MICRONIZED COAL REBURN

DEMONSTRATION FOR NO_X CONTROL

ENVIRONMENTAL INFORMATION VOLUME

DRAFT

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EXECUTIVE SUMMARY

The Micronized Coal Reburn Project can be applied to new and existing pulverized coal operations using cyclone, wall and tangential firing systems. This technology is expected to reduce NO_X emissions by 50 to 60 percent with minimal boiler modification. The coal reburn technology offers the advantages of not requiring an alternate fuel source, lower NO_X emissions, increased performance, increased carbon burn out and low load operation without the use of auxiliary fuels. The Micronized Coal Reburn Project will demonstrate a low cost option for NO_X control which will meet current and future NO_X limitations.

The Micronized Coal Reburn Project will retrofit one tangential and one cyclone fired boiler system to demonstrate its effectiveness on reducing NO_X. The micronized coal (80% below 325 mesh) will be injected into the boiler above the main burner, the region where NO_X formation typically occurs. The size reduction process creates a micronized coal with the surface area and combustion characteristics of an atomized oil flame. This allows for a uniform and compact combustion envelope which results in complete combustion of the coal/air mixture in a smaller furnace volume. The micronized coal combustion process allows carbon conversion within milliseconds and the release of volatiles at a more even rate which reduces NO_X formation while improving heat rate, reducing carbon content of the flyash and increasing boiler efficiency.

New York State Electric & Gas Corporation's Milliken Station, Unit 2 which is a 150 Mw tangentially fired boiler will be one of the host sites as well as Eastman Kodak's #15 Boiler, a 50 Mw cyclone boiler. Milliken Station will use the existing D.B. Riley MPS mill with dynamic classifiers to produce the micronized coal. The coal will be reburned for NO_X control using two methods. One method is close-coupled overfire air (CCOFA) reburning in which the existing top Low-NO_X Concentric Firing System (LNCFS) burners are used for burning the micronized coal. The second method is more standard and will use injectors to input micronized coal into the boiler.

At Eastman Kodak's site the Fuller MicroMill will be used to produce the micronized coal. Injectors will introduce the micronized coal at the top end of the boiler. Overfired air will also be installed. Both the injectors and the overfired air will be located at the optimum point downstream of the cyclone burners.

The environmental impacts resulting from the implementation of both projects will be minimal. All modifications will occur on existing facilities which are presently used for the purpose of producing electrical energy and/or steam. The NO_X reductions expected from these projects will demonstrate an economical method for controlling NO_X emissions while improving upon the operation and efficiency of the systems. This demonstration will provide methods for NO_X control at a low capital cost for utilities and industrial users to meet the current and upcoming NO_X regulations.

1.0 INTRODUCTION: MILLIKEN STATION MICRONIZED COAL REBURN

1.1 PROJECT DESCRIPTION

The proposed Milliken Micronized Coal Reburn Project will demonstrate the effectiveness of reducing nitrogen oxide (NO_X) emissions with an advanced micronized coal reburning technology. This technology will be a phased program which will use the existing combustors as well as new injectors. The same coal used in the main combustion zone will be used as the reburning fuel. This entails no incremental fuel cost or chemical cost compared to other NO_X reduction technologies. In addition to achieving lower NO_X emissions, the micronized coal firing system can also provide improved operating performance such as greater turndown without support fuel, and improved carbon burnout. This reburn technology can also be combined with various sulfur dioxide (SO_2) control technologies such as fuel switching, dry sorbet injection, or other post-combustion technologies.

1.2 NEED FOR PROPOSED ACTION

This section establishes the need for the Mironized Coal Reburn Project and its consistency with State and National energy and environmental goals. The needs that motivate development of the proposed project, based on applicable Federal emissions control regulations and the New York State Energy Plan, are:

- the continuing need for efficiently generated electricity;
- the need to develop and demonstrate environmentally responsive, energy efficient use of an abundant domestic energy source;
- the need to reduce emissions that are precursors of acid rain and ozone formation, as required by the Clean Air Act Amendments of 1990 (CAAA);
- the need to control costs of generating process steam and electricity; and
- the need to minimize waste products characteristic of other control methods.

The primary energy source for electricity generation in the U.S. is fossil fuel, with coal combustion accounting for 56 percent. Coal is America's most abundant fossil fuel. The United States is estimated to have reserves (recoverable with present technology at current prices) of at least 268 billion tons as compared to only ten billion ton equivalents of natural gas and eight billion ton equivalents of oil (DOE 1991). U.S. recoverable reserves of coal could satisfy the nation's consumption at current rates for nearly 300 years (DOE 1989).

One of the primary issues facing fossil fuel technology is the need to address environmental effects resulting from fuel combustion. One line of research involves developing new combustion technologies (such as coal fluidization beds) or more efficient energy use procedures (such as use of waste heat by cogeneration). Other efforts are directed at reducing the pollution potential of the fuel before combustion (mechanical cleaning) or after combustion but before release (stack pollution-control devices). In all of these approaches, the primary technical issue is not solely reduction of environmental impacts associated with the use of coal, it is development of technologies that can reliably reduce environmental impacts while maintaining efficiency and cost competitiveness.

Many utilities are now confronted by the dual problem of an aging boiler inventory and the potential long-term need to increase their power-generating capacity. By 2000, 44 percent of the nation's coal-fired capacity will be at least 30 years old. Utility decision makers will have to make fundamental choices to retire, refurbish, repower or replace many of these units (DOE 1991). The most energy-efficient generating facilities are the most appropriate candidates for the retrofit and installation of new clean coal technology.

The Micronized Coal Reburn project will provide a simple and inexpensive way to reduce NO_X emissions while maintaining boiler efficiency and flyash salability. Inherent in the demonstration project are features that will maintain that efficiency and avoid combustion emissions typically associated with less efficient systems.

1.2.1 The Federal Clean Air Act and Amendments

With passage of the CAAA of 1990, stringent measures have been mandated to control emissions of the principal acid rain precursors, SO_2 and NO_X. Compliance with the acid rain provisions of the CAAA is divided into two phases. Phase 1 requires certain utility units to achieve a NO_X reduction of 2 million tons below 1980 levels by January 1, 1995. Phase 2 requires installation of NO_X control on all existing coal-fired electric utility generating units by January 1, 2000 (DOE 1991).

NO_X reductions are also required due to the need for areas to achieve attainment with EPA's current ozone standard. However, EPA is currently evaluating revisions to the standard, and will likely make it more stringent. EPA is scheduled to make its recommendation on this matter later this year. The outcome of this regulatory process could likely result in yet additional requirements for further levels of NO_X reductions from power plants across the U.S.

The Micronized Coal Reburn Technology meets NYSEG's need to adhere to the CAAA required NO_X control at Milliken Station. This innovative technology proposed for Milliken is expected to reduce annual NO_X emissions by over 70 percent from pre-retrofit levels, greatly exceeding the reductions required by the CAAA. Therefore, compliance with both Phase 1 and Phase 2 of the CAAA will be fulfilled.

1.2.2 NEW YORK STATE ENERGY PLAN

The most recently published New York State Energy Plan (October 1994) recognizes the expectation of coal's continuing dominance as the Nation's most abundant and least expensive fossil fuel. The plan update recommends reducing the use of petroleum and increasing the use of clean coal, by incorporating available clean coal technologies in existing electric facilities. The Plan update further endorses the reduction of emissions of acid deposition precursors through existing and new State programs designed to be consistent with Federal Programs which mandate reductions of SO_2 and NO_X emissions from 1980 levels. The Plan update also encourages development necessary to achieve acidic deposition and ambient air quality (ozone) goals.

Milliken makes an important contribution to electricity generation in New York State, using an abundant domestic fuel source in a efficient manner. The project meets the goals and objectives set forth at the State level, providing an opportunity to demonstrate innovative, cost effective, and environmentally responsible clean coal technology.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 DESCRIPTION OF EXISTING FACILITIES

This section describes the design, construction and operational features and schedule for proposed modifications. It also presents alternatives to the project including: a no-action alternative and alternative emission control techniques.

2.1.1 GENERAL LOCATION AND DESCRIPTION

Milliken is located north of Milliken Station Road in the Town of Lansing, on the east shore of Cayuga Lake, approximately 14 miles north of Ithaca, New York (see Figure 2.1.1-1). The Milliken property location is illustrated in Figure 2.1.1-2.

Milliken is situated on a 1,100-acre parcel of land in a rural area of the Town of Lansing, in the northwestern corner of Tompkins County. The property boundaries extend north to Cuddeback Road, and east to Lake Road. Milliken Station Road is the southern property boundary, and Cayuga Lake bounds the property to the west. Components of the existing facility, as shown in Figure 2.1.1-3, include the main power plant building, scrubber building and a number of ancillary buildings and structures, including a six-acre coal

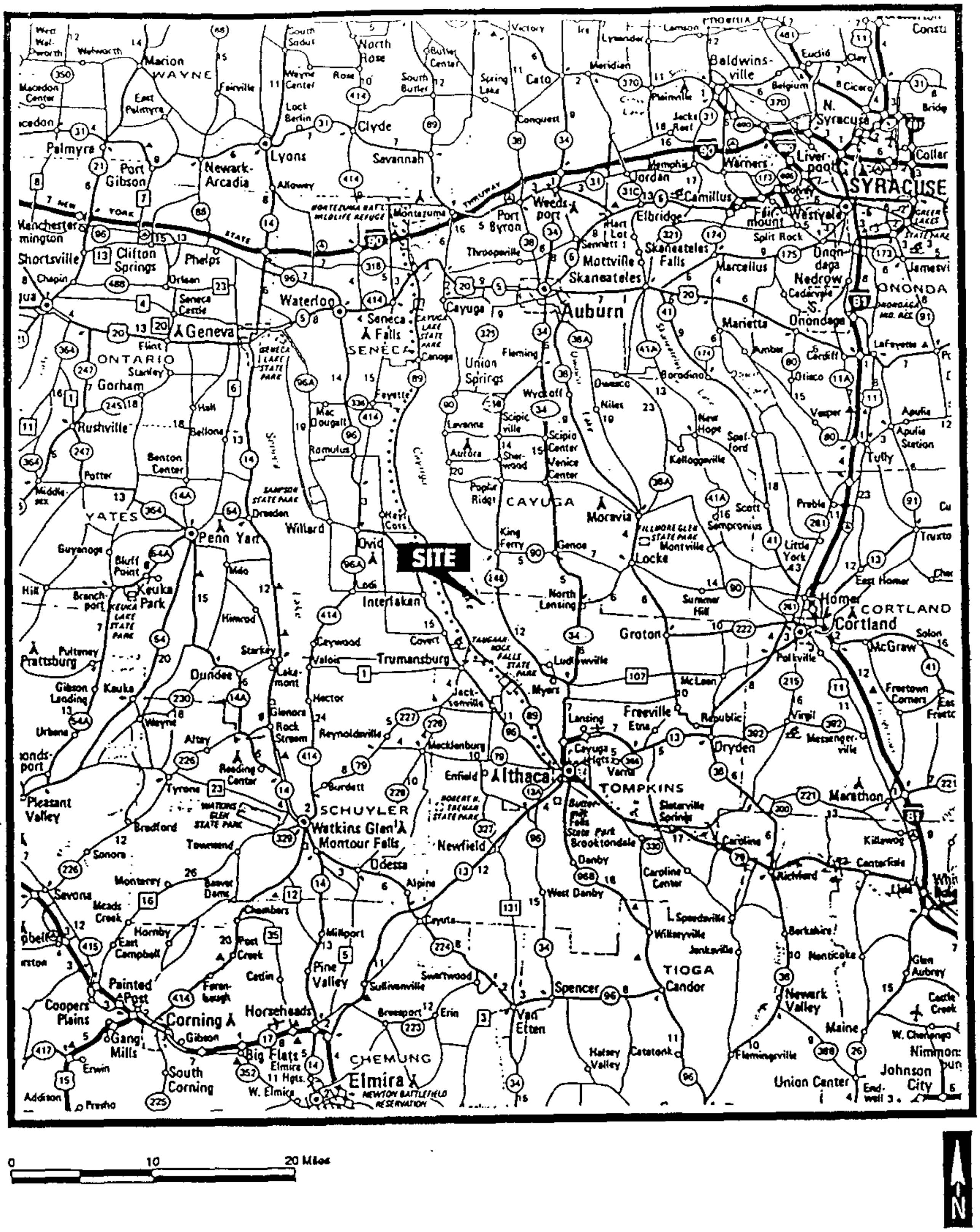
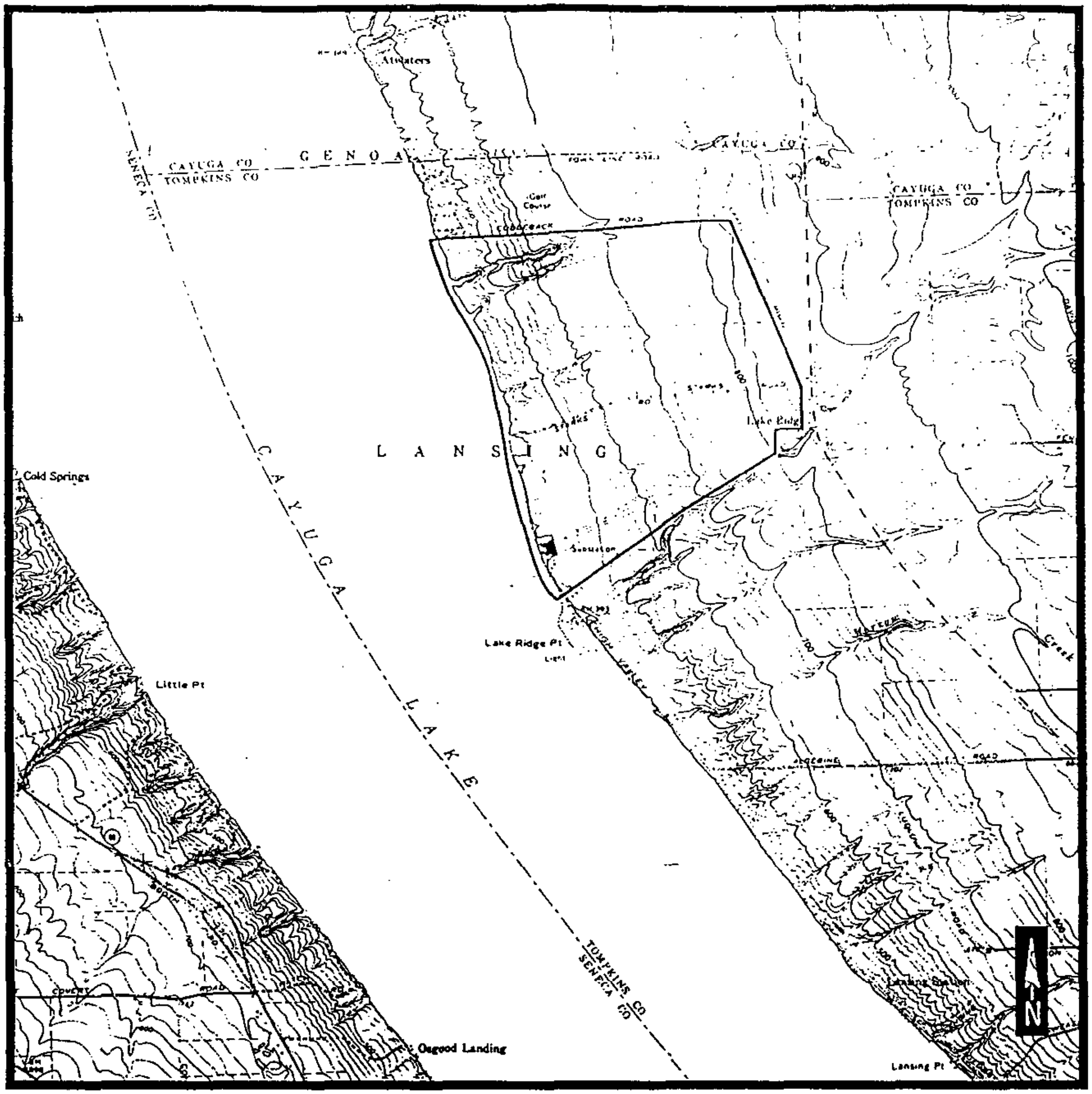


Figure 2.1.1-1
Site Locus Map



SOURCE: USGS 1970, 1971. 7.5 Minute Series (Topographic) Maps of Genoa, Ludlowville, Sheldrake and Trumansburg, NY

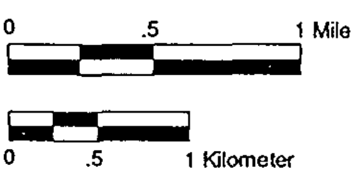


Figure 2.1.1-2
Location of Milliken Station

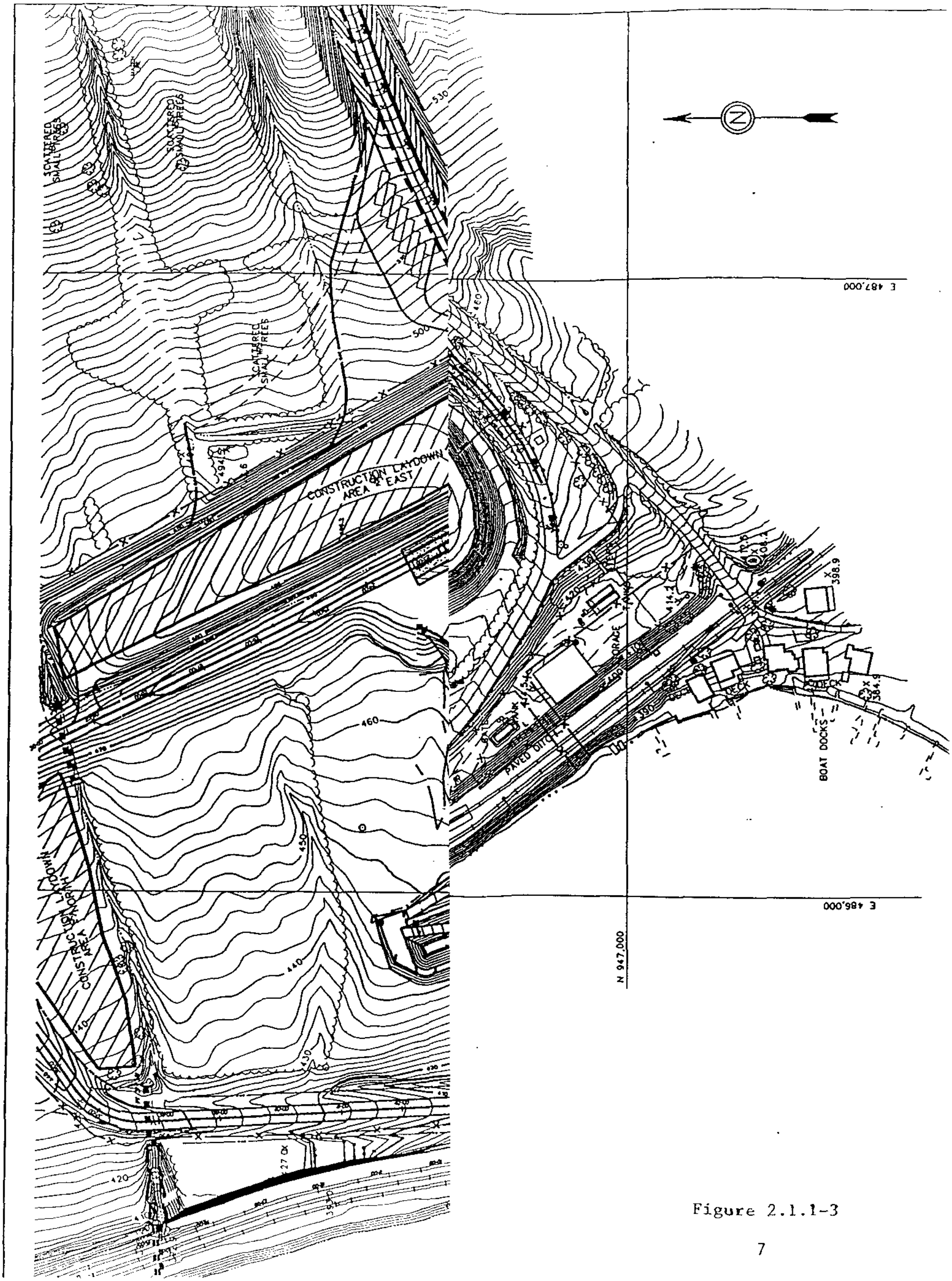

CONSTRUCTION LAYDOWN AREA EAST
CONSTRUCTION LAYDOWN AREA NORTH
SCATTERED SMALL TREES
SCATTERED SMALL TREES
SCATTERED SMALL TREES
PAVED DITCH
BOAT DOCKS
DECK
DECK
E 487,000
E 486,000
N 947,000
530
500
460
440
430
420
390
398.9
384.9

Figure 2.1.1-3

storage area and associated transfer equipment, limestone storage and associated transfer equipment, railroad sidings, an electrical substation and overhead transmission lines, fuel oil and water storage tanks, gypsum storage building and wastewater treatment building. An ash landfill area encompasses approximately 44 acres and is located east of the power plant.

Milliken Station began generating electricity in 1955 and has undergone several changes throughout its history. The first being the addition of a second generating unit in 1958. Environmental improvements have been ongoing throughout the life of the station and include installation of additional electrostatic precipitators in 1972, construction of a waste waster treatment system in 1976 and the addition of a formic acid enhanced wet limestone scrubber system in 1995.

Figure 2.1.1-4 presents a process diagram, illustrating the operation of each of Milliken's two units. Each unit has separate generating and control equipment, and combustion gases are vented into a split module scrubber which exhausts flue gas into two separate flues on top of the scrubber. In addition, a bypass flue to provide for emergency and startup conditions is also located on top of the scrubber building. The three flues are housed within a carbon steel shell which rises to a total height of 374 feet.

2.1.1.1 ELECTRIC GENERATING SYSTEM FACILITIES

The electric generating system consists of two pulverized coal-fired boiler units (Units 1 and 2), and two steam turbine-generators nominally rated at 150 MW each, and associated auxiliary equipment. The Unit 1 turbine/generator is a Westinghouse tandem compound, triple flow, condensing reheat unit. Unit 2 is a similar unit manufactured by General Electric. Both units feature a Combustion Engineering tangentially fired steam generator. The two boilers have a total design heat input of 2,840 MMBtu per hour at maximum continuous rating (MCR). During periods of peak energy demand, the total heat input can be as high as 107 percent MCR. At maximum peak capability of the steam generators, the facility produces approximately 2,260,000 pounds per hour of steam (Unit 1 at 1,800 psi and Unit 2 at 1,850 psi) at 1,005°F. Milliken has consistently been rated as one of the 20 most efficient generating stations in the United States, and in New York State is second only to NYSEG's Kintigh Station.

2.1.1.2 TRANSMISSION AND DISTRIBUTION FACILITIES

Milliken's electricity is transmitted to the NYSEG power grid via an on-site substation. Power generated by Units 1 and 2 is transmitted via 34.5 and 115 kilovolt (kV) overhead transmission lines which extend east across NYSEG property.

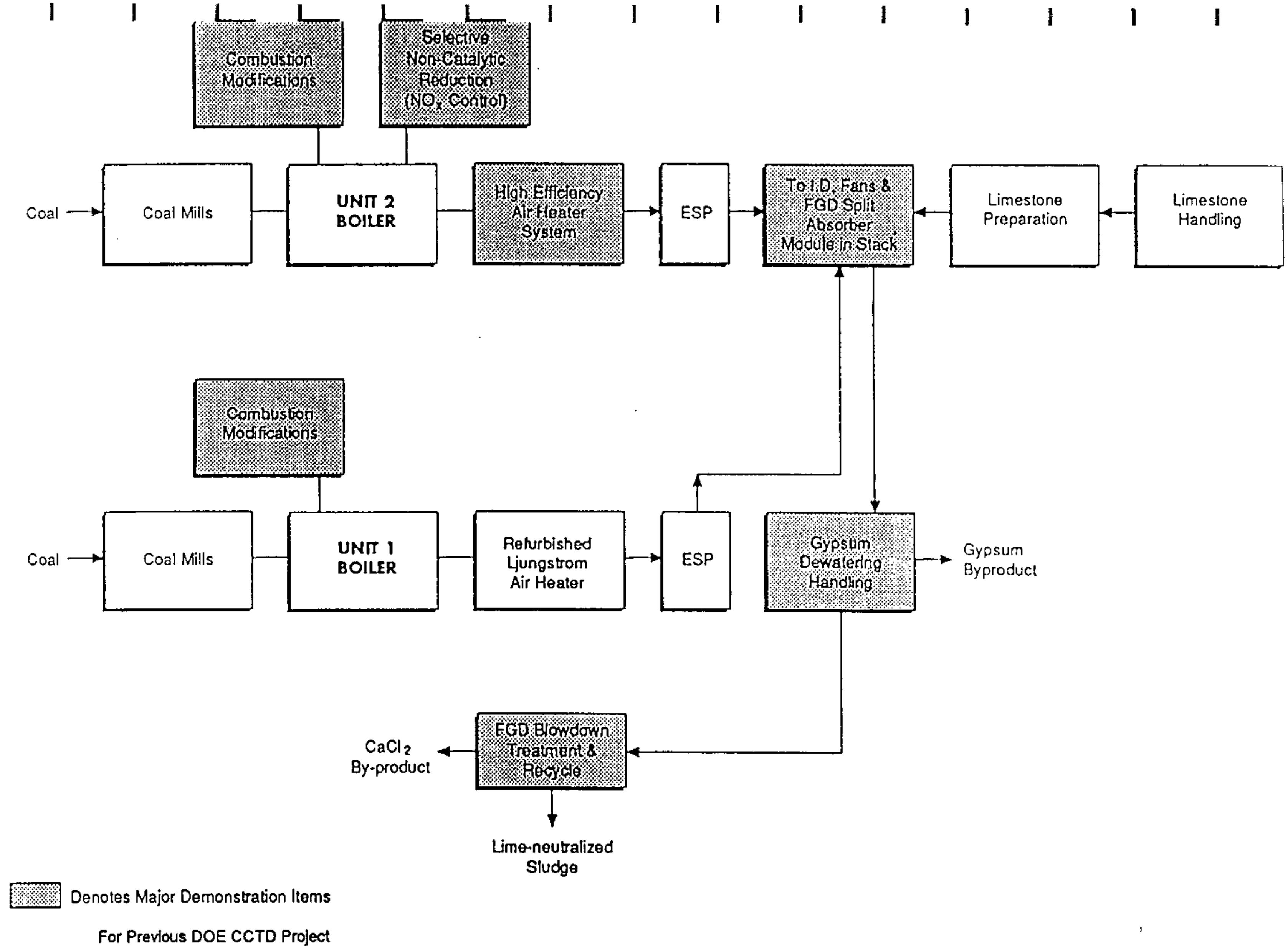


Figure 2.1.1-4
Process Block Diagram

2.1.1.3 FUELS PROCESSING

Bituminous coal mined in Pennsylvania is Milliken's primary fuel. Coal is typically transported to the facility by train. Typically, two to three freight trains arrive at Milliken per week, accessing the facility via Conrail railroad tracks that extend north from Ithaca along the east shore of Cayuga Lake. The trains usually contain between 80 to 100 cars; each car has a carrying capacity of approximately 80 to 100 tons. Occasionally, coal delivery is supplemented by truck. Under these conditions, approximately 25 deliveries per day are made, with each truck carrying roughly 25 tons of coal. Approximately 2,700 tons of coal per day are consumed at Milliken.

