2.3 WATER

2.3.1 HYDROLOGY

This section describes surface water bodies and ground water aquifers that could affect or be affected by the construction and operation of Nine Mile Point Unit 3 Nuclear Power Plant (NMP3NPP). The site-specific and regional data on the physical and hydrologic characteristics of these water resources are summarized to provide the basic data for an evaluation of impacts on water bodies, aquifers, human social and economic structures, and aquatic ecosystems of the area.

The Nine Mile Point Nuclear Station (NMPNS) site covers an area of 921 acres (373 hectares) and is located on the southeastern shore of the Lake Ontario in Scriba, NY. The climate of the site area is described in Section 2.7 and summarized below. Historical maximum precipitation for the area is shown in Table 2.3-1. Probable maximum precipitation is shown in Table 2.3-3.

Site topography (Figure 2.3-1) is relatively flat, ranging from approximately El. 280 to 260 ft (85 -79 m). At the lake shore there is a small bluff that drops from the site to the lake level of approximately El. 245 ft (75 m).

Nine Mile Point (NMP), on which the NMPNS site is located, is a slight promontory on the southeastern shore of the lake.

2.3.1.1 Surface Water Resources

The surface water resources in the vicinity of the NMPNS site are Lake Ontario and the wetlands and streams on the site. The hydrology of these waterbodies is discussed below.

2.3.1.1.1 Lake Ontario

2.3.1.1.1.1 Physical Setting

NMPNS is located on the southeastern shore of Lake Ontario in Oswego County, New York. Lake Ontario, an international body of water forming part of the border between the U.S. and Canada, is the smallest and easternmost of the Great Lakes, with a surface area of approximately 7,340 mi^2 (19,011 km^2) and a total volume of 393 mi^3 (1,638 km^3). The lake is 193 mi (311 km) long and 53 mi (85 km) wide in its largest dimensions, and has an average and maximum depth of 283 ft (86 m) and 802 ft (244 m), respectively (NMP, 2004).

Approximately 80 percent of the water flowing into Lake Ontario comes from Lake Erie through the Niagara River and averages approximately 205,000 ft^3/sec (5,805 m^3/sec). The remaining water flow comes from Lake Ontario basin tributaries and precipitation. The main feeder is the Niagara River; other large rivers draining into the lake are the Genesee and the Oswego from the south shore, the Black River from the east shore, and the Trent River from the north shore. Runoff directly into Lake Ontario from 27,300 mi^2 (70,707 km^2) of watershed in New York State and the province of Ontario provides an additional 36,000 ft^3/sec (1,019 m^3/sec). Approximately 93 percent of the water in Lake Ontario flows out to the St. Lawrence River and averages about 241,000 ft^3/sec (6,824 m^3/sec). The remaining 7 percent disperses through evaporation. Water retention time is estimated to be approximately eight years. Since Lake Ontario is the most downstream of the Great Lakes, it is impacted by human activities occurring throughout the Lake Superior, Michigan, Huron, and Erie basins (NMP, 2004a).

During the winter, ice cover forms in the slack water bays, but the lake itself is seldom more than 25 percent ice-covered. Lake Ontario's outflow river, the St. Lawrence, is ice-covered typically from late December until the end of March, all the way from the lake to the international boundary at Massena, NY (NMP, 1988).

Seiches produced by winds and atmospheric pressure gradients have occurred in Lake Ontario. These short-term lake fluctuations are generally less than 2 ft (0.6 m) in amplitude. Winds are directly related to the formation of surface waves, the magnitude of which varies between 0 and 15 ft (4.6 m) in height during a given year. Tide magnitudes amount to less than 1 inch (2.5 cm) (NMP, 1988)

The average annual precipitation in the site area is about 36 in (91 cm). It is estimated that approximately 18 in (46 cm) are lost as runoff into stream flow. Of the remaining 18 in (46 cm), approximately 16 in (41 cm) are lost via evapotranspiration. The remaining 2 in (5 cm) are available for groundwater recharge. The relatively high runoff can be attributed to the low permeability of the glacial soils and rock formations.

Once an oligotrophic system, by 1970 Lake Ontario was almost entirely eutrophic, caused by high levels of anthropogenic nutrients (primarily phosphorous) and uncontrolled pollutant discharge to the lake. The eutrophication of Lake Ontario was recognized as a serious water quality problem by the U.S. and Canada and led to the creation of the bi-national Great Lakes Water Quality Agreement (GLWQA) in 1972. Since then the lake has seen dramatic improvement in water quality. Much of this improvement can be attributed to stricter controls on land use in the Lake Ontario basin and lake-wide management plans sponsored by the GLWQA that reduced levels of non-point source pollution entering the lake (NRC, 2008).

2.3.1.1.1.2 Lake Bathymetry

The offshore slope at the plant site is steep (5 percent to 10 percent grade) at the beach, flattening to a 2 percent to 3 percent grade at the 15-foot (4.6 m) depth contour, then increasing to a 4 percent slope lakeward. In general, bottom sediments in nearshore areas are characterized by a greater predominance of coarse sands, pebbles, cobbles, and boulders, while finer sediments occur further offshore (NMP, 2004). Figure 2.3-2 shows the bathymetry in the vicinity of the proposed intake and outfall.

A geophysical survey was completed in Lake Ontario just offshore and southwest of the existing NMPNS. This survey was performed to characterize the lakebed and subsurface geological conditions at the proposed cooling water intake and discharge tunnels. Survey investigations were performed in a rectangular shaped area (approximately 3,500 ft by 2,000 ft (1,067 m by 610 m) in size) centered on the current proposed intake alignment.

The hydrographic data acquired in the survey area depict a typical lakebed profile that gradually declines offshore to the northwest. From approximately 400 ft (122 m) from the shoreline to approximately 2,900 ft (884 m) offshore, the lakebed appears rough and slope grades of approximately 3% were measured. Offshore of 2,900 ft (884 m) there is a marked change in the character and slope of the lakebed. From this point to the offshore limits of the investigation, the lakebed becomes notably smoother and appears almost flat with only a minor slope grade continuing to the northwest. Water depths of approximately 76 ft (23.2 m) were recorded along the proposed centerline at this offshore slope break point.

2.3.1.1.1.3 Sediment Transport and Shoreline Erosion Characteristics

The bottom sediments along the south shore of Lake Ontario relevant to the NMPNS site have been generally characterized as follows:

1. There is generally a west-to-east transport of sediment
2. Sites of sediment accumulation occur in nearshore shallow areas where the shoreline is irregular and where there are local deviations from the above transport pattern.
3. In general, the coarser sands, boulders, pebbles, and cobbles lie in the beach or nearshore area, and finer sediments are found lakeward.
4. Several small patches of sand occur offshore between Oswego and Mexico Bay, and it is hypothesized that these originated from the Oswego River.

2.3.1.1.1.4 Water Circulation

Lake Ontario circulation is influenced by the prevailing west-northwest winds and the eastward flow of water from the Niagara River, resulting in a counter-clockwise flow. Circulation of water generally occurs along the eastern nearshore areas and within sub-basins of the main lake (NMP, 2004). Water currents typically move in an eastward direction along the south shore of Lake Ontario in a relatively narrow band. However, circulation patterns at a specific time can be affected by winds. Major shifts in wind distribution can alter currents in a matter of hours. Wind speed - frequency data collected during recent field studies at NMPNS and reported by the NRC in the NMP Unit 2 FES indicate that, over the year, winds in excess of 20 mph (32 km/hr) occur over 21 percent of the time based on readings averaged over a six-hour period. From June - September, winds in excess of 20 mph (32 km/hr) occur 13 percent of the time. At the 19 foot (5.8 m) depth contour, the measured current speed of six-hour duration exceeded with comparable frequency is about 0.2 fps (0.06 m/sec) (NMP, 2004A).

Two other important examples of wind-induced effects on the general circulation pattern of Lake Ontario are upwelling and internal oscillation of thermocline depth. Upwelling is characterized by the rising of colder, heavier, bottom water toward the surface. As noted by the NRC in the NMP Unit 2 FES, a variety of theories have been proposed to account for the oscillations, which are a common feature of Lake Ontario temperature records. The most direct explanation is that an upwelling displaces the thermocline from equilibrium by converting the kinetic energy from wind gusts into potential energy that alters the thermocline position. When the wind stress is removed, internal waves are set in motion and contribute to the dissipation of this energy. Internal waves increase in amplitude after storms. In Lake Ontario, approximately three complete oscillations occur every 2 days (NMP, 2004).

Current measurements were made off the NMPNS promontory from May to October 1969 and from July to October 1970. Two fixed underwater towers were placed in the lake, one in 24 ft (7.3 m) of water and one in 46 ft (14.0 m) water, and provided average hourly current speed and direction data. In addition, two drogue surveys were conducted in 1969 to obtain the overall current pattern at the site.

The predominant current direction in the preceding studies is alongshore. On those occasions when onshore or offshore currents were observed, their magnitudes were substantially less than those of alongshore currents. Based on this near-field data, alongshore currents from the east are just slightly more likely to occur than from the west. Overall lake circulation patterns are typically west to east along the south shore of Lake Ontario.

The currents in the nearshore at NMPNS tend to flow alongshore in both directions. Local circulation at NMPNS near the intake and discharge is strongly influenced by the shallow depth (less than 33 ft (10 m) and proximity to shore. While longshore winds induce longshore currents directly by wind stress, onshore or offshore wind stress produces a sloping lake surface with associated longshore slope currents. The slope current associated with onshore winds across the lake flows eastward, while offshore winds with limited fetch produce weaker westward slope currents. Current reversals are frequent and are related to a variety of lake events. Current speeds are generally lower than 1 fps (0.3 m/s) because of the frictional effect of the shoreline and shallow, sloping bottom (NMP, 1984).

Velocity distributions at the intake velocities were measured at the surface and bottom of two stations during the survey period between October 21 and 25, 2007. In general, measured currents were less than 0.7 fps (20 cm/s). The offshore, deeper station displayed slightly stronger currents.

2.3.1.1.1.5 Water Temperature Distribution

Lake Ontario is a large, temperate lake that exhibits a seasonally-dependent pattern of thermal stratification, which alters circulation patterns. Changes in stratification result from atmospheric heat exchange and wind-induced mixing. In spring months, the shallow nearshore waters warm more quickly than the deep offshore waters, setting up isotherms roughly parallel to shore. As the lake temperature continues to warm, vertical stratification develops as a result of the combined effects of the lake warming and advection of the warmer, near-shore waters. Most of the lake is vertically stratified during the summer with the warm surface waters (epilimnion) averaging nearly 70 °F (21 °C) and cool deeper waters (hypolimnion) ranging between 38.8 °F (3.8 °C) and 39.2 °F (4 °C). Mixing of these strata begins as the thermocline breaks down during September as a result of surface water cooling, and continues until water temperatures are the same throughout the water column (NMP, 2004).

The lake water temperatures begin to warm in mid-March and by late-June the offshore ambient temperature stays above 39 °F (4 °C). Generally, vertical stratification is established over the entire basin by this time (NMP, 1984). During the warmest water temperature period (June - September) at NMPNS, the ambient temperature of Lake Ontario exceeds 71 °F (22 °C) approximately 10 percent of the time in the waters surrounding NMPNS. The mean summer ambient temperature of Lake Ontario at NMPNS is 67 ° F (19 °C), with a maximum surface temperature rise above ambient of approximately 12.4 °F (10.9 °C) at capacity operation (NMP, 2004). In late September, the warming process ends, the mean surface temperature drops rapidly below 63 °F (17 °C), and the thermocline breaks down, marking the beginning of the winter season. The date of overturn varies each year due to storms. After overturn and when the lake surface cools to below 39 °F (4 °C), isotherms tend to be parallel to shore. During the winter months, nearshore areas of the lake freeze while the deep offshore waters remain open (NMP, 2004).

Vertical temperature profiles revealed the existence of transient thermal gradients equal to or greater than 8 °F/3.3 ft (1 °C/m) throughout the study area. The gradients existed primarily in the summertime. They were not seasonally stable, since they were generated and destroyed by surface heating and cooling and mixing within the water column over periods dependent upon meteorological conditions. Although gradients were observed in sequential weeks for up to 3- to 4-week periods, the gradients observed were at different temperatures and at different depths from week to week and therefore were not persistent. When the gradients were observed, they appeared to be uniform from station to station. Additional thermal characteristics of the lake are discussed in Section 5.3.

2.3.1.1.1.6 Dams and Reservoirs

Since 1960, Lake Ontario outflows have been regulated to control lake water levels, under the supervisory authority of the International St. Lawrence River Board of Control (ISLRBC), by a series of dams on the St. Lawrence River. The ISLRBC was created in 1952 under the Boundary Waters Treaty of 1909 to help prevent and resolve disputes over the use of water along the Canada and United States boundary. The current plan regulating Lake Ontario outflows is Lake Ontario Regulation Plan 1958-D, which specifies weekly outflows based on the water level of the lake and water supplies to the lake. The primary water regulation facility is the Moses-Saunders Power Dam near Cornwall, Canada, and Massena, New York, approximately 100 mi (161 km) downstream from the outlet of Lake Ontario. A second dam, located near Long Sault, Ontario, Canada, acts as a spillway when outflows are larger than the capacity of the Moses-Saunders Dam. A third structure, at Iroquois, Ontario, Canada, is principally used to help to form a stable ice cover and regulate water levels at the power dam (NMP, 2004).

The ISLRBC seeks to regulate Lake Ontario water levels within a target range from 243.3 to 247.3 ft (74.2 - 75.4 m) International Great Lakes Datum (IGLD) The ISLRBC aims to maintain levels above 243.3 ft IGLD (74.2 m) from April 1 through November 30 annually. Under the most extreme dry conditions, all possible relief is provided to navigation and power production facilities. Data compiled by the U.S. Army Corps of Engineers for the period of record 1918 - 2001 indicate that average lake water levels range from approximately 244.5 ft to 246.2 ft IGLD (74.5 - 75.0 m); minimum and maximum lake water levels during that period were approximately 241.9 ft and 248.6 ft IGLD (73.7 - 75.8 m), respectively (NMP, 2004).

2.3.1.1.1.7 Flood Conditions

Prior to plant construction, the shoreline of Lake Ontario in the area of the plant site was mildly sloping to the elevation of the water level during the 100-yr flood. Areas flooded during the 100-yr event consisted of bare to lightly vegetated glacial till.

After plant construction, site grades in the 100-yr flood- plain were steeper than before construction. The major feature at the shoreline in the 100-yr floodplain is the revetment-ditch system built to protect the plant from flooding and protect the shoreline from erosion. The 100-yr flood elevation follows this dike east of the site area after NMP Unit 2 construction, as shown in Figure 2.3-3.

The 100-yr flood elevation of 249.4 ft (76.0 m) was taken from the Flood Insurance Study (FEMA, 2001). The historic maximum instantaneous water levels of the lake at Oswego, NY are shown in Table 2.3-2.

The major topographic alteration in the 100-yr flood-plain is the addition of the revetment-ditch system. A revetment ditch system was constructed along the lakeshore in front of NMP Unit 2. The top of the revetment is at elevation 263 ft (80.16 m) and prevents possible plant flooding due to lake wave action. A ditch located immediately south of the revetment collects rainfall runoff flowing north toward the lake and conveys the flow to both ends of the revetment. The other two structures in the 100-yr flood-plain are the submerged intake and discharge structures (NMP, 2004).

There is no information available to indicate that overland drainage of the site area has resulted in any historic flooding conditions.

2.3.1.1.2 On-Site Streams and Wetlands

The surface water bodies that may be affected by the NMP3NPP project are shown in Figure 2.3-10 and discussed below.

2.3.1.1.2.1 Streams

There are no named streams within the project site. There are, however, several local drainages that flow through various portions of the project site. All of the area streams discharge to Lake Ontario; none have known historical water quality or flow records. There is no known information on erosion characteristics, sediment transport, flooding and low flow conditions, or seasonal variability for these watercourses. However, considering the small size of these local water courses, as discussed below, these factors in the minor streams should have no bearing on the proposed project.

The watershed encompassing the proposed project facilities is delineated on Figure 2.3-1. The 4,240 ac (1,716 ha) delineated area is tributary to the proposed facilities and the temporary construction areas.

The majority of the watershed (Subarea A), with an approximate area of 3,322 ac (1,334 ha) is drained by Lakeview Creek. The headwaters of the two tributary branches of Lakeview Creek are approximately 4 mi (6 km) south of Lake Ontario at elevation 510 ft (155 m). The stream flows north through rural areas characterized by forest and farm lands. The confluence of the two branches is immediately south of Burt Minor Road. The stream then passes through a culvert and into a significant wetland complex on the north side of Burt Minor Road and on the east side of Strike Road, an unpaved access road to NMPNS. The stream passes through a twin 48-inch CMP culvert under Strike Road as it flows to the west and then turns north and west again as it flows through forested and wetland areas and around a topsoil disposal area from previous construction. At Lakeview Road it pass through a culvert flowing west, merges with another minor drainage, and turns north and flows through a 10-ft (3 m) elliptical CMP culvert under Lake Road. It then flows north to a double barrel culvert on the Ontario Bible Camp and through a man-made boat basin before discharging to Lake Ontario at elevation 245 ft (75 m). The stream gradient is 0.007 ft/ft (0.007 m/m).

A second unnamed stream drains the north-central portion of the watershed. The subwatershed for this stream (Subarea B), with an approximate area of 442 ac (179 ha), has its headwater at approximately 320 ft (97.5 m), approximately 1 mile (1.6 km) south of the Lake Ontario shoreline. The stream gradient is 0.006 ft/ft (0.006 m/m). The drainage area includes forested wetland in the headwaters, and includes most of the existing NMPNS and switchyard. The lower reach flows through a wetland complex and through two sets of culverts before discharging to Lake Ontario just east of the Ontario Bible Camp. This stream is not shown on the USGS map.

A third unnamed stream drains the northeastern portion of the watershed. This drainage area for this stream (Subarea C) with an approximate area of 350 ac (142 ha), also has its headwaters at approximately 320 ft (97.5 m). The stream gradient is 0.007 ft/ft (0.007 m/m). The stream is shown on the USGS map as a blue-lined channel. It drains a forested wetland complex in the headwaters area, flows north through a culvert under Lake Road and drains portions of the NMPNS and James A. Fitzpatrick Nuclear Power Plant (JAFNPP) before discharging to Lake Ontario.

The smallest unnamed stream in the project watershed drains the north-central portion. The drainage area for this stream (Subarea D, 124 ac (50 ha) has its headwaters at approximately 300 ft (91.4 m) in the area of the abandoned batch plant/shooting range. The stream gradient is 0.0125 ft/ft (0.0125 m/m). The stream also drains the area from the Visitor's Center access road to the west flowing through a wetland complex near the existing Met tower and then turning north to the Lake Ontario outlet.

2.3.1.1.2.2 Wetlands

Section 2.4.1 describes the types of wetland found on site and in the vicinity of NMPNS Figure 2.4-1 shows the aerial extent of the wetland systems on site and upstream. The wetlands generally result from disruption of drainage caused by the drumlin topography of the region, and generally consist of shallow ponds, shrub swamps, wood swamps, and intermittently inundated forests.

2.3.1.1.2.3 Off-site Watercourses

The closest major waterbodies to the project site other than those previously discussed include the Oswego River, 6 mi (10 km) to the west of the NMPSNPP site. At this distance, the river should not be influenced by the proposed plant intake and discharge.

2.3.1.2 Groundwater Resources

This section contains a description of the hydrogeologic conditions present at, and in the vicinity of the NMP3NPP site. This section describes the regional and local groundwater resources that could be affected by the construction and operation of NMP3NPP. The regional and site-specific data on the physical and hydrologic characteristics of these groundwater resources are summarized to provide the basic data for an evaluation of potential impacts on the aquifers of the area. The location of the site, including regional and local surface hydrologic features, is described in Section 2.3.1.1.

2.3.1.2.1 Hydrogeologic Setting

The location of the NMP3NPP is shown in Figure 2.3-1. The site is located in Oswego County, New York on the southeastern shore of Lake Ontario. In general, the regional groundwater piezometric surface in the various formations in the vicinity of the NMP3NPP site slopes northward toward Lake Ontario, its natural base discharge. Groundwater recharge areas and topography may affect localized groundwater movement and may vary, to some extent, the direction of aquifer flow. Previous investigations indicate that a hydraulic connection exists between the unconsolidated Pleistocene deposits and the upper consolidated Paleozoic formations.

Few of the bedrock formations in the region around the site have regularly yielded 100 gpm (6 l/sec) or more to an individual well. For the purposes of this section, yield is defined as the quantity of water flow to a well per unit of time. Most wells installed in the bedrock formations yield only sufficient quantities for domestic use. Several wells installed in well-sorted sand and gravel deposits have yielded in excess of 500 gpm (32 l/sec).

Four hydrologic units exist below the site (one soil and sediment layer and three bedrock layers): Unlithified Sediments, Oswego Sandstone, Pulaski Formation, and Whetstone Gulf Formation, in descending depth order. None of these units are considered to be sole source aquifers. Groundwater is available from an unconfined aquifer and deeper confined aquifers. The unconfined aquifer is composed of glacial till and fill material (Unlithified Sediments) and the upper portion of the Oswego Sandstone beneath the soil. The unconsolidated deposits rest on a permeable fractured zone at the top of the Oswego Sandstone. The Oswego Sandstone formation becomes relatively impermeable within approximately 20 ft (6.1 m). Within a two-mile (3.2 km) radius of the site, the local water table ranges in elevation from 300 ft (91 m) National Geodetic Vertical Datum (NGVD) in the southeast to the lake water level, approximately 246 ft (75 m) NGVD, with annual variations of approximately two ft (0.6 m) (NMP, 2004).

The normal groundwater table in the plant complex area is approximately 255 ft (78 m) NGVD . The average gradient is approximately 0.7 percent to the north-northwest.

The transition zone between the Oswego Sandstone and the youngest division of the Pulaski Formation (Pulaski Unit A) is more permeable than the overlying and underlying strata, and constitutes the uppermost confined aquifer at the site. Below this zone, another confined zone of relatively high permeability exists in the Pulaski Unit B strata. The Pulaski Unit C zone has a very low permeability and separates the confined Pulaski Unit B zone from the underlying Whetstone Gulf Formation. All of these deep aquifers are confined as characterized by artesian pressure.

Groundwater recharge in the vicinity most likely occurs as a result of infiltration of precipitation and local seepage from ponds and wetlands through the unconsolidated deposits and bedrock outcrops. Due to the low permeability of the surficial soils in the vicinity of the site, most of the precipitation runs off toward the lake, leaving approximately two inches (5 cm) available for recharge annually. The Oswego Sandstone is recharged by seepage from the unconsolidated deposits and local outcrops located to the south and southeast of the site. Recharge of the lower zones of rock beneath the surface occurs through outcrops upgradient to the site, or possibly through fractures.

Recharge of the bedrock formations may also occur by streamflow infiltration in areas where the bedrock formations come directly in contact with, or are close to, relatively higher permeable materials within a stream channel. Streamflow infiltration is reported to occur in one area in the eastern Oswego River Basin along Skaneateles Creek where a middle shale unit is crossed by the creek (NMP, 1988). There are no data or studies on the groundwater/surface water interactions within the project vicinity.

Groundwater flow velocities in the vicinity are slow due to low hydraulic conductivities. The maximum estimated regional velocity of groundwater in the unconfined aquifer is no more than a few yards (meters) annually, based on a gradient of 0.7 percent and an assumed average permeability of 4×10^{-6} in/sec (1×10^{-5} cm/sec).

The unconfined water table aquifer is generally of sufficient yield capacity for domestic use only. Within 2 mi (3.2 km) of the site, groundwater wells yield an estimated five to eight gpm (0.3 - 0.5 l/sec) from the unconsolidated deposit, and up to 10 gpm (0.6 l/sec) from the lower strata. Potable water in the area is supplied to residents either through the Scriba Water District, which receives its water from the City of Oswego, or from private wells. Currently, operation of private groundwater wells in Oswego County is not regulated, nor does any agency keep a listing of all groundwater wells in the area. A groundwater well census conducted in 1972 revealed the existence of approximately 102 domestic wells within 2 mi of NMPNS, but only 70 were in use. The average pumping rate of the active wells in use was 650 gallons per day (2,462 l/day). The nearest domestic well is approximately 1 mi from the Unit 2 Reactor Building. A review by NMPNS of aerial photographs taken in March 1995 did not reveal any residential or industrial development within 1 mi (1.6 km) of NMPNS. Currently, the nearest residence is approximately 1 mi (1.6 km) from the site. The Town of Scriba has designated the majority of the land within the 1 mi (1.6 km) radius of NMPNS as either Industrial (including the NMP Unit 1 and Unit 2 and JAFNPP) or as a Valued Natural Resource, limiting the potential for future residential growth in the area. Therefore, it is unlikely that any private groundwater supply wells have been installed significantly nearer than 1 mi (1.6 km) from the NMP Reactor Buildings.

The existing NMP Unit 1 and Unit 2 are not a direct user of groundwater, and there are no plans for direct groundwater use in the future. However, Unit 2 does have a permanent dewatering system, which consists of perimeter drains and two sumps located below the Reactor Building. The Unit 2 dewatering system is designed to maintain the water table below the reactor mat elevation of approximately 163.8 ft NGVD (50 m). Submersible pumps are located in each of the sumps, which together discharge groundwater at an estimated average of 200 gpm (12.6 l/sec) to maintain the cone of depression. The water is then discharged to Lake Ontario through a storm drain system. The cone of depression surrounding the Unit 2 Reactor Building estimated to result from this dewatering is steep; the groundwater table is estimated to reach 215 ft NGVD (66 m) within a radius of 200 to 225 ft (61 - 69 m) of the Reactor Building.

Results of groundwater monitoring at NMPNS, performed in 2002 to evaluate petroleum-impacted groundwater at the former vehicle maintenance area, indicate that the groundwater table reaches approximately 254 ft (77 m) NGVD within 600 ft (183 m) northeast of the existing Reactor Building, illustrating the limited radius of influence of the dewatering operation. The NRC concluded in the Unit 2 FES that the cone of depression created by the dewatering system was small and would have no effect on off-site groundwater use.

Due to the geologic conditions surrounding the Unit 1 Reactor Building, an active dewatering system was deemed unnecessary for that unit. According to the Unit 1 Updated Final Safety Analysis Report (UFSAR) very little groundwater seeps into the Reactor Building due to the lack of open joints in the surrounding strata at depths more than 20 ft (6 m) below the rock surface. Therefore, there is no need to maintain the groundwater table below normal levels around the Unit 1 reactor. The exterior of the Reactor Building below grade is provided with a peripheral drain for collecting any groundwater seepage. The drain discharges into a sump pit with two 150-gpm (9.5 l/sec) submersible pumps.

2.3.1.2.2 Local Geology

Soil at the site varies in thickness but is generally is less than 25 ft (7.6 m) thick. Area soils consist primarily of glacial till and are discussed further below.

Near surface bedrock in the region consists of flat-lying Paleozoic sedimentary rock with horizontal homogeneity. The sedimentary rock formations dip regionally to the south-southwest with a gradient of approximately 50 ft per mile (roughly 1 foot per hundred ft) (9.4 m/km). Locally at the NMPNS site, the bedrock surface dips to the northwest. The bedrock formations at the site are, from the surface down:

- Oswego Sandstone (sandstone, Ordovician)
- Pulaski Formation (interbedded dark gray siltstone, gray sandstone, and dark gray argillaceous sandstone, Ordovician)
- Whetstone Gulf Formation (alternating dark gray siltstone, gray sandstone, and dark gray argillaceous sandstone, Ordovician)

2.3.1.2.3 Geotechnical Setting

A geotechnical investigation was conducted in 2008 to collect and analyze field and laboratory data on soil, rock, and groundwater for design of the proposed NMP3NPP facilities. The investigation included drilling 79 bore holes and 3 test pits (Figure 2.3-4). Below are the findings of the investigation. A subsurface profile at the locations of various proposed structures is shown in Figure 2.3-5.

2.3.1.2.3.1 Soil Descriptions

The various layers of fill, natural soils, and bedrock are described below in order of increasing depth.

Fill

Fill from 4 to 13.5 ft (1.2 - 4.1 m) thick is generally located on and around the southern ball field (the area on the south side of the proposed reactor building) and near the firing range. Fill generally consisted of varying amount of silts, sands, and gravels with cobbles and boulders. Typically, the upper 6 to 12 inches (15 - 30 cm) of the fill layer is finer grained and has some organic material. NMPNS site personnel indicated that rock fill from the construction of NMP Unit 2 might have been used to fill the general area around the southern ball field.

Surficial Deposits

Surficial deposits ranged in thickness from 0.5 to 10.6 ft (0.2 - 3.2 m). Surficial deposits can be broken down into two categories: topsoil and fine-grained soil near wetland areas. The topsoil typically consisted of silty sand to sandy silt with varying amounts of organics and gravel. The topsoil was encountered throughout the site and typically ranged from 0.5 to about 2 ft (0.2 - 0.6 m) thick.

Fine grained soils were encountered to depths of up to 10.6 ft (3.2 m) in areas near wetlands to the north of the proposed reactor complex. The fine grained soils generally consisted of low plasticity silts and clays with varying amounts of sand and gravel. Occasional layers or pockets of organic materials were observed in these fine grained soils to depths of up to 10 ft (3.0 m).

Glacial Till

Glacial till was encountered either at the ground surface or just below the fill and surficial soils and extended down to the top of bedrock. The glacial till ranged in thickness from 2.1 to 21.3 ft (0.6 - 6.5 m) thick, but was typically between 5 and 15 ft (1.5 - 4.6 m) thick. The glacial till typically consisted of silty or clayey sand with gravel, with occasional cobbles and boulders. The results of grain size tests performed on glacial till samples indicated a widely graded soil with between 20 and 60% fines (passing the # 200 sieve). Atterberg limits tests performed on glacial till samples indicated the plasticity ranged from non-plastic to low plasticity. Standard Penetration Tests (SPTs) performed in the borings typically indicated a medium dense to very dense soil.

The upper portion of the glacial till layer was typically a light brown to tan color and the lower portion was light to dark gray. The grain size test results and the field classifications indicate that the gradations of the two different colored till soils are similar. The color difference appears to be related to site groundwater levels and the long-term degree of saturation of the soils.

2.3.1.2.3.2 Rock Descriptions

The top of the bedrock encountered varied between El. 283.2 and El. 238.4 ft (86.3 and 72.7 m). The top of bedrock is highest in the southern portion of the site near the Strike Road and drops to the north-northwest towards Lake Ontario.

The bedrock formations encountered in the borings were:

- Oswego Sandstone (including Oswego Transition Zone)

- Pulaski Formation (subdivided into Units A, B, and C)
- Whetstone Gulf Formation

All of these formations consist primarily of flat-lying sandstone, siltstone, and shale. The boundary between units is often gradational, and the units are lithologically similar. The engineering properties of all the units are similar.

Oswego Sandstone

The Oswego Sandstone ranged in thickness from 29 to 79 ft (8.8 - 24.1 m) with typical thicknesses of about 45 to 60 ft (13.7 - 18.3 m). The Oswego Sandstone consisted of hard, fresh to slightly weathered, unfossiliferous, greenish-gray, fine to medium grained, massive to cross-bedded sandstone. Thin dark gray siltstone and shale beds were minor and siltstone clasts were common. The sandstone was typically composed of subangular to subrounded quartz grains, sometimes with well-rounded lithic fragments, feldspar crystals, and a clay matrix.

The lower portion of the Oswego Sandstone has been informally designated as the Oswego Transition Zone (NMP, 1988). This sub-unit was found to range from 9 to 60 ft (2.7 to 18.3 m) thick in the borings with typical thicknesses of 15 to 30 ft (4.6 to 9.1 m). The Oswego Transition Zone consists of medium hard to hard, slightly weathered to fresh, alternating, laminated to thickly bedded, fine to medium-grained sandstone, argillaceous sandstone, and siltstone. Trace fossils are present. There is a general trend toward bed thinning and increasing clay content, downward through the sub-unit.

The results of in-situ permeability tests indicated permeabilities in the range from 4×10^{-7} to 3×10^{-4} in/sec (<1×10^{-6} cm/sec to 8×10^{-4} cm/sec) with a typical value of about 4×10^{-6} in/sec (1×10^{-5} cm/sec).

Laboratory test results indicated that the unit weight of the Oswego Sandstone ranged from 159 to 183 pounds per cubic foot (pcf) (2.5 to 2.9 g/cm^3) with typical values of 160 to 168 pcf (2.6 to 2.7 g/cm^3). The results of the unconfined compression tests indicated strengths in the range of 18,550 to 39,431 pounds per square inch (psi) (1,304 to 2,772 kg force/m^2) with typical values of 20,000 to 28,000 psi (1406 to 1969 kg force/sq m).

Pulaski Formation

The Pulaski Formation is approximately 100 ft (30.5 m) thick at the NMP3NPP site.

The Pulaski Formation was informally subdivided into Units A, B, and C during the investigation for NMP Unit 2 (NMP, 1988). Each unit was typically in the range of 20 to 35 ft (6 - 10.7 m) thick at the NMP3NPP site. All three units consisted of interbedded sandstone, siltstone, and shale. The relative amount of siltstone and shale increased in the lower portions of the Pulaski Formation. All three units contained marine fossil shell debris.

Unit A is the uppermost unit and consisted of slightly weathered, medium hard, dark gray argillaceous sandstone interbedded with light gray sandstone and a few beds of dark gray shale and siltstone. Unit A had abundant marine fossil debris and disturbed bedding layers. A distinctive thin green layer of smectite and chlorite was noted near the base of Unit A in many of the borings.

Unit B consisted of slightly weathered, medium hard, interbedded light gray sandstone, dark gray siltstone, and shale. Unit B had relatively more sandstone than Unit A and relatively less fossil debris than Unit A.

Unit C consisted of slightly weathered, medium hard dark gray siltstone and shale, interbedded with light gray sandstone. Unit C was darker and had more siltstone and shale than Units A and B.

The results of in-situ permeability tests in Units A and B indicated permeabilities in the range from 4 x 10^{-7} to 8 x 10^{-5} in/sec (<1 x 10^{-6} cm/sec to 2 x 10^{-4} cm/sec) with a typical value of about (4 x 10^{-6} in/sec (1 x 10^{-5} cm/sec). The results of in-situ permeability tests in Unit C indicated permeabilities in the range from 4 x 10^{-7} to 3 x 10^{-5} in/sec (<1 x 10^{-6} cm/sec to 7 x 10^{-5} cm/sec) with a typical value of about 2 x 10^{-6} in/sec (5 x 10^{-6} cm/sec).

Laboratory test results indicated that the unit weight ranged from 163 to 175 pcf (2.6 to 2.8 g/cm^3) with typical values of 166 to 170 pcf (2.65 to 2.72 g/cm^3). The results of the unconfined compression tests indicated strengths in the range of 13,184 to 30,088 psi (927 - 2,115 kg-force/cm^2) with typical values of 15,000 to 18,500 psi (1,055 -1301 kg-force/cm^2).

Whetstone Gulf Formation

The Whetstone Gulf Formation is estimated to be approximately 770 ft (235 m) thick at the NMP3NPP site.

The top of the Whetstone Gulf Formation is lithologically very similar to the Pulaski C. The differentiation among the formations is made in the literature based on the types of fossils in the rock. The Whetstone Gulf Formation was informally subdivided into Units A and B during the investigation for NMP Unit 2 (NMP, 1988). The upper unit (Unit A) consisted of dark gray siltstone and shale with occasional light gray sandstone beds. The lower unit (Unit B) consisted of siltstone and shale interbedded with sandstone. Sandstone interbeds became more common in Unit B.

The results of in-situ permeability tests in the Whetstone Gulf indicated permeabilities in the range from 4 x 10^{-7} to 8 x 10^{-6} in/sec (<1 x 10^{-6} cm/sec to 2 x 10^{-5} cm/sec) with a typical value of about 4 x 10^{-7} in/sec (1 x 10^{-6} cm/sec).

2.3.1.2.4 LOCAL AND SITE-SPECIFIC HYDROGEOLOGIC DESCRIPTIONS

During the geotechnical and hydrogeological investigation, 38 monitoring wells were installed in completed boreholes. These wells include 17 shallow groundwater monitoring wells. These shallow wells were typically installed as part of a couplet, adjacent to a deep monitoring well that was installed in a borehole. The monitoring well locations are shown in Figure 2.3-4. Groundwater elevations were measured monthly and water quality samples were analyzed quarterly.

Five wells were installed to characterize the overburden groundwater in the building footprint and were drilled through the soil, terminating at bedrock. These borings were used to construct shallow wells to measure the seasonal presence and level of groundwater in the areas to be excavated for the foundations of the reactor complex.

The other 33 well locations were selected to characterize the hydrology, and groundwater quality within the footprint of the reactor complex. The location of the wells and the depth of the screened intervals were chosen to provide representative lateral coverage across the site within each of the three stratigraphic units (Oswego, Pulaski, and Whetstone Gulf) being characterized.

Groundwater levels measured in March 2008 are also shown in Figure 2.3-4. Figure 2.3-6 to Figure 2.3-9 show contours of the piezometric levels in each of the strata.

Groundwater Levels in Soil

Five groundwater monitoring wells were installed in soil. Groundwater elevations measured in these wells during March 2008 ranged from El. 262.4 to El. 282.2 ft (80 - 86 m). The high reading of El. 282.2 ft (86 m) was measured in a monitoring well that is located in the center of the existing ball field, just to the south of the proposed reactor building.

Groundwater Levels in Oswego Sandstone

Twelve groundwater monitoring wells were screened in the Oswego Sandstone Formation. Four of the twelve wells have been slow to equilibrate. Groundwater elevations measured in March 2008 in the remaining eight wells installed in the Oswego Sandstone ranged from El. 253.2 ft (77 m) to the north near Lake Ontario to El. 281.0 ft (86 m) to the south near the old Strike Road. Groundwater elevations in the Oswego Sandstone in the general vicinity of the Nuclear Island range from about El. 255 to about El. 265 ft (78 - 81 m) moving from north to south.

Groundwater Levels in the Pulaski Formation

Twelve groundwater monitoring wells were screened in the Pulaski Formation. Groundwater elevations measured in March 2008 in these wells ranged from El. 239.7 ft (73 m) near the center of the site to El. 271.5 ft (83 m) to the south near the existing firing range. Groundwater elevations in the Pulaski in the general vicinity of the Nuclear Island ranged from El. 239.7 to El. 253.0 ft (73 - 77 m).

Groundwater levels in the Whetstone Gulf Formation

Nine groundwater monitoring wells were screened in the Whetstone Gulf Formation. Three of the nine wells have been slow to equilibrate. Groundwater elevations measured in the remaining six wells installed in the Whetstone Gulf ranged from El. 233.6 ft (71 m) to the north near Lake Ontario to El. 284.7 ft (87 m) to the south near the old Strike Road. Groundwater elevations in the Whetstone Gulf in the area of the Nuclear Island range from about El. 240 to about El. 270 ft (73 - 82 m).

Aquifer Conductivity

The lower horizontal hydraulic conductivity measured for Pulaski Formation Unit A and the confinement of natural gas beneath Unit A indicate that Pulaski Formation Unit A is a significant aquitard inhibiting vertical groundwater migration from the Oswego Formation to Pulaski Formation Unit B. This result agrees with the conclusions regarding local aquitards presented in the NMP Unit 2 USAR (NMP, 1988).

2.3.1.3 References

NRC, 1999. Standard Review Plans for Environmental Reviews for Nuclear Power Plants, NUREG-1555, Nuclear Regulatory Commission, October 1999.

NRC, 2008. Generic Environmental Impact Statement for the License Renewal of Nuclear Plants, Supplement 31 Regarding JAFNPP. Jan, 2008.

NMP, 2004. Applicant's Environmental Report – Operating License Renewal Stage. Nine Mile Point Nuclear Station. Docket nos. 50-220 and 50-410. License nos. DPR-63 and NPF-69.

NMP, 1984. Nine Mile Point Unit 2 ER-OLS. Niagara Mohawk. March, 1984.

NMP, 1988. Nine Mile Point Unit 2 Final Safety Analysis Report (FSAR), November, 1998.

FEMA, 2001. Flood Hazard Boundary Map, Oswego County, New York, Federal Emergency Management Agency, Community Panel No. 360663002D, June 6, 2001.

2.3.2 WATER USE

This section describes surface water and groundwater uses that could affect or be affected by the construction or operation of NMP3NPP and associated transmission corridor and off-site facilities. Consumptive and non-consumptive water uses are identified, and water diversions, withdrawals, consumption, and returns are quantified. In addition, this section describes statutory and legal restrictions on water use and provides the projected water use for NMP3NPP.

2.3.2.1 Surface Water Use

2.3.2.1.1 Surface Water

NMPNS is located on the southeastern shore of Lake Ontario in Oswego County, New York. Lake Ontario is an international body of water forming part of the border between the U.S. and Canada. Approximately 80 percent of the water flowing into Lake Ontario comes from Lake Erie through the Niagara River. The remaining water flow comes from Lake Ontario basin tributaries and precipitation. Other large rivers draining into the lake are the Genesee and the Oswego from the south shore, the Black River from the east shore, and the Trent River from the north shore. The surface water bodies that are within the hydrologic system where the site is located and that could affect or be affected by the construction and operation of NMP3NPP include several local unnamed drainages that flow through various portions of the project site. All of the area streams discharge to Lake Ontario. Figure 2.3-10 shows the major surface waters in the vicinity of the site, which could affect or be affected by NMP3NPP.

2.3.2.1.2 Consumptive Surface Water Use

The United States and Canadian municipal water supplies and industrial users within 50 mi (80 km) of the site that withdraw water directly from Lake Ontario are shown on Figure 2.3-11. Surface water withdrawals within 50 mi (80 km) from NMPNS are listed in Table 2.3-4 and shown in Figure 2.3-11.

Eight intake facilities in Oswego County were permitted for surface water withdrawals. Table 2.3-4 identifies the permitted surface water users and water bodies from which the withdrawals are made and the average daily withdrawal rates.

In 1981, United States withdrawals from Lake Ontario totaled approximately 2,567 mgd (9,771,000 cu m/day). Of this amount, 40 mgd (151,400 cu m/day), or approximately 2 percent, was withdrawn by municipal suppliers who served a total population of 173,000 in four New York State counties. Production capacity in 1981 for all drinking water supply systems within 50 mi (80 km) totaled 55 mgd (208,200 cu m/day). Average withdrawals represented 73 percent of production capacity.

In 1981, the population throughout the 50-mi (80-km) radius area was expected to increase slowly, and only one expansion of a water supply system was known to be planned or underway. The Metropolitan Water Board of Onondaga County was expected to increase in capacity by 50 percent (from 36-54 mgd [136,300 to 204,400 cu m/day]) by the end of 1982 to meet long-term future growth. In 1981, industries with intakes in U.S. waters of Lake Ontario within 50 mi (80 km) represented 98 percent of all withdrawals. Each industry withdrew water for cooling and returned it to the lake in a once-through cooling process. All other industries in the area used water from municipal supplies.

