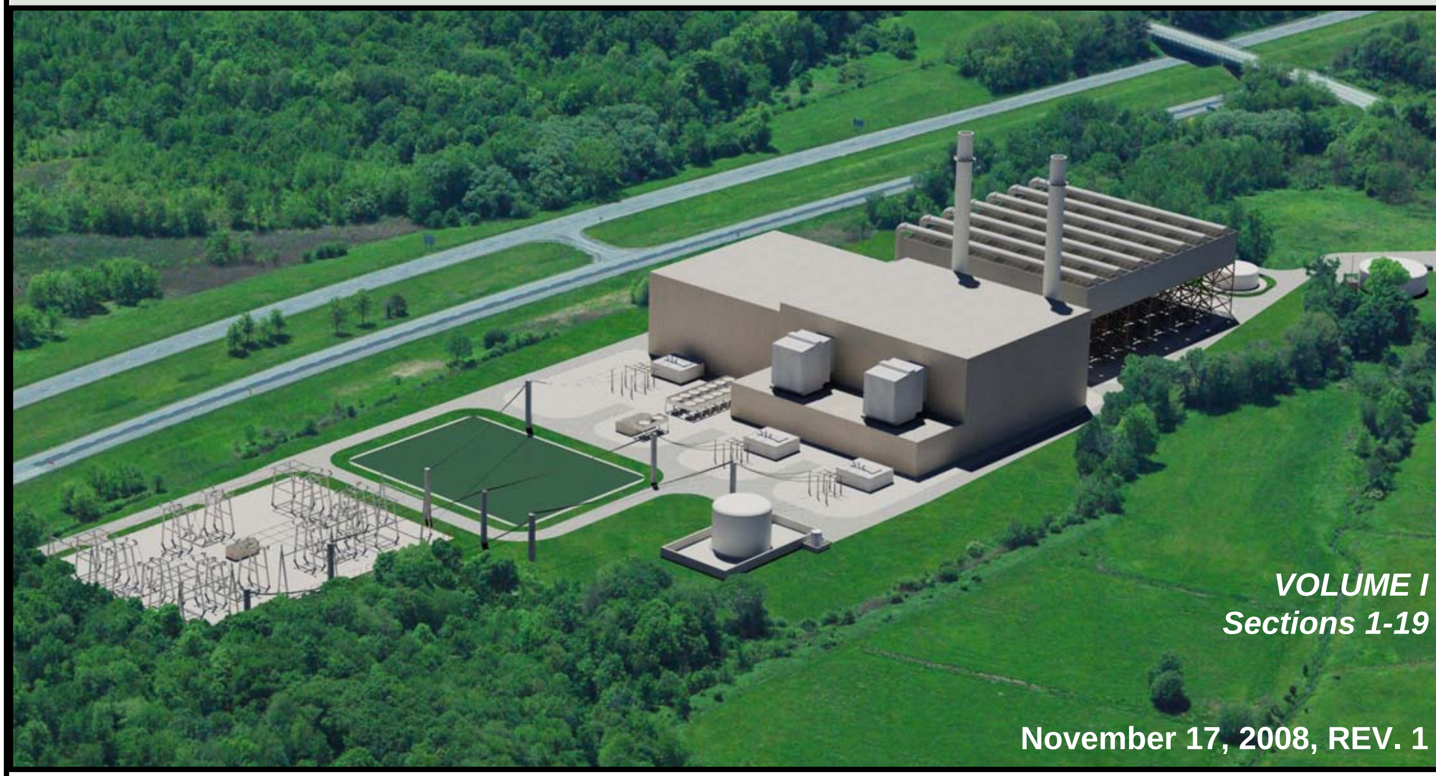
Draft
Environmental Impact Statement

CPV Valley Energy Center



VOLUME I
Sections 1-19

November 17, 2008, REV. 1

Submitted to:

Town of Wawayanda Planning Board
80 Ridgebury Hill Road
PO Box 296
Slate Hill, New York 10973

Prepared by:

TRC
Wannalancit Mills
650 Suffolk Street
Lowell, Massachusetts 01854

Submitted by:
CPV Valley, LLC
50 Braintree Hill Office Park, Suite 300
Braintree, MA 02184

ALPINE
P.O. Box 145
Montgomery, New York 12549

CPV Valley Energy Center Project

630 Megawatt, Natural Gas Fired Electrical Energy Generation Facility
US Route 6 adjacent to Interstate 84, Wawayanda,
Orange County, New York

Lead SEQR Agency: Town of Wawayanda Planning Board
P.O. Box 296
Slate Hill, NY 10973
845-355-5712

DEIS Submittal to Lead Agency Date: ________________________

DEIS Acceptance by Lead Agency Date: ________________________

For Further Information:

Contact Person: Ann Yates, Chairperson

Address: Town of Wawayanda Planning Board
P.O. Box 296
Slate Hill, NY 10973

Telephone: 845-355-5712

Firms involved in the preparation of the DEIS:

Harvey N. Goldstein, Engineering Manager
Worley Parsons
2675 Morgantown Road
Reading, PA 19607
(610) 855-2516

Scott Bonacic, Esquire
Bonacic, Krahulik & Associates, LLP
90 Crystal Run Road, Suite 104
Middletown, NY 10941
(845) 703-3101

Steven Remillard, Director of Development
CPV Valley, LLC
50 Braintree Hill Office Park, Suite 300
Braintree, MA 02184
(781) 817-8970

Jim Ulrich, PE
Alpine Environmental Consultants, Inc.
P.O. Box 145
Montgomery, NY 12549
(845) 457-8141

Steven C. Sullivan, Managing Director
Power Communications
8 Phila Street
Saratoga Springs, NY 12866
(518) 226-0260

Linda J. Quinn, Principal
Brant Energy, Inc.
7 Red Roof Lane, Unit 2
Salem, NH 03079
603-870-8002

Richard Cogen, Esquire
Nixon Peabody LLP
677 Broadway
10th Floor
Albany, NY 12207
(518) 427-2665

Glenn Harkness, Senior Vice President
TRC Environmental Corporation
Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854
(978) 656-3603

Joel Jasper, Principal
Aquagenics Inc.
215 Salem St., Suite 3
Woburn, MA 01801
781-935-7470

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

ACRONYMS LIST

1-mile radius	Primary study area
5-mile radius	Secondary study area
AAR	Authorized Account Representative
AB	Agricultural Business
AC	Alternating Current
ACC	Air-Cooled Condenser
acfm	Actual Cubic Feet per Minute
ACOE	Army Corps of Engineers
ADA	Americans with Disabilities Act
ADRP	Acid Deposition Reduction Program
AGC	Annual Guideline Concentration
AGL	Above Grade Level
AIHA	American Industrial Hygiene Association
ALOHA	Area Locations of Hazardous Atmospheres
amsl	Above mean sea level
APE	Area of Potential Effect
API	American Petroleum Institute
AQRV	Air Quality Related Values
AR	Agricultural Residential
ASOS	Automated Surface Observing System
AST	Aboveground Storage Tank
ASTM	American Society of Testing Materials
ATR	Automatic Traffic Recorder
AWSC	All-way Stop Controlled
BACT	Best Available Control technology
BEA	U.S. Department of Commerce, Bureau of Economic Analysis
BHP	Brake-Horsepower
BMP	Best Management Practices
BPIP	Building Profile Input Program
CAAA	Clean Air Act Amendments
CARB	California Air Resources Board
CBS UST	Chemical Bulk Storage Database for Underground Storage Tanks
CEA	Critical Environmental Area
CEMS	Continuous Emissions Monitoring System
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CGA	Compatible Growth Area
CH_4	Methane
cm	Centimeter
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CORRACTS	Corrective Action Report
CPA	Core Preservation Area