Milliken is equipped with unloading and conveyor equipment to transfer coal from rail cars to the long-term storage pile. The coal stockpile holds an approximately 60-day fuel supply (170,000 tons), providing an inventory capable of meeting energy needs during normal fuel delivery fluctuations.

Coal is removed from the long-term storage pile via underpile feeders. The feeder hopper discharges coal to conveyor belts, which transports it to storage bunkers and then to the coal mills, where the coal is pulverized to the consistency of talcum powder. Pulverized coal is then delivered into the boilers and burned.

Combustion heat is used to produce steam. Products of combustion are then processed to remove particulates and other pollutants. Heavier ash particles, after falling to the bottom of the boiler, are removed by a bottom ash conveying system and then sent to the bottom ash hydrobin where the ash is dewatered. Flue gas exiting each boiler is ducted to individual electrostatic precipitators to remove flyash particles. Approximately 250 tons per day of fly ash and 45 tons per day of bottom ash are generated. The flue gas is then directed to the Flue Gas Desulfurization System (FGD) via duct work where 90-95% of the SO_2 is removed. The FGD system produces 180 tons of gypsum and 5,000 gallons of brine per day.

2.1.1.4 PROCESS WATER USE

Water is used for three general functions at Milliken: generation of steam, facility service water and removal of waste heat. Water (approximately 216 million gallons per day (MGD)) is withdrawn, via four circulating pumps, from Cayuga Lake through a submerged intake.

Steam is produced by heating boiler feedwater in steam generators through combustion of pulverized coal. The steam generator produces high pressure, high temperature steam for use as the motive force in the turbine generators. Approximately 35,000 gallons per day (gpd) of water are demineralized and used for boiler feedwater make-up.

About 2,500 gpd after being treated in the plant make-up treatment system, is used for potable and sanitary purposes. An additional 4,000 gpd are used for maintenance cleaning washes.

A once-through non-contact cooling system is used to condense steam. The bulk of water drawn from Cayuga Lake is circulated through the steam condensers prior to discharge through a shoreline outfall. Approximately 215.3 MGD of water circulates through the condenser. Approximately 600,000 gpd are used for equipment cooling purposes.

2.1.1.5 Ash Disposal

Ash is collected from the furnace bottom, economizer hoppers, air heater hoppers, and electrostatic precipitators. Coal combustion produces about 80,000 cubic yards of ash per year. Through a very successful reuse program, NYSEG has been able to market the majority of fly ash for use in concrete production, and bottom ash as an anti-skid material. NYSEG typically sells 100 percent of its bottom ash and about 95 percent of the flyash. Future projections estimate that only about 7,000 cubic yards per year of fly ash will be disposed of in the on-site landfill, which is located immediately east of the station and has approximately 550,000 cubic yards of available storage capacity.

Milliken landfill meets 6 NYCRR Part 360 monofill design requirements, and is equipped with liner and leachate collection systems. NYSEG has implemented an extensive groundwater monitoring program, maintaining 37 groundwater wells located throughout the landfill area. Quarterly water quality monitoring occurs at 15 of the wells, with monthly water level monitoring at all 37 wells. Parameters such as turbidity, alkalinity, pH, total organic carbon, total dissolved solids, and a variety of metals are analyzed in water quality samples, in accordance with Milliken landfill's SPDES Permit (#0108553) and Part 360 Permit to Operate (#7-5032-00019/00001-0).

2.1.1.6 Liquid Waste Generation, Treatment and Disposal

Major station elements that generate wastewater include cooling water systems, boiler blowdown, demineralizer backwashes, sump pump discharges and sanitary sewage. The majority of wastewater from Milliken (214 MGD) is non-contact cooling water, discharged to Cayuga Lake in accordance with NYSEG's existing SPDES permit (#0001333). The remainder of the wastewater stream (2.27 MGD) is composed of regeneration wastes, boiler blowdown, sanitary wastes, area washes, yard and roof drainage, and drainage from the coal storage pile and ash landfill. Sanitary waste is discharged through a septic tank, sand filter and chlorinator.

Coal-pile runoff and maintenance cleaning wastewater is treated and discharged to Cayuga Lake in accordance with NYSEG's SPDES permit (#0001333). Process water from plant drains, yard and roof drains and accessory equipment cooling is collected and treated in a process-water reclamation facility and is discharged to Cayuga Lake in accordance with NYSEG's SPDES permit (#0001333).

Leachate and surface water runoff from Milliken landfill is currently collected in a 3.8 million gallon sedimentation basin designed to hold runoff from a 10-year, 24-hour storm event. After sedimentation, water is discharged to Cayuga Lake in accordance with the landfill's SPDES permit (#0108553). When required to meet permit limits, the basin effluent can be routed to a bottom ash filter at the basin discharge for additional solids removal.

All facility wastewater is pre-treated via API separators and is passed through a gravity sand filter prior to discharge. Runoff from the coal pile storage area and sludges from the coal pile basin, facility lift station, and API separator are neutralized, clarified and dewatered. Chemical cleaning of the boilers is performed on an approximately six-year cycle. During these times, chemical cleaning wastewater is transported off-site for treatment prior to disposal by a licensed vendor.

2.2 DESCRIPTION OF PROPOSED ACTION

2.2.1 LOCATION AND GENERAL DESCRIPTION

The demonstration project involves installation of new reburn ejectors and associated piping All demonstration features, retrofits and upgrades will be integrated into Unit 2.

2.2.2 MODIFICATIONS TO UNIT 2

The process concept will be simulated on Milliken Unit #2 using the existing equipment installed under the DOE CCT IV Demonstration project. Milliken Unit #2 baseline NO_X emission is at 0.40 lb/mmbtu. The existing Riley MPS 150 mills with dynamic classifiers have operated with fineness approaching 75% through 325 mesh. The operations of the mills will be tested at high classifier speed to demonstrate the required 80% through 325 mesh or higher fineness. The upper burner compartment will be converted to injector/combustor and de-coupled from the vertical tilting linkage for this demonstration.

The second phase of the work proposes the addition of separate reburn injectors installed above the main windboxes and below the SOFA windboxes. A set of coal diverter valves will be installed on the top coal pipes to direct the coal flow to either the top burners or to the reburning coal injectors. The reburn zone residence time for Milliken Unit #2 is constrained by the location of the existing burner and OFA equipment. A preliminary estimate of the residence time is 0.3 seconds. Consequently, the incremental additional NO_X reduction efficiency is predicted to be between 25% and 35%.

By using the existing milling equipment to demonstrate the coal reburning technology at

Milliken Station, no impacts on the boiler performance and LOI level are expected due to the system flexibility and the short distance between the reburn zone and the OFA location. Post retrofit NO_X emissions for Milliken Unit 2 is expected to be .26 lb/mmbtu.

2.3 ALTERNATIVES TO THE PROPOSED ACTION

2.3.1 NO ACTION ALTERNATIVE

A No Action Alternative would result in continued operation of the existing power plant in its existing configuration. The No Action Alternative would not meet the need to comply with emissions reductions mandated by the CAAA and the benefits of achieving the long-range energy planning goals and objectives stated in the New York State Energy Plan, as discussed in Section 1. The No Action Alternative would result in continued emissions of NO_X from Milliken Station at current levels. This alternative would not be consistent with New York State's or the Department of Energy's prioritization of programs that reduce emissions of these pollutants in a cost-effective manner, nor would it meet the need to use an abundant, economic fuel in a manner that enhances statewide air quality.

2.3.2 ALTERNATIVE EMISSION CONTROL TECHNIQUES

Alternative emission control techniques include Gas Reburn, Selective Non-Catalytic Reduction (SNCR) and Selective Catalytic Reduction (SCR). These programs were evaluated for the Milliken Station Project. Gas Reburn was ruled out due to the lack of a sufficient gas supply within the economic range of the project. The SNCR technology is scheduled to be demonstrated on Unit 1 in 1996. Boiler and equipment modifications have been made to demonstrate, Nalco Fuel Tech's NO_XOUT™ Process. However, experience with the NO_X OUT™ process at Penelec's Seward Station has resulted in air preheater pluggage. Based on the difficulties experienced at Seward Station, NYSEG is negotiating with Penelec to use their data and experience obtained during startup and operation of Seward's NO_XOUT™ Process. If this is successful NYSEG will utilize the data in lieu of jeopardizing Milliken Station availability with the NO_X OUT™ process.

NYSEG has also investigated demonstrating a SCR unit at Milliken Station in conjunction with SNCR. Due the problems with the SNCR the SCR is also in the process of being transferred to Seward Station.

3.0 EXISTING ENVIRONMENT

This section describes the environmental setting for the proposed Milliken Station Micronized Coal ReburnTechnology Demonstration Project. Baseline environmental conditions at the proposed project site and general vicinity are assessed for:

- air resources, including climatology, meteorology and air quality;
- earth resources, including topography, geology and soils;
- water resources, including surface water, groundwater and water quality;
- ecological resources, including terrestrial vegetation and wildlife, wetlands and threatened or endangered species; and
- community resources, including land use and zoning, socioeconomics, transportation, noise, visual resources and cultural resources.

3.1 AIR RESOURCES

3.1.1 SITE METEOROLOGY

The climate in the central New York Finger Lakes Region is dominated by two types of air masses: masses of cold, dry air from the northern interior of the continent and warm, humid air from the south and southwest, modified by the Gulf of Mexico and adjacent subtropical waters. The regional climate is characterized by long, cold winters and cool summers with occasional warm, humid periods.

Precipitation is evenly distributed through the year, with no pronounced dry or wet seasons, although summer precipitation is slightly higher. The climate features predominantly cloudy weather during winter months, and precipitation frequently occurs in the form of snow. Clear weather occurs approximately 60 to 65 percent of the time. During summer, thunderstorms, accompanied by heavy rain and high winds, are not uncommon and account for most of that season's precipitation. Precipitation during the rest of the year is due mainly to cyclonic storms passing through the region. The occurrence of fog in the region is highly dependent on local topography, with more fog occurring in the valleys.

Winds in the Cayuga region are dominated by prevailing westerlies. Westerly flow is interrupted by cyclonic and anticyclonic pressure systems passing through the region. Thunderstorms occur frequently in summer and destructive winds and lightning strikes are quite common. The frequency distribution of surface wind directions varies locally because of the region's terrain. Winds in the deeper valleys of the area show substantial valley influences such as channeling and nocturnal drainage. Above the valleys, winds are not significantly influenced by local topography.

3.1.2 AIR QUALITY

As Part of the Milliken Clean Coal DemonstrationTechnology Project, NYSEG started an Ambient Air Quality Monitoring Program, February 1993. This ambient monitoring program is being performed to fulfill both compliance monitoring and supplemental monitoring objectives. In the permit to construct issued for the Milliken CCTD project, the New York State Department of Environmental Conservation (NYSDEC) requires monitoring of ambient SO_2, PM_{10}, and NO_X. Additional parameters such as ozone, total suspended particulate and trace metals were added to further demonstrate and document the effects of the CCTD program.

The NYSEG Milliken Station Ambient Monitoring Program consists of a central meteorological monitoring site and three air quality monitoring sites. The central meteorological site contains a 100 meter tower monitoring three levels of wind speed and wind direction, three levels of vertical wind speed, three levels of temperature difference, ambient temperature, solar radiation and net radiation. Wind turbulence data are derived from the horizontal wind direction (sigma theta) and vertical wind speed (sigma W) by an onsite Odessa DSM 3260 data logger.

Associated with the tower is a Remtech acoustic SODAR monitoring wind speed, wind direction, vertical wind speed, and turbulence in eight atmospheric layers. The air quality monitoring sites each contain monitors for $S0_2$, NO_2, TSP, PM_{10} and 10-meter wind speed, wind direction and temperature. One of these sites also monitors 0_3. Configuration, siting, operation, data processing and quality assurance/quality control practices conform to the provisions of EPA's Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD). Gaseous air pollutant measurements are made using continuous monitors selected from EPA's list of reference and equivalent methods and operated as designated in that list.

The ambient air quality monitoring program has demonstrated that the ambient air quality around Milliken Station is well within the standards established by the EPA. The following is a summary of the ambient air quality data collected during 1994 (National Ambient Air Quality Standards are listed on Table 3.1.2-1):

- The highest hourly average SO_2 concentration measured during the year at North Site was 250 ppb with a peak 3-hour running average of 206 ppb (41% of AAQS) and a peak 24-hour running average of 55 ppb (39% of AAQS). The hourly SO_2 average for the year was 8 ppb (annual AAQS 30 ppb). The highest hourly average NO_2 and NO_X concentrations for North Site were 43 ppb and 69 ppb respectively, with an annual average of 5 ppb for NO_2 and 7 ppb for NO_X (annual AAQS for NO_2 is 50 ppb). The highest hourly average ozone concentration measured at North Site during the year was 93 ppb (77% of AAQS), with an annual hourly average of 33 ppb. The highest 24-hour PM_{10} concentration during the year was 51.8 $\mu g/m^3$ (35% of AAQS). The highest TSP concentration during the year (December 1994 only) was 27.1 $\mu g/m^3$ (18% of the secondary AAQS).

- The highest hourly average SO_2 concentration measured during the year at East Site was 176 ppb with a peak 3-hour running average of 125 ppb (25% of AAQS) and a peak 24-hour running average of 43 ppb (31% of AAQS). The hourly SO_2

Pollutant	Standard Type	Averaging Time Period	Frequency of Occurrence	Concentrations
SO_2	Primary	1 Year 24 Hour	Arithmetic Mean Annual Maximum[1]	30 ppb (80 $\mu g/m^3$) 140 ppb (365 $\mu g/m^3$)
	Secondary	3 Hour	Annual Maximum[1]	500 ppb (1,300 $\mu g/m^3$)
O_3	Primary (and Secondary)	1 Hour	Annual Maximum[1]	120 ppb (80 $\mu g/m^3$)
NO_2	Primary (and Secondary)	1 Year	Arithmetic Mean	50 ppb (100 $\mu g/m^3$)
PM_{10}	Primary (and Secondary)	1 Year 24 Hour	Arithmetic Mean Arithmetic Mean[1]	50 $\mu g/m^3$ 150 $\mu g/m^3$
TSP	Primary	1 Year 24 Hour	Arithmetic Mean Arithmetic Mean[1]	75 $\mu g/m^3$ 260 $\mu g/m^3$
	Secondary	1 Year 24 Hour	Arithmetic Mean Arithmetic Mean[1]	60 $\mu g/m^3$ 150 $\mu g/m^3$

1 Not to be exceeded more than once per year.

Table 3.1.2-1
National Ambient Air Quality Standards

average for the year was 7 ppb (annual AAQS 30 ppb). The highest hourly average NO_2 and NO_X concentrations for East Site were 39 ppb and 57 ppb respectively, with an annual hourly average of 5 ppb for NO_2 and 7 ppb for NO_X (annual AAQS for NO_2 is 50 ppb). The highest 24-hour PM_{10} concentration during the year was 49.7 $\mu g/m^3$ (33% of AAQS). The highest 24-hour TSP concentration during the year (December 1994 only) was 28.9 $\mu g/m^3$ (19% of the secondary AAQS).

- The highest hourly average SO_2 concentration measured during the year at South Site was 220 ppb with a peak 3-hour running average of 169 ppb (34% of AAQS) and a peak 24-hour running average of 69 ppb (49% of AAQS). The hourly SO_2 average for the year was 9 ppb (annual AAQS 30 ppb). The highest NO_2 and NO_X hourly concentrations were 42 ppb and 71 ppb respectively, with an annual average of 6 ppb for NO_2 and 7 ppb for NO_x (annual AAQS for NO_2 is 50 ppb). The highest 24-hour PM_{10} concentration during the year was 50.4 $\mu g/m^3$ (34% of AAQS). The highest 24-hour TSP concentration during the year (December 1994 only) was 34.3 $\mu g/m^3$ (23% of the secondary AAQS).

In accordance with one of the provisions of EPA's PSD guidelines, data capture rates exceeded 80% for all ambient air quality parameters collected during the year and 90% for all meteorological data collected from the four meteorological towers during the year. Per EPA's document entitled, Onsite Meteorological Program Guidance for Regulatory Modeling Applications (EPA-450/4-87-013) data capture requirements for the SODAR database are defined somewhat differently than for tower collected data and more conventional sensors. In spite of weather and noise related problems during this period, EPA's data capture criterion was met.

In accordance with EPA's Ambient Monitoring Guidelines for PSD, periodic calibrations and audits were performed on all air quality and meteorological monitoring systems. All air quality and meteorological calibrations were performed using standards documented traceable to the National Institute of Standards and Technology (NIST). All calibration protocols complied with the requirements of the applicable appendices to 40 CFR.

3.2 LAND RESOURCES

3.2.1 PHYSIOGRAPHY

The majority of Tompkins County is within the Allegheny Plateau, a segment of the Appalachian Plateau physiographic province. A small portion in the northwestern corner of the county, including the project site, is within the Erie-Ontario Plain. The site lies within a thick series of relatively undeformed Paleozoic sediments in the Finger Lakes region of central New York State, an area of rolling hills and valleys. These variations in topography are typical of terrain modified by glaciation.

The region is distinguished by classic surface features formed by glacial action. During the past million years, advance and retreat of the great continental glaciers affected both the topography and the soils of the region. Researchers estimate that glaciation in this area started 300,000 years ago and that the most recent of the ice events occurred about 13,000 to 16,000 years ago (SCS 1965). Ice sheets moved down across central New York, scouring and re-distributing the soil and loose rock mantle that had developed during a long period of erosion in geologic history. A considerable thickness of residual soils was removed as the last ice melted and the glacier receded, 10,000 to 12,000 years ago. Ice advances tended to smooth out the ground surface and often deepened valleys that were oriented in the direction of the advance. In the Finger Lakes region, most major river valleys ran north and south, with tributaries flowing from east to west. The Finger Lakes, including Cayuga Lake, were formed in these troughs after the retreat of the latest glaciers. The resulting topography has been modified only slightly since the retreat of the glaciers.

The region is characterized by one complete north-south ridge and parts of two other ridges, separated by the deep valleys of Cayuga and Owasco Lakes. The ridges are broad and smooth, with mild topography except for the two deep lake valleys, a few shallower valleys such as the Salmon Creek valley, and narrow gorges that have cut back into the side slopes of the ridges along the river and lake valleys. Although several interglacial gorges and hanging valleys of earlier glacial origin occur around the perimeter of Cayuga Lake, particularly to the south, such unique geologic features are not located near the site. In the site vicinity, terrain rises from the lake shore, at an approximate elevation of 400 feet above mean sea level (MSL) to an elevation of about 800 feet (MSL) within one mile. Within three miles east of the project site, the terrain rises to about 1,100 feet (MSL). From this region out to 50 miles or more, the terrain generally ranges above 1,000 feet (MSL) with widely scattered high points between 2,000 and 3,000 feet (MSL). Other glaciated valleys similar to that of Cayuga Lake exist west and northeast of the site, forming the other Finger Lakes. The topographic gradient in the region surrounding the site is illustrated in Figure 2.1.1-2.

A steep cliff face, approximately 30 feet in height, extends for several miles from Milliken north through the project site and beyond. Portions of the cliff face directly north of Milliken were excavated and removed during the construction of the existing power plant to provide space for facility components. From the top of the cliff, the site slopes east.

3.2.2 GEOLOGY

Tompkins County is underlain by sedimentary rocks that formed during the Devonian period of the Middle Paleozoic Era. The bedrock found in this area is approximately 300 to 400 million years old and consists of shale, fine-grained sandstone, and thin beds of limestone. The beds are nearly horizontal and show very little folding or faulting. They dip slightly to the south and southwest, at a gradient of 15 to 30 feet per mile (SCS 1965).

The site is underlain by a thick section of Paleozoic rocks that occur widely throughout central and southern New York. These rocks represent a thick series of sediments deposited within an extensive ancestral inland seaway. Rocks in the immediate area include Geneseo shale, Tully limestone, Moscow shale and Ludlowville shale.

Ludlowville shale is the oldest rock in the site area, cropping out at about 300 feet (MSL). The upper Ludlowville shale consists of blocky, variegated dark blue to gray nonfissile calcareous shales and siltstone units. The uppermost unit is a calcareous siltstone 20 feet thick, underlain by a spotted shaly siltstone over 45 feet thick, with 35 feet of calcareous siltstone beneath, and another shaly unit below.

Moscow shale overlies the older Ludlowville shale and crops out between 300 and 450 feet (MSL). The dark gray shale is predominantly thinly-laminated, noncalcareous and pyritic, and contains occasional bands of bluish-gray impure limestone. The formation consists of five shale units, a thin siltstone unit, and a very thin limestone bed. The steep cliff face to the north of Milliken Station is composed of this rock, which is readily crushed when dry.

Tully limestone overlies the Moscow shale. The Tully formation is about 15 feet thick near the site and contains two thin shaly interbeds. This limestone is overlain by Geneseo shale, a thinly-laminated, fissile and closely-jointed shale. The shale is over 100 feet thick; thin limestone beds occur in the lower part that overlies the Tully limestone.

Bedrock in the site area is overlain by 10 to 15 feet of soil and glacial deposits. In areas underlain by Moscow and Geneseo shales, a zone of weathered and disintegrated shale occurs beneath the soil cover and at the top of the shale formations. This weathered zone varies in thickness from less than one to three feet (NYSEG 1974).

3.2.3 SOILS

Soils on the site are primarily Hudson-Cayuga silt loams and Hudson silty clay loams, with Ovid silt loam found in areas of higher elevations north and northwest of the facility (SCS 1965). The Hudson-Cayuga soil association is moderately well drained, with coarse textured soils, and is usually associated with moderate to steep slopes. This association occurs along Cayuga Lake and Salmon Creek below the 1,000-foot contour, which represents the level of glacial Lake Ithaca when its outlet was to the south (SCS 1965). These soils developed on glacial till and lacustrine material.

Milliken Station is characterized by Hudson silty clay loams with two to six percent slopes, rock outcrops mapped along the lakeshore, and made land in the areas associated with previous construction. The Hudson soil series is characterized by deep, moderately well drained to well drained, fine-textured soils that formed in calcareous clayey lake deposits. The silt loam surface soil is high in clay. The thickness of these lake deposits ranges from as little as three feet, where Hudson soils intergrade to Cayuga soils, to more than 20 feet. On the slopes to Cayuga Lake, this deposit rests on bedrock. Bedrock beneath this soil series can range from more than 10 feet below the surface to only 36 inches below the surface on valley sides (SCS 1965). Hudson soils are fairly well drained where they occur on slopes as steep as those bordering Cayuga Lake. Steep slopes and high erodibility limit agricultural use of the soils in this association. The characteristics of these soils also require foundations for large buildings or structures to be placed in underlying till or on bedrock.

3.3 WATER RESOURCES

The bulk of the region's available water is contained in surface water bodies, primarily Cayuga Lake. Groundwater resources in the area, in the form of aquifers, are relatively small and are well removed from the site. A few small, intermittent surface water bodies and isolated impoundments associated with groundwater seeps are located on or near the site.

3.3.1 SURFACE WATER

The proposed site is within the Finger Lake Sub-basin of the Seneca-Oneida-Oswego River drainage basin (Figure 3.3.1-1). The Oswego River watershed drains approximately 5,122 square miles within central New York; it is about 100 miles across in the east/west direction and nearly 70 miles wide at its widest point. The combined surface area of the nine major lakes (Canandaigua, Keuka, Seneca, Cayuga, Owasco, Skaneateles, Otisco, Onondaga and Oneida) is approximately 208 square miles, comprising nearly 5.5 percent of the basin area (NYSDEC 1988).

