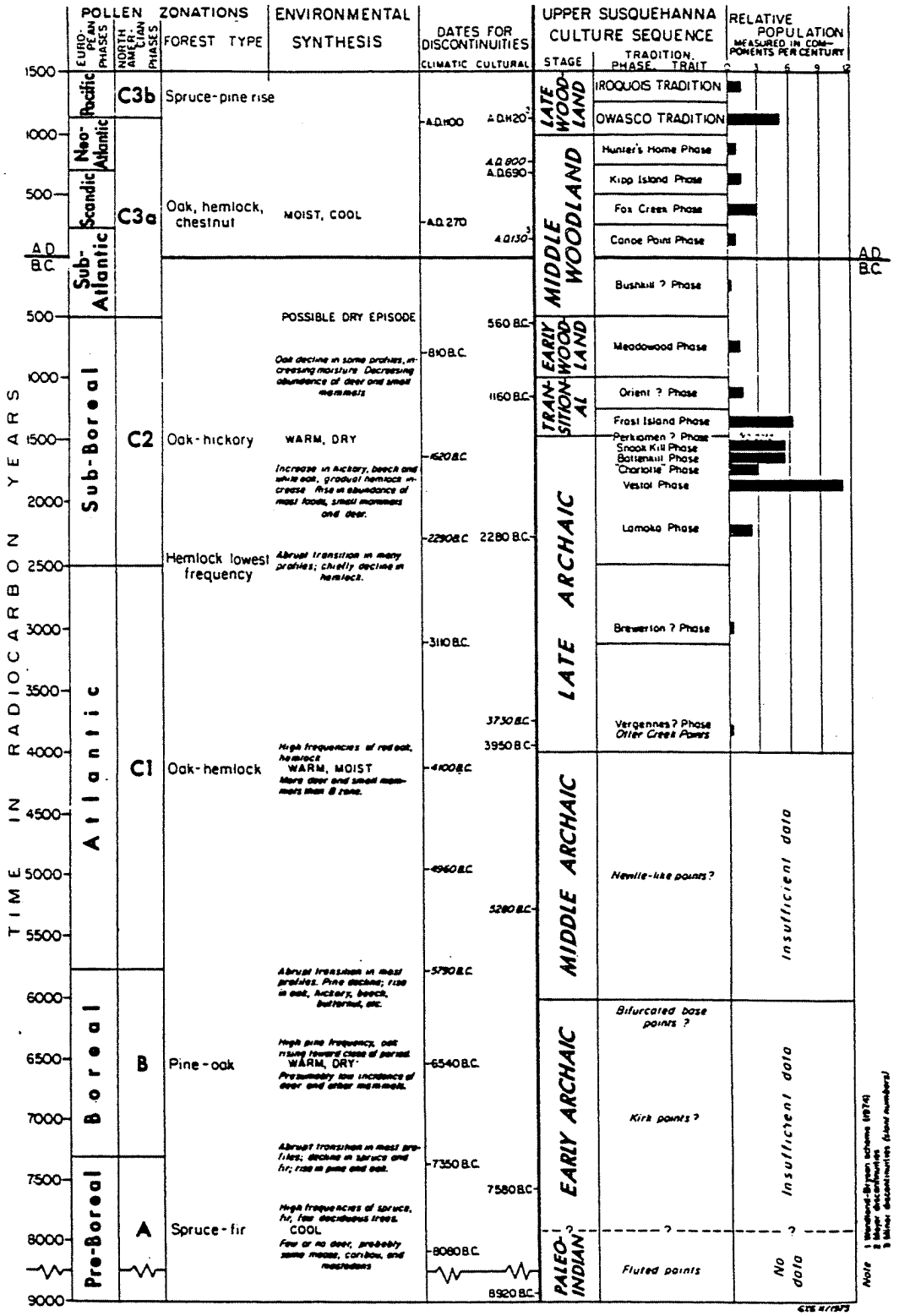

Figure 6 - Holocene Vegetation Succession and Culture History (after Rippeteau 1977)

Funk 1973) to have provided an impoverished resource base. However, oak was an important component in this pine forest as early as 12,500 B.P. in southern New York (Sirkin 1977), and Calkin and Miller (1977:305) propose a white pine-oak forest with oak and/or sugar maple in uplands and elm and black ash in lowlands after 10,500 years ago. While Trubowitz (1979) believes that hardwoods were actually dominant in western New York after 9,000 years ago, a conservative estimate of the environment is that pine peaked around that time and began to decline, possibly due to rising temperatures. This hypothesis is supported by evidence from southern New England, where Dincauze and Mulholland (1977:447-449) have found that temperatures were at or above modern levels during this time. Regardless, the decline in pine, which all authors agree upon, was off-set by a rise in hemlock, beech, and later oak, marking the establishment of a complex northern hardwoods forest by 8,500 to 8,000 B.P. (Calkin and Miller 1977:305). From 9,000 to 6,000 years ago floral communities were highly variable in time and space, with unstable plant associations and a greater number of species than in modern times. Therefore, rather than having an impoverished resource base, diverse floral and faunal communities would have been present, although they would have been at least somewhat unpredictable (Dincauze and Mulholland 1977:450).

All authors agree that this Hemlock-beech-hardwood zone, characterized by loss of pine, continues up to the arrival of Euroamerican settlers. Essentially modern floral and faunal patterns were established by 4,000 to 3,000 B.P., if not earlier (Mason 1981). At that point the vegetation and faunal patterns would be similar to those encountered by early settlers. General accounts from the 1800's regarding vegetation east of the project invariably describe the area as heavily forested with sugar maple, beech, oak and elm, with lesser amounts of pine, walnut, hickory and dogwood (Miller 1973; Doty 1925:664). Understory species included sassafras, wild hops, fox grapes, ginseng, mandrake and various types of berries.

Miller (1973) has modeled the forest types that were probably present just prior to land clearing and indicates that the project area is near the boundary between beech-maple and northern hardwoods forest zones (Figure 7). The former forest type is characterized by stands in which 50% or more of the trees are sugar maple, birch and beech with smaller amounts of white pine, basswood, hemlock, elm, and white ash. Sugar maple seedlings often form a continuous

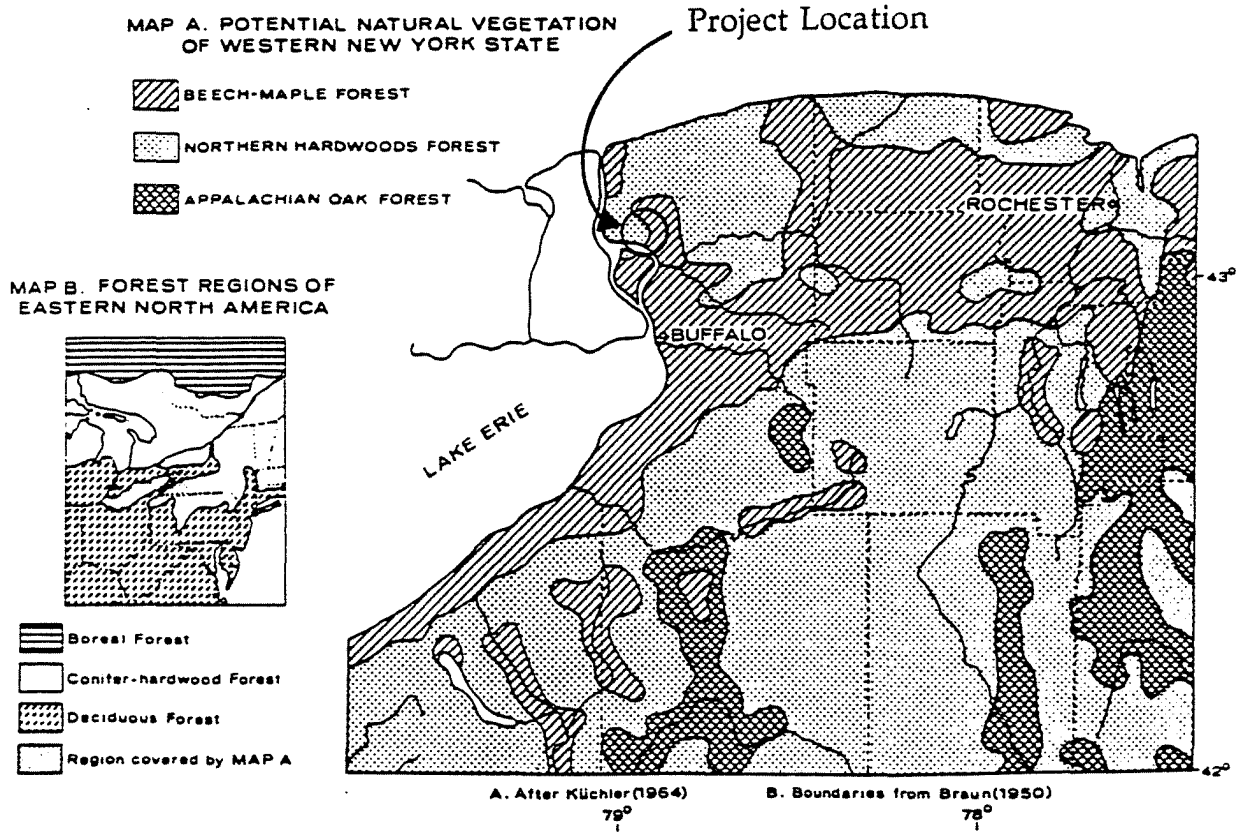

Figure 7 - Map of Potential Vegetation (after Miller 1973:15)

undergrowth. The Hemlock-northern hardwoods forests are dominated by hemlock, beech, and sugar maple with sporadic occurrences of yellow birch, basswood, red oak, white ash, ironwood, cherry and elm. Shade-tolerant shrubs and herbs would make up the understory.

As noted previously, the Project area was often rather wet compared to present conditions. Swamp forests on the Erie-Ontario Lowland were dominated by different combinations of the following species in order of decreasing importance: Elm, red oak, sugar maple, basswood, white ash, swamp white oak, green ash and black ash. Keene's (1981:56-61) exhaustive inventory of edible floral resources in temperate forests suggests that the following edible plants, nuts or berries could be expected in wet areas: Black huckleberry, currant, gooseberry, blueberry, hackberry, meadow garlic, groundnut, rosary root, crow potato,

arrowhead, skunk cabbage, cattail, marsh marigold, wood sorrels, and sedge.

Modern activities have drastically affected faunal resources in western New York also. During early historic times bear, wolves, deer, panthers, elk, numerous squirrels, partridges, quail, waterfowl and numerous pigeons were present (Doty 1925:664). Keene's list of faunal resources (1981:94-97) would add muskrat, beaver, raccoon, turtles and fish to this list. Obviously, quite a few of these animals are no longer found in the area and vegetation patterns present in and around the project area are the result of landfill activities and industrial development.

Numerous, diverse resources and micro habitats would have been present in the project area throughout prehistory, especially considering the oscillating water levels described earlier. Deer, for instance, feed on twigs, grasses and herbs, bush fruit and nuts (Keene 1981:101-102). Therefore, deer density would be highest in areas with a variety of micro habitats, and they would particularly favor swamps, forest borders, lake and marsh borders and areas of pioneer vegetation in lowlands (ibid.). Fishing and the gathering of other aquatic resources would have been an obvious source of food for any settlement situated along the River shore. Gathered vegetation is also an important resource, and most greens are found in moist woods, along the banks of the River, and other transitional zones. To summarize, the project area would have been an inviting area for prehistoric inhabitants, particularly for short-term camps. Dampness and accompanying insects would have made long-term settlement difficult.

Disturbance: Prior disturbance at the Site is a complex issue and will be discussed later in this report.

Background Research and Sensitivity Assessment

The site files of the New York State Office of Parks, Recreation and Historic Preservation (OPRHP), the New York State Museum (NYSM) and the Marian White Research Museum at the State University of New York at Buffalo (UB) were consulted to identify known sites in the area and any site location tendencies relevant to the project area.

Extensive background research on both the prehistory and history of the area was

conducted at the Map Room and libraries at the State University of New York at Buffalo, Buffalo and Erie County Public Library, Niagara Falls Public Library, North Tonawanda Public Library, Buffalo and Erie County Historical Society, and the Historical Society of the Tonawandas. Published sources consulted, but not necessarily cited in this report, are listed in the Bibliography. A number of interviews were also conducted during the course of this project, and will be presented below.

Culture History: This section examines the existing literature on cultural resources in and around the project area and provides a review of the culture history of the region. This review will be used, along with more specific information on sites in the area, to generate an outline of the cultural resources that could be found in the project area.

The first part of the section presents a review of the literature on the prehistoric culture history of western New York. A summary of historical events after Euroamerican contact and settlement follows, with an expanded discussion of the dominant factors in the development of the region. The section concludes with a subsection describing and evaluating recorded cultural resources in the vicinity of the project area.

The three major cultural traditions manifested in western New York State during the prehistoric era were the Paleoindian, Eastern Archaic, and Woodland Traditions. Cultural evolution of the area can be summarized as a gradual increase in social complexity, punctuated by several important cultural and/or technological innovations. The earliest people were nomadic big-game hunters; changing environmental conditions required an adaptation of the economy, resulting in a shift to the efficient exploitation of temperate forest resources by Archaic hunter-gatherers. In many areas of eastern North America, the Archaic is followed by a Transitional Period which bridges the Archaic and the subsequent Woodland Period. However, it does not represent a departure from Archaic social and economic patterns. Important changes do occur in the artifact assemblage and in burial practices, however (Ritchie 1955; Nichols 1928). The Woodland Tradition is marked by the introduction of pottery, agriculture, and burial mounds, and resulted in a plethora of new and very different social and economic adaptations.

After about 3,000 years ago external influences began to have an increasingly greater

effect as the area was occupied by groups who later formed the Erie and Neutral Confederacies. Culturally, they shared much with groups in southern Ontario, Canada. The tribes which eventually formed the Iroquois Confederacy evolved from antecedents in the central sub-area between the Genesee River and the Tug Plateau. There was very little interchange between these groups and those of the western New York area until the 17th century.

The arrival of European commercial interests, missionaries and, finally, settlers profoundly changed use of the land. The native population was essentially removed from the land following the War for Independence, and completion of the Erie Canal transformed western New York from a collection of frontier settlements into one of the centers of industry in the 19th century. However, away from the larger cities and villages, the area has maintained its rural character.

Paleoindian Period (ca. 13,000 - 10,000 B.P.): The precise date of humans' arrival in North America is unknown. However, access from eastern Asia via the Bering Strait land bridge was probably not possible prior to 40,000 years ago (Haag 1962). It was not until much later that the descendants of these peoples reached the northeastern United States. In New York the last glacial retreat occurred approximately 13,000 years ago, followed by a series of changing environmental conditions.

The earliest dated Paleoindian site in New York is the Dutchess Quarry Cave in the Hudson River Valley (12,530 B.P.) At this time, Lake Ontario and the St. Lawrence River were locked in ice, and the Hudson River Valley does not appear to have been an ideal environment for occupation: "The poorest possible adaptive strategy for Paleoindian hunters would have been an entry into the boreal forests with their low yields of plants and animals useful to man" (Fitting 1975:27). It is possible, however, that the environmental fluctuations that occurred during this early period were conducive to periodic forays by the Paleoindian groups into the region when conditions were suitable. As the climate gradually became more temperate, these forays may have become more extended.

Technologically, the Paleoindian has been associated with the fluted point industry. These points closely resemble the Clovis point, first discovered in the Southwest, and are generally classified as that type (Funk and Schambach, 1964). The points are generally large

(2.5 to 10 centimeters in length), with a flute on each face, produced when channel flakes were struck from the base. While many suggestions have been made regarding the function of the flute, the most obvious is that it facilitated hafting (Snow 1980). Other items in the Paleoindian tool kit included leaf-shape and ovate bifacial knives, end-scrapers, often equipped with graving spurs, and unifacial side-scrapers, knives and retouched flakes. Drills, awls and gravers are also diagnostic Paleoindian tools.

The Paleoindian subsistence strategy has traditionally been viewed as one which emphasized hunting big game. These species, many of which are extinct, included mastodon, mammoth, caribou and moose-elk, along with a variety of smaller game. Few tool associations have been made with aquatic resources remains. However, it is difficult to imagine these people not utilizing such a diverse and abundantly available food source once water conditions allowed.

Ritchie and Funk (1973:333) have classified Paleoindian sites into two main categories: quarry workshops and camps. These are further subdivided into large, recurrently occupied camps, small special-purpose camps, and caves or rockshelter sites. Chert quarrying and the preliminary stages of tool production were carried out at the tool workshops.

The Paleoindian settlement system may have been similar to the subsequent Archaic Stage system. During the seasonal peaks of resources, larger populations occupied strategically located large camps. During periods of low resource potential, the population dispersed, occupying small camp sites and rockshelters on a temporary basis.

