FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE CROTON WATER TREATMENT PLANT AT THE EASTVIEW SITE

5.17. ELECTRIC AND MAGNETIC FIELDS (EMF) AND EXTREMELY LOW FREQUENCY FIELDS (ELF) ANALYSIS

5.17.1. Introduction

Electric and Magnetic Fields (EMF) surround any electrical device that carry an electrical charge and/or current. Electric fields exist near electric equipment or devices that carry an electrical current (e.g. home appliances that are plugged into electrical outlets). They are present even when the equipment is turned off, as long as it remains connected to the source of electric power. Magnetic fields are emitted when electrical equipment is operated or the current is being transmitted. Magnetic fields can pass through most materials, while electric fields are easily shielded or weakened by conducting objects such as trees and buildings. Conducting materials also weaken magnetic fields, but not to the same degree as they do it to electric fields. The magnitude of both types of fields decreases with distance from their sources. Fields generated by electric current that is typically transmitted at 50 to 60 cycles per second are considered Extremely Low Frequency (ELF) fields.

An evaluation of electric and magnetic fields under existing and future conditions was conducted to identify potential impacts that could result from the proposed Croton Water Treatment Plant (WTP) project. Measurements were taken along the northern perimeter of the Eastview Site and along the feeder lines extending from the Consolidated Edison Company of New York (Con Edison) Grasslands Substation in the Grasslands Reservation to the water treatment plant site at the Eastview Site. The methodology used to prepare this analysis is presented in Section 4.17, Data Collection and Impact Methodologies, Electric and Magnetic Fields (EMF) and Extremely Low Frequency Fields (ELF) Analysis.

5.17.2. Baseline Conditions

In order to properly evaluate electric and magnetic fields, point sources and line sources measurements were taken. Point sources are specific sources, such as stationary equipment, that emit magnetic and electric fields. Line sources, such as power lines, also emit magnetic and electric fields. The main difference between the two sources is the rate of decay of the magnetic fields they produce (detailed information is presented in Section 4.17, Data Collection and Impact Methodologies, EMF/ELF). Point source magnetic fields decrease inversely with the cube of the distance, while line source magnetic fields decrease inversely with the square of the distance.

While there are no official standards or guidelines, this analysis compares measured electric and magnetic field data to the general guidelines of the International Radiation Protection Association (IRPA) general public limit and the New York State Right-of-way (NYSROW) maximum guidelines for electric and magnetic fields.

The Grasslands Substation is located adjacent to and south of the Westchester County Correctional Facility, on the north side of Grasslands Road/Route 100C. The new substation, which is a distribution substation, would accommodate five transformer bays, fully enclosed within a masonry building. The Grasslands Substation is connected to the Eastview Substation,

which is approximately 1.5 miles west of the water treatment plant site in the Town of Mount Pleasant, through two feeder routes. Initially, three 138-kV feeders would be installed and two additional feeders could potentially be installed.

According to Con Edison's *Certificate of Environmental Compatibility and Public Need under Article VII Application of the New York State Public Service Law for the Grasslands Project, Westchester County, N.Y., September 2002*, the new substation would supply an anticipated growing demand in the central Westchester County area. The new substation would also supply new developments in the Grasslands Reservation. According to the Article VII Application, "the magnetic fields levels produced by the proposed underground cable circuit(s) at one meter above ground at all locations along the cable route, including directly above the cables, would not exceed relevant exposure guidelines."