Cayuga Lake is approximately 40 miles long, averaging 1.7 miles in width, with a maximum width of four miles and a maximum depth of about 435 feet. Total lake surface area is 67 square miles, and the total lake volume is approximately 331 billion cubic feet (USGS 1989). This glacial lake lies in a long, narrow valley with a northwest-southeast orientation, between two ridges which range up to 1,400 feet (MSL). Lake surface elevation is approximately 382 feet (MSL).

The primary drainage basin of Cayuga Lake measures 785 square miles, including 67 square miles of lake area (USGS 1989). Net flow direction in the lake is from the south to the north. The Seneca River is the only outflow from the lake. This river enters from the west into the marshy northern area of Cayuga Lake and exits flowing northward, from the extreme northern tip of the lake. The river then flows generally to the northeast and

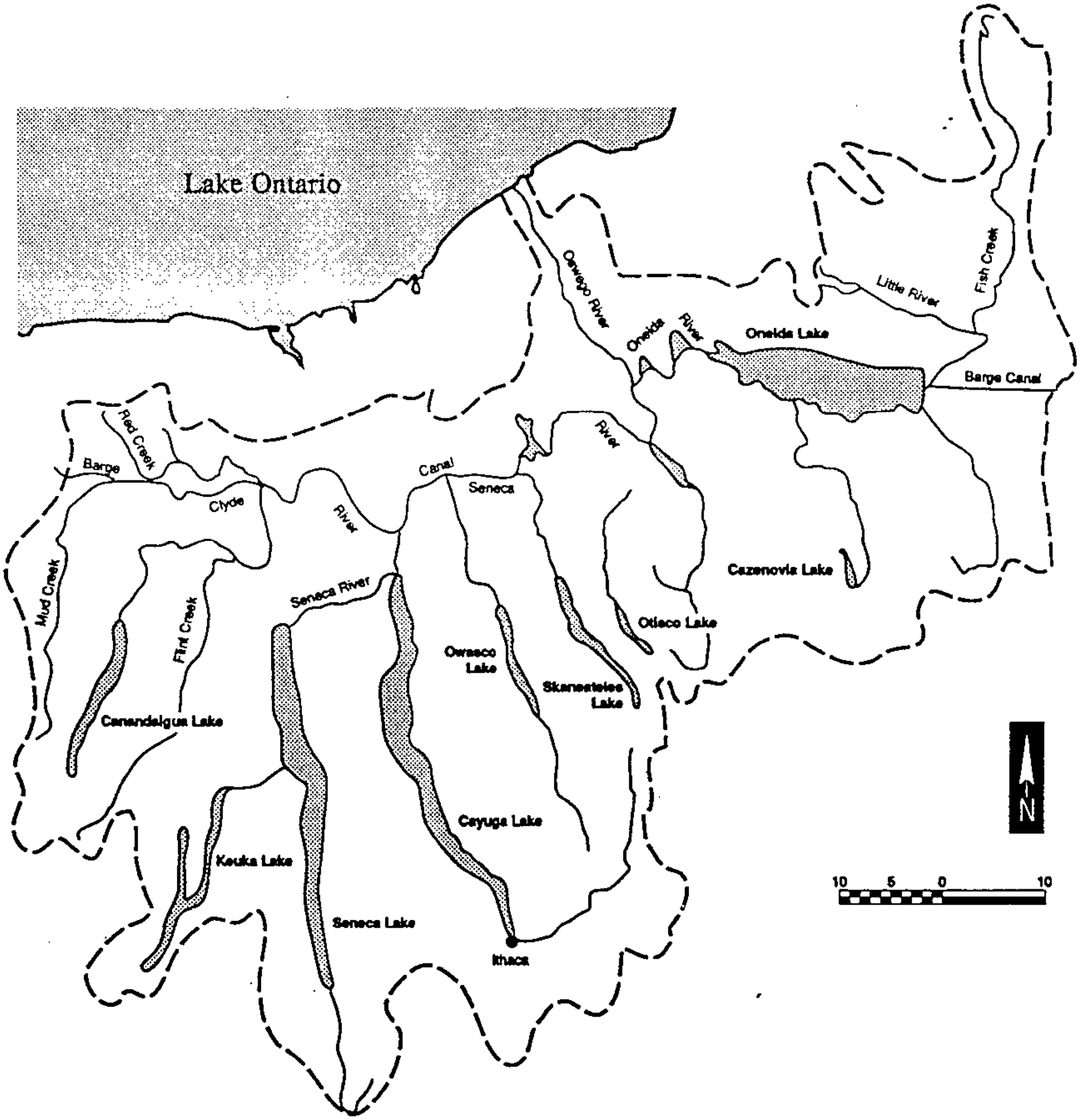


Figure 3.3.1-1
Seneca-Oswego-Oneida Rivers Drainage Basin

empties into the Oswego River, which in turn drains into Lake Ontario.

The entire river system is part of the New York State Barge Canal System. Locks on the Seneca river near its outflow from Cayuga Lake are used to control the water level in the lake. Water drainage into and out of the lake is small compared with lake volume, approximately nine percent per year (NYSEG 1974).

There are no significant natural surface water resources where construction activities are proposed. Surface water is present, however, on other portions of the site, and adjacent to it.

Numerous small, intermittent streams discharge to Cayuga Lake. These streams drain restricted surface areas located uphill from Milliken Station. Several of the streams have carved narrow ravines in the bedrock where they cross the cliff face which is exposed along the lakefront. Runoff from the entire Milliken property is directed into Cayuga Lake.

3.3.1.1 WATER USAGE

Water is used for three general functions at Milliken: generation of steam, facility service water and removal of waste heat. Water (approximately 216 million gallons per day (MGD)) is withdrawn, via four circulating pumps, from Cayuga Lake through a submerged intake.

Steam is produced by heating boiler feedwater in steam generators through combustion of pulverized coal. The steam generator produces high pressure, high temperature steam for use as the motive force in the turbine generators. Approximately 35,000 gallons per day (gpd) of water are demineralized and used for boiler feedwater make-up.

About 2,500 gpd after being treated in the plant make-up treatment system, are used for potable and sanitary purposes. An additional 4,000 gpd are used for maintenance cleaning washes.

A once-through non-contact cooling system is used to condense steam. The bulk of water drawn from Cayuga Lake is circulated through the steam condensers prior to discharge through a shoreline outfall. Approximately 215.3 MGD of water circulates through the condenser. Approximately 600,000 gpd are used for equipment cooling purposes.

3.3.1.2 Water Quality

In general, water resources in the Cayuga Lake area are of good quality. None of its surface or groundwater bodies are significantly impaired. Ground water is the primary source of drinking water for area residences.

Water in Cayuga Lake is generally of good quality (NYSDEC 1988). The 1988 NYSDEC report notes localized impairment of water quality levels within a small portion of the southern end of Cayuga Lake and Cayuga Lake Inlet, impacted by discharges from the City of Ithaca. Recent upgrades of the Ithaca POTW may have helped resolve this situation. Routine monitoring of the Cayuga Lake Outlet during 1985 indicated no violations of standards for heavy metals or volatile halogenated organics.

The NYSDEC classifies all surface water based on suitability for specific uses (i.e., public water supply, fishing and contact recreation) as indicated by historical use. Water quality standards as promulgated by 6 NYCRR Chapter 10, Section 701.19 consider factors such as turbidity, color, suspended solids, oil and grease, and toxic substances. Cayuga Lake in the vicinity of Milliken has a NYS Water Quality Classification of AA. The small unnamed streams that traverse the Milliken property, tributaries to Cayuga Lake, are rated as Class D, primarily due to their intermittent nature. NYSDEC defines AA as sources of water supply for drinking, culinary or food processing purposes and any other uses. Class D are waters suitable for fishing and is suitable for primary and secondary contact recreation even though other factors may limit the use for that purpose. These factors include natural conditions such as intermittancy of flow, water conditions are not conducive to the propagation of game fishery or stream bed conditions, the waters will not support fish propagation.

3.3.1.3 Floodplain

The proposed project site is located within a zone designated by the Federal Emergency Management Agency (FEMA) as an area of minimal flooding. Milliken Station approximately 500 feet from the 100-year floodplain of Cayuga Lake. The area designated as 100-year floodplain corresponds with the lake shoreline, and ranges in width from 20 to 200 feet in the vicinity of Milliken Station (FEMA 1985).

On June 14, 1993, NYSEG made a request to FEMA to determine whether the Milliken Station is located within the Special Flood Hazard Area (SFHA), an area that would be inundated by the 100 year flood. Based on elevation data submitted to FEMA, a determination was made that the existing structures were not included within the floodplain and has since amended the map for the Town of Lansing, New York, NFIP map number 360852-0031C, dated October 15, 1985 for removal of this property from SFHA.

3.3.1.4 WETLANDS

There are no significant natural surface waterbodies on site, nor are there NYSDEC-designated wetlands within the Milliken property boundaries. Several small pockets of unclassified freshwater wetlands are located in the open field habitat. These areas are isolated wet areas, less than one acre in size, hydrologically supported by groundwater seepage from the steep adjacent hillsides. Soils in this area are Hudson silt loams with a slope of 2 to 6 percent, and Hudson-Cayuga silt loams with slopes of 2 to 6 and 6 to 12 percent. None of these soils appear on the New York State list of hydric soils.

Aquatic ecological resources on site are limited due to the lack of significant aquatic habitat, e.g., perennial streams, large ponds, etc. Two small open water ponds, with diameters of 20 to 50 feet, and several cattail/phragmites stands are located in the open fields north and east of Milliken Station. The first of these small open water ponds, has an estimated 6 to 12 inches of water, supports a limited amount of vegetation typical of freshwater wetlands, including cattail (*Typha* sp.), sedges (*Carex* sp.), switch grass (*Panicum virgatum*) and red maple. This small pond is located at the top of a steep gradient, and adjacent to a portion of a facility access road. Other plant species surrounding this small pond are typical of fence rows in the area, and include sugar maple, rose bush, grape, raspberry, and poison ivy.

The second open water pond, is located north of the facility adjacent to an access road where it parallels several open fields. This pond is larger, oval in shape, approximately 100 to 150 feet in length and approximately 50 feet wide at its greatest width. Although it does not appear to have any large streams feeding into it, several small, undeveloped channels were observed, indicating that the pond receives overland flow during heavy rainfall events. The pond is partially open and vegetated with cattail in the vicinity of the access road. Other hydrophytic vegetation in this area, typically found in freshwater wetlands, included common reed (*Phragmites* sp.), various species of sedges, spike rush (*Eleocharis* sp.) and willow shrubs along the outer edge of the pond. Sphagnum moss also occurs within the cattail stand. Other open field species in this area include knapweed, daisy, milkweed, teasel (*Dipsacus* sp.), Queen Anne's lace (*Daucus carota*), wild onion (*Allium stellatum*), hawkweed, and bedstraw (*Galium* sp.). Shrubs in the area include willow, cottonwood and sparse red cedar (*Juniperus virginiana*).

According to a review of secondary sources, several NYSDEC-mapped wetlands are found within one-half mile of the project area: a 153-acre deciduous swamp and potential botanical site, a 15-acre (Class III wetland) deciduous swamp, and a 29-acre scrub/shrub emergent (Class IV) wetland. In comparison with project area soils, these wetlands were found in areas mapped with the following soil types: Lyons silt loam, Illion silty clay loam, Kendaia silt loam, Lima silt loam, and Ovid silt loam.

3.3.1.5 GROUNDWATER

Information on groundwater resources in the project site vicinity has been derived from previous hydrogeological investigations of the area performed during the late 1960's and early 1970's (NYSEG 1974). Groundwater occurs in small to very small amounts throughout the Milliken property. Because a limited quantity of runoff infiltrates the soil and gravelly overburden materials, some perched water occurs above the bedrock. In the bedrock formations of shale, siltstone, and some limestone beds, very small quantities of groundwater are confined to the skeleton system of open fractures and joints that exists within the upper 50 to 100 feet of the surface.

There are no water supply sources on Milliken property. All small streams draining upland areas above the project site flow intermittently, and no significant areas of surface water are impounded

3.4 ECOLOGICAL RESOURCES

Terrestrial and aquatic ecological resources in the vicinity of the proposed project have been identified and characterized through secondary data source review. Agency contacts have been made with the U.S. Fish and Wildlife Service and the NYSDEC's Information Services, for a review of the Significant Habitat and Natural Heritage Program files to determine whether threatened, rare and endangered species exist on or near the site. A review of the NYSDEC Freshwater Wetlands Maps revealed no wetlands regulated under the New York State Freshwater Wetlands Act (6 NYCRR 660 et seq.) on Milliken property in general. U.S. Fish and Wildlife Service National Inventory Maps are not presently available for this area of Tompkins County. A field investigation was performed during July of 1991 to identify and characterize any wetland resources not inventoried by secondary sources.

3.4.1 AQUATIC

As discussed in the section 3.3.1.4, there are no significant natural surface waterbodies on site. Due to the intermittent nature of the wetlands and stream, aquatic species are primarily limited to amphibians such as the American toad (*Bufo americanus*), spring peeper (*Hyla crucifer*), gray treefrog (*Hyla versicolor*), and green frog (*Rana clamitans*). These inhabit the small pockets of freshwater wetlands on-site and temporary pools in the spring. Salamanders may be found along the rocks in ravines. Reptiles which may occur on-site are ringneck snake (*Diadophis* sp.), milk snake (*Lampropeltis* sp.) and garter snake (*Thamnophis* sp.). Northern water snakes (*Natrix sipedon*) have been captured during aquatic sampling of the lake.

Cayuga Lake which adjoins the project site is deep with very little shallow water. The water drops off rapidly and has few areas of rooted aquatic vegetation. The major portion of the lake is considered habitat for cold water species such as lake trout *(Salvelinus namaycush)*, cisco (Coregonus artedii), rainbow trout (Salmo gairdneri) and salmon (Salmo salar). Alewife *(Alosa pseudoharengus)* and smelt *(Osmerns mordax)* are particularly abundant in this portion of the lake.

3.4.2 TERRESTRIAL

The proposed project area and surrounding property supports a variety of ecological habitats, including active farmland in corn, hay, pasture and other annual crops; inactive farmland including abandoned pear and apple orchards; fence rows; mixed hardwood forest; and open fields in varying stages of secondary succession. The majority of this area of Tompkins County has historically been farmed and put into timber harvest, and as a result the area is comprised of open fields of goldenrod-aster and timothy-orchard grass, invaded by shrub species such as smooth and staghorn sumac, ash, cottonwood, honey locust and sugar maple seedlings. Eastern red cedar stands and hemlock groves mixed with beech, basswood, sugar maple and elm may also be found along fencerows between the open fields, and within an area of significant forest cover located in the northeast corner of the Milliken property.

Few herbaceous species are observed in the lower vegetative strata of the forested areas that border the open fields that characterize this area. The canopy and shrub layers consist of bitternut hickory (*Carya cordiformis*), shagbark hickory (*C. ovata*), black oak (*Quercus velutina*), red oak (*Q. rubra*), American hornbeam (*Carpinus caroliniana*), hop hornbeam (*Ostrya virginiana*) and cottonwood (*Populus deltoides*). Rosebush (*Rosa* sp.), greenbrier (*Smilax* sp.), sumac (*Rhus* sp.), raspberry (*Rubus* sp.), dogwood (*Cornus* sp.), cherry (*Prunus* sp.), cottonwood and sugar maple (*Acer saccharum*) saplings and poison ivy (*Rhus radicans*) line the ditches along the perimeter of these wooded areas, coinciding with the increased availability of light. Drainage ways bordering the wooded areas measure three to six feet in width and contain no hydrophytic vegetation.

Disruption of natural vegetation due to farming and logging activity in the project area has resulted in creation of a patchwork of vegetative cover types in varying stages of succession. Abandoned farmland proceeds through natural succession by first being dominated by weeds, then grasses such as timothy (*Phleum pratense*) and bluegrass (*Poa* sp.), pasture composites such as daisy (Family Compositae), hawkweed (*Hieracium* sp.), goldenrod (*Solidago* sp.), and bush clover (*Lespedeza violacea*) followed by invasion by raspberry and blackberry shrubs and sumac species.

There are no state forests, forest preserves, wildlife refuges or similar designated wildlife areas in the immediate vicinity of the project area. The closest wildlife preserve areas are the Connecticut Hill State Wildlife Management area, approximately 15 miles south-southwest of the project site in the southwest corner of Tompkins County, and the Cayuga Lake State Wildlife Management Area and the Montezuma State Wildlife Refuge, both located approximately 25 miles northwest of the project site in Seneca County. In addition, the Finger Lakes National Forest, portions of which are located in Schuyler and Seneca Counties, is approximately ten miles west-southwest of the site, and Taughannock Falls State Park is about four miles south of the project site. The NYSDEC's Cayuga-Tompkins Hunting Co-op currently manages a portion of NYSEG's property north and northeast of Milliken.

3.4.3 THREATENED AND ENDANGERED SPECIES

According to the United States Department of the Interior, Division of Fish and Wildlife Service, no Federally listed or proposed endangered or threatened species, other than occasional transient species, are known to exist in the project area (Corin 1991). According to the NYSDEC Wildlife Resources Center Information Service, no known occurrences of rare animals, plants and natural communities and/or significant wildlife habitats have been recorded in the Significant Habitat and Natural Heritage Program files (Buffington 1991). These files are continually updated to incorporate new discoveries of rare species and/or significant habitats.

The Environmental Management Council of Tompkins County has prepared a report which provides detailed characteristics of Unique Natural Areas identified within the Town of Lansing. Hidden Glens, a pair of glens or small gorges containing unique geological features and habitat for the rare plant *Woodsia obtusa* (blunt-lobed woodsia) is located approximately 4.6 miles southeast of Milliken Station. This rock-loving fern is commonly found in limestone areas on shaded rocky banks and cliffs and in dry rocky woods, but is rarely found in northern areas. Other rare/scarce plant communities may occur here. The blunt-lobed woodsia is not likely to be identified on the project site, and was not noted during previous vegetative surveys of the area.

Endangered, threatened, exploitably vulnerable and rare plants under 6 NYCRR Part 193.3 (b), (c), (d), and (e) are protected native plants pursuant to the Environmental Conservation Law Section 9-1503. One plant species listed in Part 193.3(b), (*Botrychium lunaria* or Moonwort), "endangered native plants in danger of extinction throughout all or a significant portion of their ranges within the state and require remedial action to prevent such extinction", has been previously identified in the Lansing area.

3.5 SOCIOECONOMIC RESOURCES

This section describes existing and projected socioeconomic conditions that could be affected by development of the proposed project. A general summary of county and local issues. Topics addressed in this section include present levels and conditions of population, employment, income and community services. Information and statistics for this section were obtained through the U.S. Bureau of the Census, the New York State Department of Labor (NYSDL), Department of Commerce (NYSDC), and Department of Economic Development (NYSDED), the Southern Tier East Regional Planning Development Board (STERPDB), the Tompkins County Department of Planning, and the Town of Lansing.

Tompkins County is considered part of the eight-county Southern Tier East Region, an administrative planning district in New York State that includes Broome, Chenango, Cortland, Delaware, Otsego, Schoharie, and Tioga Counties. Tompkins County is the westernmost county within the Southern Tier East Region, and is contiguous with Cortland, Cayuga, Seneca and Tioga Counties. The county is comprised of nine towns, six incorporated villages, and the City of Ithaca.

The population of Tompkins County has increased steadily since 1950. Tompkins County had a population of 77,064 in 1970. The 1990 census figures indicate a current population of approximately 94,097, an increase of over 17,000 residents, constituting an 18 percent increase during the past 20 years (U.S. Bureau of the Census 1991). The Department of Commerce estimates indicate that the total anticipated increase in county population of 12 percent from 1980 to 2000 is the highest projected in the Southern Tier East Region (NYSDC 1985).

In 1980, the median age of the population of Tompkins County was 25.2 years, the lowest for the Southern Tier East Region, a statistic greatly influenced by the number of students attending the county's three major educational institutions. The county's median age is predicted by the NYSDC to increase to 31.3 years by 2000 (NYSDC 1985). Estimates imply relative stability in the age of the county's population, with continuing influence from the number of students residing within the county. A significant change in the overall age of Tompkins County's population is not expected during this decade.

According to the 1990 Overall Economic Development Plan for the Southern Tier East Region, Tompkins County had the greatest percentage expansion in non-agricultural employment of any of the region's counties during the past decade, exhibited by a 149 percent increase in the service sector, although definitional changes may have inflated this figure (STERPDB 1990). Services is the most significant industrial sector in the county, accounting for 51 percent of all employment and 55 percent of all wages and salaries in 1990. Non-agricultural employment increased by 1,000 jobs over this period, specifically in the transportation and public utilities, trade, services and government sectors (NYSDL 1991). The county's 2.0 percent employment growth from March 1990 to March 1991 contrasts the declines experienced by the state (-1.9 percent) and nation (-0.7 percent) (NYSDL 1991).

Cornell University has been a long-standing influence on the local economy of Tompkins County. The University presently employs an estimated 8,000 people, and together with Ithaca College, generates considerable retail and service sector activity (STERPDB 1990). Specific major employers in the county include Borg Warner, an automotive parts manufacturer; Cornell University and Ithaca College; the Ithaca City school district; National Cash Register (NCR) Corporation; Tompkins County government; Tompkins Community Hospital; Tops Friendly Markets; and New York State Electric & Gas Corporation (Tompkins County Area Development 1991).

Lansing has recently undergone significant development and increases in population, primarily within the Village of Lansing. Beginning in 1974, with the incorporation of the Village of Lansing, the town began to expand in population and develop its industrial and commercial centers. The Town's population was 5,972 in 1970. By 1980, the population had increased by over 60 percent to 8,317. Current population levels reflect a 12 percent increase in residents from 1980, the third highest increase for a governmental unit within Tompkins County.

3.5.1 TRANSPORTATION

Two routes function as primary east-west limited access highways through the Finger Lakes Region of New York. Interstate 90 (the New York Thruway) extends from the Massachusetts border near Albany, west to the Pennsylvania border, near Erie. This highway directly connects several New York State metropolitan areas including Albany, Syracuse, Rochester and Buffalo. Milliken is located approximately 33 miles south of Interstate 90 Exit 40, which is in the Village of Weedsport, Cayuga County.

South of Milliken, New York State Route 17 serves as a primary east-west limited access highway. Route 17 connects with the New York Thruway (Interstate 87) north of New York City, and joins Interstate 90 east of Erie, Pennsylvania. Although a limited-access highway for the majority of its length, portions of Route 17 contain grade-level intersections and several direct highway access points. Exit 54 of State Route 17, near the City of Elmira, Chemung County, is located approximately 40 miles south of Milliken.

Interstate 81 is the principal north-south limited-access highway through this region. Located 32 miles east of Milliken, Interstate 81 extends from Kentucky to the Canadian border. Within New York, this highway connects Binghamton (at the junction of State Route 17) and Syracuse (at the New York Thruway). From Binghamton, direct access to Albany and New England is provided via Interstate 88, which extends to the northeast.

Figure 3.5.2-1 illustrates the network of regional rural arterials that interconnect with limited-access highways. While travel along limited access highways is less frequently disrupted and more appropriate for truck traffic than travel along rural arterials with at-grade intersections, immediate access to the limited-access highways previously described is severely restricted in the Finger Lakes region. Each of the lakes is oriented in a north-south alignment, and surrounding topography is characterized by steep hills and deep valleys. Consequently, extended travel along rural arterial roads, consisting mostly of two lane roads, is required between Tompkins County and the regional limited-access highway network. Milliken is located approximately equidistant from each of the three primary highways (New York Thruway, Route 17 and Interstate 81), and a variety of routes provide access to these highways from Milliken.

Three rural arterial roadways extend north from Tompkins County, through Cayuga County, toward the New York Thruway: State Routes 90, 34B and 34 (refer to Figure 3.5.2-1).