A band level social organization is attributed to Paleoindian groups, with each band consisting of 25 or 30 people: They were initially "free wandering communities ... their direction, persistence and territory covered being controlled mainly by game movements and the abundance of other wild food resources" (Snow 1980:150, after Beardsley et al. 1956). As climatic conditions allowed more permanent occupation of an area, this wandering became more restrictive and bands settled into loose territories.

This general Paleoindian adaptive pattern overlapped the beginning of the subsequent Archaic Period, leading some to refer to the earlier periods of the Archaic as a transitional stage.

Archaic Period (ca. 10,000 - 3,500 B.P.): The Archaic Period is differentiated from the Paleoindian Period by a stylistic shift in lithic assemblage, an apparent increase in population,

changes in the subsistence strategy, and a less nomadic settlement system. Three subdivisions are generally recognized for the Archaic: Early, Middle, and Late (or Terminal).

Early and Middle Archaic (ca. 10,000 - 6,000 B.P.): Although the Early Archaic Period began in the eastern United States as early as 10,000 years ago, there is no extant settlement data this early in the Northeast. It has been suggested that the lack of dated sites in the Northeast prior to 10,000 years ago is due to the low carrying capacity of the postglacial boreal forest environment (e.g., Ritchie 1969; Fitting 1968).

A few technological changes, such as the production of ground and polished stone tools, serve to identify the Middle Archaic Period. The bannerstone, probably used as an atlatl weight, and the bell pestle were Middle Archaic innovations (Griffin 1967). Changes in the cultural system were not qualitative, however; more elaborate planning seems to have been devoted to seasonal scheduling: "The ranges of activities carried out on special-purpose sites continued to narrow while the numbers and kinds of such sites utilized within a round continued to increase" (Snow 1980:183). The territorial "settling in" process begun during the Early Archaic continued into the Middle Archaic, stimulating a process of group isolation.

Since qualitative changes can not be seen between the Early and Middle Archaic Periods, Mason (1981) does not distinguish them as separate periods. Instead, he views them as a single transitional period between the Paleoindian and the Late Archaic.

Late Archaic (ca. 6,000 - 3,500 B.P.): The Late Archaic is seen as the flowering of preceramic culture in the Northeast (Snow 1980; Mason 1981). The Period begins about 6,000 years ago and continues to the advent of pottery around 3,500 B.P. During this period prehistoric cultures "fully adjusted to the humid Temperate Continental climate which, with its oak-chestnut-deer-turkey biome, persisted to the present day" (Ritchie and Funk 1973). The increased carrying capacity of this richer and more diverse biome is reflected by an increase in the number, size, and kinds of sites documented in the archeological record.

The relatively diverse and abundant biome provided a subsistence base which was much broader than that of previous periods. Food resources consisted of large game (deer and bear), small game, fish, shellfish, waterfowl, birds, insects, vegetables and fruits. This diversity not only allowed for greater procurement efficiency, it also provided a cushion against seasonal

failures of any single resource. The general increase in numbers of milling and fishing tools suggests a shift away from red meat as a preferred resource.

While increased territorialization occurs during the Late Archaic, group isolation decreases. Communication and trade networks which characterize later periods have their developmental roots in this period. Burial ceremonialism, established in northern New England a few thousand years earlier (Tuck 1978), is conspicuously absent in some areas of New York and well developed in others.

In New York, two contemporaneous Late Archaic cultural traditions predominate: the Narrow Point Tradition, generally restricted to western and central New York, and the Laurentian Tradition, evident through all of New York.

The Narrow Point Tradition is recognized as the Lamoka Phase. Most Lamoka Phase sites are small, open camp sites, although large near-permanent base camps have also been identified (Ritchie 1980; Ritchie and Funk 1973). As with other Archaic peoples, Lamoka groups relied on hunting, fishing, and gathering. Deer and turkey were the preferred game, while in the floral group acorns and hickory nuts were impressively evident. However, the primary orientation of the culture was toward aquatic resources caught mostly with nets.

In contrast to the Lamoka, the Laurentian Tradition is characterized by a primary reliance on hunting. This tradition, which is associated with the Lake Forest Archaic of eastern New York, Vermont, and New Hampshire (Snow 1980), is represented in this area by the Brewerton Phase (4,950-3,670 B.P.). While some base camps are known for the Brewerton Phase, the majority of sites are small, temporary hinterland camps on streams, marshes and springs. The emphasis on hunting is reflected by assemblages having large proportions of points and hunting gear. Fishing gear and nutting stones are also present, but not in the quantities known from Lamoka sites.

Brewerton and Lamoka peoples occupied similar environments, and contact between the two groups is evident in central New York. Brewerton mortuary customs were somewhat more complex than Lamoka, although neither group featured regular cemetery areas. Grave goods were confined to utilitarian objects and there is no hint of the mortuary ceremonialism of the following Early Woodland Period (Ritchie 1980).

Transitional Period (ca. 3,500 - 3,000 B.P.): The Transitional Period features a continuation of Late Archaic cultural and economic patterns, with only a few innovative traits. Among these are a developing burial/ceremonial complex and, toward the end of the period, the introduction of ceramics.

Snow (1980:235) has characterized the period as Terminal Archaic, and "...the stage/period was seen as technologically transitional from the preceramic Late Archaic to the ceramic Early Woodland via an episode of soapstone vessel manufacture".

In New York, the Transitional Period is manifested by the Orient and Frost Island Phases. Because of their close association with cultural developments in the Susquehanna drainage, they are known as aspects of the Susquehanna Tradition. The primary importance of the Orient Phase is in its highly developed mortuary ceremonialism. However, the Orient Phase culture was native to Long Island and generally restricted to the southeastern portion of New York.

On the other hand, Frost Island Phase culture was generally situated in central New York with extensions into western and northern New York. Recognized by the Susquehanna Broad projectile point, numerous Frost Island Phase sites have been found throughout this portion of the State, although few have been systematically investigated. Excavations at the Claud 1 Site in the Genesee Valley revealed that 25% of the lithic artifacts were made from exotic rhyolite, suggesting long-distance trade (Snethkamp 1974).

Frost Island burial practices are not well known. Indirect evidence suggests the practice of cremation, heavy use of red ochre, and deposition of caches of projectile points in graves. Such practices show a wide distribution in the Great Lakes on this general time level and through following centuries (Mason 1981:206).

Ritchie (1980) has characterized the Frost Island settlement system as riverine. This hypothesis was supported in the Genesee Valley where these sites were located no further than 1 mile (1.6 kilometers) from the river (Trubowitz 1978). This phase has been tentatively dated to 3,545-3,240 B.P. This later date roughly corresponds to the beginning of the Early Woodland, Meadowood Phase and to the displacement of steatite vessels by Vinette I pottery.

Woodland Period (3,000 B.P. - A.D. 1500): The Woodland Period in the Northeast can be characterized as one of innovation. While the previous hunting and gathering economy

continued as a means of subsistence during Woodland times, native groups became more and more dependent on domesticated plants for food. This gradual shift to domestication is in itself less important than the ramifications of the shift. Agriculture brought with it a score of new problems that required new adaptations, and every aspect of native culture was transformed. With agriculture came settled village life, a general increase in population, technological changes, warfare, and a litany of social and political changes.

The earliest occurrence of horticulture and its ultimate role in the Northeast is problematic. According to Fitzer (1962), the indirect evidence for agriculture cited most frequently in the literature are the presence of stone, shell, or bone "hoes"; earthworks; and storage pits. Additional attributes are contemporaneous with known horticultural groups, ecological location, and settlement pattern. Theoretically a stable economy is necessary for earthwork construction, and storage pits were used for storing cultivated grain. However, the mere presence of "hoes" does not take into account that such artifacts can be used for pit construction or grave digging, or that edge polish may be the result of gathering activities. One must also consider that pits can also be used to store wild foods, and that a stable economy is possible without horticulture, as the preceding 5,000 years demonstrated.

In Caldwell's (1958) concept of "Primary Forest Efficiency", the relative abundance of wild foods facilitated a very highly developed hunting-gathering-fishing subsistence and could provide a stable economic base in the eastern United States. This economic stability provided time for elaboration of crafts, mortuary practices, and building earthworks, and thus, exerted no great pressure to develop horticulture. In our particular area, settlements prior to Owasco (Late Woodland) times never reached a size that could not be supported by hunting and gathering (Fitzer 1962).

Early Woodland (3,000 B.P. - A.D.1): The onset of the Woodland mode occurred gradually in the northeastern United States, and at somewhat different times throughout the region. However, the Early Woodland Period is generally thought to have begun with the Meadowood Phase about 3,000 years ago. Meadowood sites are found throughout the Northeast, and particularly New York.

Meadowood settlements appear to be year-round, primarily located near large bodies of

water such as the Niagara River. Granger (1978) suggests that the Meadowood settlement system operated on a seasonal fission-fusion cycle. The basic social unit, the local exogamous band, was composed of approximately 150 people occupying a territory of around 390 square miles (1,000 square kilometers). Marriage outside the band produced social linkage to other local bands, resulting in the formation of a regional band composed of around 500 people. In the autumn, winter, and early spring local bands operated from base settlements. In the spring and summer, the local group fissioned into smaller task groups, operating from resource extraction camps. Other specialized Meadowood site types include chert resource sites and mortuary activity sites, which were commonly shared by a number of local bands.

The Riverhaven Complex, located on the opposite shore of the Niagara River and south of the project area, represents one of the most important and well-studied Meadowood Phase assemblages (particularly Riverhaven 2) in the northeast. Riverhaven 2 appears to have been intensively and repeatedly occupied from late autumn to early spring. Several of the Riverhaven sites are located on high knolls adjacent to former marshes.

Meadowood technological innovations included: Vinette I pottery (which made its first appearance during the Transitional Period), gorgets, clay and stone tubular smoking pipes, birdstones (which may have served as atlatl weights), and boatstones. Copper was also introduced into New York from the western Great Lakes during this phase. Other typical Meadowood artifacts include thin side-notched projectile points, trianguloid cache blades, bone tools, copper beads, groundstone celts and adzes, and copper adzes. No definitive data exists concerning the nature of Meadowood dwellings; however, a postmold pattern at the Scaccia Site in Livingston County appears to be oblong in shape (Ritchie and Funk 1973).

Mortuary ceremonialism, which had its roots in the Archaic and continued to develop through the Transitional Period, became more developed during the Early Woodland. Typically, the dead were placed on scaffolds or in charnel houses, and were cremated after decay. Flexed, bundle and multiple burials also occurred. Grave offerings were numerous, consisting of cache blades (sometimes numbering in the hundreds), smoking pipes, gorgets, birdstones, copper, fire-making kits, and a generous sprinkling of red ochre. Often the grave offerings were purposefully "killed" (broken). Meadowood cemeteries were generally situated on knolls, a fundamental

concept which may have been a precursor of the Middle Woodland artificial burial mound.

Cultural manifestations of the latter part of the Early Woodland in New York have been grouped into the Early Point Peninsula Tradition. This tradition is somewhat vaguely defined and is primarily recognized by the presence of Vinette pottery. In some areas of New York, Point Peninsula traits are found in conjunction with elements of the Ohio Adena Tradition, comprising the Middlesex Phase in New York.

The Middlesex Phase is poorly delineated in New York, and is primarily known from burial sites. Typical Middlesex-Adena burial offerings consist of stone blocked-end pipes, cache blades, copper celts and awls, points, copper and shell beads, amulets, pendants, birdstones, and red ochre. These graves generally contain up to 30% Adena-inspired artifacts. Although Middlesex Phase components are often found in association with Meadowood Phase materials, the connection between the two is presently unclear. Moreover, explanations regarding the presence of Adena traits in New York are controversial. It has been postulated that Adena burial customs were the result of migrations of Adena peoples from central Ohio, forced from their homeland by the expansion of Hopewell Culture (Ritchie and Dragoo 1959, Dragoo 1963). They presumably entered western New York through the Ohio and Allegheny Rivers, Conewango Creek, and possibly, the Genesee River. The question is raised, however, that if these cultural traditions were transmitted "in person", why are they reflected only in grave goods, and not in other kinds of mundane materials? A second hypothesis is suggested by this - that it is easier for an idea to migrate than groups of people. It is assumed that the networks of trade and communication which were established during the Archaic Period along major waterways continued to grow during the Woodland Period, becoming increasingly efficient (Spence 1967).

It can generally be said that sites farthest away from the Ohio Adena heartland will contain the fewest Adena traits. This concept is borne out by data across the state, with the exception of the Long Sault Island Site in the St. Lawrence River. It is the site of the only known artificial Adena mound in New York, and contains a large number of artifacts manufactured in Ohio (Ritchie and Dragoo 1959).

Middle Woodland (A.D. 1 - 650): The Point Peninsula Tradition, expressed primarily by ceramic traits, continues throughout the Middle Woodland Period. Point Peninsula

development during this period is characterized by four Phases: Canoe Point (A.D. 2 - 150), Squawkie Hill (A.D. 100 - 300), Kipp Island (A.D. 300 - 650), and Hunter's Home (an early Late Woodland manifestation).

The Canoe Point Phase is vaguely understood and known from only a few sites. It shows little change from the Early Woodland. "Subsistence, seasonality, and the larger settlement unit continued much as previously, although the settlement system was probably more decidedly semipermanent sedentary" (Snow 1980:274). No house structure patterns have been found in New York, but analogous Canadian sites show the presence of rectanguloid structures measuring 10 to 16 feet by 16 to 23 feet (3 to 5 meters by 5 to 7 meters), and containing single hearths. The single hearth and the house size would seem to indicate a basic household social unit no larger than an extended family.

In western New York the Canoe Point Phase is overlapped by the Squawkie Hill Phase, which is marked by the intrusion of the Hopewell burial cult from Ohio. Hopewell can be characterized as a body of material and behavioral traits associated with the burial of the dead. It is not clear whether Hopewell is a manifestation of a true cultural system, or simply a burial cult like the Adena. In the upper Midwest, Hopewell can be seen in its entirety. In New York, however, it is evidenced only by burial mounds, simple and small by comparison to those found in Ohio. New York mounds are generally about 30 feet (9 meters) in diameter, and 3 or 4 feet (.9 to 1.2 meters) high. Common ceremonial assemblages consist of cured base platform pipes, copper axes, copper ear ornaments, pearl beads, and mica. Polished stone celts and adzes, and red ochre are also found in New York burial mounds, although pottery is not. Burials are generally secondary cremations, and are rarely extended, flexed, or bundled.

The following Kipp Island Phase is known from seasonal and semi-permanent camps and cemeteries. Hunting, gathering, and fishing appear to be the main sources of subsistence. While maize horticulture was well established in the Hopewell heartland prior to this time, it is still not evident in New York. Kipp Island Phase burial practices are less elaborate than Squawkie Hill, and indicate continued Hopwellian influence, but in a much attenuated form. Grave offerings often consist of polished stone pendants, several pipe types, barbed bone points, and some of the more common Hopewell artifacts.

The reasons for the eventual decline of Hopewell influence in mortuary ceremonialism can be explained best by the nature of the cult itself. Hopewell burial ritualism was based on elaborate trade networks for obtaining exotic materials such as obsidian from the Rockies and the Southwest, and shells from the Gulf Coast. According to Prufer (1964), the Late Middle Woodland Period is characterized by a general increase in "unrest" and warfare, evidenced by the fortification of some of the Hopewell heartland centers. The disruption and later destruction of the Hopewell trade networks cut the flow of exotic raw materials and, later, finished goods. Western New York and other peripheral areas were particularly vulnerable.

Following the collapse of the Hopewell, local traditions were re-established. In much of New York this was the terminal Point Peninsula Tradition, the Hunter's Home Phase.

Late Woodland (A.D. 650 - 1500): In western New York, the transition between the Middle and Late Woodland Periods is marked by the Hunter's Home Phase, an aspect of the terminal Point Peninsula Tradition and sometimes designated Late Woodland (Mason 1981). According to Ritchie and Funk (1973), most Hunter's Home sites are moderately large with heavy refuse concentrations, storage pits, house patterns, and a wide range of artifacts. The Phase, which has been dated as late as 1000, is often difficult to distinguish because of the presence of both Kipp Island Phase and later Owasco traits. The notched projectile points common in Kipp Island are less popular in Hunter's Home, and are generally replaced by the triangular Levanna points which became commonplace during Owasco times and foreshadow the triangular Iroquois points (Mason 1981).

Another important feature which marks the Hunter's Home Phase is a decrease in elaborate mortuary ceremonialism. Both single and multiple in-the-flesh interments and bundle burials occur, but the presence of grave offerings is sporadic. The predominance of secondary burials seems to indicate that corpses were left above ground, possibly in charnel houses, for a considerable time before interment (Ritchie 1980).