In 1981, Canadian water intakes on Lake Ontario within 50 mi (80 km) of NMPNS were permitted by the Ontario Ministry of the Environment to withdraw a total of 86 mgd (324,100 cu m/day). Public water supplies accounted for approximately 37 percent of withdrawals, and industries about 63 percent. All intakes were located more than 44 mi (70 km) from NMP Unit 2. Data on Canadian water suppliers and industrial users are also provided in Table 2.3-4.

The existing NMP Unit 1 and Unit 2 and JAFNPP in 1981 were the largest water users of Lake Ontario, with 576.00 and 570.24 mgd (2180 and 2158 million liters/day), respectively. The next largest users in 1981 were the units of Oswego Steam Station; Unit 6 withdrew 468.00 mgd (1771.38 million liters/day); Unit 5 withdrew 411.84 mgd (1,558.814 million liters/day); Units 1-4 withdrew 119.52 mgd (0.452 million liters/day; Table 2.3-4). NMP Unit 1 was the next largest user, with 386 mgd (1461.17 million liters/day) for once-through cooling. NMP Unit 2 uses another 77.2 mgd (9292.17 million liters/day) for both its service water cooling and circulating water system. Most of this water is returned to Lake Ontario. NMPNS holds a Great Lakes Water Withdrawal Registration issued by the New York State Department of Environmental Conservation, allowing withdrawal of water from Lake Ontario. NMP Unit 2 consumes anywhere from 18,500 gpm (70,030 liters/min) or 26.6 mgd (100.7 million liters/day) to 30,545 gpm (115,625 liters/minute) or 44.0 mgd (166.6 million liters/day). Withdrawal rates of the NMP Unit1, Unit 2 and NMP3NPP will vary over the year.

In 1981, the New York State total water use from Lake Ontario for irrigation was approximately 10 mgd (37,900 cu m/day). United States irrigation intakes and their locations are identified in Table 2.3-5.

In 1981, the Ontario Ministry of the Environment permitted a total of approximately 6.4 mgd (24,200 cu m/day) to be withdrawn from Lake Ontario for irrigation (Table 2.3-6).

Surface water use in Oswego County is categorized in Table 2.3-4 as domestic, industrial and irrigational use. Irrigational surface withdrawal mainly for farming in the county is conducted primarily during spring and summer in the year. The yearly withdrawal rate for irrigational and agricultural use varies depending on dry and wet intervals of the year. The institutional withdrawal rate is relatively constant for the entire year.

2.3.2.1.3 Non-Consumptive Surface Water Use

The major non-consumptive surface water uses in the 6-mile (10 km) vicinity of the site are recreation and fishing on Lake Ontario. Section 2.5 provides detailed descriptions of these uses and activities

2.3.2.1.4 Statutory and Legal Restrictions on Surface Water Use

The withdrawal of water for NMP3NPP from Lake Ontario will require that a Great Lakes Water Withdrawal Registration be filed with the New York State Department of Environmental Conservation (NYSDEC).

The discharge of blowdown from cooling towers, effluent from a sewage treatment plant and storm water runoff will be subject to the State's Pollutant Discharge Elimination System Permit, issued by the NYSDEC, as discussed in Section 2.3.3

2.3.2.1.5 Plant Water Use

Plant water use for NMP3NPP is described in Section 3.3. There are no other station water uses other than those described in Section 3.3.

2.3.2.2 Groundwater Use

This section provides a description of the groundwater use at, and in the vicinity of, the NMP3NPP site. This section also describes the regional and local groundwater resources that could be affected by the construction and operation of NMP3NPP.

This section also discusses the U.S. Environmental Protection Agency (EPA) sole source aquifers within the region and describes groundwater use in western New York State, current users in Oswego County, current NMP Unit 1 and Unit 2 groundwater use, expected future groundwater demand for central New York State and Oswego County.

2.3.2.2.1 Physical Setting

The NMPNS site covers an area of approximately 900 acres (364 hectares), and is located on the southeastern shoreline of Lake Ontario in Oswego County, New York. The climate in this region is described in Section 2.7 and summarized below. The regional climate is characterized as humid continental. The proximity of Lake Ontario affects both the temperatures and precipitation in the region, resulting in cooler lake breezes in the spring and summer and heavy snow precipitation in fall and winter. The regional topography consists of rolling hills shaped by previous glaciations. The NMPNS site itself is relatively flat, sloping slightly towards Lake Ontario. The local relief ranges from approximately 246 ft (75 m) above mean sea level at the western end of the site to 276 ft (84 m) above mean sea level.

Section 2.2 and Section 2.5 provide a detailed description of the site vicinity and surrounding region and nearby communities and major population centers respectively.

The NMPNS site on the southeastern shoreline of Lake Ontario is generally characterized as rural and is located approximately 6 mi (8 km) northeast of Oswego, NY. Syracuse, the nearest large city, is about 35 mi (56 km) southwest of NMPNS and Rochester is located approximately 65 mi (105 km) west. Lake Ontario defines the north-northwestern boundary of site. The location of the NMPNS site is further described in Section 2.1.

2.3.2.2.2 Hydrogeologic Setting

The regional and site-specific physical and hydrologic characteristics of these groundwater resources are presented in Section 2.3.1.2. The following sections provide a brief summary of hydrogeologic conditions in the vicinity of the NMP3NPP site.

The NMP3NPP site is located near the Erie-Ontario Lowlands subdivision of the Central Lowlands Physiographic Province. Subdivisions of this province located in a 50 mi (80 km) radius of the NMP3NPP site are: The Erie-Ontario Lowlands, Tug Hill Uplands, and Black River Valley.

Aquifers are found primarily in the sand, gravel, and calcareous sediments. They can be traced over long distances, although some occur in lenses and some are localized. The aquifers are vertically separated by confining units that primarily consist of clay with lesser amounts of silt and sand. Depending on the thickness and sand content of the confining units, they can act locally as either aquitards or aquicludes by retarding vertical groundwater flow to varying degrees. Although water moves more readily through the aquifers than the intervening confining units, water can leak through the confining units and, therefore, the aquifer systems are considered to be hydraulically interconnected to some degree (USGS, 1997).

The regional groundwater piezometric surface in the various formations in the vicinity of NMPNS generally slopes northward toward Lake Ontario, its natural base discharge. Groundwater recharge areas and topography may affect localized groundwater movement and may vary, to some extent, the direction of aquifer flow. Previous investigations performed during the NMP Unit 2 Preliminary Safety Analysis Report (PSAR) investigation indicate that a hydraulic connection exists between the unconsolidated Pleistocene deposits and the upper consolidated Paleozoic formations.

Few of the bedrock formations in the region around NMPNS have regularly yielded 100 gpm (6 l/sec) or more to an individual well. For the purposes of this section, yield is defined as the quantity of water flow to a well per unit of time. Most wells installed in the bedrock formations yield only sufficient quantities for domestic use. Several wells installed in well-sorted sand and gravel deposits have yielded in excess of 500 gpm (32 liters/sec).

Four hydrologic units exist below the NMPNS site, Unlithified Sediments, Oswego Sandstone, Pulaski Formation, and Whetstone Gulf Formation, in descending order. Groundwater is available from an unconfined aquifer and deeper confined aquifers. The unconfined aquifer is composed of glacial till and fill material (Unlithified Sediments) and the upper portion of the Oswego Sandstone beneath the soil. The unconsolidated deposits rest on a permeable fractured zone at the top of the Oswego Sandstone. The Oswego Sandstone formation becomes relatively impermeable within approximately 20 ft (6.1 m). Within a two-mile (3.2 km) radius of NMPNS, the local water table ranges in elevation from 300 ft National Geodetic Vertical Datum (NGVD) (91 m) in the southeast to the lake water level, approximately 246 ft NGVD (75 m), with annual variations of approximately two ft (0.6 m).

The normal groundwater table in the plant complex area is approximately 255 ft NGVD (78 m). The average gradient is approximately 0.7 percent to the north-northwest.

A subsurface characterization study collected data at subsurface locations throughout the NMPNS facility. Typical subsurface profiles are described in Section 2.3.1.2.

2.3.2.2.3 Sole Source Aquifers

The Sole Source Aquifer (SSA) Program, which is authorized by the Safe Drinking Water Act, allows for groundwater protection when a community is dependent on a single source of drinking water and there is no possibility of a replacement water supply to be found. The U.S. EPA defines a sole or principal source aquifer as one which supplies at least 50% of the drinking water consumed in the area overlying the aquifer (USEPA, 2008a).

There are no sole source aquifers associated with the NMP3NPP site. The closest sole source aquifer is the Northern Tug Hill Glacial Aquifer, underlying portions of Jefferson, Lewis, and

Oswego Counties, New York, which is the sole or principal source of drinking water for the Hamlet of Adams Center, Hamlet of Pierrepont Manor, Village of Adams, Village of Lacona, Village of Mannsville, and Village of Sandy Creek (USEPA, 2006).

2.3.2.2.4 Regional Groundwater Use

In 1982, there were 15 public water supply systems within 30 mi (80 km) of NMPNS. Three of these utilize Lake Ontario as a source, five others use groundwater from either springs, spring fed reservoirs, or public wells. The groundwater resources in the region are relatively underdeveloped. Estimated yields from the Nine Mile Point Updated Safety Analysis Report (NMP, 2004a) reported that 908,400 m^3/day (240 mgd) are available as opposed to the estimated use of 102,200 m^3/day (27 mgd).

Generally, the quality of the groundwater varies depending on the substrate in which the well is created. Those wells installed in bedrock formations often produce water that is high in iron, hydrogen sulfide, and chlorides, while those wells in unconsolidated glacial deposits tend of have water of better quality for resource development.

The primary source of high yield groundwater wells are sand and gravel deposits found regionally. In 1982, the public water supply systems that used wells to supply water within 30 mi of NMPNS produced and output of approximately 5.6 mgd (21,200 m^3/day).

The regional groundwater from these unconfined Pleistocene deposits discharge westward toward Lake Ontario. Due to its position on the shoreline, all public water supply systems in the region are upgradient of NMPNS by at least 10 mi (16 km).

2.3.2.2.5 Oswego County Groundwater Use

Groundwater as a resource in Oswego County is mainly for potable water. Approximately 49% of Oswego County's population receives potable water from private groundwater wells while the rest is supplied through various public water districts. The source of the water from these districts is generally Lake Ontario (64%) or various groundwater aquifers and springs (34%) (NMP, 2004b). Public water supply users are shown in Table 2.3-7.

In the 2004 NMP Unit 2 Applicant's Environmental Report-Operating License Renewal Stage (NMP, 2004b), four aquifers are identified as the principal sources of groundwater in Oswego County. Three of them are used for public water facilities, while one is relatively unused:

- The sand ridge aquifer extends for 13 mi (21 km) and is almost completely within the towns of Palermo and Schroeppel, NY.

- The Redfield aquifer is located in the same region as the sand ridge aquifer, the Redfield aquifer is relatively unused although it has the potential to provide as much as 8 to 14 million gallons (30-53 liters) of water per day.

- The Fulton aquifer is the most used of the four listed groundwater resources. The aquifer encompasses five municipalities in Oswego County.

- The tug hill aquifer is a 47 mile (76 km) long, crescent shaped aquifer located in eastern Oswego county as well as Jefferson and Oneida counties.

Table 2.3-10 lists consumptive uses in Oswego County in 2000. Public water supply removes 4.83 mgd (18.28 million liters per day); industrial users added an additional 2.09 mgd (7.91

million liters per day). Private water supplies removed another 3.74 mgd (14.2 million liters per day). There were no known groundwater withdrawals for irrigation.

The nearest public groundwater system to NMPNS is owned by the Village of Mexico, approximately 10 mi (16 km) to the east southeast.

In Oswego County, the surface and ground water sources are capable of supplying 6 million gpd in excess of projected needs.

The Safe Drinking Water Information System (SDWIS) maintained by the U.S. EPA lists community, non-transient non-community, and transient non-community water systems that serve the public (USEPA, 2007b). Community water systems are defined as those that serve the same people year-round (e.g., in homes or businesses). Non-transient non-community water systems are those that serve the same people, but not year-round (e.g., schools that have their own water system). Transient non-community water systems are those that do not consistently serve the same people (e.g., rest stops, campground, and gas stations). Table 2.3-10 through Table 2.3-12 lists the community, non-transient non-community, and transient non-community water systems using groundwater as their primary water source in Oswego County (USEPA, 2008b).

Coordinates for the locations of the water systems listed in the SDWIS database for Oswego County are not publicly released. In addition, many of the addresses provided are mail drop locations for the owners of water systems and, for some, addresses are not provided. Therefore, a figure depicting the locations of these systems was not developed.

2.3.2.2.6 NMP Unit 1 And Unit 2 Groundwater Use

Currently, no groundwater is being used at NMPNS and no plans have been made for future groundwater use (NMP, 2004b). However, NMP Unit 2 does have a permanent dewatering system, which consists of perimeter drains and two sumps located below the Reactor Building. The NMP Unit 2 dewatering system is designed to maintain the water table below the reactor mat elevation of approximately 163.8 ft NGVD (50 m). Submersible pumps are located in each of the sumps, which together discharge groundwater at an estimated average of 200- gpm (12.6 liters/sec) to maintain the cone of depression. The water is then discharged to Lake Ontario through a storm drain system. This system is described in more detail in Section 2.3.1

2.3.2.2.7 Groundwater Demands

Groundwater withdrawals from the region are associated with water supply wells for the smaller communities and private residents across the NMP3NPP regional study area. There are no large withdrawal sources. There are no overall statistics for regional groundwater demand. The groundwater demand for Oswego County is the nearest comparable statistic. Groundwater demand in Oswego County in 2000 was 10.66 mgd (40.35 million liters per day) (Table 2.3-9). This demand includes irrigation intakes (50-mile (80 km) radius)), Table 2.3-6, domestic wells (2-mile (3.2 km) radius), Table 2.3-8 and known community water supplies (Table 2.3-10, Table 2.3-11 and Table 2.3-12).

Total surface and groundwater withdrawals in Oswego county are presented in Table 2.3-9.

2.3.2.2.8 NMP3NPP Groundwater Use Projections

There are currently no proposed plans for groundwater use at NMP3NPP and no permanent dewatering system is needed. NMP3NPP Groundwater Impacts

The impacts of NMP3NPP on groundwater resources are presented in Section 4.2 and Section 5.2

2.3.2.2.9 Groundwater Monitoring

Groundwater monitoring (water level observation) of the NMP3NPP area has been implemented through the use of the groundwater observation wells installed at the site in 2007 for the NMP3NPP subsurface investigation and through the periodic review of regional water levels from selected wells within the USGS Ground-Water Level Monitoring Network. No additional groundwater monitoring is planned.

2.3.2.2.10 Site Characteristics for Subsurface Hydrostatic Loading and Dewatering

There is no planned future use of groundwater at NMP3NPP. There is no current use of groundwater at NMP Unit 1 and Unit 2 except as previously discussed. The static elevation of groundwater in the Oswego Sandstone is greater than 3.3 ft (1.0 m) below the proposed grade elevation of 271 feet (82.6 m) in the area of the power block. Thus a dewatering system for plant structures is not planned. Dewatering of foundation excavations is expected to be necessary during construction. To help minimize this construction task, the surface soils and glacial till will be removed and re-graded during construction, thus removing the seasonal unconfined/perched groundwater in the soil. Standard techniques will be used for excavation dewatering, specifically pumping of groundwater, rain and any runoff that collects to site drainage structures. At least a portion of site characterization monitoring wells will remain in place to provide water level data over the long-term, prior to construction.

In the event that construction dewatering is deemed necessary at the NMP3NPP site, similar conditions to those described for NMP Unit 2 are anticipated. The NMP Unit 2 USAR (Sections 2.4-35 to 2.4-36) states that approximately 110 gpm (6.9 l/sec) was dewatered from the screenwell shaft, while approximately 200 gpm (12.6 l/sec) was dewatered from the reactor building excavation.

The northerly flow direction observed in the Pulaski Formation is in the direction of Lake Ontario and NMP Unit 2. This flow direction suggests that active dewatering may be slightly influencing the direction of groundwater flow at NMP3NPP. Currently, pumping is done at the NMP Unit 2 containment foundation level, at approximately El. 164 ft (50 m). Annual daily flow from 2004 to 2007 has ranged from a minimum of 69,000 gpd (262 m^3/day) (in 2007) to a maximum of 133,000 gpd (504 m^3 /day (in 2005). Discharge is into a plant storm drain system that discharges to Lake Ontario. The system is non-safety related and is referred to as "The Unit 2 Mat Drain." It operates using two or four sumps with float switches and is located in the basements of the Control Building and the Nitrogen Yard (GEI, 2008c).

The cone of depression surrounding the NMP Unit 2 reactor building associated with this dewatering system is steep; the groundwater table is estimated to reach El. 215 ft (65.5 m) within a radius of 200 to 225 feet (61.0 to 68.6 m) of the reactor building (GEI, 2008c). The cone of depression reaches approximately El. 254 ft (77.4 m) within 600 feet (183 m) of the NMP Unit 2 reactor building, and the normal groundwater table at the NMP Unit 2 complex is El. 255 ft (77.7 m). Therefore, dewatering activities at NMP Unit 2 have resulted in a groundwater table drawdown of one foot (0.3 m) or less beyond the 600 feet (182.9 m) radius around the reactor building (GEI, 2008c). Given these data, groundwater extraction at NMP Unit 2 is not expected to influence NMP3NPP site structures.

2.3.2.3 References

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2.3.3 WATER QUALITY

This section describes the site-specific surface water quality characteristics that could directly be affected by plant construction and operation or that could affect plant water use and effluent disposal within the vicinity of the NMP3NPP site. Site-specific water quality data was obtained through the New York State Department of Environmental Conservation (NYSDEC), City of Oswego, Monroe County, US EPA, site water quality sampling, and other available sources.

The data available and collected for this report are believed to be adequate to characterize the water resources in terms of suitability for aquatic organisms and to serve as a baseline for assessing if plant construction or operations have impacted water quality. All liquid effluent discharges during plant operation will be monitored and regulated by a State Pollutant Discharge Elimination System (SPDES) permit.

Most of the data available were collected to characterize Lake Ontario, the most significant water body in the vicinity of the NMPNS site. The most important parameters in terms of evaluating Lake Ontario water quality are temperature, sediments and chemical contaminants, and nutrients. Because nutrient loading is widely regarded as Lake Ontario's most critical water quality problem, this section examines trends in macronutrient concentrations (total nitrogen, nitrates, ammonia, phosphorus, orthophosphate) in Lake Ontario in the vicinity of the NMPNS site. Many of these parameters will also be measured in surface water samples collected in June 2008 from the on-site streams. Groundwater samples were collected to monitor water quality parameters in the four geologic units in the area of the proposed project.

Best Management Practices will be used during plant construction to prevent pollutant discharges to the on-site water bodies or groundwater aquifers. The most probable pollutant expected during construction would be suspended sediment entering streams, or groundwater. These particulates could also contain possible contaminants such as heavy metals. Stormwater pollution prevention measures will be taken to mitigate the generation and transport of these particulate materials and other contaminants commonly produced from construction activities.

2.3.3.1 Surface Water

NMP is located on the southeastern shore of Lake Ontario in Oswego County, New York. Lake Ontario, an international body of water forming part of the border between the U.S. and Canada, is the smallest and easternmost of the Great Lakes, with a surface area of approximately 19,010 km (7,340 mi) and a total volume of 1,638 km (393 mi). The lake is 310 km (193 mi) long and 85 km (53 mi) wide in its largest dimensions, and has an average and maximum depth of 86 m (283 ft) and 244 m (802 ft), respectively (NMP, 2004A).

Surface water resources located on, or adjacent to, the NMP3NPP site include Lake Ontario, which borders the site to the north, and three unnamed streams that flow through the site. In addition, the site contains two small ponds, which appear to be man-made. Lake Ontario is the only proposed makeup water source and receiving water body for NMP3NPP. Surface water and groundwater flow regionally towards the lake, with some minor seasonal drainage across the northern part of the site from northeast to southwest. All other surface water and groundwater in the site vicinity are upgradient from the station and are not affected by station operation (NMP, 1984).

While no major impacts to surface water quality have been reported to date due to the construction and/or operation of NMP Units 1 and 2, these on-site surface water bodies and Lake Ontario, could potentially be impacted by the construction and operation of NMP3NPP.

2.3.3.1.1 Freshwater Bodies

According to the Unit 2 License Renewal Report, there are no natural watercourses on the Unit 1 and 2 sites. A revetment ditch runs from the NMP Unit 2 cooling tower area westward and then northward to Lake Ontario. The revetment ditch receives site stormwater runoff and monitored discharges from the wastewater treatment facility and the oil retention pond (NMP, 2004A).

Four streams are present on the NMP site (Figure 2.3-16): Subarea A Stream - Lakeview Creek, Subarea B Stream (which flows intermittently), Subarea C Stream (which flows intermittently), and Subarea D Stream (which flows intermittently). No known historic sampling or flow data are available for these water bodies. Lakeview Creek passes along the southwestern periphery of the NMP3NPP site about 4,000 ft (1,200 m) upstream of Lake Ontario and passes 1,400 ft (427 m) southwest of the Power Block. Lakeview Creek flows for about 4 mi (2.5 km) from its headwater at Hammonds Corner to its confluence with Lake Ontario at the Hamlet of Lakeview. Lakeview Creek has a watershed area of about 5 mi^2 (13 km^2), which is predominated by glacial till (NRCS Soil Type C) and covered by woodlands with some low-density residential development. The Lakeview Creek is a Class C stream, defined as streams or rivers most suitable for fishing and also capable of supporting fish and wildlife propagation. The Subarea B Stream flows from south to north through a series of wetlands complexes and discharges into Lake Ontario near the Unit 1 site. The Subarea C Stream originates on the J.A. Fitzpatrick Nuclear Station located East of NMP. This stream flows through a wetland, under a field and connects via culverts to steep banked stream which flows to Lake Ontario. The Subarea D Stream flows west from the Visitor's Center access road to the east of the proposed Unit 3 cooling tower.

In June of 2008 water quality, fish, and benthic sampling was conducted at the Unit 3 site. As part of the water quality study, two surface water samples were collected from each of the onsite streams to obtain baseline data. The samples were collected from points located upstream and downstream of areas of proposed work, and were analyzed for various parameters including nutrients, metals, pH, hardness, alkalinity, turbidity, conductivity, suspended solids, coliform bacteria, chlorophyll a, and dissolved oxygen. Analytical results of these samples are provided in Table 2.3-27. Fish and benthic samples were collected during this sampling event at 9 sites. Following the Rapid Bioassessment Protocol, dissolved oxygen, conductivity, and temperature were recorded at these sites. Also, stream flow was measured at several locations.

The water quality of Subarea A Stream is not of the highest water quality. However, it likely reflects water quality of a stream that is heavily influenced by natural wetlands. The stream does not appear to be impacted by sediment and nutrient loadings. Based on the fish sampling results, this stream appears to be meeting the state's designated use classification (Class C) of supporting fish and wildlife propagation. Overall nutrients, biochemical oxygen demand (BOD), and chlorophyll a levels were relatively low indicating that nutrient loading in this stream is not creating eutrophication problems. The field- observed dissolved oxygen reading from NMP Site 1 - Lakeview Creek was 3.0 mg/l which is below the state standard of 6.0 mg/l (NYSDEC, 2008b); however, further sampling along the creek reported dissolved oxygen readings from 6.5 mg/l to 7.3 mg/l. The pH was neutral. The downstream sodium value was high. With a chloride level of 35.2 mg/l, it may be speculated that the elevated sodium level is directly related to salt loading in the watershed. Total dissolved solids and turbidity were lower than observed at the other two streams. Chemical oxygen demand (COD) was relatively high, however, as was organic nitrogen and color. This may result from natural tannic acids typically associated with wetland-influenced stream and which may also be associated with high color and COD, but low BOD, similar to the water found in Subarea A Stream.

The Subarea B Stream sample was collected from a pool of standing water that was surrounded by wetlands. This should be considered when trying to characterize general water quality of this stream. As with Subarea A Stream, the overall water quality is not of the highest stream water quality, and it appears to be more indicative of stream heavily influenced by wetlands. The stream does not appear to be impacted by nutrient loadings. The pH of the stream was neutral. The ammonia as N value was one of the highest for all the sampling sites. When ammonia is considered with high total suspended solids and turbidity levels that were also observed for this stream, it is possible that these parameters may reflect organic matter or sediment collected with the water samples which may also influence other water quality parameters.

Low-flow and no-flow conditions were observed in the Subarea C Stream. These factors should be considered when trying to characterize general water quality of the stream. Subarea C Stream water quality appears to be the most impacted of the four streams due to sediment and nutrient loadings. The pH of the stream was neutral. The state standard of 250 mg/l for chloride was exceeded for both sampling locations (NYSDEC, 2008b). The biochemical oxygen demand and chemical oxygen demand were very high. Sodium values were the highest for all the sampling sites at the Subarea C downstream site. Total dissolved solids values were extremely high (1,444 and 1,172 mg/l) for both sample locations and exceeded the state standard of 500 mg/l (NYSDEC, 2008b). Both sodium and total dissolved solid levels are likely strongly related to salt. Total phosphorus was very high (0.13 and 0.12 mg/l) from the upstream and downstream sites as was chlorophyll a. The turbidity was also the highest for all sample locations for the Subarea C Stream. As noted in the Subarea B Stream discussion, when ammonia is considered with high total suspended solids and turbidity levels that were also observed for this stream, it is possible that these parameters may reflect organic matter or sediment collected with the water samples which may also influence other water quality parameters.

Low-flow and no-flow conditions were observed in the Subarea D Stream. This should be considered when trying to characterize general water quality of the stream. Subarea D Stream water quality appeared to be impacted by sediment and nutrient loadings, perhaps because of a greater amount of disturbance within its watershed and/or the flow conditions observed during sampling. The pH of the stream was neutral. The Sodium value was the highest of all sampling locations as was Ammonia as N. The total phosphorus level was very high (0.22 mg/l) as was chlorophyll a (0.088 mg/l). These water quality results indicate that phosphorus loading in the stream may be elevated. The chemical oxygen demand was also higher than most other sites with the exception of Stream C Upstream, also indicating organic loading. When ammonia is considered with high total suspended solids and turbidity levels that were also observed for this stream, it is possible that these parameters may reflect organic matter or sediment collected with the water samples which may also influence other water quality parameters.

Bacteria, mercury, lead, organic nitrogen, nitrate as N, and nitrite values were low for all sites.

2.3.3.1.2 Lake Ontario Tributaries and Related Waterbodies

NMP is located within the Lake Ontario and Minor Tributary Drainage Basin, more specifically within the Salmon-Sandy Hydrologic Unit 04140102 (Figure 2.3-12). Within this watershed, water from the Little Salmon River, Mad River, Salmon River, Butterfly Creek, Deer Creek, Lindsey Creek, Little Sandy Creek, South Sandy Creek, Salmon Reservoir, Sandy Creek, Skinner Creek, Stony Creek, and Trout Brook flow into Lake Ontario and affect it's water quality (NYSDEC, 2007b).

2.3.3.1.3 Priority Waterbodies Listing

Although water quality in the open waters of the lake has greatly improved in recent decades, Lake Ontario shoreline and embayments - bays, river mouths and associated wetland habitat continue to experience significant impacts that reduce aquatic life support, limit recreational use and ultimately affect the economic development of the region. These impacts include algae blooms and aquatic weeds, invasive species, habitat destruction, turbidity and sediment loadings, water level fluctuations and the resulting impacts to coastal waters and shoreline resources (NYSDEC, 2007b).

In order to fulfill certain requirements of the Federal Clean Water Act, the NYSDEC must provide regular, periodic assessments of the quality of the water resources in the state. The information has been compiled into an inventory database of all waterbodies in New York State used to record current water quality information, characterize known and/or suspected water quality problems and issues, and track progress toward their resolution. This inventory of water quality information is called the Waterbody Inventory/Priority Waterbodies List (WI/PWL) (NYSDEC, 2007b).

Several tributaries and creeks within the Salmon-Sandy watershed are listed on the PWL and have posted Fish Advisories to limit fish consumption due to of past/historic industrial discharges of organics/pesticides which contaminate the lake sediments. Also the Salmon River Reservoir, also within this watershed, posts Fish Advisories due to atmospheric deposition of mercury. Two waterbodies within eight miles (13 km) of NMP3NPP are listed on the state PWL. Wine creek is located approximately five miles (8 km) to the west of NMP3NPP near the Oswego River and is impacted from unspecified toxicity. Landfill disposal sites are the suspected source. Previously, impacts to the fishery of Wine Creek were due to toxicity from a number of suspected sources. One of these sources was the Niagara Mohawk fire training facility where subsequent changes at the facility may have alleviated impacts from this source. Another suspected source was the Pollution Abatement Services hazardous waste site which has undergone various levels of remediation. The Little Salmon River is located approximately 8 miles (13 km) to the east of NMP3NPP. It is listed as a PWL due to low flow conditions during the 2001 sampling event. Since that time water quality in the river is noted be excellent (NYSDEC, 2007b).

Waterbodies on the PWL - TMDL list are priority waters in New York State that are required by 303 (d) of the Clean Water Act and 40 CFR 130.7 to prepare a Total Maximum Daily Load (TMDL) assessment. The state identifies waters where required technology pollution controls are not sufficient to attain water quality standards, identifies the pollutants causing the standards violation and ranks or prioritizes the waters for TMDL development. The Salmon-Sandy Hydrologic Unit is not listed as needing TMDL development. This Hydrologic Unit is also not listed for PWL-Acidification. The Salmon-Sandy Hydrologic Unit is listed as a priority for PWL - Fish Consumption, PWL-Other, Fish and Wildlife Populations, Habitat, and Endangered Species and Flow. The Sandy-Salmon Hydrologic Unit is also listed as a Category 1 Restoration Watershed as part of the state's Unified Watershed Assessment (NYSDEC, 1998).

2.3.3.1.4 New York State 303 (d) List of Impaired Waterbodies

A portion of the Oswego River approximately 6 miles (10 km) west of the site but outside of the Salmon-Sandy Hydrologic Unit, is listed by the state as an Area of Concern (AOC) and is impaired due to fish consumption advisories resulting from sediments contaminated with PCBs (NYSDEC, 2007b, NYSDEC, 2006). Although, The Oswego River is not part of the Salmon-Sandy Hydrologic Unit, water flowing from the river impacts the near shore waters of Lake Ontario adjacent to NMP. In the past, analyses of sediments from Lake Ontario confirmed the major Mirex sources as the Niagara and Oswego Rivers (NYSDEC, 2006). A recent report by NYSDEC noted that the Oswego River has officially completed Stage 3 of the Delisting Process by showing that the water quality in the AOC is not impaired, that local beneficial uses are not impaired, and that the Remedial Action Plan and EPA delisting criteria have been achieved. The lakewide consumption restrictions for Lake Ontario (not a specific AOC) apply to migratory fish entering the Oswego River and Harbor area (NYDEC, 2006).

The Salmon River, approximately 12 miles (19 km) east of NMP is part of the Salmon-Sandy Hydrologic Unit. The Salmon River including the Lower Segment, Lower Salmon River Reservoir, Middle Segment, and the Salmon River Reservoir, is listed as impaired on the State's 303 (d) list due to Mirex and Polychlorinated Biphenyls (PCBs) contamination in the sediment (NYSDEC, 2007a, NYSDEC, 2007b, USEPA, 2008A). Also as noted previously, the entire shoreline of Lake Ontario including the eastern portion adjacent to NMP is listed as impaired due to fish consumption advisories as a result of sediments contaminated with PCBs, Mirex, and dioxin (NYSDEC, 2007a, NYSDEC, 2007b).

2.3.3.1.5 Lake Ontario

Approximately 80 percent of the water flowing into Lake Ontario comes from Lake Erie through the Niagara River near Buffalo, New York. The remaining water flow comes from Lake Ontario basin tributaries and precipitation. Approximately 93 percent of the water in Lake Ontario flows out to the St. Lawrence River and the remaining 7 percent disperses through evaporation. Water retention time is estimated to be approximately eight years. Since Lake Ontario is the most downstream of the Great Lakes, it is impacted by human activities occurring throughout the Lake Superior, Michigan, Huron, and Erie basins.

Lake Ontario is a mixing zone of freshwater influx from rivers and streams and the existing lake water. Circulation in the lake transport sediments, dissolved oxygen, nutrients, and chemical contaminants, and planktonic aquatic biota. Wind and weather patterns drive the circulation of nutrients and sediments throughout the lake.

2.3.3.1.6 Plant Water Use

For NMP Unit 1 the Intake Structure is located approximately 850 feet (259 m) from the existing shoreline in 18 feet (5.5 m) of water. Water enters the intake tunnel through a bellmouth-shaped inlet. The inlet is surrounded by hexagonally shaped concrete guard structure, the top of which is about six feet (1.8 m) above the lake bottom and 14 feet (4.3 m) below the lowest anticipated lake water level. The discharge tunnel is 10 feet (3 m) in diameter and approximately 78 square feet (7.25 sq m) in cross section, and is designed for a flow velocity of approximately eight fps (2.4 m/s). The tunnel directs the heated water from the Screen House to a hexagonally shaped Discharge Structure located approximately 335 feet (102.1 m) off shore (NMP, 2004A).

The Unit 2 intake system conveys required cooling water from Lake Ontario through two identical submerged Intake Structures located approximately 950 feet (290 m) and 1,050 feet (320 m) from the existing shoreline. The Unit 2 discharge system consists of an onshore discharge bay, a discharge tunnel, and a two-port diffuser. The cooling water discharge consists of that portion of service water not used for makeup to the CWS, plus a portion of the circulating water flow that is discharged to maintain dissolved solids at an appropriate equilibrium in the system (i.e., cooling water blowdown). This discharge is conveyed to the discharge bay, which is located on the west side of the two intake shafts and is separated from them by a wall that acts as a weir. The discharge tunnel terminates at a point approximately 1,500 feet (457.2 m) from the existing shoreline, where the discharge enters a 4.5 foot (1.4 m) diameter steel riser leading to a two-port diffuser located approximately three feet (0.9 m) above the lake bottom. Water exits the diffuser nozzles at an approximate velocity of 18 fps (5.5 m/s) (NMP, 2004A). The discharge flow from Unit 2 ranges from a minimum of 1.5 m^3/s (23,055 gpm) to a maximum of 2.2 m^3/s (35,040 gpm) during normal operation. During normal shutdown, the maximum plant discharge is approximately 3.1 m^3/s (48,800 gpm) (NRC, 2006).

Proposed NMP3NPP will withdraw makeup water from the Lake Ontario through a new intake structure located immediately 0.5 miles (0.8 km) west of the existing intake structure of NMP Unit 2 with two intake tunnels extending approximately 1,280 ft (389 m) and 1,580 ft (482 m) into Lake Ontario, as discussed in Section 3.4. Plant effluent going back to Lake Ontario from NMP Unit 3 consists of cooling tower blowdown from the CWS cooling towers and the ESWS cooling towers, and non-radioactive wastewater streams from the domestic water treatment and circulating water treatment systems. All of these discharges from the new unit, will be discharged to Lake Ontario via a new discharge structure routed outfall pipe used to discharge the plant effluent to a submerged diffuser located approximately 1,167 ft (355.7 m) offshore and approximately 416 ft (126.8 m) south of the new intake structure. The diffuser structure is located at 204 ft (62.2 m) elevation of the Lake Ontario bed where it is discharged to the lake. The discharge diffuser is comprised of 2 ports with port openings 3 feet (0.9 m) above the lake floor. The velocity out of the diffuser will not exceed 10 fps (3.04 mps). The discharge is diluted to meet the maximum surface temperature rise limit of 3 °F (16 °F).

2.3.3.1.7 Lake Circulation

Lake circulation is influenced by the prevailing west-northwest winds and the eastward flow of water from the Niagara River, resulting in a counter-clockwise flow. Circulation of water generally occurs along the eastern nearshore areas and within sub-basins of the main lake. Water currents typically move in an eastward direction along the south shore of Lake Ontario in a relatively narrow band. However, circulation patterns at a specific time can be affected by winds. Major shifts in wind distribution can alter currents in a matter of hours. Wind speed frequency data collected during current measurement studies at Nine Mile Point and reported by the NRC in the Unit 2 FES indicate that, over the year, winds in excess of 20 mph (8.9 m/s) occur over 21 percent of the time based on readings averaged over a six-hour period. From June to September, winds in excess of 20 mph (8.9 m/s) occur 13 percent of the time. At the 19 ft (5.8 m) depth contour, the measured current speed of six-hour duration exceeded with comparable frequency is about 0.2 ft/s (0.06 m/s) (NMP, 2004).

Since 1960, Lake Ontario outflows have been regulated to control lake water levels, under the supervisory authority of the International St. Lawrence River Board of Control (ISLRBC), by a series of dams on the St. Lawrence River. The ISLRBC was created in 1952 under the Boundary Waters Treaty of 1909 to help prevent and resolve disputes over the use of water along the Canadian and U.S. boundary. One requirement in the ISLRBC's order was to regulate Lake Ontario water levels within a target range from 243 to 247 ft (74.2 to 75.4 m) International Great Lakes Datum (IGLD) . [Note: The only difference between IGLD (1985) and NGVD (1988) is that the IGLD (1985) bench mark elevations are published as dynamic heights and the NGVD (1988) elevations are published as Helmert orthometric heights (Zilkoski et al. 1992)]. The ISLRBC aims to maintain levels above 243 ft (74.2 m) IGLD from April 1 through November 30 annually. Under the most extreme dry conditions, all possible relief is provided to navigation and power production facilities (ISLRBC 2002b). Data compiled by the U.S. Army Corps of Engineers for the period of record 1918 to 2001 indicate that average lake water levels range from approximately 244.5 to 246.2 ft (74.5 to 75.0 m) IGLD; minimum and maximum lake water levels during that period were approximately 241.9 ft and 248.6 ft (73.7 and 75.8 m) IGLD, respectively (NMP, 2004).

2.3.3.1.8 Water Quality Datasets

The following water quality datasets, maintained by state agencies, federal agencies, and non-profit groups, were accessed to locate available and applicable water quality data relevant to Lake Ontario water in the area of the NMP site:

- U.S. Atomic Energy Commission. Final Environmental Statement Related to the Operation of Nine Mile Nuclear Station Unit 1. Niagara Mohawk Power Corporation. (AEC, 1974)
- Niagra Mohawk Power Corporation. Environmental Report Operating license State Nine Mile Point Nuclear Station Unit 2 (NMPC, 1985)
- Heritage Station Application for Certification of a Major Generating Facility Under Article X of the New York State Public Service Law (Heritage Power, 2000)
- U.S. Environmental Protection Agency. Great Lakes Monitoring Limnology Program (EPA, 2005).
- Monroe County Water Authority "2000 Water Quality Monitoring Program Summary". Rochester, New York (MCWA 2001).
- Service Water System Water Quality Data (intake water from Lake Ontario)

Other monitoring programs in place within the region include the Statewide Waters Monitoring Program (SWMP) which monitors waters in the Salmon-Sandy Hydrologic Unit and Lake Ontario. SWMP consists of component programs, including the Rotating Integrated Basin Studies (RIBS) program for rivers and streams, the Lake Classification and Inventory program (LCI), the Citizens Statewide Lake Assessment Program (CSLAP), which uses volunteers to conduct additional lake monitoring, the Stream Biomonitoring Program and Toxicity Testing Program which provides biological monitoring components, and a Regulatory Sampling Program to monitor point source compliance (NYSDEC, 2006).

Based on a review of current literature, state, federal and non-profit groups do not appear to monitoring water quality in the waters adjacent to NMP within the area of influence at this time.

2.3.3.1.9 Freshwater Flow

Water quality of Lake Ontario is directly influenced by the quantity and quality of freshwater inflow. The NMP site lies within the Salmon-Sandy watershed which is characterized by freshwater inflow from the. Little Salmon River, Mad River, Salmon River, Butterfly Creek, Deer Creek, Lindsey Creek, Little Sandy Creek, South Sandy Creek, Salmon Reservoir, Sandy Creek, Skinner Creek, Stony Creek, Otter Creek, Catfish Creek, Wine Creek, Snake Creek, Trout Brook and other minor creeks and brooks (Figure 2.3-12). The site topography is fairly flat, ranging from approximately El. 280 to 260 feet (85 to 79 m). At the lake shore there is a small bluff that drops from the site to the lake level of approximately El. 245 feet (75 m). The site is well drained by short, intermittent streams. These streams include: Subarea A Stream - Lakeview Creek, Subarea B Stream (which flows intermittently), Subarea C Stream (which also flows intermittently), and Subarea D Stream (which flows intermittently).

Based on data from FEMA, Lakeview creek at it's confluence with Lake Ontario has an estimated peak 100-year discharge of 810 cfs (22.9 m^3/sec) and an estimated peak 500-year discharge of 1,090 cfs (30.9 m^3/sec). There are no USGS or other stream gauging stations located in Lakeview Creek or the NMP site. The FEMA Flood Insurance Study for the Town of Scriba limited its analysis of flooding along Lakeview Creek to the low-lying areas near the Hamlet of Lakeview, and does not include any portion of the NMP3NPP site.

The results of the analysis indicate a maximum PMF elevation in the vicinity of the Power Block (safety related structures) as about 268.5 ft (81.8 m) or 2.5 ft (0.8 m) below the finished first floor elevation of the safety related structures. Therefore, safety related structures are not expected to be flooded due to the Lakeview Creek PMF.

Prior to NMP Unit 1 and 2 plant construction, the shoreline of Lake Ontario in the area of the plant site was mildly sloping to the elevation of the water level during the 100-yr flood. Areas flooded during the 100-yr event consisted of bare to lightly vegetated glacial fill.

After NMP Unit 1 and 2 construction, site grading in the 100-yr flood- plain was somewhat less mildly sloping than before construction. The major feature at the shoreline in the 100-yr floodplain is the revetment-ditch system built to protect the plant from flooding and protect the shoreline from erosion. There is no information available to indicate that overland drainage of the site area has resulted in any historic flooding conditions (See Section 2.3.1 for more detailed information).

Lakeview Creek is the only on site stream that does not experience low-flow and no-flow conditions. As noted previously, historical flow and water quality data do not exist for this stream or any other on-site stream.

The average annual precipitation in the site area is about 36 in (91 cm). It is estimated that approximately 18 in (46 cm) are lost as runoff into stream flow. Of the remaining 18 in (46 cm), approximately 16 in (41 cm) are lost via evapotranspiration. The remaining 2 in (5 cm) are available for groundwater recharge. The relatively high runoff can be attributed to the low permeability of the glacial soils and rock formations. (NMP, 2004B).

2.3.3.1.10 Effluent Discharges

NMP is required by permit to monitor effluent discharge on an annual basis. Information on the average flow during periods of effluent discharge was reported in the Annual Radioactive Effluent Release Report for Units 1 and 2. The 2004 effluent flow data provided is as follows:

- 257,000 gals (1.17×10^6 L) of liquid waste were generated (volume prior to dilution)
- 5.47×10^7 gals (2.48×10^8 L) volume of diluted effluent released to Lake Ontario (NMP, 2006)

Sanitary wastewater from Units 1 and 2 is currently treated by the Unit 1 Sewage Treatment Plant. The maximum permitted flow is 120,000 gpd (0.005 m^3/s) as 30-day average. Daily flow ranges from 35,000 to 240,000 gpd (0.002 to 0.01 m^3/s) (NMP, 1984, NRC, 2006, NYSDEC, 2003).