CPB	Central Pine Barrens
CT/DB	Combustion Turbine/Duct Burner
CTG	Combustion Turbine Generator
CPT	Cone Penetration Test
CPV	CPV Valley, LLC
dB	Decibels
dBA	Decibels A-weighted
DC	Direct Current
DCS	Distributed Control System
DEIS	Draft Environmental Impact Statement
DEM	Digital elevation model
NLCD	National Land Cover Dataset
DLN	Dry Low-NO_x
DRO	Diesel Range Organics
EAF	Environmental Assessment Form
ECL	Environmental Conservation Law
EDI	electrodeionization
EDR	Environmental Data Resources, Inc.
EIS	Environmental Impact Statement
EJ	Environmental Justice
EMF	Electric and Magnetic Fields
EMS	Emergency Medical Services
EPA	United States Environmental Protection Agency
EPM	Environmental Procedures Manual
EPRI	Electrical Power Research Institute
ER	Exurban Residential
ERC	Emission Reduction Credits
ERNS	Emergency Response Notification System
ERPG-2	Emergency Response Planning Guidelines Level 2
ESA	Environmental Site Assessment
EZPA	Empire Zones Program Act
F	Fahrenheit
FAA	Federal Aviation Administration
FAR	Floor Area Ratio
FERC	Federal Energy Regulatory Commission
FGR	Flue Gas Recirculation
FHWA	Federal Highway Administration
FRES	Fire, Rescue and Emergency Services
ft	Feet
FWW	Freshwater Wetlands Program
GEP	Good Engineering Practice
GIS	Geographic Information System
gpd	Gallons Per Day
gpm	Gallons Per Minute
GPS	Global Positioning System
GRO	Gasoline Range Organics

g/s	Grams per Second
GWGs	Global Warming Gases
H_2SO_4	Sulfuric Acid
HAP	Hazardous Air Pollutant
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HCL	Hydrochloric Acid
HFCs	Hydrofluorocarbons
HHV	Higher Heating Value
HPS	High-Pressure Sodium
HRSG	Heat Recovery Steam Generator
Hz	Hertz
IBC	International Building Code
I	Interstate
ICS	Industrial chemical survey
IES	Illuminating Engineering Society
IPCC	Intergovernmental Panel on Climate Change
IORB	Industrial Office/Research/Business
IRPA	International Radiation Protection Association
ISCST	Industrial Source Complex Short-Term
ISO	International Organization for Standardization
IWS	Industrial wastewater survey
K	Kelvin
km	Kilometer
kPa	Kilopascals
kV	Kilovolt
LAER	Lowest Achievable Emission Rate
lb/hr	Pound Per Hour
lb/mmBtu	Pounds per million British Thermal Units
lb/MWh	Pound per Megawatt-hour
LNB	Low-NO_x Burner
LIE	Long Island Expressway
LINSHA	Long Island North Shore State Heritage Area
LIPA	Long Island Power Authority
LIRR	Long Island Rail Road
LOS	Level of Service
LOCMA	Lower Orange County Metropolitan Area
LQG	Large Quantity Generator
LTANKS	Leaking Storage Tank Incident Reports
LWC	Liquid Water Content
m	Meter
MACT	Maximum Achievable Control Technology
MC	Mixed Commercial
MDS	makeup demineralizer system
MF	microfiltration
mG	Milligauss

mgd	Million Gallons Per Day
mg/l	milligrams per liter
MI	Manufacturing Industrial District
Millennium	Millennium Pipeline
mm	millimeter
mmBtu/hr	Million British Thermal Units per hour
MMTCE	Million Metric Tons of Carbon Equivalent
MP	Milepost
m/s	Meters per Second
MOSF	Major Oil Storage Facility
MSDS	Material Safety Data Sheets
MSL	Mean Sea Level
MTA	Metropolitan Transit Authority
MTCDE	Metric Tons of Carbon Dioxide Equivalent
MTCE	Metric Tons of Carbon Equivalent
MW	Megawatt
MWTP	Middletown Wastewater Treatment Plant
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NFRAP	No Further Remedial Action Planned
NH_3	Ammonia
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOx	Oxides of Nitrogen
NO_2	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NRCS	Natural Resources Conservation Service
NRHP	Natural Register of Historic Places
NSPS	New Source Performance Standards
NSR	New Source Review
NWA	National Wilderness Area
NWI	National Wetland Inventory
NWP	Nationwide Permit Program
NWR	National Wildlife Refuge
NWS	National Weather Service
NYAAQS	New York Ambient Air Quality Standards
NYCRR	New York Code of Rules and Regulations
NYISO	New York Independent System Operator
NYNHP	New York Natural Heritage Program
NYPA	New York Power Authority
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation

NYSDPS	New York State Department of Public Service
NYSOPRHP	New York State Office of Parks, Recreation, and Historic Preservation
O_2	Oxygen
O&M	Operations and Maintenance
OPRHP	New York State Office of Parks, Recreation & Historic Preservation
O&R	Orange & Rockland
OSHA	Occupational Safety and Health Act
Pb	Lead
PBS	Petroleum Bulk Storage
PCE	Tetrachloroethene
PFCs	Perfluorocarbons
pH	Hydrogen ion concentration
PID	Photoionization detector
PILOT	Payment in Lieu of Taxes
PM-10	Particulate Matter with aerodynamic diameter of 10 microns or less
PM-2.5	Microscopic liquid or solid particle with an aerodynamic diameter equal to or less than 2.5 microns
POTW	Public Owned Treatment Works
ppm	Parts Per Million
ppmvd	Parts Per Million Dry Volume
PRCHC	Planned Retirement Congregate Housing
Project or Facility	CPV Valley Energy Center
PSC	New York State Public Service Commission
PSD	Prevention of Significant Deterioration
psi	Per Square Inch
PSNS	Pretreatment Standards for New Sources
PTE	Potential-to-Emit
RACT	Reasonably Achievable Control Technology
RBLC	RACT, BACT, LAER Clearinghouse
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RFP	Request for Proposals
RGGI	Regional Greenhouse Gas Initiative
RIMS	Regional Industrial Multiplier System
RO	reverse osmosis
ROW	Right-of-Way
SASS	Scenic Areas of Statewide Significance
SCDHS	Suffolk County Department of Health Services
SCDPW	Suffolk County Department of Public Works
SCF	Standard Cubic Foot
SCR	Selective Catalytic Reduction
SCWA	Suffolk County Water Authority
sec/veh	Seconds/vehicle
SEQRA	State Environmental Quality Review Act
SF_6	Sulfur Hexafluoride
SGC	Short-term Guideline Concentration

SGPA	Special Groundwater Protection Area
SHPO	State Historic Preservation Office
SHWS	State Hazardous Waste Sites
SILs	Significant Impact Levels
SIP	State Implementation Plan
SNCR	Selective Non-Catalytic Reduction
SO_2	Sulfur Dioxide
SO_3	Sulfur Trioxide
SPCC	Spill Prevention Control and Countermeasure
SPDES	State Pollutant Discharge Elimination System
SPHINX	State Historic Preservation Historical Information Exchange
SPL	Sound Pressure Level
SQG	Small Quantity Generator
SR	Suburban Residential
SRIS	System Reliability Impact Study
STG	Steam Turbine Generator
STPs	Shovel Test Pits
SWF/LF	Solid Waste Facilities/Landfill Sites
SWPPP	Stormwater Pollution Prevention Plan
SWRCY	Registered Recycling Facility List
SWTIRE	Registered Waste Tire Storage & Facility List
TAGM	Technical and Administrative Guidance Memorandum
TC	Town Commercial
TOGS	Division of Water Technical & Operational Guidance Series
TPH	Total petroleum hydrocarbons
TSD	Transportation, Storage, and Disposal
TSP	Total Suspended Particulates
TWSC	Two-way Stop Controlled
UN	United Nations
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tanks
UTM	Universal Transverse Mercator
V/C	Volume/Capacity Ratio
VCP	Voluntary Cleanup Agreements sites
VIA	Visual Impact Assessment
VOC	Volatile Organic Compounds
WQC	Water Quality Certification Program
WSRR	Wild, Scenic and Recreational Rivers
$\mu g/m^3$	Microgram per Cubic Centimeter

1.0 EXECUTIVE SUMMARY

1.1 INTRODUCTION

CPV Valley, LLC (CPV) is proposing to construct a 630 megawatt (MW) natural gas combined-cycle electric generating facility on a 122 acre parcel located in the Town of Wawayanda, New York. The CPV Valley Energy Center (also referred to herein as Project or Facility) will generate up to 630 Megawatts (MW) of electricity for the regional electric power transmission grid through an interconnection with the New York Power Authority's (NYPA) transmission lines north of the development site. Following completion of permitting, construction of the Facility will require approximately 24 months. The projected operational date for the Facility is late Spring/Summer 2012. The development site proper is an industrially zoned property bounded by Route 6, Interstate (I)-84, and Route 17M.