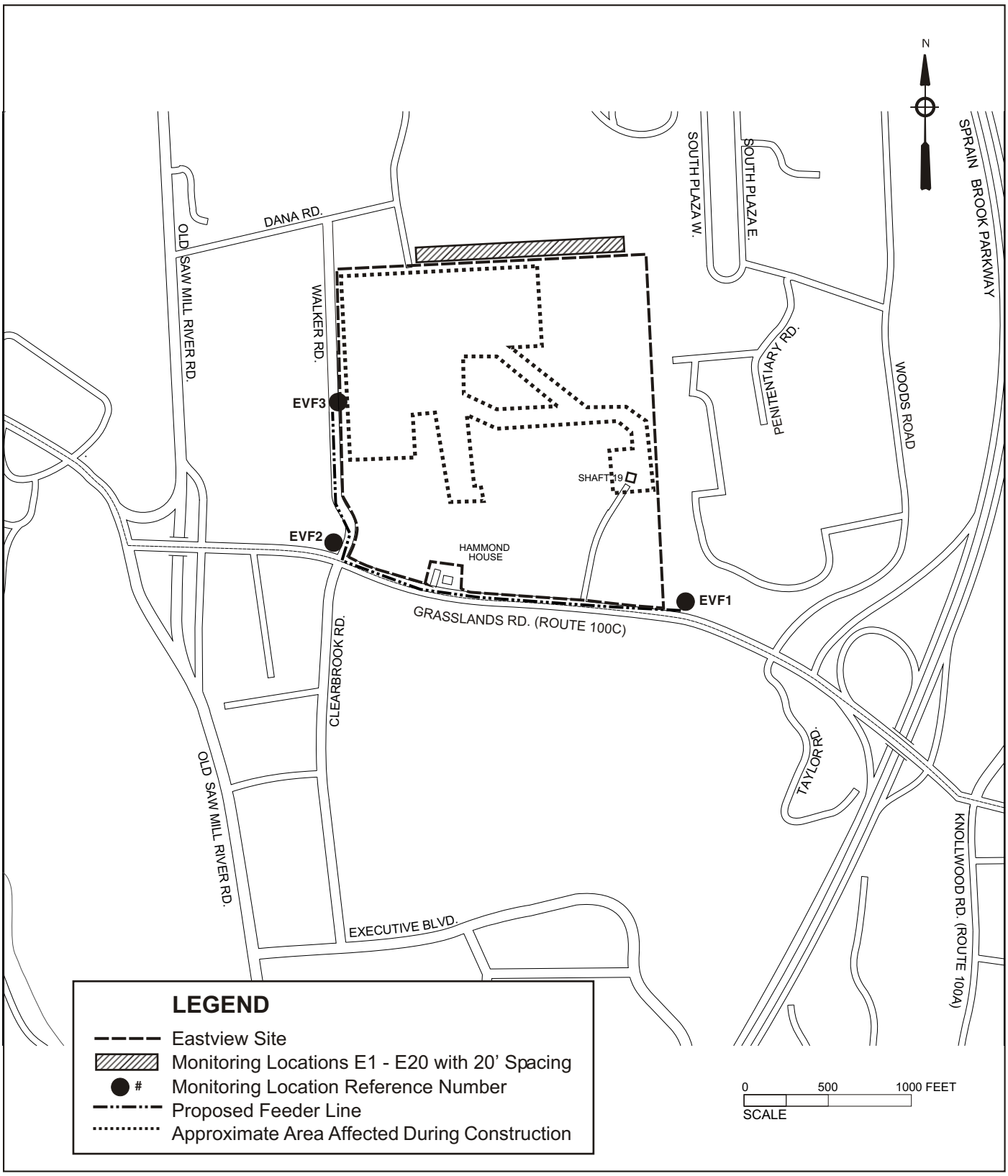
5.17.2.1. Existing Conditions

Electric and magnetic field measurements were conducted in August 2001 at the Eastview Site and in December 2002 along the proposed feeder route from the Grasslands Substation. The sampling locations at the water treatment site, E1 to E20, are indicated on Figure 5.17-1. The sampling locations for the feeder route, EVF1 to EVF3, are indicated on Figure 5.17-1. Measurements for these locations are summarized in Table 5.17-1 and Table 5.17-2.

The electric and magnetic field measurements were performed at the Eastview Site using the Holaday meter, following procedures outlined in Section 4.17, Data Collection and Impact Methodologies, Electric and Magnetic Fields (EMF) and Extremely Low Frequency Fields (ELF) Analysis.