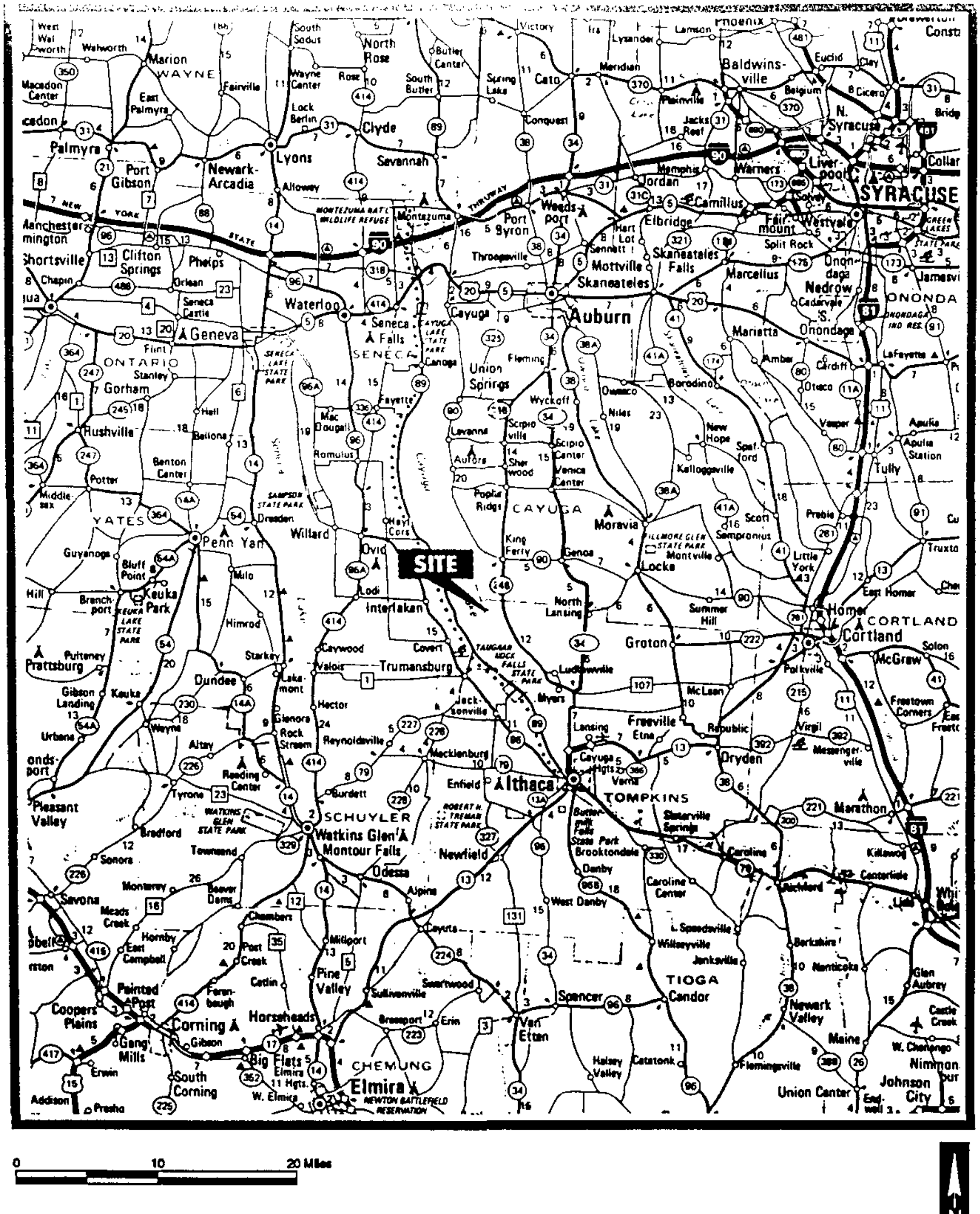


Figure 3.5.2-1
Site Locus Map

3.6 AESTHETIC/CULTURAL RESOURCES

3.6.1 ARCHAELOGICAL/HISTORICAL RESOURCES

The Office of Parks, Recreation and Historic Preservation (OPRHP) is the state agency responsible for the coordination of New York State's Historic Preservation Programs. A request was made to the OPRHP to provide a determination of the existence of any historical or archaeological resources of concern on or near the site. According the OPRHP, the proposed project will have no effect or impact on those characteristics of the property which would qualify it for inclusion in the National Register of Historic Places. It was determined by the OPRHP that there are no buildings or structures listed in the State or National Register of Historic Places adjacent to the project site, and that the project will not physically or visually impact any structures of historical significance. No need for further review of the site was indicated.

3.6.2 NATIVE AMERICAN RESOURCES

The proposed project site area has a low degree of archaeological or historical sensitivity (Stokes 1991). The site is adjacent to an area that has been previously disturbed through excavation, filling, grading and construction. There are no buildings or structures of age greater than 50 years adjacent to or within the proposed project area. In an effort to further evaluate the historical or natural significance of the site and its vicinity, a listing of National Natural Landmarks obtained from the U.S. Department of the Interior National Park Service was reviewed. The McClean Bogs, located approximately 20 miles east-southeast of the project site, is the closest and only national natural landmark listed for Tompkins County.

3.6.3 SCENIC OR VISUAL RESOURCES

The proposed site is located in a sparsely populated, rural area. The existing viewshed to Milliken is complex. Located on the east lakeshore, Milliken is a local landmark and is visible from an extended area of the west shore of Cayuga Lake, and many outlying positions to the northwest, west, southwest, and south. Even where the buildings themselves are not in view, the stack indicate the station's presence. Views of the existing facility from the southeast, east and north, however, are limited due to rising topography and intervening vegetation.

The topography of the Town of Lansing and Tompkins County is quite varied, but in general is gently sloping toward the lake and river valleys. Land to the east of the project site rises sharply from the lakeshore elevation of approximately 400 feet (MSL) to the crest elevation of the lakefront cliff of 425 feet (MSL). East from this cliff, the land rises gently on a rather regular slope to elevations of about 625 feet. Beyond this area, elevations continue to rise at a gentler slope to the eastern property boundary where the elevation is approximately 850 feet.

The Town of Lansing, and the Towns of Covert and Ulysses on the western side of the lake, are characterized by expansive areas of agricultural and rural residential land, a mix of thickly settled residential neighborhoods, and light industrial and commercial properties associated with the towns' major roadways and intersections. The visual environment in the project area includes an extensive area of industrial development at Milliken, adjacent to residential and recreational land uses on both shores of Cayuga Lake. The foreground of most views of the facility is characterized by large expanses of Cayuga Lake. The background of these views is comprised of rolling hills, dense hardwood forests, and cultivated fields east of the project site.

Structures within the Milliken complex include boiler/turbine buildings with associated electrostatic precipitators, FGD building and stack, limestone storage an conveying system, gypsum storage building, electric substation and overhead transmission lines, coal pile and associated handling equipment, and various ancillary buildings. Conrail railroad tracks bound the site to the west. Milliken ash landfill is located to the east, at elevations approximately 200 to 300 feet higher than the base elevation of 400 feet (MSL).

3.6.4 RECREATIONAL RESOURCES

The recreational facilities of Tompkins County are numerous and varied; tourism is also an important aspect of the county's economy. The 42,496-acre Cayuga Lake, and the scenic waterfalls, gorges and other natural formations that typify the unique geological character of the region provide opportunity for many recreational activities. Boating, fishing, hunting and camping center around the county's four state parks: Buttermilk Falls State Park, Robert H. Treman State Park, Allan H. Treman State Marine Park, and Taughannock Falls State Park.

4.0 ENVIRONMENTAL CONSEQUENCES

This section evaluates potential environmental impacts associated with the proposed Milliken Micronized Coal Reburn Technology Demonstration Project, as well as the impacts associated with alternatives to the proposed project. Potential beneficial and adverse impacts during both construction and operational phases of the proposed project are discussed for:

- air resources, including air quality;
- earth resources, including topography, geology and soils;
- water resources, including surface water, groundwater, drainage and storm water flows;
- ecological resources, wetlands and wildlife habitat; and
- community resources, including land use and zoning, socioeconomics, transportation, noise, aesthetics and cultural resources.

4.1 AIR QUALITY IMPACTS

4.1.1 REGULATIONS AND GUIDELINES

Air quality standards are contained within the Clean Air Act Amendments of 1990 and the NYSDEC Air Pollution Control Regulations. These regulations establish ambient air quality standards and emission limits for air contaminants.

The proposed project must comply with the following existing Federal and State air quality rules and regulations:

- National and State Ambient Air Quality Standards (NAAQS) (40 CFR Part 50 and 6 NYCRR 257);
- NYSDEC Air Pollution Control Regulations (6 NYCRR 200 et seq.); and
- Good Engineering Practice Stack Height Regulations (40 CFR Part 51).

In addition, Title IV of the Clean Air Act Amendments of 1990 (CAAA) requires reductions of emissions of SO_2 and installation of controls for NO_x. Each owner or operator of an affected unit under these provisions must submit a permit application and compliance plan specifying the method selected to meet the reduction requirements. Milliken is an affected unit for which a compliance plan and permit application was submitted.

4.1.2 AMBIENT AIR QUALITY STANDARDS (AAQS)

The U.S. EPA has established primary air quality ambient standards to protect public health and secondary standards to protect public welfare. These National Ambient Air Quality Standards (NAAQS) have been adopted by the NYSDEC. Ambient standards exist for sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter of less than 10 micrometers (PM_{10}), nitrogen dioxide (NO_2), carbon monoxide (CO), photochemical oxidants (as ozone, O_3), and lead (Pb). In addition, the NYSDEC has retained the total suspended particulate (TSP) ambient standard, which was replaced on the Federal level with the PM_{10} standard. Additional ambient air quality standards have been established by the NYSDEC for fluorides (F), beryllium (Be) and hydrogen sulfide (H_2S). Each standard has an associated averaging time, as shown in Table 4.1.2-1. Based on the ambient air quality analysis described in Section 3.1.2, the proposed project will not cause contraventions of any State or Federal AAQS.

Sources located in attainment areas are potentially subject to Prevention of Significant Deterioration (PSD) regulations. PSD regulations apply to new major sources with the potential to emit more than 100 or 250 tons per year (depending upon the source category) of at least one attainable/unclassifiable pollutant, or modification to existing sources that would add 15 to 100 tons per year, depending on the pollutant (40 CFR 52.21). Since emissions of these pollutants will be reduced by the modifications to

Table 4.1.2-1
Summary of National Ambient Air Quality Standards (NAAQS)
and New York State Standards

Pollutant	Averaging Period	National AAQS[2]		New York AAQS[2]
		Primary	Secondary	
Carbon Monoxide	8-hour 1-hour	10 40	10 40	10 40
Lead	3-month	1.5	1.5	--
Nitrogen Dioxide	Annual	100	100	100
Ozone[3]	1-hour	235	235	160
Particulate Mattter less than 10 μm in diameter	Annual 24-hour	50 150	50 150	-- --
Total Suspended Particulates (TSP)	Annual 24-hour	-- --	-- --	65 250
Sulfur Dioxide	Annual 24-hour 3-hour	80 365 --	-- -- 1300	80 365 1300
Fluorides	6-month 24-hour 3-hour	-- -- --	-- -- --	40 60 80
Beryllium	1-month	--	--	0.01
Hydrogen Sulfide	1-hour	--	--	14

(1) National and New York standards, other than those based on annual averages or annual geometric means, are not to be exceeded more than once per year.

(2) All values are in $\mu g/m^3$ except CO, which is in mg/m^3, and fluorides, which are in ppm.

(3) The ozone standard is attained when the expected number of days per calendar year in which the maximum hourly average concentrations is above the standard is less than or equal to one. New York AAQS currently being revised to coincide with federal standard.

Standard: 40 CFR 50 and 6 NYCRR 257.

Milliken, changes will be less than the PSD criteria, and the facility will not be subject to review under PSD regulations.

The EPA has enacted Continuous Emission Monitoring Rules (40 CFR Part 75) in conjunction with efforts to establish a regulatory program pursuant to the CAAA. NYSEG currently has certified continuous emissions monitors installed at Milliken. The certification of the CEM was completed in conjunction monitors in accordance with existing NYSDEC regulations.

4.1.3 NEW SOURCE PERFORMANCE STANDARDS

The U.S. EPA has promulgated national emission standards for new or modified existing sources of air pollution. Under 40 CFR 60.14, the addition or use of any system or device whose primary function is the reduction of air pollutants is not considered a modification to an existing source of air pollution. The standards established within the NSPS regulations do not, therefore, apply to the proposed project.

AIR QUALITY IMPACTS

Conversion of coal fired boilers to reburn systems employing micronized coal and overfired air has the potential of reducing NO_X emissions by 50-60% while increasing plant efficiency and capacity. This technology can be used as an economic retrofit at Milliken Station. Annual NO_X emissions as summarized in the "OTC NO_X Baseline Inventory" list NYSEG with 29,075 tons.

NYSEG's Milliken Station demonstration of micronized coal using existing equipment is expected to be significantly below existing NO_X limitations of .42 lbs/mmbtu for tangentially fired boilers. During the test program if NO_X emissions exceed permitted cap limitations placed on the NYSEG system, the original combustion operating conditions will be resumed.

Changes in the grind size of the coal will not impact total suspended particulate since the electrostatic precipitators can handle a wide range of particulate sizes. Milliken Station presently has a precipitator capable of removing the flyash from the micronization process. Performance parameters measured on Unit 2 ESP during the week of October 16, 1995, measured particulate removal efficiency ranging form 99.80 to 99.88 percent for the north section of the ESP and from 99.91 to 99.92 percent for the south section of the ESP. The average mass mean particle diameter at the ESP inlet was 11.4 um; the mass mean diameter at the ESP outlet was 2.4um. Approximately 92 percent of the ESP outlet particulate consisted of particles smaller than 10um.

Carbon monoxide emissions are expected to be reduce with the addition of the reburn system and overfired air in the reburn and burnout zones of micronized coal reburn system as demonstrated at the Milliken program. No impacts are expected for carbon monoxide.

Sulfur dioxide emissions are directly related to the sulfur content in the fuel and is not related to the combustion process. A new Flue Gas Desulfurization system treats all flue gas generated by the boilers. Testing on the FGD system during the fourth quarter of 1995 demonstrated that the process could consistently remove up to 98% of the SO_2.

4.2 LANDUSE IMPACTS

4.2.1 REGULATIONS AND GUIDELINES

Land use controls in NYS are primarily established and enforced by the Local governing agency such as township, village or city. A local planning board develops and approves a land use and zoning plan for future development. The plan is established to guide development in a direction which conserves and preserves natural resources, unique and scenic habitat and provides a means of assuring that development will address environmental and socioeconomic constraints. The land use plan insures that the existing or proposed infrastructure will mitigate any and all impacts of proposed projects and land development. In situations where a zoning plan is not approved, an environmental review of a major project which is proposed within an unrestricted area is the responsibility of the NYSDEC. This State siting process is defined within the State Environmental Quality Review Act (6 NYCRR 617).

LANDUSE IMPACTS

The micronized coal demonstration will not impact land use at the Milliken site. Modifications to Milliken Station will lie totally within the existing boiler building. The facilities lie wholly within an industrial complex which has been zoned for industrialized use.

One of the advantages of utilizing a micronized coal reburn system is the use of existing systems and site infrastructure which minimizes the need for exterior disturbances such as additional buildings, storage tanks and landfill capacities as would be required for alternate technologies discussed in Section 2.3.2.

Increased efficiency in the combustion process will result in ash with a lower carbon content which result in improved marketability of combustion byproducts such as flyash and bottom ash, unlike other combustion modifications which have resulted in high concentrations of unburned carbon and ammonia contained in the combustion byproducts. The micronized coal reburn will result in less dependance on landfilling systems and potential impacts to ground and surface water.

4.3 WATER QUALITY IMPACTS

Work impacting water resources must comply with: the Federal Water Pollution Control Act of 1972, the Clean Water Act of 1977, the Water quality Act of 1987 and the New York State regulations and standards for discharges to surface water bodies and groundwater. The Safe Drinking Water Act of 1974 and the Safe Drinking Water Act amendments of 1986 provide further water quality standards for discharges to surface and groundwater drinking sources.

NYSDEC requires a State Pollution Discharge Elimination System (SPDES) permit for any point source which discharges to a surface water or groundwater system. The SPDES permit insures that any point source discharges meet applicable water quality standards. Under the USEPA a storm water management regulation (40 CFR 122-124) which established National Pollutant Discharge Elimination System (NPDES) requirements for storm water discharges associated with industrial activity, NYSDEC has become the lead agency for enforcing the storm water regulations through the SPDES permitting process.

4.3.1 WATER QUALITY IMPACTS

Micronized coal reburn will have minimal, if any, impacts on surface and groundwater at Milliken Station. The MCR system is a closed system using gravity and air as the primary forces for transporting the coal from the bunker to the boiler. There is no water contact with the fuel during any stage of the process.

Fouling of the air heater system will not increase with the addition of the micronized coal demonstration, therefore, maintenance cleaning washes of the air heaters is expected to remain constant. Milliken Station is equipped to treat the waste water from this process at an onsite SPDES permitted waste water treatment system which adjusts pH and removes metals and solids to meet NYS surface water quality standards.

The carbon content of flyash is expected to be less than 4% by weight. This meets marketability standards established by the New York State Department of Transportation's concrete specification. Maintaining salability of the flyash while minimizing NO_X will be a significant accomplishment of part of this demonstration project which will reduce the impact on surface and groundwater associated with the operation and maintenance of a solid waste disposal area.

4.4 ECOLOGICAL IMPACTS

4.4.1 REGULATIONS AND GUIDELINES

On the Federal level, construction, placement of fill, dredging, and/or the draining of freshwater wetlands is regulated by the Army Corps of Engineers. A Section 404 Dredge and Fill Permit is required for such activities. Projects that would disturb one acre or less of freshwater wetlands are covered under the Nationwide Permitting process (33 CFR 330). The NYSDEC Freshwater Wetlands Program protects freshwater wetlands 12.4

acres or larger, as set forth in the Freshwater Wetlands Act (6 NYCRR 663). Adjacent buffer areas, extending up to 100 feet from freshwater wetland boundaries, are also regulated by the NYSDEC. There are no state-designated freshwater wetlands within NYSEG property.

The presence of threatened or endangered species on a project site requires special consideration. If no such species are known to occur on a site, the impact assessment is based on the significance and diversity of the site ecosystem, as well as the availability of similar or suitable habitat elsewhere in the vicinity.

4.4.2 ECOLOGICAL IMPACTS

Installation of the MCR system will be in two phases, the first phase will use existing boiler configuration to demonstrate the potential for MCR technology on Unit 2. If this phase demonstrates significant benefits, then modifications to the boiler will be made under phase two of this program which will require the installation of coal piping and injectors. All of the work will be accomplished within the boiler building and will not require any external disturbances or construction activities. As a result no ecological impacts will occur due to this project.

4.5 COMMUNITY RESOURCE IMPACTS

4.5.1 REGULATIONS AND GUIDELINES

Socioeconomic impacts assess the impacts of a particular project on the economy of the area or region. Since this project is a modification to an existing industrial land use, it will not be incongruous or incompatible with existing socioeconomic conditions. Socioeconomic evaluations are required as part of the NEPA or SEQRA processes for permitting projects.

Socioeconomic impacts are evaluated based on the extent of proposed changes resulting from the project, including:

- Impacts on development patterns, including changes in population distribution
- Impacts on public services such as schools, highways, hospitals, police and fire protection, water and sewer service
- Impacts on housing, including availability and residential development patterns
- Impacts on recreational facilities and provision of recreational services
- Impacts on the price and availability of energy to consumers
- Impacts on employment patterns and levels
- Impacts on retail and wholesale sales and other sectors of the economy

4.5.2 SOCIOECONOMIC IMPACTS

The project's socioeconomic impacts would include duration of construction, workforce size, composition and origin; utility requirements; taxation; and changes in public service demands. The size of the project dictates that the duration would not exceed 18 months and the workforce would peak to approximately 100 individuals. The workforce needs can be accommodated through the regional labor pool and will not require the relocation of any number of individuals. Utility requirements and changes to public service demands will fall within the range of the existing services and will not require any additional mandates upon these systems. Taxation will fall within the existing system for assessment of school and local taxes, the incremental difference may be inconsequential based on pollution control bonding for this project.

Landuse will not be changed due to this project since it is located within an industrial complex which will not require any additional buildings then already exist. The site is presently zoned industrial for the generation of electricity. The boiler modifications will be accomplished in the same manner as any routine outage requiring minimum manpower and down time. Transportation, as with any routine outage, will adequately address the additional manpower and materials requirements. Parking areas are provided at Milliken for outage related workforces.

Since existing equipment will be utilized during this project, there will be no increases in sound levels. The exterior configuration of the buildings will remain the same and will have no impact on the visual character of the station. Cultural resources will be unaffected by the project due to the minimal requirements. The socioeconomic impacts associated with this project will be minimal and will be of a short duration.

4.6 MITIGATION OF IMPACTS

This section addresses the mitigation of impacts associated with this project. The proposed mitigative action will attempt to alleviate the impacts resulting from the construction and operation of this project.

4.6.1 AIR RESOURCE MITIGATION

The primary objective of the demonstration project is to mitigate air emissions. Implementation of the micronized coal reburn system will result in substantial reductions in NO_X emissions. An objective of this program is to significantly reduce emissions of NO_X without degrading plant efficiency or the use of flyash as a marketable material. The project design incorporates technologies that enhance Milliken's high overall operating efficiency so that the project's energy needs will not require additional power generation elsewhere in the state power grid.

4.6.2 Physiological Resource Mitigation

Since the project will be constructed in an area characterized by industrial use, significant adverse impact to land use will not occur, and extensive mitigation measures are not warranted. All activities will be housed in existing buildings and facilities.

4.6.3 Water Resource Mitigation

The MCR program will not require any additional water requirements during operations. Construction impacts will be minimal and fall within the ranges of the facility requirements. Sanitary wastes from the construction work force will be handled using portable and existing facilities.

4.6.4 Ecological Resource Mitigation

Since the proposed project will not disturb any areas outside of existing facilities, permanent wildlife displacement will not occur. Portions of the site have been allowed to return to a natural state. These measures will provide some habitat opportunities for some plant and animal species. Station storm water management controls will be maintained to avoid adverse impact to on-site wetland resources. Dust abatement practices such as periodic wetting of unpaved access roads will minimize fugitive dust impacts.

4.6.5 Community Resource Mitigation

Community resource mitigation will not be required due to the limited size and duration of this project. Landuse and zoning will not be an issue during this project since all improvements will be made within the confines of the existing buildings. Work force numbers will not exceed those numbers typically encountered during an annual boiler maintenance outage. The temporary nature of the job will not require the relocation of individuals or families. Transportation requirements for workers, equipment and parts will be minimal, and will not effect vehicular traffic in and around the community. Noise will not be impacted due to the type and amount of equipment being installed also all work activities will occur primarily within the confines of existing buildings. Visual and cultural resources will not require any mitigative responses since no exterior changes will be required to complete the work. Community resource mitigation will not be required due to the limited duration, minimal construction and minor changes made to the operation of the boiler.

5.0 REGULATORY ENVIRONMENTAL REQUIREMENTS

5.1 Air Permits

Based on the minimal modifications required to the boiler, no permit to construct is required. The existing permit to construct will be modified to acknowledge the changes made to the boiler and its ability to operate at lower NO_X levels.

5.2 WATER PERMITS

No wastewater will be generated as a result of this project, therefore no wastewater discharge permit modifications are required.

5.3 SOLID WASTE PERMITS

Flyash conditions are expected to improve due to the micronized coal demonstration technology. However the existing landfill permit allows the disposal of combustion byproducts at Milliken's solid waste disposal area.

5.4 ENVIRONMENTAL REVIEW

Due to the minimal nature of this job, no environmental review will be required for this job.

5.5 TOWN PERMITS

A building permit will be required by the Town of Lansing to allow the construction and modifications to the building.

6.0 INTRODUCTION: EASTMAN KODAK MICRONIZED COAL REBURN PROJECT

6.1 PROJECT DESCRIPTION

The primary objective of this project is to demonstrate that it is both technically feasible and economically advantageous to use coal as a reburn fuel in a cyclone boiler to achieve a greater than 50% reduction in NO_X emissions.

#15 Boiler at the Kodak Park Site in Rochester, New York is a Babcock Wilcox RB-230 cyclone boiler installed in 1956. It has a maximum continuous rating (MCR) of 400,000 pounds per hour (PPH) of steam at a pressure of 1,400 pounds per square inch gauge (PSIG) and a temperature of 900 degrees Fahrenheit (^{0}F). Cyclone boilers were designed to effectively and efficiently burn high sulfur, low cost coals. One of the negative side effects of this high temperature, high turbulence process is a relatively high generation of NO_X compounds in the combustion process.

Two state of the art technologies will be demonstrated during this project. The first will be the installation of two Fuller MicroMills which are each capable of micronizing 5 tons per hour (TPH) of coal. The second will be the installation of an Energy and Environmental Research (EER) designed reburn system that will be included in eight micronized coal injectors and six overfire air ports. The entire system will be designed to reduce the NO_X emissions from #15 Boiler by more than 50%.

6.2 NEED FOR THE PROPOSED ACTION

Eastman Kodak Company (Kodak) has an agreement with the New York State Department of Environmental Conservation (NYSDEC) that states that Kodak will install coal or natural gas reburn systems on all four of the cyclone boilers at the Kodak Park Site. Kodak is currently completing the installation of a natural gas reburn system on #43 Boiler which is located in Building 321 on the western side of the Kodak Park Site facility. The upgrades to the three remaining boilers: #15, #41, and #42, are planned for the 1996 through 1998 time frame. #15 Boiler is located apart from the other three cyclone boilers. It is located in Building 31 in the eastern section of the Kodak Park Site facility approximately three miles from Building 321. The micronized coal reburn system is an attractive alternative to natural gas since coal is half the price of natural gas and access to natural gas is limited. This project will enable Kodak to meet the terms and conditions of the Kodak/DEC agreement in a more economical and timely fashion.

The technologies employed in this project will provide an effective and economic NO_X system throughout the United States. Fuller currently manufactures the MicroMills in three different sizes: one ton per hour, five ton per hour, and thirty ton per hour. Due to the unique design, light weight, and low cost there are many applications such as schools, prisons, hospitals, small industries that could utilize this technology to decrease NO_X emissions or improve the efficiency of current steam or heat generating equipment. The combined Fuller micronization and EER injection/overfire air reburn system could be installed on many small, medium, or large cyclone, wall fired, or tangentially fired boilers that are in need of emission reductions or improvement in efficiency.

7.0 PROPOSED ACTION AND ALTERNATIVES

7.1 DESCRIPTION OF THE FACILITY

7.1.1 DESCRIPTION OF THE KODAK PARK SITE

Kodak Park Site is one of the largest industrial parks in the nation. It covers an area of over 1,300 acres. There are over two hundred buildings on the site that produce thousands of different products. The primary products that are produced on the site are photographic grade films and papers, photographic chemicals and other synthetic chemicals.