Natural gas will be supplied to the Facility via a lateral from either the Millennium Pipeline ("Millennium") or Orange & Rockland ("O&R") Gas Company. CPV Valley is reviewing two options for gas transportation service to connect the Facility to the Millennium system, located approximately 7 miles away. The options are either a direct lateral by Millennium to the Millennium System, or an interconnection to O&R, located approximately 3 miles away. Each option is still in the preliminary stages of establishing routing and contractual terms, which will continue through the development process and will fully define the commercial options available to the proposed CPV Valley Energy Center. Both entities have provided initial indications of their ability to provide gas transportation service to the CPV Valley Energy Center with the addition of certain facilities to connect the Project to the existing natural gas transportation grid. The permitting of the gas lateral will be ultimately completed by the selected gas supplier and not CPV Valley, LLC under either a FERC Section 7 (c) or N.Y.S. Article VII application. Therefore, as specified in the Scoping Document, a map level analysis of the potential gas lateral route alternatives is presented in Section 17.0, Cumulative Impacts, of the Draft Environmental Impact Statement (DEIS).

The Facility will also have the capability of operating on ultra-low sulfur distillate oil up to a maximum of 720 equivalent full load hours of operation each year to insure reliability of electric supply for the New York power system. The CPV Valley Energy Center has been designed to utilize advanced air, dry cooling to reduce water consumption.

The Facility will be built using the most advanced and environmentally-conscious power generation technology available today, making it one of New York's cleanest natural gas power plants. The Facility will generate enough electricity to power more than 600,000 homes, helping to meet the growing demand for power and increased reliability in the Lower Hudson Valley. The New York Independent System Operator (NYISO), which operates the state's electric grid, has cited the need for additional resources in the region as part of their planning process.

Due to the efficiency of natural-gas combined cycle technology, the CPV Valley Energy Center is expected to help reduce dependency on the use of older and less efficient generators that currently serve the region, thus improving the region's environmental profile. The Project's innovative design also incorporates advanced dry cooling, which utilizes air instead of water for cooling and reduces water use by approximately 85%, as compared to an equivalent facility using wet cooled technology. In addition, as part of the effort to minimize the use of water resources, the Project intends to use grey water from the nearby wastewater treatment facility located in the City of Middletown. An onsite ground water well is being explored to determine if groundwater supply could provide an alternative water source.

When completed, the CPV Valley Energy Center will represent a long-term source of additional revenue for the Town of Wawayanda, Orange County, and the Minisink school district through a Payment in Lieu of Taxes (PILOT) agreement. During its first two decades in operation, the Project is estimated to provide significant additional revenue that can be used to help reduce or stabilize tax burdens, provide funding for infrastructure maintenance, as well as support school and community service operations.

In addition to the increased local revenue, the Project will also provide a significant boost for the local economy with the creation of well-paying jobs both in the short-term, during construction, and long-term employment opportunities for people in the area when the Project is completed. It is expected that approximately 664 union construction jobs will be created during peak onsite construction, and about 25 well-paying permanent jobs will be created once the Facility is in operation. Local merchants and other businesses will benefit from the increased economic activity, as a result of additional dollars spent in the local economy, generated by the new jobs created in the area. CPV Valley LLC's corporate philosophy is to purchase local material, to the greatest extent possible, as a way of supporting the host community.

The CPV Valley Energy Center is classified as a Type 1 action under the State Environmental Quality Review Act (SEQRA) pursuant to Article 8 of the Environmental Conservation Law (ECL 8-0101 et seq.), and associated implemented regulations 6 NYCRRR Part 617. A full Environmental Assessment Form (EAF) was circulated to involved parties by the Town of Wawayanda Planning Board on May 9, 2008. Concurrent with the circulation of the EAF, the Planning Board indicated its desire to serve in the capacity of Lead Agency for the SEQRA review of the CPV Valley Energy Center. Following conclusion of the 30 day agency coordination period, the Planning Board on June 11, 2008 assumed Lead Agency status for the SEQRA review.

On June 25, 2008, the Planning Board in its capacity as Lead Agency issued a Positive Declaration indicating that an Environmental Impact Statement (EIS) would be required for the CPV Valley Energy Center. A Draft Scoping Document was distributed by the Planning Board, as SEQRA lead agency, to the public and to all interested and involved agencies for review and comment in August 2008. A public meeting to receive oral and written comments on the Draft Scoping Document was held on Wednesday August 27, 2008. The Final Scoping Document was issued by the Planning Board on October 14, 2008.

This DEIS has been prepared in accordance with SEQRA and the Project's Final Scoping Document that was approved by the Planning Board. The Final Scoping Document, a copy of which is provided in Appendix 1-A, identifies and describes the scope of environmental studies to be conducted to analyze the potential environmental impacts of the Project.

1.2 ORGANIZATION OF THE DEIS

This DEIS is organized as follows:

1.0 Executive Summary
2.0 Project Description
3.0 Land Use, Zoning, and Public Policy
4.0 Cultural Resources
5.0 Visual Resources
6.0 Community Facilities
7.0 Socioeconomics and Environmental Justice
8.0 Traffic and Transportation
9.0 Air Quality
10.0 Noise
11.0 Soil, Geology, and Seismology
12.0 Infrastructure
13.0 Water Resources
14.0 Ecology
15.0 Construction Impacts
16.0 Community Character
17.0 Cumulative Impacts
18.0 Other Environmental Impacts
19.0 Alternatives

Appendices are provided in the DEIS that provide supporting information to the technical analyses completed.

1.3 PROJECT PURPOSE AND NEED

The CPV Valley Energy Center, located in the Lower Hudson Valley region of New York, will be a state-of-the-art and highly efficient combined-cycle electric generating facility with a peak electric generating capacity of 630 MW. The Project will interconnect with the New York Power Authority 345 kV electric transmission system and provide power for the New York State power system. The Project represents a capital investment of an estimated $800 million and through the PILOT program, a host community benefits package will provide significant economic benefit to the Town of Wawayanda, Orange County, and the local community.

The Final Scoping Document identified and described the scope of environmental studies to be conducted, including an assessment of the "Purpose and Need" for the proposed CPV Valley Energy Center. The following provides specific information regarding the technical, environmental, and economic basis supporting the purpose and need for the proposed electric generation facility in the lower Hudson Valley.

New York State Energy Infrastructure Need

The New York Independent System Operator (NYISO) specifically identified the Lower Hudson Valley as an area in need of electric generation resources for system reliability purposes. Each year, the NYISO conducts a thorough evaluation of the New York State electrical system to determine the specific needs to maintain a reliable supply of electricity to meet projected demand. The evaluation or study is referred to as the Comprehensive Reliability Planning Process, and ultimately yields a formal report referred to as the Comprehensive Reliability Study. The NYISO 2008 Comprehensive Reliability Study identified, among other items, the state of New York's need for 1,050 MW of electrical generating resources to be located in the lower Hudson Valley for reliability purposes[1].

The following are key findings in the NYISO's 2008 Comprehensive Reliability Study that define a need for electric generation capacity in the region of the proposed CPV Valley Energy Center:

- The 2008 Reliability Needs Assessment (RNA) determines that additional resources would be needed over the 10-year study period (2008-2017) in order for the Control Area to comply with applicable reliability criteria.

- The construction of planned resources [including electric generation] should move forward on the schedules provided so that at least 2,350 MW of market-based resources from the 3,380 MW of merchant generation, transmission and demand response projects that have been proposed for New York are in service when needed. Approximately, 1,000 MW of these resources should be located in Zone J or be provided through unforced capacity delivery rights (UDRs) into Zone J; *1,050 MW of resources in the lower Hudson Valley*[2]

New York Energy Plan

The New York State Energy Planning Board issued the 2002 State Energy Plan (State Energy Plan) and Final Environmental Impact Statement in June 2002. The State Energy Planning Board issues the Energy Plan to provide strategic direction with regard to energy related decisions and matters. Since June 2002, the Energy Planning Board has issued a 2005 Annual Report and Activities Update in March 2006. Currently the Energy Planning Board is working on a 2009 Energy Plan and has undergone an in depth scoping process through 2008.

The State Energy Plan 2005 Annual Report and Activities Update, the most current State Energy Plan, provides a summary of the state's energy policy objectives. Included in summary were the following objectives[3]:

- Stimulating sustainable economic growth, technological innovation, and job growth in the State's energy and transportation sectors through competitive market development and government support.

[1] New York Independent System Operator, *"2008 Comprehensive Reliability Plan, Final Report"*, dated July 15, 2008, Page 5.