5.17.2.1.1. Point Sources

The magnetic field measurements taken from several points along the northern perimeter (closest to the identified sensitive receptors) of the Eastview Site were conducted in August 2001. Presented in Table 5.17-1, these measurements range from 0.000197 to 0.000203 Gauss. These values are well below the International Radiation Protection Association (IRPA) general public limit of 1.0 Gauss. The IRPA issued interim standards for electric and magnetic field exposure limits for the general public in 1990 are based upon 1984 World Health Organization guidelines. In addition, New York State (NYS) uses informal guidelines to limit electric and magnetic field strengths along rights-of-way (ROW) for overhead power transmission lines. These guidelines have been designed to ensure that field levels around new transmission lines do not exceed those around the existing transmission lines. Currently, there are no existing guidelines specifically for underground distribution lines. The magnetic field data are well below the NYSROW maximum guideline for magnetic field strength of 0.2 Gauss.



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EMF/ELF Monitoring Locations
Eastview Site

Croton Water Treatment Plant

Figure 5.17-1

The electric field measurements taken from the points along the northern perimeter are presented in Table 5.17-1, these measurements range from 1.46 to 6.80 volts/meter (V/m). These values are well below the IRPA general public limit for electric field strength of 5,000 V/m. Likewise, they are below the NYSROW maximum guidelines for an electric field of 11,800 V/m.

TABLE 5.17-1. EXISTING ELECTRIC AND MAGNETIC FIELD DATA

Sample Location	Holaday Magnetic Field Gauss August 2001	Holaday Electric Field Volts/Meter August 2001
E1	0.000197	5.40
E2	0.000201	1.46
E3	0.000201	6.00
E4	0.000201	6.20
E5	0.000201	5.00
E6	0.000203	4.70
E7	0.000200	5.70
E8	0.000199	5.20
E9	0.000202	4.70
E10	0.000200	4.90
E11	0.000201	5.80
E12	0.000201	4.90
E13	0.000202	5.70
E14	0.000203	5.60
E15	0.000200	6.80
E16	0.000204	5.60
E17	0.000201	5.40
E18	0.000200	5.70
E19	0.000202	5.50
E20	0.000199	6.20

5.17.2.1.2. Line Sources

In addition to the 20 sampling locations at the Eastview Site, three points were chosen along the proposed feeder route from the Grasslands Substation, which is located adjacent to the southeast corner of the Eastview Site, north of Grasslands Road/Route 100C and south of the Correctional Facility to examine line sources. The sampling locations, EVF1 to EVF3, are shown on Figure 5.17-1. Up to six 13.2-kV feeder lines would supply electrical power to the proposed plant. These feeders would be located below grade along Grasslands Road/Route 100C and Walker Road, and would enter the water treatment plant site on the west side, from Walker Road.

The magnetic field measured along the feeder route ranged from 0.00025 to 0.00281 Gauss (Table 5.17-2). These values are well below the IRPA general public limit of 1.0 Gauss and the NYSROW maximum guidelines for magnetic field strength of 0.2 Gauss.

TABLE 5.17-2. EXISTING ELECTRIC AND MAGNETIC FIELD DATA ALONG THE PROPOSED FEEDER DISTRIBUTION LINES

Sample Location	Holaday Magnetic Field Gauss December 2002	Holaday Electric Field Volts/Meter December 2002
EVF1	0.00281	11.50
EVF2	0.00129	4.57
EVF3	0.00025	1.48

The three points chosen along the proposed feeder route from the Grasslands substation were also used to collect electric field measurements. The electric field measured along the feeder route ranged from 1.48 to 11.50 V/m (Table 5.17-2). They are well below the IRPA general public limit for electric field strength of 5,000 V/m. Likewise, they are below the NYSROW maximum guidelines for an electric field of 11,800 V/m. Sampling point EVF1 exhibits higher electric field values because the measurement was taken across the road from an existing transformer unit.

5.17.2.2. Future Without the Project

The Future Without the Project conditions were developed for the anticipated peak year of construction (2008) and the anticipated year of operation (2010) for the proposed project. The anticipated peak year of construction is based on the peak number of workers.