The liquid effluent currently discharged from NMP Units 1 and 2 has relatively minimal impacts to Lake Ontario (NMP, 2004). Potential impacts include the distribution of water at higher or lower temperatures than the ambient waters and the discharge of toxic and/or radioactive materials to the receiving water body. The 2004 License Renewal Document states that the staff concludes that there are no impacts of the following:

- Altered current patterns at intake and discharge structures
- Altered thermal stratification of lakes
- Temperature effects on sediment transport capacity

- Scouring caused by discharged cooling water
- Eutrophication
- Discharge of chlorine or other biocides
- Discharge of sanitary wastes and minor chemical spills
- Discharge of other metals in wastewater
- Water use conflicts (plants with once-through cooling systems) (NMP, 2004).

The planned total amount of effluent discharged to Lake Ontario by NMP3NPP is on average 9,173 gpm (34,720 lpm) with a maximum flow of 9,891 gpm (37,437 lpm). The Wastewater Retention Basin will discharge on average 9,162 gpm (34,678 lpm) and a maximum of 9,880 gpm (37,396 lpm). The remaining 11 gpm (42 lpm) of effluent discharge will come from the Liquid Radwaste System.

2.3.3.1.11 Pycnocline

A pycnocline in freshwater environments such as lakes is a rapid change in water density with depth primarily caused by water temperature. No information related to pycnoclines is reported for the waters adjacent to NMP.

2.3.3.1.12 Water Temperature

The Lake water temperatures begin to warm in mid-March and by late-June the offshore ambient temperature stays above 39 °F (4 °C). Generally, vertical stratification is established over the entire basin by this time (NMP, 2004A). During the warmest water temperature period (June - September) at Nine Mile Point, the ambient temperature of Lake Ontario exceeds 71 °F (22 °C) approximately 10 percent of the time in the waters surrounding NMP. The mean summer ambient temperature of Lake Ontario at Nine Mile Point is reportedly 67 °F (19 °C), with a maximum surface temperature rise above ambient of approximately 12.4 °F (10.9 °C) at capacity operation (NMP, 2004A). In late September, the warming process ends, the mean surface temperature drops rapidly below 63 °F (17 °C), and the thermocline breaks down, marking the beginning of the winter season. The date of overturn varies each year due to storms. After overturn and when the lake surface cools to below 39 °F (4 °C), isotherms tend to be parallel to shore. During the winter months, nearshore areas of the Lake freeze while the deep offshore waters remain open (NMP, 2004).

Vertical temperature profiles revealed the existence of transient thermal gradients equal to or greater than 8 °F/3.3 ft (1 °C/m) throughout the study area. The gradients existed primarily in the summertime. They were not seasonally stable, since they were generated and destroyed by surface heating and cooling and mixing within the water column over periods dependent upon meteorological conditions. Although gradients were observed in sequential weeks for up to 3- to 4-week periods, the gradients observed were at different temperatures and at different depths from week to week and therefore were not persistent. When the gradients were observed, they appeared to be uniform from station to station. Additional thermal characteristics of the Lake are discussed in Section 5.3 (NMP, 1984)

Available surface water quality data for Lake Ontario in the vicinity of the site consists primarily of samples collected between 1973 and 1980. These data are described in the Environmental Report-Operating License Stage (ER-OLS) prepared for NMP Unit 2 in 1984 and are provided in

Table 2.3-13 and Table 2.3-14. The 1984 ER-OLS reported water temperatures with seasonal variations directly related to air temperature. Water temperature was measured monthly or twice monthly in Lake Ontario in the water quality monitoring program. In addition, continuous in situ monitoring was conducted. Long-term trends indicate no significant change in water temperature over time. Seasonal water temperature variations were also noted. Spatial temperature variations are evident in the raw data presented in the 1984 report. The NMP Unit 1 discharge elevates lake surface temperature, particularly in the nearshore region (NMP, 1984).

In Lake Ontario two important examples of wind-induced effects on the general circulation pattern of Lake Ontario are upwelling and internal oscillation of thermocline depth. Upwelling is characterized by the rising of colder, heavier, bottom water toward the surface. As noted by the NRC in the Unit 2 FES, a variety of theories have been proposed to account for the oscillations, which are a common feature of Lake Ontario temperature records. The most direct explanation is that an upwelling displaces the thermocline from equilibrium by converting the kinetic energy from wind gusts into potential energy that alters the thermocline position. When the wind stress is removed, internal waves are set in motion and contribute to the dissipation of this energy. Internal waves increase in amplitude after storms. In Lake Ontario, approximately three complete oscillations occur every 2 days (NMP, 2004A, NYSDEC, 2006).

Lake Ontario is a large, temperate lake that exhibits a seasonally-dependent pattern of thermal stratification, which alters circulation patterns. Changes in stratification result from atmospheric heat exchange and wind-induced mixing. In spring months, the shallow nearshore waters warm more quickly than the deep offshore waters, setting up isotherms roughly parallel to shore. As the lake temperature continues to warm, vertical stratification develops as a result of the combined effects of the lake warming and advection of the warmer, near-shore waters. Most of the Lake is vertically stratified during the summer with the warm surface waters (epilimnion) averaging nearly 70 °F (21 °C) and cool deeper waters (hypolimnion) ranging between 38.8 °F (3.8 °C) and 39.2 °F (4 °C). Mixing of these strata begins as the thermocline breaks down during September as a result of surface water cooling, and continues until water temperatures are the same throughout the water column (NMP, 2004A)

2.3.3.1.13 Dissolved Oxygen

The 1984 Environmental Report Operating License Stage (ER-OLS) Report noted that relatively high levels of dissolved oxygen, more than adequate for most aquatic organisms, were found during all seasons. The New York State standard for Class A - Special Waters requires a dissolved oxygen concentration not less than 6 mg/l (NYSDEC, 2008b). Data from 1984 reported dissolved oxygen levels were above this standard during all sampling at all locations, except the minimum value reported in 1973 of 5.8 mg/l DO. Dissolved oxygen levels were above the EPA (USEPA, 2000) criterion of not less than 5 mg/l for the protection of aquatic life (NMP, 1984A).

2.3.3.1.14 General Nutrient and Chemical Contaminant Trends in Lake Ontario

Lake Ontario has been designated by NYSDEC as Class A - Special Waters (International Boundary Waters). Its waters are suitable for use as a source for drinking water, for culinary or food-processing purposes, for primary and secondary contact recreation, and fishing. In addition, Class A-Special Waters are suitable for fish, shellfish, and wildlife propagation and survival (NYSDEC, 2008a). The water quality of Lake Ontario has changed dramatically since the mid-1960s, when work began to construct NMP Unit 1. Historic changes in land uses and uncontrolled pollutant discharges into all the Great Lakes contributed to a general eutrophication of the entire lake system. These nutrient-rich waters were characterized by high phosphorus concentrations and high turbidity up to the late-1970s (NMP, 2004).

2.3.3.1.15 General Water Quality Trends

Changes in selected basic water quality parameters over the past thirty years are shown in Table 2.3-13. These data were collected at the NMPNS area in 1972 and 1978, the City of Oswego water intake, located about 8 mi (12.8 km) southwest of the project site, in 1998 and 1999, and at the Monroe County water intake in 2000, approximately 50 mi (81 km) west of NMPNS. General reductions in pollutants such as phosphorus and dissolved solids, and in turbidity levels have been observed over the past thirty years. However, while some nutrients have decreased, nitrogen input has increased (NMP, 1984).

The gradual changes in Lake Ontario's water quality have also contributed to successive changes in the biological communities of the lake. Nutrient supplies and other environmental pressures (e.g., toxic pollutants) have also caused direct effects upon all trophic levels within the lake ecosystem (NMP, 1984).

The largest source of pollutants, including phosphorus, into Lake Ontario is Lake Erie, via the Niagara River (NYSDEC, 2006). Additional phosphorus and nitrogen enter Lake Ontario directly through runoff from agricultural lands, urban areas, and sewage outflows. The eutrophication of Lake Ontario was recognized by Canada and the U.S. in the 1960s, and led to the bi-national Great Lakes Water Quality Agreement (GLWQA) in 1972. Since the implementation of the U.S. Clean Water Act (CWA) and the GLWQA, phosphorus levels have been significantly reduced (NYSDEC, 2006; NMP, 2004A). There are no persistent lakewide eutrophication problems at this time, although near-shore and major tributary impairments have been noted. A 1993 report prepared by the NYSDEC indicates phosphorus levels have fallen below the 10 µg/l target level established by the International Joint Commission (IJC). Based on an increase in Secchi depth (an index of water clarity), decline in photosynthesis and a decline in late summer zooplankton production noted since the early 1980s. it is believed that the lake is shifting toward more oligotrophic conditions.

Nitrogen concentrations in Lake Ontario were not considered a major cause of eutrophication in the 1960s and 1970s. However, since the 1970s, nitrogen has been increasing in Lake Ontario, as well as in all of the other Great Lakes. The causal factors are not well understood, but agricultural runoff and atmospheric deposition are considered the most likely sources (NYSDEC, 2006).

Persistent, bioaccumulative, toxic chemicals (PBTs), which include mirex, polychlorinated biphenyls (PCBs), dioxins, and DDT, entered Lake Ontario via tributaries and historically were accumulated in the sediments. These contaminants have contributed to the restrictions of fish and wildlife consumption, degradation of benthic organisms, and restrictions on dredging activities in the Lake Ontario and surrounding areas of concern (NYSDEC, 2007b). Concentrations of toxic chemicals in Lake Ontario led the International Joint Commission (IJC) to name Lake Ontario the most contaminated of the Great Lakes. Canada and the U.S. developed and implemented the "Lake Ontario Toxics Management Plan," in 1989, to address the PBTs through regulation of the toxic chemicals' manufacture and use (NYSDEC, 2007A). Reductions in toxic chemical concentrations in some Lake Ontario biota have been reported by the NYSDEC from the 1960s to the 1980s. The reductions have been generally attributed to restrictions placed on the manufacture and use of those chemicals. The downward trend of toxic chemical concentrations has leveled off since the 1980s and may be due, in part, to a sequestering of the toxics within the Lake's benthic sediments. Consumption advisories for numerous fish species continue to be issued by the NYSDEC, based on concentrations of PBTs found in fish samples.

2.3.3.1.16 Specific Nutrient and Chemical Containment Trends

Available surface water quality data for Lake Ontario in the vicinity of the site consists primarily of samples collected between 1972 and 2000. These data are described in the ER-OLS prepared for NMP Unit 2 in 1984 and are provided in Table 2.3-13, Table 2.3-14 and Table 2.3-15 (NMP, 1984). Based on the 2007 Intake System Water Quality data, water quality in the lake near NMP has not changed appreciably (Table 2.3-28). The following measured parameters were compared to the 1973 through 1980 data for Lake Ontario: chloride, copper, iron, manganese, ortho phosphate, pH, silica, sodium, specific conductance, sulfur, and zinc. All parameters were found to be within the noted 1973 to 1980 range with the exception of silica, and sulfur which were slightly higher but not exceeding the New York State Standard. Copper and pH values were reported to be slightly lower than the 1973 to 1980 data, within acceptable state limits.

NMPNS data indicate a maximum variation of 2.5 pH units seasonally, with no apparent long-term trends. The New York State standard for Class A - Special Waters requires a pH range of 6.7 to 8.5 (NYSDEC, 2008b). All yearly mean values are in the range of 8.0 to 8.4 (slightly alkaline), which is typical of the results from other Lake Ontario studies. Annual maximum pH values have consistently exceeded the classification upper bound of 8.5. It is likely that the high pH data reflect photosynthetic activity near the water surface (NMP, 1984).

Data indicate an increase in specific conductance over the 6 years reported. Specific conductance of Lake Ontario water has been increasing yearly at a rate of 13 micromhos/cm per decade over the last 30 years. The NMPNS data reflect the preceding trend of increasing specific conductance over time (NMP, 1984).

Turbidity values collected during the 6-year sampling program indicate no trend in the season-to-season measured turbidity. Annual variations in turbidity are generally restricted in range, with the exception of the 0 to 52 NTU range reported in 1973. Turbidity variations can be attributed to spring and fall overturns, and algal blooms in the summer season. During 1967, turbidity values for Lake Ontario ranged from 0.2 to 2.5 NTU; increases followed phytoplankton blooms. From 1965 to 1975, the overall mean turbidity value based on several studies in eastern Lake Ontario was 0.87 NTU. The NMPNS data indicate a higher yearly mean and maximum value for turbidity than the data reported from other studies, but still below the State Standard of 5 NTU (NMP, 1984; NYSDEC, 2008B).

Lakewide data indicate Total Dissolved Solids (TDS) levels have remained stable since 1971. All mean TDS concentrations for 1973 through 1978 have been in excess of the 200 mg/l standard for New York State Class A - Special Waters. In 1980, the lake as a whole was in excess of the 200 mg/l standard for TDS. Lake Ontario's downstream position in the Great Lakes chain is thought to explain its relatively elevated TDS levels (NMP, 1984).

TDS concentrations measured in the NMPNS studies exhibited seasonal fluctuations, with spring peaks, and failed to indicate any impact due to power plants' discharges on regional TDS values. Spatial distributions indicate that the Oswego River discharge plume elevates TDS values in the western (NMPW transect) region of the NMPNS study area (NMP, 1984).

Average values for Total Suspended Solids (TSS) measured between 1973 and 1978 ranged from <2.3 mg/l to 10.6 mg/l, with the lowest values occurring during the last two years of sampling. No trends were otherwise evident in the data (NMP, 1984).

Available concentration data for the cations calcium, magnesium, potassium, and sodium, show no apparent trends over time, with the exception of unusually high concentrations of sodium and potassium in 1974 (NMP, 1984). Anions monitored during the same study included total alkalinity, chlorides, fluorides, and sulfates. No important long-term or seasonal trends were observed for anions in the study area (NMP, 1984).

Required aquatic nutrients include nitrogen, phosphorus, and silica compounds. However, concentrations of these nutrients in excess of requirements can promote degradation of water quality. Species of nitrogen measured during these studies included ammonia, nitrate, and organic nitrogen. Phosphorus species included total orthophosphate and total phosphorus. The relative concentrations of nitrogen, phosphorus, and silica compounds provide important data for assessing the availability of these nutrients for primary production (NMP, 1984).

The New York State Class A - Special Waters standard for ammonia is 2.0 mg/l (NYSDEC, 2008B). All values reported in 1973 through 1978 for the study area are well below this standard. Long-term trends indicate a decrease in mean and maximum yearly ammonia from 1973 through 1978. Seasonally, nitrate concentrations were at their lowest levels during the summer months, which may be attributed to uptake by plankton, and no season-to-season trends were apparent for nitrate over the 6-year sampling program (NMP, 1984).

Nitrate concentrations in Lake Ontario appear to be slightly lower in recent years than in the 1960s; however, the long-term trend indicates a gradual increase. A mean of 0.3 mg/l-N was reported for lakewide nitrate values in 1965. Values reported for Mexico Bay, immediately to the east of NMPNS, in 1965 ranged from 0.1 to 0.47 mg/l-N, with a mean of 0.28 mg/l-N. Total organic nitrogen values were reported in 1973, 1976, 1977, and 1978. Data indicate an apparent decrease in total organic nitrogen in NMPNS waters during this period. Total nitrogen concentration, the sum of ammonia, nitrate, and total organic nitrogen species, remained relatively constant over the 6-year sampling program. In general, it appears that total nitrogen concentrations in the study area have remained at a nearly constant level throughout the sampling program (NMP, 1984).

Lake Ontario water column phosphorus concentrations have been decreasing in a stepwise manner for 10 years. From 1972 to 1974, 1975 to 1977, and 1978 to 1980, phosphorus concentrations did not change significantly. Historically, these plateaus were followed by definite decreases in phosphorus concentrations. No long-term trends are evident for total orthophosphate and total phosphorus concentrations. Orthophosphate exhibited minimum values during the summer and fall months, as would be expected due to phytoplanktonic nutrient utilization. Total phosphorus measurements varied irregularly throughout the sampling period (NMP, 1984).

Indicators of contamination include: bacteria, biochemical and chemical oxygen demand, organic carbon, cyanide, and phenols. The New York State standard for coliforms is less than 1,000/100 ml total coliforms and less than 200/100 ml fecal coliforms (NYSDEC, 2008b). The Lake Ontario study area is well within the coliform bacteria standards on an annual average basis. The Biochemical Oxygen Demand (i.e., 5-day BOD) concentrations remained extremely low throughout the 1973 through 1978 study period. The 6-year mean concentration of 1.9 mg/l is comparable with a lakewide mean of less than 2 mg/l. Chemical oxygen demand concentrations were similarly low; the maximum yearly mean was 13 mg/l, which is less than the 17 mg/l mean concentration reported for eastern Lake Ontario from 1965 through 1972. Total organic carbon concentrations were also very low, indicative of little organic pollution of Lake Ontario water within the study area (NMP, 1984).

Cyanide concentrations were usually below detection limits throughout the water quality monitoring period of 1973 through 1978. The maximum reported value of 7 µg/l is well within the 200 µg/l state standard (NYSDEC, 2008b). Phenol concentrations were present in trace quantities, usually at or below the detection limit, from 1967 through 1978. The data indicate no significant phenol flux to the NMPNS regional waters. Cadmium concentrations were observed to be at or below the laboratory detection limits during the last 5 years of the sampling program. The 1973 data indicated the maximum value of 67 µg/l exceeded the 5. µg/l limit (NYSDEC, 2008b).

All yearly mean concentrations of copper were less than the 200 µg/l standard (NYSDEC, 2008b), except during 1974. In 1974, sample contamination was reported to have occurred during analysis. Maximum values reported from 1975 through 1978 were well below the 200 µg/l copper limit. All mean annual iron concentrations in the study area are less than the standard of 300 µg/l (NYSDEC, 2008b). Maximum iron concentrations reported from 1973 through 1977 exceeded the standard. Near the end of the monitoring program, a trend toward decreasing iron concentrations can be noted, with the 1978 maximum of 220 µg/l. Excluding 1974 data, zinc concentrations ranged, on an average yearly basis, from less than 14 µg/l to 50.6 µg/l. No long-term trends were evident in the data. Maximum zinc concentrations in 1973 and 1978 exceeded the state standard of 300 µg/l in 1978, but NYSDEC no longer has a standard for zinc for this class of water (NMP, 1984, NYSDEC, 2008B).

2.3.3.1.17 Sediments

The site is located near the Erie-Ontario Lowlands subdivision of the Central Lowlands Physiographic Province. The Nine Mile Point site is located on a slight promontory (also named Nine Mile Point) on the southeastern shore of the lake. In general, bottom sediments in nearshore areas are characterized by a greater predominance of coarser sands, pebbles, cobbles, and boulders, while finer sediments occur further offshore (NMP, 2004). Based on the divers report, the bottom adjacent to NMP consists of cobble, ledge rock, zebra mussels, and cladophora. Sediments were not found in the area studied. Due to the general nature of the bottom adjacent to NMP sediment samples have not been collected.

As noted previously, persistent, bioaccumulative, toxic chemicals (PBTs), which include Mirex, polychlorinated biphenyls (PCBs), dioxins, and DDT, entered Lake Ontario via tributaries and historically were accumulated in the lake sediments. These contaminants have contributed to the restrictions of fish and wildlife consumption, degradation of benthic organisms, and restrictions on dredging activities in the Lake Ontario and surrounding areas of concern (NYSDEC, 2007b). The entire shoreline of Lake Ontario including the eastern section adjacent to NMP, is listed as impaired due to fish consumption advisories as a result of sediments contaminated with Polychlorinated Biphenyls (PCBs), Mirex, and dioxin (NYSDEC, 2007A). The primary source of contamination is the open lake rather than the near-shore waters. It is unknown whether sediments in water in the vicinity of NMP are contaminated.

2.3.3.1.18 SPDES Permit Outfall/Monitoring Requirements

NMPNS has an existing State Pollutant Discharge Elimination System (SPDES) permit for 19 outfalls associated with NMP Unit 1 and Unit 2. NMP Unit 1 and Unit 2 are regulated under NYSDEC Pollutant Discharge Elimination System (SPDES) Discharge Permit no. NY-000-1015, with a permit expiration date of 1 December 2009. NMP Unit 1 and Unit 2 SPDES permit is currently under review. An application under the environmental Benefit Permit Strategy was submitted on August 31, 2007. Eighteen of the outfalls (including outfalls for storm drainage, condenser cooling water, wastewater, floor drains, cooling water blowdown and service water) discharge to Lake Ontario. The remaining outfall (NMP Unit 2 cooling tower emergency overflow) discharges to Lake Ontario and to groundwater. Table 2.3-16 provides a summary of existing NMPNS outfalls and indicates the parameters that are tested for at each location under the SPDES permit. Effluent parameters that are monitored include temperature, flow, oil and grease, total suspended solids, phosphorus, copper, pH, total aluminum, total copper, iron, free available chlorine, inhibitor AZ8104, and Cuprostat pf. A separate SPDES application will be prepared for NMP3NPP. The SPDES permitting process will involve participation and consultation from appropriate Federal and state regulatory agencies.

2.3.3.1.19 SPDES Permit Data Summary

Cooling and service water systems are treated with sodium hypochlorite and other oxidants to control biofouling. The site-specific SPDES permit specifies the molluscicides that may be used at NMPNS to control zebra mussels. An example is EVAC™, which has been used in recent years. A maximum limit of two treatments per year for each unit is conducted and the applications are made in the warmer summer months when the organisms are certain to filter water and be exposed to the chemical. NMP Unit 1 and Unit 2 each receive up to two 48-hour treatments. NMP Unit 2 has one delivered at the submerged, offshore intake structure, and the other is delivered at the onshore traveling screen inlets to the water systems. NMP Unit 1 treatments are delivered onshore. The SPDES Permit Special Conditions (NYSDEC, 2004a) require 48-hour notification to the NYSDEC before EVAC™ is applied and monitoring is performed to ensure the effluent concentration does not exceed the SPDES limit (NRC, 2006).

Sanitary wastewater from NMP Units 1 and Unit 2 is currently treated by the NMP Unit 1 Sewage Treatment Plant. Treated effluent from the sanitary waste water treatment system undergoes chlorination and subsequent dechlorination before being discharged via a 12-in. (30.5-cm.) pipe to a drainage ditch eventually flowing to Lake Ontario. The discharge is permitted as Outfall 030. The effluent is monitored for flow, biochemical oxygen demand, suspended solids, settable solids, pH, and total residual chlorine. Maximum permitted flow is 120,000 gpd (0.005 m^3/s) as 30-day average. Daily flow ranges from 35,000 to 240,000 gpd (0.002 to 0.01 m^3/s) (NMP, 1984; NRC, 2006; NYSDEC, 2003).

Stormwater discharges from impervious surfaces at NMP Unit 1 and Unit 2 are controlled and minimized by provisions of the Storm Water Pollution Prevention Plan in accordance with the SPDES program. This plan calls for periodic monitoring and record keeping of the engineered controls to ensure they are effective in minimizing runoff volume and contaminants and evaluating the need to repair or replace the installed stormwater controls such as silt fences, hay bales, berms and settling ponds (NMP, 2004). NMP3NPP will develop a Storm Water Pollution Prevention Plan during SPEDS permitting phase of NMP3NPP development.

Pesticides are used to clear vegetation from transmission corridors and roadways at NMP. Best management practices related to use and storage of pesticides will be utilized at NMP3NPP in accordance with state regulations. There is continuing high concern in New York for the overuse or misuse of pesticides and the potential for groundwater contamination. Registration of pesticides is managed by NYSDEC. Commercial application businesses are required to register with DEC with certification required for each individual who performs pesticide application. New York State has also adopted a Neighbor Notification Law that requires the posting of visual notification markers when 100 square feet or more of residential lawn application occurs. Lastly, a permit is required for the sale of restricted use pesticides in New York State. The New York State Department of Agriculture and Markets, through its AEM program, has developed 2 pesticide management worksheets dealing with use, storage, mixing, and loading. AEM operates at state and local levels providing financial, educational and technical assistance to farmers to deal with environmental concerns (NYSDEC, 2006).

Other toxic chemicals are used onsite at NMP for various purposes. Under the 1987 agreement on the Niagara River, the 4 parties (NYSDEC, USEPA, Ontario Ministry of the Environment, Environment Canada) agreed to develop a joint Lake Ontario Toxics Management Plan. This plan, completed in 1989, establishes a process for the United States and Canada to use current and developing programs to the maximum extent possible to reduce toxic pollutants entering Lake Ontario. The Lake Ontario Toxics Management Plan noted substantial improvements with respect to concentration trends in biota since the 1960s for a number of contaminants (e.g. PCB, DDT, mirex, and dioxin) due to restrictions placed on their manufacture and use. However, since the early 1980s this downward trend has leveled off for some substances such as PCB and Mirex, with some occasional increases in concentration also noted. This suggests continuing inputs or recycling of these substances within the system. Fish consumption advisories remain in effect for Lake Ontario for several species including American eel, channel catfish, carp, lake trout, chinook salmon, coho salmon, rainbow trout, brown trout, white perch and white sucker because of contamination by PCB, Mirex and dioxin (NYSDEC, 2006). NMP3NPP will use best management practices outlined by NYSDEC and the Lake Ontario Toxic Management Plan to manage toxic chemicals onsite at NMP. A plan will be developed during the SPDES permitting phase of NMP3NPP development.

Hazardous wastes are materials with properties that make them dangerous or potentially harmful to human health or the environment, or that exhibit at least one of the following characteristics: ignitability, corrosivity, reactivity or toxicity. Federal Resource Conservation and Recovery Act regulations govern the generation, treatment, storage and disposal of hazardous wastes. Hazardous waste is defined as any solid, liquid or gaseous waste that is not mixed waste, is listed as hazardous by any federal or state regulatory agency or meets the criteria of 40 CFR 261, Subpart D or Code of New York Regulation 6 NYCRR 371. NMP3NPP will develop and maintain a Hazardous Waste Minimization Plan that documents the current and planned efforts to reduce the amount or toxicity of the hazardous waste to be generated at NMP3NPP. This plan will be developed during the SPDES permitting phase of NMP3NPP development.

Monitoring conducted as part of the SPDES program found that there were no reported SPDES permit exceedances for July and November 2007, January, February, March and April 2008 . The plant operates in accordance with applicable local, state, and federal discharge limitations. No notices of violation have been reported in the past five years, the length of record reviewed (NRC, 2006)

2.3.3.1.20 Oswego County SPDES Permitted Discharges

A number of permitted (SPDES) discharges occur to Lake Ontario in the vicinity of the site. The JAFNPP is located immediately east of NMPNS and has five outfalls that discharge to Lake Ontario. Discharges from these outfalls are regulated under a SPDES permit. The discharges consist of the following: circulating cooling water, service water, intake screen backwash, clarifier blowdown, filter backwash, clearwell overflow, waste tank discharges, borated water, and emergency diesel generator cooling water, combined storm water and oil-water separator wastewater, storm water runoff, and overflow from a sedimentation containment pond. Concentrations of monitored constituents in the effluent streams have been in accordance with applicable local, State, and Federal discharge limitations, and no known notices of violation have been issued within the past five years (NRC, 2008).

In addition to JAFNPP, 47 other facilities located in Oswego County have regulated SPDES discharges. Information concerning these facilities is summarized in Table 2.3-17.

The major waste constituent discharged to Lake Ontario as a result of site and vicinity water usage is heat. NMP Unit 1 and Unit 2 and the JAFNPP use Lake Ontario water for cooling.

Heated cooling water discharges are rapidly assimilated and cooled to ambient water temperatures outside the defined mixing zone. Waste discharges from the preceding facilities contribute minor amounts of TDS to the Lake Ontario NMPNS regional waters (NMP, 1984).

2.3.3.1.21 Radiological Discharges

The total volume of liquid waste generated by NMP Unit 1 during 2004 was 3.79 m^3 (1000 gal). After dilution, the volume of effluent released to Lake Ontario was 4.52 m^3 (1190 gal). In this effluent, there was a total fission and activation product activity (a) of 0.0681 MBq (1.84 x 10-6 Ci) and a total tritium activity of 1800 MBq (0.0486 Ci). In the same year, the total volume of liquid waste generated by NMP Unit 2 was 970 m^3 (256,000 gal). After dilution, the volume of effluent released to Lake Ontario was 207,000 m^3 (5.47 x 107 gal). In this liquid effluent, there was a total fission and activation product activity of 792 MBq (0.0214 Ci) and a total tritium activity of 2.15 x 105 MBq (5.8 Ci). The total activity released from both units combined in 2004 was approximately 792 MBq (0.0214 Ci) for fission and activation products and 2.16 x 105 MBq (5.85 Ci) for tritium (NMP, 2006).

Based on the values reported in the annual and semiannual Radioactive Effluent Release Reports for the two units over the five-year period from 2000 through 2004 the total activity of the average annual liquid releases from the two units combined over the same years was approximately 43,300 MBq (1.17 Ci) for fission and activation products and 9.65 x 105 MBq (26.1 Ci) for tritium. The annual releases were within the regulatory limits as specified in the Offsite Dose Calculation Manuals (ODCM) (NMP, 2006).

2.3.3.1.22 Intake Water Discharges

In February 2007, three water samples were collected at the NMP Unit 2 cooling water intake structure, two sampled the Circulating Water System and one sampled the Service Water System. Sample results and analytical parameters are shown in Table 2.3-28. In general, the intake analyte concentrations and measurements show that there are no significant pollutants in the influent cooling water for Unit 2.

The largest discharges originate from NMP Unit 1 and 2. This discharge consists mainly of warm water from the once-through cooling system and minor amounts of treated effluent from other waste streams. Most of NMP Unit 1 and 2 liquids are discharged to Lake Ontario through the submerged outfalls located 3 ft (0.9 m) and 4 ft (1.2 m) above the lake floor approximately 1,500 ft (457 m) offshore of the plants. The sanitary wastewater is treated by one system (Unit 1) and released to the onsite drainage ditch which discharges to Lake Ontario. The quantity and quality of the water discharged are regulated and permitted by the State of New York. Given the approximate 2,700 ft (823 m) distance from NMP3NPP outfall to the NMP Units 1 and 2 intake, and Lake Ontario current patterns, any possible pollutants in the entrained lake water would be greatly diluted before reaching the Units 1 and 2 plant intake structures.

The most likely pollutants that might be present in effluent discharged from NMP Units 1 and 2 operations would be treatment chemicals used to prevent scaling and rusting in the cooling system piping, those used in the wastewater treatment plant operations, and diluted radioactive liquid waste. The volume of those effluents would be very minor compared to the total volume discharged.

Since the other surface water bodies on site are not used for any plant operations, no impact would be expected from any pollutants that might be present in them.

2.3.3.1.23 Wastewater Treatment Discharges

Sanitary wastewater from NMP Unit 1 and Unit 2 is currently treated by the NMP Unit 1 Sewage Treatment Plant. Treated effluent from this sanitary wastewater treatment system undergoes chlorination and subsequent de-chlorination before being discharged via a 12-in. (30.5-cm.) pipe to a drainage ditch eventually flowing to Lake Ontario. The discharge is permitted as Outfall 030 under the site's SPDES permit. The effluent is monitored for flow, biochemical oxygen demand, suspended solids, settable solids, pH, and total residual chlorine. Maximum permitted flow is 120,000 gpd (0.005 m^3/s) as 30-day average. Daily flow ranges from 35,000 to 240,000 gpd (0.002 to 0.01 m^3/s) (NMP, 1984), (NRC, 2006), (NSDEC, 2003)].

Sanitary wastewater from NMP3NPP will be treated by two sanitary wastewater treatment plants using extended aeration with operating capacity of 75,000 gallons per day. A 225,000 gallon storage tank with necessary aeration will be provided to capture three days wastewater at full load. This tank will be used when maintenance is required. The NMP3NPP Sanitary Wastewater Treatment System (SWTS) will operate similar to the NMP Unit 1 Sewage Treatment Plant System. The NMP3NPP system is designed to meet the following criteria:

- BOD5: 30 -day average less than 30 mg/l and 7-day average less than 45 mg/l at 20° C,
- Total Suspended Solids: 30-day average less than 30 mg/l and 7-day average less than 45 mg/l,
- Fecal Coliform: 30 -day average less than 200 col/100 ml 7-day average less than 400 col/100 ml. pH in the range of 6 to 9
- Total Residual Chlorine shall be greater than 0.5 mg/l (SL, 2008a)

The NMP3NPP Sewage Treatment Plant is expected to treat sanitary waste only and exclude industrial materials, such as chemical laboratory waste. The NMP3NPP Sewage Treatment Plant operation will be similar to the NMP Unit 1 Sewage Treatment Plant and will follow standard practices and use processes that are similar to wastewater treatment plants throughout New York and meet similar limitations.

The expected effluent characteristics of the new treatment plan are expected to be similar to those for the existing NMP Unit 1 and Unit 2 Sewage Treatment Plant and will meet applicable health standards, regulations, and total daily maximum loads (TMDLs) set by the NYSDEC and the U.S. EPA.. Similar to the Unit 1 and 2 plant, the new sanitary waste treatment plant will not impact stormwater runoff. The treated sanitary effluent will be combined with the discharge stream from the on-site wastewater retention basin and discharged to Lake Ontario. The discharge will be in accordance with local and state safety regulations, and SPDES permit requirements. The waste sludge from the NMP3NPP Sewage Treatment Plant will removed by a private company and transported to a waste processing plant. All sludge will be checked for radiological contaminants prior to release.

2.3.3.1.24 Other System Effluent Discharges

Non-radioactive liquid effluents that could potentially drain to Lake Ontario are limited under the SPDES permit. There are three anticipated regulated outfalls for release of non-radioactive liquid effluents from NMP3NPP: One outfall for the pumped discharge from the retention basin for plant effluents (e.g., cooling tower blowdown, effluent from sanitary wastewater treatment, effluent from intake water treatment, reject water from the DWDS, and miscellaneous low volume flows) via the offshore submerged diffuser; one outfall for stormwater via various surface outlets through the NMP3NPP site, and one outfall for intake screen backwash. These outfalls will be controlled under the NMP3NPP SPDES permit.

Other non-radioactive liquid waste effluents from plant sources (i.e., Steam Generator Blowdown Demineralizing System) are managed and processed by the Liquid Waste Storage System and the Liquid Waste Processing System. These systems also manage and process radioactive liquid wastes. Similar to Units 1 and 2, NMP3NPP non-radioactive liquid waste effluents will not be directly discharged. Non-radioactive liquid waste is first stored in a tank where it is pre-treated chemically or biologically. Chemical pre-treatment gives the waste an optimum pH value; biological pre-treatment allows organics to be consumed. If deemed cleaned, it can be routed directly to one of the monitoring tanks; otherwise, once pre-treated, the wastes are forwarded to the Liquid Waste Processing System for treatment. After the wastewater has been treated, it is received in one of two monitoring tanks, which also receive treated liquid radwaste. Wastewater is then sampled and analyzed and if within the limits for discharge, it can be released to the detention basin.

2.3.3.1.25 Stormwater Management System Discharges

The stormwater from all the facilities will be collected through a network of storm sewers and ditches and drained into three stormwater detention ponds. The stormwater detention ponds are designed to retain runoff from storms up to and including a 100-year, 24-hour rainfall. The stormwater runoff in the stormwater ponds will be released to a natural stream as per an allowable release rate. The storm drainage system is designed to carry the peak storm runoff from a 50-year rainfall without flooding the adjacent plant roads and facilities. The plant storm sewer systems are conceptually developed for the main plant area to function during a 50-year rainfall without flooding plant roads or facilities. Manholes and catch basins are provided as necessary for the storm sewer system. The peripheral areas, including the construction parking and laydown areas, are drained by means of ditches and culverts. Ditches will be designed to carry the peak flow from the 50-year storm event. The runoff from these areas drain to the stormwater ponds. The stormwater detention ponds are planned to collect the stormwater from plant facilities through a network of sewers, ditches, and culverts. Stormwater from roof drains will be drained through downspouts for each of the plant buildings. Stormwater from the downspouts will be collected and routed to the nearest catch basin or manhole and then drained through the storm sewer system.

The proposed NMP3NPP will be served by a stormwater collection system consisting of a series of drainage swales and storm water detention basins. The power block will be located in the Lake Ontario watershed (e.g., drainage from the power block will runoff directly to the lake). A portion of the site's ancillary structures such as the switchyard will drain to Lakeview Creek. Best management practices will be used to minimize runoff and impacts to onsite water bodies. A Stormwater Pollution Prevention Plan will be created during the SPDES permitting phase of project development.

2.3.3.2 Groundwater

Groundwater use is discussed in Section 2.3.2 of this report. Groundwater is not utilized for any of the NMPNS water systems and there are no production wells on the site. The NMP Unit 1 Reactor Building has a peripheral drain for collecting any groundwater seepage which is then pumped to the lake. The NMP Unit 2 Reactor Building area is actively dewatered (NMP, 1984). As noted previously, the NMP Unit 2 cooling tower emergency overflow discharges to Lake Ontario and to groundwater.

2.3.3.2.1 NMPNS General Groundwater Quality

Groundwater is available in the NMPNS area from both confined and unconfined aquifers consisting of four geologic units: nonlithified aquifer (Overburden), Oswego Sandstone, Pulaski, and Whetstone Gulf Formations in descending order. Section 2.3.1 provides a description of these units found to exist within the NMPNS site area. During the site characterization for NMP3NPP, 79 borings were drilled. From these borings 38 groundwater monitoring wells were installed to monitor groundwater elevation and water quality, including 17 wells to monitor shallow groundwater.

Yields from the regional bedrock aquifers are low and the groundwater is highly mineralized and of poor quality with elevated levels of iron, hydrogen sulfide, chlorides and hardness. Shale units contain excessive amount of highly-soluble halite and gypsum and abundant limestone and dolomites add soluble minerals (calcium carbonate and magnesium carbonate) to groundwater. Dissolved solids in the first 50 to 100 ft (15.2 to 30.4 m) of the saturated zone range from 100 to 1,500 parts per million. Hardness in the water samples collected in the county ranged from 50 to 2,000 ppm. Groundwater with a high sulfate, chloride, and TDS content, is typically "hard" and is generally unsuited for drinking water.

2.3.3.2.2 Regional Groundwater Quality

The general quality of groundwater in the bedrock in the central New York region is often poor. Each of the bedrock units is composed of a distinctive group of minerals with varying degrees of solubility. The Paleozoic shales contain excessive amounts of highly-soluble salt and gypsum (hydrated calcium sulfate). Water flowing through these units has dissolved much of the salt and gypsum, causing a high sulfate, chloride, and TDS content in the local water.

The upper shale and sandstone-shale units are composed of relatively insoluble minerals. Soluble carbonates in limestones that are interbedded with the upper shale may slightly degrade groundwater quality. The sandstone (Oswego) and lower shale units (Pulaski and Whetstone Gulf Formations) consist almost entirely of insoluble minerals and have the lowest dissolved solids in the region. The median dissolved solids concentration for sandstone aquifers in New York is 300 mg/l and the median chloride concentration is 100 mg/l.

The general chemical constituents of the groundwater in the unconsolidated deposits are similar to those in the consolidated bedrock formations, but with lower mineral concentrations. Median dissolved solids concentrations in the unconsolidated sand and gravel aquifers in the NMP3NPP region can be as high as 200 mg/l, due to the presence of composed mostly of limestone fragments carried by advancing glaciers.

The unconsolidated deposits in the northeastern part of the Oswego Sandstone unit outcrop area are free of limestone fragments carried by the advancing glacier over the Tug Hill Upland. As a result, overall groundwater quality differs from that of the Erie-Ontario Lowlands.

In general, groundwater obtained from wells installed in bedrock formations is of poor quality. Elevated levels of iron, hydrogen sulfide, chlorides, and hardness are common. On the other hand, groundwater obtained from wells screened in the Pleistocene unconsolidated glacial deposits is generally of better quality and is favorable for resource development.

2.3.3.2.3 NMPNS Groundwater Data

Groundwater sampling was conducted quarterly beginning in September 2007 with the final round of sampling scheduled for July 2008. Figure 2.3-13 through Figure 2.3-15 show the sampling locations in relation to NMP3NPP and other proposed structures. Sixty parameters from 15 sampling locations were analyzed to characterize the groundwater quality at NMP3NPP. As part of this sampling protocol, NMPNS collected tritium samples in accordance with the requirements of 10 CFR 50.75 (g) (CFR, 2006). Table 2.3-18 through Table 2.3-26 show the groundwater analytical results sorted by geologic unit. The results were compared to the 2008 New York State Water Quality Standards (NYSDEC, 2008b). These standards cover surface water, groundwater, and groundwater effluent limits for the state of New York. Where New York Standards were not available, the 2006 U.S. EPA Surface Water Quality Standards were implemented (USEPA, 2008). The range and mean were calculated for each parameter using Microsoft Excel 2007. It should be noted that for results less than the detection limit (i.e., <5.0), half the detection limit (i.e., 2.5) was used to calculate the range and mean. It also should be noted that the high total dissolved and suspended solids in the water sample may be driving the high metals concentrations detected in all the samples.

2.3.3.2.4 Overburden (Nonlithifed Aquifer)

The Overburden (nonlithified) aquifer was sampled for the first time in March 2008 at five locations: BA120-N NMP3NPP CZ/URB, BA121-NW NMP3NPP CZ/UKH, BA122-South Central Area of NMP3NPP CZ, BA123-E NMP3NPP CZ/UBP, and BA124-W Corner of NMP3NPP CZ/UJK. Overall quality of the groundwater in the nonlithified aquifer was fair. Results from this aquifer exceeded the standards less often than results for the other geologic units.

The New York State Standards were exceeded for the following parameters: aluminum (mean 26 times the standard); cobalt (mean 5 times the standard), iron (mean 14 times the standard); magnesium (mean 2 times the standard), manganese, sodium, vanadium, and color. The range of reported values for these parameters was large and varied from the detection limit to 45 times the standard. Total dissolved solids were very high (782,000 and 686,000 µg/l) for the Overburden samples, exceeding the EPA standard of 500,000 µg/l. Total suspended solids were also quite high at 205,000 µg/l.

All the Overburden samples were collected near the proposed NMP3NPP Construction Zone (CZ). Spatially there is very little variation. When standards were exceeded for the parameters noted above, they generally were exceeded at all sample locations with the exception of manganese and sodium, which only exceeded the standards at 2 of the 5 locations. Also other sampled parameters that did not exceed the standards generally followed the same trends from location to location with the exception of zinc sampled at BA122-South Central of NMP3NPP CZ where the value was half of the reported values for the other locations. Ammonia as nitrogen sampled at BA121-NW Corner of NMP3NPP CZ was 4 times the reported values from the other locations. Aluminum was generally 35 to 46 times the standard, but was only 6 to 15 times the standard at BA122-South Central NMP3NPP CZ and BA123-SE corner of the NMP3NPP Construction Zone. Total suspended solids for BA121-NW Corner of NMP3NPP CZ and BA124-SW Corner of NMP3NPP CZ were also very high when compared to the other locations-20 or more times the reported values when compared to the other sites. Since the Overburden samples were only collected in March 2008, temporal variation can not be evaluated.