[2] New York Independent System Operator, *"2008 Comprehensive Reliability Plan, Final Report"*, dated July 15, 2008, Page 6.

[3] Energy Coordinating Workgroup, *"State Energy Plan – 2005 Annual Report and Activities Update"*, March 2006.

- Increasing energy diversity in all sectors of the State's economy through greater use of energy efficiency technologies and alternative energy resources, including renewable-based energy.

- Promoting and achieving a cleaner and healthier environment.

The CPV Valley Energy Center is consistent with the State's Energy Plan and energy policy objectives. The Project represents a significant capital investment in New York that will stimulate the local economy through construction and operational job creation. As detailed in Section 7.0, Socioeconomics and Environmental Justice, the economic stimulus provided by the Project once in operation is in excess of $23 million annually. The economic and job growth created is based on a private entity, CPV Valley LLC, responding to competitive market signals to invest in New York's energy infrastructure and market. This is an indication that the New York energy market is sending appropriate signals to market participants to attract new investment within the State.

The Project is a combined-cycle power generation facility, which is one of the most efficient technologies for producing electricity. The Project's high efficiency, along with the clean burning of natural gas, creates a positive environmental impact. With the higher efficiency of combined-cycle technology, less fuel is required to be burned to produce the equivalent amount of energy. Therefore, there is less fuel consumption. This attribute combined with the cleanliness of natural gas as a fuel will make CPV Valley Energy Center one of the state's most environmentally responsive and efficient generating facilities.

1.4 OVERVIEW DESCRIPTION OF THE PROPOSED FACILITY

The proposed CPV Valley Energy Center would occupy approximately 21 acres within the larger 122-acre parcel (i.e., the Project site) located in the northeast portion of the Town of Wawayanda proximate to the boundary with the City of Middletown.

The Project site is currently undeveloped land consisting of tracts used for agricultural purposes, including the growing of hay and corn crops, and wooded areas. Carpenter Creek traverses the northern extent of the site running in an east to west direction. Portions of the site have identified wetland areas. Topography generally slopes gently from Route 6 on the north to Interstate 84 on the south. Figure 1-1 shows the site boundary on an aerial photo of the general area.

The Project site is located within the Town of Wawayanda's Manufacturing-Industrial (M-I) District, which permits electric generating facilities by special use permit issued by the Town Planning Board. The land uses adjacent to the Project site to the east and northeast are mainly light industrial and commercial. An affordable housing complex is currently under construction on a piece of land adjacent to the site, and a small number of single family residences abut the site along Route 6 to the north.

As proposed, the CPV Valley Energy Center would utilize F class gas turbine technology and would be permitted for full year operation (24 hours per day, 365 days per year). Natural gas would be utilized as the primary fuel with provisions to use ultra low-sulfur distillate fuel oil for up to the equivalent of 720 hours annually at full load as the back-up fuel for the combustion turbines. The Project would be constructed in a two-on-one configuration with two combustion turbines, two heat recovery steam generators (HRSG), and a single steam turbine. The two HRSGs will be equipped with natural gas-fired duct burners. The Facility will have the capability to generate up to 630 MW of electricity. Air-cooled condensing will be employed to (i) minimize water usage, (ii) reduce water treatment costs, and (iii) eliminate cooling tower plume impacts. Selective catalytic reduction (SCR) technology and an oxidation catalyst system will be utilized to control emissions of oxides of nitrogen (NO_x) and carbon monoxide (CO), respectively. The air cooled condenser at 115 feet in height represents the tallest facility building structure. The two exhaust stacks of 275 feet in height represent the tallest appurtenances associated with the Project.

Natural gas for the Facility will be provided via a lateral from the Millennium Pipeline located approximately seven (7) miles west of the site or the Orange and Rockland Gas Company distribution system planned expansion, which will be approximately 2-3 miles from the site. Electricity generated by the CPV Valley Energy Center would be transmitted to the NYPA transmission line located approximately 0.5 miles to the north of the Project site. The 345 kV electrical interconnect from the CPV Valley Energy Center would consist of an overhead wire configuration from the on-site facility substation east to Route 17M. From the eastern boundary of the development site to the NYPA transmission grid, the electrical interconnect will consist of underground lines. The underground segment of the electrical interconnection will utilize available area within the New York State Department of Transportation (NYSDOT) Route 17M right-of-way.

To ensure reliable operation and supply of electricity to the New York power system, there is a need to operate on ultra-low sulfur distillate should natural gas service be interrupted. The Project will include a 965,000-gallon fuel storage tank and associated off-loading facilities, transfer piping, and pump systems. The storage tank will be contained within a lined retention basin with a capacity of 110% of the storage tank to contain any potential tank leak. In addition, all piping outside of the basin will be double walled and the containment facilities will be equipped with monitoring technology for early detection and mitigation of a potential leak. Fuel transport to the tanks will be via tanker truck, and the fuel off-loading facilities would be capable of handling two trucks simultaneously.

Potable water will be brought to the Project site area via a lateral from the Town public supply main extension along Route 6. Approximately 2,900 gallons per day (gpd) of potable water will be required. The Project will require approximately 150,000 gpd of grey water during summer peak operations which would be provided from the Middletown Wastewater Treatment Plant via an underground pipeline to be constructed along Route 17M. Wastewater from the Facility will be discharged back to the treatment plant. Water consumption will vary depending on ambient air temperature and operation conditions.

The target in service date for the CPV Valley Energy Center is second quarter 2012. During the approximately 24 month construction period, the number of construction workers peak at around 664. The CPV Valley Energy Center will employ approximately 25 full-time employees across three shifts once operational.

1.5 SUMMARY OF DISCRETIONARY APPROVALS AND INVOLVED AND INTERESTED AGENCIES

Development and operation of the CPV Valley Energy Center may require or involve the following discretionary federal, state, and local regulatory agency notifications, actions, permits, and approvals.

United States Environmental Protection Agency (USEPA)

- Prevention of Significant Deterioration Permit

Federal Aviation Administration

- Notice of Proposed Construction

United States Army Corps of Engineers

- Nationwide Wetlands Permit
- Section 404 Clean Water Act Individual Permit

New York Public Service Commission

- Section 68 Certificate of Public Convenience and Necessity

New York Power Authority (NYPA)

- NYPA Electrical Interconnect Approval

New York State Department of Environmental Conservation (NYSDEC)

- Part 201 Title V Facility Permit
- Part 237 (Acid Deposition Reduction NO_x Budget Trading Program) Permit
- Part 238 (Acid Deposition Reduction SO_2 Budget Trading Program) Permit
- Part 243 (CAIR NO_x Ozone Season Trading Program) Permit
- Part 244 (CAIR NO_x Annual Trading Program) Permit
- Part 245 (CAIR SO_2 Trading Program) Permit
- Title IV Acid Rain Permit
- SPDES Permit for Storm Water Discharges Associated with Industrial Activities and Process Wastewater Discharge
- SPDES General Permit For Stormwater Discharges From Construction Activities
- Wetlands Permit

- Section 401 Water Quality Certificate
- 6 NYCRR 596, Registration of Hazardous Substance Bulk Storage Tanks
- 6 NYCRR 610, Major Oil Storage Facility License.

New York Department of Transportation

- Highway Work Permit

Orange County Department of Health

- Sanitary Code Approval for Water and Sewer
- Approval for Hazardous Materials Storage
- Orange County Industrial Development Authority PILOT Agreement

Orange County Planning Department

- Advisory Recommendation

Town of Wawayanda

- Special Use Permit Approval for Electric Generating Facility (Town Board)
- Site Plan Approval (Planning Board)

Town of Wawayanda Zoning Board of Appeals

- Height Variance

City of Middletown

- Cooling Water Supply
- Wastewater Discharge Permit

New York State Office of Parks, Recreation and Historic Preservation

- Cultural Resources Signoff

Other Permits include Building Permit (state or local), and Town and County Highway Permits

For interconnection with the Millennium Pipeline, a natural gas pipeline lateral would be constructed that may require either Federal Energy Regulatory Commission (FERC) 7(c) or New York State Public Service Commission approval. If Orange and Rockland Gas is the fuel supplier, they must seek approval under Article VII of the N.Y.S. Public Service Law.

1.6 PUBLIC OUTREACH AND PARTICIPATION

CPV Valley has and will continue to be engaged in a Public Outreach Program to encourage early and meaningful public participation by stakeholders and others interested in issues associated with construction and operation of the proposed Facility.