Kodak Park Site was designed and developed to be almost totally self sufficient. It has its own water treatment facility on the shores of Lake Ontario that pumps about 38 MGD of water to the site. It has its own hazardous waste Chemical Incinerator in Building 218 for disposal of solid and liquid hazardous wastes. An on-site landfill provides for the disposal of non-hazardous solid wastes. The site has over sixty miles of three different types of sewer systems beneath the streets and buildings. The storm sewer system is for transporting storm water offsite. The sanitary system is to transport sanitary wastes to Monroe County's Van Lare Sewage Treatment Facility. The industrial sewer transports non-contact cooling water and some industrial wastes and bi-products to the King's Landing Wastewater Purification Plant which treats about 28 MGD. Kodak Park Site also has two main power plants, one in Building 31 and the other in Building 321, which generate all of the steam and almost all of the electric power requirements for the site. Major industrial refrigeration systems are also installed in a several buildings throughout the site. Steam is produced at several different pressures: 5 PSIG, 70 PSIG, 260 PSIG and 600 PSIG for specific customers. Refrigeration systems also produce chilled water or chilled brine systems at various temperatures all of the way down to -95^{0}F. All of these processes are currently managed by the Utilities Division.

7.1.2 STEAM AND ELECTRIC GENERATION AT KODAK PARK SITE

The Building 31 power plant, in Kodak Park East (KPE), generates steam from high pressure (i.e. 260, 800 and 1400 PSIG) boilers. The Building 321 power plant, in Kodak Park Middle (KPM), generates steam from high pressure (i.e. 1400 PSIG) boilers. Generally, the high pressure steam generated by the boilers enter header systems in each building which distribute the steam to several different equipment systems depending on the generation strategy. The steam then passes through turbine generators to co-generate electricity for Kodak Park Site use. There are seven turbine generators in Building 31, four turbine generators in Building 321, and a lone turbine generator in Building 101 which is located approximately midway between the other two buildings. Refer to Figure 7.1 for a visual description of the linkage between the boilers, the turbine generators, and the refrigeration machines. The steam is extracted from the turbines at about 260, 135-140 and 70 PSIG for use in boiler auxiliaries, high-pressure refrigeration drives and various condensing processes. The lower pressure steam (i.e. <5 PSIG) is used to drive low-pressure refrigeration equipment, provide space heating and process steam for manufacturing. The total system generating capacities are 3,810,000 PPH of steam and 203 megawatts (MW) of electricity. Refer to Table 7.1 for a detailed description of each of the boilers and their emission control systems.

7.1.2.1 BUILDING 31 POWER PLANT

There are ten boilers in this building which burn coal and/or #6 fuel oil. Four boilers burn only coal, five boilers burn only #6 fuel oil and one boiler burns coal as a primary fuel and #6 fuel oil a secondary fuel (i.e. startup, shutdown & emergency). These units discharge their exhaust gasses into two, separate chimneys 366 feet in height. The flue gasses from the package boilers (Boilers #1, #2, #3, and #4) are connected to a common breaching in which the opacity is monitored and recorded continuously before discharging into the north chimney. The flue gasses from Boilers #13 and #14 pass through a shared electrostatic precipitator (ESP). The opacity of both boilers is monitored after leaving the ESP. The flue gas is discharged into the same chimney as the package boilers. The flue gasses from Boilers #11 and #12 pass through a shared ESP. The opacity of the emissions as they leave the ESP is monitored continuously before discharging into the south chimney. The flue gasses from Boilers #15 and #16 pass through their own respective ESP's. The opacity of the emissions as they leave the ESP is monitored continuously before discharging into the same chimney as Boilers #11 and #12. Boilers #15 and #16 have Continuous Emission Monitors (CEM) that measure the amount of nitrous oxide (NO_X) compounds and carbon monoxide (CO) emitted from these boilers.

KODAK PARK STEAM SYSTEM

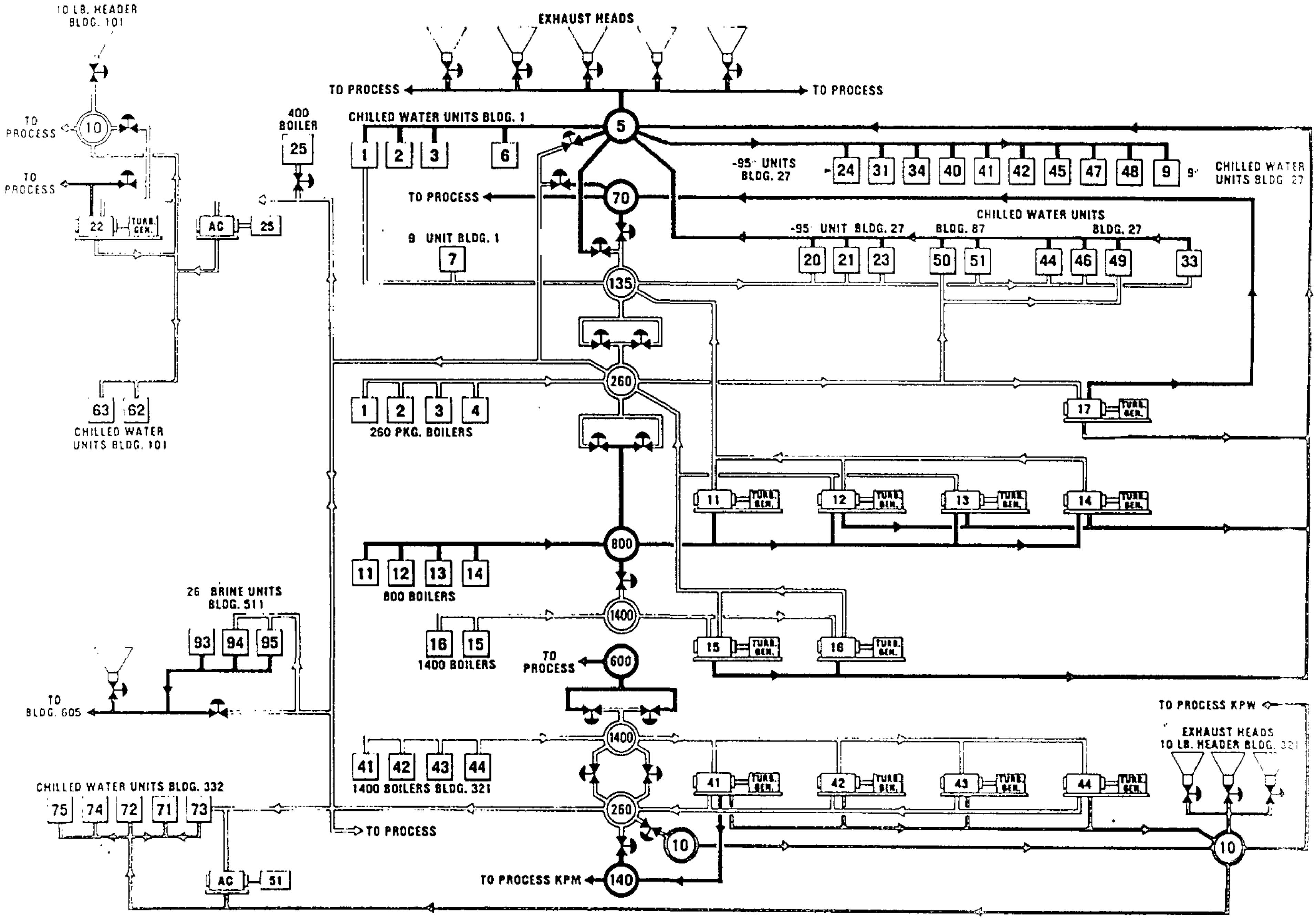


Figure 7-1

TABLE 7.1

<u>Emission Point (by stack) Hardware List Referenced in this Modification Request</u>

B-31 North Stack

Division Of Air Resources Stack ID: 261400-0258-0001
NYTM 286.1 Easting
Stack Inside Diameter at outlet 11.0 feet or 132 inches
Diameter of Breaching From ESP: 17.5 feet or 210 inches
Elevation (top) of Breaching into the Stack (KP Datum): 316.83 feet
Foundation Elevation (KP Datum): 218.58 feet
Stack Top Elevation (KP Datum): 584.58 Feet
Exit Velocity: 63 Ft/sec
Center to center from B-31 South Stack: 145.86 feet

Total Permitted Heat Input: 882 MMBTU/Hour
Stack Inside Diameter at base 19.8 feet or 238 inches
Stack Inside Diameter at outlet 12.3 feet or 147 inches
Diameter of Breaching Into Stack: 18.8 feet or 226 inches
Length of Breaching (Entrance to Outlet): 267.8 feet
Ground Elevation: 420 Ft.
Stack Top Elevation: 787.43 Feet
Exit Flow: 359,500 ACFM
Stack Thickness @ Base: 42 inches

NYTM 786.1 Northing
Stack Outside Diameter at base 27.8 feet or 334 inches
Stack Erected: 1907
Average Diameter of Breaching: 14.2 feet or 170 inches
Stack Height 366 ft above grade
Height Above Structures: 294 Ft.
Exit Temp: 390E F
Number of Bricks in Stack: 363,000
Permitted Heat Input: 882 Mmbtu/Hour

Boilers Exhausting into the Stack	Unit ID Number	Emission Point ID	Rated Heat Input @ MCR	Permitted Heat Input	Hardware Information
Name: Package Boiler #1 Desc: #6 Fuel Oil Boiler Year Built: 1966 Year Placed into Service 1966 Output MCR: 80,000 $_{\text{Nominal}}$ lb steam/hr @ 600°F Output $_{\text{4 Hour Peak}}$: No 4 Hour Peak Identified	<u>NYSDEC ID #:</u> 261400025800001A <u>Mfg'er SERIAL #:</u> 20548 <u>NYS Boiler Reg. #</u> 6277 <u>National Board #.</u> 20548	Unit 1A	98 Mmbtu/Hour	98 Mmbtu/Hour	Burner Guns: 2, steam atomized using #6 Fuel. Typically the unit is fired using 1 burner only. Ignitor Gun: 1, using propane with a spark ignitor 1 Forced Draft Fan: 132,000 ACFM $_{\text{Boilers \#1, \#2, \#3 \& \#4}}$ (1981 test with package boilers #1-4 running)_∴_~ 132,000 ACFM ACFM $_{\text{Boilers \#1, \#2, \#3 \& \#4}}$ = 33,000 ACFM $_{\text{Boiler \#1 Contribution @ MCR}}$: Primary Fuel: #6 Fuel Oil Secondary Fuel: None Mfg'r: Combustion Engineering Model: 24-VP-12W Burner: COEN Company 2066-OM Particulate Control: No Particulate Control Used to provide process steam at 260 PSIG during peak load periods and co-generate electricity.
Name: Package Boiler #2 Desc: #6 Fuel Oil Boiler Year Built: 1966 Year Placed into Service 1966 OUTPUT $_{\text{MCR}}$: 80,000 $_{\text{Nominal}}$ lb steam/hr @ 600°F Output $_{\text{4 Hour Peak}}$: No 4 Hour Peak Identified	<u>NYSDEC ID #:</u> 261400025800001B <u>Mfg'er SERIAL #:</u> 20546 <u>NYS Boiler Reg. #:</u> 5858 <u>National Board #.</u> 20546	Unit 1B	98 Mmbtu/Hour	98 Mmbtu/Hour	Burner Guns: 2, steam atomized using #6 Fuel. Typically the unit is fired using 1 burner only. Ignitor Gun: 1, using propane with a spark ignitor. 1 Forced Draft Fan: 132,000 ACFM $_{\text{Boilers \#1, \#2, \#3 \& \#4}}$ (1981 test with package boilers #1-4 running)_∴_~ 132,000 ACFM ACFM $_{\text{Boilers \#1, \#2, \#3 \& \#4}}$ = 33,000 ACFM $_{\text{Boiler \#2 Contribution}}$ @ MCR Primary Fuel: #6 Fuel Oil Secondary Fuel: None Mfg'r: Combustion Engineering Model: 24-VP-12W Burner: COEN Company 2066-OM Particulate Control: No Particulate Control Used to provide process steam at 260 PSIG during peak load periods and co-generate electricity.
Name: Package Boiler #3 Desc: #6 Fuel Oil Boiler Year Built: 1966 Year Placed into Service 1966 OUTPUT $_{\text{MCR}}$: 80,000 $_{\text{Nominal}}$ lb steam/hr @ 600°F Output $_{\text{4 Hour Peak}}$: No 4 Hour Peak Identified	<u>NYSDEC ID #:</u> 261400025800001C <u>Mfg'er SERIAL #:</u> 20549 <u>NYS Boiler Reg. #:</u> 6175 <u>National Board #:</u> 20549	Unit 1C	98 Mmbtu/Hour	98 Mmbtu/Hour	Burner Guns: 2, steam atomized using #6 Fuel. Typically the unit is fired using 1 burner only. Ignitor Gun: 1, using propane with a spark ignitor. 1 Forced Draft Fan: 132,000 ACFM $_{\text{Boilers \#1, \#2, \#3 \& \#4}}$ (1981 test with package boilers #1-4 running)_˙_~ 132,000 ACFM ACFM $_{\text{Boilers \#1, \#2, \#3 \& \#4}}$ = 33,000 ACFM $_{\text{Boiler \#3}}$ Contribution @ MCR Primary Fuel: #6 Fuel Oil Secondary Fuel: None Mfg'r: Combustion Engineering Model: 24-VP-12W Burner: COEN Company 2066-OM Particulate Control: No Particulate Control Used to provide process steam at 260 PSIG during peak load periods and co-generate electricity

TABLE 7.1 (CONTD)

Name: Package Boiler #4 Desc: #6 Fuel Oil Boiler Year Built: 1966 Year Placed into Service 1966 Output $_{\text{MCR}}$: 80,000 $_{\text{Nominal}}$ lb steam/hr @ 600°F Output $_{\text{4 Hour Peak}}$: No 4 Hour Peak Identified	NYSDEC ID #: 261400025800001D Mfg'er SERIAL #: 20547 NYS Boiler Reg. #: 6757 National Board #: 20547	Unit 1D	98 Mmbtu/Hour	98 Mmbtu/Hour	Burner Guns: 2, steam atomized using #6 Fuel. Typically the unit is fired using 1 burner only. Ignitor Gun: 1, using propane with a spark ignitor. 1 Forced Draft Fan: 132,000 ACFM $_{\text{Boilers \#1, \#2, \#3 \& \#4}}$ (1981 test with package boilers #1-4 running)_˜_~ 132,000 ACFM ACFM $_{\text{Boilers \#1, \#2, \#3 \& \#4}}$ = 33,000 ACFM Boiler #4 Contribution @ MCR Primary Fuel: #6 Fuel Oil Secondary Fuel: None Mfg'r: Combustion Engineering Model: 24-VP-12W Burner: COEN Company 2066-OM Particulate Control: No Particulate Control Used to provide process steam at 260 PSIG during peak load periods and co-generate electricity.
Name: Built-up Boiler #13 Desc: Underfed Stoker Boiler Year Built: 1947 Year Placed into Service 1948 Output $_{\text{MCR}}$:200,000 $_{\text{Nominal}}$ lb steam/hr @825° F Output x 92.5% derating = 185,000 lb steam/hr @ 875°F Output $_{\text{4 Hour Peak}}$: No 4 Hour Peak Identified	NYSDEC ID #: 261400025800001E Mfg'er SERIAL #: S-9384 NYS Boiler Reg. #: 1924 National Board #: 14825	Unit 1E	Designed for 265 Mmbtu/Hour but per 1995 NOx RACT Compliance Plan this unit was derated to 92.5% of its design capacity resulting in 245 Mmbtu/Hour	245 Mmbtu/Hour	Hand fired. 1, Forced Draft Fan: 80,000 CFM $_{\text{MCR}}$ (Mfg's. Performance Specs.) 1, Induced Draft Fan: 140,000 CFM $_{\text{MCR}}$ (Mfg's. Performance Specs.) Total Balanced Flow: Common Breaching with Boiler #14 yielding 246,000 ACFM $_{\text{Boiler \#13 \& \#14 @ MCR}}$ (1992 test) (400,000 lbs steam MCR/246,000 ACFM);$^{\text{(370,000 lbs steam Derated}}$/ $_{\text{227,500 ACFM}}$) ∴ _~227,000 ACFM $_{\text{Derated}}$/2=113,750 ACFM $_{\text{Boiler \#13 Contribution @ MCR}}$ Primary Fuel: Bituminous Coal Secondary Fuel: None Mfg'r: Babcock & Wilcox Model: S-9384 Burner: Westinghouse Multiple Underfeed Retort Stokers Particulate Control: Common ESP (Research Cottrell/Belco Technologies weighted wire put into service Jan. 1968) with Boiler #14 demonstrating 93.5% Particulate Control (Mar. 92 Stack Test) Provides 800 PSIG steam to co-generate electricity and process steam
Name: Built-up Boiler #14 Desc: Underfed Stoker Boiler Year Built: 1947 Year Placed into Service 1948 OUTPUT $_{\text{MCR}}$:200,000 $_{\text{Nominal}}$ lb steam/hr @ 825° F Output x 92.5% derating = 185,000 lb steam/hr @ 875° F Output $_{\text{4 Hour Peak}}$: No 4 Hour Peak Identified	NYSDEC ID #: 261400025800001F Mfg'er SERIAL #: S-9384 NYS Boiler Reg. #: 17957 National Board #: 14826	Unit 1F	Designed for 265 Mmbtu/Hour but per 1995 NOx RACT Compliance Plan this unit was derated to 92.5% of its design capacity resulting in 245 Mmbtu/Hour	245 Mmbtu/Hour	Hand fired. 1, Forced Draft Fan: 80,000 CFM $_{\text{MCR}}$ (Mfg's. Performance Specs.) 1, Induced Draft Fan: 140,000 CFM $_{\text{MCR}}$ (Mfg's. Performance Specs.) Total Balanced Flow: Common Breaching with Boiler #13 yielding 246,000 ACFM $_{\text{Boilers \#13 \& \#14 @ MCR}}$ (1992 test) (400,000 lbs steam MCR/246,000 ACFM);$^{\text{(370,000 lbs steam Derated}}$/ $_{\text{227,500 ACFM}}$) ∴ _~227,500 ACFM $_{\text{Derated}}$/2=113,750 ACFM $_{\text{Boiler \#14 Contribution @ MCR}}$ Primary Fuel: Bituminous Coal Secondary Fuel: None Mfg'r: Babcock & Wilcox Model: S-9384 Burner: Westinghouse Multiple Underfeed Retort Stokers Particulate Control: Common ESP (Research Cottrell/Belco Technologies weighted wire put into service Jan. 1968) with Boiler #13 demonstrating 93.5% Particulate Control (Mar. 92 Stack Test) Provides 800 PSIG steam to co-generate electricity and process steam

TABLE 7.1 (CONTD)

Emission Point (by stack) Hardware List Referenced in this Modification Request (cont.)

B-31 South Stack

Division Of Air Resources Stack ID: 261400-0258-0002
Total Permitted Heat Input: 1371.0 MMBTu/Hour
NYTM 786.1 Northing
NYTM 286.1 Easting
Stack Inside Diameter at base 22.7 feet or 272 inches
Stack Outside Diameter at base 31.0 feet or 372 inches
Stack Inside Diameter at outlet 13.0 feet or 156 inches
Stack Outside Diameter at outlet 15.3 feet or 183 inches
Stack Erected: 1910
Diameter of Breaching From ESP: 19.8 feet or 238 inches
Diameter of Breaching Into Stack: 15.7 feet or 188 inches
Average Diameter of Breaching: 14.2 feet or 170 inches
Elevation (top) of Breaching into the Stack (KP Datum): 328.08 feet
Length of Breaching (Entrance to Outlet): 256.5 feet
Stack Height 366 ft above grade

Foundation Elevation (KP Datum): 218.58 feet
Ground Elevation: 420 Ft.
Height Above Structures: 294 Ft.
Stack Top Elevation (KP Datum): 584.58 Feet
Stack Top Elevation: 787.43 Feet
Exit Temp: 300° F
Exit Velocity: 85 Ft/sec
Exit Flow: 678,000 ACFM
Number of Bricks in Stack: 466,000
Center to center from B-31 South Stack: 145.86 feet
Stack Thickness @ Base: 44 inches
Permitted Heat Input: 1441 MMBTu/Hour

Boilers Exhausting into the Stack	Unit ID Numbers	Emission Point ID	RatedHeat Input @ MCR	Permitted Heat Input	Hardware Information
Name: Built-up Boiler #11 Desc: Underfed Stoker Boiler Year Built: 1937 Year Placed into Service 1937 OUTPuT $_{MCR}$: 160,000 $_{Nominal}$ lb steam/hr @ 750° F Output $_{4\ Hour\ Peak}$: No 4 Hour Peak Identified;	NYSDEC ID #: 261400025800002A Mfg'er SERIAL #: S-8817 *NYS Boiler Reg. #:* 3761 National Board #: 10784,	Unit 2A	197 Mmbtu/Hour	197 Mmbtu/Hour	Hand fired. 1, Forced Draft Fan: 80,000 CFM$_{MCR}$ (Mfgs. Performance Specs.) 1, Induced Draft Fan: 140,000 CFM$_{MCR}$ (Mfgs. Performance Specs.) Total Balanced Flow: Common Breaching with Boiler #12 yielding 250,000 ACFM $_{Boiler\ \#11\ \&\ \#12\ @\ MCR}$ (1992 test) ∴_~ACFM/2 = 125,000 ACFM $_{Boiler\ \#11\ Contribution\ @\ MCR}$; Primary Fuel: Bituminous Coal Secondary Fuel: None Mfg'r: Babcock & Wilcox Model: S-8817 Burner: Westinghouse Multiple Retort Particulate Control: Common ESP (Research Cottrell/Belco Technologies weighted wire put into service Jan. 1968) with Boiler #12 demonstrating 95% Particulate Control (Nov. 94 Stack Test) Provides 800 PSIG steam to co-generate electricity and process steam
Name: Built-up Boiler #12 Desc: Underfed Stoker Boiler Year Built: 1941 Year Placed into Service 1942 Output $_{MCR}$: 180,000 $_{Nominal}$ lb steam/hr @ 750° F Output $_{4\ Hour\ Peak}$: No 4 Hour Peak Identified	NYSDEC ID #: 261400025800002B Mfg'er SERIAL #: S-9097 NYS Boiler Reg. #: 17080 National Board #: 12425	Unit 2B	222 Mmbtu/Hour	222 Mmbtu/Hour	Hand fired. 1, Forced Draft Fan: 80,000 CFM$_{MCR}$ (Mfgs. Performance Specs.) 1, Induced Draft Fan: 140,000 CFM$_{MCR}$ (Mfgs. Performance Specs.) Total Balanced Flow: Common Breaching with Boiler #11 yielding 250,000 ACFM $_{Boiler\ \#11\ \&\ \#12\ @\ MCR}$ (1992 test) ∴_~ 250,000 ACFM/2 = 125,000 ACFM $_{Boiler\ \#12\ Contribution\ @\ MCR}$ Primary Fuel: Bituminous Coal Secondary Fuel: None Mfg'r: Babcock & Wilcox Model: S-9097 Burner: Westinghouse Multiple Retort Particulate Control: Common ESP (Research Cottrell/Belco Technologies weighted wire put into service Jan. 1968) with Boiler #11 demonstrating 95% Particulate Control (Nov. 94 Stack Test) Provides 800 PSIG steam to co-generate electricity and process steam
Name: Built-up Boiler #15 Desc: Cyclone, Wet Bottom Type Boiler Year Built: 1955 Year Placed into Service 1956 Output $_{MCR}$:400,000 $_{Nominal}$ lb steam/hr @ 900° F Output x 85% baseloading = 340,000 lb steam/hr @ 900EF Output $_{4\ Hour\ Peak}$: 440,000 lb steam/hr @ 900° F	NYSDEC ID #: 261400025800002C Mfg'er SERIAL #: RB230 NYS Boiler Reg. #: 7106 National Board #: 18835	Unit 2C	478 Mmbtu/Hour Per 1995 NOx RACT Compliance Plan this unit will be 85% baseloaded to 408 Mmbtu/Hour but their is a potential the unit could be operated @ MCR therefore the 478 Mmbtu/Hour value is placed on the permit	478 Mmbtu/Hour	Cyclones: 2 Burner Guns: 2, (1 upper & 1 lower) per cyclone yielding 4 total. Designed for #6 Fuel Oil using heated & pressurized fuel injected through a >lance' tube. Ignitor Gun: 1, using #2 Fuel Oil using a spark to ignite. 2 Forced Draft Fans: 175,000 ACFMMCR (1975 Test) Primary Fuel: Bituminous Coal Secondary Fuel: #6 Fuel Oil Mfg'r: Babcock & Wilcox Model: RB-230 Burner: Babcock & Wilcox Cyclone Particulate Control: ESP (Research Cottrell/BelcoTechnologies weighted wire put into service Jan. 1968) demonstrating 94.4% Particulate Control (1983 Stack Test) Provides 1400 PSIG steam to co-generate electricity and process steam

TABLE 7.1 (CONTD)

Name. Built-up Boiler #16 Desc: #6 Fuel Oil Boiler Year Built: 1971 Year Placed into Service 1972 Output $_{MCR}$: 450,000 $_{Nominal}$ lb steam/hr @ 900°F Output $_{4\ Hour\ Peak}$: No 4 Hour Peak Identified	NYSDEC ID #: 261400025800002D Mfg'er SERIAL #: 5232 NYS Boiler Reg. #: 2826 National Board #: 83	Unit 2D	544 Mmbtu/Hour	544 Mmbtu/Hour	Burner Guns. 4, (2 upper & 2 lower) air atomized using #6 Fuel. Ignitor Gun: 4, (1 per burner) using methane and a spark to ignite. 2 Forced Draft Fans: 215,000 ACFM 85% MCR (1978 test) (450,000 $^{lb\ steam\ MCR}$/ $_{253,000\ ACFM}$);($^{382,500\ lb\ steam\ 85\%\ MCR}$/ $_{215,000\ ACFM}$) ∴_~253,000 ACFM$_{MCR}$ Primary Fuel: #6 Fuel Oil Secondary Fuel: None Mfg'r: Foster Wheeler, LTD. Model: SD-28X Burner: Fornay Verloop TTL-6 Particulate Control: ESP (Research Cottrell/BelcoTechnologies weighted wire put into service Jan. 1972) demonstrating 75% Particulate Control (1983 Stack Test) Provides 1400 PSIG steam to co-generate electricity and process steam

Emission Point (by stack) Hardware List Referenced in this Modification Request (cont.)