2.3.3.2.5 Oswego Sandstone Formation

Groundwater from the Oswego Sandstone aquifer was sampled on September 27-28, 2007, December 3, 2007, and March 5, 2008 at five locations: BA107-Northern Road outside the CZ for NMP3NPP, BA111-SW Corner NMP3NPP CZ, BA202-NW Corner NMP3NPP CZ, BA217-NE Corner NMP3NPP CZ including B801 and B902, BA236-SE Corner NMP3NPP CZ, BA801, BA902. Like the Overburden layer, Oswego Sandstone groundwater exhibited high metals concentrations exceeding the New York State Standards. The standards were exceeded for the following parameters: aluminum (mean 30 times the standard); arsenic (mean 5 times the standard); barium (mean 2 times the standard); beryllium (EPA standard was exceeded, but not New York State Standard); chromium; cobalt (mean 5 times the standard); copper; iron (mean 4 times the standard); magnesium; manganese; selenium; sodium (mean 67 times the standard); vanadium (mean 7 times the standard). Exceedances of the standard for inorganics included: ammonia as nitrogen and chloride (mean 10 times the standard). The pH was high in March 2008 at B202-NW Corner NMP3NPP CZ. The reported value for benzene was equal to the standard during the December 2007 sampling at the Northern Road Site BA107. Total dissolved solids were high 17,300,000 µg/l. Total suspended solids also were high 55,000 µg/l. Like the Overburden, the minimum and maximum reported values for the above noted parameters was quite large and ranged from the detection limit to 229 times the standard for a particular parameter.

Spatial patterns for the Oswego Sandstone Formation for metals parameters were somewhat consistent across the sample locations. A stable pattern of exceeding the limit by 5 times for cobalt was shown at all sample locations and sample dates. Magnesium generally did not exceed the limit at the Northern Road, NW Corner, or NE corner, but the SW corner reported the highest values at twice the standard. The Northern Road location reported high aluminum on September 28, 2007 and location BA902 also reported high aluminum values. Copper values exceeded the standard at the Northern Road location and was very consistent at the other locations within NMP3NPP CZ. Consistently the SW Corner of NMP3NPP CZ reported exceedances for aluminum, arsenic, barium, beryllium, cobalt, iron, magnesium, and manganese. Values for cadmium, chromium, copper, lead, nickel, selenium (SW Corner and North Road reported values were somewhat higher), nitrate & nitrite as N (high value at NE Corner), Nitrate Nitrogen were consistent at all locations with very little variation. Vanadium, Total Kjeldahl Nitrogen were found to be extremely high at the North Road location and very stable at the remaining sample sites. Chloride peaked in value at the SW Corner of NMP3NPP CZ with the only other exceedance occurring at the North Road. Values for sodium are lower at the SE Corner of NMP3NPP CZ, but still exceeded the state standard. Total dissolved solids were extremely high at the SW Corner of NMP3NPP CZ and North Road for all sample dates, but were 34 times more than the values reported for the NW, NE, and SE Corners of NMP3NPP CZ with the lowest value reported at the SE Corner in March 2008. Total Phosphorus was also 5 times higher at the North Road site.

Temporal patterns for the Oswego Sandstone Formation emerge as a slight decline in reported values from September to March 2008 for aluminum, calcium, iron with the exception of the SW Corner site. In the March 2008 data, fewer parameters exceeded standards and when they exceeded the standard generally it was less than twice the standard with the exception of SW Corner NMP3NPP CZ where iron was exceptionally high. Chloride levels exhibited a slight decline from September 2007 to March 2008 with the lowest value reported at the SE Corner of NMP3NPP CZ in March 2008.

2.3.3.2.6 Pulaski Formation

Groundwater from the Pulaski Formation was sampled on September 27, 2007, December 3, 2007, and March 6, 2008 at five sample locations: BA102-NW of NMP3NPP CZ; BA117-Railroad/Transmission Corridor including B802; B208-N Central NMP3NPP - Vent Stack; BA219-W Central NMP3NPP/UBP; and B235-E Central NMP3NPP/UBP. Similar to the Overburden and Oswego Formations, the Pulaski Formation reported high metals values for all sample locations. The following parameters exceeded New York State Standards: aluminum (mean 50 times the standard); arsenic (mean 5 times the standard); barium (mean 35 times the standard); beryllium (mean 5 times the EPA Standard - 2 times NY Standard); cadmium; chromium; cobalt (mean 14 times the standard); iron (mean 13 times the standard); magnesium (mean 8 times the standard); manganese (mean 6 times the standard); nickel; selenium (mean 11 times the standard); sodium (mean 500 times the standard); thallium (mean 2 times the standard); vanadium (mean 3 times the standard); ammonia as nitrogen (mean 11 times the standard); color; and chloride (mean 91 times the standard). Total dissolved solids were also very high with a maximum of 7,930,000 µg/l. Total suspended solids were also high with a maximum of 341,000 µg/l.

Groundwater quality at the three locations is poor. All of the locations exceeded the parameters listed above for all sample dates with the exception of ammonia as nitrogen and color which were only violated on March 5, 2008 at BA102-NW of NMP3NPP CZ. Nickel also only exceeded the standard at B208 on September 27, 2007. The highest reported values for most parameters were found at BA102-NW of NMP3NPP CZ. The lowest reported values for most parameters were found at BA117-Railroad/Transmission Corridor.

Temporal trends were noted for the Pulaski Formation as a decrease in reported values from September 2007 to December 2007. In March 2008, the reported values increased to slightly less than the values reported in September 2007.

2.3.3.2.7 Whetstone Gulf Formation

Groundwater from the Whetstone Gulf Formation was sampled on September 27, 2007, December 3, 2007, and March 6, 2008 at five sample locations: BA106-Northern Road; BA110-SW of NMP3NPP CZ; BA216-NE Corner NMP3NPP CZ; B230-Central NMP3NPP Near Core; and B238-SW Corner NMP3NPP Cooling Tower. Similar to the Overburden, Oswego, and Pulaski Formation, groundwater from the Whetstone Gulf Formation reported high metals values for all sample locations. The following parameters exceeded New York State Standards: aluminum (mean 570 times the standard); arsenic (mean 19 times the standard); barium (mean 152 times the standard); beryllium (mean 11 times EPA Standard - 4 times NY Standard); cadmium (mean 2 times the standard); chromium (mean 3 times the standard); cobalt (mean 23 times the standard); copper; iron (mean 263 times the standard); magnesium (mean 23 times the standard); manganese (mean 24 times the standard); nickel; selenium (mean 9 times the standard); sodium (mean 956 times the standard); thallium (mean 2 times the standard); vanadium (mean 14 times the standard); ammonia as nitrogen (mean 80 times the standard); color; pH; and chloride (mean 229 times the standard). Total dissolved solids were also very high with a maximum of 5.13 x 108 µg/l. Total suspended solids were also high with a maximum of 5.21 x 107 µg/l.

Like the other geologic formations, Whetstone Gulf Formation groundwater quality is poor. Exceedances of the standard were common for all the parameters noted above with the exception of pH and ammonia as nitrogen which exceeded the standards only in March of 2008 for BA106-Northern Road, BA110- SW Corner NMP3NPP CZ, and B230-Central NMP3NPP Near Core. Another anomaly existed on September 28, 2007 for BA110-SW Corner NMP3NPP where iron, magnesium, manganese and nickel values did not exceed the standards. Also on March 5, 2008 BA230-Central NMP3NPP Near Core did not exceed the standard for iron or manganese. BA238-SW Corner NMP3NPP Cooling Tower did not exceed standards for magnesium and manganese for all sample dates. Generally the values at BA238-SW Corner NMP3NPP Cooling Tower were lower than all other sampling locations. Aluminum values were low in December 2007 for BA106-Northern Road also on March 5, 2008 for BA238-SW Corner NMP3NPP Cooling Tower. Aluminum values were extremely high at BA106-Northern Road on September 27, 2007 and again at BA110-SW Corner NMP3NPP CZ on December 3, 2007. Barium values were also exceptionally high (152 times the standard) at BA106-Northern Road for all sample dates. In general the water quality samples from BA-238-SW Corner Cooling Tower had fewer exceedances of the standard and lower reported values for most parameters. Magnesium varied spatially quite a bit. Values were very high for BA106-Northern Road, inconsistently high for BA110-SW Corner NMP3NPP CZ, moderate for BA230-Central NMP3NPP Core and low for BA238-SW Corner Cooling Tower.

Reported values for the Whetstone Gulf Formation followed a weak decreasing trend from September 2007 to December 2007 and into March 2008. Chloride, sodium, and calcium, were consistently high on all sample dates.

2.3.3.3 References

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Table 2.3-1—Historical Maximum Precipitation

Duration (min)	10	15	30	60
Rainfall depth, in	1.21	1.28	1.32	1.63
Rainfall depth, cm	3.07	3.25	3.35	4.14

Table 2.3-2—Maximum Instantaneous Water Levels of Lake Ontario at Oswego, New York

	Lake Level Historical Period of Record* (1900-1982)		Period of Current Lake Regulation (October 1963-1982)	
	Meters	Feet	Meters	Feet
January	75.74	248.50	75.50	247.73
February	75.74	248.50	75.54	247.84
March	75.76	248.57	75.76	248.57
April	75.98	249.29	75.98	249.29
May	76.06	249.55	76.06	249.55
June	76.25	250.19	76.07	249.58
July	76.01	249.38	75.95	249.18
August	75.90	249.03	75.64	248.19
September	75.77	248.59	75.46	247.59
October	75.70	248.36	75.30	247.06
November	75.67	248.26	75.21	246.76
December	75.83	248.80	75.28	247.00

Note:

* USLS measurements

Table 2.3-3—Probable Maximum Precipitation (PMP)

Duration (hr.)	Cumulative All-Season PMP		Area	
	(in)	(cm)	(sq mi)	(sq km)
0.17 (10 min)	7.1	18.0	1.00	2.59
0.25 (15 min)	8.6	21.8	1.00	2.59
0.33 (20 min)	9.9	25.1	1.00	2.59
0.50 (30 min)	12.3	31.2	1.00	2.59
1	16.0	40.6	1.00	2.59
6	27.5	68.6	1.00	2.59
0.50 (30 min)	12.0	30.5	1.34	3.47
1	15.7	39.9	1.34	3.47
2	20.0	50.8	1.34	3.47
3	22.9	58.2	1.34	3.47
4	24.9	63.2	1.34	3.47
5	26.2	66.5	1.34	3.47
6	27.1	68.8	1.34	3.47
6	23.5	59.7	10.0	25.9

Table 2.3-4—Surface water withdrawals from Lake Ontario within 50 mi (80 km) of NMPNS

(Page 1 of 2)

Map No.	Name	Location	Amount (mgd)	Amount (million liters per day)	Distance from NMP3NPP in mi (kg)	Use	Source of Info.
11	Metropolitan Water Board	Oswego NY (Oswego County)	24	90.85	8 (13)	Domestic, industrial	1
10	City of Oswego	Oswego NY (Oswego County)	8	30.28	8 (13)	Domestic, industrial	1
7	NRG (formerly Oswego Steam Station, Unit 5	Oswego NY (Oswego County)	411.84	1558.814	10 (15)	Industrial, cooling	1
8	NRG Oswego Steam Station, Units 1-4	Oswego NY (Oswego County)	119.52	452.2	10 (15)	Industrial, cooling	1
9	NRG Oswego Steam Station, Unit 6	Oswego NY (Oswego County)	468	1771.4	10 (15)	Industrial, cooling	1
12	NMP Unit 1	Scriba NY (Oswego County)	386	1461.17		Industrial, cooling	1
	NMP Unit 2	Scriba NY (Oswego County)	77.184	292.17			1
13	Entergy Fitzpatrick Plant	Scriba NY (Oswego County)	570.24	2.158		Industrial, cooling	1
3	Town of Williamson	Williamson NY (Wayne County)	2	7.57	41 (66)	Domestic, industrial	1
6	Village of Wolcott	Wolcott NY (Wayne County)	0.155	0.59	25 (41)	Domestic, industrial	1
27	Monroe Co. Water Authority	Greece NY (Monroe County)	54.5	206.30	49 (79)	Domestic, industrial	2
2	Town of Ontario Water District	Ontario NY (Wayne County)	3.0	11.35	46 (74)	Domestic, industrial	1
4	Sodus Village including Sodus Point	Sodus NY (Wayne County)	0.085	0.322	36 (58)	Domestic, industrial	1
14	Sackets Harbor	Hounsfield NY (Jefferson County)	0. 3	1.13	32 (51)	Domestic	1
16	Cape Vincent (withdraws from St. Lawrence River)	Cape Vincent NY (Jefferson County)	0.6	2.27	41 (65)	Domestic	1
31	City of Napanee	Napanee ON	2.1	7.95	48 (77)	Domestic	
15	D.A.N.C Water Line (formerly Chaumont Village)	Lime, Chaumont, Dexter, Brownville, Glen Park, NY (Jefferson County)	0.07	0.27	38 (61)	Domestic	1

Table 2.3-4—Surface water withdrawals from Lake Ontario within 50 mi (80 km) of NMPNS

(Page 2 of 2)

Map No.	Name	Location	Amount (mgd)	Amount (million liters per day)	Distance from NMP3NPP in mi (kg)	Use	Source of Info.
28	Town of Henderson	Henderson NY (Jefferson County)	0.026	0.10	26 (41)	Domestic	
29	Town of Clayton	Clayton NY (Jefferson County)	0.155	0.59	49 (79)	Domestic	
26	City of Picton	Picton ON	1	3.79	48 (77)	Domestic	1
30	City of Wellington	Wellington ON	0.25	0.95	48 (77)	Domestic	1
18	City of Kingston	Kingston ON	16	60.57	49 (78)	Domestic	
17	R.J. Sweezey	Pittsburgh ON	0.03	0.114	49 (79)	Domestic	1
19	Township of Kingston	Kingston ON	7.21	27.29	47 (75)	Domestic	1
21	Township of Ernestown	Ernestown ON	0.19	0.719	47 (75)	Domestic	1
1	Constellation Energy (Formerly Rochester Gas and Electric) Ginna Plant	Ontario NY (Wayne County)	576	2180.16	49 (78)	Industrial, cooling	1
20	Dupont of Canada	Kingston ON	21.53	81.491	46 (74)	Industrial, cooling, processing and sanitary	1
22	Canada Cement Company LaFarge LtD.	Ernestown ON	3.24	12.263	47 (75)	Industrial	1
23	Millhaven Fibers LTD	Ernestown ON	28.82	109.084	47 (75)	Industrial	1
24	Permanent Concrete LTD		0.04	0.151	47 (75)	Industrial	1
25	Sandhurst Water Works LTD	South Fredericksburgh	0.07	0.265	47 (75)	Domestic	1

Note:

1 - NMP, 1984
2- MCWA, 2008

Table 2.3-5—United States Irrigation Intakes within a 50-mile radius (80 km) of NMP3NPP

Location of Intake	Distance in mi (km) by water from discharge	Area in acres (ha)	Average water use, gal/acre (l/ha)]	Total Water Use in Mgd (m^3/day)	Application
On Lake Ontario between Demster Beach Rd. and Hickory Grove Rd. (Oswego County).	5.1 (8.2)	24.3 (60)	762,000 (81,463)	4.98 (18510)	Once per year, one year in 4
South Side of Butterfly Swamp (Oswego County)	6.2 (9.9)	20 (8.1)	762,000 (81,463)	1.63 (6170)	Once per year, dry weather only
East Branch Of Sterling Creek (Cayuga Co.)	24.1 (36.6)	28.3(70)	508,000 (54,308)	3.8 (14389)	Once per year, 1 year in 5

Table 2.3-6—Irrigation Intakes on Lake Ontario within 50 mi (80 km) of Unit 2 circa 1984

Name	Location	Rate per Day		Mg/d	m^3/day
Picton Golf and Country Club	Hallowell Township	454	120	0.05	189
G. Vader	Athol Township	2,044	540	0.30	1,136
K. Perry	Athol Township	1,249	330	0.31	1,173
R & K. Hicks	North Marysburgh Township	1,423	376	0.54	2,044
Windy Acres Farms	Hallowell Township	1,635	432	0.36	1,363
McArthur (West Lake Farms Ltd.)	Hallowell Township	908	240	0.26	984
C.Foster	Hallowell Township	1,703	450	0.38	1,438
G. Bosma	South Marysburgh Township	568	150	0.14	530
Point Pleasant Farms Ltd.	North Marysburgh Township	1,703	450	0.65	2,460
Waupoos Canning Co.,Ltd.	North Marysburgh Township	1,703	450	0.54	2,044
J. Carter	North Marysburgh Township	2,502	661	0.59	2,233
R. & K. Carson	North Marysburgh Township	1,703	450	0.38	1,438
E. Vowinckel	South Marysburgh Township	2,275	601	0.86	3,255
R. R. Dodokin	South Marysburgh Township	454	120	0.18	681
W. Hicks	South Marysburgh Township	908	240	0.06	227
C. A. McCormack	South Marysburgh Township	840	222	0.20	757
Cataraqui Golf and Country Club	Kingston	1,590	420	0.60	2,271

Table 2.3-7—Public Water Supply Within 30 mile (48 km) of NMPNS

Distance From Site mi (km)	Number (1)	Town	Estimated Population Served (1980)	Average Output mgd (million liters per day)	Source of Water Supply
0 to 10 (0-16)	1	Onondaga County Water Authority	40,000	22-24(83-91)	Lake Ontario (intake at Oswego)
	2	Oswego	30,270	14(53)	Lake Ontario (intake at Oswego)
10 to 20(16-32)	3	Village of Mexico	1,725	0.24(0.90)	3 wells: 2 40-ft deep, 1 38-ft deep; average yield 275 gpm; probably in alluvium
	4	Village of Pulaski	2,700	0.025(0.094)	Springs
	5	City of Fulton	15,000	2.0 (7.6)	12 wells: 30- to 70-ft deep; in alluvium
	6	Village of Sandy Creek	1.435	0.33 (1.2)	2 wells: 21-ft deep, average yield 275 gpm; probably in alluvium
20 to 30 (32-48)	7	Village of Central Square	1,427	0.96 (3.6)	2 wells: 1 24-ft deep, 1 10-ft deep; in alluvium
	8	Town of Orwell	250	0.015 (.06)	Spring
	9	Village of Phoenix	2,600	1.0 (3.8)	2 wells: 1 25-ft deep, 1 45-ft deep; average yield 400 gpm; probably in alluvium
	10	Baldwinsville	10,000	1.0 (3.8)	4 wells: 1 93-ft deep, yield 1,500 gpm; 3 shallow wells, in alluvium
	11	Fairhaven	765	0.1(0.6)	Spring; 1 well 46-ft deep, yield 300 gpm
	12	Cato	500	0.033 (1.2)	3 wells: 2 55-ft deep, 1 70-ft deep; average yield 350 gpm
	13	Wolcott	1,640	0.22(0.83)	Lake Ontario
	14	Adams	1,735	0.3 (1.1)	Spring, infiltration gallery
	15 (4)	Red Creek (4)		0.03 (0.1)	Wells and springs
	16	Constantia	3,060	0.20(0.76)	Spring-fed reservoir

Table 2.3-8—Domestic wells within 2 mi (3.2 km) of NMPNS

(Page 1 of 4)

Well No.	Well Depth (ft)	Well Depth (m)	Approx. Land Surface El (ft)	Approx. Land Surface El (m)	Depth to Water Level (ft)	Depth to Water Level (m)	Approx. El of Water Level (ft)	Approx. El of Water Level (m)	Type of Well	Est. Pumpage Rate (gpd)	Est. Pumpage Rate (lpd)	Name of Owner
1	18	5	275	84	10	3	265	81	Dug, 3' (7.6 cm)	Not in use		Jack Timon
2	43	13	275	84		0		0	Drilled	150	567	Jack Timon
3	43	13	275	84	7	2	268	82	Drilled	300	1134	E. Roy
4	25	8	280	85	8	2	272	83	Drilled	300	1134	J. Roy
5	28	9	280	85	4	1	278	85	Drilled	100	378	Mason
6	30	9	275	84		0		0	Drilled, 6" (15 cm)	225	851	Barns
7	45	14	275	84	8	2	267	81	Drilled, 6"	150	567	Malone
8	40	12	270	82	8	2	262	80	Drilled, 6" (15 cm)	(For lawn only)		Malone
9	30	9	270	82	8	2	262	80	Drilled, 6" (15 cm)	(For lawn only)		Malone
10	35	11	270	82	8	2	262	80	Drilled, 6" (15 cm)	975	3686	Malone
11	40	12	270	82	8	2	262	80	Drilled, 6" (15 cm)	975	3686	Malone
12	60	18	285	87					Drilled	Not in use		Hudson
13	60	18	275	84					Drilled	375	1418	Upcraft
14	25	8	275	84	Near to Surface				Drilled	Not in use		R. Fauata
15	80	24	280	85					Drilled	150	567	R. Dickenson-Brown
16	20	6	285	87					Dug	225	851	R. Dickenson-Brown
17	38	12	275	84	11	3	264	80	Drilled	1,000	3780	J. E. Reardon
18	60	18	285	87	25	8	260	79	Drilled	375	1418	J. Murray
19		0	280	85						500	1890	Donahue
20		0	275	84						Not in use		Ketchem
21	12	4	260	79	5	2	255	78	Dug	400	1512	R. Palmateer
22	25	8	255	78	8	2	247	75	Drilled, 6" (15 cm)	Up to 1,500		Malone (campground)
23	70	21	310	94	10	3	300	91	Drilled	Not in use		D. Stevens
24	70	21	310	94		0		0	Drilled	Not in use		D. Stevens

Table 2.3-8—Domestic wells within 2 mi (3.2 km) of NMPNS

(Page 2 of 4)

Well No.	Well Depth (ft)	Well Depth (m)	Approx. Land Surface El (ft)	Approx. Land Surface El (m)	Depth to Water Level (ft)	Depth to Water Level (m)	Approx. El of Water Level (ft)	Approx. El of Water Level (m)	Type of Well	Est. Pumpage Rate (gpd)	Est. Pumpage Rate (lpd)	Name of Owner
25	30	9	290	88		0		0	Dug	Not in use		Simineau
26	12	4	290	88	5	2	285	87	Dug	100	378	Simineau
27	80	24	285	87		0		0	Drilled	Not in use		Simineau
28	15	5	285	87	5	2	280	85	Dug	Not in use		Simineau
29		0	285	87	0	0	285	87	Dug	Not in use		Simineau
30	20	6	285	87	0	0	265	81	Dug	100	378	Whiting
31	40	12	285	87	0	0	285	87	Drilled	Not in use		Whiting
32		0	290	88	0	0	290	88	Dug	Not in use		J. McLean
33	42	13	330	101	30	9	300	91	Dug	375	1417.5	Adkins
34		0	330	101		0		0	Dug	Not in use		C. Upcraft
35		0	330	101		0		0	Dug	Not in use		C. Upcraft
36		0	340	104		0		0		Not in use		Pryor
37	60	18	350	107	7	2	343	105	Dug	Not in use		R. W. Rasmussen
38	18	5	310	94		0		0	Dug	225	850.5	J. O'Conner
39	22	7	320	98	18	5	302	92	Dug	100	378	E. LaBouef
40		0	330	101		0		0	Drilled	150	567	F. Peck
41	42	13	330	101	12	4	318	97	Drilled	150	567	Randall
42	100	30	330	101		0		0	Drilled	300	1134	Pitcher
43	45	14	330	101	17	5	312	95	Drilled	700	2646	Hopkins and Kersey
44		0	325	99		0		0	Drilled	Not in use		Unknown
45	15	5	325	99	10	3	315	96	Dug	100	378	E. Whaley
46		0	325	99	5	2	320	98	Drilled	50	189	L. Whaley
47	12	4	325	99		0		0	Dug	300	1134	L. Whaley
48	25	8	325	99	12	4	313	95	Drilled	375	1418	Dickenson
49	6	2	325	99	3	1	322	98	Dug	300	1134	R. LaBouef
50	38	12	340	104	21	6	319	97	Drilled	375	1418	Carpenter
51	28	9	330	101	11	3	319		Drilled	375	1418	Nelson
52		0	330	101		0				Not in use		Unknown
53	22	7	335	102	9	3	327		Dug	450	1701	M. Coe
54	60	18	340	104	25	8	315	96	Drilled	375	1418	Upcraft
55	27	8	335	102		0		0	Dug	100	378	F. A. Newstead

Table 2.3-8—Domestic wells within 2 mi (3.2 km) of NMPNS

(Page 3 of 4)

Well No.	Well Depth (ft)	Well Depth (m)	Approx. Land Surface El (ft)	Approx. Land Surface El (m)	Depth to Water Level (ft)	Depth to Water Level (m)	Approx. El of Water Level (ft)	Approx. El of Water Level (m)	Type of Well	Est. Pumpage Rate (gpd)	Est. Pumpage Rate (lpd)	Name of Owner
56	30	9	340	104	12	4	328	100	Drilled	150	567	L. F. Dillenbeck
57	30	9	340	104	15	5	325	99	Drilled, 6″ (15 cm)	150	567	Lawton
58	30	9	340	104	15	5	325	99	Drilled, 6″ (15 cm)	300	1134	Woods
59		0	340	104		0		0	Dug	150	567	Unknown
60	30	9	340	104	15	5	325	99	Drilled	600	2268	Goodness
61	30	9	345	105	27	8	318	97	Drilled	50	189	Vandish
62	39	12	340	104	15	5	325	99	Drilled, 4″ (10 cm)	500	1890	Richardson
63	30	9	335	102	24	7	311	95	Drilled	300	1134	Albright
64	15	5	325	99					Drilled	Not in use		Unknown
65	25	8	340	104					Dug	Not in use		Prosser (temp. vacant)
66	65	20	325	99					Drilled	500	1890	Read and Ocheebein
67		0	325	99	3	1	320	98	Drilled, 6″ (15 cm)	500	1890	LaBouef
68		0	325	99		0		0	Dug	375	1418	Wills
69	58	18	330	101	8	2	322	98	Drilled, 6″ (15 cm)	200	756	G. Drake
70	25	8	335	102			335	102	Dug	300	1134	C. Drake
71	30	9	325	99	3	1	322	98	Dug	Not in use		Brandon (temp. vacant)
72	15	5	330	101	3	1	327	100	Dug	Not in use		Klesinger (temp. vacant)
73	65	20	335	102		0		0	Drilled	400	1512	Conroy
74	32	10	340	104	15	5	325	99	Dug	400	1512	S. McLean
75	44	13	330	101	14	4	316	96	Drilled	50	189	E. Patrick
76	22	7	335	102	10	3	325	99	Dug	800	3024	France
77	30	9	315	96	25	8	290	88	Drilled, 6″ (15 cm)	300	1134	Whaley
78		0	290	88		0		0	Dug, 3′ (7.6 cm)	150	567	F. O'Conner

Table 2.3-8—Domestic wells within 2 mi (3.2 km) of NMPNS
(Page 4 of 4)

Well No.	Well Depth (ft)	Well Depth (m)	Approx. Land Surface El (ft)	Approx. Land Surface El (m)	Depth to Water Level (ft)	Depth to Water Level (m)	Approx. El of Water Level (ft)	Approx. El of Water Level (m)	Type of Well	Est. Pumpage Rate (gpd)	Est. Pumpage Rate (lpd)	Name of Owner
79	9	3	290	88	4	1	286	87	Dug	Not in use		F. O'Conner
80	42	13	290	88					Drilled	225	851	L. Whaley
81		0	75	23						Not in use		Unknown
82	54	16	275	84	12		263		Drilled	375	1418	J. O'Conner
83	45	14	270	82	8		262		Drilled	100	378	J. T. O'Conner
84	18	5	280	85	8		272		Dug	100	378	E. Henry
85	6	2	275	84	4		271		Dug	Not in use		E. Hutchins
86		0	280	85					Dug	10,500+		C. Parkhurst
87	26	8	300	91	15		285		Dug	8,500+		K. Parkhurst
88		0	315	96	20		295		Dug	100	378	M. Goewey
89	6	2	320	98	0		320		Dug	850+		J. Parkhurst
90	10	3	325	99	3		322		Dug	4,200+		Woolson
91	90	27	325	99					Drilled	150	567	Woolson
92		0	290	88					Dug	300+		King
93	90	27	295	90					Drilled	375	1418	King
94	31	9	300	91	25		275		Drilled	400	1512	Barton
95	12	4	280	85	2		278		Dug	225		Parkhurst
96		0	280	85						Not in use		Unknown
97	8	2	270	82	0		270		Dug	225	851	Bellemo
98	24	7	275	84	3		270		Dug	150	567	R. Fox
99	30	9	280	85	15		265		Dug	375	1418	Fox
100		0	265	81						Not in use		Jansen
101	10	3	300	91	3		297			Not in use		Unknown (summer home)
102		0	285	87						Not in use		Unknown (summer home)

Table 2.3-9—Total Surface and Groundwater Withdrawals in Oswego County in 2000

	mgd	Million Liters per Day
Public supply, total withdrawals, fresh	13.83	52.35
Public supply, ground-water withdrawals, fresh	4.83	18.28
Public supply, surface-water withdrawals, fresh	9.00	34.07
Domestic, total self-supplied withdrawals, fresh, in Mgal/d	3.74	14.16
Industrial, ground-water self-supplied withdrawals, total	2.09	7.91
Industrial, surface-water self-supplied withdrawals, fresh	3.89	14.73
Industrial, surface-water self-supplied withdrawals, total	3.89	14.73
Industrial, total self-supplied withdrawals, fresh	5.98	22.64
Industrial, total self-supplied withdrawals, total	5.98	22.64
Irrigation, acres irrigated, sprinkler, in thousands	0.97	3.67
Irrigation, acres irrigated, microirrigation, in thousands	0.12	0.45
Irrigation, acres irrigated, surface, in thousands	0.03	0.11
Irrigation, acres irrigated, total, in thousands	1.12	4.24
Irrigation, ground-water withdrawals, fresh	0.00	0.00
Irrigation, total withdrawals, fresh	0.49	1.85
Thermoelectric power, surface-water withdrawals, fresh	951.10	3600.31
Thermoelectric power once-through, surface-water withdrawals, fresh	951.10	3600.31
Thermoelectric power once-through, surface-water withdrawals, total	951.10	3600.31
Total, ground-water withdrawals, fresh	10.66	40.35
Total, surface-water withdrawals, fresh	964.48	3650.95
Total withdrawals, fresh	975.14	3691.31

Table 2.3-10—Community Water Systems: Water Systems in Oswego County that serve the same people year-round (e.g. in homes or businesses)

(Page 1 of 3)

Water System Name	County Served	Population Served	Primary Water Source Type	System Status	Water System ID
Ainslee Drive Wd	Oswego	150	Purchase surface water	Active	NY3730171
Andel Mobile Home Park	Oswego	32	Groundwater	Active	NY3700912
Big Bay Wd	Oswego	672	Purchase surface water	Active	NY3704368
Bisbos Trailer Park	Oswego	41	Groundwater	Active	NY3700995
Blue Jay Lane Llc	Oswego	234	Groundwater	Active	NY3701001
Caughdenoy Wd	Oswego	455	Purchase surface water	Active	NY3730116
Central Square Village	Oswego	1670	Purchase surface water	Active	NY3704352
Cleveland Village	Oswego	925	Groundwater	Active	NY3704353
Conifer Mobile Village	Oswego	375	Groundwater	Active	NY3701000
Country Haven Mobile Home Park	Oswego	250	Groundwater	Active	NY3730045
Crosby Hill Mobile Home Park	Oswego	160	Groundwater	Active	NY3700910
Deer Run Mhp	Oswego	230	Groundwater	Active	NY3700916
Eason Mobile Home Park	Oswego	60	Groundwater	Active	NY3720098
East River Road North Wd	Oswego	350	Purchase surface water	Active	NY3704367
Evergreen Mobile Home Park	Oswego	54	Groundwater	Active	NY3701002
Fort Brewerton Wd	Oswego	795	Purchase surface water	Active	NY3704357
Fox Meadow Mhp	Oswego	180	Groundwater	Active	NY3700920
Fulton City	Oswego	15400	Purchase surface water	Active	NY3704355
Granby Town Wd #3	Oswego	430	Purchase surface water	Active	NY3730168
Green Acres Mobile Court	Oswego	141	Groundwater	Active	NY3700906
Hannibal Hills Trailer Park	Oswego	25	Groundwater	Active	NY3730034
Hannibal Town Water District #2	Oswego	2000	Purchase surface water	Active	NY3730101
Holly Park M H P	Oswego	50	Groundwater	Active	NY3721559
Idle Wheels Trailer Park Inc	Oswego	150	Groundwater	Active	NY3700907
Indian Hills Mobile Home Park	Oswego	300	Groundwater	Active	NY3700908
Kens Quiet Acres	Oswego	70	Groundwater	Active	NY3700925
Kerfien Mobile Home Park	Oswego	100	Groundwater	Active	NY3700911
Lakeview Mobile Park	Oswego	15		Active	NY3700919
Liberty Park	Oswego	70	Groundwater	Active	NY3700943

Table 2.3-10—Community Water Systems: Water Systems in Oswego County that serve the same people year-round (e.g. in homes or businesses)

(Page 2 of 3)

Water System Name	County Served	Population Served	Primary Water Source Type	System Status	Water System ID
Locust Grove Trailer Park	Oswego	100	GW under influence of surface water	Active	NY3700914
Lyndon Lawn Mobile Park Inc	Oswego	160	Groundwater	Active	NY3700915
Maple Avenue Water District	Oswego	400	Purchase ground water	Active	NY3717301
Mexico Village	Oswego	1600	Groundwater	Active	NY3704359
Minetto Town Water District	Oswego	1589	Purchase surface water	Active	NY3713845
North Shore Hideaway @ Maple Grove	Oswego	50	Groundwater	Active	NY3700917
Northridge Acres	Oswego	50	Groundwater	Active	NY3700938
Orwell Wd	Oswego	150	GW under influence of surface water	Active	NY3704360
Oswego City	Oswego	29400	Surface_water	Active	NY3704361
Oswego Town Water District	Oswego	4182	Purchase surface water	Active	NY3730026
Owen Road Wd	Oswego	50	Purchase ground water	Active	NY3704369
Partridge Acres	Oswego	120	GW under influence of surface water	Active	NY3700923
Peters Properties, Llc	Oswego	90	Groundwater	Active	NY3730001
Phoenix Village	Oswego	2138	Groundwater	Active	NY3704363
Pulaski Village	Oswego	2398	Groundwater	Active	NY3704364
Richland Town Pws	Oswego	2350	Groundwater	Active	NY3730165
Riverview Mobile Court	Oswego	45	Groundwater	Active	NY3700927
Rt 11 Fuller Road	Oswego	487	Purchase surface water	Active	NY3730166
Rte 48 South Wd	Oswego	200	Purchase ground water	Active	NY3721463
S&E Mobile Home Park, Llc	Oswego	95	Groundwater	Active	NY3700942
Sandridge Mobile Home Park	Oswego	450	Groundwater	Active	NY3715923
Sandy Creek/Lacona Joint Waterworks	Oswego	1435	Groundwater	Active	NY3704365
Scotch Pine Manor	Oswego	84	Groundwater	Active	NY3725000
Scriba Wd (Oswego)	Oswego	3700	Purchase surface water	Active	NY3730037
Seneca Hill Water District-Volney	Oswego	297	Purchase surface water	Active	NY3718508
Seneca Hill Wd-Scriba	Oswego	226	Purchase surface water	Active	NY3716003
Silver Rock Mobile Home Park	Oswego	40	Groundwater	Active	NY3700929
Spruce Grove Trailer Park & Campground	Oswego	160	Groundwater	Active	NY3700932
Sundown Mobile Home Park	Oswego	90	Groundwater	Active	NY3701003

Table 2.3-10—Community Water Systems: Water Systems in Oswego County that serve the same people year-round (e.g. in homes or businesses)

(Page 3 of 3)

Water System Name	County Served	Population Served	Primary Water Source Type	System Status	Water System ID
Unity Acres	Oswego	80	Groundwater	Active	NY3730129
Volney Town Wd	Oswego	103	Purchase surface water	Active	NY3730167
West River Road North Wd	Oswego	400	Purchase ground water	Active	NY3704356
Wildwood Mobile Home Park	Oswego	36	GW under influence of surface water	Active	NY3700937
Winns Trailer Park	Oswego	54	Groundwater	Active	NY3700939
Wooded Acres Mobile Home Park	Oswego	30	Groundwater	Active	NY3700940
Woodland Manor	Oswego	150	Groundwater	Active	NY3700921
Woodland Mobile Home Haven	Oswego	104	Groundwater	Active	NY3700941

Table 2.3-11—Non-Transient Non-Community Water Systems: Water Systems in Oswego County that serve the same people, but not year-round (e.g. schools that have their own water system)

Water System Name	County Served	Population Served	Primary Water Source Type	System Status	Water System ID
A A Cole School	Oswego	200	Groundwater	Active	NY3702974
Altmar Elementary School	Oswego	120	Groundwater	Active	NY3702976
Apw High School	Oswego	500	Groundwater	Active	NY3702975
Apw Middle School	Oswego	500	Groundwater	Active	NY3721813
Boces Heavy Equipment	Oswego	25	Groundwater	Active	NY3704911
Boces Trades Fair (Main Bldg)	Oswego	25	Groundwater	Active	NY3704910
Fulton Boiler Works	Oswego	45	Groundwater	Active	NY3730127
Industrial Park (Schroeppel)	Oswego	100	Purchase ground water	Active	NY3730110
Maple Manor Adult Home	Oswego	36	Groundwater	Active	NY3730138
New Haven Elementary School	Oswego	350	Groundwater	Active	NY3708905
Omega Wire Corp	Oswego	200	Groundwater	Active	NY3719034
Oswego County Energy Recovery Facility	Oswego	26	Groundwater	Active	NY3730126
Palermo Elementary School	Oswego	260	Groundwater	Active	NY3708984
Parish Elementary School	Oswego	300	Groundwater	Active	NY3702970
Pennellville Alternative School	Oswego	55	Groundwater	Active	NY3702969
Schoeller Paper	Oswego	65	Groundwater	Active	NY3730005
Williamstown Elementary	Oswego	267	Groundwater	Active	NY3702968

Table 2.3-12—Transient Non-Community Water Systems: Water Systems in Oswego County that do not consistently serve the same people (e.g. rest stops, campgrounds, gas stations)

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Water System Name	County Served	Population Served	Primary Water Source Type	System Status	Water System ID
Altmar Hotel	Oswego	67	Groundwater	Active	NY3706596
Altmar Mini Mart	Oswego	25	Groundwater	Active	NY3730070
Amboy 4h Environmental Center	Oswego	60	Groundwater	Active	NY3730009
Anglers Lodge	Oswego	36	Groundwater	Active	NY3721273
Battle Island State Park	Oswego	187	Groundwater	Active	NY3708903
Bayshore Grove	Oswego	200	Groundwater	Active	NY3706774
Beaver Meadow Camp	Oswego	29	Groundwater	Active	NY3730103
Beaver Meadows Golf & Recreation	Oswego	240	Groundwater	Active	NY3713448
Big Bear Campground	Oswego	25	Groundwater	Active	NY3730172
Bodees	Oswego	124	Groundwater	Active	NY3706588
Bowens Corner General Store	Oswego	25	Groundwater	Active	NY3730071
Brandys Sunrise Cafe	Oswego	100	Groundwater	Active	NY3721796
Brendas Motel And Campground	Oswego	74	Groundwater	Active	NY3722731
Brennan Rv Resort	Oswego	6000	Surface_water	Active	NY3702220
Brewsters	Oswego	63	GW under influence of surface water	Active	NY3719786
Browns Campground	Oswego	120	Groundwater	Active	NY3722728
C&Js Grocery & Deli	Oswego	25	Groundwater	Active	NY3730072
Camp Near Wilderness	Oswego	66	Groundwater	Active	NY3713421
Camp Talooli	Oswego	57	Groundwater	Active	NY3713443
Camp Woodland	Oswego	115	Groundwater	Active	NY3713424
Camp Zerbe	Oswego	100	GWunder influence of surface water	Active	NY3713447
Cannons Place Motel	Oswego	105	Groundwater	Active	NY3730030
Catfish Creek Fishing Camp Inc	Oswego	48	Groundwater	Active	NY3720562
Catfish Creek Marina	Oswego	99	Groundwater	Active	NY3722897
Central Square Pop Warner	Oswego	25	Groundwater	Active	NY3730054
Charleys Boat Livery	Oswego	56	Groundwater	Active	NY3718415
Charlies Place	Oswego	100	Groundwater	Active	NY3706722
Checkered House Corners	Oswego	25	Groundwater	Active	NY3730118
Chedmardo Campsites	Oswego	400	GW under influence of surface water	Active	NY3702045
Colonial Court Campground	Oswego	184	GW under influence of surface water	Active	NY3713439
Constantia Cove	Oswego	120	Groundwater	Active	NY3702224
Country Time Cafe	Oswego	55	Groundwater	Active	NY3719961

Table 2.3-12—Transient Non-Community Water Systems: Water Systems in Oswego County that do not consistently serve the same people (e.g. rest stops, campgrounds, gas stations)

(Page 2 of 6)

Water System Name	County Served	Population Served	Primary Water Source Type	System Status	Water System ID
Creekside Cafe	Oswego	25	Groundwater	Active	NY3706595
Debz Drive Inn Restaurant	Oswego	70	GW under influence of surface water	Active	NY3721797
Deer Creek Motel	Oswego	40	Groundwater	Active	NY3721807
Dowiedale Campgrounds	Oswego	800	Groundwater	Active	NY3702223
Driftwood Motel	Oswego	40	Groundwater	Active	NY3708028
Driveway Inn	Oswego	80	Groundwater	Active	NY3706707
East Coast Resorts Of America Inc	Oswego	720	Groundwater	Active	NY3718351
Eddies Cove	Oswego	67	GWunder influence of surface water	Active	NY3709734
Elms Golf Club Restaurant	Oswego	200	GW under influence of surface water	Active	NY3706749
Emerald Crest Golf Course	Oswego	100	GW under influence of surface water	Active	NY3719978
Family Auction Center	Oswego	400	Groundwater	Active	NY3719815
Fastrac #209 (Schroeppel)	Oswego	25	Groundwater	Active	NY3730094
Flatrock Resorts Inc.	Oswego	450	GW under influence of surface water	Active	NY3702222
Fox Hollow Lodge, Inc.	Oswego	50	Groundwater	Active	NY3730067
Fulton Speedway Llc	Oswego	3000	Groundwater	Active	NY3720058
Fulton Youth Soccer League, Inc.	Oswego	25	Groundwater	Active	NY3730047
Galloways Good Eats	Oswego	49	Groundwater	Active	NY3718598
Gardners Fishing Station	Oswego	99	Groundwater	Active	NY3722730
Glennwood Golf Course	Oswego	44	Groundwater	Active	NY3730044
Gram & Gramps Family Diner	Oswego	49	GW under influence of surface water	Active	NY3706764
Greene Point Mobile Home Park	Oswego	440	Groundwater under influence of surface water	Active	NY3721195
Greenside Restaurant/Pines Golf Course	Oswego	200	Groundwater	Active	NY3706748
Greenview Country Club	Oswego	400	Groundwater	Active	NY3706766
Gristmill Restaurant	Oswego	150	GW under influence of surface water	Active	NY3706705
Groman Shores Campground	Oswego	60	GW under influence of surface water	Active	NY3719081
Happy Valley Inn	Oswego	75	GW under influence of surface water	Active	NY3706706
Harmony Riders Association	Oswego	50	Groundwater	Active	NY3722151
Hastings Inn Inc	Oswego	50	Groundwater	Active	NY3719154
Hayloft Pub	Oswego	94	GW under influence of surface water	Active	NY3730128
Hazzys Llc	Oswego	30	Groundwater	Active	NY3706714
Hidden Acres Campground	Oswego	110	Groundwater	Active	NY3730013
High Braes Refuge	Oswego	64	Groundwater	Active	NY3718360