1.6.1 Public Participation Plan Overview

The intent of Project's public outreach efforts is to provide a variety of meaningful public participation opportunities by which public concerns can be identified as early as possible in and throughout the various stages of the SEQRA environmental review and overall Project permitting process, to establish communication between stakeholders and CPV Valley, and to educate the public as to the specific Project and the required SEQRA environmental review and the overall Project permitting process.

To ensure a comprehensive outreach and facilitate a readily accessible and understandable method of communicating with the public, CPV Valley has implemented a program designed to encourage and solicit maximum public feedback. These efforts and resources include:

- Convening public meetings at critical milestones in the planning and development and SEQRA environmental review processes;
- Notifying the community about Project developments through mailings and advertisements;
- Establishing SEQRA Project document repositories throughout the local project area to provide the public with the widest possible access to the Draft SEQRA Scoping Document, Final SEQRA Scoping Document, this DEIS, and all other SEQRA documents created concerning the Project;
- Developing an informational brochure for general use and distribution that addresses specific project details, plans, and benefits;
- Soliciting public input through a telephone hotline;
- Creating a Project website to provide news about the process, and a direct e-mail link for the CPV Valley Energy Center (http://www.cpvvalley.com/);
- Making presentations to community, environmental, and business organizations;
- Initiating a proactive newspaper campaign which seeks to inform the public about the proposed CPV Valley Energy Center;
- Conducting briefings for stakeholder groups and entities that have expressed an interest in the Project; and

- Holding a public open house to provide interested stakeholders with access to Project information and personnel.

Documentation related to the Project's public outreach efforts thus far is included in Appendix 1-B of this DEIS and an updated list will be posted on the Project's website on a continuing basis.

The above public outreach activities will continue throughout the Project's SEQRA environmental review and permitting process. During construction, commissioning, and operation of the Facility, CPV Valley will continue to maintain relationships established with regulatory agency staff, local officials, stakeholders, and interested citizens. During construction and commissioning, CPV Valley will schedule meetings to report on the Project's status, and CPV Valley representatives will be available to attend meetings, give presentations, and answer questions as requested. CPV Valley will continue to participate and support community activities.

1.6.2 Public Outreach Meetings

During the planning of the CPV Valley Energy Center, representatives of CPV Valley LLC met with representatives of the following federal, state, and local governments, agencies, and interest groups regarding the proposed Facility:

- United State Environmental Protection Agency (USEPA), Region 2
- New York State Department of Environmental Conservation (NYSDEC)
- New York State Department of Transportation
- New York State Department of Public Service (NYSDPS)
- New York State Department of Transportation (NYSDOT)
- New York State Executive Branch
- Orange County Executive
- Minisink School District
- Industrial Development Authority (IDA)
- Middletown Common Council
- New Hampton Fire Company
- Slate Hill Pacers
- Kiwanis
- Local labor unions
- Local news media

As indicated previously, CPV Valley LLC will continue to participate in public outreach activities throughout the project's SEQRA environmental review and permitting process. CPV Valley LLC representatives will be available to attend meetings, give presentations, and answer questions as requested.

1.7 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION

The DEIS provides a comprehensive and thorough analysis of the environmental and community topics outlined in the Scoping Document, including an analysis of existing conditions, potential impacts, and mitigation as appropriate. A brief summary of findings is provided below:

1.7.1 Land Use and Zoning

The proposed CPV Valley Energy Facility, which is an allowed Special Permit Use within the MI District would serve a vital public need by improving system reliability and providing additional electric power to Orange County. The proposed Facility would comply with the substantive requirements of the Town of Wawayanda Zoning Code, with the exception of exceeding the maximum height requirement, which is required because of facility engineering and air quality constraints. The Facility would comply with the Town noise standards. It would not result in adverse impacts to nearby properties or existing or proposed land uses.

The proposed Facility would not adversely impact zoning districts or land uses within a 1-mile radius of the Project site. The Project and proposed interconnections would not prevent the orderly and reasonable use of permitted or legally established uses in surrounding zoning districts.

1.7.2 Cultural Resources

The Project site, laydown areas, and offsite interconnections have been thoroughly investigated for potential historical and archaeological resources. No significant archaeological resources have been identified on the proposed CPV Valley Energy parcel or offsite interconnections. As such, no impacts to archaeological resources would result from the construction, operation, and maintenance of the proposed Facility. One NRHP-eligible historical structure resource is located within the 0.5-mile Area for Potential Effect (APE), but as the Facility will not be visible from this property, there will be No Effect to historic resources. Phase IA/IB Cultural Resource Reports have been submitted to the New York State Office of Parks Recreation and Historic Preservation on October 31, 2008.

There is a small family cemetery, the Cooley Cemetery, located on the far north western corner of the Project site. Field observations during the archaeological survey of the site and vicinity recorded a scatter of both displaced and upright headstones and footstones within an approximate 9-x-9-m area. The fieldstones are dated back to the 1830s. The Cooley Cemetery will not be disturbed by the construction of the proposed CPV Valley Energy Center. Because the land will change ownership, CPV Valley, LLC has proposed to take measures to restore and protect the cemetery. These measures include construction of a gated fence around the cemetery and an access to the cemetery from the CPV Valley parking area. Broken headstones and footstones would be repaired and placed in their upright positions.

1.7.3 Visual Resources and Aesthetics

A thorough Visual Impact Assessment was conducted as part of the DEIS. The results of the viewshed analysis and field survey show that the areas with the greatest potential for views of the Project are limited to open areas in both low lying locations in the site vicinity and at higher elevations where views are not obscured by hills and vegetation.

A thorough viewpoint selection process was conducted following procedures specified in the NYSDEC guidance document "Assessing and Mitigating Visual Impacts." The majority of the specific viewpoint locations evaluated do not have views of the Facility. Views from parks, schools, and other sensitive receptors considered in this study would be very limited as a result of dense tree cover and intervening topography.

There will however, be partial views of the Facility from some residential locations in the vicinity during both leaf-on and leaf-off conditions. In these situations, most of the visibility as shown in the photosimulations can be attributed to the height of the stacks rather than a view of the entire Facility. Additionally, with distance and the presence of foreground elements or topography, visual impacts are minimized as the Facility and stacks are not the dominant visual focus of the landscape. Some of the views will be of short duration during travel along roadways due to prevailing topography and vegetation while other areas may show a greater abundance of views.

The CPV Valley Project will create a new visual element in the landscape, but will not dominate views in all cases. Additionally, there are several industrial and commercial elements in the area as well as existing transmission lines that currently traverse through the landscape. Specific visual mitigation for the Facility includes minimizing stack height, preserving natural vegetation on site to the extent possible, landscaping, and neutral coloring of Facility façade.

1.7.4 Community Facilities

The Project will not adversely impact the community facilities. The local emergency responders for the Project will be the New York State Police, Troop F and the New Hampton Fire Company.

CPV Valley has discussed the nature of the Project with the New York State Police, Troop F. CPV Valley has also requested the input of the New York State Troopers, Troop F in Middletown under letter dated October 7, 2008. In addition, CPV has consulted with the New Hampton Fire Company regarding emergency planning for the Project. No concerns were raised during the communications that has been held to date regarding the ability of the service providers to provide adequate emergency response services to the Project. CPV Valley has provided the New York State Police, Troop F and the New Hampton Fire Company with a copy of the Preliminary Emergency Response Plan and requested input from the respective departments. CPV Valley will continue communications with both the State Police and New Hampton Fire Company to provide continued opportunity to address future questions regarding the Project.

Due to the limited number of operational employees (approximately 25 total), the proposed Facility will not result in the placement of a significant number of additional students in local schools or impact the ability of local service providers to meet community needs. Although construction and operation of the Project is not expected to bring a significant number of additional school-age children into the school districts, when completed, the CPV Valley Energy Center will represent a long-term source of additional revenue for the Town of Wawayanda and the Minisink school district through a PILOT agreement with the Orange County Industrial Development Agency (IDA).

1.7.5 Socioeconomics and Environmental Justice

The Project will represent a significant new source of revenue for the Town via its PILOT agreement and also benefit the county and region economy through the hiring of local labor during construction (peak construction workforce of 664 workers) and for operation of the Facility (25 workers). As well, a substantial amount of money will be invested in the area as a result of the purchase of supplies and equipment for construction, which in turn will have beneficial multiplier affects resulting in additional revenue and job creation. At the same time, costs to the community in terms of municipal services will be minimal. The Project does not anticipate significant in-migration of workers during construction or operation, and hence no additional impact is expected on schools or other public services. The Project is located near an environmental justice area, but the evaluation of environmental impacts clearly shows that this community will not suffer any discernable environmental impacts as a result of the Project.