B-321 East Stack

Division Of Air Resources Stack ID: 261400-0258-0003
NYTM 282.8 Easting
Stack Inside Diameter at outlet 12.0 feet or 144 inches
Stack Height 408 ft above grade
Height Above Structures: 222 Ft.
Exit Velocity: 51 Ft/sec
Stack Thickness @ Base: 27 inches

Total Permitted Heat Input: 850.0 Million BTU/Hour
Stack Inside Diameter at base 16.9 feet or 203 inches
Stack Outside Diameter at outlet 22.0 feet or 264 inches
Foundation Elevation (KP Datum): 246 ft
Stack Top Elevation: 855.75 ft (above sea level)
Exit Flow: 346,000 ACFM
Permitted Heat Input: 1000 MMBTu/Hour

NYTM 786.2 Northing
Stack Outside Diameter at base 34.2 feet or 410 inches
Stack Erected: 1984, Placed into service 26 Sept. 1984
Ground Elevation: 449 ft (above sea level)
Exit Temp: 305o F
Poured Concrete Structure

NOTE: The outside of the stack is 408 ft of poured concrete column, the inside has 273 feet of acid brick lining

Boilers Exhausting into the Stack	Unit ID Numbers	Emission Point ID	Rated Heat Input @ MCR	Permitted Heat Input	Hardware Information
Name: Built-up Boiler #41 Desc: Cyclone, Wet Bottom Type Boiler Year Built: 1963 Year Placed into Service 1964 OUTPUT $_{MCR}$:400,000 $_{Nominal}$ lb steam/hr @ 900° F Output x 85% baseloading = 340,000 lb steam/hr @ 900° F Output $_{4\ Hour\ Peak}$ 440,000 lb steam/hr @ 900° F;	NYSDEC ID #: 261400025800003A Mfg'er SERIAL #: S-10112 NYS Boiler Reg. #: 10006 National Board #: 21189;	Unit 3A	500 MMBTU/Hour Per 1995 NOx RACT Compliance Plan this unit will be 85% baseloaded to 425 MMBTU/Hour but their is a potential the unit could be operated @ MCR therefore the 500 MMBTU/Hour value is placed on the permit;	500 Mmbtu/Hour	Cyclones: 2 Burner Guns: 1 per cyclone yielding 2 total. Designed for #6 Fuel Oil using heated & pressurized fuel injected through a 'lance' tube. Ignitor Gun: 4, using #2 Fuel Oil using a spark to ignite. 2 Forced Draft Fans: 173,000 ACFM $_{MCR}$ (1988 test) Primary Fuel. Bituminous Coal Secondary Fuel: #6 Fuel Oil Mfg'r: Babcock & Wilcox Model: S-10112 Burner: Babcock & Wilcox Cyclone Particulate Control: ESP (Research Cottrell/BelcoTechnologies weighted wire put into service Jan. 1964) demonstrating 94% Particulate Control (Oct. 1988 Stack Test) Provides 1400 PSIG steam to co-generate electricity and process steam
Name: Built-up Boiler #42 Desc: Cyclone, Wet Bottom Type Boiler Mfg's. Serial #: S-10198 Year Built: 1967 Year Placed into Service 1968 OUTPUT $_{MCR}$:400,000 $_{Nominal}$ lb steam/hr @ 900° F Output x 85% baseloading = 340,000 lb steam/hr @ 900° F Output $_{4\ Hour}$ Peak: 440,000 lb steam/hr @ 900° F	NYSDEC ID #: 261400025800003B Mfg'er SERIAL #: S-10198 NYS Boiler Reg. #: 8506 National Board #: 22300	Unit 3B	500 MMBTU/Hour Per 1995 NOx RACT Compliance Plan this unit will be 85% baseloaded to 425 MMBTU/Hour but their is a potential the unit could be operated @ MCR therefore the 500 MMBTU/Hour value is placed on the permit	500 Mmbtu/Hour	Cyclones: 2 Burner Guns: 1 per cyclone yielding 2 total. Designed for #6 Fuel Oil using heated & pressurized fuel injected through a 'lance' tube. Ignitor Gun: 4, using #2 Fuel Oil using a spark to ignite. 2 Forced Draft Fans: 173,000 ACFM $_{MCR}$ (1988 test) Primary Fuel: Bituminous Coal Secondary Fuel: #6 Fuel Oil Mfg'r: Babcock & Wilcox Model: S-10198 Burner: Babcock & Wilcox Cyclone Particulate Control: ESP (Research Cottrell/BelcoTechnologies weighted wire put into service Jan. 1967) demonstrating 94% Particulate Control (Oct. 1988 Stack Test) Provides 1400 PSIG steam to co-generate electricity and process steam

TABLE 7.1 (CONTD)

Emission Point (by stack) Hardware List Referenced in this Modification Request (cont.)

B-321 West Stack

Division Of Air Resources Stack ID: 261400-0258-0004
NYTM 282.8 Easting
Stack Inside Diameter at outlet 15.0 feet or 180 inches
Stack Height 408.5 ft above grade
Height Above Structures: 222 Ft.
Exit Velocity: 45 Ft/sec
Stack Thickness @ Base: 14 inches

Total Permitted Heat Input: 1310.0 mmbtU/Hour
Stack Inside Diameter at base 17.8 feet or 214 inches
Stack Outside Diameter at outlet 22.0 feet or 264 inches
Foundation Elevation (KP Datum): 245 5 ft
Stack Top Elevation: 855.75 ft (above sea level)
Exit Flow: 475,000 ACFM
Permitted Heat Input: 1310 mmbtU/Hour

NYTM 786.2 Northing
Stack Outside Diameter at base 34.2 feet or 410 inches
Stack Erected: 1986, Placed into service 24 Dec. 1986
Ground Elevation: 449 ft (above sea level)
Exit Temp: 300° F
Poured Concrete Structure

NOTE: The outside of the stack is 408.5 ft of poured concrete column, the inside has 408.5 feet of acid brick lining

Boilers Exhausting into the Stack	Unit ID Numbers	Emission Point ID	Rated Heat Input @ MCR	Permitted Heat Input	Hardware Information
Name: Built-up Boiler #43 Desc: Cyclone, Wet Bottom Type Boiler Year Built: 1968 Year Placed into Service 1969 Output $_{MCR}$:550,000 $_{Nominal}$ lb steam/hr @ 900° F Output $_{4\ Hour\ Peak}$: 605,000 lb steam/hr @ 900° F	NYSDEC ID #: 261400025800004A Mfg'er SERIAL #: S-10213 NYS Boiler Reg. #: 16249 National Board #: 22705	Unit 4A	640 Mmbtu/Hour	640 Mmbtu/Hour	Cyclones: 2 Burner Guns 1 per cyclone yielding 2 total. Designed for #6 Fuel Oil using heated & pressurized fuel injected through a 'lance' tube. Ignitor Gun: 4, using #2 Fuel Oil using a spark to ignite. 2 Forced Draft Fans: 225,000 ACFM$_{MCR}$ (1988 Test) Primary Fuel: Bituminous Coal Secondary Fuel: #6 Fuel Oil Mfg'r: Babcock & Wilcox Model: S-10213 Burner: Babcock & Wilcox Cyclone Particulate Control: ESP (Research Cottrell/BelcoTechnologies weighted wire put into service Nov. 1969) demonstrating 94% Particulate Control (Oct. 1988 Stack Test) Provides 1400 PSIG steam to co-generate electricity and process steam
Name: Built-up Boiler #44 Desc: Tangential Fired Pulverized Coal Boiler Year Built: 1986 Year Placed into Service 1987 Output $_{MCR}$:550,000 $_{Nominal}$ lb steam/hr @ 900°F Output $_{4\ Hour\ Peak}$: 605,000 lb steam/hr @ 900° F	NYSDEC ID #: 261400025800004B Mfg'er SERIAL #: 20383 NYS Boiler Reg. #: 1101 National Board #: 23598	Unit 4B	670 Mmbtu/Hour	670 Mmbtu/Hour	Burner Guns: 4 per level (A/B & B/C) yielding 8 total, tangentially designed for #2 Fuel Oil using air atomization. Ignitor Guns: 8, using #2 Fuel Oil using a spark to ignite. 1 Forced Draft Fan: 240,000 ACFM $_{90\%\ MCR}$ (1989 test) (400,000 lbs steam MCR/250,000 ACFM);(384,000 lbs steam 90% MCR/240,000 ACFM) ∴_~250,000 ACFM $_{MCR}$ Primary Fuel: Bituminous Coal Secondary Fuel: #2 Fuel Oil Mfg'r: Combustion Engineering Model: MDL VU40 Burner: Combustion Engineering Particulate Control: ESP (Environmental Elements, Inc., rigid frame put into service June 1986) demonstrating 99.7% Particulate Control (Sept. 1989 Stack Test) Provides 1400 PSIG steam to co-generate electricity and process steam

7.1.2.2 Building 321

There are four boilers in this building which burn coal as a primary fuel and either #2 or #6 fuel oil as a secondary fuel (i.e. startup, shutdown & emergency). The flue gasses from each unit pass through their own respective ESP's and discharge into two collective chimneys (Boilers #41 and #42 into the east chimney and Boilers #43 and #44 into the west chimney). The opacity of the emissions as they leave the ESP is monitored continuously before discharging into the respective chimneys. All four of these boilers have CEM systems which monitor NO_X and CO emissions.

7.1.3 #15 Boiler

Kodak's #15 Boiler is a Babcock Wilcox Model RB-230 cyclone boiler commissioned in 1956. It is located in Building 31 within the Kodak Park Site in Rochester, New York. *The unit was designed to generate 400,000 lbs/hr of 1400 PSIG, 900° F steam with a rated* heat input of 478 MMBTU/hr at Maximum Continuous Rating (MCR). The fuel supplied to this boiler is Pittsburgh Steam medium to high sulfur coal with a Hardgrove Grindability Index (HGI) of approximately 55 and a high heating value of 13,427 BTU/lb.

The coal of a nominal 2" x 0" size is delivered by bottom hopper rail cars. The coal is dumped through grates onto #11 peck. The coal drops onto #13 belt which feeds #14 elevator. The coal drops onto #15 belt and is reduced to 3/4" x 0" in #16 crusher. The coal is then dropped into #15 bunker. #15 bunker is a dual unloading bunker which feeds two volumetric apron feeders and two coal conditioners which reduce the coal size to 1/4" x 0" which then feeds the two cyclones.

7.1.4 Environmental Considerations

The Kodak Park Site is a vast area with thousands of manufacturing processes. The two power plants are approximately three miles apart. The east power plant in B-31 contains ten boilers. The modifications proposed in this document will impact only #15 Boiler. Therefore, this section will review the environmental considerations for #15 Boiler only.

7.1.4.1 Coal

#15 Boiler currently utilizes Pittsburgh steam medium to high sulfur coal for this cyclone boiler. That coal is currently procured from two different mines. One mine is located in Pennsylvania and the other is located in West Virginia. This project will focus on the continued use of the West Virginia coal as a fuel for this boiler. Approximately 135,000 tons of coal are burned in #15 Boiler each year.

7.1.4.2 EXISTING AIR EMISSIONS

The emissions from #15 boiler based on current fuels:

- 1.36 pounds of NO_X per mmbtus
- 0.111 *pound of particulates per mmbtus*
- 3.09 pounds of SO_2 per mmbtus
- 0.05 pound of CO per mmbtus

7.1.4.3 WATER USE AND WASTEWATER DISCHARGE

The water that is used for #15 Boiler is from the Kodak Park Site water distribution system which is fed from Kodak's Lake Station on the shores of Lake Ontario. Approximately 120 million gallons of water per year are used in the #15 Boiler steam generation process. The Kodak Park water is processed through demineralizers and sent through deaerators prior to entering the boiler. The blowdown is sent directly to the industrial sewer system beneath Kodak Park Site which transports the liquid to the King's Landing Wastewater Purification Plant where the water is treated prior to discharge to the Genessee River.

The steam that is generated by #15 Boiler enters a header system that feeds turbine generators for generation of electricity. The steam is extracted from the turbine and sent to refrigeration units for process cooling purposes. If the refrigeration unit is not a condensing unit, the low pressure steam is transported to Kodak Park Site manufacturing customers for building heat or process heating. The condensate produced throughout the cycle is captured and pumped back to Building 31 for reprocessing. The condensate is analyzed and, if determined acceptable, is returned to one of the boilers. If the condensate has been contaminated, it is sent to the industrial sewer and on to the King's Landing Wastewater Purification Plant for treatment.

This project should have no impact on the water usage or processing for #15 Boiler.

7.1.4.4 SOLID AND LIQUID WASTE

Any solid or liquid waste that is generated as a byproduct of water treatment for #15 Boiler or the operation of #15 Boiler, that may be hazardous, is sent to the hazardous waste incinerator in Building 218. Non-hazardous liquid discharges are sent to the industrial sewer which is treated at the wastewater treatment plant. Solid non-hazardous wastes are sent to the Kodak Park Site Landfill for disposal.

Two process waste streams are specifically generated by #15 Boiler that are processed separately. The flyash that is generated by #15 Boiler is currently either land filled in the Kodak Park Site Landfill or sent to an external company for use in a concrete-like product called flowable fill. The bottom ash, or boiler slag, is ground and either sent to the Kodak

Park Site Landfill or it is used as an additive for local cities and towns to treat the roads during icy conditions. About 140 tons of flyash are generated from #15 Boiler annually. About 30 tons of bottom ash are generated annually by #15 Boiler.

This project will not change the total amount of ash generated. It will change the distribution between flyash and bottom ash. The amount of flyash will increase as a result of the installation of the micronized coal reburn system. The disposal methods for both flyash and bottom ash will not change due to this project.

7.2 ENGINEERING DESCRIPTION

7.2.1 THE MICRONIZED COAL REBURN PROJECT

The overall scope of this project encompasses two state of the art technologies: coal micronization via the Fuller MicroMills and micronized coal reburn via the Energy and Environmental Research (EER) coal injection/overfire air system.

7.2.1.1 THE MICRONIZED COAL REBURN PROCESS

The reburning process is a process by which a fraction of the coal is injected downstream of the primary combustion zone into a reburn zone. Overfire air is injected into a burnout zone downstream of the reburn zone.

Primary Zone:
The primary combustion zone will be the two cyclones themselves and the area directly in front of the cyclones in the boiler. This process is conducted with an excess amount of air to assure good combustion performance. With a reburn system, only 70-80% of the coal now being fed to the cyclone will continue to be used by the cyclone. The remaining 20-30% of the coal will be withdrawn from the bunker, micronized in the Fuller MicroMills and then injected through the EER injectors directly into the reburn zone.

In a cyclone boiler the primary combustion zone is where the majority of the NO_X compounds are generated due to the extreme turbulence and temperatures within the cyclone itself. Temperatures in this zone will exceed 3000^0F.

Reburn Zone:
The micronized coal will be injected into the reburn zone on the rear side of the boiler. This zone will be substoichiometric with excess fuel. The theory is that carbon has a greater affinity for oxygen than does nitrogen, especially at 2000^0F. Therefore as the NO_X compounds pass through this zone, the carbon in the coal will take the oxygen from the NO_X compounds in an attempt to complete the combustion process. The nitrogen will either revert back to elemental nitrogen or become a nitrogen-hydrogen derivative such as NH_3. Since this will be a fuel rich zone, most of the oxygen should be stripped from the

NO_X compounds as they pass through this zone. The key to the successful reburning is the appropriate amount of fuel, with the appropriate stoichiometry, with complete mixing of the flue gasses.

Burnout Zone:
In this zone overfire air is added to produce another air-rich zone to complete the combustion process for the coal injected in the reburn zone. The overall stoichiometry for this zone would be between 1.0 and 1.1. The fact that the temperature in this zone would be approximately 2000^{0}F, and the fact that this process is similar to a staged combustion process will yield much less NO_X generation than by the original design of the cyclone boiler. The overall stoichiometry for the boiler would not change from current design conditions.

7.2.1.2 THE FULLER MICROMILL

Pulverized coal that is used as a fuel in many boilers today is nominally 60 microns in diameter and approximately 70% of the pulverized coal will pass through 200 mesh. Micronized coal, as produced by the Fuller MicroMill is nominally 20 microns in diameter and 80% of the micronized coal will pass through 325 mesh. The surface area of micronized coal is three times as large as pulverized coal which will allow devolatilization and carbon conversion to occur very rapidly. The combustion characteristics of micronized coal are quite similar to burning oil.

The heart of the Fuller system is a patented centrifugal-pneumatic MicroMill with only one moving part, the replaceable rotating impeller. Size reduction is accomplished by the particles themselves striking against one another as they rise up through the tornado-like column of air inside the MicroMill. Centrifugal force retains the material in the rotational impact zone (RIZ) as the particles continue to reduce in size prior to being conveyed by the air stream entering the center of the rotating impeller. Material entering the impeller is swept out into the classifier which separates the coal into particle sizes. Micronized coal is discharged directly to the coal injectors in the reburn system while the larger particles are returned to the MicroMill for further size reduction.

7.2.1.3 THE EER REBURN SYSTEM

EER has conducted baseline testing for #15 Boiler to determine all current operating characteristics of the boiler including operation parameters and emissions. EER has built a 1/12th scale Plexiglas model of the boiler to develop a subscale physical flow model. This will allow EER to establish flow patterns under baseline conditions and to evaluate the mixing patterns of alternate micronized coal and overfire air injection configurations. EER has used their Reburning Design Methodology (RDM) to design the optimum reburn design for #15 Boiler. This includes the use of heat transfer, combustion, NO_X kinetics, flow models and a mathematical model to predict future performance with a reburn system.

The design requires that eight coal injectors be installed on the rear wall of the boiler at a height just above the cyclone burners. The analysis also requires that four overfire air ports will be located on the front wall of the boiler around twenty feet above the cyclone. Flue gas will be extracted from the boiler system and sent to the MicroMills. The air will help to dry the coal and transport it to the fuel injectors. The overfire air will be taken from the existing secondary air system on the boiler itself.

7.2.2 PROJECT PHASES

In order to accomplish the project objective, the demonstration project is divided into three phases.

Phase I - Design

Task I.1 Boiler Testing and Characterization
Task I.2 Cold Flow and Computer Modeling
Task I.3 Reburn System Design
Task I.4 Preliminary Process Engineering Design

Phase II - Detailed Design Construction
Task II.1 Detailed Process Design
Task II.2 Equipment Specification, Procurement and Construction
Task II.3 Equipment Start-Up, Debug, and Commissioning

Phase III - Operation

Task III.1 Post Upgrade Parametric Testing
Task III.2 Long Term Demonstration Testing
Task III.3 Final Project Report Preparation

7.3 ALTERNATIVES

7.3.1 NO-ACTION ALTERNATIVES

Under the No-Action Alternative, whereby DOE does not provide cost shared funding support, it is likely that this project would not be completed by Kodak at this time. This boiler was not scheduled for reburn retrofit until late 1998. Advancing this project from 1998 to 1996 will enable Kodak to achieve the NO_X reductions sooner than originally anticipated.

7.3.2 ALTERNATIVE SITES

There are four cyclone boilers at the Kodak Park Site. #43 Boiler is currently in the commissioning phase of a natural gas reburn system retrofit. #15 Boiler is the most logical cyclone boiler of the remaining three boilers to demonstrate micronized coal reburn technology since it is the tallest cyclone boiler and, therefore, has the greatest residence time to allow for complete combustion.

8.0 EXISTING ENVIRONMENT

The MCR Project will be installed adjacent to B-31 in Kodak Park East (KPE). This section describes the existing environment around the Kodak Park facility. A detailed description of the project site location, the atmospheric, land, and water resources, the ecological conditions, and the socioeconomic, aesthetic, and cultural resources is provided.

8.1 ATMOSPHERIC RESOURCES

8.1.1 SITE METEOROLOGY

Rochester, New York, is located at the mouth of the Genesee River at about the mid point of the south short of Lake Ontario. The river flows northward from northwest Pennsylvania and empties into Lake Ontario. The land slopes from a lakeshore elevation of 246 feet to over 10,000 feet some 20 miles south. The airport, just south of the City of Rochester, has an elevation of 55 feet.

The Greater Rochester metropolitan area's climate is influenced greatly by Lake Ontario. In the summer, the lake's cooling effect inhibits the temperature from rising much above the low to mid 90's (the all time record high is 102). In the winter, the lake's modifying temperature effect prevents temperatures from falling below -15 most of the time, although locations more than 15 miles inland from the lake can drop to below -30. Annual temperature and precipitation along with other data for the Greater Rochester metropolitan area are presented in Table 8-1.

Figure 8-1 presents a wind rose for the surrounding area near Kodak Park for 1995. The meteorological data used to generate the wind rose were obtained from the Kodak Park on-site meteorological tower, shown in Figure 8-2. The tower is approximately 5 miles south of Lake Ontario and 1.2 miles west of the Genesee River Valley.

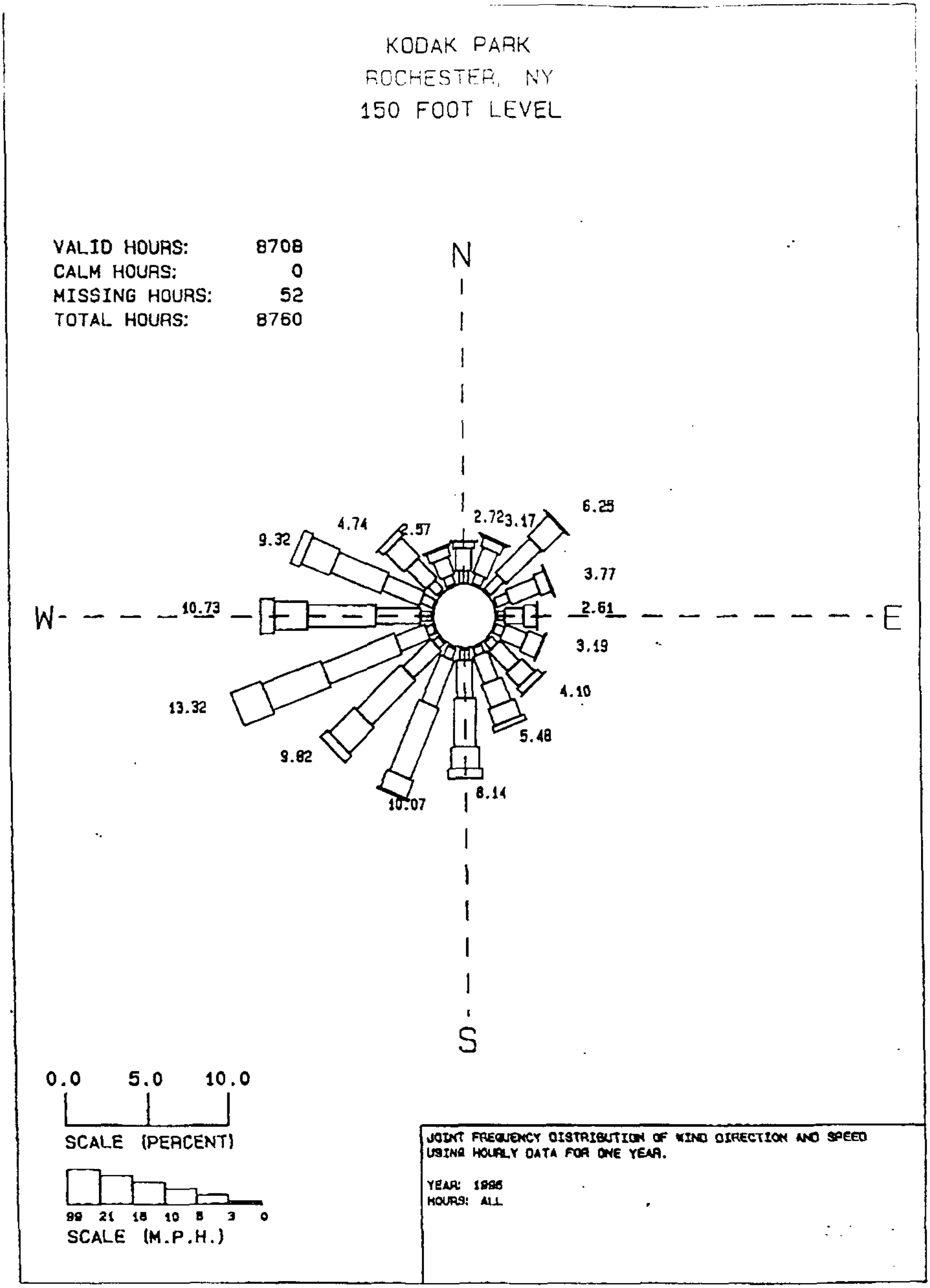

KODAK PARK
ROCHESTER, NY
150 FOOT LEVEL
VALID HOURS: 8708
CALM HOURS: 0
MISSING HOURS: 52
TOTAL HOURS: 8760
N
S
W
E
2.72
3.17
6.25
3.77
2.61
3.19
4.10
5.48
8.14
10.07
9.82
13.32
10.73
9.32
4.74
2.57
0.0 5.0 10.0
SCALE (PERCENT)
99 21 18 10 5 3 0
SCALE (M.P.H.)
JOINT FREQUENCY DISTRIBUTION OF WIND DIRECTION AND SPEED USING HOURLY DATA FOR ONE YEAR.
YEAR: 1995
HOURS: ALL

Figure 8-1

SITE: 150' METEOROLOGICAL TOWER
YEAR INSTALLED: 1982
PARAMETERS: 150' WS, WD, ΔT, DP
33' WS, WD, T, DP
GRD SR, BP, PRECIP.