Table 2.3-12—Transient Non-Community Water Systems: Water Systems in Oswego County that do not consistently serve the same people (e.g. rest stops, campgrounds, gas stations)
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Water System Name	County Served	Population Served	Primary Water Source Type	System Status	Water System ID
Hillside Markets Campground	Oswego	74	Groundwater	Active	NY3720097
Hoggers Restaurant	Oswego	50	GW under influence of surface water	Active	NY3718592
Holbrooks Motel	Oswego	252	Groundwater	Active	NY3720787
I.O.O.B. Chapter 1647	Oswego	49	GW under influence of surface water	Active	NY3709743
Irish Wigwam Llc	Oswego	160	Groundwater	Active	NY3718385
J&J Campgrounds	Oswego	250	Groundwater	Active	NY3713449
Jamieson Corners Convenience Store	Oswego	25	Groundwater	Active	NY3730080
Joas Pizza	Oswego	25	Groundwater	Active	NY3718588
Joes Corner Market	Oswego	25	GW under influence of surface water	Active	NY3730148
John & Suzs Motel & Restaurant	Oswego	60	Groundwater	Active	NY3719777
Johnson Bay Marina	Oswego	36	Groundwater	Active	NY3718361
Joseph Disalvo Farms Inc	Oswego	42	Groundwater	Active	NY3708902
Kevins Kasoag Lake Park	Oswego	169	Groundwater	Active	NY3706762
Kiblin Shores Trailer Park	Oswego	52	Groundwater	Active	NY3713441
Kwik Fill #10	Oswego	25	Groundwater	Active	NY3730131
La Siesta Motel	Oswego	50	GW under influence of surface water	Active	NY3702252
Lake Effect Inn	Oswego	96	Groundwater	Active	NY3721476
Little Lukeys Store	Oswego	25	Groundwater	Active	NY3730081
Living Word Camp	Oswego	200	Groundwater	Active	NY3720711
Lloyds Place Of Colosse	Oswego	49	Groundwater	Active	NY3706717
Longshot	Oswego	165	Groundwater	Active	NY3706696
M & Js Pine Grove Inn	Oswego	75	Groundwater	Active	NY3706590
Mallory Store	Oswego	25	Groundwater	Active	NY3730082
Mamma Marias	Oswego	45	Groundwater	Active	NY3730063
Manhattan Moon, Inc.	Oswego	120	Groundwater	Active	NY3721958
Maple Grove Resort	Oswego	24	Groundwater	Active	NY3730049
Martz Stop	Oswego	25	Groundwater	Active	NY3730161
Mexico Point State Park Beach	Oswego	100	GW under influence of surface water	Active	NY3730059
Mexico Point State Park Boat Launch	Oswego	300	Groundwater	Active	NY3708986
Moniraes Inc	Oswego	430	Groundwater	Active	NY3706691
Nice-N-Easy #11 (Constantia)	Oswego	25	Groundwater	Active	NY3730086
Nice-N-Easy #22 (Schroeppel)	Oswego	25	Groundwater	Active	NY3730088

Table 2.3-12—Transient Non-Community Water Systems: Water Systems in Oswego County that do not consistently serve the same people (e.g. rest stops, campgrounds, gas stations)

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Water System Name	County Served	Population Served	Primary Water Source Type	System Status	Water System ID
Nice-N-Easy #37 (Richland)	Oswego	25	Groundwater	Active	NY3730092
Nice-N-Easy #38 (Williamstown)	Oswego	25	Groundwater	Active	NY3730085
Old Boathouse (The)	Oswego	83	Groundwater	Active	NY3718590
Ontario Bible Camp	Oswego	90	Groundwater	Active	NY3713445
Ostranders Village Market	Oswego	25	Groundwater	Active	NY3730090
Palermo Town Park	Oswego	25	Groundwater	Active	NY3721484
Parish Mini Mart	Oswego	25	Groundwater	Active	NY3730087
Parish Motel (The)	Oswego	47	Groundwater	Active	NY3730052
Parish Town Park	Oswego	25	Groundwater	Active	NY3730119
Patsys Diner	Oswego	75	Groundwater	Active	NY3706593
Phoenix Recreation Inc,	Oswego	50	Groundwater	Active	NY3718945
Pleasant Lake Rv Park	Oswego	440	Groundwater	Active	NY3702042
Portly Angler Lodge	Oswego	242	Groundwater	Active	NY3722532
Quickway #64	Oswego	25	Groundwater	Active	NY3730075
Quik Lique	Oswego	64	GW under influence of surface water	Active	NY3730041
Rainbow Shores Campground	Oswego	440	GW under influence of surface water	Active	NY3702044
Rainbow Shores Hotel	Oswego	269	Groundwater	Active	NY3713436
Redfield Cheese Factory	Oswego	35	GW under influence of surface water	Active	NY3719813
Redfield Country Motel	Oswego	60	Groundwater	Active	NY3730062
Redfield Hotel	Oswego	99	Groundwater	Active	NY3718964
Redfield Square Hotel	Oswego	30	Groundwater	Active	NY3706704
Reds Palermo Market	Oswego	25	Groundwater	Active	NY3730091
Richland Hotel	Oswego	50	Groundwater	Active	NY3718595
Richland Volunteer Fire Department	Oswego	200	Groundwater	Active	NY3730038
S&J Pizza	Oswego	25	Groundwater	Active	NY3730019
Salmon Country Inc	Oswego	183	Groundwater	Active	NY3718352
Salmon Heaven Lodge	Oswego	27	Groundwater	Active	NY3721485
Salmon River Outfitters	Oswego	25	GW under influence of surface water	Active	NY3730064
Sandy Creek Little League Association	Oswego	26	Groundwater	Active	NY3730158
Sandy Island Beach Inc	Oswego	200	Groundwater	Active	NY3713442
Sandy Pond Beach Inc	Oswego	200	Groundwater	Active	NY3702043
Sandy Pond Estates	Oswego	45	Groundwater	Active	NY3730010

Table 2.3-12—Transient Non-Community Water Systems: Water Systems in Oswego County that do not consistently serve the same people (e.g. rest stops, campgrounds, gas stations)
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Water System Name	County Served	Population Served	Primary Water Source Type	System Status	Water System ID
Sandy Pond Marina & Camp	Oswego	150	GW under influence of surface water	Active	NY3719120
Sandy Pond Sportsmans Assoc., Inc	Oswego	140	Groundwater	Active	NY3730122
Schneiders Lil Salmon Inn	Oswego	49	Groundwater	Active	NY3706716
Schoolhouse Inn Lodge	Oswego	32	Groundwater	Active	NY3722839
Seber Shores Marina & Campsite	Oswego	100	Groundwater	Active	NY3719119
Selkirk Shores State Park & Pine Grove	Oswego	158	Groundwater	Active	NY3708983
Senior Nutrition - Parish	Oswego	100	Groundwater	Active	NY3730012
Shars Country Diner	Oswego	39	Groundwater	Active	NY3730033
Steelhead Lodge & Motel	Oswego	48	Groundwater	Active	NY3721808
Sticks Sportsbar Grill Motel	Oswego	78	Groundwater	Active	NY3706753
Stoneys Pineville Campgrounds	Oswego	228	Groundwater	Active	NY3720647
Streamside Campground & Country Club	Oswego	120	Groundwater	Active	NY3730156
Sun-Up Auto Truck Plaza	Oswego	226	Groundwater	Active	NY3721173
Sun-Up Food Store #1	Oswego	25	Groundwater	Active	NY3730078
Sun-Up Food Store #2	Oswego	25	Groundwater	Active	NY3730077
Sun-Up Food Store #7	Oswego	25	Groundwater	Active	NY3730076
Sunset Campground	Oswego	200	Groundwater	Active	NY3722729
Taft Bay Park (Drinking Water)	Oswego	300	Groundwater	Active	NY3730068
Tasswood Bakery & Diner	Oswego	68	Groundwater	Active	NY3706776
Three Rivers Plaza	Oswego	25	Groundwater	Active	NY3718724
Trappers Place	Oswego	70	Groundwater	Active	NY3725001
Two Guys From Italy	Oswego	25	Groundwater	Active	NY3725004
Up Country Family Campground	Oswego	50	Groundwater	Active	NY3730004
Vanderkamp	Oswego	185	Groundwater	Active	NY3713423
Vanessas Place	Oswego	48	Groundwater	Active	NY3730015
Vellas Market	Oswego	25	Groundwater	Active	NY3730095
Volney Fire Hall Kitchen	Oswego	300	Groundwater	Active	NY3721816
Wander Inn	Oswego	60	Groundwater	Active	NY3708031
William Britton Memorial	Oswego	42	Groundwater	Active	NY3730021
Wilsons Red & White	Oswego	25	Groundwater	Active	NY3730097

Table 2.3-12—Transient Non-Community Water Systems: Water Systems in Oswego County that do not consistently serve the same people (e.g. rest stops, campgrounds, gas stations)

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Water System Name	County Served	Population Served	Primary Water Source Type	System Status	Water System ID
Yellow Rose Campground	Oswego	25	Groundwater	Active	NY3730162
Youth Advocates Program Inc.	Oswego	25	Groundwater	Active	NY3706775
Zappala Farms #4	Oswego	40	Groundwater	Active	NY3730102

Table 2.3-13—Selected Water Quality Parameters of Lake Ontario 1972-2000

Parameter	1972	1978	1998-99	2000
pH	8.0	8.4	7.96	7.6
Total Alkalinity (mg/L)	72 - 90	94.2	92	83
Total Phosphorus (mg/L)	0.01 - 0.28	0.027	ND	ND
Total Dissolved Solids (mg/L)	107 - 186	202	ND	160
Total Nitrates (mg/L)	0.04 - 0.40	<0.18	ND	0.34
Turbidity	2 - 6 (JTU)	3.0 (NTU)	0.5 (NTU)	0.09 (NTU)

Note:

JTU = Jackson Turbidity Unit(s)
mg/L = milligram(s) per liter
ND = no data available
NTU = Nephelometric Turbidity Unit(s)

Table 2.3-14—NMPNS Water Quality Data

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Constituent	Study	1973	1974	1975	1976	1977	1978	1979	1980
General Water Quality									
Temperature (deg C)	Xbar	14.8	11.5	13.6	12.5	12.6	13.2	11.7	13.1
	X_{min}	4.4	1.9	2.3	0.4	1.8	3.0	1.6	4.1
	X_{max}	39.4	25.1	24.5	20.6	26.0	24.9	24.7	22.7
	n	217	32	36	36	54	54	36	32
Oxygen, dissolved (mg/l)	Xbar	9.8	10.5	10.5	10.5	10.9	11.4	11.2	10.9
	X_{min}	5.8	8.3	8.2	8.6	9.0	8.2	8.7	8.3
	X_{max}	13.8	12.3	13.8	13.3	14.1	15.5	13.7	14.0
	n	210	36	36	36	53	54	36	36
pH	Xbar	8.2	8.0	8.3	8.2	8.3	8.4	NM	NM
	X_{min}	6.6	6.9	8.0	7.9	7.9	7.9		
	X_{max}	9.1	8.8	8.7	8.5	9.4	8.7		
	n	230	36	36	36	54	54		
Conductance, specific (micro mhos/cm)	Xbar	279.0	286.8	331	366.6	316	365	NM	NM
	X_{min}	80.0	220.0	296	296.0	200	310		
	X_{max}	490.0	350.0	440	590.0	380	510		
	n	190	28	36	36	36	36		
Alkalinity, total (mg/l - $CaCO_3$)	Xbar	89	85.6	89.1	95.4	95.7	94.2	NM	NM
	X_{min}	73	70.0	78	89	89	80		
	X_{max}	120	107.0	106	105	105	112		
	n	75	36	36	36	36	36		
Calcium (mg/l)	Xbar	NM	47.8	43.0	44.1	43.2	41.7	NM	NM
	X_{min}		3.1	34.2	32.3	27.5	32.8		
	X_{max}		105.0	111.8	56.8	51.9	50.6		
	n		36	36	36	36	36		
Chloride (mg/l)	Xbar	37.5	32	33	38.7	32.8	35.4	NM	NM
	X_{min}	26	0	24	25	26.1	26.5		
	X_{max}	70	108	59	89	53.2	64.5		
	n	75	36	36	36	36	36		
Color, true	Xbar	6.5	10	9	14	1	1	NM	NM
	X_{min}	0	5	5	5	1	1		
	X_{max}	45	35	20	40	1	1		
	n	59	36	36	36	36	36		

Table 2.3-14—NMPNS Water Quality Data

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Constituent	Study	1973	1974	1975	1976	1977	1978	1979	1980
Fluoride (mg/l)	Xbar	0.1	0.1	-b	<0.24+	<0.11-	0.15	NM	NM
	X_{min}	0.1	0.0	<0.2	<0.2	<0.05	0.06		
	X_{max}	0.2	0.2	0.2	0.6	0.2	0.24		
	n	38	36	36	36	36	36		
Magnesium (mg/l)	Xbar	8.0	8.0	7.8	10.5	8.2	7.95	NM	NM
	X_{min}	0.3	6.2	6.7	7.8	6.0	6.70		
	X_{max}	10.1	11.9	11.2	17.6	9.7	9.93		
	n	52	36	36	36	36	36		
Potassium (mg/l)	Xbar	1.9	54.0	2.3	1.9	1.7	1.61	NM	NM
	X_{min}	1.3	40.0	1.7	1.3	0.8	1.20		
	X_{max}	2.5	66.6	3.5	3.6	2.9	2.10		
	n	74	36	36	36	36	36		
Residue, filterable (TDS) (mg/l)	Xbar	240	228	209	224.3	210	202	NM	NM
	X_{min}	135	180	179	181	135	146		
	X_{max}	525	460	297	366	324	295		
	n	75	36	36	36	36	36		
Residue, nonfilterable (TSS) (mg/l)	Xbar	8.6	8	5	10.6	<2.31-	<3.7+	NM	NM
	X_{min}	0.0	1	1	2	<0.1	<0.1		
	X_{max}	260	63	26	69	11.4	20.2		
	n	240	36	36	36	35	36		
Residue, total (mg/l)	Xbar	237	236	214	235	213	206	NM	NM
	X_{min}	145	195	185	105	141	146		
	X_{max}	530	470	301	392	326	299		
	n	240	36	36	36	36	36		
Sodium (mg/l)	Xbar	16.4	37.6	15.8	21.2	14.3	16.0	NM	NM
	X_{min}	8.8	9.7	10.8	9.9	6.6	11.9		
	X_{max}	31.6	216.0	27.8	37.7	19.3	28.6		
	n	74	36	36	36	36	36		
Sulfate (mg/l)	Xbar	28.7	35	30	29.6	28.6	30.5	NM	NM
	X_{min}	22	22	22	23	20.7	24.4		
	X_{max}	39	53	74	41	36.7	42.0		
	n	75	36	36	36	36	36		

Table 2.3-14—NMPNS Water Quality Data

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Constituent	Study	1973	1974	1975	1976	1977	1978	1979	1980
Turtidity (NTU)	Xbar	4.4	3.8	3	4.5	2.1	3.0	NM	NM
	X_{min}	0.0	1	1	1.0	0.7	1.4		
	X_{max}	52	22	8	26.0	7.9	7.8		
	n	240	36	36	36	36	36		
Aquatic Nutrients									
Ammonia (mg/l-N)	Xbar	0.0	0.2	0.1	0.3	0.04	0.033+	NM	NM
	X_{min}	0.0	0.0	0.1	0.1	0.01	<0.002		
	X_{max}	0.2	0.8	0.5	0.4	0.1	0.084		
	n	62	36	36	36	36	36		
Nitrate (mg/l-NO_3)	Xbar	0.1	0.15	0.17	0.2	0.2	<0.18+	NM	NM
	X_{min}	0.0	0.02	0.01	0.0	0.0	0.01		
	X_{max}	0.4	0.46	0.48	0.5	0.3	0.33		
	n	240	36	36	36	36	36		
Organic nitrogen, total, (mg/l)	Xbar	0.3	NM	NM	0.4	0.15	0.23	NM	NM
	X_{min}	0.0			0.0	0.07	0.01		
	X_{max}	1.0			1.2	0.31	0.63		
	n	38			31	36	36		
Nitrogen, total (TKN) (mg/l)	Xbar	0.5	0.5	0.40	0.6	0.2	0.27	NM	NM
	X_{min}	0.0	0.00	0.00	0.002	<0.002	0.002		
	X_{max}	1.4	1.0	0.90	1.5	0.4	0.66		
	n	200	35	36	35	36	36		
Orthophosphate, total, (mg/l-P)	Xbar	0.0092	0.01	0.004	0.012	<0.006+	<0.007+	NM	NM
	X_{min}	0.0	0.00	0.00	0.002	<0.002	0.002		
	X_{max}	0.80	0.03	0.02	0.058	0.012	0.022		
	n	240	36	36	36	36	36		
Phosphorus, total, (mg/l-P)	Xbar	0.053	0.03	0.024	0.022	0.021	0.027	NM	NM
	X_{min}	0.0	0.01	0.00	0.004	0.007	0.005		
	X_{max}	0.91	0.08	0.07	0.066	0.047	0.106		
	n	240	36	36	101	36	36		
Silica, soluble (mg/l-SiO_2)	Xbar	1.0	0.4	<0.7+	<0.96+	<0.30+	<0.20+	NM	NM
	X_{min}	0.0	0.0	<0.1	<0.04	<0.05	<0.05		
	X_{max}	7.0	1.2	2.0	1.08	0.56	0.37		
	n	31	35	36	36	36	36		

Table 2.3-14—NMPNS Water Quality Data

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Constituent	Study	1973	1974	1975	1976	1977	1978	1979	1980
Indicators of Contamination									
Biochemical oxygen demand, 5-day (mg/l)	Xbar	1.8	3	2	1.2	1.6	1.7	NM	NM
	X_{min}	0.0	1	1	1.0	0.0	0.0		
	X_{max}	6.0	5	4	5.0	3.6	4.0		
	n	223	36	36	36	36	36		
Bacteria, total coliform (no./100 ml)	Xbar	63.8	18	19	-d	>137++	<248+	NM	NM
	X_{min}	0.0	0	0	8	2.2	<2		
	X_{max}	430	100	121	772	2,400.0	1,800		
	n	61	36	36	32	36	36		
Bacteria, fecal coliform (no./100 ml)	Xbar	13.4	9	6	27.7	43+,++	<54+	NM	NM
	X_{min}	0.0	0	0	1.0	<2.0	<2		
	X_{max}	550	107	76	166	>300.0	550		
	n	59	36	36	36	36	36		
Organic carbon, total, (mg/l)	Xbar	5.2	11	NM	<7.3+	11.0	NM	NM	NM
	X_{min}	0.0	3		<1.0	6.6			
	X_{max}	18	62		15	19.5			
	n	38	34		24	16			
Phenol (mg/l)	Xbar	0.03	0.001	0.002	<0.0033+	-b	-b	NM	NM
	X_{min}	0.0	0.000	0.00	<0.001	<0.005	<0.005		
	X_{max}	0.169	0.018	0.05	0.018	0.005	0.018		
	n	67	36	36	36	36	36		
Chemical oxygen demand (mg/l)	Xbar	13	11	9	11.4	<6.8+	<5.3+	NM	NM
	X_{min}	0	0	2	5	<2.0	<2.0		
	X_{max}	65	26	19	22	10.8	9.6		
	n	230	36	36	36	36	36		
Cyanide, total CN (mg/l-CN)	Xbar	0	0	0	-b	-b	-b	NM	NM
	X_{min}	0	0	0	<0.02	<0.005	<0.005		
	X_{max}	0	0	0	<0.02	<0.005	0.007		
	n	46	36	36	28	36	36		
Trace Constituents									
Aluminum Al (micro g/l)	Xbar	16	2,831	<130	<190	74	112	NM	NM
	X_{min}	0	0	<20	<20	1	22		
	X_{max}	27	87,500	1,660	670	238	275		
	n	47	36	36	36	36	36		

Table 2.3-14—NMPNS Water Quality Data

(Page 5 of 6)

Constituent	Study	1973	1974	1975	1976	1977	1978	1979	1980
Lead Pb (micro g/l)	Xbar	23.2	70c	-b	-b	<8+	-b	NM	NM
	X_{min}	0	0	<80	<50	<1	<1		
	X_{max}	240	750c	<80	<50	44	15		
	n	55	36	36	36	36	36		
Manganese Mn (micro g/l)	Xbar	57.8	4	-b	<14+	<11+	`8+	NM	NM
	X_{min}	0	0	<20	<10	<1	<1		
	X_{max}	360	40	80	60	92	97		
	n	48	32	36	36	36	36		
Mercury Hg (micro g/l)	Xbar	0	1	-b	<1.7	-b	-b	NM	NM
	X_{min}	0	0	<2	<1	<0.2	<0.2		
	X_{max}	0	24	6	5	<0.5	<0.5		
	n	24	36	32	36	36	36		
Nickel Ni (micro g/l)	Xbar	31.3	15C	-b	-b	<8+	<4+	NM	NM
	X_{min}	0	0	<50	<20	<2	<1		
	X_{max}	200	256C	50	30	50	10		
	n	66	36	36	36	36	36		
Arsenic As (micro g/l)	Xbar	0.4	0	-b	-b	<3.4+	<0.5	NM	NM
	X_{min}	0	0	<28	<2	<0.5	<0.2		
	X_{max}	0.6	0	<28	<28	21	0.0016		
	n	14	36	36	36	36	36		
Beryllium Be (micro g/l)	Xbar	4.9	0	-b	-b	-b	-b	NM	NM
	X_{min}	0	0	5	<5	<1	<1		
	X_{max}	51	0	<5	<5	<1	<1		
	n	74	36	36	36	36	36		
Cadmium Cd (micro g/l)	Xbar	4	0	-b	-b	-b	-b	NM	NM
	X_{min}	0	0	<20	<2	<1	<1		
	X_{max}	67	0	<20	<4	1	<1		
	n	74	36	36	36	36	36		
Chromium Cr (micro g/l)	Xbar	12.3	40	-b	-b	-b	-b	NM	NM
	X_{min}	0	0	<100	<20	<1	<1		
	X_{max}	160	590	<100	190	1	2		
	n	73	36	36	36	36	36		

Table 2.3-14—NMPNS Water Quality Data

(Page 6 of 6)

Constituent	Study	1973	1974	1975	1976	1977	1978	1979	1980
Copper Cu (micro g/l)	Xbar	64.4	1,390c	-b	-b	<8+	<194	NM	NM
	X_{min}	0	0	<30	<10	<1	<1		
	X_{max}	410	15,100c	50	<10	36	116		
	n	74	36	36	36	36	36		
Iron Fe (micrpo g/l)	Xbar	176	289	<80+	<132+	116	91	NM	NM
	X_{min}	0	0	<20	<20	3	6		
	X_{max}	1,920	1,200	470	460	613	220		
	n	75	36	36	36	36	36		
Selenium Se (,micro g/l)	Xbar	0	0	NM	<24.1	<1.4+	<7+	NM	NM
	X_{min}	0	0		<1	<0.3	<0.2		
	X_{max}	0	0		82	4.1	20		
	n	21	12		36	36	36		
Vanadium V (micro g/l)	Xbar	23.5	0	-b	-b	<2+	-b	NM	NM
	X_{min}	0	0	<20	<0.2	<1	<2		
	X_{max}	300	0	<200	<0.2	2	<2		
	n	51	36	36	36	36	36		
Zinc Zn (micro g/l)	Xbar	45.3	958	<17+	<14+	<19+	<48+	NM	NM
	X_{min}	0	0	<10	<5	<1	<1		
	X_{max}	638	9,800	91	120	77	675		
	n	67	36	36	36	36	36		

Key:

Xbar = mean value
X_{min} = minimum value reported
X_{max} = maximum value reported
n = number of values reported used to calculate the mean value
+ = "less than" table entries for raw data were input to calculated means as equal to the detection limit
++ = "greater than" table entries for raw data were input to calculated means as equal to the detection limit NM = not measured
b = mean not calculated when >75 percent of the entry values were below the detection limits
c = mean and sample influenced by contamination of the sample or samples
d = April sample too numerous to count

Note:

Data presented is the maximum, minimum, and average values of four samples, one each from the surface and bottom of the water column at the 8- and 14-m (25- and 45-ft) contours on the NMP/PITZ transect in the Nine Mile Point vicinity each month (Section 6.6.2). The sampling year was generally from April to December. The more extensive 1973 data is the product of all monthly and bimonthly water quality surveys performed that year. Certain latter years. data sets with n>36 reflect use of monthly surface values at the 6- and 12-m (20- and 40-ft) contours of the NMPW, FITZ, and NMPE transects.

Table 2.3-15—NMPNS Surface Water Quality Data - Monthly Variations

(Page 1 of 2)

Parameter	Unit		April	May	June	July	August	September	October	November	December
Dissolved oxygen	**mg/l-DO**	Mean	14.9	15.1	13.1	8.8	8.6	9.3	9.1	10.7	13.6
		Range	14.2-15.5	14.2-16.7	12.0-14.6	8.3-9-7	7.4-9.0	8.5-11.1	8.8-9.7	10.2-11.3	13.3-14.0
		SD*	0.5	0.6	1.0	0.5	0.6	1.0	0.3	0.4	0.2
		No	18	18	18	18	18	18	18	18	18
Nitrate	**mg/l-N**	Mean	0.31	0.26	0-18	0.03	<0.04	0.13	0.14	0.18	0.29
		Range	0.28-0.38	0.20-0.35	0.15-0.27	<0.01-0.06	<0.04	0.05-0.17	0.12-0.19	0.16-0.22	0.27-0.33
		SD	0.04	0.05	0.03	0.02	0.00	0.04	0.02	0.02	0.02
		No	16	16	16	16	16	16	16	16	16
Total phosphorus	**mg/l-P**	Mean	0.021	0.018	0.024	0.028	0.012	0.013	0.027	0.012	0.038
		Range	0.005-0.048	0.008-0.033	0.018-0.033	0.017-0.044	0.004-0.022	0.008-0.020	0.016-0.048	0.005-0.022	0.008-0.110
		SD	0.009	0.008	0.005	0.007	0.005	0.003	0.010	0.004	0.030
		No	22	22	22	22	22	22	22	22	22
Ortho-phosphorus	**mg/l-P**	Mean	0.009	0.011	0.004	0-004	0.004	0.003	0.002	0.004	0.008
		Range	0.004-0.019	0.006-0.018	0.003-0.006	<0.002-0.008	<0.002-0.012	<0.002-0.004	<0.002-0.006	<0.002-0.006	<0.003-0.022
		SD	0.004	0.005	0.001	0.002	0.004	0.001	0.001	0.002	0.007
		No	16	16	16	16	16	16	16	16	16
Silica	**mg/l-SiO_3**	Mean	0.37	0.08	0.11	0.19	0.18	0.21	0.14	0.18	0.29
		Range	0.31-0.49	0.05-0.13	<0.05-0.17	0.09-0.30	0.11-0.30	0.13-0.27	0.10-0.17	0.11-0.25	0.14-0.37
		SD	0.08	0.03	0.05	0.08	0.07	0.05	0.02	0.04	0.07
		No	16	16	16	16	16	16	16	16	16
Calcium	**mg/l-Ca**	Mean	37.0	41.3	41.9	44.7	40.9	33.0	36.7	41.0	34.6
		Range	33.1-38.4	36.4-50.6	39.2-45.3	37.5-53.8	38.8-43.8	30.7-37.8	30.5-50.0	36.4-47.0	28.6-43.0
		SD	1.9	5.7	2.1	4.6	2.0	2.2	7.1	3.6	6.0
		No	10	10	10	10	10	10	10	10	10
Sulfate	**mg/l-SO_4**	Mean	33.4	31.5	27.9	25.0	25.8	27.9	28.8	31.1	27.6
		Range	27.7-40.7	27.2-42.0	25.8-30.9	24.3-25.9	23.7-28.2	24.6-30.7	27.6-29.7	29.9-32.9	25.8-30.8
		SD	5.9	5.8	1.7	0.5	1.8	1.9	0.8	1.2	1.7
		No	10	10	10	10	10	10	10	10	10
Total solids	**mg/l-TS**	Mean	204	251	212	168	185	233	202	226	217
		Range	146-248	176-419	167-251	136-222	147-211	163-316	160-225	196-266	178-249
		SD	29	62	20	25	34	55	14	17	18
		No	22	22	22	22	22	22•	22	22	22

Table 2.3-15—NMPNS Surface Water Quality Data - Monthly Variations

(Page 2 of 2)

Parameter	Unit		April	May	June	July	August	September	October	November	December
Total suspended solids	**mg/l-TSS**	Mean	1.6	3.1	1.4	4.8	1.1	0.3	1.1	2.0	7.3
		Range	<0.1-4.0	0.8-15.8	0.2-4.0	0.6-7.4	<0.1-4.0	<0.1-1.2	<0.1-3.8	<0.1-7.6	<0.1-21.0
		SD	1.3	3.5	0.9	2.3	1.0	0.5	0.9	2.2	8.0
		No	22	22	22	22	22	22	22	22	22

Table 2.3-16—Summary of NMP Unit 1 and Unit 2 SPDES Outfalls Effluent Parameters

(Page 1 of 2)

Outfall No.	Outfall Description	Receiving Water	Effluent Parameters Monitored									
			Intake-Discharge Temperature Difference	Net Rate of Addition of Heat	Total Residual Oxidant	Inhibitor AZ8104	Cuprostat pf	Spectrus CT 1300	Calgon H-130 M	Calgon EVAC	BOD	Fecal Coliform
01A	Decay Heat Cooling Tower Blowdown	Lake Ontario (Class A)										
001	Storm Drainage*	Lake Ontario (Class A)								x		
002	Storm Drainage*	Lake Ontario (Class A)										
007	Floor and equipment drains	Lake Ontario (Class A)										
008	Screen Well Fish Diversion System*	Lake Ontario (Class A)										
010	Condenser cooling water Unit #1	Lake Ontario (Class A)	x	x	x			x	x	x		
010A	Forebay Cleaning/sedimentation basins	Lake Ontario (Class A)										
011	Unit #1 Wastewater**	Lake Ontario (Class A)										
020	Storm Drainage Unit #1, Perimeter drains, condensation water	Lake Ontario (Class A)										
021	Filter backwash and makeup demineralizer water supply	Lake Ontario (Class A)										
023	Unit #1 Oil Spill Retention Basin	Lake Ontario (Class A)										
024	NMP Unit 1 Diesel Off Loading Pad Drainage	Lake Ontario (Class A)										
025	Unit #2 Cooling Tower Emergency Overflow	Lake Ontario (Class A) and Groundwater (Class GA)										
026	Unit #2 Resin Regeneration, Demineralized Test Water, and Reverse Osmosis Wastewater	Lake Ontario (Class A)										
030	Sewage Treatment Facility	Lake Ontario (Class A)									x	x

Table 2.3-16—Summary of NMP Unit 1 and Unit 2 SPDES Outfalls Effluent Parameters

(Page 2 of 2)

Outfall No.	Outfall Description	Receiving Water	Effluent Parameters Monitored									
			Intake-Discharge Temperature Difference	Net Rate of Addition of Heat	Total Residual Oxidant	Inhibitor AZ8104	Cuprostat pf	Spectrus CT 1300	Calgon H-130 M	Calgon EVAC	BOD	Fecal Coliform
040	Cooling tower Blowdown and Service Water (Unit #2)	Lake Ontario (Class A)	x	x	x	x	x	x	x	x		
040A	Circulating water pumps, Area sumps	Lake Ontario (Class A)										
040B	Forebay Cleaning/sedimentation basins	Lake Ontario (Class A)										
041	Unit #2 Wastewater **	Lake Ontario (Class A)										

Notes:

Information taken from Nine Mile Point Nuclear Station SPDES permit No. NY-000-1015, dated July 21, 2003.
SPDES - State Pollutant Discharge Elimination System
TSS - Total Suspended Solids
P - Phosphorus
* - no monitoring required
** - includes water generated from demineralizer, reverse osmosis electrodeionization, filtration, and treated radioactive wastewater

Table 2.3-17—SPDES Permitted Discharges in Oswego County
(Page 1 of 4)

NPDES ID	Facility Name	Address	County Name	Permit Issued Date	Permit Expired Date	Sic Code	Sic Desc	Mapping Info	USGS HUC
NY0216186	Altmar Parish Williamstown Middle School	Cheese Factory Rd - 1 1/4 mi S On CR 22 From Ho Parish, NY 13131	Oswego	Feb-19-2002	Jul-01-2007	8999	Services, Not Elsewhere Classified	Map	04140102
NYU700460	Amboy Maintenance Garage	2391 County Route 23 Williamstown, NY 13493	Oswego					Map	
NYU700533	Bayshore Grove Parking Lot	Scriba /T/, NY	Oswego					Map	
NY0216291	Big Bay SD	Town Hall, County Route 11 West Monroe, NY 13167	Oswego	Apr-06-2004	Nov-01-2009	4952	Sewerage Systems	Map	04140202
NY0157376	Caughdenoy SD	Hastings (T) Munic Bldg Rt 11 Central Square, NY 13036	Oswego	May-01-2001	Aug-01-2006	4952	Sewerage Systems	Map	04140202
NY0035131	Central Square (V) Wwtp	Village Place, NYS Rte 49 Central Square, NY 13036	Oswego	Dec-06-2005	May-31-2011	4952	Sewerage Systems	Map	04140202
NY0214370	Cleveland (V) WWTP	Po Box A Cleveland, NY 13042	Oswego	Nov-22-2004	May-31-2010	4952	Sewerage Systems	Map	04140202
NY0033456	Conifer Mobile Home Village	7173 Dry Bridge Road Central Square, NY 13036	Oswego	Sep-10-2002	Feb-01-2008	8999	Services, Not Elsewhere Classified	Map	04140202
NY0213705	Corner Laundry	Main & Lake St Sandy Creek, NY 13145	Oswego	Oct-08-2003	Jun-01-2009	7215	Coin-Operated Laundries And Drycleaning	Map	04140102
NYU700037	Corner Laundry	Sandy Creek, NY 13145	Oswego					Map	
NYU700058	D/B/A Snow White Laundry	Route 3 Hannibal, NY 13074	Oswego					Map	
NY0087858	East Coast Resorts Of America	Crim Road Parish, NY 13131	Oswego	Apr-29-2005	Nov-30-2010	8999	Services, Not Elsewhere Classified	Map	04140102

Table 2.3-17—SPDES Permitted Discharges in Oswego County
(Page 2 of 4)

NPDES ID	Facility Name	Address	County Name	Permit Issued Date	Permit Expired Date	Sic Code	Sic Desc	Mapping Info	USGS HUC
NY0000515	Felix Schoeller Technical Papers	179 County Route 2a Pulaski, NY 131420250	Oswego	Nov-16-2005	Mar-31-2011	2672	Coated And Laminated Paper, Not Elsewhere Classified	Map	04140102
NY0020109	JAFNPP	268 Lake Road Scriba, NY 13126	Oswego	Jul-26-2001	Aug-01-2006	4911	Electric Services	Map	04140102
NY0245062	Fort Brewerton SD	1134 US Route 11 Central Square, NY 13036	Oswego	May-07-2002	Jun-01-2007	4952	Sewerage Systems	Map	04140202
NY0026301	Fulton - C STP	West River Road North Route 48 Fulton, NY 13069	Oswego	Jan-20-2004	Jun-01-2009	4952	Sewerage Systems	Map	04140203
NY0231410	Fulton Cogeneration Assoc Project	662 South 7th St (Between Burt & John Sts) Fulton, NY 13069	Oswego	Jan-04-2005	May-31-2010	4911	Electric Services	Map	04140203
NY0243931	Fulton Municipal Water Treatment Facility	City Water Works At Rte 57 Fulton, NY 13069	Oswego	Jan-10-2002	Jul-01-2007	4941	Water Supply	Map	04140203
NY0213845	Green Haven Community	332 Ellisburg Road Oswego, NY 13126	Oswego	Feb-03-2004	Sep-01-2009	8999	Services, Not Elsewhere Classified	Map	04140102
NYR00D577	Horners Automotive	1562 Lamson Road Phoenix, NY 13135	Oswego					Map	
NY0001902	Huhtamaki Consumer Packaging-Fulton Inc	100 State Street Fulton, NY 13069	Oswego	Nov-08-2001	Feb-01-2007	9999	Nonclassifiable Establishments	Map	04140203
NY0233196	Independence Station	76 Independence Way Scriba, NY 13126	Oswego	Jul-01-2002	Nov-01-2007	4931	Electric And Other Services Combined	Map	04140102
NY0003344	Interface Solutions Inc	2885 State Route 481 Fulton, NY 13069	Oswego	Nov-01-2001	Mar-01-2007	2621	Paper Mills	Map	04140201
NY0106780	International Wire Group - Omega Wire Facility	Main StreetWilliamstown, NY 13493	Oswego	Nov-22-2004	Mar-31-2010	3471	Electroplating, Plating, Polishing, Anodizing, And Coloring	Map	04140202
NYU700470	Metal Transportation Systems	2601 North Rd Scriba, NY 13126	Oswego					Map	
NY0036617	Mexico (V) STP	Po Box 309 Mexico, NY 13114	Oswego	Jul-29-2002	Jan-01-2008	4952	Sewerage Systems	Map	04140102

Table 2.3-17—SPDES Permitted Discharges in Oswego County
(Page 3 of 4)

NPDES ID	Facility Name	Address	County Name	Permit Issued Date	Permit Expired Date	Sic Code	Sic Desc	Mapping Info	USGS HUC
NY0216321	Mhc Brennan Beach Rv Resort, LLC	80 Brennan Beach Road Pulaski, NY 13142	Oswego	Jul-01-2003	Jul-01-2008	8999	Services, Not Elsewhere Classified	Map	04140102
NY0032468	Miller Brewing	Route 57 & Owen Road Fulton, NY 13069	Oswego	Mar-14-2002	Jul-01-2007	2082	Malt Beverages	Map	04140203
NY0036749	Minetto SD WPCP	Snell Road - Box 220 Minetto, NY 13115	Oswego	Mar-01-2002	Mar-01-2007	4952	Sewerage Systems	Map	04140203
NY0000981	Nestle Foods Corp	555 South 4th Street Fulton, NY 130692995	Oswego	Feb-19-2002	Aug-01-2007	9999	Nonclassifiable Establishments	Map	04140203
NY0001015	Nine Mile Pt Nuclear Station LLC	348 Lake Rd Scriba, NY 13126	Oswego	Jun-08-2004	Dec-01-2009	4911	Electric Services	Map	04140102
NY0002143	Novelis Corp	448 County Route 1a Oswego, NY 131260028	Oswego	Mar-22-2005	Aug-16-2010	3353	Aluminum Sheet, Plate, And Foil	Map	04140102
NY0216348	Oneida Fish Hatchery	Hatchery Road Constantia, NY 13044	Oswego	May-23-2002	Jan-01-2008	0921	Fish Hatcheries And Preserves	Map	04140202
NY0029114	Oswego - C East Side STP	71 Mercer St Oswego, NY 13126	Oswego	Jun-18-2004	Nov-01-2009	4952	Sewerage Systems	Map	04140102
NY0155519	Oswego Co Energy Recovery Fac	2801 State Route 481 Volney, NY 13069	Oswego	Oct-30-2003	Apr-01-2009	9999	Nonclassifiable Establishments	Map	04140203
NY0002186	Oswego Harbor Power	261 Washington Blvd. Oswego, NY 13126	Oswego	Jan-03-2005	May-31-2010	4911	Electric Services	Map	04140102
NY0092321	Owens Brockway Glass Container Incorporated	123 Great Bear Road Fulton, NY 13069	Oswego	Sep-05-2002	Jan-01-2008	3221	Glass Containers	Map	04140203
NY0107654	Parish - V STP	Red Mill Road Parish, NY 13131	Oswego	May-17-2005	Oct-31-2010	4952	Sewerage Systems	Map	04140102
NY0154822	Penn Can Truckstops & Rest	Po Box 680 Central Square, NY 13036	Oswego	Jul-09-2004	Mar-01-2010	8999	Services, Not Elsewhere Classified	Map	04140202
NY0020664	Phoenix STP	821 North Main Street Phoenix, NY 13135	Oswego	Oct-05-2001	Feb-01-2007	4952	Sewerage Systems	Map	04140203
NY0020257	Pulaski - V STP	48 Riverview Dr Pulaski, NY 13142	Oswego	Apr-06-2004	Nov-01-2009	4952	Sewerage Systems	Map	04140102

Table 2.3-17—SPDES Permitted Discharges in Oswego County

(Page 4 of 4)

NPDES ID	Facility Name	Address	County Name	Permit Issued Date	Permit Expired Date	Sic Code	Sic Desc	Mapping Info	USGS HUC
NYU700534	Pulaski Ford & Mercury	6141 Route 11 Pulaski, NY 13142	Oswego					Map	
NY0109053	Salmon River Fish Hatchery	2133 County Rte 22 Altmar, NY 13302	Oswego	Jun-04-2003	Jan-01-2009	0921	Fish Hatcheries And Preserves	Map	04140102
NYA000453	Seeleu Brook Farm	269 County Route 35 Fulton, NY 13069	Oswego	Jun-23-2004	Jun-30-2009	0291	General Farms, Primarily Livestock And Animal Specialties	Map	
NY0029238	Sleepy Hollow SD	Box 68a, Johnson Road Oswego, NY 13126	Oswego	Mar-29-2002	Nov-01-2007	4952	Sewerage Systems	Map	04140101
NY0232432	Snow White Laundry	489 Church Street Hannibal, NY 13074	Oswego	Dec-14-1999	May-01-2005	7215	Coin-Operated Laundries And Drycleaning	Map	04140101
NY0063592	South Oswego Terminal	Fifth Avenue (Steam Station) Oswego, NY 13126	Oswego	Jun-04-2002	Oct-01-2007	5171	Petroleum Bulk Stations And Terminals	Map	04140101
NY0232378	Specialty Minerals Inc	114 Mitchell Street Oswego, NY 13126	Oswego	Jan-09-2001	Aug-01-2006	2819	Industrial Inorganic Chemicals, Not Elsewhere Classified	Map	04140102
NY0029106	West Side Wastewater Treatment Facility	First Ave And West Schuyler St Oswego, NY 13126	Oswego	Jun-04-2001	Oct-01-2006	4952	Sewerage Systems	Map	04140203