Hunter's Home Phase economy can generally be characterized as a hunting, fishing, and collecting system. Increases in both social complexity and population are evident, leading to the hypothesis that "maize horticulture was already being practiced as an important aspect of the Hunter's Home economy" (Ritchie and Funk 1973:356). This hypothesis is partly founded on

Ritchie's contention that some horticulture was practiced in the earlier Kipp Island Phase (1980:240). However, most of the evidence for maize horticulture up to this time period is indirect; cultivated plant remains are rarely found archeologically in New York State because of generally poor conditions for preservation of organic materials.

Once maize horticulture was significantly incorporated into the economy later in the Period, it did not seem to drastically alter existing cultural patterns. For most of the Late Woodland Period horticulture served simply as an additional procurement system. It was not until Euroamerican disruption of native culture that groups became more fully dependent on horticulture for subsistence.

In New York State, the two primary Late Woodland Traditions are Owasco, beginning with the Carpenter's Brook Phase (A.D. 1000), and the prehistoric Iroquois, beginning with the Oak Hill Phase (A.D. 1300). In western New York, however, the Owasco Traditional does not occur in a pristine state. Instead, the prehistoric cultures of western New York developed under heavy influence from the southern Ontario Princess Point Complex.

Princess Point subsistence generally consisted of hunting, fishing, gathering and, after about 500, maize horticulture. This represents the first occurrence of maize horticulture in northeastern North America. The corn was of the Northern Flint variety (*Zea mays*) with eight rows of kernels, probably related to a variety cultivated by the Hopewell cultures of Ohio and Illinois (Noble 1975).

Sites are generally located on relatively flat, exposed areas near, and not much above, water. Low riverine areas were occupied during the late spring and summer, whereas winter and spring occupations were in hilly areas away from the flood plain and free of seasonal inundation (Stothers 1977). Corn horticulture was not solely equated with village life. Evidence has been found which also associates horticulture with Princess Point riverine camps (Noble 1975).

The Princess Point complex shared many cultural traits with the Owasco to the east. Pottery was manufactured using the paddle and anvil technique as opposed to the coil or fillet method used prior to this time. Most tools were made from Onondaga chert; points were trianguloid, similar to Levanna points. Some antler points and bone awls have also been recovered. Because of its similarity to the Owasco, these cultures have been referred to as

Ontario "Owasco" (Stothers 1977). The Martin Site (UB 214), an important Hunter's Home/ Princess Point site is located on the opposite river shore, at the southern end of Grand Island.

The incipience of the Glen-Meyer branch (Ontario Iroquois Tradition) by about 1300 is accompanied by a major shift in settlement system, the development of settled village life. By 630 years ago (Middleport Horizon) villages were located near small tributaries, covering 5 to 6 acres (2 to 2.4 hectares) and consisting of a number of longhouses surrounded by a palisade (Wright 1964). At this time, the eight row variety of Northern Flint corn is replaced by the ten row variety, which proliferated after the introduction of beans and squash. The development of bean and squash horticulture is roughly correlated to a growth in population and village size. By the latter part of the 15th century, some longhouses were up to 300 feet (91 meters) in length with central hearths spaced 20 to 30 feet (6 to 9 meters) apart. In the latter part of the 16th century, house length is observed to have decreased to a range of 20 to 90 feet (6 to 20 meters) with central hearths 5 to 8 feet (1.5 to 2.4 meters) apart, although the number of houses in the villages increased (Noble 1975). Burials are located in and around the villages, and contain little or no grave offerings (Wright 1964).

In western New York, White (1963) hypothesizes that the introduction of horticulture led to changes in the settlement system. According to White (1963:4), "When the production of the food resources was controlled by the group through planting, then the limits on the amount of food set by natural seasonal replenishment were overcome". Near the beginning of the period (ca. 1100), groups lived in semi-sedentary villages, occupation was seasonal, and the villages were periodically moved. Around 1570, these same groups were living, year-round, in semi-permanent sedentary villages. Like the later Huron (Sykes 1980), these groups moved their villages every 15 to 20 years in response to changing environmental conditions. The impetus for village movement most often cited is soil exhaustion (Sykes 1980; White 1960, 1961, 1963); however, other factors such as game depletion, fire wood depletion, refuse accumulation, and chronic warfare may also have been contributing factors. Game depletion, in particular, may have been a strong motivation for movement, since deer provided a resource for both food and clothing (Gramly 1977).

Just prior to substantial European contact in the early 17th century, groups on both sides

of the Niagara River and Lake Ontario coalesced into the Neutral Confederacy. The Confederacy managed to stay intact until decimation by the Seneca in 1650.

In conclusion, important changes occurring in this period were social rather than techno-economic. The technology of the period is characterized by refinement of the developments of earlier periods with styles and techniques becoming more regionalized. Horticulture, primarily the growing of corn, beans, and squash, was the primary source of plant food for the prehistoric Iroquois, but never totally supplanted the hunting, fishing, and collecting strategy as the most important means of subsistence procurement. However, the practice of horticulture had other ramifications. Primary among these was that it allowed, even demanded, increased sedentarism. Even before this period, the regional demographic situation was in a process of reorganization. With the added premium placed on land in the Late Woodland, territorialism was accelerated.

In the sociopolitical sphere, many later traits were under development in the early part of the period (1000-1300). These included residence rules, formal village arrangement, and, by 1400, clans which were the extensions of formal lineages developed during Owasco times (Noble 1969). As warfare increased, an institutional method of control became more desirable. One of the responses was the development of matrilocal social segments. The eventual size and apparent rigidity of structure and integration of these segments can be attributed to two factors: size seems primarily related to the growth of agriculture, while integration was due to the need for making decisions regarding group policy in questions of inter-group relations (Whallon 1968).

This trend toward increasing social integration continued during the Period and eventually led to the establishment of formal, matrilocal tribes. Changes in the social environment caused by Euroamerican intervention resulted in further adaptive responses, culminating in the formation of the Iroquois Confederacy in either Late Woodland or early Protohistoric times.

Protohistoric/Iroquois Occupation (A.D. 1500 - 1650): Native American groups in western and central New York were profoundly affected by the introduction of the fur trade, long before the arrival of a permanent Euroamerican population in the area. The Protohistoric Period conventionally begins in 1534 when the French explorer Jacques Cartier sailed up the St.

Lawrence River and met groups of Iroquoian-speaking Native Americans at what is now Quebec City and Montreal. However, there is some evidence that Basque, Portuguese and Breton fishermen were traveling to the Gulf of St. Lawrence - Newfoundland area and making sporadic contacts with native groups somewhat earlier (Hoffman 1961). This period dates the beginning of the end of traditional Native American cultural patterns due to ever-increasing political, military, religious and economic interactions with Europeans.

Archaeological evidence suggests that major changes in the spatial distribution of the native population were taking place as early as 1500-1510. Demographic shifts took the form of community amalgamation. Excavations of the early 16th century Draper and Parsons Sites (southern Ontario) revealed unusually large villages that appeared to have grown over their duration through the addition of large population segments. Ceramic remains from these sites indicate that the population influx was from the east.

Ramsden (1978) argues that these changes were correlated with the first appearance of European trade goods in small quantities among these Iroquoian groups and that this supports the hypothesis that a St. Lawrence - Ottawa River - Great Lakes trade and transportation route was in existence prior to the 16th century. Furthermore, pre-existing intertribal trading relationships were the mechanism by which European trade goods were channeled into the lower Great Lakes from the Gulf of St. Lawrence area.

In addition to the tensions introduced through simple contact with Europeans, trade has been recognized as having a major impact upon traditional aboriginal cultural patterns. The most immediate changes were due to the introduction of a far superior material culture. Once the fur trade was established, assuring a stable supply of these goods, the manufacture of native goods rapidly declined until they were entirely replaced by European manufactured implements.

Finally, changes occurred in sociopolitical relationships after 1640 as the fur trade intensified and the supply of furs declined. The most important of these changes was the formation of confederations such as the Five Nations Confederacy of New York State, the Neutral Confederacy and the Huron Confederacy.

An important catalyst for these sociopolitical changes was the European policy of supplying guns and ammunition to native groups as part of a strategy to enlist the various tribes

and confederacies as proxies in the European struggle for control over the continent. The introduction of firearms in some quantity led to a major adjustment in traditional warfare and upset the traditional balance of power in the region. That the Iroquois of central and eastern New York State were the first to exploit this upset in the balance of power, and eventually proved to be victorious, is thought to be the result of their geographical location (Trigger 1976). Unlike their major competitors, the Iroquois were surrounded on all sides by sedentary agricultural groups and, therefore, had no direct access to the fur resources of the interior of the continent. The Huron Confederacy geographically straddle the major transportation networks and were able to exploit their hunter-gatherer neighbors' need for agricultural by trading corn and other products for furs, thereby securing the advantage of access to the vast supplies of the interior. The Iroquois wars of the mid 17th century were aimed at eliminating the Huron and other agricultural groups as middle men to obtain direct access to fur supplies (Trigger 1976; White 1971; Hunt 1940).

Beginning in 1638 with the Wenro tribe of western New York, and in rapid succession, the dispersals began. After the Seneca had secured the resources of the Niagara Frontier, large-scale concerted attacks by the League were directed against the Huron Confederacy (dispersed by 1649), the Petun (dispersed by 1650), the Neutral Confederacy (dispersed by 1651) and, finally, the Erie Confederacy (dispersed by 1655). Thus, by the mid 17th century, the League Iroquois of New York emerged as a politically, militarily, and economically united Confederacy with sole access to both the land and resources surrounding the lower Great Lakes.

Historic Period: The first Europeans in the shore areas of New York State were French war parties conducting raids of Iroquois villages. The French missionary Dallion made contact with the Seneca in the Niagara River region in 1626 and 1627 (Horton 1947), but French visits to the area were infrequent until the 1660's.

The French control of the western end of Lake Ontario through Fort Conti (now Fort Niagara), built in 1679 by LaSalle, gave them an early advantage in the fur trade. However, maintenance of this control was not without problems. The fort was burned to the ground by the Seneca in 1680 (Horton 1947). The Marquis de Denonville, the governor of New France, returned and built another fort at the same spot in 1687. Regarding LaSalle, it is interesting to note that in 1679 he built the Griffon, the first

European ship to sail the Great Lakes, near the mouth of Cayuga Creek in Niagara Falls approximately 2.6 miles (4 kilometers) northwest of the project area.

Despite their alliance with the British, the Iroquois did not like the steady encroachment of European settlers on their land (Doty 1925). The British managed to obtain permission to build a fort on Seneca land in 1699, however, and the British became increasingly competitive in the fur trade.

There was a considerable amount of activity in the area during the Revolutionary War years. The Onondaga, Mohawk and Seneca, who had decided to side with the British before the outbreak of war, began to conduct raids on pro-Continental settlements in New York. Fort Niagara once more became important, functioning as a center of Tory and Indian activities.

While the bulk of the Revolution's military engagements occurred on the Atlantic Seaboard, Sullivan's 1779 campaign against the Iroquois in central New York was the most carefully planned, extensive, and important continental offensive during the war (Melone 1932:60-61). The campaign crushed the Iroquois Confederacy, thwarted an impending British offensive from the west, and destroyed Iroquois fields and produce which would have fed the British and their allies. Many of the Iroquois fled to the safety of Fort Niagara, or to areas not yet settled by whites (Doty 1925:258). Although the Iroquois continued raiding after the Sullivan campaign, they never again gathered in a large force, nor were they a force to be reckoned with on the western frontier (Doty 1925; Melone 1932). The great success of the Sullivan campaign assured the emerging nation at least a few years of relative security after peace was established in 1783.

In 1784, the State of New York declared the Mile Strip, 1 mile (1.6 kilometers) back from the Niagara River from Lake Ontario to Lake Erie (and including the project area), prohibited from sale. Claims to this land were made by both Massachusetts and New York. Finally, in 1786 these two states came to an agreement and Massachusetts ceded all claims to the lands subject to Indian title, which was subsequently purchased by New York. In 1791, Robert Morris of Philadelphia held an option on all the lands of Niagara County and, from 1792 through 1800, he sold the rights to present Niagara County to the Holland Land Company, an organization composed of 11 merchants from the City of New Amsterdam, present New York City (Wiley and Scott 1892b). Up to 1801, there appears to have been only one Euroamerican family settled in the County. Pioneer settlement increased somewhat beginning in 1802. Joseph

Ellicott, the resident agent for the Holland Land Company, was in charge of laying out all of the land into saleable lots and marketing them. A few of the earliest listed (Wiley and Scott 1892a) settlers in this part of the County were:

1805: Benjamin Kelso
1807: Edward Smith, Solomon Wolcott, Marvin Judd, Thomas White, Daniel Judd, Ozias Judd, Benjamin Graham, John Harvey
1808: James Field
1809: George Burgher, Jacob Stover, William Scott
1810: Joshua Pitt

However, none of these men held property in or adjacent to the project area.

During this early period most settlement occurred in Buffalo, which in 1804 was called New Amsterdam and consisted of a few houses at the mouth of Buffalo Creek. By 1810, however, the population numbered 1,508. The City was completely burned by the British during the War of 1812. These continuing hostilities between the Americans and British greatly deterred settlement, especially along the Niagara where most of the War took place.

Following the Treaty of Ghent in 1814, substantial settlement of the region commenced and by 1820 Buffalo had 2,095 inhabitants (Meinig 1966). "Niagara River Road" was established by 1816, when a stage coach line followed the approximate route of present River Road (Wiley and Scott 1892b). However, the most important element in the development of this area was the building of the Erie Canal, which was completed in 1825 (Meinig 1966). By 1824, three men, James and John Sweeney of Buffalo, and George Goundry of Geneva, recognized the impact the Canal would have and were instrumental in the promotion of the industrial development of the North Tonawanda area (Horton 1947). They issued advertising material describing the location of the future great lumber port and industrial center. At that time, they proposed naming the area the Village of Niagara, but that name was not utilized for very long. Upon completion of the Canal the entire Niagara Frontier commenced steady growth. The presence of the Canal, Lake Erie and the Niagara River all provided tremendous shipping capabilities.

A large population increase was caused by the Canal, as evidenced by the fact that

Buffalo's population grew to 10,000 by 1831 (Meinig 1966), however; by the end of the Civil War, the population of North Tonawanda stood at only 440 (Saliba, 1958). The Town of Wheatfield, which originally encompassed the entire project area, was incorporated and held its first town meeting on June 6, 1836 in the District No. 7 school house in the northernmost portion of the Town (Pioneer Association 1902). The Town derived its name from being so well adapted to the raising of wheat, the main product in its early years.

The railroad era in western New York began in 1835, when construction work was begun on the Buffalo and Niagara Falls Railroad, a steam operated railroad (Wilmer 1931). An enterprise of Peter Porter, it was one of the pioneer railroads of the United States. Two parallel lines of wooden streamers, 6 inches square, were spiked to the cross ties and on each stringer a flat bar of iron, called the strap tie, was laid as a surface for the car wheels to run on (ibid.).

It's first locomotive, the Little Buffalo, ran from Black Rock, just north of the City of Buffalo, to Tonawanda on August 26, 1836. The second locomotive placed in service was called the Niagara. Construction to Niagara Falls began at about the same time. When completed, the rail line ran from Black Rock to Niagara Falls along the Niagara River and Niagara River Road (Wiley and Scott 1892b). Burr's 1839 Atlas shows the Niagara Falls Rail Road following approximately the same route as the present Conrail corridor along the present River Road.

After 1850, Buffalo, Tonawanda and North Tonawanda became lumber transfer points, and lumber yards occupied many miles of lake front and river bank, including the area along the river which encompasses the project site (Ditmar, personal communication). The latter community, in particular, grew in size and in May, 1865 the Village of North Tonawanda was incorporated.

The transportation system grew along with population, and in 1870 the Suspension Bridge and the Erie Junction Branches of the Erie Railroad were constructed (Wiley and Scott 1892b). By 1875, the Erie Railroad and the New York Central and Hudson Railroad also ran along the route of the present Conrail corridor; the New York Central was used for through freight and passenger traffic, while the Erie was used for local tonnage (Meinig 1966).

The lumber industry, in particular, continued to grow in the region, and in 1876, nearly 120 million board feet of lumber were received in the Buffalo area, half of which moved on

eastward via the improved State Barge Canal (Meinig 1966). In 1890, the Tonawandas were second only to Chicago in the shipment of lumber, drawing upon the rich resources of Michigan, and capitalizing upon its intermediate position between the resources and the markets on the Eastern Seaboard (ibid.).

By 1893, the project area is part of the Village of North Tonawanda (Hopkins 1893; Figure 8) which incorporated as a City in 1897. The Niagara Shore Terminal Railroad runs west of River Road.