1.7.6 Traffic and Transportation

The proximity to I-84, route 17M, and Route 6 facilitates access to the Facility site. There are a few instances when the peak construction related traffic will cause deterioration in Level of Service at a study location. The drop in Level of Service is generally moderate and will be temporary, lasting only during the 4 to 5 months of peak construction activity. Thereafter, conditions will return to pre-construction levels. Under Facility operation, no traffic impacts are identified.

No traffic related mitigation measures are required due to Facility operation.

1.7.7 Air Quality and Meteorology

The USEPA has established National Ambient Air Quality Standards (NAAQS) for seven criteria pollutants for the protection of public health and welfare: SO_2, PM_{10}, $PM_{2.5}$, NO_2, CO, ozone O_3, and Pb. USEPA has set primary and secondary NAAQS for these pollutants. The results of clinical and epidemiological studies established the primary NAAQS to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. The secondary NAAQS protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. USEPA has established both short-term and long-term standards.

The NYSDEC has adopted the NAAQS as the New York Ambient Air Quality Standards (NYAAQS). In addition, NYSDEC has NYAAQS for TSP gaseous fluoride, beryllium, and hydrogen sulfide.

The proposed location of the Project is an area currently designated as attainment or unclassifiable for SO_2, CO, NO_2, and PM_{10}. Therefore, for these pollutants, the Project is required to demonstrate compliance with the NYAAQS and NAAQS. Orange County is located in the ozone transport region. Therefore, facilities emitting more than 100 tons/year of NO_x or 50 tons/year of VOC are subject to Non-Attainment New source Review (NSR) requirements for these pollutants. The Facility will be subject to Non-Attainment NSR for both NO_x and VOC. Orange County is also designated as nonattainment for $PM_{2.5}$. The Facility will be less than the 100 tons/year NSR threshold for $PM_{2.5}$.

Table 1-1 summarizes the annual Facility emissions. With respect to new sources of air emissions, USEPA and NYSDEC have adopted Significant Impact Levels (SILs) to determine if modeled concentrations require more comprehensive analysis. Being below the SILs indicates potential impacts are so small as to not require further analysis. The Facility predicted maximum impacts are below the SILs for all criteria pollutants with the exception of $PM_{2.5}$ when backup ultra low sulfur distillate oil is being used. The cumulative impact modeling of the Facility, with other major sources, indicated compliance with the $PM_{2.5}$ air quality standards.

Table 1-1
Prevention of Significant Deterioration (PSD) and Non-Attainment New Source Review (NSR) Significant Emission Rates and Project Potential Emission Rates

Pollutant[1]	PSD Significant Emission Rates (tons/year)	NSR Significant Emission Rates (tons/year)	Annual Facility Emissions (tons/year)	PSD/NSR Triggered? (Yes/No)
Carbon Monoxide	100	N/A	344.0	Yes
Sulfur Dioxide	40	100/40	41.3	Yes
TSP	25	N/A	95	Yes
PM_{10}	15	N/A	95	Yes
$PM_{2.5}$	10	100/10	95	No
Nitrogen Oxides	40[2]	100[3]	187.0	Yes
VOC	40	50[3]	64.6	Yes
Sulfuric Acid Mist	7	N/A	12.6	Yes
Lead	0.6	N/A	0.02	No

Notes:
[1] Regulated substances not emitted by the proposed project (e.g., fluorides and total reduced sulfur) have not been included in the table.
[2] PSD threshold is for NO_2.
[3] Ozone non-attainment major source threshold.

Source: TRC Environmental, 2008; 6NYCRR 231-2 and 40 CFR 52.21 (b)(23)(i)

A major source in a USEPA designated non-attainment area must obtain emission offsets as a condition for approval. The offsets required result in a net air quality benefit to the region given they are greater in magnitude than the emission quantities generated by the Facility. The Facility's location in a non-attainment area for ozone requires the purchase of Emission Reduction Credits (ERCs). Emission offsets will also be required for NO_x and VOCs given the non-attainment status of the Orange County area.

1.7.8 Noise

A detailed noise assessment of the proposed Project was conducted. The assessment included an ambient noise monitoring program, conducted during the leaf off season when no insect noise was present (January 28-29, 2008), and a computer noise modeling study. The ambient program was conducted in order to quantify the existing noise environment, including during the late night hours when ambient noise levels are typically lowest. The computer modeling study included Facility source-specific noise emission data. Modeling included consideration of topographic features, and was conservative in that no credit was taken for tree cover or any intervening off site structures that would act to reduce noise levels. Conceptual noise control measures, including enclosing most major noise sources inside buildings, acoustical specifications for building walls, and noise limits for the air cooled condensers, were included in the model.

The resulting calculated Facility noise levels were compared to minimum late night ambient noise levels from each noise monitoring location in order to determine if any increases in noise would occur. This analysis revealed that no increases in noise would be expected at any of the noise monitoring locations, with the exception being at the Uhlig Road location, where an increase of 4 dBA was projected, which is below the NYSDEC 6 dBA impact criterion. The analysis also indicated that the Town of Wawayanda noise standard would be met. Accordingly, no significant noise impacts are anticipated due to Project operation.

1.7.9 Soils, Geology, and Seismology

No unique geologic resources have been identified at the Project site, and no impacts to geologic resources or geologic setting will be realized during operation. Where site development will include the excavation and stockpiling of soils, the natural agricultural soil resource will be lost. The site location is isolated and adjacent to significant development and Interstate 84. The loss of this limited agricultural resource is not part of a larger agricultural tract.

Based on the preliminary geotechnical analysis, the unconsolidated material at the site is suitable to support the proposed Facility. Construction of the Project will require the excavation of soils and the reworking of the unconsolidated surficial material. No need for blasting has been identified. Soils and surface topography will be re-established to original conditions following the installation of the water/wastewater lines interconnect. As with the electrical interconnection, cut material not suitable for re-use as backfill will be recycled off-site.

1.7.10 Infrastructure and Water Resources

Several advanced technologies coupled with sound water resources management policies and practices have been incorporated into the Facility's overall design to minimize impacts to water resources in Orange County during construction and operation. These include:

- Using combined-cycle technology for power generation, thereby increasing the overall water and fuel efficiency of the Facility when compared to traditional steam electric generating plants serving New York State;

- Selecting air-cooled condensers to dissipate heat, thereby eliminating the need for large volumes of water for cooling purposes;

- Reusing tertiary treated effluent from the City of Middletown's Sewage Treatment Plant to satisfy process makeup requirements for power generation, thereby minimizing water withdrawals from the municipal distribution system; and

- Developing and implementing an erosion and sediment control plan to ensure that applicable site specific controls are in place and properly maintained throughout the construction process.

To minimize water supply demands on the municipal distribution system, process makeup water for the Facility, which is estimated to range from approximately 44 gallons per minute (gpm) (~63,360 gallons per day) up to 426 gpm (~613,000 gpd), would be satisfied through reuse of tertiary treated effluent from the Middletown Sewage Treatment Plant.

As an alternative to reuse of tertiary treated effluent, CPV is also investigating the potential for redevelopment of an existing on-site groundwater well to satisfy all or a portion of the Facility's process makeup requirements.

Potable water for the Facility, which is estimated to average 2 gpm (~2880 gpd), would be obtained through an interconnect to the municipal distribution system on Route 6.

Process wastewater requiring off-site disposal would typically range from approximately 35 gpm (~50,000 gpd) to 65 gpm (~94,000 gpd) during gas-fired operation. When the combustion turbines are operated using ultra-low sulfur distillate, the process wastewater generation rate approaches 175 gpm (~252,000 gpd). Process wastewater would either be directed to the headworks of the Middletown Sewage Treatment Plant or discharged to the Middletown Sewage Treatment Plant outfall pipe (Wallkill River) under an individual SPDES permit. Site stormwater runoff would be routed to an on-site detention basin prior to discharge to on-site wetlands that ultimately drain to Monhagen Brook.

With proper storage, handling, and management of fuels, lubricating oils and other hazardous materials coupled with implementation of a site-wide Best Management Practices (BMP) Plan addressing stormwater management, the Facility would not result in significant adverse impacts to groundwaters or surface waters of Orange County.