LOCATION: 77° 43.4' LONGITUDE
43° 12.2' LATITUDE

CLOSEST OBSTRUCTION: BUILDING 206

DISTANCE FROM TWR	80.5m
HEIGHT	7.0m
WIDTH (N-S)	92.6m
LENGTH (E,W)	37.5m

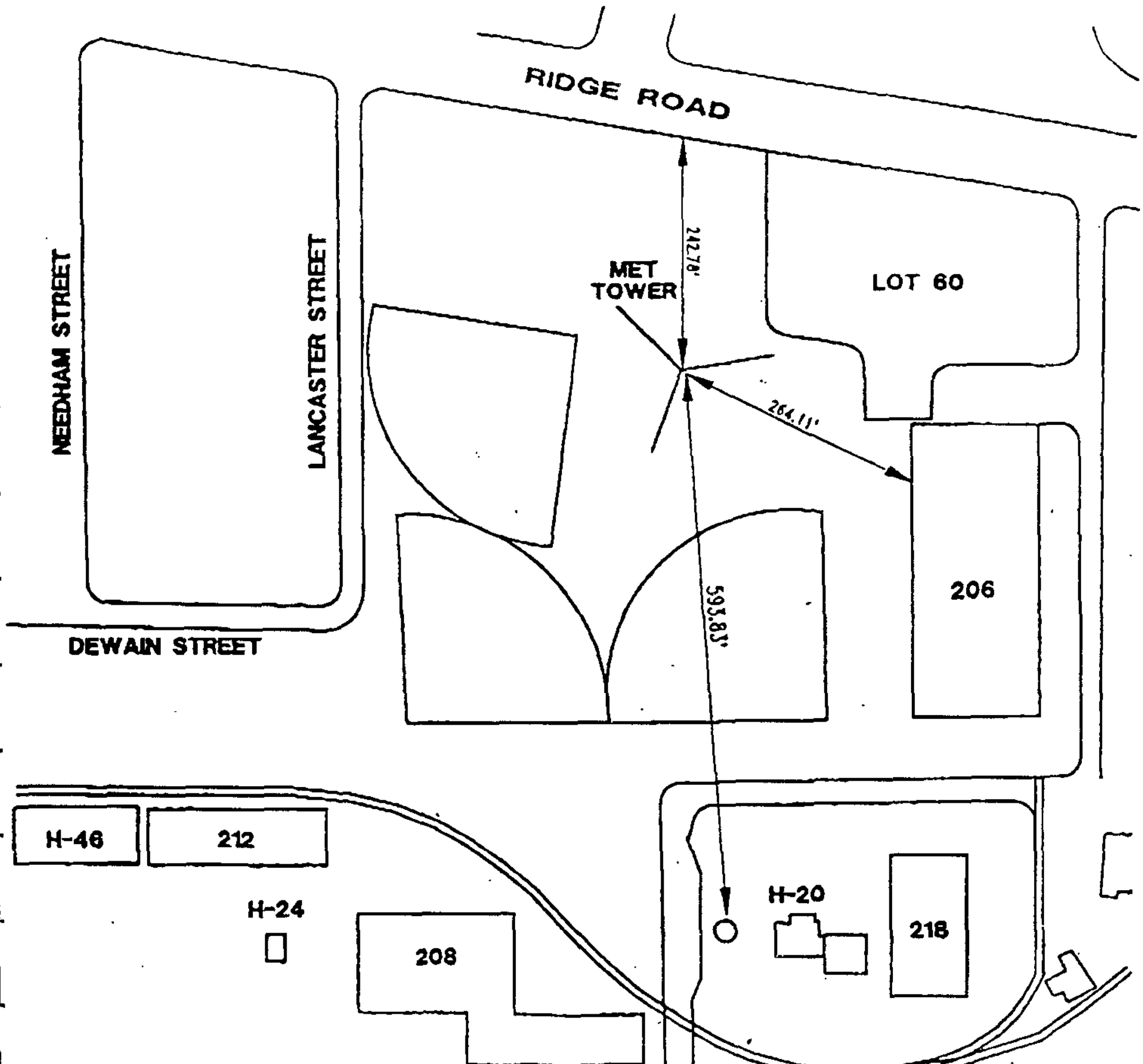


Figure 8-2
Tower Site (Kodak Park)

Region 8

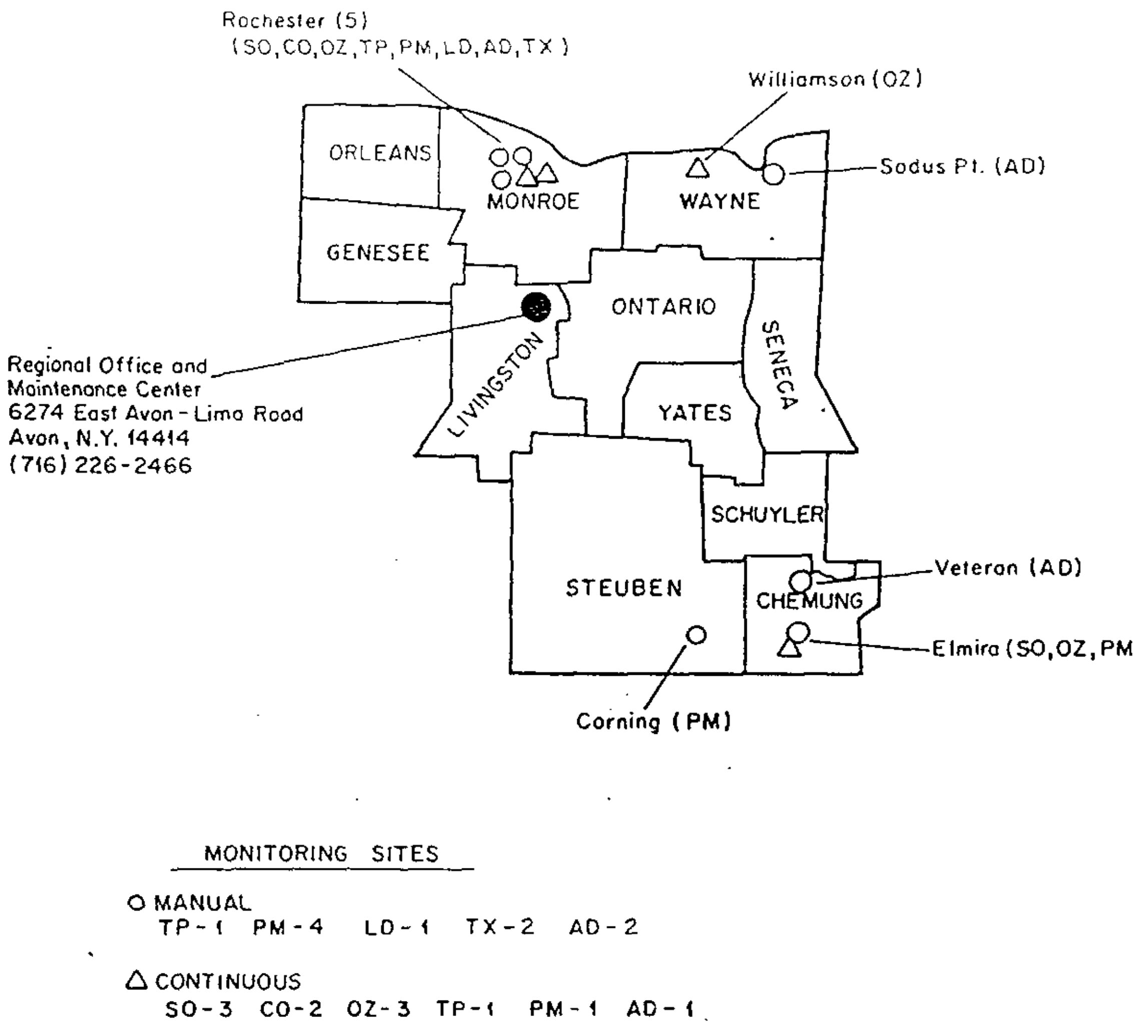


Figure 8-3

8.1.2 AIR QUALITY

The New York State Department of Environmental Conservation (NYSDEC) tracks air quality by region. Region 8 (see Figure 8-3) includes the Genesee-Finger Lakes Air Quality Control Region (AQCR) which is the air shed for the Greater Rochester metropolitan area and Monroe County. Figure 8-3 shows air quality monitoring sites situated within the Genesee-Finger Lakes AQCR. This area is in attainment for all criteria pollutants and is a part of the northeastern United States ozone transport region.

TABLE 8-1 CLIMATOLOGICAL SUMMARY: MONTHLY AVERAGES

Month	Temperature °F	Precipitation in. Water	Snowfall inches	Heating Degree Days	Wind Speed mph, (direction)	Possible Sunshine %
January	23.6	2.1	22.7	1283	11.6 (wsw)	36
February	24.6	2.1	22.4	1131	11.3 (wsw)	40
March	34.3	2.3	14.4	952	11 (wsw)	49
April	45.9	2.6	3.6	573	10.7 (wsw)	54
May	57.1	2.7	0.3	270	9.3 (wsw)	59
June	65.1	3	-	62	8.6 (sw)	67
July	70.2	2.7	-	10	8.0 (sw)	69
August	68	3.4	-	33	7.7 (sw)	66
September	61.7	3	-	137	8.0 (sw)	59
October	51.1	2.4	0.2	435	8.8 (sw)	49
November	40.5	2.9	6.7	735	10.2 (wsw)	31
December	9.1	2.7	19.6	1113	10.7(wsw)	31

Table 8-2 (40 CFR 81.333) describes the national ambient air quality (NAAQS) attainment designations for various pollutants. Table 8-3 provides the national and state ambient air quality standards.

TABLE 8-2 NAAQS ATTAINMENT DESIGNATION

Pollutant	Genesee-Finger Lakes Air Quality Control Region
SO_2	Better than national standards
NO_2	Cannot be classified or better than national standards
PM10	Not designated
CO	Unclassifiable/Attainment
03	Unclassifiable/Attainment
Pb	Not designated
TSP	Better than national standards

TABLE 8-3 TABLE SHOWING NY AND NATIONAL STANDARDS (COMMON TO EK AND NYSEG)

Pollutant (Unit)	Averaging Time	Statistic	Rochester Monitoring Station	Concentration (YR 1994)
SO_2 (ppm)	Annual	Arithmetic Mean	2701-01 2701-08	0.013 0.010
PM10 (ug/m3)	Annual	Arithmetic Mean	2701-01 2701-12 2701-18	19 18 22
CO (ppm)	Annual 8-hr 1-hr	Arithmetic Mean Max (average) Max (average)	2701.01 2701-08 2701-01 2701-01	0.6 0.5 7.8 13.9
03 (ppm)	Annual 1-hr	Arithmetic Mean Max (average)	5863-01 2701-08	0.03 0.108
Pb (ug/m3)	Annual 24-hr	Arithmetic Mean Max (average)	2701-18 2701-18	0.04 .06

8.2 Land Resources

Kodak Park is located in Monroe County in northwestern New York State. Portions of Kodak Park are in the northwestern section of the City of Rochester and the southwestern section of the Town of Greece, approximately five miles south of Lake Ontario, as shown in Figure 8-4.

Kodak Park is divided into five geographic sections that include manufacturing or industrial operations. These five sections are identified as: KPE, KPW, KPX, KPM, and KPS (oldest to most recent development). These sections extend continuously westward from the Genesee River to New York State (NYS) Route 390. These sections of Kodak Park encompass approximately 1300 acres. Kodak Park is irregularly-shaped, approximately 2.8 miles long (east-west) and 1.8 miles wide (north-south) measured at the extremes.

The following sections provide a general overview of Kodak Park topography, geology (overburden material and bedrock descriptions), and hydrogeologic setting. Since groundwater quality across Kodak Park is highly variable, its description is limited to the KPE area where the proposed #15 Boiler Micronized Coal Reburn Project site (Building 31) is located.

8.2.1 Physiography

Kodak Park lies within the relatively low-lying physiographic province referred to as the Erie Ontario Lowlands. The topography is relatively flat and slopes gently downward to the north and east. Ground surface elevations range from El. 208 feet (Kodak Park Datum) at the eastern boundary of KPE (excluding the Genesee Gorge) to El. 340 feet in KPS.

The most prominent topographic feature is a west-southwest trending, north-sloping ridge approximately 35 feet high along the southern fenceline of KPM. This feature likely resulted from erosion along the shorelines of glacial Lake Dawson. The Old (abandoned) Erie Canal bed lies along the top of this slope and separates KPM and KPS.

A smaller escarpment feature located in southwestern KPS, is an outcrop of the resistant Lockport Dolomite. This feature is thought to be an extension of the Niagara Escarpment prominent in Orleans and Niagara Counties.

Another topographic feature of Kodak Park is a shallow basin which has formed along the northern fenceline of KPM at the headwaters of Paddy Hill Creek. The creek drains to the north. This future may have been a bay to Lake Iroquois, formed by wave action eroding the basal till in the area.

In addition, the Genesee River Gorge, a steep bedrock gorge approximately 150 fee deep borders Kodak Park to the east.

8.2.2 Bedrock Geology

Bedrock units underlying Kodak Park include the Rochester Shale, the Clinton Group, the Thorald Sandstone, the Grimsby Sandstone and the Queenston Shale. The Rochester Shale subcrops to the south in the KPS, while the Grimsby predominates as the subcropping unit beneath the remainder of the facility.

The bedrock is generally flat lying with beds gently dipping to the south and striking east-west. This condition is reflected in the subcrop pattern of the bedrock units where the formational contacts are predominantly parallel and east-west trending.

The most prominent bedrock feature of Kodak Park is the bedrock escarpment in southern KPM where the area/distance between formational contacts narrows significantly in the area between Ridgeway Avenue and Weiland Road. This feature likely resulted from erosion along the shoreline of glacial Lake Dawson.

The top of rock expression of Kodak Park is an irregular surface affected by glacial erosion that generally dips to the north and east. The central portions of KPW and KPX are dominated by broad relatively flat-lying bedrock "Plateaus". These areas are underlain by the Grimsby Sandstone which is comprised of relatively flat-lying beds that are somewhat resistant to erosion. A north-facing bedrock slope occurs along Eastman Avenue beneath KPE which may reflect an offset in the bedrock along a known faulted zone. Erosion action in this area by the Lake Iroquois shoreline may have enhanced the escarpment.

A bedrock escarpment with approximately 15 feet of relief occurs along the northern KPM fenceline. The north-facing, east-west trending slope likely resulted from shoreline erosion of glacial Lake Iroquois.

Low but prominent "mounds" of bedrock are found in western KPM. Just south of these "mounds" the bedrock is noticeably lower in elevation. This may be an indication of folding or faulting in this area.

8.2.3 Soils

A nearly continuous layer of overburden deposits blanket the bedrock across Kodak Park. Subsurface borings and other explorations indicate overburden thickness ranges from approximately 3 to 90 feet.

The overburden of Kodak Park consists primarily of fill materials and fluvial, lacustrine, and till deposits. In nearly all developed sections of Kodak Park, fill material is the uppermost overburden unit encountered. The fill is highly variable ranging from silt to cobble sized fragments of concrete, cinders, glass, brick, metal, paper, ashes, and wood.

The native soils in Kodak Park are derived from glacial processes and materials. Glacial meltwater deposited alluvial material exhibiting rough stratification which generally lack silts and clays. Glacial till was transported and deposited directly by the glacial ice. Till deposits generally contain unstratified poorly sorted materials.

During retreat of the ice front, meltwater flowing off the glacier was occasionally impounded between the ice front to the north and higher ground to the south forming pro-glacial lakes. Material deposited in the lacustrine environment is generally well sorted, sometimes varied, ranging in size from clay to sand.

Depending on the duration of the lake stages, prominent shoreline features such as beach ridges formed. Two of these features occur in the Kodak Park area, along West Ridge Road (NYS Route 104) associated with glacial Lake Iroquois and along Ridgeway Avenue, associated with glacial Lake Dawson. These beach ridge deposits consist of well sorted coarse grained materials.

Most of the bedrock in Kodak Park is immediately overlain by glacial till which was transported and deposited directly by glacial ice. These deposits are generally dense, unstratified, and poorly sorted. In general, the till forms a continuous layer over the underlying bedrock highs. In portions of northern KPM and eastern KPX, lacustrine deposits directly overlie the bedrock.

Analysis of subsurface logs indicate relative consistency in the overburden stratigraphic sequence. Fill material generally overlies lacustrine deposits which are underlain by glacial till. Explorations in portions of KPM have encountered what has been described as re-worked till, which has been interpreted as a glacial till deposit eroded and re-deposited by lake shoreline mechanisms.

8.2.4 PRIME AND UNIQUE FARMLAND

There are no properties within or adjacent to Kodak Park zoned for agricultural use.

8.3 WATER RESOURCES

8.3.1 SURFACE WATER

Lake Ontario is located about five miles north of Kodak Park. It is the last in the Great Lakes chain and was the first to be influenced by European settlement. It is the smallest by surface area (7340 sq. miles) but has an average depth (283') slightly higher than Lake Michigan and much greater than Lakes Erie or Huron.

All surface runoff in Monroe County ultimately drains to Lake Ontario. The Genesee River serves as the largest river in the area. Other streams in the area include the New York State Barge Canal, Paddy Hill Creek, Irondequoit Creek, Black Creek, and Oatka Creek. During periods of dry weather, flow within these streams consists almost entirely of groundwater discharge except in areas where water treatment or industry discharge contribute to flow.

The major streams which border Kodak Park include the Genesee River and the New York State Barge (Erie) Canal. The Genesee drains a 2479 square mile area over a 157 mile long channel from northern Pennsylvania to Lake Ontario. Flow in the Rochester area is controlled by a dam in Mt. Morris, New York, to the south; various substations of Rochester Gas and Electric; and the New York State Barge Canal which crosses the Genesee about 11 miles south of Lake Ontario. Mean annual discharge from 1905-1983 was 2,794 cubic feet per second (cfs) at the HSGS gaging station at Driving Park Bridge in Rochester.

The Barge Canal extends from Lake Erie, through western New York including Monroe County to the Hudson River. Within central Monroe County, the canal flows through a blasted bedrock channel and borders Kodak Park along the southwest portion. Water levels within the canal are regulated by the New York State Department of Transportation. During the winter, when the canal is not used for transportation, the water level is lowered by as much as 20 feet. The varying water levels within the canal have a localized effect on groundwater elevations and flow direction.

Table 8-4 provides the air quality data from the two monitoring sites of Genesee-Finger Lakes AQCR.

8.3.1.1 WATER USAGE

Kodak Park is the largest industrial facility in the Great Lakes Basin. Kodak Park withdraws about 38 million gallons per day (mgd) from Lake Ontario and discharges about 28 mgd of treated effluent wastewater into the Genesee River. Raw water from Lake Ontario is obtained through either one of two intakes, 42" and 54" diameter, with respective capacities of 25 and 75 mgs. Average flows are about 38 mgd with a peak capacity of about 53 mgd. The intakes are situated about 55 feet below the lake surface and about 1.5 miles offshore. Raw water is treated with sodium hypochlorite at the intake to protect the mains from zebra mussel infestation. This water is used for manufacturing purposes, feedwater to boilers for steam generation, cooling water and other non potable purposes. The treatment process is designed to remove large and small particulates in the raw water and to decrease viable bacteria and algae levels. The treated water is pumped to Kodak Park via three water supply lines (24", 30", and 48").

8.3.1.2 WATER QUALITY

Lake Ontario: Within the lake, about 90 percent of the inflowing water from the Niagara River circulates in a period of a few months, with currents moving in a generally counter clockwise motion. The result is a relatively short mixing time that ensures the distribution of any introduced contaminant throughout the lake in one to two years.

In terms of diversity and concentrations of persistent toxic substances, Lake Ontario may be the most contaminated of the Great Lakes. While significant improvement in water quality has been achieved over the past 25 years some significant problems remain.

The edible portions of fish tissue in the larger specimens of some Lake Ontario fish (most frequently salmon, brown trout, eels and carp) exceed Canadian and/or U.S. standards for PCBs, mirex, chlordane, dioxin, 2,3,7,8-TCDD, and mercury. They also exceed more stringent U.S. EPA guidelines for hexachlorobenzene, DDT and metabolites, and dieldrin.

Bioaccumulation of PCBs, dioxin, chlordane, mirex, dieldrin, DDT and metabolites, and octachlorostyrene has occurred in fish to levels which appear to have adversely affected wildlife. Mink and bald eagle populations have diminished on the Lake Ontario shoreline.

Efforts are underway to control the loadings of toxic pollutants to Lake Ontario. The Lake Ontario Toxic Management Plan is being folded into the Lake Ontario LakeWide Management Plan by USEPA, Environment Canada, Ontario Ministry of the Environment and NYSDEC. USEPA's Water Quality Guidance for the Great Lakes System is being implemented in all eight Great Lakes States to further protect the Great Lakes and their tributaries.

Genesee River: NYSDEC has classified the river, from Oatka Creek to the river mouth as Class B, with best usage for contact recreation. The river in the Rochester area is not to be used for water supply or food processing (O'Brien and Gere, 1975). The water quality (from Ballantyne Bridge to the mouth) was studied by a NYSDEC multi-disciplinary team in 1992 (Phase 1), 1993 (Phase 2) and 1994. A report was issued. There were many potential sources of possible pollutants along the banks. These were typical of metropolitan areas and included industrial effluents, municipal effluents, storm sewers, and inactive hazardous waste sites.

The lower portion of the river was found to support a higher diversity of fish than the upstream control sites. A weekly measurement of conventional parameters (D.O., pH, temperature, and conductivity) during Phase I indicated that there were no impairments to the water column. A caged fish mortality study indicated that most metals were present in concentrations lower than water quality standards. Reporting levels of cadmium, selenium, and silver were higher than the standards and could not be evaluated. Generally most concentrations of toxics in bottom sediment were not higher than evaluation guidelines except for one site where contaminants were believed to be from non-point sources or that more contaminated sediments were exposed by scour due to higher flows.

Porewater generally showed no toxicity to any organisms except c. dupia, significant mortality of which was attributed to high ammonia concentration in one site. High flows in Phase I affected the multiplate results. The biotic indices were better than those for 1974, 1980, or 1990. Based on multiple sampling, no significant water quality impairment was measured downstream of Kodak's King's Landing Waste Water Purification Plant Morphological deformity of midge larvae indicated toxic conditions at one site. Using conductivity data, it was determined that the site was within the influence of canal water in August.

The report recommends further fish tagging study, caged fish study, investigating storm sewers and storm water runoff, and additional core samples of sediment for metals evaluation. The lower Genesee River is listed in the NYSDEC 1993 Report Priority Water Problem List which lists stressed segments of waterbodies in New York State.

8.3.1.3 FLOOD PLAIN

The project site is situated approximately 170 feet above the Genesee River surface. Based on information published by the Federal Emergency Management Agency (FEMA), the project site is located in an area designated as Zone C (area of minimal flooding). This information was obtained from a National Flood Insurance Program - Flood Insurance Rate Map (revised September, 1992). The project site is located outside of designated "Special Flood Hazard Areas" related to either the Genesee River or Paddy Hill tributaries.

8.3.1.4 WETLANDS

There are no New York State (NYS) designated wetland located within Kodak Park. NYS designated wetlands exist approximately one mile to the west of Kodak park property south of Ridgeway Avenue. Wetlands also exist along the Genesee River gorge situated east of Kodak Park.

8.3.1.5 GROUNDWATER

This section discusses the occurrence and flow of groundwater in unconsolidated and bedrock formations beneath the Kodak Park area. An introduction to groundwater occurrence and usage in the Kodak Park area and descriptions of groundwater quality in KPB follows. It should be noted that the proposed project is not expected to have any affect on groundwater quality. Groundwater is present in unconsolidated deposits (overburden) and all bedrock formations beneath Kodak Park. Groundwater in the overburden flows through primary pore spaces. The type of overburden deposit (e.g. grain size, sorting, and deposit geometry) affects the direction and rate of groundwater movement. Coarser grained deposits, such as alluvial sand and re-worked till, generally transmit larger volumes of water than fine grained lacustrine silts and clay till. Fill deposits, because of their varied origin and composition, may transmit large or small volumes of groundwater.