As usual, as population in the region grew, so did the need for improved transportation. Beginning in the 1890's almost every community with more than 5,000 people had a streetcar system (Meinig 1966). Radiating from the central business district, the electric lines were a major factor in promoting growth and allowing suburban commuting to become a normal pattern for a rapidly increasing proportion of the urban labor force. The original line of the Buffalo and Niagara Falls Electric Railway (BNFR), a double-track electric line primarily constructed for commuters, first began operating in 1895, running parallel to the New York Central Railroad (Gordon 1970:354-355). The BNFR was extremely successful, carrying over 1,000,000 passengers its first year, exclusive of local passengers in Buffalo, and by 1900 the BNFR was one of the finest interurban systems in the world (ibid.).

Site Specific Information

Prehistoric and Protohistoric: Exact locations for the requested 2 mile (3.2 kilometer) search radius were not, in all cases, provided. However, the data indicate that there are no known sites within a one-mile radius of the project area. There are a relatively large number of sites within two miles of the project area. These include a number of sites associated with Black Creek, well north of the project area and in a different environmental setting. Three sites were reported near the mouth of Tonawanda Creek by Parker (1922). One of these is UB 250, a former earthwork site on the north end of Tonawanda Island. Two sites, north of the project area, are situated on rises which would have been islands during high water episodes of Lakes Tonawanda and Wainfleet and dry land perched above wet lowlands for most of the remainder of prehistory, presenting unique opportunities for both habitation and resource procurement.

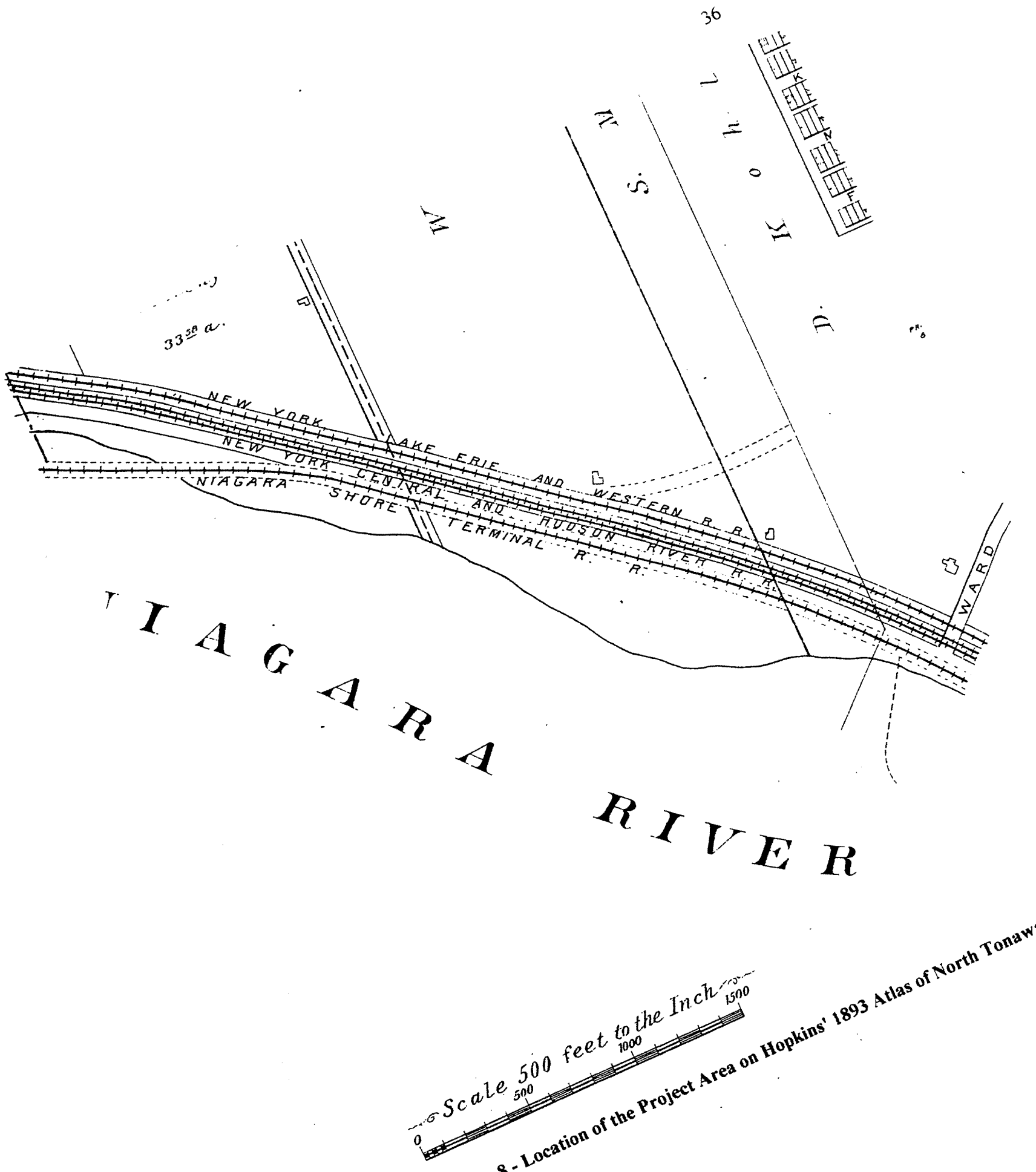

Figure 8 - Location of the Project Area on Hopkins' 1893 Atlas of North Tonawanda

Hayfield #1 is categorized as a workshop where one or more chert tools were manufactured or rejuvenated. While Hayfield #2 is categorized as a stray find, the artifact inventory consisted of 3 flakes, one of which was utilized. This suggests a very short episode of resource extraction rather than an accidental loss or other activity that can not be easily explained. The last site is categorized as stray finds which were found on well drained soils. However, the artifact inventory includes a potsherd, which archaeologists traditionally have considered indicative of short- or long-term habitation sites. The bulk of the sites within a two mile radius are located on Grand Island, which has been intensively studied in this century, particularly after the 1950's. Most of the sites are located well inland from the Niagara River.

Information on six sites were provided by the New York State Office of Parks, Recreation and Historic Preservation (OPRHP), which did include exact site locations (A063-11-0016 through 0020 and 0063). Two of the sites, consisting of 2 flakes and 1 untyped projectile point, appear to have been found on Raynham silt loam, which is present in the mid-section of the project area. Although this soil is poorly drained, it does include small, better drained rises. Given that the site forms list drainage conditions as "good", it appears that the sites were located on higher, better drained areas above wetter soils.

In summary, the project area does not share the same general environmental elements that are present on Grand Island, the closest analog. Those sites are on rises away from the river and Spicer Creek is nearby. The Martin Site (UB 214), a Hunter's Home/Princess Point site, near the southern end of Grand Island, is on the river but is perched on a 6-7 foot terrace. It is possible that small, short-term fishing camps may have been situated in the project area during drier periods. If they existed, they would likely have been obliterated (see below) prior to the early archaeological surveys and inventories.

Historic: According to the 1875 Beers Atlas (Figure 9) portions of the project area were owned by Messrs Mye and Thomkins, both listed as farmers, suggesting that the property may have, for a time, been farmed. However, during the historic period, the project area was more closely associated with the lumber and iron industries. As noted earlier, the Tonawandas were a major lumber center from the late nineteenth to the early twentieth century and a number of yards were located in this part of the city. In the early part of this century, River Road

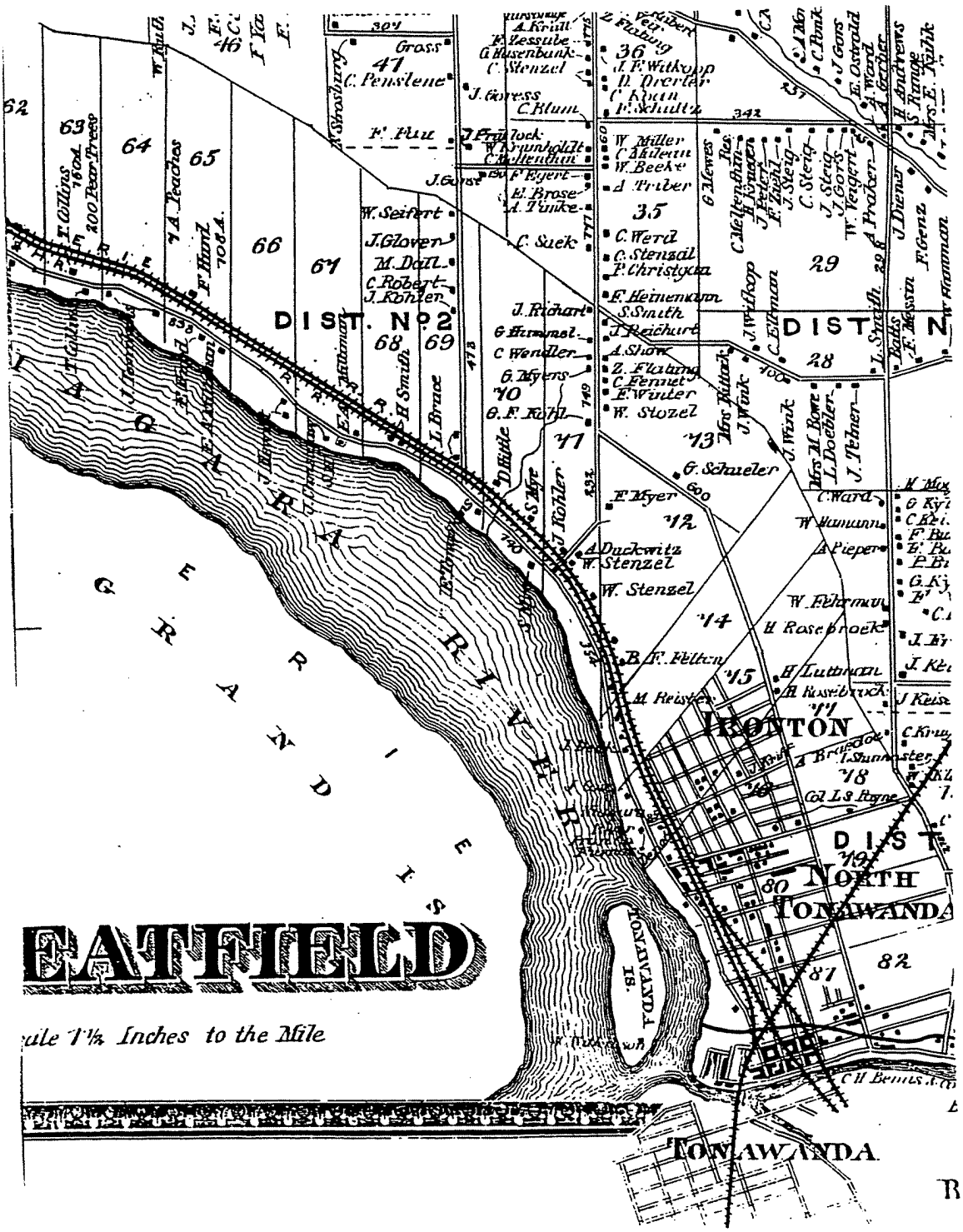

Figure 9 - Location of the Project Area on Beers' 1875 Atlas of the Town of Wheatfield

"resembled a path through the piles of lumber" (Willard Ditmar, personal communication) indicating that lumber was staged on both sides of River Road. At the turn of the century, the bulk of the property came under the ownership of the Tonawanda Iron & Steel Company.

The *Tonawanda Iron & Steel Company* was for many years the largest non-lumber related industry in the city. The main plant was located on the west side of River Road between the City of Lockport water intake and the North Tonawanda Waste Water Treatment Plant, and encompassing the present Fisherman's Park. The company can trace its roots back to the Niagara River Iron Works, established in 1810 and one of the earliest industries in the county. In 1872, it was reorganized as the Niagara River Iron Company and its first furnace came on line in 1873. By the 1890's, the company had become known as the Tonawanda Iron and Steel Company, specializing in the production of pig iron (Pool, 1897). In 1895, a state-of-the-art furnace was installed and lit, by remote control, by President McKinley. By the 1950's, the company had become a division of American Standard and the plant was modernized in 1958 (Saliba, 1958). By the mid-1960's, the company still had a presence in the city but ceased operation soon thereafter. At present, very little, if anything remains.

The company is relevant here, not for its product but for its industrial waste (primarily slag and molding sand). There is direct evidence (see Figure 10) that the company dumped slag on the east side of River Road less than a mile south of the project area (now occupied by

Figure 10 - Photo (poor reproduction) showing the "Tonawanda Iron Company" dumping molten slag on the east side of River Road, south of the project area (from Jehrio, 1992).

commercial businesses and a golf driving range). The fact that the company owned the bulk of the project area for many years (Figure 11) and the availability of steam rail service on the west side of River Road, and into the property (not shown on map but appears on the map plate south), suggests that the company used the property as a slag dump. This was confirmed by borings done at the site and by personal interview (see below).

Interviews: Individuals who might have detailed knowledge of the project area were contacted. Following are summaries of these interviews:

> **Mr. Willard Ditmar,** Historical Society of the Tonawandas, 113 Main Street, North Tonawanda, New York 14150 (716 694-7406): First contacted in April 1996, Ditmar indicated that the area was known early as a lumber storage area and later as vacant or as a dump. Mr. Ditmar produced some 1910 Sanborn maps that showed no structures on the property. He had two photos of the area estimated to be from the late 1950's (could not be photocopied) that showed the area as vacant, although one photo showed a heavy shovel parked in the middle of the property and there were indications that some excavating was occurring at the site.
>
> **Mr. Charles Fleischman,** Emergency and Civil Defense Manager for the City of North Tonawanda and local historian (716 695-8550): Mr. Fleischman wrote a pamphlet in 1965 commemorating the 100 year anniversary of village incorporation but had only vague recollection of the project area being used as a gravel pit in the 1930's.
>
> **Mr. Larry Kuebler,** Park Maintenance Foreman, City of North Tonawanda (716 695-8549). Mr. Kuebler was contacted regarding his knowledge of the Gratwick Riverside Park. He indicated that much of the topographic relief in the area was due to uneven settling of fill. He also indicated that the "Dog Park" located just south of the high fill area was constructed in the late 1970's and that grading was done using existing soil. The area is presently delineated by a fence made from old sidewalk material (see Photo 20).
>
> **Mr. Hub Strassburg,** Former Heavy Equipment Operator, City of North Tonawanda (716 693-2208): Mr. Strassburg was the equipment operator at the site from 1942-52 and 1958-63, and operated the shovel in the photo mentioned above in the Ditmar interview. He stated that slag was excavated from the site by the City for use as road bedding and that the resulting depressions were filled with bulk trash from City collections. He indicated that the City utilized almost

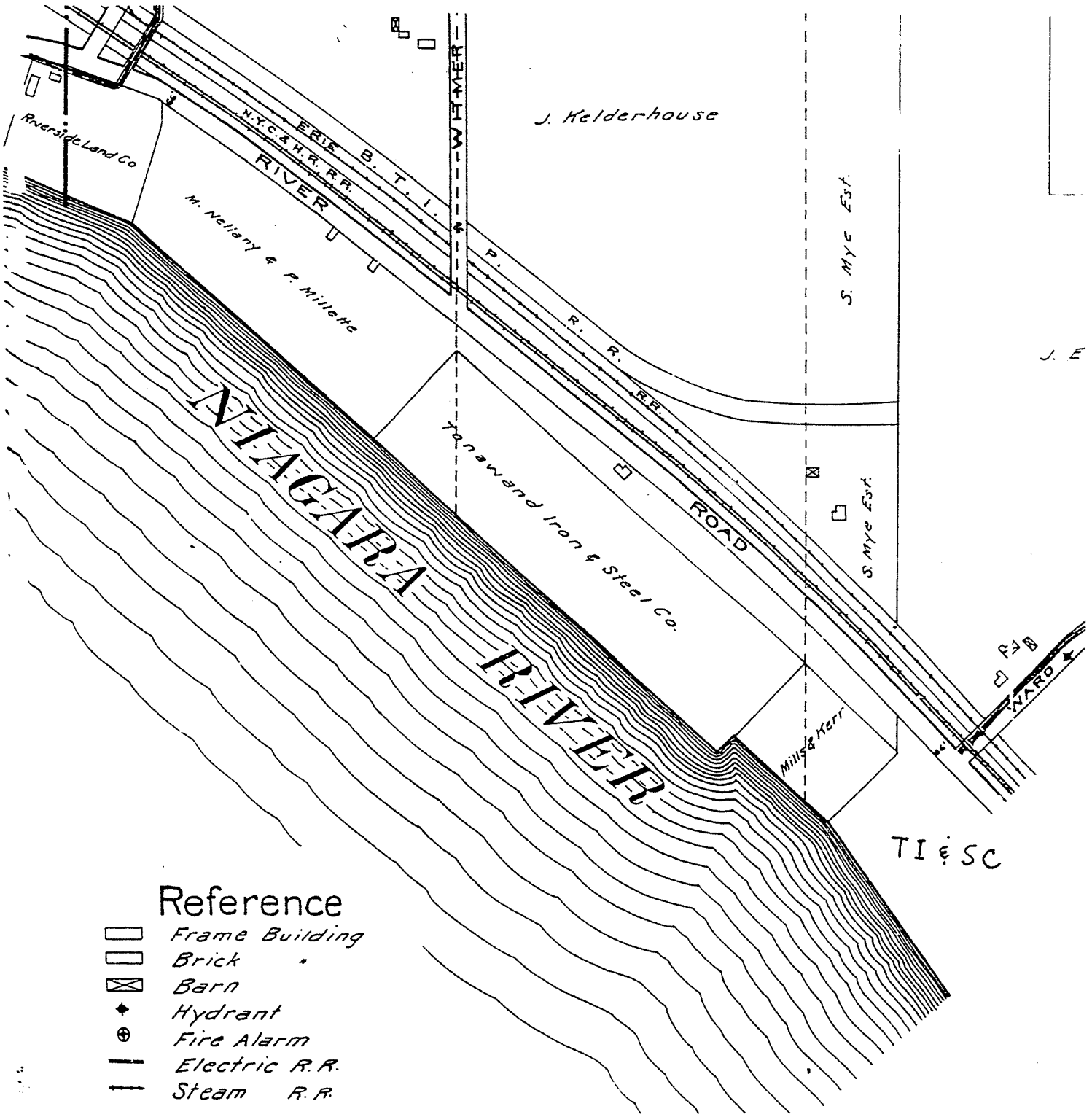

Figure 11 - 1908 New Century Atlas showing property ownership of the project area. TI&SC = Tonawanda Iron & Steel Company

the entire area for this purpose from the City line to Ward Road and from River Road to the River shore. Mr. Strassburg was not sure but indicated that the area south of Ward Road was composed primarily of molding sand that was also excavated for City use.