1.7.11 Ecology

As a result of the Project construction, permanent impacts on the 122 acre site parcel will occur to 21.25 acres of Cropland/row crop ecological community, permanent filling 0.34 acres of federal jurisdictional wetland, and an addition 0.02 acres of both federal and state jurisdictional wetlands for electric interconnect structures. For construction laydown/parking areas, approximately 7 acres of successional old field and hayfield will be temporarily impacted, and will be restored upon completion of construction. For the electrical interconnect, construction related impacts include the permanent conversion of 0.83 acres of Red maple-hardwood swamp (also federal/state jurisdictional wetlands) to non-forested wetlands (with no additional wetland filling), conversion of 2.32 acres of upland Beech-maple mesic forest to non-forested upland, and up to 0.14 acre (6,000 sq. ft.) of temporary impacts to Shallow emergent marsh for installation of the underground electrical conduit.

Impacts to wildlife habitat will be minimized due to utilization of agricultural fields for the majority of the proposed Facility. Losses of forested habitat will be minimized through the southern routing of the overhead electrical interconnect and the use of roadway shoulders for the underground portion. No impacts to federal or state listed Threatened or Endangered species are anticipated.

Permanent impacts to wetlands will be mitigated through on-site replication of 0.7 acres of wetlands, providing a wetland replacement ratio of 2:1. This wetland replication area will also provide enhanced wildlife habitat functions for the site.

1.7.12 Alternatives

The DEIS, Section 19.0, presents the alternatives considered for the Project. A brief summary is provided below:

CPV considered several sites for potential development. As described in Section 19.3, CPV screened several locations in New York for siting a similar type of facility as the Project. A site in Stoney Point, New York was identified and pursued. However, after detailed technical review the Stoney Point alternative was no longer viable.

Electric Interconnect Right-of-Ways Considered*:* CPV considered several alternatives for interconnecting to the NYPA transmission lines. The routes included an on-site and off-site portion. All alternatives considered utilized the same on-site routing, which routes overhead transmission lines along the southern perimeter of the site shouldering I-84 and then paralleling Route 17M in a northerly direction. At the point where the transmission lines approach Monhagen Brook, the transmission lines will transition underground and travel off-site. Once off-site, the following alternatives were considered.

One off-site route would extend east from the underground facilities on-site and travel under Rt. 17M. On the east side of 17M, the transmission lines would travel northeast via underground conduits to the NYPA right-of-way. Prior to the NYPA right-of-way, the underground transmission lines would transition to overhead transmission lines via riser poles and then tie-in to the existing NYPA lines.

An alternate route to the west of Rt. 17M was considered. Under this alternative, the transmission lines would proceed underground beneath Rt. 6 and parallel Rt. 17M in DOT right-of-way. Once in the vicinity of the NYPA right-of-way, the underground transmission lines would transition to overhead transmission lines via riser poles and then tie-in to the existing NYPA lines.

While these alternatives are considered by CPV Valley, input from the NYISO and NYPA during the interconnection process will impact the route selected.

Alternative Project Technology, Including Cooling Technologies: For the CPV Valley Energy Center, exhaust steam from the steam turbine would be cooled (i.e., condensed) and then returned to the HRSG using an air-cooled condenser. Air-cooled condensing would be employed to minimize water use and eliminate potential cooling tower plume impacts. Alternatives to using an air-cooled condenser for cooling include: once-through cooling, mechanical draft (wet) cooling tower system, hybrid (wet/dry) cooling tower system, natural draught towers, and closed-cycle dry cooling systems.

Site Design Alternatives: As part of the development of the Facility site plan, CPV Valley considered a number of potential site layouts on the 122-acre parcel. Locating the Facility at the southern center portion of the 122-acre parcel was preferred. Alternate site plans were considered to further optimize the layout. The final siting of the Facility general arrangement within the southern portion of the 122-acre parcel was determined based on a site plan that minimized the overall facility footprint; utilized mostly cleared, non-forested portions of the site, avoided potentially significant impacts to wetlands, and complied with the Town of Wawayanda setback requirements.

Fuel Right-of-Way Alternatives: The two potential natural gas sources include a direct interconnection with the Millennium interstate pipeline system, via a new 7 to 8 mile lateral or a 2 to 3 miles Orange & Rockland, Local Distribution company main extension that will originate at Minisink and would terminate in New Hampton. Both would be the subject of its own permitting and environmental review process, with location and final routing to be approved by others. CPV conducted a map level environmental review of these alternatives, which is presented in Section 17.0, Cumulative Impacts, of this DEIS.

Cooling Water Alternatives: Water supply sources considered for this Project include: grey water from the Middletown Sewage Treatment Plant, local ground water, surface water withdrawal, and municipal water. As an alternative to reuse of tertiary treated effluent, CPV has also investigated the potential redevelopment of an existing on-site groundwater well to satisfy all or a portion of the Facility’s process makeup requirements. The Wallkill River situated approximately 2.6 miles southeast of the proposed site was considered but would require installation of a 3+ mile pipeline depending upon where easements could be obtained. The Middletown municipal supply was considered but would not be capable of meeting a significant percentage of the process makeup requirements due to insufficient supply capacity under drought conditions.

1.8 CONCLUSIONS AND MITIGATION MEASURE SUMMARY

The analyses conducted during preparation of the DEIS indicate that the CPV Valley Energy Center will have no significant adverse impacts to the Project area environment. The Facility will comply with applicable Town, State, and Federal standards in addition to providing an efficient and clean source of needed new electricity to the lower Hudson Valley. The Facility will be a major new revenue source for the Town of Wawayanda and Orange County. The construction and operation of the Facility will also realize economic benefits to the region’s labor force and material suppliers.

The avoidance of significant environmental impacts is attributable to the following initiatives undertaken to date by CPV Valley LLC:

- Early identification of environmental resources and location of physical structures on the 122 acre site to avoid resource areas to the maximum extent possible;

- Implementation of a Facility design that takes advantage of the 122 acre area with respect to physical separation from offsite land uses, achieving the lowest vertical profile for building structures, and preserving ground cover in the approximate 95 acres of the site left undeveloped; and

- Committing to state of the art generating equipment, environmental controls, and construction/operational phase mitigation measures.

Table 1-2 provides an overview summary of the environmental impact mitigation measures identified during the preparation of the DEIS.

Table 1-2
DEIS Environmental Impact Mitigation Measure Summary

Environmental Consideration	Construction Phase	Operation Phase
1. LAND USE	• Public participation Program briefing to adjacent land owners Prior to Construction • Maintenance of communication links for land owners during construction	• Use of roadway rights-of-way to maximum extent possible for electrical and water lines • Siting of physical plant in south central portion of site adjacent to Interstate 284 • Maintain 95 of 122 acre site as undeveloped open space
2. CULTURAL RESOURCES	• Commitment to archaeological resource assessment if potential resources identified during construction	• Restoration of the Cooley Cemetery
3. VISUAL RESOURCES	• Orderly stockpiling of construction materials • Daily maintenance of site for control of debris	• Enclosing Facility structure in buildings • Implementation of a Facility landscaping program • Use of neutral color building materials • Design of building structures and stack to lowest feasible vertical profiles
4. COMMUNITY FACILITIES	• Advance notice of construction activities to Police and Fire	• Establish communication link with Police, Fire, and Emergency Medical Service providers • Training of onsite personnel
5. SOCIOECONOMICS	• Commitment to using union labor from area • Maximize use of local material suppliers	• Development of Host Community benefits package • Development of PILOT agreement with IDA
6. TRAFFIC	• Use of police officer control, as required during peak onsite construction activity • Schedule construction worker shifts off commuter peak hour periods • Schedule truck deliveries during off commuter peak periods	• Site access drive STOP sign control on approach to Route 6

Table 1-2 DEIS Environmental Impact Mitigation Measure Summary		
Environmental Consideration	**Construction Phase**	**Operation Phase**
7. AIR QUALITY	• Periodic wetting of disturbed areas to minimize fugitive dust emissions • Early seeding of disturbed areas	• Application of SCR for NOx control and oxidation catalyst for CO and VOC control • Purchase of emission offsets for NOx and VOCs • Limit use of back ultra low sulfur distillate oil to equivalent of 720 hours annually • Implementation of BACT/LAER • Purchase of Emission Reduction Credits
8. NOISE	• Use of mufflers on construction equipment • Directing construction activity primarily to daytime hours	• Building enclosure of mechanical equipment
9. WATER RESOURCES	• Use of construction phase Stormwater Pollution Prevention Plan (SWPPP)	• Use of grey water for Facility operation • Discharge of wastewater to City of Middletown Sewage Treatment Plant • Utilization of water conservation measures to minimize supply needs • Application of operation Stormwater Pollution Prevention Plan and SPCC plan • Grease and oil traps in catch basins
10. ECOLOGY	• Avoidance of NYSDEC wetland areas for generating Facility • Reestablish natural ground cover following temporary disturbance • Compensatory 2:1 replacement of disturbed wetland areas	
11. GEOLOGY, SEISMOLOGY AND SOILS	• Avoid use of blasting during foundation construction • Implementation of soil erosion control measures	

2.0 PROJECT DESCRIPTION

This Section provides a detailed description of the proposed CPV Valley Energy Center (Project or Facility). This section includes information on the physical characteristics of the Project Site; the combined cycle generation technology of the proposed Facility; and the anticipated Project development schedule.