For each year, two scenarios are assessed: one scenario without the Catskill/Delaware Ultraviolet Light Disinfection Facility (Cat/Del UV Facility) at the Eastview Site and another with the Cat/Del UV Facility at the Eastview Site. The scenario Without the Cat/Del UV Facility at the Eastview Site assumes that the NYCDEP Catskill/Delaware Ultraviolet (UV) Light Disinfection Facility would not be present on the Eastview Site. The scenario With the Cat/Del UV Facility at the Eastview Site discloses the additional incremental impact of the proposed Croton project if the UV facility and the other projects planned for the area would be built. The scenario With the Cat/Del UV Facility at the Eastview Site assumes that the Cat/Del UV Facility is included in the site analysis; specifically the Cat/Del UV Facility would be located in the southeastern area of the Mount Pleasant parcel. It should be noted that the Eastview Site is the only location under consideration for the Cat/Del UV Facility. The scenario without the Cat/Del UV Facility is included because that project has not yet received its necessary approvals and its inclusion or not would reflect major changes to the site. By the peak construction year, two additional NYCDEP projects could be located on the Eastview Site, namely a Police Precinct and possibly an Administration Building[1]. The Police Precinct may be located in the southwest corner of the

[1] This depends on the results of a siting evaluation which is currently ongoing. The siting decision will be evaluated and discussed as part of a separate independent environmental review.

Mount Pleasant parcel. The Administration Building is less certain; however, as the Eastview Site is one of several properties currently being evaluated for use as a possible site for that particular building. In addition to these projects, NYCDEP's Kensico-City Tunnel may be under construction at the Eastview Site starting in 2009. All of these NYCDEP projects are analyzed in this Final SEIS to the extent to which information is available. They are all separate actions from the proposed project and will undergo their own independent environmental reviews.

5.17.2.2.1. Without Cat/Del UV Facility at Eastview Site

Plans for electrical utilities upgrades are in place by Westchester County to accommodate the anticipated growth (developments are listed in Section 5.2, Land Use, Zoning, and Public Policy). As noted above, facilities associated with the Kensico-City Tunnel (KCT) Project, the possible Administration Building, and police precinct are proposed for the Eastview Site. The precinct would be located on the southwest corner of the Eastview Site. Potential increases in EMF/ELF in the Future Without the Project would not be detectable within the Eastview Site, and would be below standards and guidelines presented above.

5.17.2.2.2. With Cat/Del UV Facility at Eastview Site

In addition to the projects described above, the Cat/Del UV Facility could be built in the southeast portion of the Eastview Site. During operation of the Cat/Del UV Facility, EMF/ELF sources would include the electrical equipment that operates within and/or around the proposed facility (i.e., main disinfection building and electrical generator building) and the feeder lines that bring power to the proposed facility. Con Edison would supply two 13.8 kV underground feeders from the Grasslands Substation to the City's property line. The underground feeders would be triplex-shielded cables installed within rigid steel conduits, where appropriate, which would adsorb the electric fields emitted from the four feeders and prevent public exposure to the line sources. Any increases in electric field levels would be null because of shielding and/or the rapid decreases in field strength from the electrical source.

Construction power for the Cat/Del UV Facility would be obtained at 4,160 volts from the Grasslands Substation. An overhead pole line would be installed with a 4,160-volt feeder from the service point at Grasslands Road to the vicinity of the construction trailer area. At the trailer area, a 300 kVA step-down transformer and secondary service, provided by Con Edison, would provide 120/208 volt three phase power to the trailer complex. The Contractor would also have the option of providing temporary power through the use of temporary/portable generators as necessary. Any increases in electric field levels would be null because of the shielding and also the rapid decrease in field strength from the electrical source.

The electrical/generator building would house the main 13.8kV utility switchgear, 13.8kV generator paralleling switchgear, and 480V distribution equipment (motor control centers, etc. for equipment within the electrical/generator building) and each electrical room would contain two unit substations that would step the voltage from 13.8kV down to 480V for distribution within the facility. Additionally, it is anticipated that there would be two 10,000-KVA pad-

mounted transformers installed within a fenced area adjacent to the Electrical/Generator Building for the incoming utility feeders from Con Edison.

Data from prior magnetic field measurements at varying distances from the Wards Island and North River Water Pollution Control Plants, which house similar electrical equipment as the proposed project, were used to estimate the magnetic fields strength from the point sources and the line sources at the proposed facility. From what was determined, the point sources and line sources would not create any measurable increase in magnetic field levels surrounding the facility. Since the electrical equipment would be located several hundred feet from the nearest receptor and housed in the Cat/Del UV Facility, further attenuating any magnetic field levels, there would be no significant increase above existing magnetic field levels.