Mr. Dale Marshall, City Engineer, City of North Tonawanda: Mr. Marshall was contacted to determine if his department had any data on the Site. He furnished a 1951 aerial photo of the Site along with boring logs from the Northwest Storm Sewer Project (1990). The storm sewer runs along the northern border of the project area.

Mr. Geoff Gerstung, Local History Section, Niagara Falls Library, 1425 Main Street, Niagara Falls, New York 14301 (716 286-4881): Contacted to gather historic maps, primary sources and information regarding the area's railroads.

National Register of Historic Places: According to the database maintained by OPRHP there are no properties presently on or eligible for inclusion on the National or State Register of Historic Places within or adjacent to the project area.

Sensitivity Assessment

Site: The Site has been extensively disturbed as a result of a number of activities over the past 100 years. For example, River Road was originally one lane. By the 1950's and probably earlier, it had been widened to two lanes and by the 1960's, a wide four lanes. Since the railroad has always run along the inland side of the road, all expansion had to occur towards the River, eventually encompassing the railroad bed that paralleled the road on the west. Lumbering and utility construction (at least three storm sewers traverse the Site) also affected the Site, albeit in a relatively minor way.

By far, the most extensive disturbance to the Site was due to the slag dumping by Tonawanda Iron & Steel and subsequent mining and refilling by the City. The borings and well excavations conducted at the Site indicate the extent of the fill. The fill on the Site ranges in depth from 9 ft near River Road to 20 ft near the River, compared to one foot from two off-site wells. Figures 12 and 13 depict the condition of the Site in 1950.

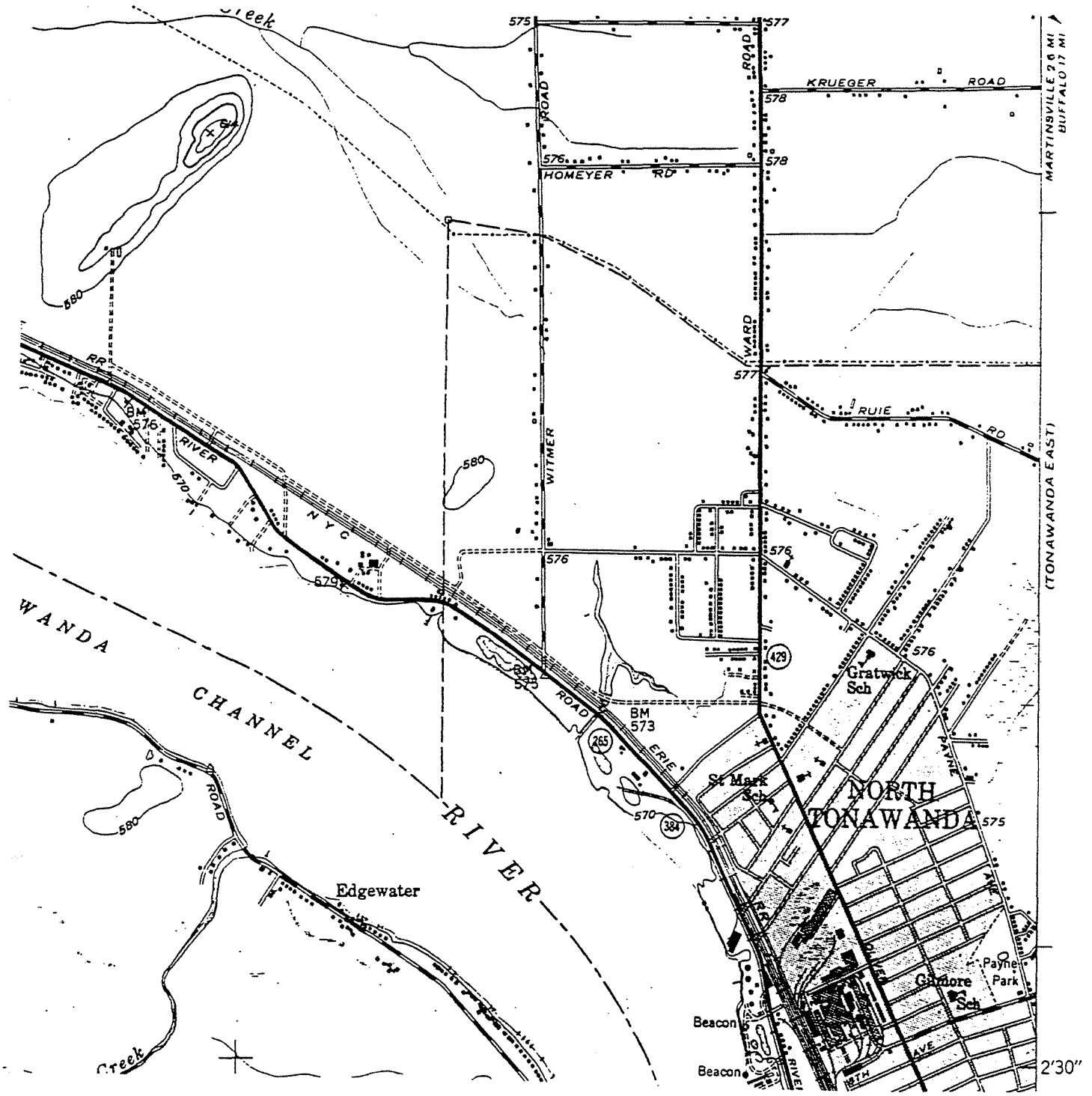

Figure 12 - Location of the Project Area on the 1950 Tonawanda West, N.Y. U.S.G.S. Quadrangle.

Figure 13 - 1951 aerial photograph of the project area.

Note the depressions apparent in Figure 12 and the moonscape-like appearance of the Site in Figure 13.

A number of site visits were conducted during April and May, 1996 to assess the size, location and nature of disturbances caused by landfill operations; photographs of the project area can be found in the Photo Appendix. These visits confirmed that disturbance of the Site has been extensive. It is apparent that any archaeological sites formerly present on the Site would have been destroyed as a result of the activities discussed above. The Site is, therefore, considered to have no probability of containing any intact cultural resources.

Viewshed: Reconnaissance of the potential viewshed was conducted in April-May 1996, before seasonal growth of deciduous shrubs and trees. The viewshed does not extend beyond the Conrail tracks on the east and includes much of the River on the west. The Site cannot be clearly viewed from Grand Island as shown in Photo 1; a function of distance.

Stage 1B Recommendations

Site: As noted previously, the Site has been totally disturbed from an archaeological perspective. Therefore, no further cultural resources investigations are recommended.

Viewshed: Based on the present aesthetics at the Site and the anticipated condition of the Site following remediation, it is anticipated that the visual impacts resulting from the remediation will range from slight to positive. No additional work is recommended in this area. However, if the design is changed and the result is a significantly more elevated cap, then the visual impact issue should be reconsidered, since an increase in elevation will usually result in an expanded viewshed.

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1893 *Atlas of the Vicinities of the Cities of Niagara Falls, North Tonawanda and Buffalo, New York.* G.M. Hopkins, Philadelphia, Pennsylvania.

Sanborn Map Company
1810 *Insurance Maps of the Tonawandas, New York.* Sanborn Map Company, Inc., Pelham, New York.

United States Geological Survey
1950 Tonawanda West, New York Quadrangle.

United States Geological Survey
1965 Tonawanda West, New York Quadrangle.

United States Geological Survey
1980 Tonawanda West, New York Quadrangle.

Photo Appendix

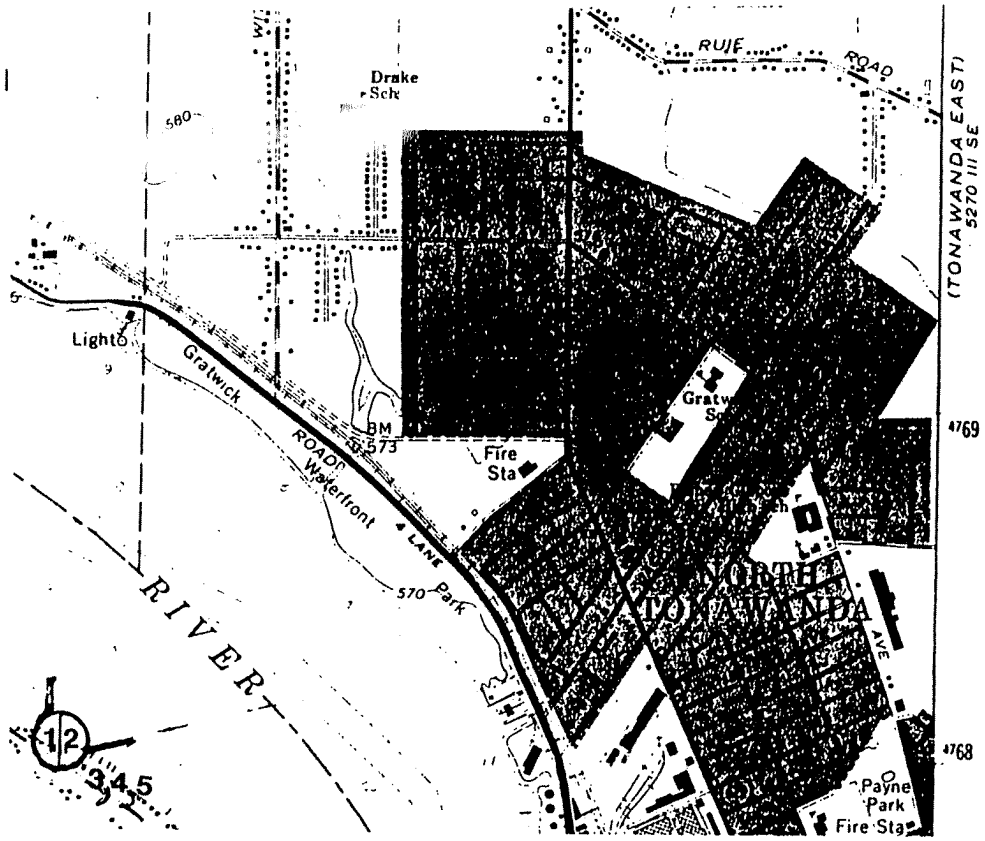
Contains:

- Photo angle map
- Photos of project area and viewshed

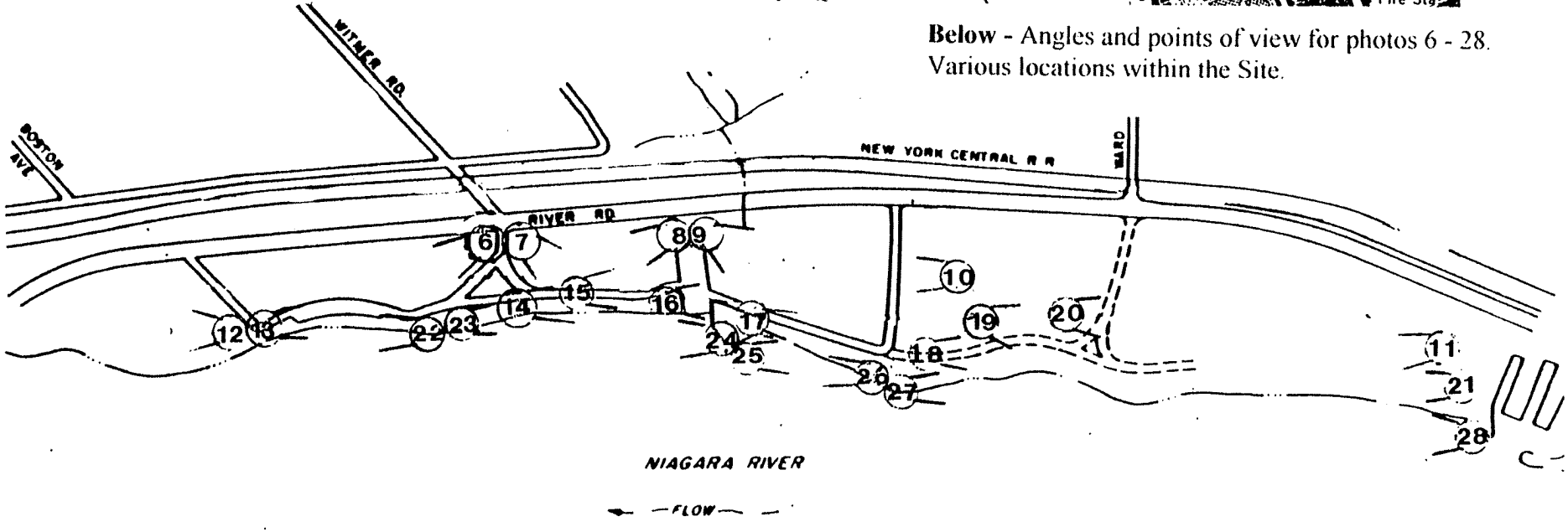
Figure 14 - Photo angle map

Right - Angles and points of view for photos 1 - 5. All shots were take from the same location on the Grand Island shore.

(16) Photo location/angle



Below - Angles and points of view for photos 6 - 28. Various locations within the Site.



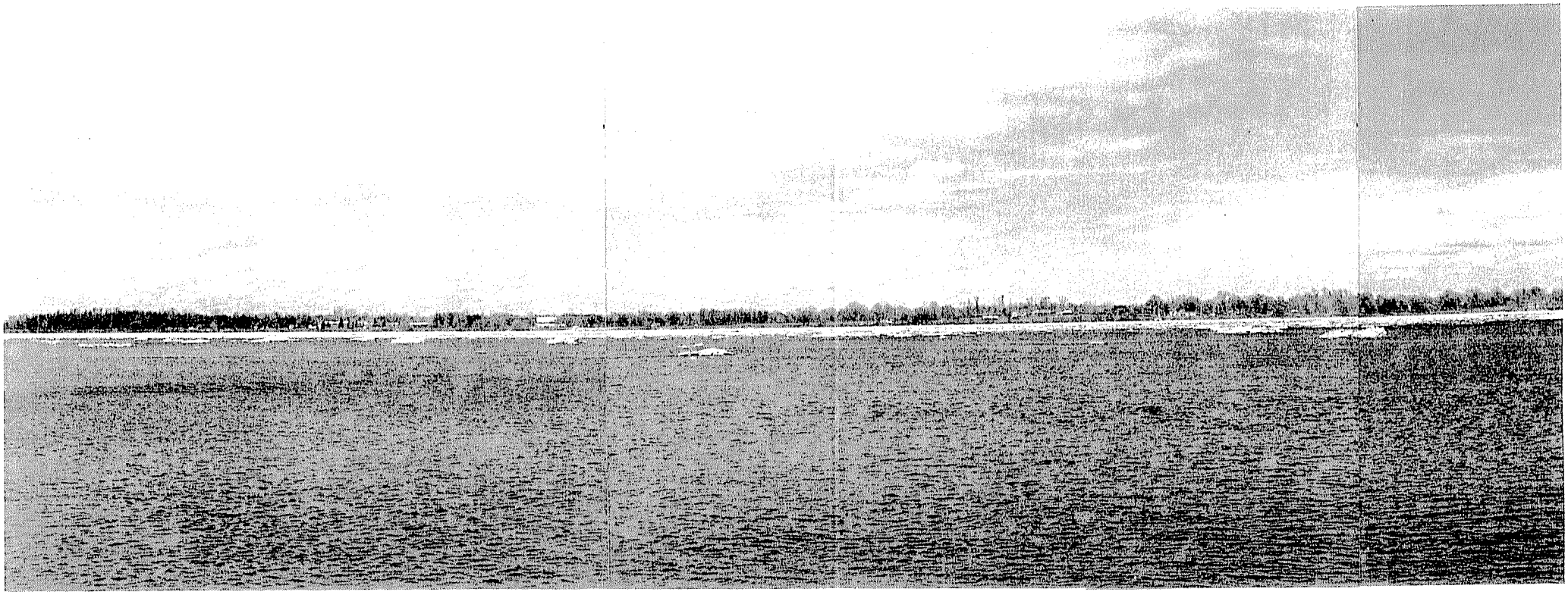


Photo 1 - Panoramic view of the entire project area from the opposite river bank on Grand Island due west of the marina which marks the southern boundary of the project area, facing northeast (50mm lens).