Groundwater flow in bedrock occurs through primary structures such as bedding planes, as well as secondary porosity features such as joints, faults and fractures. The relative importance of primary or secondary features in transmitting groundwater depends on the lithology and diagenetic, structural and weathering history of the formation. Bedrock lithology, as well as regional fracture systems, local structures and weathering processes affect the rate and direction of groundwater flow. At Kodak Park observations of many hundreds of feet of rock core, as well as direct observation of rock outcrops in the Genesee River gorge, indicate that groundwater flows principally though joints and fractures in bedrock. In highly fractured portions of the bedrock, the volume and rate of groundwater flow may be relatively large. In contrast, less fractured intervals of the stratigraphic column tend to act as barriers to groundwater flow.

Faults may act both as flow barriers or conduits for the flow of groundwater. In the Kodak Park area, several faults have been observed in the Monroe County Combine Sewer Overflow Abatement Program (CSOAP) tunnel system. Where the faults are filled with finer grained material, they do not appear to transmit relatively large volumes of groundwater. Faults may also serve to connect fractures from different flow horizons in the bedrock and as such may act as conduits for vertical groundwater migration across an aquitard.

Weathering processes have had a pronounced effect on the ability of bedrock formations beneath Kodak Park to transmit water. The upper portion of bedrock formations beneath Kodak Park have been subjected to intense physical and chemical weathering processes associated with relatively recent glacial activity. As a result, the primary and secondary porosity of the upper part of the bedrock have been greatly increased. In addition, weathering and groundwater circulation have continued to enhance the porosiy of these bedrock features. The enhanced porosity and permeability of the upper bedroc formations (top of the rock, or TOR) has generally created a highly transmissive flow zone in the top

15 to 20 feet of subcropping bedrock across Kodak Park.

In the Kodak Park area, overburden and bedrock wells do not yield sufficient high quality potable water for large scale supply of water. Accordingly, water supply wells are not present in the Kodak Park area. The community surrounding Kodak Park has a public water supply (treated surface water). Water supply aquifers are located to the east and south of Kodak Park. The largest of these aquifers occupies a buried valley formed by the pre-glacial Genesee River. Located beneath the Irondequoit Creek and Irondequoit Bay drainage area, this aquifer is frequently referred to a the Irondogenesee Valley Aquifer. It provides the municipal water supplies of East Rochester, Pittsford, Webster and approximately 1,000 additional private wells. The aquifer is characterized by a complex system of unconflned water table aquifers and deeper aquifers producing well yields of several hundred gallons per minute. Several smaller aquifers are located south of Kodak Park. These are generally unconflned and many are recharged by surface water sources. The yield of water from wells in these deposits range from less than 10 gallons per rmnute to more than 100 gallons per minute.

8.4 ECOLOGICAL RESOURCES

8.4.1 AQUATIC

Previous studies conducted by New York State Department of Environmental Conservation indicate that the aquatic environment adjacent to Kodak Park (Lower Genesee River) supports a variety of animal communities. A recent study reported the possible presence of a smallmouth bass spawning/nursery area.

8.4.2 TERRESTRIAL

Information of the diversity of terrestial plant species adjacent to Kodak Park is currently unavailable.

8.4.3 THREATENED AND ENDANGERED SPECIES

8.4.3.1 AQUATIC

Athough intensive investigations have not recently been performed to confirm the presence of threatened or endangered aquatic species in the aquatic environment adjacent to Kodak Park, historical records suggest that the local habitat may support known endangered species.

8.4.3.2 TERRESTRIAL

No Federal- or State-listed terrestrial threatened species have been known to reside

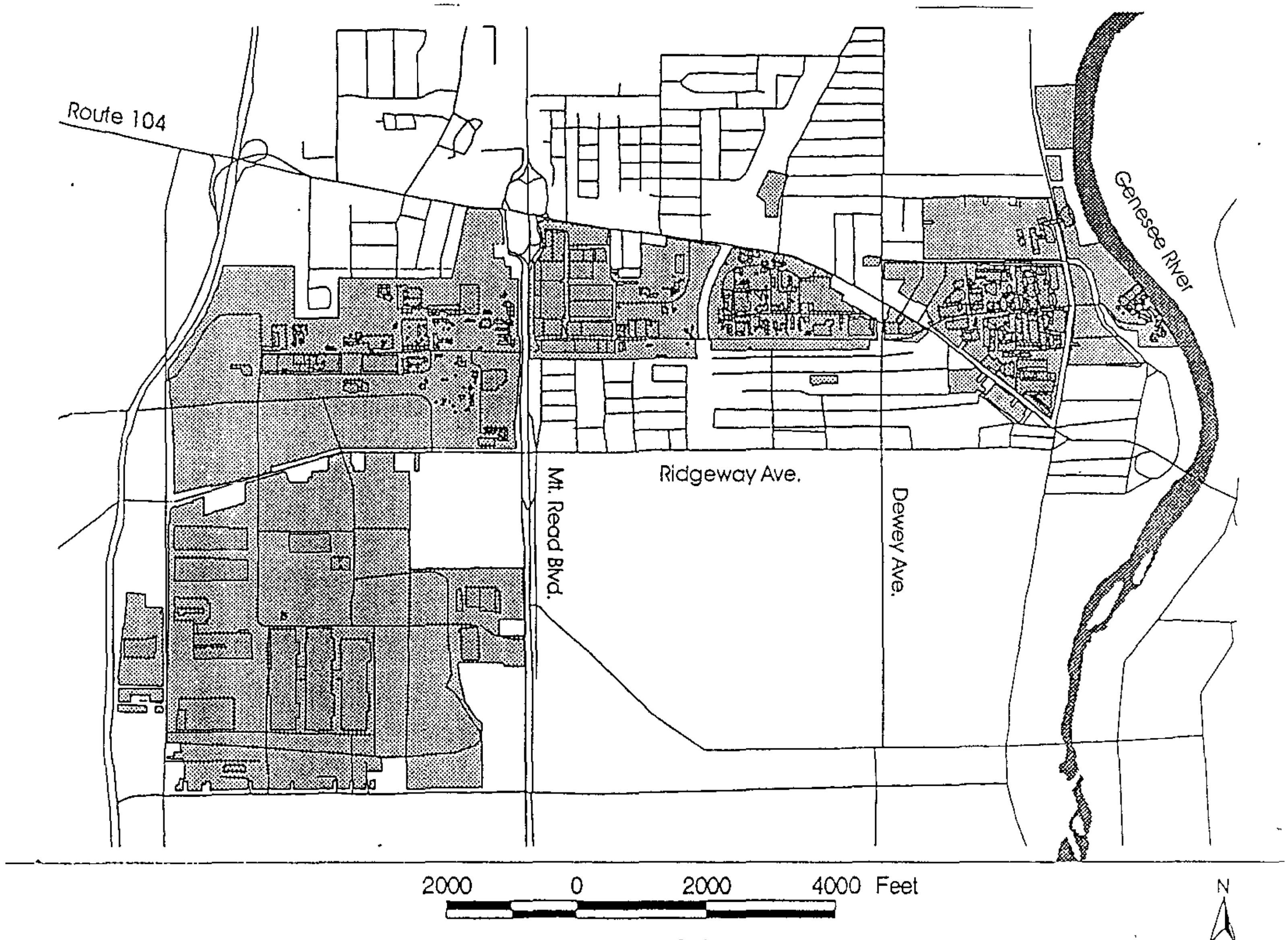


Figure 8-4
Kodak Park site plan showing facility property lines and building locations.

AMBIENT AIR QUALITY STANDARDS
NEW YORK STATE/FEDERAL

		New York State Standards			Corresponding Federal Standards					
						Primary Standard			Secondary Standard	
Pollutant (1)	Averaging Period	Conc.	Units	Statistic (2)	Conc.	Units (3)	Statistic	Conc.	Units	Statistic
Sulfur Dioxide	12 consecutive months	0.03	PPM	Arithmetic Mean (A.M.)	80	ug/m^3	A.M.			
	24-Hour	0.14	PPM	Maximum(2)	365	ug/m^3	Maximum(2)			
	3-Hour	0.50	PPM	Maximum				1300	ug/m^3	Maximum
Carbon Monoxide	8-Hour	9	PPM	Maximum	10	mg/m^3	Maximum	10	mg/m^3	Maximum
	1-Hour	35	PPM	Maximum	40	mg/m^3	Maximum	40	mg/m^3	Maximum
Ozone (4)	1-Hour	0.12	PPM	Maximum	235	ug/m^3	Maximum	235	ug/m^3	Maximum
Hydrocarbons (non-methane)	3-Hour (6-9 a.m.)	0.24	PPM	Maximum						
Nitrogen Dioxide	12-consecutive months	0.05	PPM	A.M.	100	ug/m^3	A.M.	100	ug/m^3	A.M.
Lead (5)	3-consecutive months				1.5	ug/m^3	Maximum			
Inhalable (6) Particulates (PM10)	12-consecutive months				50	ug/m^3	A.M.	50	ug/m^3	A.M.
	24-Hour				150	ug/m^3	Maximum	150	ug/m^3	Maximum
Total Suspended Particulates (TSP) (7)	12-consecutive months	75	ug/m^3	Geometric Mean(G.M.)						
	24-Hour	250	ug/m^3	Maximum	260	ug/m^3	Maximum	150	ug/m^3	Maximum

(1) New York State also has standards for beryllium, fluorides, hydrogen sulfide, and settleable particulates (dustfall). Ambient monitoring for these pollutants is not currently conducted.

(2) All maximum values are concentrations not to be exceeded more than once per calendar year. (Federal Ozone Standard not to be exceeded more than three days in three calendar years).

(3) Gaseous concentrations for Federal standards are corrected to a reference temperature of 25°C and to a *reference pressure of 760 millimeters of mercury*.

(4) Former N.Y.S. Standard for ozone of 0.08 PPM was not officially revised via regulatory process to coincide with the Federal standard of 0.12 PPM which is currently being applied by NYS to determine compliance status.

(5) Federal standard for lead not yet officially adopted by N.Y.S. but *is currently being applied to determine compliance status.*

(6) Federal Standard for PM10 not yet officially adopted by N.Y.S. but is currently being applied to determine compliance status.

(7) New York State also has 30, 60, and 90-day standards as well as annual geometric mean standards of 45, 55, and 65 ug/m^3 in Part 257 of NYCRR. While these TSP standards have been superseded by the above PM10 standards, TSP measurements *may still serve as surrogates to PM10 measurements in the determination of compliance status.*

Table 8-4

adjacent to Kodak Park, however, the seasonal observance of eagles at the site has been noted.

Information on the presence of threatened or endangered terrestrial plants adjacent to Kodak Park is currently unavailable.

8.5 SOCIOECONOMIC RESOURCES

8.5.1 SOCIOECONOMIC CHARACTERISTICS

In 1992, Rochester's population was about 234,000, while the regional population (Rochester and adjacent counties) was about 1.1 million people (May 21, 1995, Rochester newspaper Democrat & Chronicle). Kodak, Xerox, and Bausch and Lomb are the region's three largest manufacturing employers. The region is among the top ten exporters in the U.S. The unemployment in the region was at 4% in May 1995, compared to the U.S. unemployment of 5.1%. Because of the proposed project's size (scale), no employees are expected to relocate to Rochester or Monroe County area to work on the project.

8.5.2 TRANSPORTATION

Primary access to KPE is from West Ridge Road (NYS Route 104); a major public thoroughfare adjacent to the property boundary, that runs east-west. Access is also possible from Eastman Avenue, also just outside the fence line/boundary on the norh side. Lake Avenue runs north-south adjacent to KPE, but access or entry by vehicles to KPE from Lake Avenue is not available. The most recent (1991) vehicle traffic data provided by the Monroe County Traffic Department indicates that the average volume load at the intersection of West Ridge Road and Lake Avenue is approximately 57,000 vehicles per day. The proposed project will not affect vehicle traffic loads near the Kodak Park facility.

8.6 AESTHETIC/CULTURAL RESOURCES

8.6.1 ARCHAEOLOGICAL/HISTORICAL RESOURCES

A review of local, state, and national registries indicates that there is one site adjacent to Kodak Park that has designated landmark status. The former Saint Bernards Seminary site is a listed landmark in the City of Rochester registry and in the New York State and national landmark registries. This site is located at 2260 Lake Avenue, north of KPE. A few other local sites have been identified by the Rochester Museum and Science Center (RMSC) as "recorded archeological sites". These are:

-RMSC Roe 056 - King's/Hanford Landing site, located at east end of KPE
-RMSC Roe 080 - Ridgeview Earthworks, located at the north end of Maplewood Park adjacent to KPE
-RMSC Roe 105 - Cabin site, within RMSC 056 site identified above

8.6.2 Native American Resources

The proposed action inside Kodak Park will not impact any religious or ceremonial concerns of any Native American group.

8.6.3 Scenic or Visual Resources

The proposed project will be totally contained within Kodak Park B-31 area and will not affect any offsite scenic or visual resource. New equipment and structures will not be visible from any public road.

8.6.4 Recreational Resources

Lake Ontario (about 5 miles north of the proposed project location), Irondequoit Bay (about 4 miles east), and Genesee River (about 1 mile east) are outlets for summer recreational boating and fishing. Seneca Park Zoo and Maplewood park are within a few miles east of Kodak Park. The surrounding area near Kodak Park is predominantly urban.

9.0 CONSEQUENCES OF THE PROPOSED MCR PROJECT

This section presents a comprehensive analysis of anticipated impacts from the proposed MCR project using the #15 Boiler at B-31 in Kodak Park. As shown in the following sections, the MCR project is not anticipated to adversely affect the air quality near Kodak Park.

9.1 Air Quality Impacts

All registered emission points in Kodak Park are routinely evaluated for impact on air quality using an extensive and sophisticated in house computer dispersion modeling system. Kodak is committed to maintaining the air quality in the surrounding community/neighborhoods and therefore will automatically evaluate air quality impact from any potential new source or increases to emissions of any existing source.

The Kodak Air Resources Evaluation System (KRES) is a computerized air dispersion modeling system which contains all of the necessary data to estimate ambient air quality concentrations from Kodak-Rochester emissions on a chemical-specific basis. In addition, the system allows the user to work on "what-if" scenarios to estimate changes in concentration levels as a result of variations in Kodak operaflons (i.e., changes in emission rates, addition of chemicals to existing sources, addition or modification of sources, etc.). The KARES system is based on the EPA Industrial Source Complex Short-Term 3 Model with additional enhancements to provide a more detailed and accurate analysis of Kodak emissions.

Meteorological data for KARES includes processed hourly surface data for 1992 from the Kodak Park and Kings Landing on-site meteorological towers and upper air data from the

Buffalo International Airport. Cloud cover observations from the National Weather Service (NWS) station at Rochester International Airport are used in dassifring atmospheric stability.

KARES is designed to assess the cumulative maximum concentration of each registered air contaminant from all sources or combinations of sources at the facility. As such, the receptors selected for the KARES database span the range of expected maximum concentrations for all sources. KARES is also intended to provide direct information on concentrations that can be of public conceim, even if those concentrations are not the overall highest concentrations. For this reason, receptors are located at points of potential public concern, in addition to areas of expected maximum concentrations. In all, there are 648 receptor locations both on- and off-site.The south chimney/stack on B-31 is identified as NYSDEC Emission Point 031B-2. Emissions from boilers (through their respective ESPs) #11&12, 14 16, and #15 (proposed for use in the MCR project) currently are discharged through the south stack. The maximum off-site impact from 031B-2 has been determined by KARES modeling to occur at receptor 4466. The impact is calculated to be 0.0226 *ug/m3, for each unit emission rate of 1 gram/second (g/s) of a contaminant.*

Figure 9-1 shows the location of emission point 031B-2 and receptor #466. Table 9-1 describes the baseline (current) and proposed (project) emissions and impacts for pollutants of interest. The following observations are based on the data presented in Table 9-1.

$N0_2$:The objective of the proposed project is to decrease NO_X emissions. It is anticipated that the proposed emissions of $N0_2$ will decrease by at least 48%. The dispersion modeling indicates that the proposed impact will be lowered by 42%.

CO:Emission of carbon monoxide and hence the impact are not anticipated to change significantly. KARES calculates only annualized impact, and there is no annual CO standard for direct comparison; the NAAQS 8-hr standard is shown for illustration.

TSP:Future project emission of total solid particulates is not expected to increase from current levels. Any potential increase in flyash partitioning to the ESP is within the design *removal capability of the ESP. Consequently, ground level impact is not anticipated to* change significantly. The predicted new impact from future potential emission is 0.19 ug/m3, compared to the State standard of 75 ug/m3.

SO_2:Emission of SO_2 and impact are not anticipated to change signiflcanfly. The current impact is 5.5 ug/m3 and is compared to NAAQS of 80 ug/m3.

In summary, the proposed project will decrease the emissions of NO_2 by 49% and the ground level concentration (impact) of NO_2 by 42%. Emissions and impacts of other pollutants will not be substantially altered.

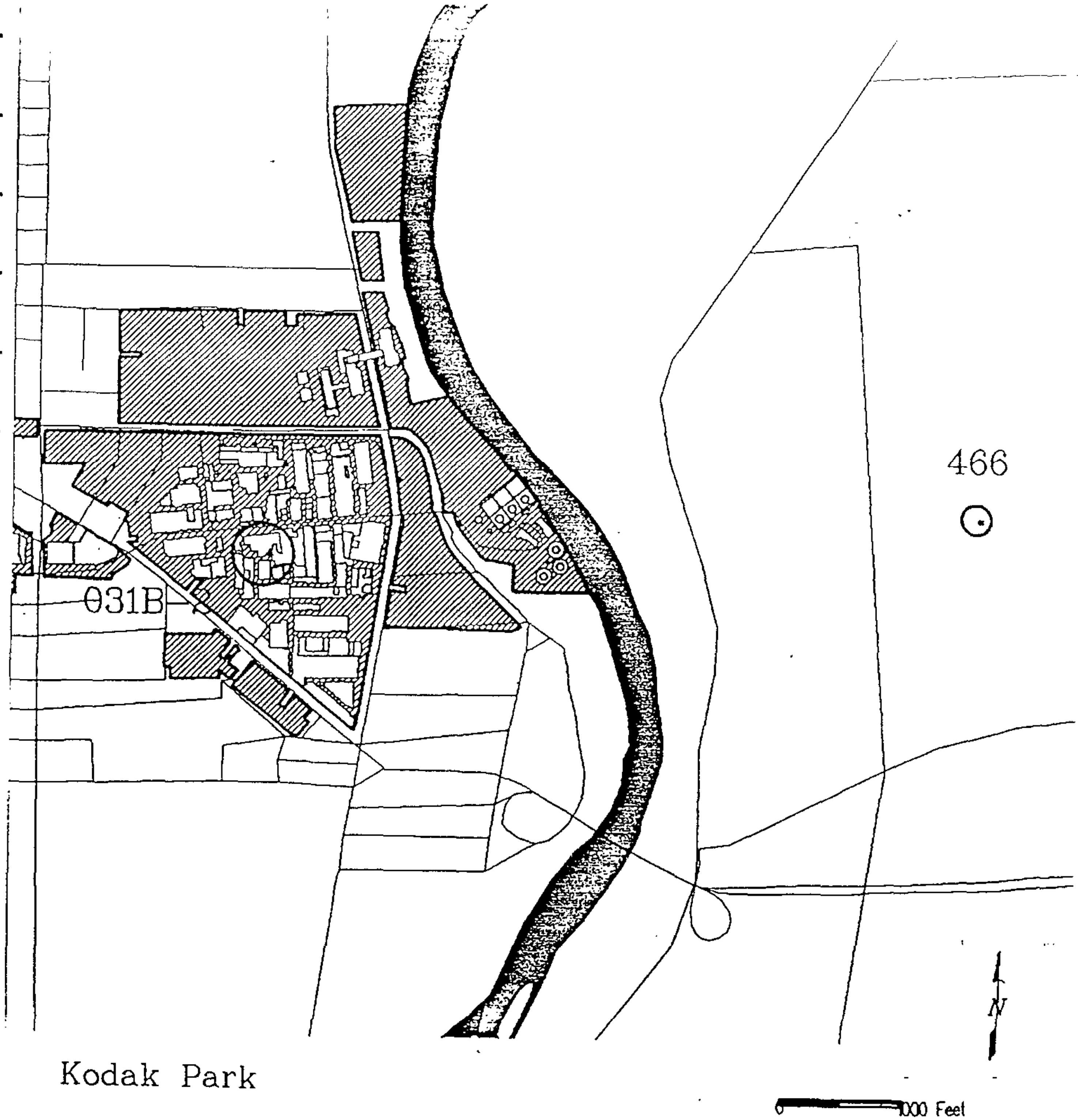


Figure 9-1
Source 031B-2 and Receptor #466 Location

Table 9-1. Dispersion Modeling Summary

	A	B	C	D	E	F	G
Pollutant	Current Emissions from #15 Boiler (lbs/hr)(1)	Current Emissions from 031B-2 (lbs/hr)(2)	Current Impact from (031B-2) (ug/m3)(3)	Proposed (Project) Emissions from #15 Boiler (lbs/yr)	Proposed Total Emissions from 031B-2 (lbs/yr)	Predicted (Project) Impact from 031B-2 (ug/m3)(4)	NAAQS (ug/me)
NO_2	4,920,717	5,809,997	1.9	2,512,368 (6)	3,401,648	1.1	100
CO	180,909	1,471,497	0.48	289,454	1,574,042	0.52	10,000 (7)
TSP	402,000	602,265	0.19	402,000	602,265	0.19	75 (8)
SO_2	11,180,158	16,933,258	5.5	11,180,158	16,933,258	5.5	80

(1)Based on #15 boiler permitting data, Column A.
(2)Includes emissions of all sources through 031B-2 (ESPs of #11/12, #15, and #16 boilers); Column B
(3)Obtained by multiplying the stack dispersion coefficient (with appropriate unit conversion) by base line emission rate of pollutant form all sources emitting through the stack; Column C
(4)Future project emissions are anticipated emissions upon completion of the project.
(5)Projected source impact; Column E multiplied by dispersion coefficient.
(6)Reflects a 49% decrease in emissions due to the project.
(7)No annual standard for CO exists; 8-hr max. standard is shown
(8)Federal standard does not exist; NY Standard shown (12 consecutive months, geometric mean).

9.2 LAND IMPACTS

There will be no land impacts during the construction or operation of the project since the project will be located inside Kodak Park facility boundaries.

9.3 WASTE DISPOSAL

Production of ash from the use of micronized coal will remain essentially the same as produced by current operations. There would be no impact on the ash collection, handling, and disposal requirement.

9.4 WATER QUALITY IMPACTS

The project will not use any potable water. Total water usage for the B-31/KPE power station will be unchanged. Construction and operation of the MCR project will have no significant impact on groundwater or surface water quality. State Pollutant Discharge Elimination System (SPDES) permit modifications are not anticipated. Storm water characteristics and potential run-off quantity from the project are not anticipated to vary from present conditions or sources. Storm sewers in the vicinity in Kodak Park can adequately handle any potential increase in volume.

9.5 ECOLOGICAL IMPACTS

Neither construction nor operation of this project will impact aquatic or terestrial resources, including endangered and threatened species. Construction of the project will be limiited to occur within and near B-31 and on developed plant property. As outlined earlier, operation of the project will not involve additional water use and will result in no change in ash or other solid waste discharge.

9.6 COMMUNITY IMPACTS

The proposed project will not impact the community land use or zoning requirements. The socioeconomics and transportation characteristics will not be altered due to the scale (size) of the proposed project. There will be no change to the existing background noise level at the fenceline. The proposed project will be totally contained within Kodak Park B-31 area and will not affect any offsite scenic or visual resource. New equipment and structures will not be visible from any public road. No specific mitigation efforts are planned or deemed necessary.

10.0 REGULATORY COMPLIANCE REQUIREMENTS

This section describes the existing permits governing the #15 boiler operation. Proposed modifications to existing permits are also addressed.

Currently the #15 boiler is subject to the requirements of 6 NYCRR Part 227 as well as the fuel sulfur limitations in 6 NYCPR Part 225.1. The proposed modification is being undertaken to fulfill the NO_XRACT requirements of the New Source Performance Standard in 40 CER Part 60 Subpart Db. It is excluded from the definition of modification because its "...primary function is the reduction of air pollutants..." as defined in 40 CFR Part 60. 14(e)(5).

The modification could potentially trigger the requirements of New Source Review relative to the emissions of particulates. A modification can be excluded from those requirements, known as Prevention of Significant Deterioration (PSD), if the permitting agency concludes that it represents a pollution control project. Based on the expected NO_X emission reductions, a request for this exclusion will accompany the application for

Permit to Construct.

10.1 Air Permit

As mentioned in Section 8.0, the #15 boiler/ESP emissions (and #11/12 and #16 boilers/ESPs) are exhausted through NYSDEC Emission Point 031B-2. This source has a 'Certificate to Operate' under the NYS air permit program.

New York State requires a Permit to Construct for new emission sources and any modifications to existing sources even if there were no proposed increases to air emissions. Kodak will file an application for Permit to Construct for this project.

10.2 Building Permit

Under the existing ordinances, Kodak has filed an application for Building Permit with the City of Rochester for this project.

10.3 Wastewater Permit

Process effluents from all Kodak Park operations are treated at the company owned KLWPP which operates under the New York State Pollutant Discharge Elimination System (SPDES) Permit. No SPDES permit modifications will be necessary.

10.4 Solid Waste Permit

Ash from all the B-31 boilers is currently landfilled in Kodak's Weiland Road Landfill. No modifications to the existing permit will be necessary.

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