Emergency power to the Cat/Del UV Facility would be supplied by four (4) 1500kW diesel engine generators that would supply standby power in the event of a power interruption from the utility. These emergency generators would be located inside the building, shielding the field strength of magnetic fields and electrical fields; therefore no significant impacts from magnetic fields or electrical fields are anticipated from this facility. The UV lamps themselves would be enclosed in a protective sleeve and housed in a steel chamber within the main Cat/Del UV Facility. The nearest receptor is the Westchester County Correctional Facility located 435 feet from the Cat/Del UV Facility. With all the components for the UV lamps enclosed in the Cat/Del UV Facility, the magnetic fields at maximum operating conditions would have a negligible increase on the existing magnetic field.

Design parameters would be incorporated to shield and weaken the electric and magnetic fields by introducing materials and distances between these sources and the closest public access. Within the plant, all major electrical equipment would be located indoors within dedicated electrical rooms. As a result, it is not anticipated that EMF/ELF would exceed the guidelines and standards presented above. The Cat/Del UV Facility would be separate and independent of the proposed Croton project and would undergo its own independent environmental review. The proposed facility would be completed by 2009.

5.17.3. Potential Impacts

5.17.3.1. Potential Project Impacts

The anticipated year of operation for the proposed project is 2010. Therefore, potential project impacts have been assessed by comparing the Future With the Project conditions against the Future Without the Project conditions both without the Cat/Del UV Facility at the Eastview Site, and with the Cat/Del UV Facility at the Eastview Site for the anticipated year of operation (2010).

5.17.3.1.1. Without Cat/Del UV Facility at Eastview Site

There would be two principal sources of electrical and magnetic fields anticipated at the proposed plant; point sources and line sources. The point sources would include the electrical equipment that operates within and/or around the proposed plant (i.e., raw water pumping station [RWPS] and the electrical substation). The line sources would include the feeder lines that bring power to the proposed plant. Point and line sources are not anticipated to result from the proposed NYCDEP police precinct or the KCT Project.

Point Sources. As discussed above in the Future Without the Project With the Catskill Delaware UV Facility at the Eastview Site, magnetic field levels were measured at two existing New York City-owned facilities, the Wards Island and North River Water Pollution Control Plants (WPCP). These two plants house electrical equipment similar to the proposed electrical equipment requirement to be selected for the proposed plant. Measurements were taken at varying distances from the equipment to determine how the magnetic fields would decrease with distance based on the inverse cube relationship. The maximum magnetic fields and measurement distances from each type of equipment at the two WPCPs are presented below in Table 5.17-3. These maximum magnetic fields in Gauss were used to estimate the magnetic fields strength from the point sources at the proposed plant, shown in Table 5.17-4.

TABLE 5.17-3. MAGNETIC FIELD LEVELS FROM POINT SOURCES IN THE EXISTING WPCPs

Equipment	Measurement Distance from Equipment (ft)	Potential Max. Magnetic Field Strength (Gauss) [1]
2,000 hp Motor [3]	1.6	0.0985
4.16 kV Switchgear [3]	1.6	0.0133
13.2 kV Switchgear [3]	1.6	0.0156
Transformer (7,500 kVA)	1.6	0.0725
Transformer (11,250 kVA)	1.6	0.10875[2]
Inductor	1.0	0.1170

Notes:
1. Maximum magnetic field measured at either Wards Island or North River WPCP
2. Extrapolation was based on a 7,500 kVA transformer
3. hp = horse power; kV = kilo-Volt

According to the estimated magnetic fields shown in Table 5.17-4, the proposed plant would have negligible effects on the existing magnetic fields. The maximum magnetic fields strength would potentially increase by less than 0.0001 Gauss; the estimated strengths would be well below the IPRA general public limit of 1.0 Gauss.

Extrapolating from the actual measured background magnetic field strengths and using the previously discussed decay equation, point sources would not create any measurable increases in the magnetic field levels surrounding the proposed project. Since the electrical equipment is located several hundred feet away from the nearest receptor locations (i.e. property lines), there would be no significant increase above existing magnetic field levels. In addition, all electrical equipment would be housed within the main treatment building and pump station, which would further attenuate the magnetic field levels.