Photo 2 - Panoramic view of the northern section of the project area from the opposite river bank on Grand Island due west of the marina which marks the southern boundary of the project area, facing, from top left: north-northeast, northeast, and east-northeast (420mm lens).

Photo 3 - View of the midsection of the project area from the opposite river bank on Grand Island due west of the marina which marks the southern boundary of the project area, facing northeast (420mm lens). The main park shelter is on the left. Confer Plastics lies east of River Road and the Conrail tracks.

Photo 4 - View of the southern end of the park section of the project area from the opposite river bank on Grand Island due west of the marina which marks the southern boundary of the project area, facing northeast (420mm lens).

Photo 5 - View of the southern portion of the project area from the opposite river bank on Grand Island due west of the marina which marks the southern boundary of the project area, facing east-northeast (420mm lens).

Photo 6 - Westernmost section of Gratwick Riverside Park facing west from the main park entrance and River Road.

Photo 7 - Midsection of Gratwick Riverside Park facing south from the main park entrance and River Road.

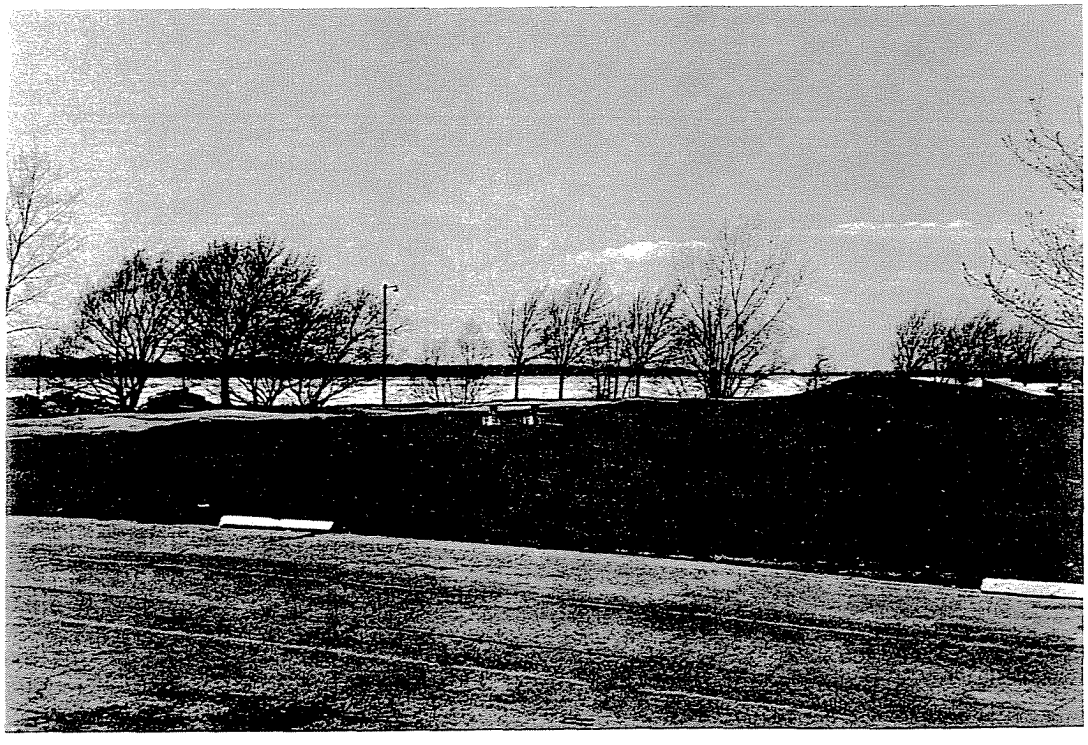


Photo 8 - Midsection of Gratwick Riverside Park west of the boat ramps facing south-southwest from the rear of the ramp parking lot approximately 100 ft from River Road.

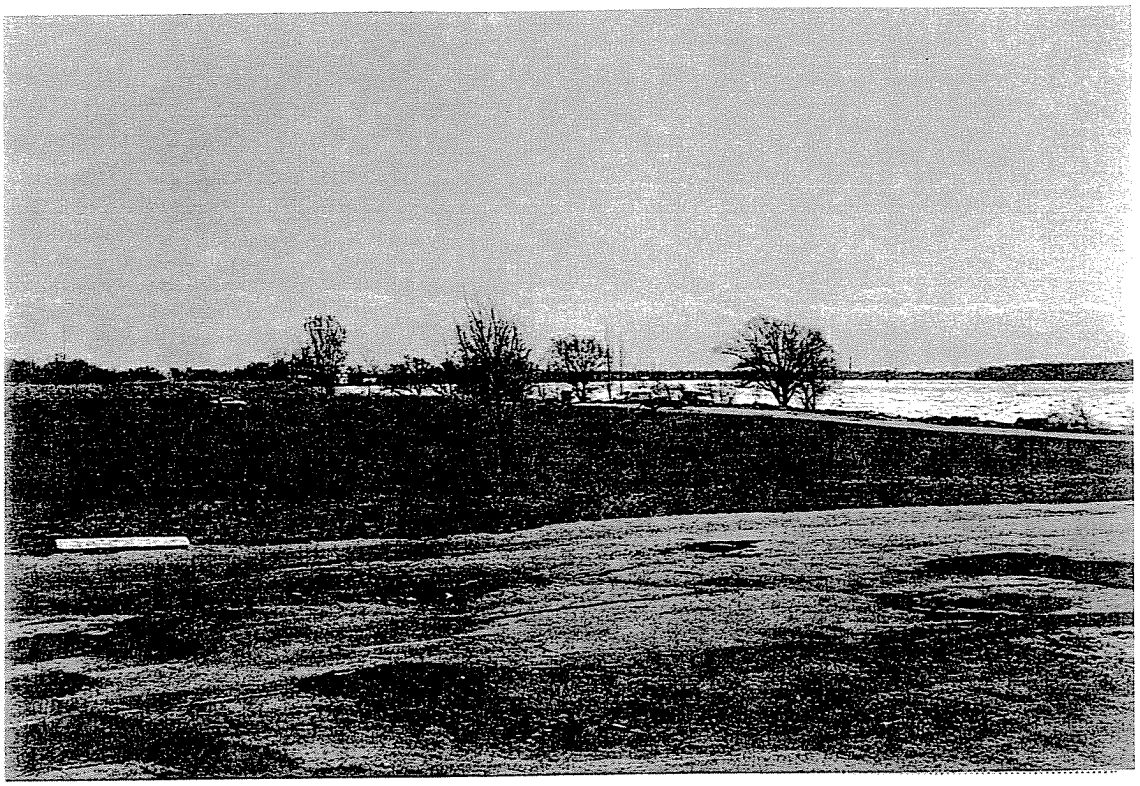


Photo 9 - Easternmost section of Gratwick Riverside Park east of the boat ramps facing south from the rear of the ramp parking lot approximately 100 ft from River Road

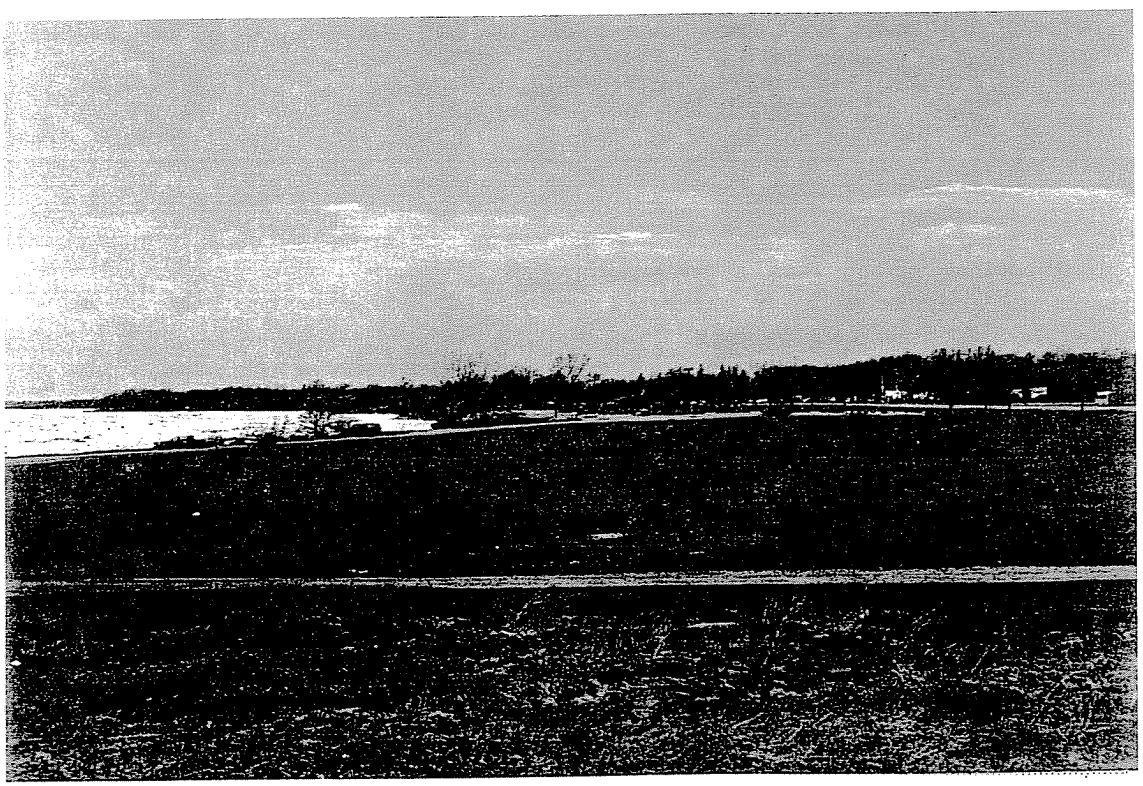


Photo 10 - Eastern section of Gratwick Riverside Park east of the boat ramps facing northwest from the top of the high fill area.

Photo 11 - Easternmost section of project area facing northwest from a rise 150 ft west of the marina and 150 ft from the river. The high fill area is in the background.

Photo 12 - Westernmost section of project area shoreline facing northwest from a point 40 ft west of the west park access road and 30 ft from shore.

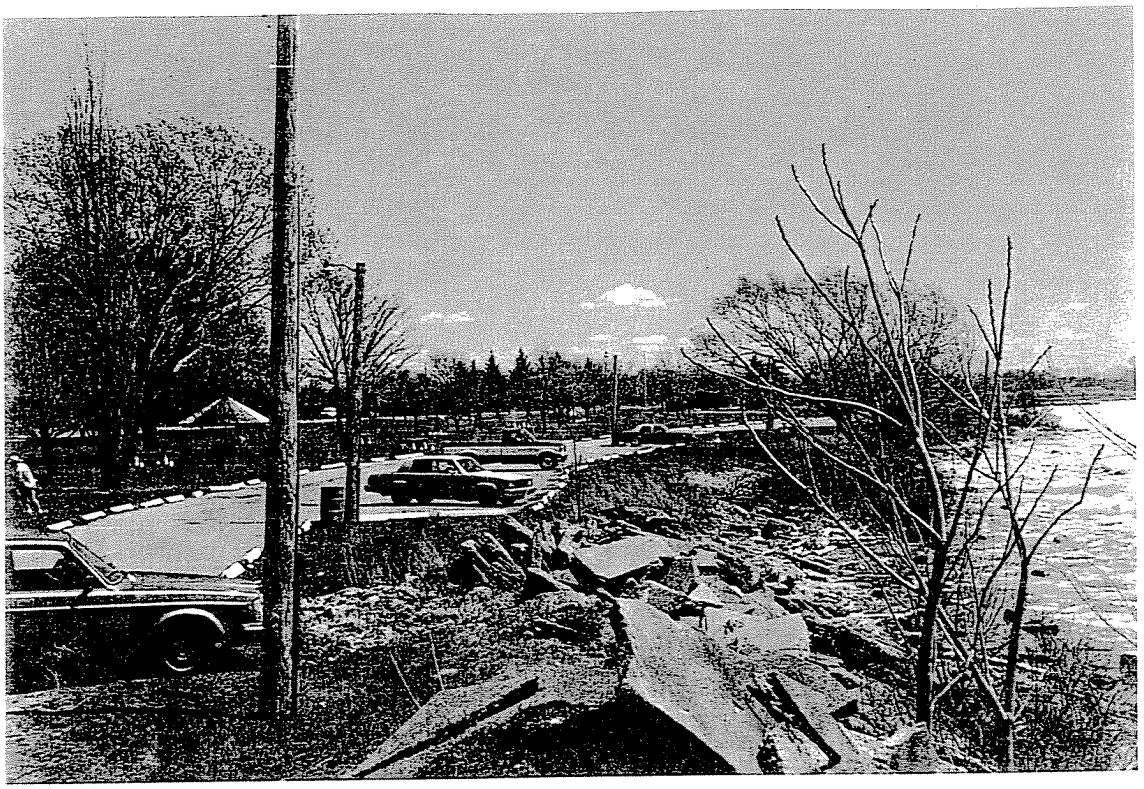


Photo 13 - Western section of park shoreline facing southeast from a point 40 ft west of the west park access road and 30 ft from shore.

Photo 14 - Midsection of park shoreline facing southeast from a point near the east branch of the main park access road and 30 ft from shore.

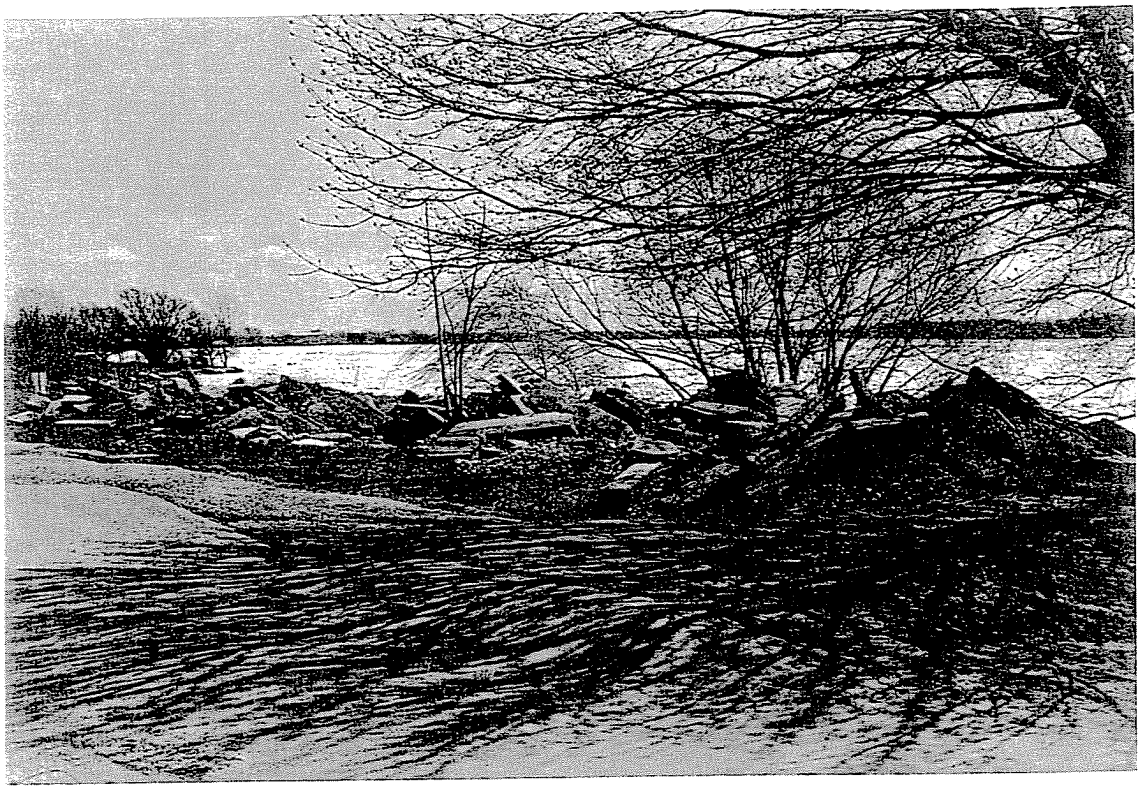


Photo 15 - Construction and demolition debris on the shoreline west of the boat ramps facing south-southeast from a point on the park road midway between the main park access road and the ramp parking lot.