Table 2.3-18—NMPNS Groundwater Data - Overburden
(Page 1 of 3)

	EPA Standard	NY Standard	Units	Min	Max	Mean	Overburden BA120(MW)B 3/8/2008 6.0 - 14	Overburden BA121(MW)B 3/8/2008 6.0 - 17	Overburden BA122(MW)B 3/8/2008 6.0 - 19	Overburden BA123(MW)B 3/8/2008 5.7 - 7.7	Overburden BA124(MW)B 3/8/2008 6.5 - 11.5
Volatile Organic Compounds (VOCs)			µg/L				NT	NT	NT	NT	NT
Acetone			µg/L								
Benzene		1	µg/L								
Butanone,2- (MEK)			µg/L								
Chloroform		7	µg/L								
Toluene		5	µg/L								
Vinyl chloride		2	µg/L								
Semi-Volatile Organic Compounds (SVOCs)			µg/L				NT	NT	NT	NT	NT
Benzoic acid			µg/L								
Bis(2-ethylhexyl)phthalate		5	µg/L								
Total Petroleum Hydrocarbons			µg/L				NT	NT	NT	NT	NT
Cyanides			µg/L				NT	NT	NT	NT	NT
Metals			µg/L								
Aluminum		100	µg/L	649	4560	2599.75	4560	3640	649	1550	4650
Arsenic	10	50	µg/L	5	5	5	< 10	< 10	< 10	< 10	< 10
Barium		1,000	µg/L	100	100	100	< 200	< 200	< 200	< 200	< 200
Beryllium	4	11	µg/L	2	2	2	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Cadmium		5	µg/L	2	2	2	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Calcium			µg/L	75800	171000	107550	75800	87100	96300	171000	103000
Chromium		50	µg/L	5	5	5	< 10	< 10	< 10	< 10	< 10
Cobalt		5	µg/L	25	25	25	< 50	< 50	< 50	< 50	< 50
Copper		200	µg/L	12.5	12.5	12.5	< 25	< 25	< 25	< 25	< 25
Iron		300	µg/L	1530	7320	4070	7320	5200	1530	2230	8280
Lead		50	µg/L	2.5	2.5	2.5	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Magnesium		35,000	µg/L	35300	76700	60025	60100	76700	68000	35300	71300
Manganese		300	µg/L	276	310	290.5	310	278	276	298	873
Mercury		0.7	µg/L	0.1	0.1	0.1	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20

Table 2.3-18—NMPNS Groundwater Data - Overburden

(Page 2 of 3)

	EPA Standard	NY Standard	Units	Min	Max	Mean	Overburden BA120(MW)B 3/8/2008 6.0 - 14	Overburden BA121(MW)B 3/8/2008 6.0 - 17	Overburden BA122(MW)B 3/8/2008 6.0 - 19	Overburden BA123(MW)B 3/8/2008 5.7 - 7.7	Overburden BA124(MW)B 3/8/2008 6.5 - 11.5
Mercury	2		µg/L				NT	NT	NT	NT	NT
Nickel		100	µg/L	20	20	20	< 40	< 40	< 40	< 40	< 40
Potassium			µg/L	2500	15900	8057.5	8740	15900	5090	< 5000	11600
Selenium		10	µg/L	5	5	5	< 10	< 10	< 10	< 10	< 10
Sodium		20,000	µg/L	11100	26200	19975	11100	23900	26200	18700	16100
Thallium		8	µg/L	5	5	5	< 10	< 10	< 10	< 10	< 10
Vanadium		14	µg/L	15	15	15	< 30	< 30	< 30	< 30	< 30
Zinc	5000*		µg/L	10	28.3	20.725	28.3	23.7	< 20	20.9	28.1
Polychlorinated Biphenyls			µg/L				NT	NT	NT	NT	NT
Inorganics			µg/L								
Alkalinity			µg/L				NT	NT	NT	NT	NT
Alkalinity			µg/L	226000	370000	305000	306000	318000	370000	226000	435000
Ammonia as Nitrogen		2,000	µg/L	130	520	257.5	140	520	240	130	230
Bicarbonate alkalinity as CaCO3			µg/L	226000	365000	302500	302000	317000	365000	226000	434000
Biological Oxygen Demand			µg/L	1000	3000	1500	3000	< 2000	< 2000	< 2000	< 2000
Bromide			µg/L	250	2000	750	< 500	< 1000	< 500	2000	< 1000
Chemical Oxygen Demand			µg/L	10000	10000	10000	< 20000	< 20000	< 20000	< 20000	< 20000
Chloride		250,000	µg/L	3500	207000	55675	3500	8000	4200	207000	6500
Color		15	CU	5	25	16.25	20	25	15	5	25
Hardness			µg/L	450000	561000	513750	450000	561000	507000	537000	517000
Nitrate & Nitrite as N		10,000	µg/L	50	1700	542.5	< 100	260	160	1700	< 100
Nitrogen, Nitrate		10,000	µg/L	55	1700	543.75	< 110	260	160	1700	< 110
Nitrogen, Nitrite		1000	µg/L	5	16	7.75	< 10	< 10	< 10	16	< 10
Nitrogen, Total Kjeldahl			µg/L	150	570	347.5	< 300	570	350	320	420
pH		6.5 to 8.5	s.u.	6.91	7.38	7.1425	7.38	7.16	7.12	6.91	7.14
Phosphate			µg/L	50	50	50	< 100	< 100	< 100	< 100	< 100
Silica, Dissolved			µg/L	10000	12800	11650	12100	10000	12800	11700	13800
Sulfate		250,000	µg/L	51000	246000	160250	144000	246000	200000	51000	101000

Table 2.3-18—NMPNS Groundwater Data - Overburden

(Page 3 of 3)

	EPA Standard	NY Standard	Units	Min	Max	Mean	Overburden BA120(MW)B 3/8/2008 6.0 - 14	Overburden BA121(MW)B 3/8/2008 6.0 - 17	Overburden BA122(MW)B 3/8/2008 6.0 - 19	Overburden BA123(MW)B 3/8/2008 5.7 - 7.7	Overburden BA124(MW)B 3/8/2008 6.5 - 11.5
Total Dissolved Solids	500000*		µg/L	473000	782000	637250	473000	608000	686000	782000	486000
Total Organic Carbon			µg/L	2100	3900	2750	2100	2800	3900	2200	3700
Total Organic Nitrogen			µg/L	200	200	200	< 400	< 400	< 400	< 400	< 400
Total Phosphorous			µg/L	100	100	100	< 200	< 200	< 200	< 200	210
Total Suspended Solids			µg/L	2000	205000	56750	8000	205000	< 4000	12000	173000

Note:

* EPA Secondary Drinking Water Standard
** NY State GW Effluent Limitations for GA Class Waters
Analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
"<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
NT = The sample was not tested for this analyte.
ND = The analyte was not detected above the laboratory reporting limit. See the laboratory data sheets for the laboratory reporting limit.
µg/L = micrograms per liter; s.u. - standard unit; CU = Colorimetric Unit; ft = feet
For results less than the detection limit, 1/2 the detection limit was used to calculate min, max, and mean

Table 2.3-19—NMPNS Groundwater Data - Oswego Sandstone Formation

(Page 1 of 3)

Aquifer							Oswego SS Trns.	Oswego SS Trns.	Oswego SS Trns.	Oswego SS Trns.
Location							**BA107(MW)**	**BA107(MW)**	**BA111(MW)**	**BA111(MW)**
Date							**9/28/2007**	**12/3/2007**	**9/27/2007**	**12/3/2007**
	EPA Standard	**NY Standard**	**Units**	**Min**	**Max**	**Mean**	**57.7-67.7**	**57.7-67.7**	**74-84**	**74-84**
Volatile Organic Compounds (VOCs)			µg/L				NT			
Acetone			µg/L	2.5	145	16.8		145	< 5.0	< 5
Benzene		1	µg/L	0.25	1.0	0.3		1	< 0.50	< 0.5
Butanone,2- (MEK)			µg/L	2.5	2.5	2.5		< 5	< 5.0	< 5
Chloroform		7	µg/L	0.5	0.5	0.5		< 1	< 1.0	< 1
Toluene		5	µg/L	0.5	0.5	0.5		< 1	< 1.0	< 1
Vinyl chloride		2	µg/L	0.5	0.5	0.5		< 1	< 1.0	< 1
Semi-Volatile Organic Compounds (SVOCs)			µg/L				NT			
Benzoic acid			µg/L	5	36	10.7		36	< 11	< 11
Bis(2-ethylhexyl)pht halate		5	µg/L	1	4.8	2.4		4.8	3.2	< 2.2
Total Petroleum Hydrocarbons			µg/L				ND	NT	ND	NT
Cyanides			µg/L				ND	NT	ND	NT
Metals			µg/L							
Aluminum		100	µg/L	100	22900	3029.6	22900	10700	1660	844
Arsenic	10	50	µg/L	5	632	53.5	632	78.5	< 10	40.4
Barium		1,000	µg/L	100	9310	1933.3	< 200	< 200	9310	8100
Beryllium	4	11	µg/L	2	17.1	5.2	10.1	14.7	< 4.0	17
Cadmium		5	µg/L	2	2	2.0	< 4.0	< 4	< 4.0	< 4
Calcium			µg/L	7190	716000	168236.9	7190	57000	716000	623000
Chromium		50	µg/L	5	380	45.6	280	380	< 10	< 10
Cobalt		5	µg/L	25	25	25.0	< 50	< 50	< 50	< 50
Copper		200	µg/L	12.5	226	29.1	226	63.8	< 25	< 25
Iron		300	µg/L	50	5820	1443.4	299	1840	1670	1970
Lead		50	µg/L	2.5	15	5.2	< 5.0	7.7	< 10	8.6
Magnesium		35,000	µg/L	2500	89800	28570.0	< 5000	< 5000	89800	85400
Manganese		300	µg/L	7.5	1070	273.2	< 15	38.3	734	1040

Table 2.3-19—NMPNS Groundwater Data - Oswego Sandstone Formation

(Page 2 of 3)

Aquifer							**Oswego SS Trns.**	**Oswego SS Trns.**	**Oswego SS Trns.**	**Oswego SS Trns.**
Location							**BA107(MW)**	**BA107(MW)**	**BA111(MW)**	**BA111(MW)**
Date							**9/28/2007**	**12/3/2007**	**9/27/2007**	**12/3/2007**
	EPA Standard	**NY Standard**	**Units**	**Min**	**Max**	**Mean**	**57.7-67.7**	**57.7-67.7**	**74-84**	**74-84**
Mercury		0.7	µg/L	0.1	0.1	0.1	< 0.2	< 0.2	< 0.2	< 0.2
Mercury	2		µg/L				NT	NT	NT	NT
Nickel		100	µg/L	20	20	20.0	< 40	< 40	< 40	< 40
Potassium			µg/L	5060	849000	103642.5	112000	849000	96700	177000
Selenium		10	µg/L	5	50	10.2	38.1	10.5	< 100	< 10
Sodium		20,000	µg/L	24800	5020000	1337137.5	2160000	3540000	5020000	4570000
Thallium		8	µg/L	5	5	5.0	< 10	< 10	< 10	< 10
Vanadium		14	µg/L	15	1270	97.6	1270	82	< 30	< 30
Zinc	5000*		µg/L	10	114	25.3	< 20	< 20	< 20	114
Polychlorinated Biphenyls			µg/L				ND	NT	ND	NT
Inorganics			µg/L							
Alkalinity			µg/L	120000	4900000	994090.9	3440000	4900000	122000	120000
Alkalinity			µg/L	125000	379000	293400.0	NT	NT	NT	NT
Ammonia as Nitrogen		2,000	µg/L	650	12200	3550.0	NT	NT	NT	NT
Bicarbonate alkalinity as CaCO3			µg/L	125000	378000	271200.0	NT	NT	NT	NT
Biological Oxygen Demand			µg/L	1000	10900	5600.0	NT	NT	NT	NT
Bromide			µg/L	250	85300	17470.0	NT	NT	NT	NT
Chemical Oxygen Demand			µg/L	10000	138000	35600.0	NT	NT	NT	NT
Chloride		250,000	µg/L	51200	15500000	2637480.0	NT	4750000	15500000	9500000
Color		15	CU	2.5	10	7.5	NT	NT	NT	NT
Hardness			µg/L	86100	2050000	572020.0	NT	NT	NT	NT
Nitrate & Nitrite as N		10,000	µg/L	50	100	53.3	NT	< 100	< 100	< 100
Nitrogen, Nitrate		10,000	µg/L	55	55	55.0	NT	< 110	< 110	< 110
Nitrogen, Nitrite		1000	µg/L	5	93	10.9	NT	93	< 10	< 10
Nitrogen, Total Kjeldahl			µg/L	670	15000	4174.0	NT	NT	NT	NT

Table 2.3-19—NMPNS Groundwater Data - Oswego Sandstone Formation

(Page 3 of 3)

Aquifer							**Oswego SS Trns.**	**Oswego SS Trns.**	**Oswego SS Trns.**	**Oswego SS Trns.**
Location							**BA107(MW)**	**BA107(MW)**	**BA111(MW)**	**BA111(MW)**
Date							**9/28/2007**	**12/3/2007**	**9/27/2007**	**12/3/2007**
	EPA Standard	**NY Standard**	**Units**	**Min**	**Max**	**Mean**	**57.7-67.7**	**57.7-67.7**	**74-84**	**74-84**
pH		6.5 to 8.5	s.u.	7.38	9.55	7.8	NT	NT	NT	NT
Phosphate			µg/L	50	100	60.0	NT	NT	NT	NT
Silica, Dissolved			µg/L	6000	11000	9120.0	NT	NT	NT	NT
Sulfate		250,000	µg/L	2500	34800	10220.0	NT	< 5000	< 5000	< 5000
Total Dissolved Solids	500000*		µg/L	184000	17300000	4455750.0	7200000	9100000	16600000	17300000
Total Organic Carbon			µg/L	500	169000	13453.3	NT	169000	1200	< 1000
Total Organic Nitrogen			µg/L	200	2000	560.0	NT	NT	NT	NT
Total Phosphorous			µg/L	100	530	128.7	NT	530	< 200	< 200
Total Suspended Solids			µg/L	2000	55000	18400.0	NT	NT	NT	NT

Table 2.3-20—NMPNS Groundwater Data - Oswego Sandstone Formation - Continued

(Page 1 of 3)

Aquifer	Oswego SS Trns.	Oswego SS Trns.	Oswego SS Trns.	Oswego SS Trns.	Oswego SS	Oswego SS	Oswego SS	Oswego SS	Oswego SS
Location	**BA111(MW)**	**B202 (MW)**	**B202 (MW)**	**B202 (MW)**	**B217 (MW)**	**B902/217(MW)**	**B217 (MW)**	**B217 (MW)**	**B801/217(MW)**
Date	**3/5/2008**	**9/27/2007**	**12/3/2007**	**3/5/2008**	**9/27/2007**	**9/27/2007**	**12/3/2007**	**3/5/2008**	**3/5/2008**
	74-84	**19.8-29.8**	**19.8-29.8**	**19.8-29.8**	**28-48**	**28 - 48**	**28-48**	**28-48**	**28-48**
Volatile Organic Compounds (VOCs)	NT			NT				NT	NT
Acetone		< 5.0	< 5		< 5.0	< 5.0	< 5		
Benzene		< 0.50	< 0.5		< 0.50	< 0.50	< 0.5		
Butanone,2- (MEK)		< 5.0	< 5		< 5.0	< 5.0	< 5		
Chloroform		< 1.0	< 1		< 1.0	< 1.0	< 1		
Toluene		< 1.0	< 1		< 1.0	< 1.0	< 1		
Vinyl chloride		< 1.0	< 1		< 1.0	< 1.0	< 1		
Semi-Volatile Organic Compounds (SVOCs)	NT			NT				NT	NT
Benzoic acid		12.4	< 11		12.9	< 10	< 11		
Bis(2-ethylhexyl)phthalate		3.8	< 2.1		3.5	< 2.0	< 2.1		
Total Petroleum Hydrocarbons	NT	ND	NT	NT	ND	ND	NT	NT	NT
Cyanides	NT	ND	NT	NT	ND	ND	NT	NT	NT
Metals									
Aluminum	1650	5180	918	260	1250	2290	< 200	< 200	< 200
Arsenic	35.3	14.6	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Barium	8770	< 200	206	< 200	308	316	478	455	449
Beryllium	17.1	< 4.0	< 4	< 4.0	< 4.0	< 4.0	< 4	< 4.0	< 4.0
Cadmium	< 4.0	< 4.0	< 4	< 4.0	< 4.0	< 4.0	< 4	< 4.0	< 4.0
Calcium	612000	25600	24700	19400	46700	41600	71600	67200	66000
Chromium	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Cobalt	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Copper	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25
Iron	3090	5820	1450	357	1840	2630	378	491	432
Lead	8.7	15	< 5	< 5.0	6.5	5.5	< 5	< 5.0	< 5.0
Magnesium	86700	10100	7190	6330	11600	11100	16000	15100	14900

Table 2.3-20—NMPNS Groundwater Data - Oswego Sandstone Formation - Continued

(Page 2 of 3)

Aquifer	Oswego SS Trns.	Oswego SS Trns.	Oswego SS Trns.	Oswego SS Trns.	Oswego SS	Oswego SS	Oswego SS	Oswego SS	Oswego SS
Location	**BA111(MW)**	**B202 (MW)**	**B202 (MW)**	**B202 (MW)**	**B217 (MW)**	**B902/217(MW)**	**B217 (MW)**	**B217 (MW)**	**B801/217(MW)**
Date	**3/5/2008**	**9/27/2007**	**12/3/2007**	**3/5/2008**	**9/27/2007**	**9/27/2007**	**12/3/2007**	**3/5/2008**	**3/5/2008**
	74-84	**19.8-29.8**	**19.8-29.8**	**19.8-29.8**	**28-48**	**28 - 48**	**28-48**	**28-48**	**28-48**
Manganese	1070	124	35.3	< 15	97.1	113	127	117	115
Mercury	< 0.20	< 0.2	< 0.2	< 0.20	< 0.2	< 0.2	< 0.2	< 0.20	< 0.20
Mercury	NT	NT	NT	NT	NT	NT	NT	NT	NT
Nickel	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Potassium	165000	85300	20700	45900	17000	17600	17100	16000	15900
Selenium	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Sodium	4750000	214000	193000	193000	137000	150000	132000	118000	116000
Thallium	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Vanadium	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30	< 30
Zinc	< 20	37.9	< 20	< 20	39.1	33.1	< 20	< 20	< 20
Polychlorinated Biphenyls	NT	ND	NT	NT	ND	ND	NT	NT	NT
Inorganics									
Alkalinity	NT	292000	269000	NT	318000	333000	397000	NT	NT
Alkalinity	125000	NT	NT	348000	NT	NT	NT	379000	369000
Ammonia as Nitrogen	12200	NT	NT	1500	NT	NT	NT	1700	1700
Bicarbonate alkalinity as CaCO3	125000	NT	NT	240000	NT	NT	NT	378000	368000
Biological Oxygen Demand	< 2000	NT	NT	5200	NT	NT	NT	7900	10900
Bromide	85300	NT	NT	1300	NT	NT	NT	< 500	< 500
Chemical Oxygen Demand	138000	NT	NT	< 20000	NT	NT	NT	< 20000	< 20000
Chloride	8500000	230000	207000	120000	190000	115000	76500	71000	74000
Color	10	NT	NT	10	NT	NT	NT	10	5
Hardness	2050000	NT	NT	86100	NT	NT	NT	219000	221000
Nitrate & Nitrite as N	< 100	< 100	< 100	< 100	100	< 100	< 100	< 100	< 100
Nitrogen, Nitrate	< 110	< 110	< 110	< 110	< 110	< 110	< 110	< 110	< 110
Nitrogen, Nitrite	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Nitrogen, Total Kjeldahl	15000	NT	NT	1400	NT	NT	NT	1900	1900

Table 2.3-20—NMPNS Groundwater Data - Oswego Sandstone Formation - Continued

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Aquifer	Oswego SS Trns.	Oswego SS Trns.	Oswego SS Trns.	Oswego SS Trns.	Oswego SS	Oswego SS	Oswego SS	Oswego SS	Oswego SS
Location	**BA111(MW)**	**B202 (MW)**	**B202 (MW)**	**B202 (MW)**	**B217 (MW)**	**B902/217(MW)**	**B217 (MW)**	**B217 (MW)**	**B801/217(MW)**
Date	**3/5/2008**	**9/27/2007**	**12/3/2007**	**3/5/2008**	**9/27/2007**	**9/27/2007**	**12/3/2007**	**3/5/2008**	**3/5/2008**
	74-84	**19.8-29.8**	**19.8-29.8**	**19.8-29.8**	**28-48**	**28 - 48**	**28-48**	**28-48**	**28-48**
pH	7.38	NT	NT	9.55	NT	NT	NT	7.43	7.44
Phosphate	< 100	NT	NT	< 100	NT	NT	NT	100	< 100
Silica, Dissolved	6000	NT	NT	8300	NT	NT	NT	11000	11000
Sulfate	< 5000	12100	< 5000	5400	10700	5300	< 5000	9900	10700
Total Dissolved Solids	13800000	560000	615000	549000	2160000	563000	550000	515000	520000
Total Organic Carbon	1400	2600	< 1000	1400	2100	9800	1100	2500	2800
Total Organic Nitrogen	< 4000	NT	NT	< 400	NT	NT	NT	< 400	< 400
Total Phosphorous	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200
Total Suspended Solids	55000	NT	NT	31000	NT	NT	NT	< 4000	< 4000

Table 2.3-21—NMPNS Groundwater Data - Oswego Sandstone Formation - Continued
(Page 1 of 2)

Aquifer	Oswego SS	Oswego SS	Oswego SS
Location	B236 (MW)	B236 (MW)	B236 (MW)
Date	9/27/2007	12/3/2007	3/6/2008
	24.7-34.7	24.7-34.7	24.7-34.7
Volatile Organic Compounds (VOCs)			NT
Acetone	< 5.0	< 5	
Benzene	< 0.50	< 0.5	
Butanone,2- (MEK)	< 5.0	< 5	
Chloroform	< 1.0	< 1	
Toluene	< 1.0	< 1	
Vinyl chloride	< 1.0	< 1	
Semi-Volatile Organic Compounds (SVOCs)			NT
Benzoic acid	12.9	< 11	
Bis(2-ethylhexyl)phthalate	3.2	< 2.1	
Total Petroleum Hydrocarbons	ND	NT	NT
Cyanides	ND	NT	NT
Metals			
Aluminum	322	< 200	< 200
Arsenic	< 10	< 10	< 10
Barium	864	757	519
Beryllium	< 4.0	< 4	< 4.0
Cadmium	< 4.0	< 4	< 4.0
Calcium	119000	112000	82800
Chromium	< 10	< 10	< 10
Cobalt	< 50	< 50	< 50
Copper	< 25	< 25	< 25
Iron	410	367	< 100
Lead	5.5	< 5	< 5.0
Magnesium	37300	35000	25600
Manganese	269	276	200
Mercury	< 0.2	< 0.2	< 0.20
Mercury	NT	NT	NT
Nickel	< 40	< 40	< 40
Potassium	10400	7620	5060
Selenium	< 10	< 10	< 10
Sodium	41000	35400	24800
Thallium	< 10	< 10	< 10
Vanadium	< 30	< 30	< 30
Zinc	59.9	< 20	20.1
Polychlorinated Biphenyls	ND	NT	NT
Inorganics			
Alkalinity	394000	350000	NT
Alkalinity	NT	NT	246000
Ammonia as Nitrogen	NT	NT	650
Bicarbonate alkalinity as CaCO3	NT	NT	245000
Biological Oxygen Demand	NT	NT	3000
Bromide	NT	NT	< 500
Chemical Oxygen Demand	NT	NT	< 20000
Chloride	90000	87500	51200

Table 2.3-21—NMPNS Groundwater Data - Oswego Sandstone Formation - Continued

(Page 2 of 2)

Aquifer	Oswego SS	Oswego SS	Oswego SS
Location	B236 (MW)	B236 (MW)	B236 (MW)
Date	9/27/2007	12/3/2007	3/6/2008
	24.7-34.7	24.7-34.7	24.7-34.7
Color	NT	NT	< 5.0
Hardness	NT	NT	284000
Nitrate & Nitrite as N	< 100	< 100	< 100
Nitrogen, Nitrate	< 110	< 110	< 110
Nitrogen, Nitrite	< 10	< 10	< 10
Nitrogen, Total Kjeldahl	NT	NT	670
pH	NT	NT	7.42
Phosphate	NT	NT	< 100
Silica, Dissolved	NT	NT	9300
Sulfate	14700	34800	34700
Total Dissolved Solids	570000	506000	184000
Total Organic Carbon	2700	1800	2400
Total Organic Nitrogen	NT	NT	< 400
Total Phosphorous	< 200	< 200	< 200
Total Suspended Solids	NT	NT	< 4000

Note:

* EPA Secondary Drinking Water Standard
** NY State GW Effluent Limitations for GA Class Waters
Analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
"<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
NT = The sample was not tested for this analyte.
ND = The analyte was not detected above the laboratory reporting limit. See the laboratory data sheets for the laboratory reporting limit.
µg/L = micrograms per liter; s.u. - standard unit; CU = Colorimetric Unit; ft = feet
For results less than the detection limit 1/2 the detection limit was used to calculate min, max, and mean

Table 2.3-22—NMPNS Groundwater Data - Pulaski Formation

(Page 1 of 2)

Aquifer							Pulaski B	Pulaski B	Pulaski B	Pulaski B
Location							**BA102 (MW)**	**BA102 (MW)**	**BA102 (MW)**	**BA117 (MW)**
Date							**9/27/2007**	**12/3/2007**	**3/5/2008**	**9/27/2007**
	EPA Standard	**NY Standard**	**Units**	**Min**	**Max**	**Mean**	**106-124**	**106-124**	**106-124**	**145-165**
Volatile Organic Compounds (VOCs)			µg/L						NT	
Acetone		50*	µg/L	2.5	31	9.1	17.8	17.4		< 5.0
Benzene		1	µg/L	0.25	0.99	0.35	< 0.50	0.99		< 0.50
Butanone,2- (MEK)		50*	µg/L	2.5	2.5	2.5	< 5.0	< 5		< 5.0
Chloroform		7	µg/L	0.5	0.5	0.5	< 1.0	< 1		< 1.0
Toluene		5	µg/L	0.5	11.1	1.7	< 1.0	< 1		< 1.0
Vinyl chloride		2	µg/L	0.5	0.5	0.5	< 1.0	< 1		< 1.0
Semi-Volatile Organic Compounds (SVOCs)			µg/L						NT	
Benzoic acid		NS	µg/L	5	22.6	11.8	< 11	< 11		12.1
Bis(2-ethylhexyl)phthalate		5	µg/L	1.05	3.8	2.0	< 2.2	< 2.2		3.7
Total Petroleum Hydrocarbons			µg/L				ND	NT	NT	ND
Cyanides		200	µg/L				ND	NT	NT	ND
Metals			µg/L							
Aluminum		NS	µg/L	100	31200	3361.6	31200	4390	7190	324
Arsenic	10	25	µg/L	5	102	52.7	60.8	84.6	33.9	< 10
Barium		1,000	µg/L	1270	102000	35470.6	47400	7820	5450	1370
Beryllium	4	3*	µg/L	2	46	21.3	< 20	34.8	15.4	< 4.0
Cadmium		5	µg/L	2	20	4.8	< 20	< 8	< 4.0	< 4.0
Calcium		NS	µg/L	34700	5000000	2391056.3	4130000	3580000	1670000	34700
Chromium		50	µg/L	5	276	43.0	< 50	28.2	20.8	< 10
Cobalt		5	µg/L	25	250	59.4	< 250	< 100	< 50	< 50
Copper		200	µg/L	12.5	125	30.0	< 130	< 50	< 25	< 25
Iron		300	µg/L	50	20700	3593.4	20700	3850	3690	330
Lead		25	µg/L	2.5	184	25.0	< 25	20.8	12.1	< 5.0
Magnesium		35,000*	µg/L	2500	686000	260481.9	575000	118000	28600	14800
Manganese		300	µg/L	7.5	4500	1655.5	2750	247	196	< 15
Mercury		0.7	µg/L	0.1	0.1	0.1	< 0.2	< 0.2	< 0.20	< 0.2
Mercury	2	0.7	µg/L				NT	NT	NT	NT
Nickel		100	µg/L	20	200	47.5	< 200	< 80	< 40	< 40
Potassium		NS	µg/L	116000	1150000	423687.5	323000	682000	252000	116000

Table 2.3-22—NMPNS Groundwater Data - Pulaski Formation

(Page 2 of 2)

Aquifer							Pulaski B	Pulaski B	Pulaski B	Pulaski B
Location							**BA102 (MW)**	**BA102 (MW)**	**BA102 (MW)**	**BA117 (MW)**
Date							**9/27/2007**	**12/3/2007**	**3/5/2008**	**9/27/2007**
	EPA Standard	**NY Standard**	**Units**	**Min**	**Max**	**Mean**	**106-124**	**106-124**	**106-124**	**145-165**
Selenium		10	µg/L	5	500	99.7	< 1000	< 20	< 10	< 10
Sodium		20,000	µg/L	3460000	19700000	9470625.0	17600000	10600000	4080000	3460000
Thallium		0.5*	µg/L	5	50	12.8	< 50	25.3	< 10	< 10
Vanadium		NS	µg/L	15	150	35.6	< 150	< 60	< 30	< 30
Zinc	5000*	2000	µg/L	10	176	42.2	176	< 40	29.2	27.5
Polychlorinated Biphenyls			µg/L	0	0		ND	NT	NT	ND
Inorganics			µg/L	0	0					
Alkalinity		NS	µg/L	39400	4350000	1228066.7	243000	788000	NT	198000
Alkalinity		NS	µg/L	44500	2620000	873280.0	NT	NT	1380000	NT
Ammonia as Nitrogen		2,000	µg/L	8000	49600	25980.0	NT	NT	12700	NT
Bicarbonate alkalinity as CaCO3		NS	µg/L	7100	51900	26620.0	NT	NT	7400	NT
Biological Oxygen Demand		NS	µg/L	1000	14600	5380.0	NT	NT	9300	NT
Bromide		NS	µg/L	48000	370000	182040.0	NT	NT	81100	NT
Chemical Oxygen Demand		NS	µg/L	155000	1480000	585200.0	NT	NT	282000	NT
Chloride		250,000	µg/L	4300000	44000000	20609375.0	37000000	22000000	13000000	5850000
Color		15	CU	2.5	25	11.5	NT	NT	15	NT
Hardness		NS	µg/L	128000	13500000	6799600.0	NT	NT	4330000	NT
Nitrate & Nitrite as N		10,000	µg/L	50	790	128.2	790	230	320	< 100
Nitrogen, Nitrate		10,000	µg/L	55	770	129.1	770	190	320	< 110
Nitrogen, Nitrite		1000	µg/L	5	44	11.6	25	44	< 10	< 10
Nitrogen, Total Kjeldahl		NS	µg/L	13200	51000	33180.0	NT	NT	13200	NT
pH		6.5 to 8.5	s.u.	6.72	9.55	7.8	NT	NT	7.46	NT
Phosphate		NS	µg/L	50	50	50.0	NT	NT	< 100	NT
Silica, Dissolved		NS	µg/L	1000	5800	3220.0	NT	NT	< 2000	NT
Sulfate		250,000	µg/L	2500	99800	12487.5	22200	99800	28200	< 5000
Total Dissolved Solids	500000*	500,000	µg/L	8600000	79300000	35221250.0	66200000	38900000	17700000	11300000
Total Organic Carbon			µg/L	500	27500	5393.8	2200	4300	3800	5500
Total Organic Nitrogen			µg/L	2000	31000	9200.0	NT	NT	< 4000	NT
Total Phosphorous			µg/L	100	500	196.3	470	250	< 200	< 200
Total Suspended Solids			µg/L	2000	341000	105000.0	NT	NT	341000	NT

Table 2.3-22—NMPNS Groundwater Data - Pulaski Formation - Continued

(Page 1 of 2)

Aquifer	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B
Location	**BA117 (MW)**	**B802/117 (MW)**	**BA117 (MW)**	**B208 (MW)**	**B208 (MW)**	**B208 (MW)**	**B219 (MW)A**
Date	**12/3/2007**	**12/3/2007**	**3/5/2008**	**9/27/2007**	**12/3/2007**	**3/6/2008**	**9/27/2007**
	145-165	**145-165**	**145-165**	**138-148**	**138-148**	**138-148**	**130-145**
Volatile Organic Compounds (VOCs)			NT			NT	
Acetone	< 5	10.1		< 5.0	< 5		31
Benzene	< 0.5	< 0.5		< 0.50	< 0.5		0.59
Butanone,2- (MEK)	< 5	< 5		< 5.0	< 5		< 5.0
Chloroform	< 1	< 1		< 1.0	< 1		< 1.0
Toluene	3.1	11.1		< 1.0	< 1		< 1.0
Vinyl chloride	< 1	< 1		< 1.0	< 1		< 1.0
Semi-Volatile Organic Compounds (SVOCs)			NT			NT	
Benzoic acid	15.6	16.7		< 10	< 11		22.6
Bis(2-ethylhexyl)phthalate	< 2.1	< 2.2		3.6	< 2.1		3.8
Total Petroleum Hydrocarbons	NT	NT	NT	ND	NT	NT	ND
Cyanides	NT	NT	NT	ND	NT	NT	ND
Metals							
Aluminum	680	872	< 200	< 2000	< 600	< 2000	3540
Arsenic	38.2	41.6	29.2	< 100	99.3	89.3	16.5
Barium	1690	1870	1270	102000	75100	77900	3760
Beryllium	13.8	14.5	13.9	< 40	44.3	42	< 4.0
Cadmium	< 4	< 4	< 4.0	< 40	< 8	< 8.0	< 4.0
Calcium	67000	72900	37300	5000000	4130000	4160000	517000
Chromium	< 10	< 10	< 10	< 100	< 20	< 20	276
Cobalt	< 50	< 50	< 50	< 500	< 100	< 100	< 50
Copper	< 25	< 25	< 25	< 250	< 50	< 50	< 25
Iron	1210	1390	< 100	4260	1320	770	4340
Lead	9.5	9.5	7.3	< 50	19.5	16.6	184
Magnesium	13400	13500	6910	686000	529000	544000	< 5000
Manganese	50.8	56	< 15	4320	4500	4110	88.6
Mercury	< 0.2	< 0.2	< 0.20	< 0.2	< 0.2	< 0.20	< 0.2
Mercury	NT	NT	NT	NT	NT	NT	NT
Nickel	< 40	< 40	< 40	< 400	< 80	< 80	< 40
Potassium	200000	208000	185000	306000	421000	463000	1150000
Selenium	< 10	< 10	< 10	< 1000	< 20	< 20	< 20

Table 2.3-22—NMPNS Groundwater Data - Pulaski Formation - Continued

(Page 2 of 2)

Aquifer	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B
Location	**BA117 (MW)**	**B802/117 (MW)**	**BA117 (MW)**	**B208 (MW)**	**B208 (MW)**	**B208 (MW)**	**B219 (MW)A**
Date	**12/3/2007**	**12/3/2007**	**3/5/2008**	**9/27/2007**	**12/3/2007**	**3/6/2008**	**9/27/2007**
	145-165	**145-165**	**145-165**	**138-148**	**138-148**	**138-148**	**130-145**
Sodium	3520000	3490000	3550000	19700000	14800000	13400000	4420000
Thallium	< 10	< 10	< 10	< 100	< 20	< 20	< 10
Vanadium	< 30	< 30	< 30	< 300	< 60	< 60	< 30
Zinc	< 20	< 20	< 20	< 200	< 40	< 40	58.8
Polychlorinated Biphenyls	NT	NT	NT	ND	NT	NT	ND
Inorganics							
Alkalinity	514000	509000	NT	39400	58300	NT	4350000
Alkalinity	NT	NT	270000	NT	NT	44500	NT
Ammonia as Nitrogen	NT	NT	49600	NT	NT	8000	NT
Bicarbonate alkalinity as CaCO3	NT	NT	22300	NT	NT	44400	NT
Biological Oxygen Demand	NT	NT	< 2000	NT	NT	< 2000	NT
Bromide	NT	NT	48000	NT	NT	370000	NT
Chemical Oxygen Demand	NT	NT	269000	NT	NT	1480000	NT
Chloride	6200000	7500000	5400000	44000000	34000000	37000000	5700000
Color	NT	NT	< 5.0	NT	NT	10	NT
Hardness	NT	NT	128000	NT	NT	12600000	NT
Nitrate & Nitrite as N	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Nitrogen, Nitrate	< 110	< 110	< 110	< 120	< 120	< 120	< 110
Nitrogen, Nitrite	< 10	< 10	< 10	< 20	< 20	< 20	12
Nitrogen, Total Kjeldahl	NT	NT	51000	NT	NT	39000	NT
pH	NT	NT	7.93	NT	NT	7.22	NT
Phosphate	NT	NT	< 100	NT	NT	< 100	NT
Silica, Dissolved	NT	NT	5800	NT	NT	4000	NT
Sulfate	< 5000	< 5000	< 5000	< 5000	14800	7300	< 5000
Total Dissolved Solids	9600000	8600000	9240000	79300000	56000000	57600000	14300000
Total Organic Carbon	< 1000	2200	1700	< 1000	4300	3400	27500
Total Organic Nitrogen	NT	NT	< 11000	NT	NT	31000	NT
Total Phosphorous	< 200	< 200	< 200	< 200	200	< 1000	< 200
Total Suspended Solids	NT	NT	< 4000	NT	NT	74000	NT

Table 2.3-23—NMPNS Groundwater Data - Pulaski Formation Continued

(Page 1 of 3)

Aquifer	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B
Location	**B219 (MW)B**	**B219 (MW)**	**B219 (MW)**	**B235 (MW)**	**B235 (MW)**	**B235 (MW)**
Date	**9/28/2007**	**12/3/2007**	**3/6/2008**	**9/27/2007**	**12/3/2007**	**3/6/2008**
	130-145	**130-145**	**130-145**	**138-148**	**138-148**	**138-148**
Volatile Organic Compounds (VOCs)	NT		NT			NT
Acetone		8.3		< 5.0	< 5	
Benzene		< 0.5		< 0.50	< 0.5	
Butanone,2- (MEK)		< 5		< 5.0	< 5	
Chloroform		< 1		< 1.0	< 1	
Toluene		< 1		< 1.0	< 1	
Vinyl chloride		< 1		< 1.0	< 1	
Semi-Volatile Organic Compounds (SVOCs)	NT		NT			NT
Benzoic acid		14.9		12.8	13.6	
Bis(2-ethylhexyl)phthalate		< 2.1		3.3	< 2.1	
Total Petroleum Hydrocarbons	NT	NT	NT	ND	NT	NT
Cyanides	NT	NT	NT	ND	NT	NT
Metals	NT					
Aluminum		< 200	< 200	1790	< 400	< 2000
Arsenic		36.8	32.5	< 50	102	97.8
Barium		4890	6410	72000	81500	77100
Beryllium		14.6	14.8	< 20	46	43.4
Cadmium		< 4	< 4.0	< 20	< 8	< 8.0
Calcium		998000	1380000	3690000	4530000	4260000
Chromium		143	60	< 50	< 20	< 20
Cobalt		< 50	< 50	< 250	< 100	< 100
Copper		< 25	< 25	< 130	< 50	< 50
Iron		108	307	5410	4980	4780
Lead		9.6	8.7	< 50	19.8	18.1
Magnesium		< 5000	< 5000	535000	550000	546000
Manganese		< 15	< 15	3220	3490	3430
Mercury		< 0.2	< 0.20	< 0.2	< 0.2	< 0.20

Table 2.3-23—NMPNS Groundwater Data - Pulaski Formation Continued

(Page 2 of 3)

Aquifer	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B
Location	**B219 (MW)B**	**B219 (MW)**	**B219 (MW)**	**B235 (MW)**	**B235 (MW)**	**B235 (MW)**
Date	**9/28/2007**	**12/3/2007**	**3/6/2008**	**9/27/2007**	**12/3/2007**	**3/6/2008**
	130-145	**130-145**	**130-145**	**138-148**	**138-148**	**138-148**
Mercury		NT	NT	NT	NT	NT
Nickel		< 40	< 40	< 200	< 80	< 80
Potassium		722000	396000	245000	602000	508000
Selenium		< 10	< 10	< 1000	< 20	< 20
Sodium		3490000	3620000	15700000	16000000	14100000
Thallium		< 10	< 10	< 50	< 20	< 20
Vanadium		< 30	< 30	< 150	< 60	< 60
Zinc		< 20	< 20	134	< 40	< 40
Polychlorinated Biphenyls	NT	NT	NT	ND	NT	NT
Inorganics						
Alkalinity	4310000	3590000	NT	78800	58300	NT
Alkalinity	NT	NT	2620000	NT	NT	51900
Ammonia as Nitrogen	NT	NT	19700	NT	NT	39900
Bicarbonate alkalinity as CaCO3	NT	NT	7100	NT	NT	51900
Biological Oxygen Demand	NT	NT	14600	NT	NT	< 2000
Bromide	NT	NT	54100	NT	NT	357000
Chemical Oxygen Demand	NT	NT	155000	NT	NT	740000
Chloride	NT	4300000	6300000	32500000	36500000	32500000
Color	NT	NT	5	NT	NT	25
Hardness	NT	NT	3440000	NT	NT	13500000
Nitrate & Nitrite as N	190	< 100	< 100	< 100	< 100	< 100
Nitrogen, Nitrate	170	< 110	< 110	< 120	< 120	< 120
Nitrogen, Nitrite	22	< 10	< 10	< 20	< 20	< 20
Nitrogen, Total Kjeldahl	NT	NT	19900	NT	NT	42800
pH	NT	NT	9.55	NT	NT	6.72
Phosphate	NT	NT	< 100	NT	NT	< 100
Silica, Dissolved	NT	NT	< 2000	NT	NT	4300

Table 2.3-23—NMPNS Groundwater Data - Pulaski Formation Continued

(Page 3 of 3)

Aquifer	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B	Pulaski B
Location	**B219 (MW)B**	**B219 (MW)**	**B219 (MW)**	**B235 (MW)**	**B235 (MW)**	**B235 (MW)**
Date	**9/28/2007**	**12/3/2007**	**3/6/2008**	**9/27/2007**	**12/3/2007**	**3/6/2008**
	130-145	**130-145**	**130-145**	**138-148**	**138-148**	**138-148**
Sulfate	NT	< 5000	< 5000	< 5000	< 5000	< 5000
Total Dissolved Solids	NT	9800000	13800000	57600000	51000000	62600000
Total Organic Carbon	NT	6500	15700	1200	2400	4600
Total Organic Nitrogen	NT	NT	< 5000	NT	NT	< 10000
Total Phosphorous	NT	< 200	< 200	< 200	220	< 1000
Total Suspended Solids	NT	NT	45000	NT	NT	63000