TABLE 5.17-4. ESTIMATED MAGNETIC FIELD LEVELS FROM POINT SOURCES IN THE PROPOSED PLANT

Equipment	Estimated Distance to Nearest Receptor Location (ft) [1]	Estimated Potential Increase Magnetic Field Strength (Gauss) [2]
2,000 hp Motor	300	$< 1x10^{-4}$
4.16 kV Switchgear	250	$< 1x10^{-4}$
13.2 kV Switchgear	250	$< 1x10^{-4}$
Transformer (10,000 kVA)	670	$< 1x10^{-4}$
Transformer (15,000 kVA) [3]	670	$< 1x10^{-4}$
Inductor	250	$< 1x10^{-4}$

Notes:

1. Distance to nearest receptor location (proposed public walkway route) from similar equipment planned in the proposed plant. The nearest receptor location would either be the Walker Road or Dana Road.
2. Estimated EMF strength derived from $[X_1 \times (d_1/d_2)^3]$, where X_1 = Max. Magnetic Field measured at WPCPs (Table 5.17-3), d1 = distance (m) to the receptor from a point source at WPCPs , and d_2 = distance (m) to the receptor from a point source at the proposed plant.
3. The 15,000 kVA transformer magnetic field point source was calculated in the following way: power capacity of 15,000 kVA/power capacity 10,000 kVA = kVA_1/kVA_2. The magnetic field strength of 15,000 kVA = (magnetic field strength of 10,000 kVA) x (kVA_2/kVA_1).

Although magnetic fields near the transformer and the inductor shown in Table 5.17-4 have the highest magnetic field strength, their small structures allow the field strength to diminish rapidly with distance, as it does from any point source. For this reason, having a transformer located near the proposed plant would not be a major source of concern to the operators' on-site or the visitors. In addition to the distance between the potential point sources and the receptor, all major electrical equipment would be located indoors in dedicated electrical rooms. The electrical substation, which receives 13.2 kV feeders would step down voltage to 4.16 kV for plant-wide distribution, would be located away from the receptors within the main treatment building. The electrical substation would consist of the 13.2 kV service switchgear, service transformers, 4.16 kV main and distribution switchgear, 4.16 kV bus ducts, current-limiting reactors and 125 VDC battery banks and control system. Electric fields would be shielded and

weakened by conducting material and distances between these sources and the closest public access. Therefore, no significant adverse impacts are anticipated from magnetic fields.

Point sources would not create any measurable increases in the electric field levels surrounding the proposed plant. All major electrical equipment would be located indoors in dedicated electrical rooms. Electric fields would be shielded and weakened by conducting material between the sources and the closest public access area. Therefore, no significant adverse impacts are anticipated from electric fields.

Emergency power would be provided on-site to supply life safety and critical systems in the event of total power failure. The emergency system would include two diesel emergency generators, rated at about 1,500-kW; one of the generators would serve as a backup, a 3,000-gallon fuel storage tank load banks for exercising the diesel engine (generators would be operated on a monthly basis for testing). The proposed emergency system would be smaller than a standard 10,000-kVA transformer (in terms of its electric power) that may potentially contribute approximately $1.5x10^{-5}$ Gauss at the nearest sensitive receptor. From this example it could be concluded that the proposed system would result in less than a $1.5x10^{-5}$ Gauss reading at the nearest sensitive receptor; therefore, no significant impacts on the surrounding magnetic fields are anticipated from the emergency power system. In addition, since the proposed emergency power system would be housed within the proposed facility, electric fields would be shielded and weakened by conducting material between the sources and the closest public access area. Therefore, no significant adverse impacts on the surrounding electric fields are anticipated from the emergency power system.

When considered together the point source magnetic fields (from the proposed plant and emergency power system) would have negligible effects on the existing magnetic fields. The maximum magnetic fields strength would add up to less that 0.0001 Gauss. The estimated strengths would be well below the IPRA general public limit of 1.0 Gauss and the NYS ROW maximum guidelines for magnetic field strength of 0.2 Gauss. All electric fields associated with the proposed project (i.e. the proposed plant and emergency power system) would be contained within a building shielding the electric fields from the closest public access area. Therefore, no significant adverse impacts are anticipated from the combination of magnetic and electric field point sources.