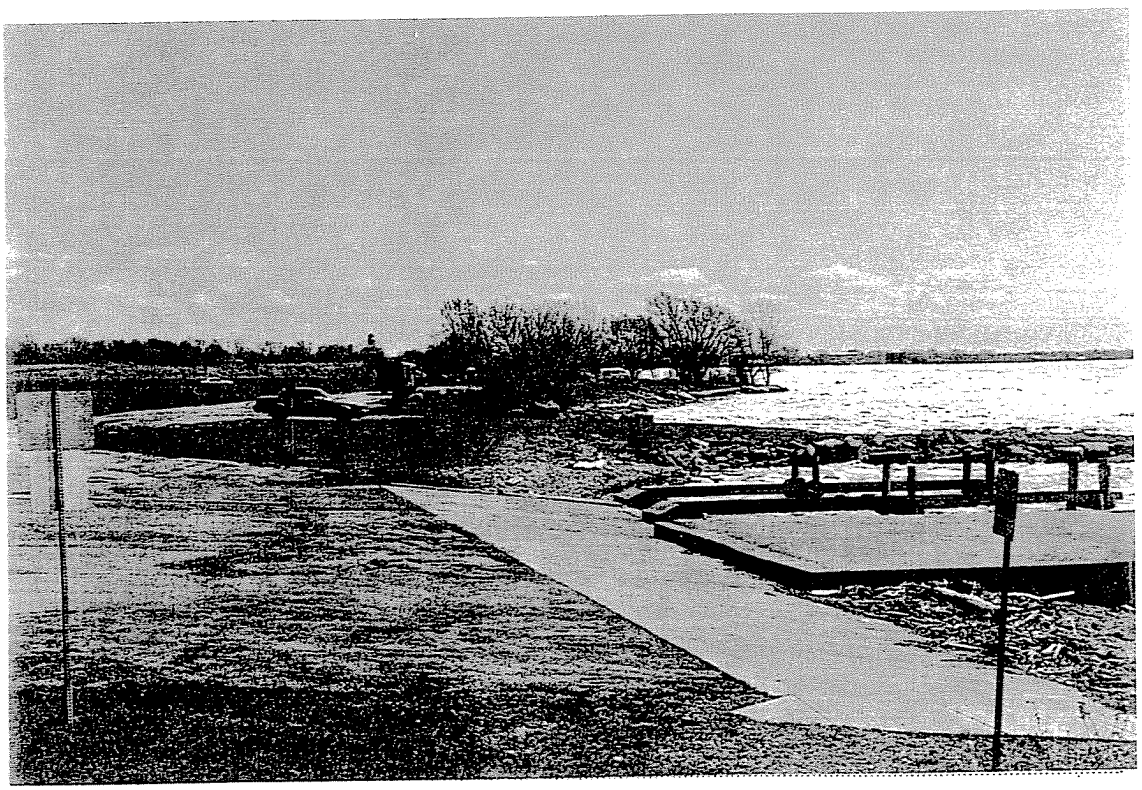


Photo 16 - Park shoreline and boat ramps facing southeast from a point just west of the ramps and 50 ft from shore.

Photo 17 - Park shoreline facing south-southeast from a point 150 ft east of the ramps and 20 ft from shore.

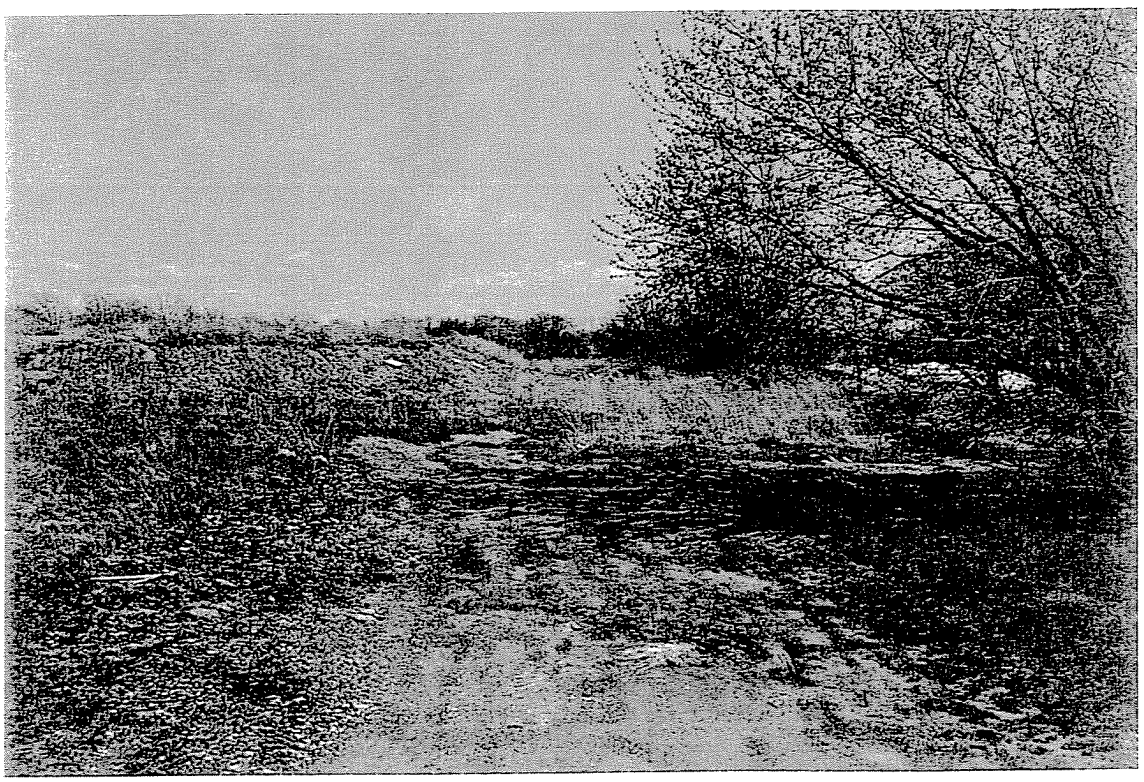


Photo 18 - Shore area and high fill area in the eastern section of the project area facing southeast from the eastern park access road and the dirt road to the high fill area.

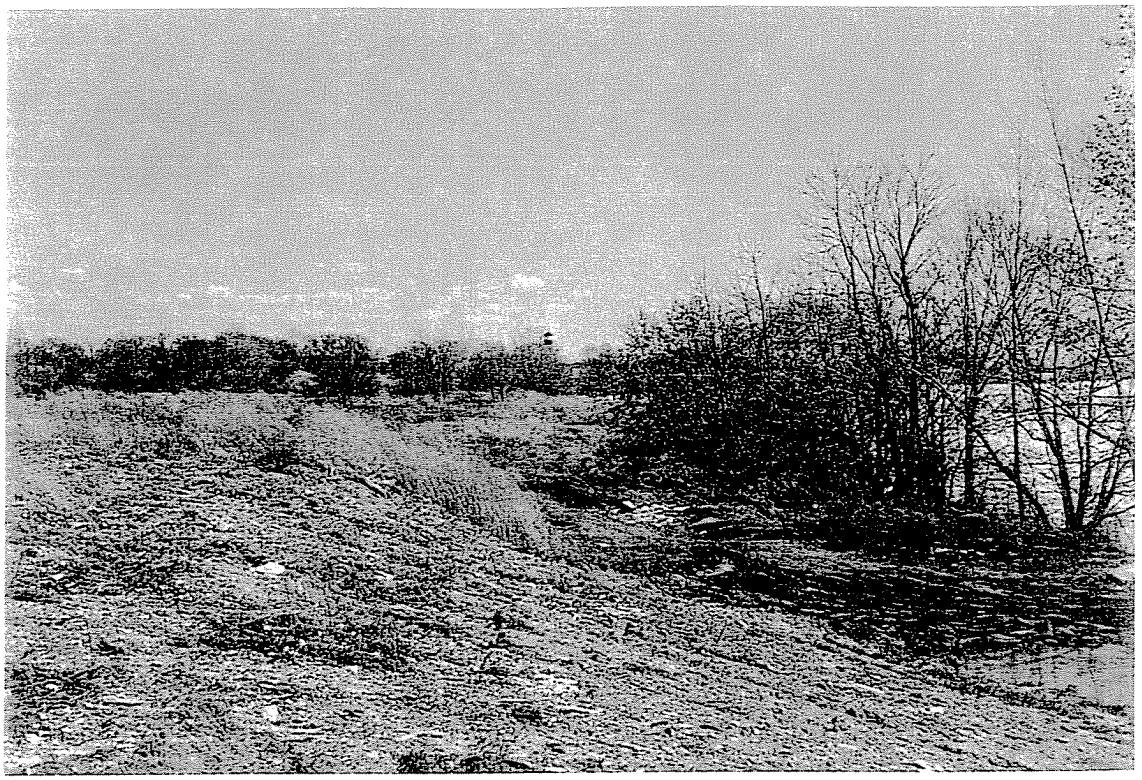


Photo 19 - Shore area adjacent to the high fill area in the eastern section of the project area facing southeast from the top of the southern edge of the high fill.

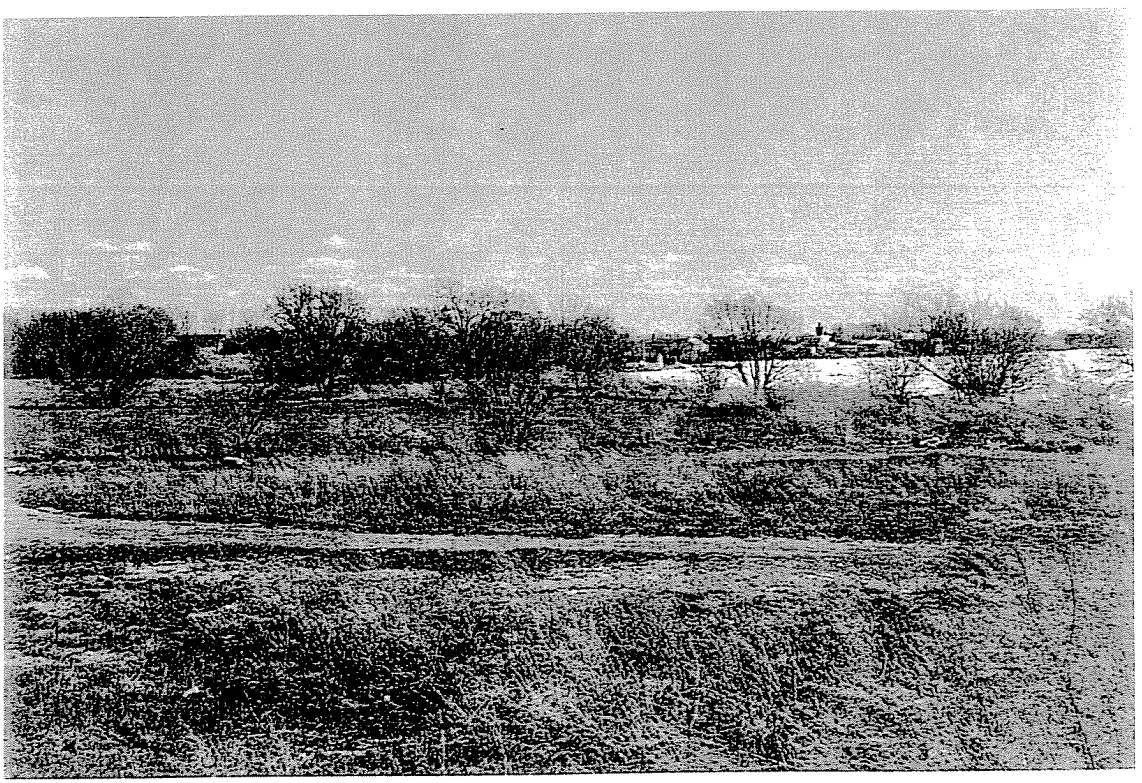


Photo 20 - Shore area adjacent to the high fill area in the eastern section of the project area facing southeast from the top of the southeast corner of the high fill. The "dog park" is in the foreground and the marina in the far background.

Photo 21 - Shore area in the easternmost section of the project area facing northwest from a point 100 ft west of the marina and 60 ft from shore.

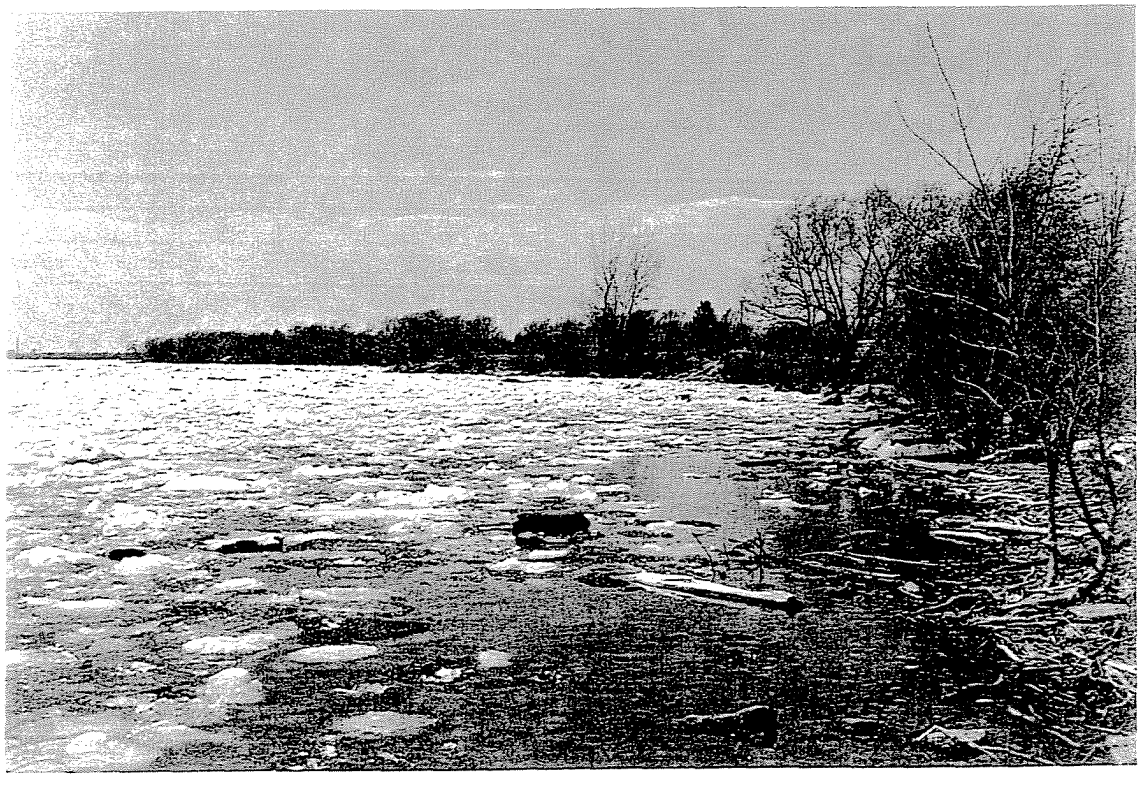


Photo 22 - River and bank in the western section of the project area facing northwest from the shore near groundwater well 6S.