Note:

* EPA Secondary Drinking Water Standard
** NY State GW Effluent Limitations for GA Class Waters
Analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
"<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
NT = The sample was not tested for this analyte.
ND = The analyte was not detected above the laboratory reporting limit. See the laboratory data sheets for the laboratory reporting limit.
μg/L = micrograms per liter; s.u. - standard unit; CU = Colorimetric Unit; ft = feet
For results less than the detection limit 1/2 the detection limit was used to calculate min, max, and mean

Table 2.3-24—NMPNS Groundwater Data - Whetstone Gulf Formation

(Page 1 of 3)

Aquifer							Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A
Location							**BA106(MW)A**	**BA106(MW)B**	**BA106(MW)**
Date							**9/27/2007**	**9/28/2007**	**12/3/2007**
	EPA Standard	**NY Standard**	**Units**	**Min**	**Max**	**Mean**	**172-192**	**172-192**	**172-192**
Volatile Organic Compounds (VOCs)			µg/L					NT	
Acetone		50*		2.5	101	46.6	< 5.0		38.1
Benzene		1		0.25	1.7	0.8	< 0.50		< 0.5
Butanone,2- (MEK)		50*		2.5	18.4	4.7	< 5.0		< 5
Chloroform		7		0.5	3.2	0.9	< 1.0		< 1
Toluene		5		0.5	3.6	0.8	< 1.0		< 1
Vinyl chloride		2		0.5	3.4	0.8	3.4		< 1
Semi-Volatile Organic Compounds (SVOCs)			µg/L				NT		
Benzoic acid		NS		5.5	20.8	12.7		14.6	16.2
Bis(2-ethylhexyl)phthalate		5		1.05	12	3.9		4.6	< 2.1
Total Petroleum Hydrocarbons			µg/L				ND	NT	NT
Cyanides		200	µg/L				ND	NT	NT
Metals			µg/L					NT	
Aluminum		NS		400	2090000	199145.5	303000		< 1600
Arsenic	10	25		5	1280	227.8	290		460
Barium		1,000		772	572000	147278.8	538000		547000
Beryllium	4	3*		2	255	62.2	< 40		179
Cadmium		5		2	91.9	16.2	61.2		< 32
Calcium		NS		281000	28300000	9776933.3	27100000		27800000
Chromium		50		11.2	3960	414.3	369		< 80
Cobalt		5		25	1490	216.2	536		< 400
Copper		200		12.5	4740	449.6	307		< 200
Iron		300		159	3460000	320883.3	417000		8530
Lead		25		2.5	697	108.4	< 500		66
Magnesium		35,000 *		2500	3880000	1043695.3	3110000		2890000

Table 2.3-24—NMPNS Groundwater Data - Whetstone Gulf Formation

(Page 2 of 3)

Aquifer							Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A
Location							**BA106(MW)A**	**BA106(MW)B**	**BA106(MW)**
Date							**9/27/2007**	**9/28/2007**	**12/3/2007**
	EPA Standard	**NY Standard**	**Units**	**Min**	**Max**	**Mean**	**172-192**	**172-192**	**172-192**
Manganese		300		7.5	109000	14037.7	29400		21900
Mercury		0.7		0.1	2.4	0.3	NT		< 0.2
Mercury	2	0.7		0.1	0.1		< 0.20		NT
Nickel		100		20	3190	342.7	416		< 320
Potassium		NS		62200	2110000	1066480.0	833000		1730000
Selenium		10		5	1000	96.3	< 2000		< 80
Sodium		20,000		38000	58900000	22363200.0	49900000		57500000
Thallium		0.5*		5	250	40.2	< 100		< 80
Vanadium		NS		15	3040	316.4	452		< 240
Zinc	5000*	2,000*		10	9360	887.7	1530		< 160
Polychlorinated Biphenyls			µg/L				ND	NT	NT
Inorganics								NT	
Alkalinity		NS	µg/L	26500	4800000	1999110.0	26500		81600
Alkalinity		NS	µg/L	13800	2440000	1562760.0	NT		NT
Ammonia as Nitrogen		2,000	µg/L	470	408000	138214.0	NT		NT
Bicarbonate alkalinity as CaCO3		NS	µg/L	2500	1290000	273160.0	NT		NT
Biological Oxygen Demand		NS	µg/L	11200	31900	23180.0	NT		NT
Bromide		NS	µg/L	250	1920000	799650.0	NT		NT
Chemical Oxygen Demand		NS	µg/L	22300	2250000	981460.0	NT		NT
Chloride		250,000	µg/L	21700	160000000	60594780.0	160000000		152000000
Color		15	CU	10	10	10.0	NT		NT
Hardness		NS	µg/L	2050000	79700000	32262000.0	NT		NT
Nitrate & Nitrite as N		10,000	µg/L	50	700	226.0	190		< 100
Nitrogen, Nitrate		10,000	µg/L	55	560	200.0	< 150		< 180
Nitrogen, Nitrite		1000	µg/L	5	140	51.7	89		< 80
Nitrogen, Total Kjeldahl		NS	µg/L	1100	430000	173620.0	NT		NT
pH		6.5 to 8.5	s.u.	6.66	9.81	8.1	NT		NT

Table 2.3-24—NMPNS Groundwater Data - Whetstone Gulf Formation

(Page 3 of 3)

Aquifer							**Whetstone Gulf A**	**Whetstone Gulf A**	**Whetstone Gulf A**
Location							**BA106(MW)A**	**BA106(MW)B**	**BA106(MW)**
Date							**9/27/2007**	**9/28/2007**	**12/3/2007**
	EPA Standard	**NY Standard**	**Units**	**Min**	**Max**	**Mean**	**172-192**	**172-192**	**172-192**
Phosphate		NS	µg/L	50	14900	3110.0	NT		NT
Silica, Dissolved		NS	µg/L	1000	5800	2220.0	NT		NT
Sulfate		250,000	µg/L	2500	58300	9540.0	< 5000		< 5000
Total Dissolved Solids	500000*	500,000	µg/L	2260000	513000000	126482000.0	368000000		286000000
Total Organic Carbon		NS	µg/L	3400	32900	18333.3	28700		31400
Total Organic Nitrogen		NS	µg/L	630	149000	50926.0	NT		NT
Total Phosphorous		NS	µg/L	100	75000	8323.3	8600		1200
Total Suspended Solids		NS	µg/L	27000	52100000	10701400.0	NT		NT

Table 2.3-25—NMPNS Groundwater Data - Whetstone Gulf Formation - Continued

(Page 1 of 3)

Aquifer	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A
Location	**BA106(MW)**	**BA110(MW)A**	**BA110 (MW)**	**BA110(MW)**	**BA110(MW)**	**BA216(MW)**	**BA216(MW)**
Date	**3/6/2008**	**9/27/2007**	**9/28/2007**	**12/3/2007**	**3/6/2008**	**9/27/2007**	**12/3/2007**
	172-192	**204.2-224.2**	**204.2-224.2**	**204.2-224.2**	**204.2-224.2**	**184-204**	**184-204**
Volatile Organic Compounds (VOCs)	NT		NT		NT		
Acetone		62.8		62.4		101	73.1
Benzene		0.98		1.7		0.63	1.5
Butanone,2- (MEK)		< 5.0		18.4		< 5.0	8.3
Chloroform		< 1.0		< 1		< 1.0	< 1
Toluene		< 1.0		< 1		< 1.0	< 1
Vinyl chloride		< 1.0		< 1		< 1.0	< 1
Semi-Volatile Organic Compounds (SVOCs)	NT	NT			NT		
Benzoic acid			< 11	14.8		15.6	< 11
Bis(2-ethylhexyl)phthalate			3.7	< 2.2		5.2	< 2.1
Total Petroleum Hydrocarbons	NT	ND	NT	NT	NT	ND	NT
Cyanides	NT	ND	NT	NT	NT	ND	NT
Metals			NT				
Aluminum	< 10000	166000		204000	7990	165000	16900
Arsenic	345	86.5		206	111	87	252
Barium	572000	3420		87700	62900	3420	203000
Beryllium	136	< 20		55.2	46.7	< 20	104
Cadmium	< 20	< 20		16.5	< 8.0	< 20	< 20
Calcium	28300000	586000		5950000	4790000	584000	12700000
Chromium	< 50	398		396	52.6	397	< 50
Cobalt	264	< 250		153	< 100	< 250	< 250
Copper	329	287		382	< 50	280	< 130
Iron	2340	301000		250000	11800	299000	29100
Lead	66.3	142		89.2	22	146	46.9
Magnesium	2980000	133000		518000	83800	133000	1040000
Manganese	25400	5560		6320	280	5480	1550
Mercury	< 0.20	0.28		0.37	< 0.20	0.24	< 0.2

Table 2.3-25—NMPNS Groundwater Data - Whetstone Gulf Formation - Continued

(Page 2 of 3)

Aquifer	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A
Location	**BA106(MW)**	**BA110(MW)A**	**BA110 (MW)**	**BA110(MW)**	**BA110(MW)**	**BA216(MW)**	**BA216(MW)**
Date	**3/6/2008**	**9/27/2007**	**9/28/2007**	**12/3/2007**	**3/6/2008**	**9/27/2007**	**12/3/2007**
	172-192	**204.2-224.2**	**204.2-224.2**	**204.2-224.2**	**204.2-224.2**	**184-204**	**184-204**
Mercury	NT	NT		NT	NT	NT	NT
Nickel	< 200	334		326	< 80	335	< 200
Potassium	1680000	461000		2010000	2110000	462000	1860000
Selenium	< 50	< 50		< 20	< 20	< 50	< 50
Sodium	58900000	3830000		18300000	19800000	3340000	32900000
Thallium	< 50	< 50		27.8	20.5	< 50	80.1
Vanadium	< 150	297		259	< 60	293	< 150
Zinc	< 100	626		505	47.1	631	< 100
Polychlorinated Biphenyls	NT	ND	NT	NT	NT	ND	NT
Inorganics			NT				
Alkalinity	NT	1790000		4800000	NT	1390000	863000
Alkalinity	13800	NT		NT	2440000	NT	NT
Ammonia as Nitrogen	119000	NT		NT	408000	NT	NT
Bicarbonate alkalinity as CaCO3	13800	NT		NT	44400	NT	NT
Biological Oxygen Demand	11200	NT		NT	30500	NT	NT
Bromide	1920000	NT		NT	411000	NT	NT
Chemical Oxygen Demand	1240000	NT		NT	969000	NT	NT
Chloride	155000000	12500000		40500000	46000000	7500000	75500000
Color	10	NT		NT	10	NT	NT
Hardness	79700000	NT		NT	12800000	NT	NT
Nitrate & Nitrite as N	410	540		< 100	300	340	< 100
Nitrogen, Nitrate	410	480		< 110	270	340	< 140
Nitrogen, Nitrite	< 80	57		95	31	< 10	< 40
Nitrogen, Total Kjeldahl	120000	NT		NT	430000	NT	NT
pH	6.66	NT		NT	9.81	NT	NT
Phosphate	< 1000	NT		NT	< 100	NT	NT
Silica, Dissolved	2300	NT		NT	< 2000	NT	NT

Table 2.3-25—NMPNS Groundwater Data - Whetstone Gulf Formation - Continued

(Page 3 of 3)

Aquifer	Whetstone Gulf A	Whestone Gulf A	Whestone Gulf A	Whestone Gulf A	Whestone Gulf A	Whestone Gulf A	Whestone Gulf A
Location	**BA106(MW)**	**BA110(MW)A**	**BA110 (MW)**	**BA110(MW)**	**BA110(MW)**	**BA216(MW)**	**BA216(MW)**
Date	**3/6/2008**	**9/27/2007**	**9/28/2007**	**12/3/2007**	**3/6/2008**	**9/27/2007**	**12/3/2007**
	172-192	**204.2-224.2**	**204.2-224.2**	**204.2-224.2**	**204.2-224.2**	**184-204**	**184-204**
Sulfate	< 5000	17400		10200	< 5000	58300	< 5000
Total Dissolved Solids	513000000	14300000		65400000	92900000	13900000	126000000
Total Organic Carbon	32900	16300		20300	31500	10300	15000
Total Organic Nitrogen	< 40000	NT		NT	< 130000	NT	NT
Total Phosphorous	< 1000	17200		7600	< 1000	8200	4600
Total Suspended Solids	841000	NT		NT	467000	NT	NT

Table 2.3-26—NMPNS Groundwater Data - Whetstone Gulf Formation - Continued
(Page 1 of 3)

Aquifer	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A
Location	**BA216(MW)**	**B230 (MW)A**	**B230 (MW)**	**B230 (MW)**	**B230 (MW)**	**B238 (MW)**	**B238 (MW)**	**B238 (MW)**
Date	**3/6/2008**	**9/28/2007**	**9/28/2007**	**12/3/2007**	**3/5/2008**	**9/28/2007**	**12/3/2007**	**3/6/2008**
	184-204	**187-202**	**187-202**	**187-202**	**187-202**	**190-210**	**190-210**	**190-210**
Volatile Organic Compounds (VOCs)	NT		NT		NT			NT
Acetone		18.9		9.8		28.6	68.3	
		0.59		0.8		0.67	0.69	
Butanone,2- (MEK)		< 5.0		< 5		< 5.0	< 5	
Chloroform		1.3		< 1		3.2	1	
Toluene		3.6		< 1		< 1.0	< 1	
Vinyl chloride		< 1.0		< 1		< 1.0	< 1	
Semi-Volatile Organic Compounds (SVOCs)	NT	NT			NT			NT
Benzoic acid			13.9	14.4		20.8	< 11	
Bis(2-ethylhexyl)phthalate			4.1	< 2.1		12	5.2	
Total Petroleum Hydrocarbons	NT	ND	NT	NT	NT	ND	NT	NT
Cyanides	NT	ND	NT	NT	NT	ND	NT	NT
Metals			NT					
Aluminum	2090000	11600		13000	< 800	1170	1900	423
Arsenic	1280	51.1		127	52.7	25	39.4	< 10
Barium	26300	16400		120000	21500	1360	5410	772
Beryllium	255	17.6		51.5	23	8.4	14.6	< 4.0
Cadmium	91.9	< 4.0		< 8	< 4.0	< 4.0	< 4	< 4.0
Calcium	25000000	2090000		7240000	2420000	281000	989000	824000
Chromium	3960	194		117	111	67.3	51	11.2
Cobalt	1490	< 50		< 100	< 50	< 50	< 50	< 50
Copper	4740	39.5		117	< 25	< 25	34.3	< 25
Iron	3460000	14800		16800	159	350	1960	411
Lead	697	17.1		29.3	11.2	28.2	11.8	< 5.0
Magnesium	3880000	49400		823000	7730	< 5000	< 5000	< 5000
Manganese	109000	721		4910	< 15	< 15	22.1	< 15

Table 2.3-26—NMPNS Groundwater Data - Whetstone Gulf Formation - Continued

(Page 2 of 3)

Aquifer	Whestone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A
Location	**BA216(MW)**	**B230 (MW)A**	**B230 (MW)**	**B230 (MW)**	**B230 (MW)**	**B238 (MW)**	**B238 (MW)**	**B238 (MW)**
Date	**3/6/2008**	**9/28/2007**	**9/28/2007**	**12/3/2007**	**3/5/2008**	**9/28/2007**	**12/3/2007**	**3/6/2008**
	184-204	**187-202**	**187-202**	**187-202**	**187-202**	**190-210**	**190-210**	**190-210**
Mercury	2.4	< 0.2		< 0.2	< 0.20	< 0.2	< 0.2	< 0.20
Mercury	NT	NT		NT	NT	NT	NT	NT
Nickel	3190	< 40		< 80	< 40	< 40	< 40	< 40
Potassium	1400000	474000		714000	518000	846000	837000	62200
Selenium	< 500	< 10		< 20	< 10	< 10	< 10	< 10
Sodium	52700000	5620000		19600000	7660000	1800000	3560000	38000
Thallium	< 500	12.5		20.8	10.7	< 10	< 10	< 10
Vanadium	3040	< 30		< 60	< 30	< 30	< 30	< 30
Zinc	9360	164		233	< 20	< 20	< 20	< 20
Polychlorinated Biphenyls	NT	ND	NT	NT	NT	ND	NT	NT
Inorganics			NT					
Alkalinity	NT	2310000		1740000	NT	3890000	3100000	NT
Alkalinity	1300000	NT		NT	1850000	NT	NT	2210000
Ammonia as Nitrogen	47600	NT		NT	116000	NT	NT	470
Bicarbonate alkalinity as CaCO3	1290000	NT		NT	15100	NT	NT	< 5000
Biological Oxygen Demand	31900	NT		NT	12900	NT	NT	29400
Bromide	1510000	NT		NT	157000	NT	NT	< 500
Chemical Oxygen Demand	2250000	NT		NT	426000	NT	NT	22300
Chloride	137000000	37500000		62500000	16200000	1800000	4900000	21700
Color	10	NT		NT	10	NT	NT	10
Hardness	59900000	NT		NT	6860000	NT	NT	2050000
Nitrate & Nitrite as N	270	230		< 100	< 100	110	< 100	700
Nitrogen, Nitrate	270	160		< 110	< 110	< 110	< 110	560
Nitrogen, Nitrite	< 80	75		34	33	17	59	140
Nitrogen, Total Kjeldahl	197000	NT		NT	120000	NT	NT	1100
pH	7.9	NT		NT	8.96	NT	NT	7.04
Phosphate	14900	NT		NT	< 100	NT	NT	< 100

Table 2.3-26—NMPNS Groundwater Data - Whetstone Gulf Formation - Continued

(Page 3 of 3)

Aquifer	Whestone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A	Whetstone Gulf A
Location	**BA216(MW)**	**B230 (MW)A**	**B230 (MW)**	**B230 (MW)**	**B230 (MW)**	**B238 (MW)**	**B238 (MW)**	**B238 (MW)**
Date	**3/6/2008**	**9/28/2007**	**9/28/2007**	**12/3/2007**	**3/5/2008**	**9/28/2007**	**12/3/2007**	**3/6/2008**
	184-204	**187-202**	**187-202**	**187-202**	**187-202**	**190-210**	**190-210**	**190-210**
Silica, Dissolved	5800	NT		NT	< 2000	NT	NT	< 2000
Sulfate	< 5000	6800		< 5000	< 5000	25400	< 5000	< 5000
Total Dissolved Solids	231000000	26900000		110000000	27400000	9270000	10900000	2260000
Total Organic Carbon	16600	3400		14700	8500	18700	20600	6100
Total Organic Nitrogen	149000	NT		NT	< 40000	NT	NT	630
Total Phosphorous	75000	400		650	< 200	< 200	< 200	< 200
Total Suspended Solids	52100000	NT		NT	72000	NT	NT	27000

Note:

* EPA Secondary Drinking Water Standard
** NY State GW Effluent Limitations for GA Class Waters
Analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
"<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
NT = The sample was not tested for this analyte.
ND = The analyte was not detected above the laboratory reporting limit. See the laboratory data sheets for the laboratory reporting limit.
µg/L = micrograms per liter; s.u. - standard unit; CU = Colorimetric Unit; ft = feet
For results less than the detection limit 1/2 the detection limit was used to calculate min, max, and mean

Table 2.3-27—Summary of Surface Water Quality Sampling NMP June 2008-Streams

Parameter	Units	NY Standard	Subarea A Upstream	Subarea Downstream	Subarea B Upstream	Subarea B Downstream	Subarea C Upstream	Subarea C Downstream
Alkalinity CaCO3	mg/L		90	98	224	98	352	232
Ammonia as N	mg/L	2	0.06	0.09	0.21	0.23	0.17	0.19
Biochemical Oxygen Demand	mg/L		<4	<2	<2	<2	<2	21
Calcium Hardness	mg/L		68	81	149	122	294	285
Calcium, Total (Ca)	mg/L		27.3	32.5	59.6	49.1	118	114
Chemical Oxygen Demand	mg/L		20	60	10	100	320	80
Chloride	mg/L	250	35.2	41.6	<1	114	479	342
Chlorophyll a	mg/L		0.0041	0.0056	0.0084	0.088	0.044	0.08
Color	units		100	40	50	180	50	20
Conductance	umhos/cm		285	326	380	581	1987	1779
Dissolved Oxygen	mg/L	not < 6.0	11.2	11.4	8.6	6.8	10.6	9.2
Fecal Coliform, MF	cfu/100ml	** 200	22	8	8	<2	14	< 2
Lead, Total (Pb)	mg/L	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Magnesium, Total (Mg)	mg/L	35	5.16	6.8	9.08	12.6	26.8	24
Mercury, Total (Hg)	mg/L	0.00007	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nitrate as N	mg/L	10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite	mg/L	1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Odor	t.o.n.		2	No Odor	2	5	2	4
Organic Nitrogen	mg/L		1.19	0.77	0.8	1.69	1.38	0.66
Ortho Phosphate as P	mg/L		0.03	<0.02	<0.02	0.09	<0.02	<0.02
pH	std units	6.5 to 8.5	6.82	7.17	7.05	6.49	7.22	7.14
Potassium Total (K)	mg/L		<0.50	0.94	<0.50	1.35	1.04	5.25
Sodium Total (Na)	mg/L		19.4	25.8	3.97	49.3	198	217
Sulfate	mg/L	250	7.92	6.81	5.28	29.8	<5	15
Total Coliform	cfu/100ml	*1000	104	68	52	64	68	150
Total Dissolved Solids	mg/L	500	186	196	236	430	1444	1172
Total Kjeldahl Nitrogen	mg/L		1.25	0.86	1.01	1.92	1.55	0.85
Total Phosphorus as P	mg/L		0.08	0.05	0.06	0.22	0.13	0.12
Total Suspended Solids	mg/L		16	4	20	18	48	52
Turbidity	NTU		3.5	1.2	26	6.5	11	12

** The geometric mean of not less than 5 samples, taken over not more than a 30-day period shall not exceed 1,000.
** The monthly geometric mean, from a minimum of 5 examinations, shall not exceed 200.

Table 2.3-28—NMP Service Water System (SWS) and Circulating Water System (CWS) Data-2007

Parameter	Units	Unit 2 SWS RO3012188		Unit 2 CWS R0301219		Unit 2 CWS R0524104	
		Result	Median of # Previous Results	Result	Median of # Previous Results	Result	Median of # Previous Results
Alkalinity "M" as $CaCO_3$	ppm	106	92 (5)	227	144 (5)	195	144 (5)
Alkalinity "P" as $CaCO_3$	ppm	0	0 (5)	21	3.4 (5)	8.9	3.4 (5)
Calcium Hardness	ppm	111	89 (5)	400	285 (5)	333	285 (5)
Chloride	ppm	33	24 (5)	106	84 (5)	115	84 (5)
Copper, Total as Cu	ppm	0.024	0.009 (5)	0.55	0.27 (5)	0.26	0.27 (5)
Hardness, Total ($CaCO_3$)	ppm	157	126 (5)	563	402 (5)	465	402 (5)
Iron, Total as Fe	ppm	0.27	0.24 (5)	0.89	0.22 (5)	0.12	0.22 (5)
Magnesium Hardness, Total as $CaCO_3$	ppm	45	37 (5)	161	119 (5)	131	119 (5)
Manganese, Total as Mn	ppm	0.01	0.01 (3)	0.03	0.02 (5)	0.01	0.02 (5)
Ortho Phosphate as P	mg/L	<0.2	0.2 (5)	<0.2	0.2 (5)	0.2	0.2 (5)
pH	std/units	6.5	8.0 (5)	8.5	8.3 (5)	8.5	8.3 (5)
Silica, Total as SiO_2	NTU	2.5	1.2 (5)	9.2	2.1 (5)	3.1	2.3 (5)
Sodium as (Na)	ppm	17.7	14.2 (5)	70	49 (5)	69	49 (5)
Specific Conductance at 25 degrees	umhos/cm	384	349 (5)	1160	1020 (5)	1200	1020 (5)
Sulfur, Total as SO_4	ppm	44	31 (5)	269	257 (5)	247	258 (5)
Total Phosphate as PO_4	ppm	<0.4	0.4 (5)	<0.4	0.4 (5)	0.4	0.4 (5)
Total Suspended Solids	ppm	<10	10.0 (5)	15.0	10.0 (5)	<10	11.0 (5)
Zinc, Total	ppm	0.03	0.01 (3)	0.18	0.11 (5)	0.08	0.12 (5)

Refs. NYSDEC, 2008B, USEPA, 2006A

Figure 2.3-1—Site Topography and Watershed Boundaries

Figure 2.3-2—Bathymetry in the Vicinity of the Proposed Intake and Discharge

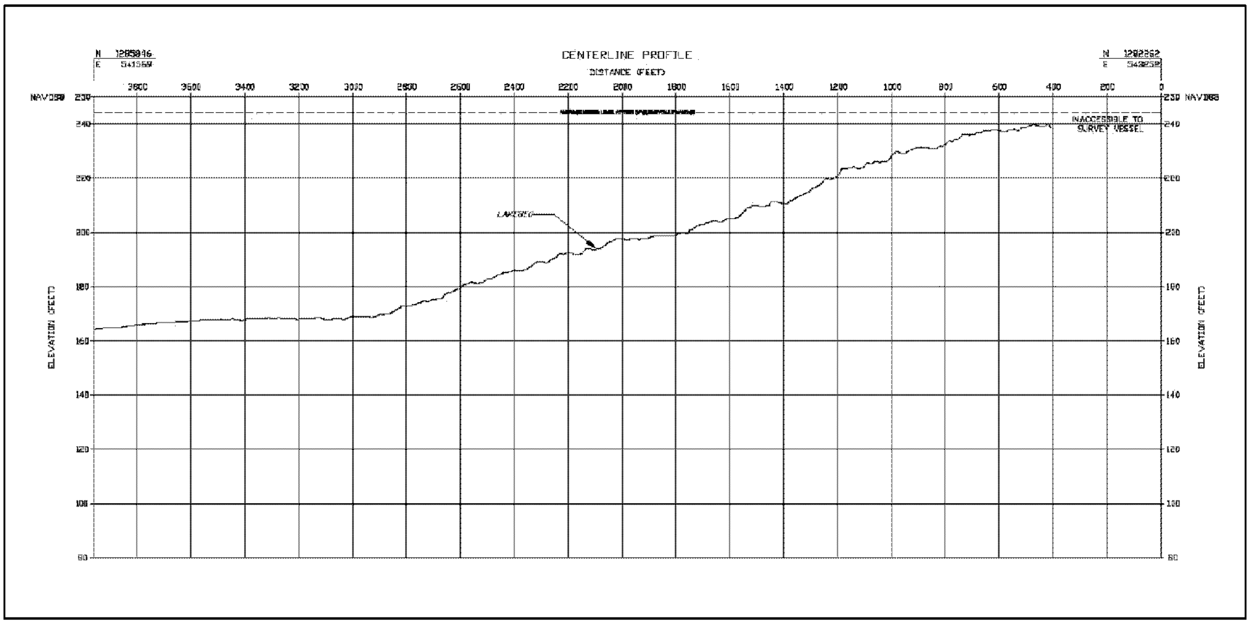


Figure 2.3-3—FEMA 100-year Floodplain in the Vicinity of NMPNS

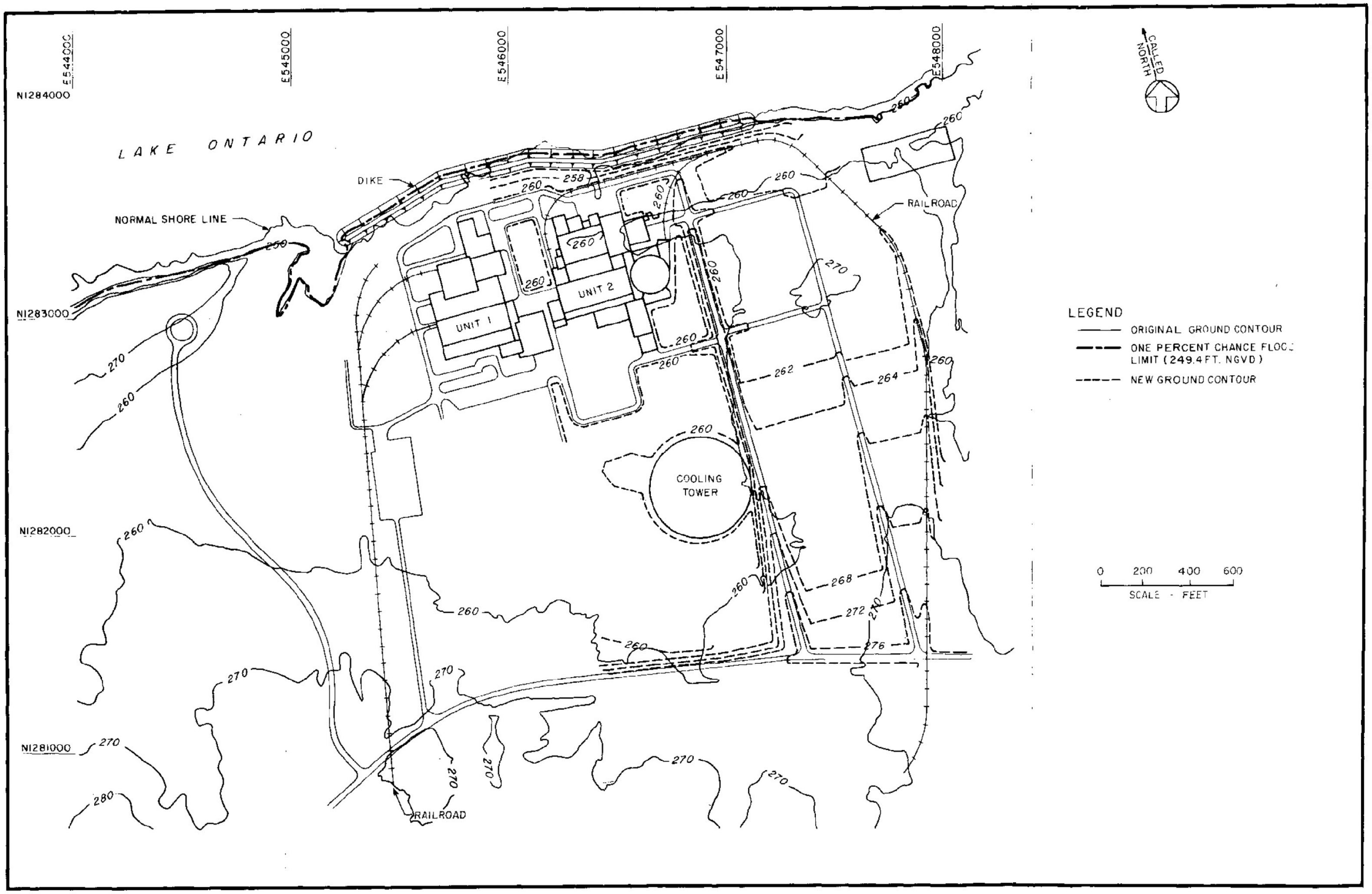
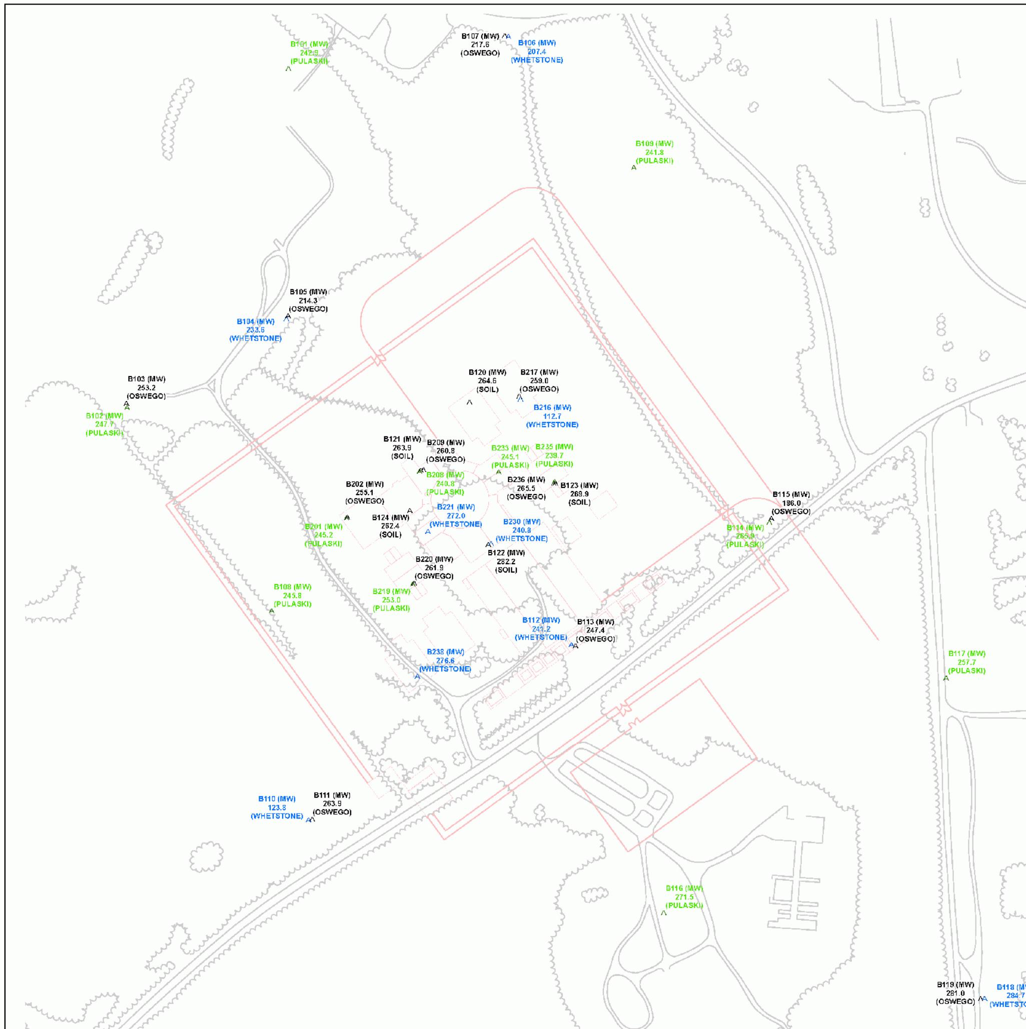


Figure 2.3-4—Location of Borings at NMPNS



Number	Boring Number	NORTHING	EASTING	Geological Formation	March 2008 Groundwater Elevation (Feet)
1	B101 (MW)	1282173.9	543489.0	Pulaski B & C	242.9
2	B102 (MW)	1281119.1	542988.4	Pulaski A & B	247.7
3	B103 (MW)	1281133.2	542986.1	Oswego Sandstone, Oswego Transition, & Pulaski A	253.2
4	B104 (MW)	1281396.9	543483.1	Whetstone Gulf	233.6
5	B105 (MW)	1281404.3	543488.9	Oswego Sandstone & Oswego Transition	214.3
6	B106 (MW)	1282272.9	544173.3	Whetstone Gulf	207.4
7	B107 (MW)	1282275.5	544161.8	Oswego Sandstone & Oswego Transition	217.6
8	B108 (MW)	1280487.7	543437.5	Pulaski B	245.8
9	B109 (MW)	1281864.9	544562.3	Pulaski B	241.8
10	B110 (MW)	1279838.6	543552.2	Whetstone Gulf Formation	123.8
11	B111 (MW)	1279841.1	543563.3	Oswego Transition & Pulaski A	263.9
12	B112 (MW)	1280382.8	544368.5	Pulaski C & Whetstone Gulf	241.2
13	B113 (MW)	1280379.7	544381.4	Oswego Transition	247.4
14	B114 (MW)	1280763.3	544983.0	Pulaski A, B, & C	265.9
15	B115 (MW)	1280775.0	544989.7	Oswego Transition & Pulaski A	186.0
16	B116 (MW)	1279550.8	544655.3	Pulaski B	271.5
17	B117 (MW)	1280280.0	545532.7	Pulaski B	257.7
18	B118 (MW)	1279283.8	545652.1	Whetstone Gulf	284.7
19	B119 (MW)	1279282.6	545639.9	Oswego Sandstone & Oswego Transition	281.0
20	B120 (MW)	1281136.8	544052.3	Soil	264.6
21	B121 (MW)	1280926.9	543909.4	Soil	263.9
22	B122 (MW)	1280694.8	544110.8	Soil	282.2
23	B123 (MW)	1280883.9	544313.3	Soil	269.9
24	B124 (MW)	1280799.2	543866.6	Soil	262.4
25	B201 (MW)	1280776.2	543669.7	Pulaski B	245.2
26	B202 (MW)	1280779.1	543673.3	Oswego Sandstone	255.1
27	B208 (MW)	1280921.3	543897.4	Pulaski B & C	240.8
28	B209 (MW)	1280924.5	543901.5	Oswego Sandstone & Oswego Transition	260.8
29	B216 (MW)	1281146.8	544210.4	Whetstone Gulf	112.7
30	B217 (MW)	1281155.3	544206.5	Oswego Sandstone	259.0
31	B219 (MW)	1280570.9	543875.9	Pulaski B	253.0
32	B220 (MW)	1280574.3	543880.2	Oswego Transition	261.9
33	B221 (MW)	1280735.3	543922.7	Pulaski C & Whetstone Gulf	272.0
34	B230 (MW)	1280698.5	544118.4	Pulaski C & Whetstone Gulf	240.8
35	B233 (MW)	1280918.8	544142.4	Pulaski C	245.1
36	B235 (MW)	1280889.9	544316.3	Pulaski B & C	239.7
37	B236 (MW)	1280883.8	544319.0	Oswego Sandstone	265.5
38	B238 (MW)	1280285.2	543890.3	Pulaski C & Whetstone Gulf	276.6

NOTES:

1. Existing features from C. T. Male Land Title Survey Dated 10/10/01.
2. Proposed Plant features taken from drawing SK-12188-001.dgn dated 8/02/07 prepared by Sargent & Lundy.