Line Sources. The Con Edison Grasslands substation, which would be completed prior to the year 2005, would supply power to the proposed plant. Up to six 13.2-kV feeders for plant power would be located below grade along Grasslands Road/Route 100C and turn north at Walker Road, then turn east to the proposed electrical substation located within the proposed plant. These feeders would be triplex-shielded cables installed within rigid steel conduits where appropriate. The triplex-shielded cables would adsorb the electric fields emitted from the 13.2-kV feeders and prevent public exposure to lines sources related to the proposed project. Any increases in electric field levels would be zero because of shielding and/or the rapid decrease in field strength from the electrical source.

The service feeders would be located underground in concrete-encased steel conduits. The magnetic fields generated by the currents in each of the three conductors within each of the

service feeders would cancel each other out. Therefore, the magnetic fields at maximum operating condition would have a negligible increase on the existing magnetic field at the water treatment plant site.

To calculate the projected magnetic field strength from underground feeders associated with the proposed project, additional field measurements were taken at the Wards Island and North River WPCPs. Since the proposed plant would use 13.2-kV feeders, similar to those already existing at the two WPCPs, the field measurements at the WPCPs are considered representative of field measurements that would occur at the proposed plant. To be conservative, the maximum magnetic field readings at the WPCPs of 0.002 Gauss for Holaday meter at a distance of 2.0 meters away from sources was used to predict magnetic field levels for the proposed plant. Using the formula in Note 3 of Table 5.17-5, the projected magnetic fields strengths for the proposed plant were derived from the measured magnetic fields from North River WPCP and from the values of the proposed route of feeder lines in the Town of Mount Pleasant.

Table 5.17-5 shows a quantitative basis that the magnetic field strength from line sources from the proposed plant would not increase significantly. The Holaday calculations show that the field strength from line sources would range from 0.0021 to 0.0035 Gauss. The calculation shows on a quantitative basis that the magnetic field strength from line sources for the proposed plant would increase but would remain well below the IRPA standard of 1.0 Gauss; therefore, no significant impacts are anticipated from the magnetic fields.

TABLE 5.17-5. ESTIMATION OF PROPOSED WATER TREATMENT PLANT LINE SOURCE MAGNETIC FIELD STRENGTH

Sample Location [1]	Existing Conditions Magnetic Field (Gauss) [2]	Potential Magnetic Field Strength During Operation (Gauss) [3]
EVF1	0.00281	0.0035
EVF2	0.00129	0.0024
EVF3	0.00025	0.0021

Notes:

1. Sampling locations along the proposed route near the water treatment plant site.
2. Existing conditions for magnetic field measurements performed in December 2002 at the water treatment plant site's proposed feeder line route (see Table 5.17-2).
3. Projected magnetic field strength from the proposed plant. Calculated using the formula $x_1(d_1/d_2)^2=x_2$. Then, $[(x_2)^2+(x_3)^2]^{½}$ was used, where x_1=0.002 Gauss for Holaday meter, d_1=2.0 m (distance from feeder at the North River WPCP), d_2=2.0 m (distance from feeder at the proposed plant), and x_3=existing conditions value above.

The electric and magnetic fields potential project impacts are insignificant individually as discussed above. The magnetic fields generated would be calculated by multiplying the new magnetic field level calculated for the EVF1 sampling location by six (the maximum number of feeder lines). The four feeder lines would cumulatively emit a magnetic field of 0.020694Gauss, still an insignificant exposure. The potential electric and magnetic fields from the operation of the proposed project are insignificant as discussed above. The projected impacts discussed above, would be well below the IRPA general public limit of 1.0 Gauss. However, the following features would generally be incorporated in the design to ensure that the prospective electric and magnetic fields would be minimized further:

- Providing the remote control/monitoring for personnel to minimize time in electrical equipment rooms.

- Specifying equipment that has negligible harmonic voltages and currents and providing tuned harmonic filters (to prevent/minimize harmonic fields).