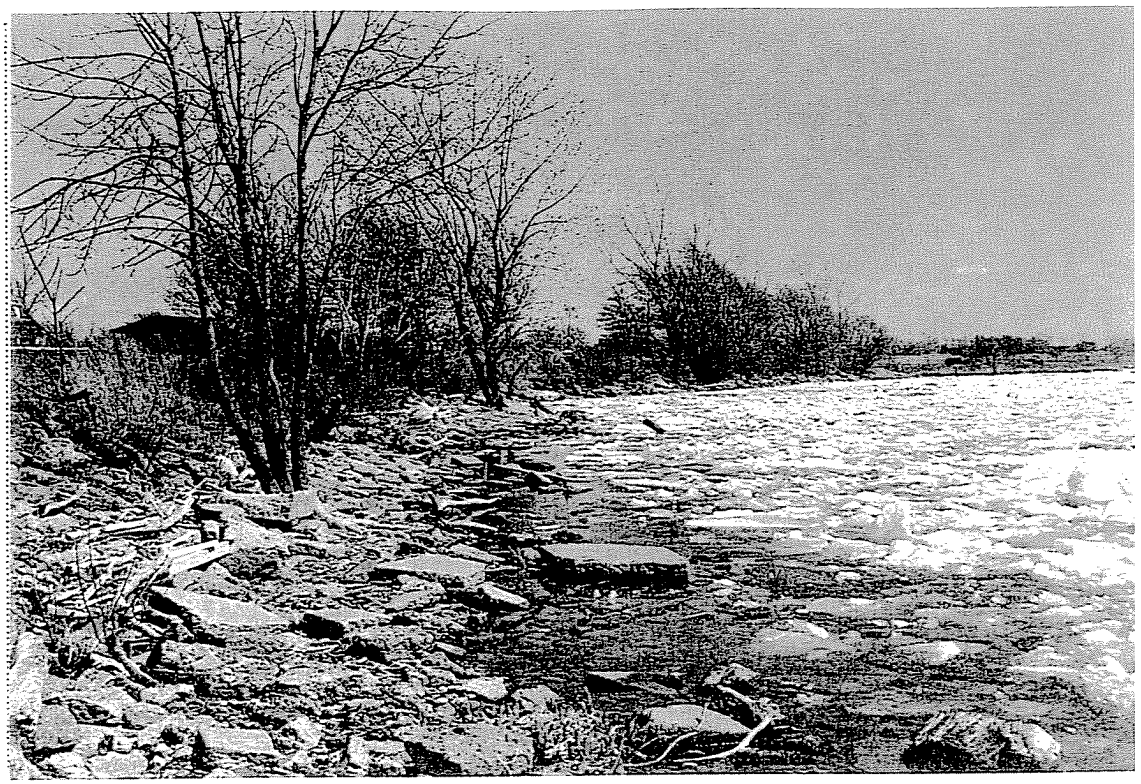


Photo 23 - River and bank in the western section of the project area facing southeast from the shore near groundwater well 6S.

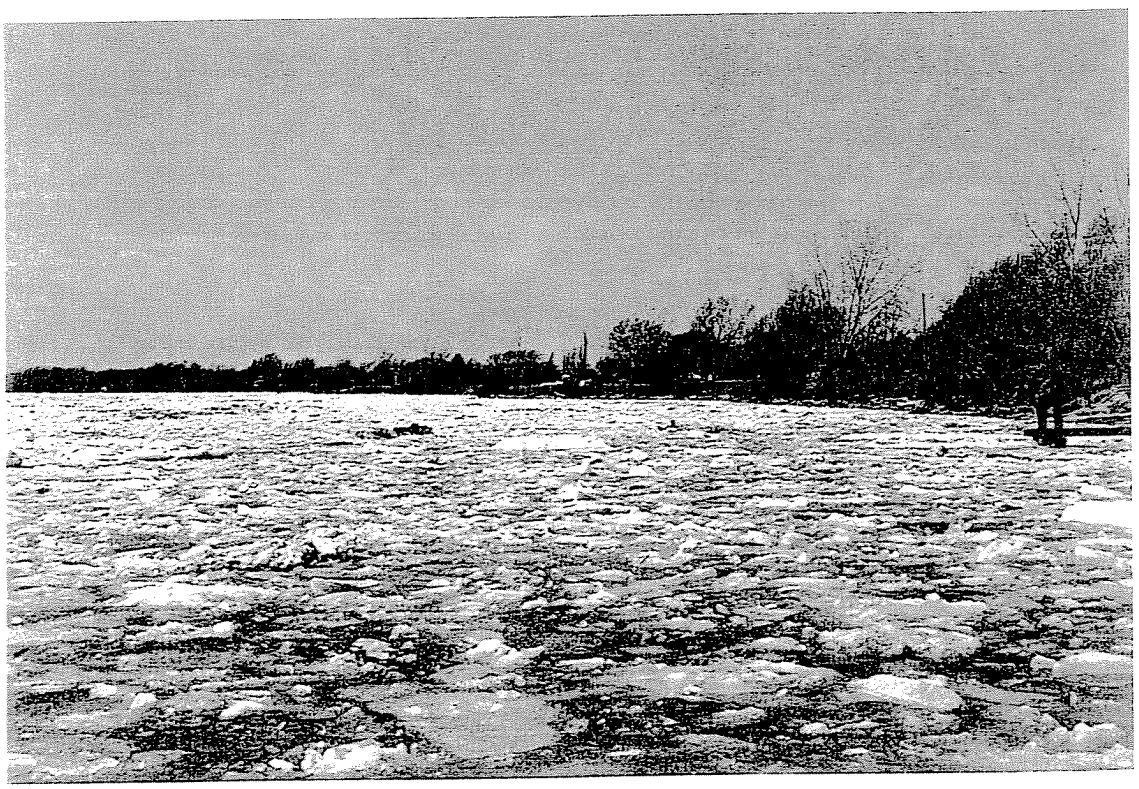


Photo 24 - River and bank west of the boat ramp facing northwest from a promontory on the east side of the ramps.

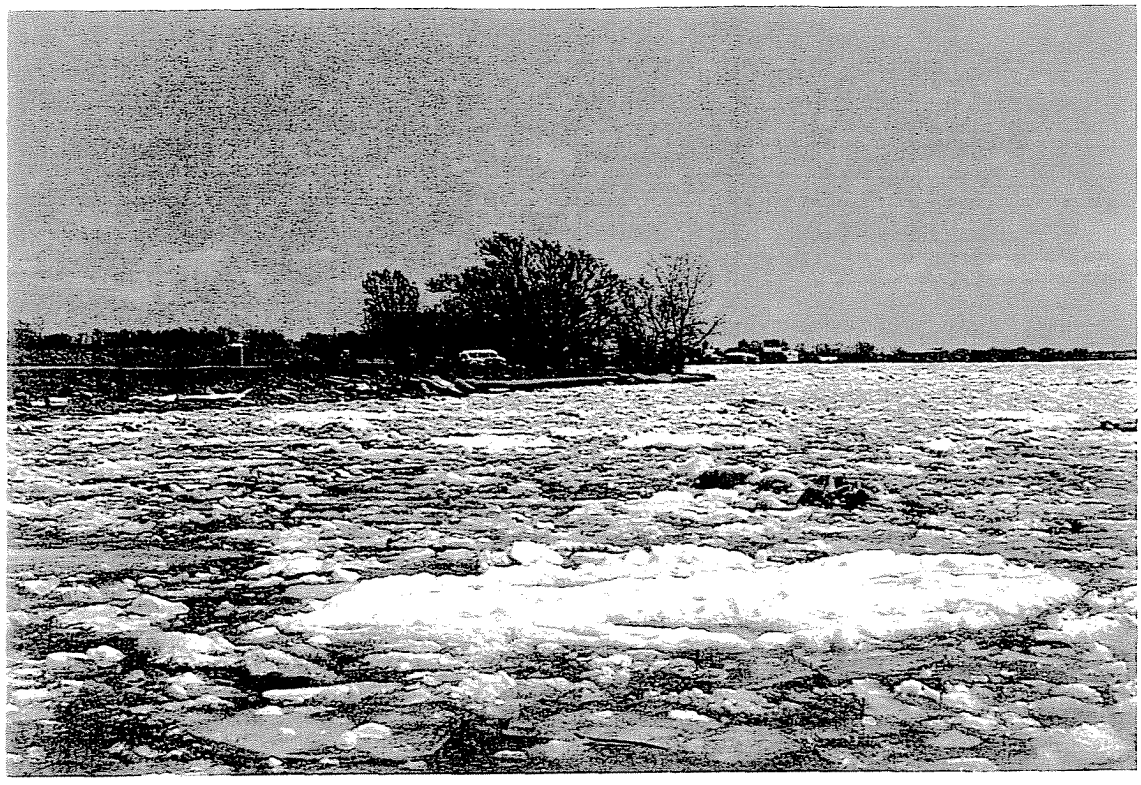


Photo 25 - River and bank east of the boat ramp facing southeast from a promontory on the east side of the ramps.

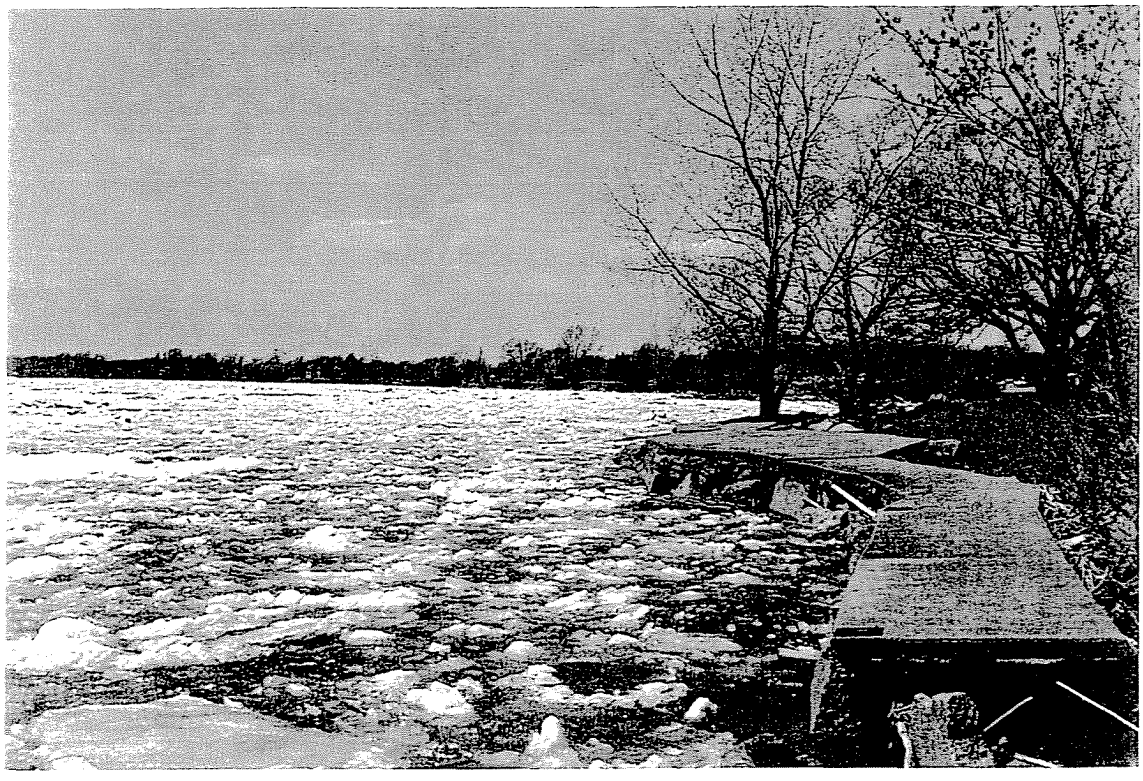


Photo 26 - River and bank in the easternmost section of the park showing old sidewalk remnants used as rip-rap facing northwest from the shore near the eastern park access road and groundwater well 5.

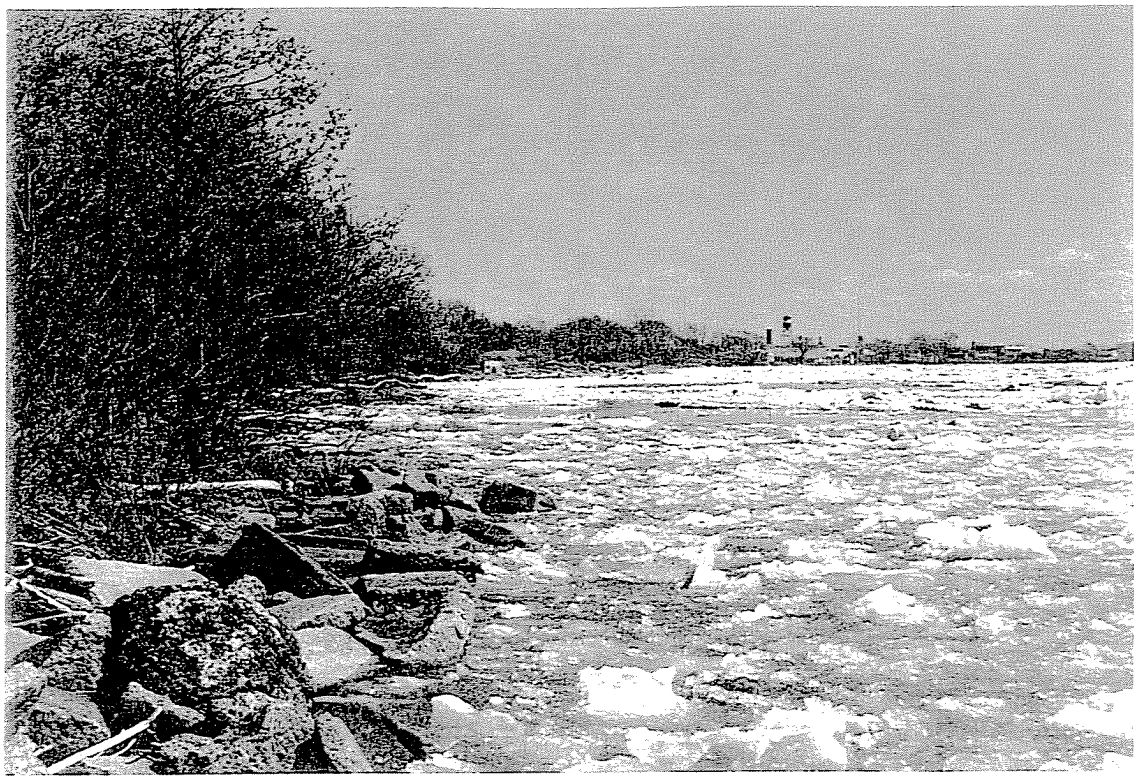


Photo 27 - River and bank in the easternmost section of the project area showing old sidewalk remnants used as rip-rap facing southeast from the shore near the eastern park access road and groundwater well 5.

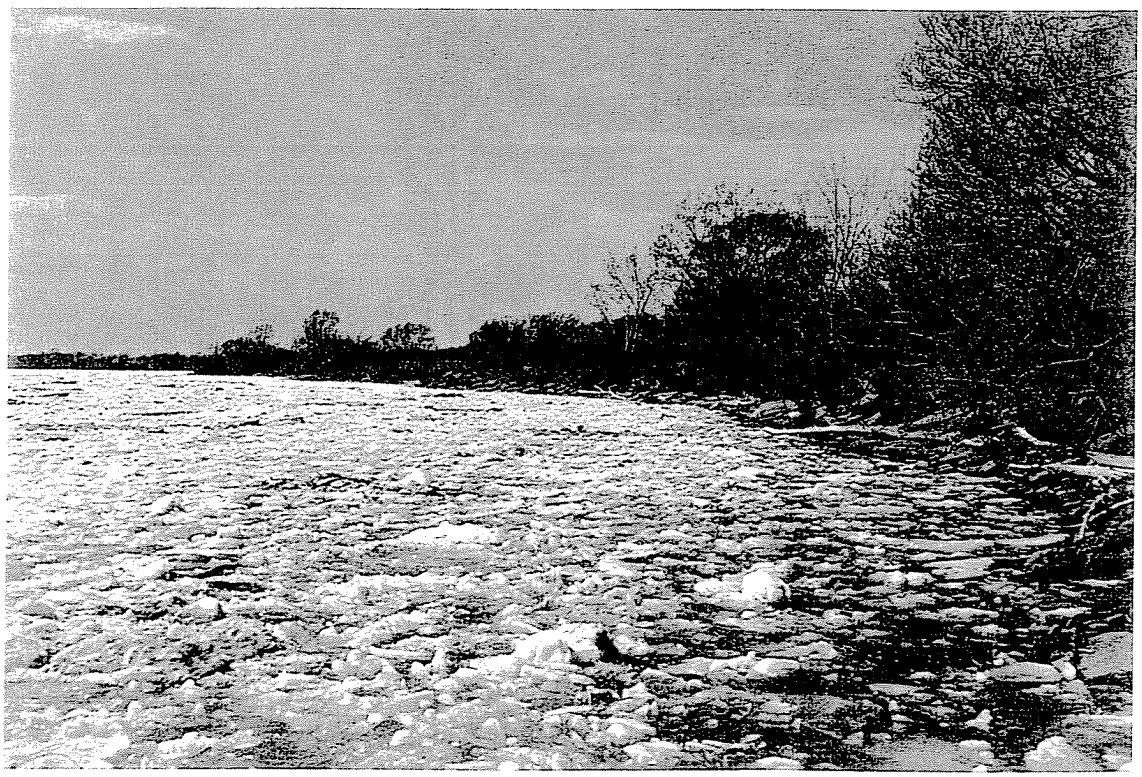


Photo 28 - River and bank in the easternmost section of the project area facing northwest from the shore at the marina.