0 200 400 Feet
1" = 200'

Figure 2.3-5—Subsurface Profile at Site

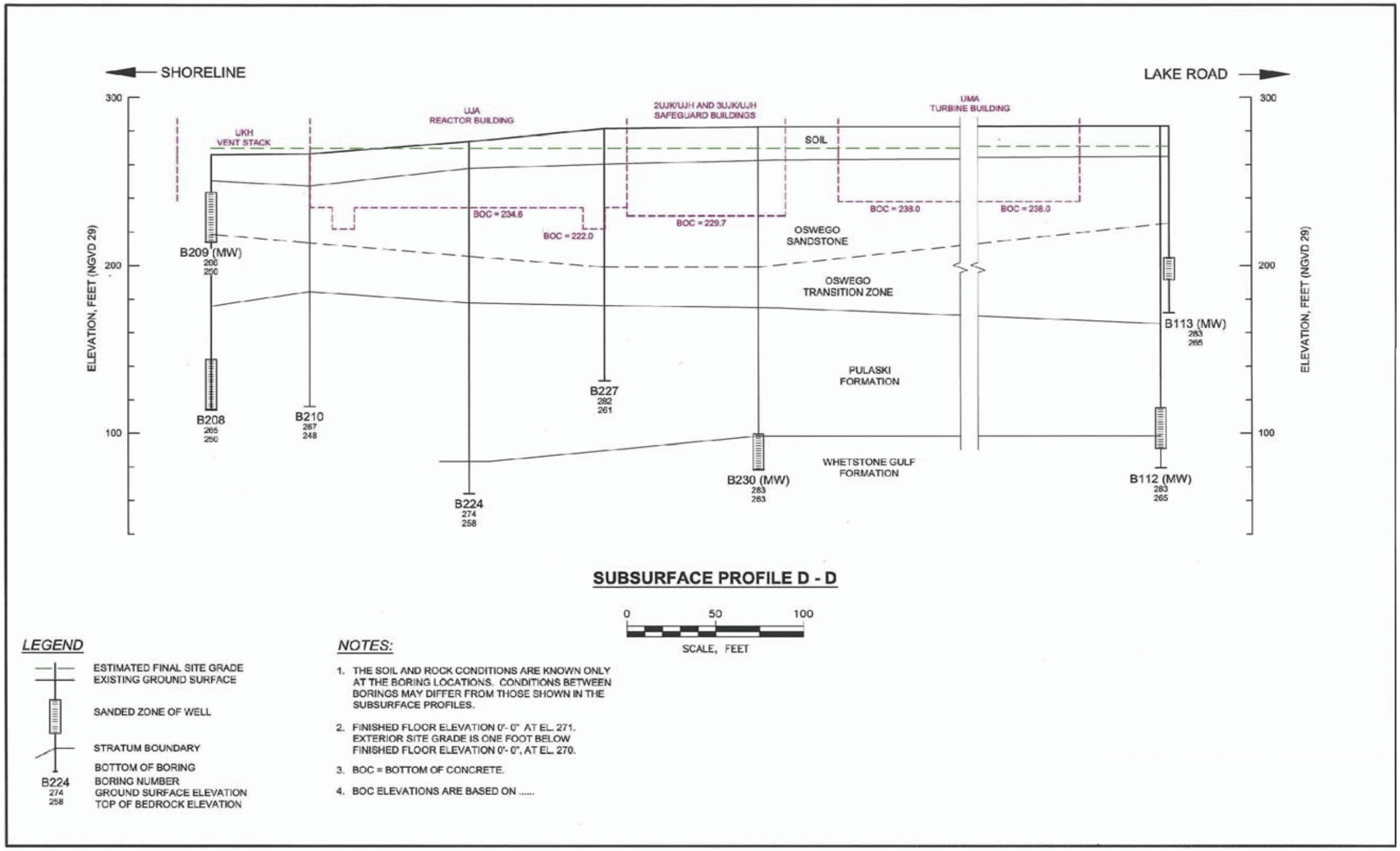
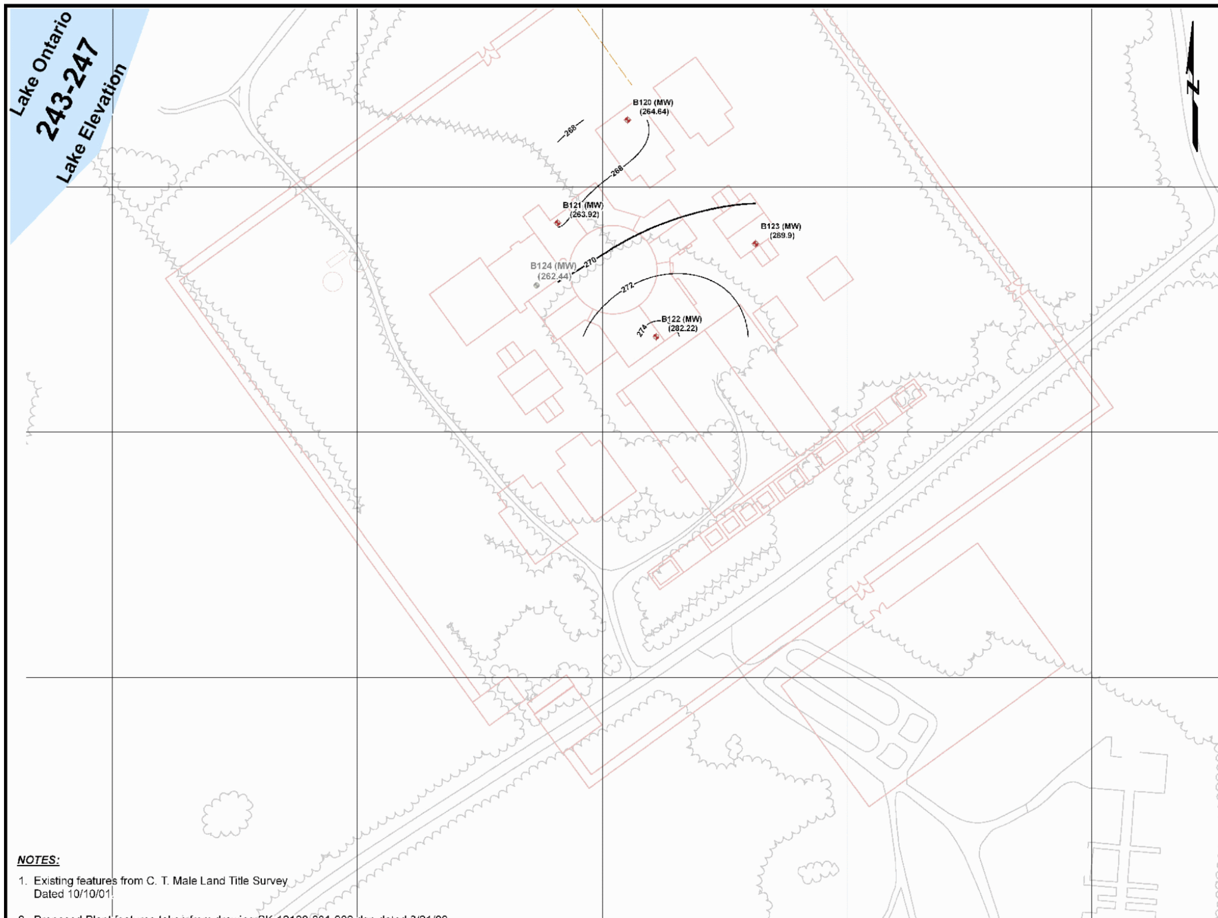


Figure 2.3-6—Groundwater Contours in the Surficial Layer



WELLS USED FOR CONTOURING

BORING #	FORMATION	GW_ELEV	N	E
B120 (MW)	Soil	264.64	1281136.76	544052.3
B121 (MW)	Soil	263.92	1280926.86	543909.45
B122 (MW)	Soil	282.22	1280694.76	544110.77
B123 (MW)	Soil	269.9	1280883.92	544313.33

WELLS NOT USED FOR CONTOURING BECAUSE THEY DO NOT FIT THE GENERAL TREND

BORING #	FORMATION	GW_ELEV	N	E
B124 (MW)	Soil	262.44	1280799.17	543866.61

LEGEND

B100 Soil Borings

Proposed Plant

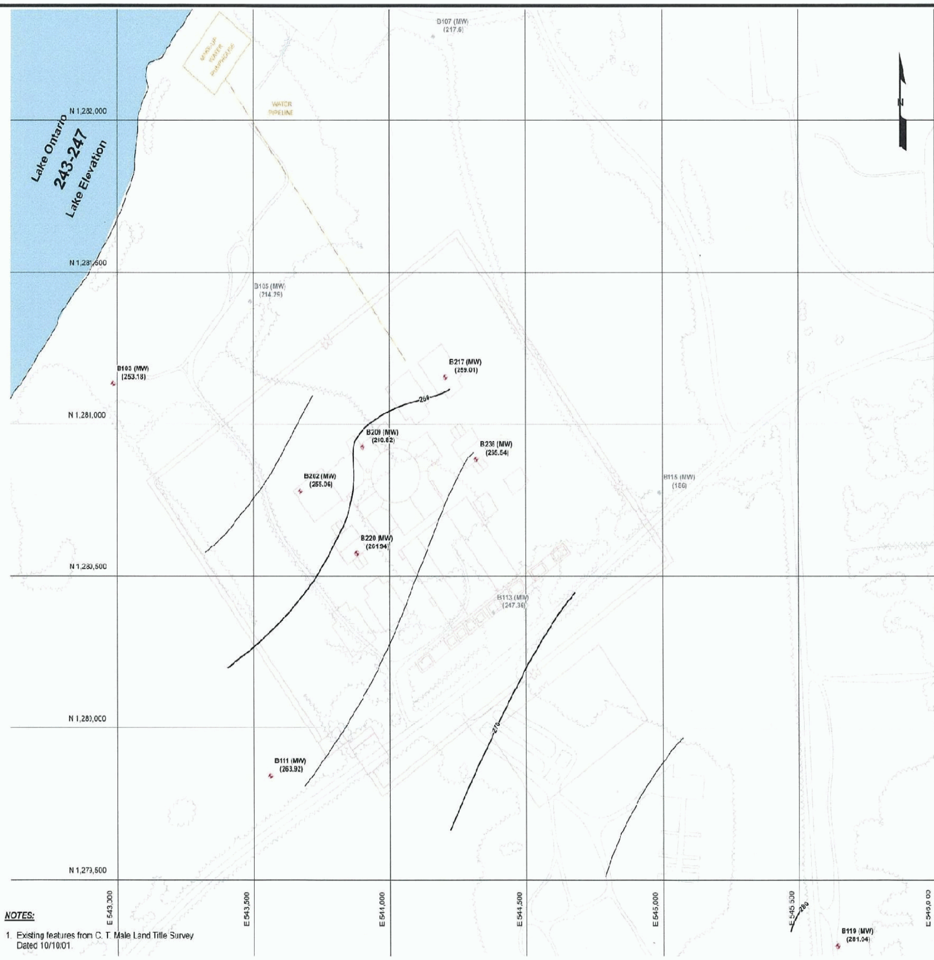
Soil Groundwater Contours: Interval 2 Feet

NOTES:

1. Existing features from C. T. Male Land Title Survey Dated 10/10/01
2. Proposed Plant features taken from drawing SK-12198-001-002.dgn dated 3/21/08 prepared by Sargent & Lundy.
3. Horizontal control is based on the Central Zone of the New York State Plane Coordinate System North American Datum of 1927 (NAD 27).
4. Elevations are based on the National Geodetic Vertical Datum of 1929 (NGVD 29).
5. Lake Ontario elevations based on Interational Great Lakes Datum of 1985 (IGLD85).

0 200 400 Feet
1" = 200'

Figure 2.3-7—Groundwater Contours in the Oswego Sandstone Formation



WELLS USED FOR CONTOURING

Boring #	FORMATION	GW_ELEV	N	E
B103 (MW)	Oswego Sandstone, Oswego Transition, & Pulaski A	253.18	1281133.22	542986.14
B111 (MW)	Oswego Transition & Pulaski A	263.92	1279841.05	543563.3
B119 (MW)	Oswego Sandstone & Oswego Transition	281.04	1279282.54	545639.91
B202 (MW)	Oswego Sandstone	255.06	1280779.11	543673.3
B209 (MW)	Oswego Sandstone & Oswego Transition	260.82	1280924.53	543901.52
B217 (MW)	Oswego Sandstone	259.01	1281155.33	544206.49
B220 (MW)	Oswego Transition	261.94	1280574.31	543880.23
B236 (MW)	Oswego Sandstone	265.54	1280883.32	544318.99

WELLS NOT USED FOR CONTOURING BECAUSE THEY DO NOT FIT THE GENERAL TREND

BORING #	FORMATION	GW_ELEV	N	E
B105 (MW)	Oswego Sandstone & Oswego Transition	214.29	1281404.26	543488.91
B107 (MW)	Oswego Sandstone & Oswego Transition	217.6	1282275.48	544161.76
B113 (MW)	Oswego Transition	247.36	1280379.65	544301.42
B115 (MW)	Oswego Transition & Pulaski A	186	1280775.02	544989.75

LEGEND

B100 Borings & Wells

Proposed Plant

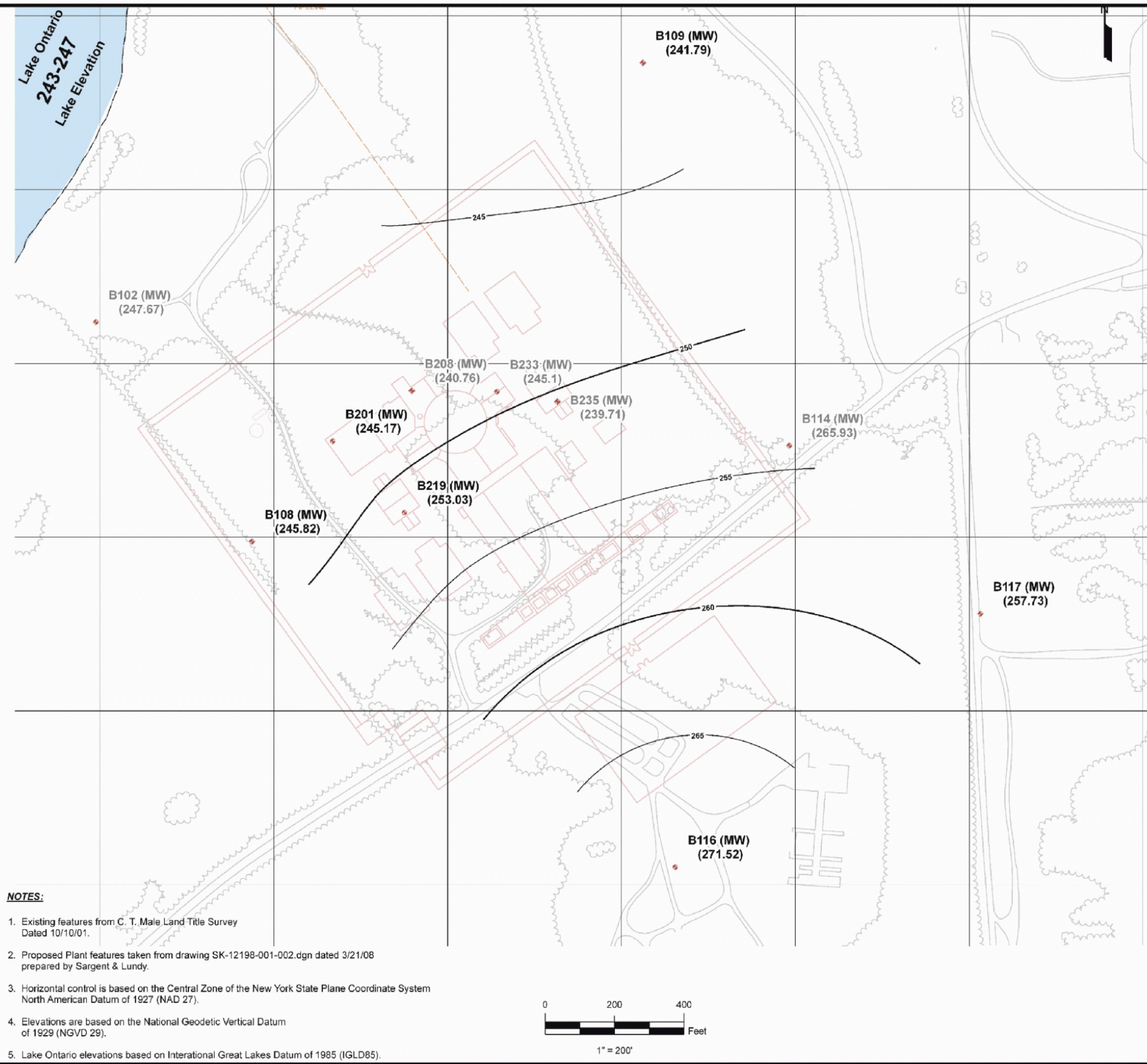
Oswego Sandstone Groundwater Contours: Interval 5 Feet

NOTES:

1. Existing features from C. T. Male Land Title Survey Dated 10/10/01.
2. Proposed Plant features taken from drawing SK-12198-001-002.dgn dated 3/21/08 prepared by Sargent & Lundy.
3. Horizontal control is based on the Central Zone of the New York State Plane Coordinate System North American Datum of 1927 (NAD 27).
4. Elevations are based on the National Geodetic Vertical Datum of 1929 (NGVD 29).
5. Lake Ontario elevations based on Interational Great Lakes Datum of 1985 (IGLD85).

0 200 400 Feet
1" = 200'

Figure 2.3-8—Groundwater Contours in the Pulaski Formation



WELLS USED FOR CONTOURING

Boring #	FORMATION	GW_ELEV	N	E
B108 (MW)	Pulaski B	245.82	1280487.69	543437.49
B109 (MW)	Pulaski B	241.79	1281864.87	544562.3
B116 (MW)	Pulaski B	271.52	1279550.81	544655.28
B117 (MW)	Pulaski B	257.73	1280280.02	545532.72
B201 (MW)	Pulaski B	245.17	1280776.23	543669.68
B219 (MW)	Pulaski B	253.03	1280570.9	543875.86

WELLS NOT USED FOR CONTOURING BECAUSE SCREENED INTERVAL INCLUDES PULASKI UNITS A and/or C

Boring #	FORMATION	GW_ELEV	N	E
B101 (MW)	Pulaski B & C	242.89	1282173.94	543489.04
B102 (MW)	Pulaski A & B	247.67	1281119.14	542988.42
B114 (MW)	Pulaski A, B, & C	265.93	1280763.34	544983.02
B208 (MW)	Pulaski B & C	240.76	1280921.25	543897.37
B233 (MW)	Pulaski C	245.1	1280918.76	544142.44
B235 (MW)	Pulaski B & C	239.71	1280889.94	544316.31

LEGEND

B100 Borings & Wells

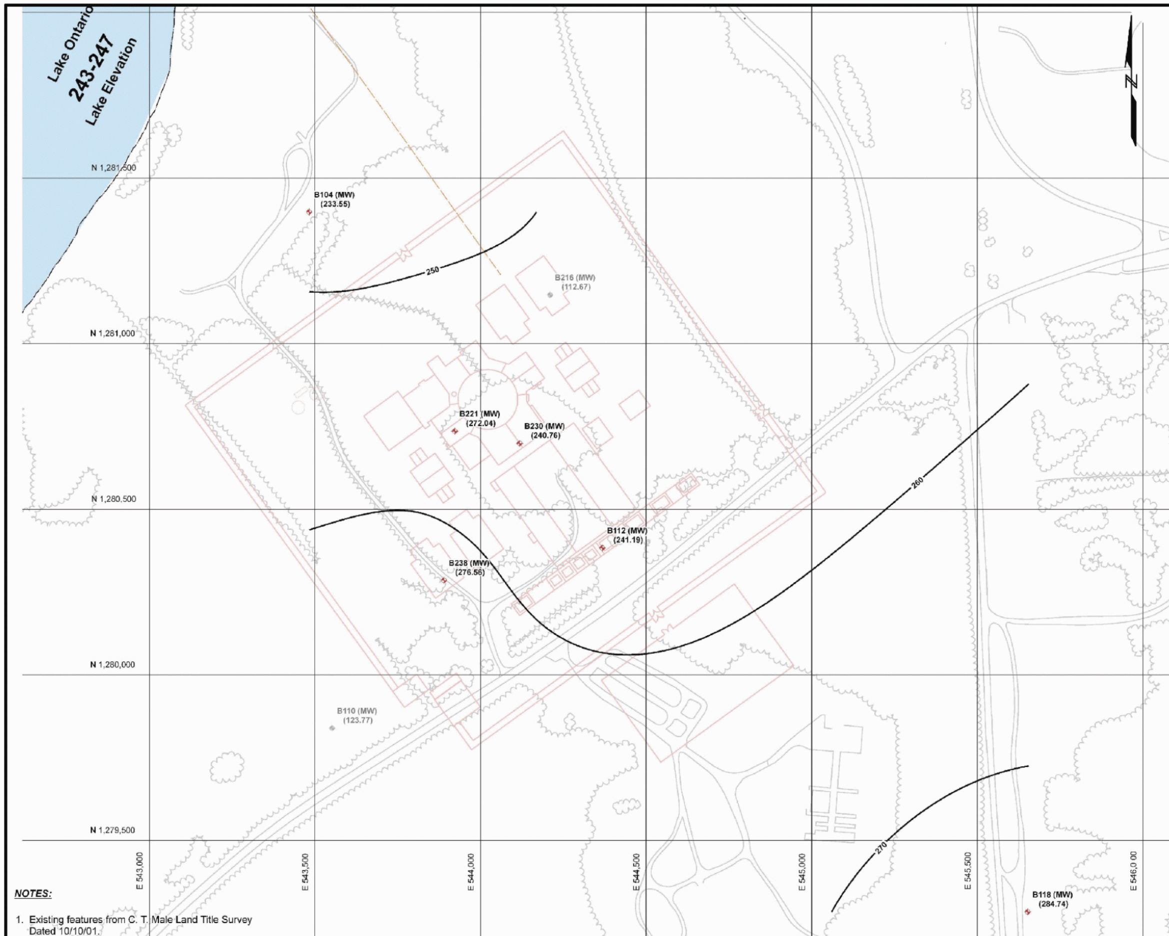
Proposed Plant

Pulaski Formation Groundwater Contours: Interval 5 Feet

NOTES:

1. Existing features from C. T. Male Land Title Survey Dated 10/10/01.
2. Proposed Plant features taken from drawing SK-12198-001-002.dgn dated 3/21/08 prepared by Sargent & Lundy.
3. Horizontal control is based on the Central Zone of the New York State Plane Coordinate System North American Datum of 1927 (NAD 27).
4. Elevations are based on the National Geodetic Vertical Datum of 1929 (NGVD 29).
5. Lake Ontario elevations based on Interational Great Lakes Datum of 1985 (IGLD85).

Figure 2.3-9—Groundwater Contours in the Whetstone Gulf Formation



WELLS USED FOR CONTOURING

Boring #	FORMATION	GW_ELEV	N	E
B104 (MW)	Whetstone Gulf	233.55	1281396.9	543483.08
B112 (MW)	Pulaski C & Whetstone Gulf	241.19	1280382.77	544368.55
B118 (MW)	Whetstone Gulf	284.74	1279283.81	545652.05
B221 (MW)	Pulaski C & Whetstone Gulf	272.04	1280735.28	543922.69
B230 (MW)	Pulaski C & Whetstone Gulf	240.76	1280698.54	544118.35
B238 (MW)	Pulaski C & Whetstone Gulf	276.56	1280285.19	543890.26

WELLS NOT USED FOR CONTOURING BECAUSE THEY DO NOT FIT THE GENERAL TREND

BORING #	FORMATION	GW_ELEV	N	E
B106 (MW)	Whetstone Gulf	207.44	1282272.87	544173.29
B110 (MW)	Whetstone Gulf Formation	123.77	1279838.6	543552.18
B216 (MW)	Whetstone Gulf	112.67	1281146.84	544210.44

LEGEND

B100 Borings & Wells

Proposed Plant

Whetstone Gulf Formation Groundwater Contours: Interval 10 Feet

NOTES:

1. Existing features from C. T. Male Land Title Survey Dated 10/10/01.
2. Proposed Plant features taken from drawing SK-12198-001-002.dgn dated 3/21/08 prepared by Sargent & Lundy.
3. Horizontal control is based on the Central Zone of the New York State Plane Coordinate System North American Datum of 1927 (NAD 27).
4. Elevations are based on the National Geodetic Vertical Datum of 1929 (NGVD 29).
5. Lake Ontario elevations based on Interational Great Lakes Datum of 1985 (IGLD85).

0 200 400 Feet

1" = 200'

Figure 2.3-10—Surface Water Bodies Within 50 Mi (80 km) Radius of the NMP3NPP Site

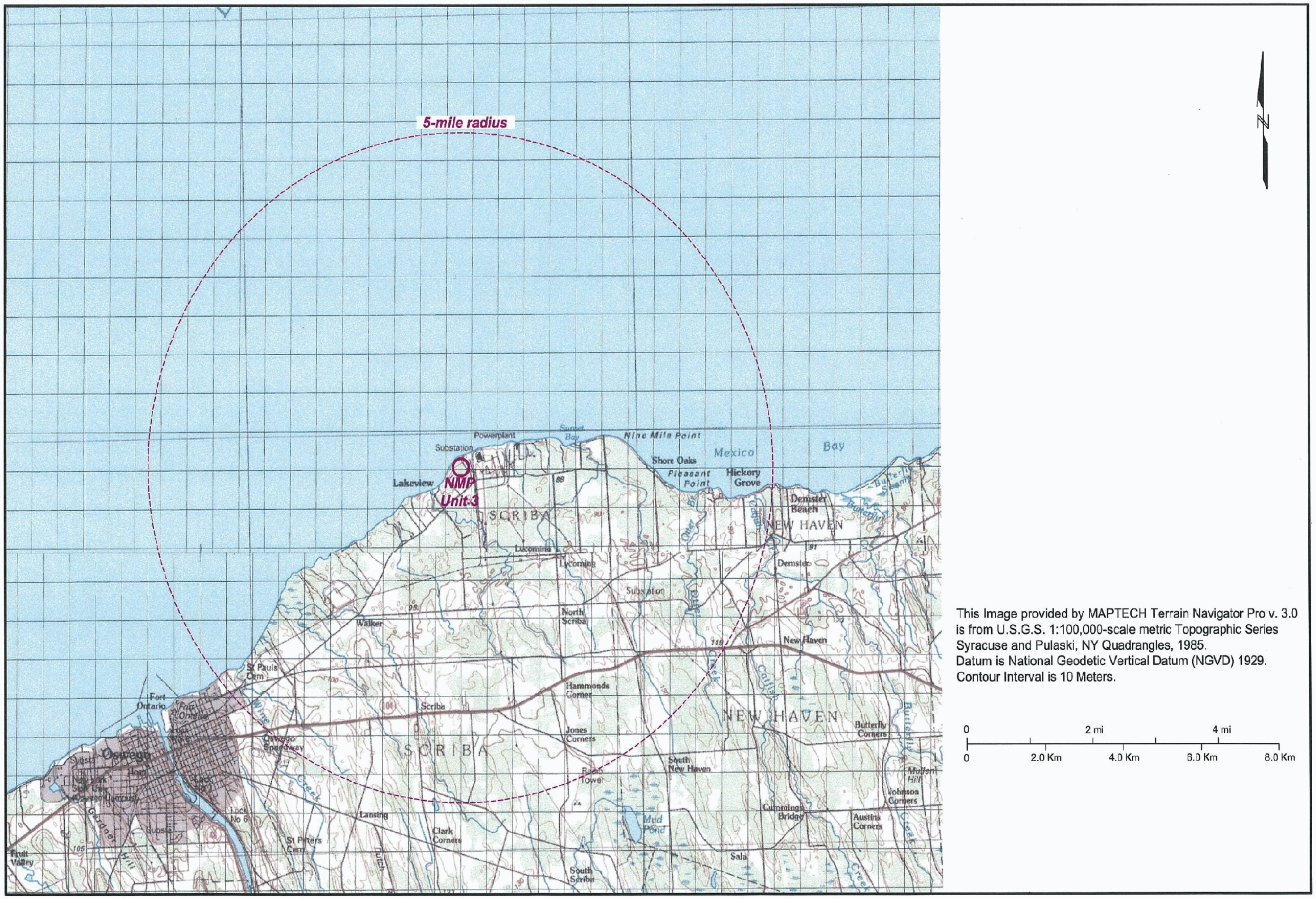


Figure 2.3-11—Water Supplies and Industrial Users within the 50 mi (80 km) region of NMP3NPP

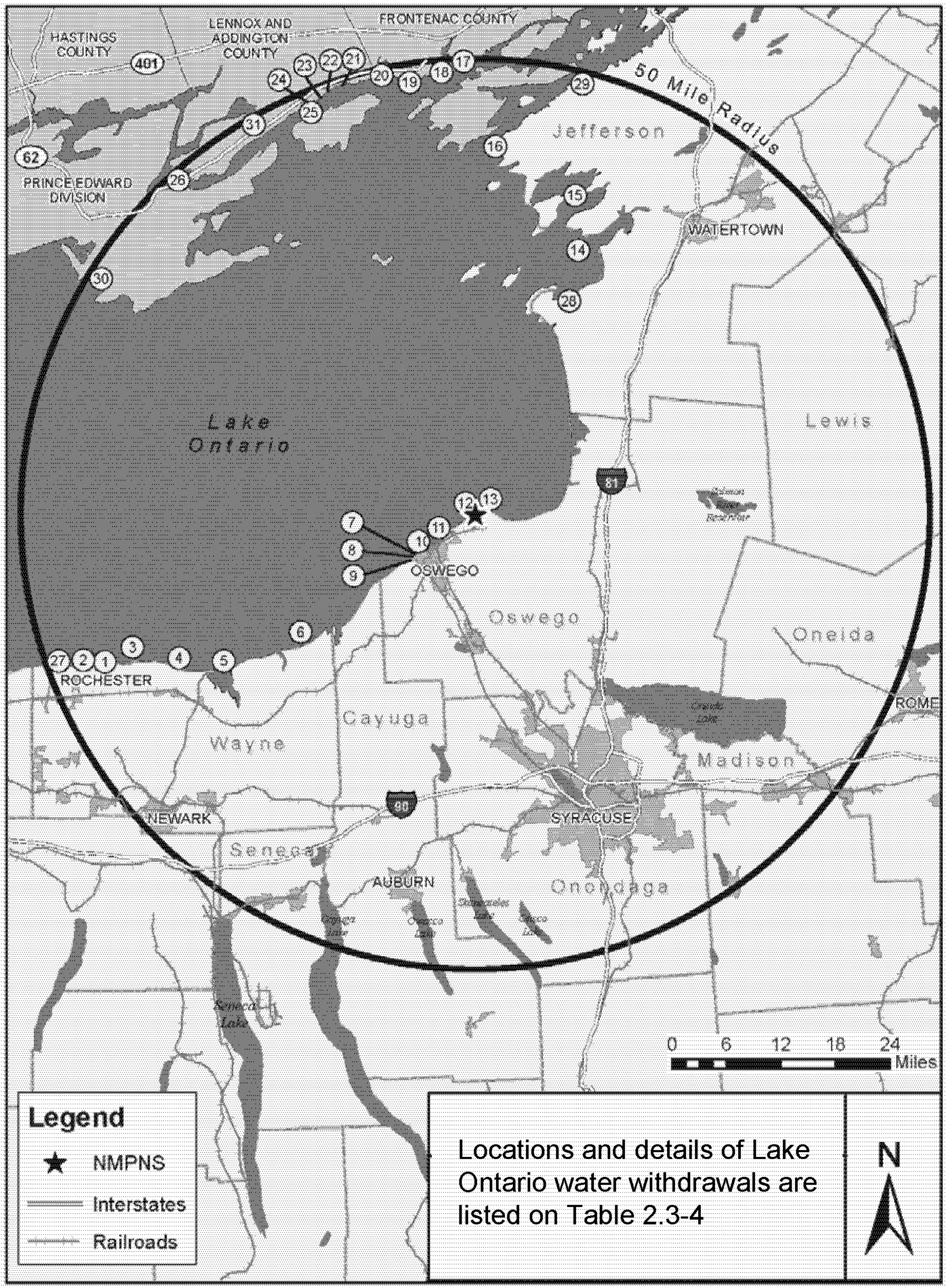


Figure 2.3-12—Salmon-Sandy Hydrologic Unit 014140102

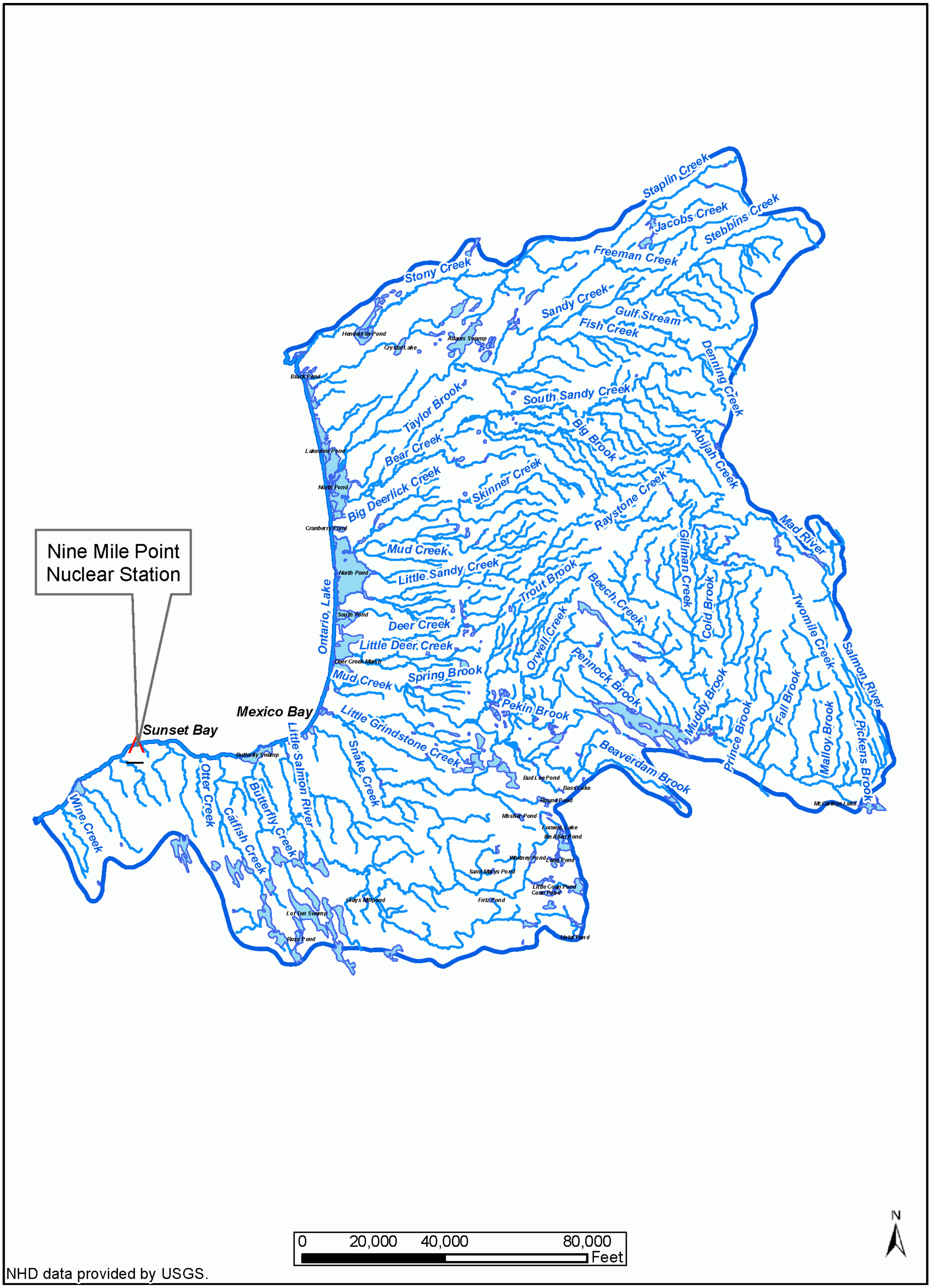


Figure 2.3-13—Groundwater Sampling Location (100 and 300 Series Borings (North))

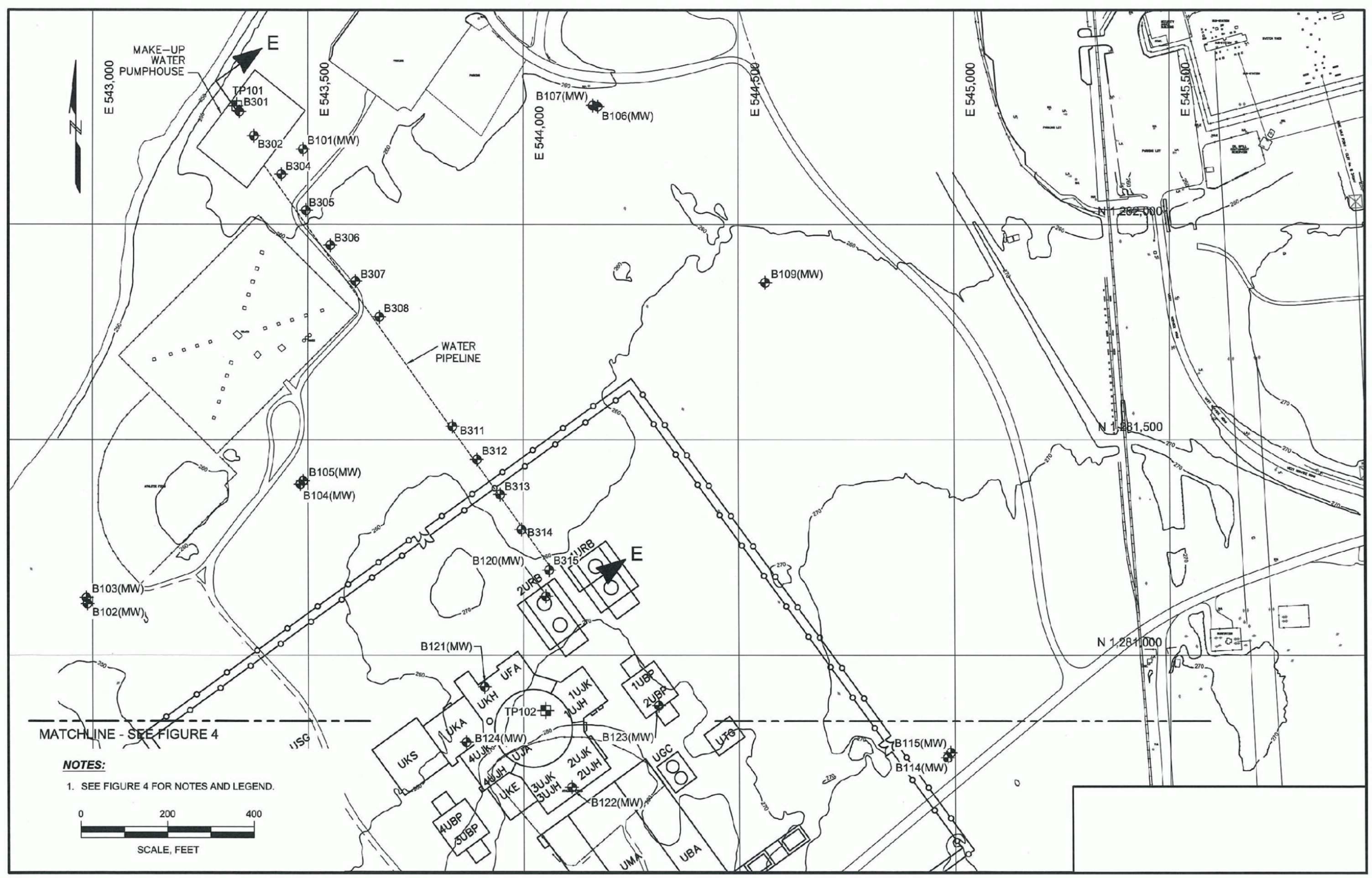


Figure 2.3-14—Groundwater Sampling Location (100 and 300 Series Borings (South))

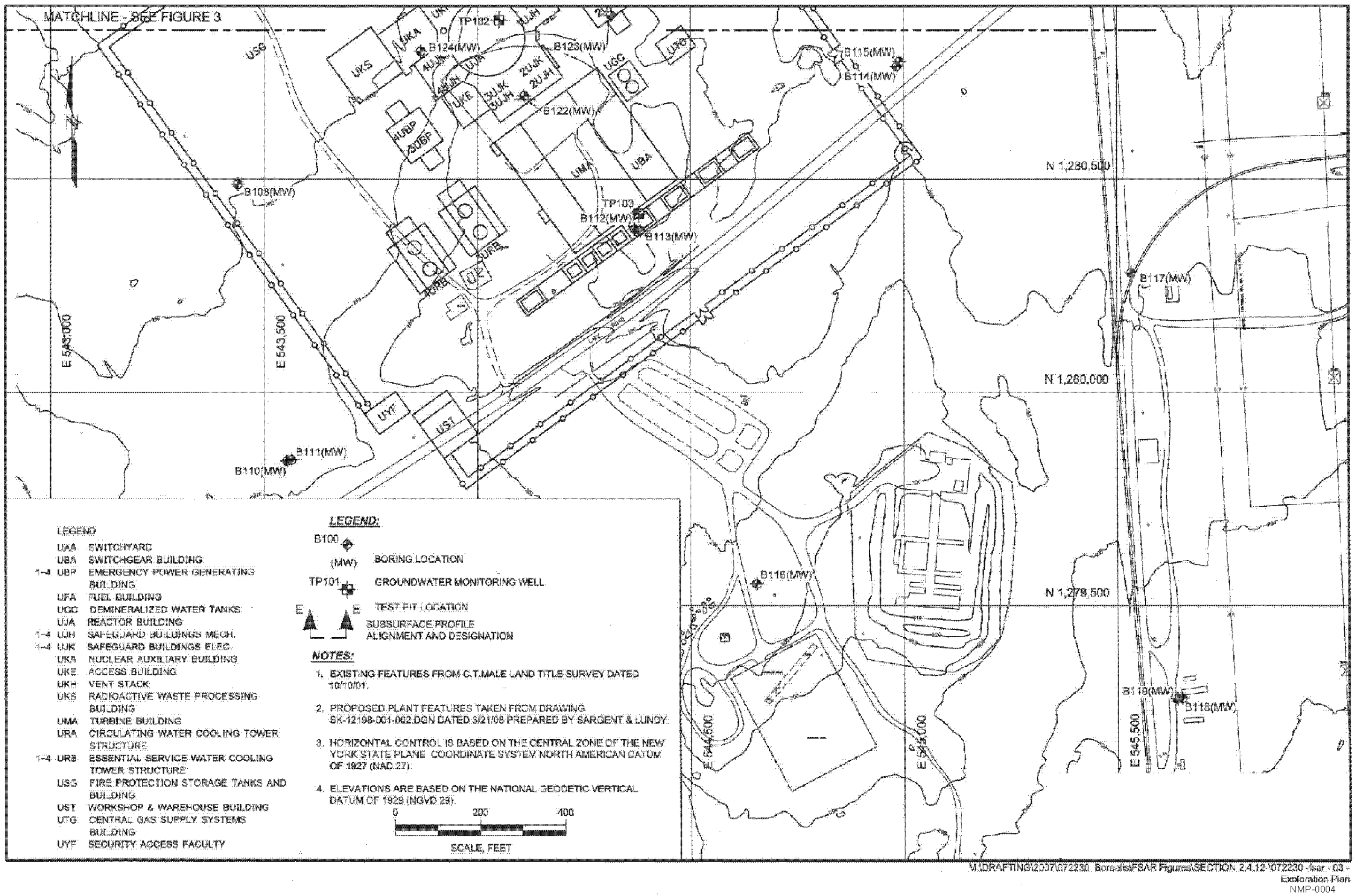


Figure 2.3-15—Groundwater Sampling Location (200 Series Borings

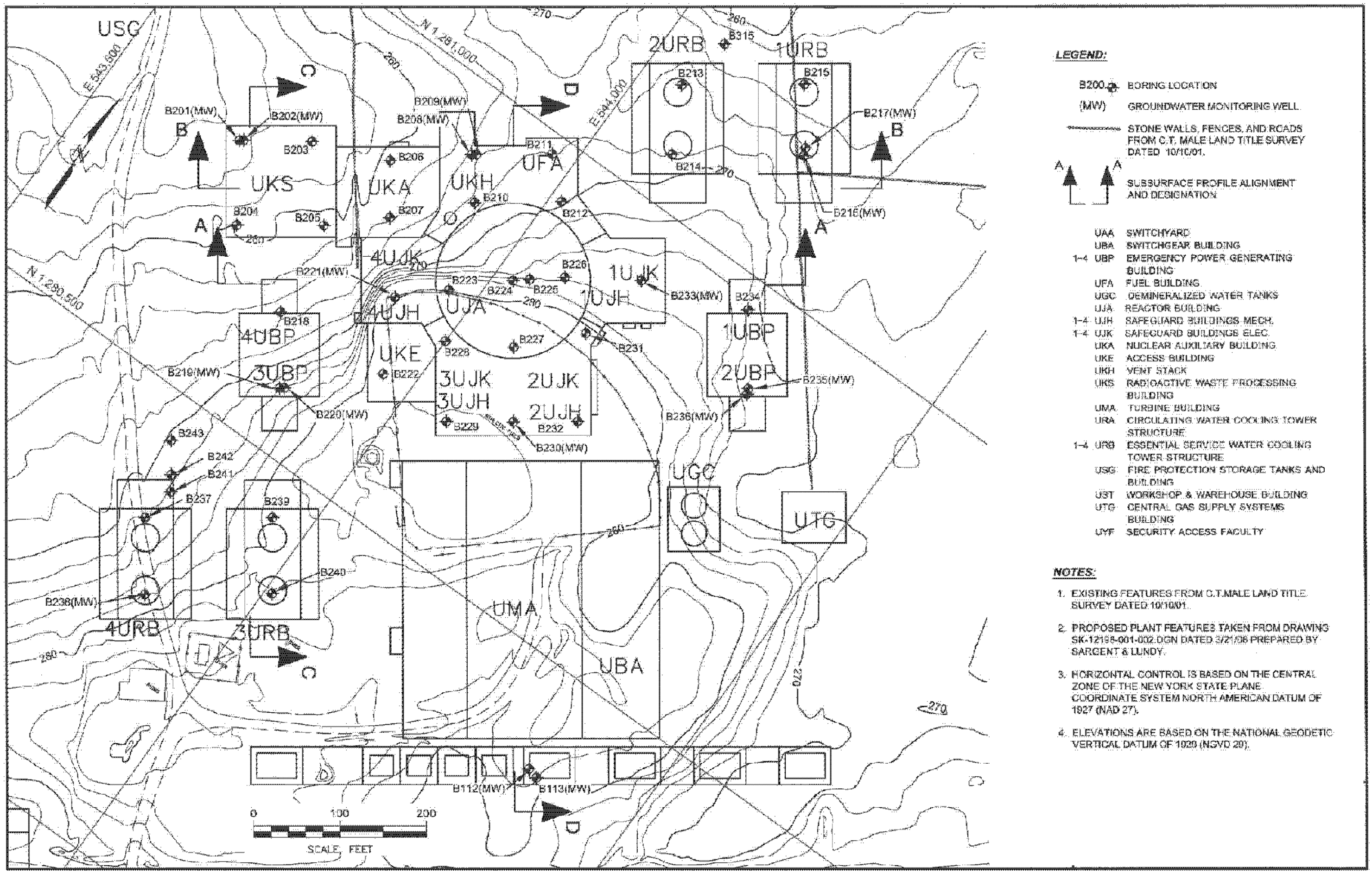


Figure 2.3-16—Surface Water Quality, Fish, and Benthic Sampling Locations