- Using computer monitors designed for low magnetic field emissions and active power line conditioners for groups of computers.

- Balancing of electrical systems, as much as possible, such that fields would cancel each other or the residual field would be minimized.

- Reducing the field-producing line currents through energy conservation and power factor correction.

- Project plans include shielding ELF and isolating EMF sources so that the public would not be exposed to significant increases in ELF/EMF. The goal would be to avoid a measurable increase above local background levels.

5.17.3.1.2. With Cat/Del UV Facility at Eastview Site

As noted above, the Cat/Del UV Facility may be located on the Eastview Site in the Future Without the Project. The incremental effects of EMF/ELF from operation of the proposed Croton project would be the same in the Future With the Project regardless of whether the Cat/Del UV Facility is operating at the Eastview Site. Therefore, no significant adverse EMF/ELF impact is anticipated.

5.17.3.2. Potential Construction Impacts

The anticipated year of peak construction for the proposed plant is 2008. Therefore, potential project impacts have been assessed by comparing the Future With the Project conditions against the Future Without the Project conditions both without the Cat/Del UV Facility at the Eastview Site, and with the Cat/Del UV Facility at the Eastview Site for the anticipated year of peak construction (2008).

5.17.3.2.1. Without Cat/Del UV Facility at Eastview Site

Point Sources. A number of diesel 1,500-kVA generators would be available on a temporary basis during construction for uses in a localized construction area (i.e., to provide power to an emergency escape elevator or for dewatering of water from deep excavation). The generator's power capacity is much less than the 10,000-kVA transformer; and therefore, the magnetic field produced by the generator would be less than the 0.0725 Gauss produced by the 7,500 kVA transformer. The emergency generators would be located inside the electrical substation, and the conducting material and distances between these sources and the closest public access would weaken the electrical field. Any increases in electric field levels would therefore be null because of the shielding and also the rapid decrease in field strength from the electrical source. Therefore, no significant adverse impacts on the surrounding magnetic and electric fields are anticipated from the emergency power facility.

Line Sources. Four temporary feeders (three online, one backup) each supplying 2,500 kVA would be provided by Con Edison to supply power during the construction period at the water treatment plant site. The temporary feeders would originate from the Grasslands Substation southeast of the construction site. 5,000 kVA of the total temporary demand would supply the tunnel work that includes the tunnel boring machine (TBM) and welding. The additional 2,500 kVA would supply electricity to other construction equipment, site lighting, and field offices for contractors, resident engineers and the NYCDEP personnel.

The temporary feeders (total 7,500-kVA) source magnetic field strength is anticipated to be less than 0.0035 Gauss based on an estimated magnetic field strength of the larger projected proposed feeders (total 15,000-kVA), refer to Table 5.17-4. The distribution feeders would provide electrical power to a temporary on-site substation. These feeders would be buried underground and, where appropriate would be enclosed in steel conduits that would shield electric and magnetic fields. These feeders would be triplex-shielded cables installed within rigid steel conduits where appropriate. The triplex-shielded cables would adsorb the electric fields emitted from the four feeders and prevent public exposure to the line sources related to the proposed project. Any increases in electric field levels would be null because of shielding and/or the rapid decreases in field strength from the electrical source.

The four temporary feeders would each be made of three conductors, and these conductors would each produce magnetic fields. In each feeder, the magnetic fields of its conductors would cancel each other out. Therefore, the magnetic fields at maximum operating conditions would have a negligible increase on the existing magnetic field at the water treatment plant site. The projected line source magnetic field is anticipated to be well below the IRPA general public limit of 1.0 Gauss. Therefore, the contribution of the substation and feeders to the line source magnetic and electric field are anticipated to be negligible and no significant adverse impacts are anticipated.

5.17.3.2.2. With Cat/Del UV Facility at Eastview Site

As noted above, the Cat/Del UV Facility may be located at the Eastview Site in the Future Without the Project. The incremental effects of EMF/ELF from construction of the proposed project would be the same in the Future With the Project regardless of whether the Cat/Del UV Facility is under construction at the Eastview Site. Therefore no significant adverse EMF/ELF impact is anticipated.