2.1 SITE DESCRIPTION

The proposed Project will utilize an approximate 30-acre portion of the total 122 acre site parcel of open land in the northeast portion of the Town of Wawayanda proximate to the boundary with the City of Middletown. Table 2-1 provides a breakdown of Facility development area requirements. The 122-acre site is bounded by Interstate Route 84 to the south; Route 17M on the east and Route 6 to the north and west. Figure 2-1 shows the Project Site boundary on the United States Geological Survey (USGS) map for the general area. Figure 2-2 provides the site boundary and Facility development area on an aerial photograph. Figure 2-3 provides the existing conditions plan for the Project Site.

Table 2-1
Site Development Area Requirements

Facility Development Component	Area Requirements (Acres)	Description
Energy Facility Physical Footprint	21.25	Permanent fill out to edge of erosion controls
Construction Phase Material Laydown and Parking	7.6	Temporary impact during construction phase
Access to Construction Laydown Areas	0.08	Temporary impact during construction phase
On-Site Overhead Electrical Interconnect (Forested Segment)	3.24	Includes clearing of forested right-of-way adjacent to overhead electrical wires.
On-Site Overhead Electrical Interconnect (Open Field Segment)	1.17	Open field easterly portion
Underground Electrical Conduit Construction	0.46	Construction right-of-way from Site eastern boundary to NYPA transmission lines

The Project Site is currently undeveloped land consisting of tracts used previously for agricultural purposes, including the growing of hay and corn crops, and wooded areas. Carpenter Creek a tributary to Monhagen Brook traverses the site running from west to east. A second intermittent tributary to Monhagen Brook enters the Project Site from the south and meets the other tributary on the eastern portion of the site before flowing downstream. Portions of the Project Site have been identified as wetland areas. Topography generally slopes gently from Route 6 on the north to Interstate Route 84 on the south. Surface elevations across the 122-acre parcel range from approximately 452 feet above mean sea level (MSL) to 498 feet above MSL.

The Project Site is located within the Town of Wawayanda's Manufacturing Industrial (MI) District, which permits electric generating facilities (under "other industrial uses") by special permit issued by the Town Planning Board. The land uses nearby and adjacent to the proposed Project Site are mainly light industrial, commercial, and undeveloped open space. A workforce housing complex is currently under construction adjacent to Route 6 and a small number of single-family residences abut the Project Site along Route 6 to the north.

The Project will interconnect with the New York Power Authority's (NYPA) 345-kilovolt (kV) transmission system, which is located less than one mile north of the Project Site. The new Facility 345 kV switchyard will be located adjacent to the proposed generating station near the step-up transformers. The electrical interconnect segment from the switchyard to the eastern edge of the site will be overhead. From the site's eastern edge to the NYPA transmission system, the electrical interconnect will be underground within the New York State Department of Transportation (NYSDOT) Route 17M right-of-way.

Figure 2-4 shows the Tax map parcels comprising the development Project Site proper. A review of identified easements indicate that they do not present obstacles to the planned development.

2.2 FACILITY OVERVIEW

The proposed combined-cycle facility will generate a peak of approximately 630 megawatts (MW) of electricity. On a hot day (90°F ambient dry bulb temperature), approximately 365 MW of this power will be produced using two F Class combustion turbine generator sets. Exhaust heat from the combustion turbines will be sent to heat recovery steam generators (HRSGs) to produce steam to drive a steam turbine generator. The HRSGs will include a natural gas-fired "duct burner" (supplemental firing system). The duct burners will allow for additional electrical production during select periods. The steam turbine generator will provide approximately 288 MW, the balance of the Facility's gross output. Approximately 23 MW are consumed within the Facility to power necessary systems, which leaves a net electric output of 630 MW. For environmental purposes, the Project will be equipped with state-of-the-art emissions control technology; selective catalytic reduction technology (SCR) to control oxides of nitrogen (NO_x) and an oxidation catalyst will to control carbon monoxide (CO) emissions. Exhaust steam from the steam turbine will be cooled (i.e., condensed) and then returned to the HRSG using an air-cooled condenser. Air-cooled condensing will be employed to minimize water use and eliminate potential cooling tower plume impacts.

Natural gas will be used as the primary fuel with ultra-low sulfur distillate oil serving as a back-up fuel for reliability purposes. Use of the back-up fuel will be limited to the equivalent of 720 hours per year, per turbine, so that the Facility can reliably support the electrical system in the event that natural gas supplies are needed to meet residential heating or other demands. To accommodate short-term operation on ultra-low sulfur distillate oil, the proposed Project will include a 965,000-gallon fuel oil storage tank and associated off-loading facilities. Consistent with New York State and municipal requirements, the storage tank will be equipped with secondary containment capable of retaining 110 percent of the storage tank capacity. In addition, fuel delivery piping outside of the containment area will be double walled. Fuel oil will be delivered to the site via tanker truck. The fuel off-loading facilities will be capable of handling two trucks simultaneously and will have its own containment capacity.

Auxiliary equipment at the Facility will include a fuel gas dew point heater, a combustion turbine inlet air evaporative cooler, fuel gas compressors, power transformers, a water demineralization system, an electric fire pump, an emergency diesel fire pump, an emergency diesel generator, and an auxiliary boiler. The fuel gas dew point heater will be natural gas fired and be used to prevent the condensation of moisture in the gas, the formation of gas hydrates (linked water and hydrocarbon molecules), and the condensation of hydrocarbons in the gas. The emergency diesel fire pump will provide back-up power to the electric fire pump for on-site fire-fighting capability in case of power failure and will only be tested for brief durations during normal operations. The demineralization system will be used to further purify the grey water from the City of Middletown municipal Sewage Treatment Plant, for use as HRSG makeup.

2.3 OVERVIEW OF COMBINED-CYCLE OPERATION

Figure 2-5 shows a conceptual flow diagram of the proposed combined cycle electric generation Facility operation. The Facility will have two combustion turbines, two HRSGs and one steam turbine.

The process of utilizing both the power generated from a combustion turbine generator and a steam turbine generator is referred to as “combined-cycle” electric generation. A combined-cycle plant uses waste heat from a combustion turbine to serve as the heat input to a conventional steam turbine. The combustion turbine consists of a compressor, combustor, and turbine sections. The fuel (natural gas or ultra-low sulfur distillate) is ignited in the combustor section with high-pressure air. The resulting exhaust gases created by the combustion process are expanded through the turbine section. The expanding exhaust gas causes the turbine blades and shaft to rotate. A generator is coupled to the turbine shaft to convert rotational mechanical energy into electrical energy.

After combustion, the hot combustion turbine exhaust gases are routed via ductwork to the HRSG. Heat from the exhaust gases is transferred to the water/steam tubes that are immersed in the HRSG gas flow path, first to boil the water into steam and then to superheat the steam for use in the steam turbine. The expansion of the steam in the steam turbine rotates the turbine shaft. A generator is coupled to the turbine shaft to convert rotational mechanical energy into electrical energy. Exhaust gases exit the HRSG through a stack. Steam exhausting from the steam turbine is sent to an air-cooled condenser, where it is converted back into water and pumped to the HRSG for reuse.

The “combined-cycle” technology is approximately 30 percent more efficient than conventional electric generation technologies. Since a combined-cycle plant uses less fuel than either a steam turbine or a gas turbine to generate a kilowatt-hour of electricity, the savings in fuel costs and therefore energy costs are significant. Another benefit of combined-cycle technology is that because less fuel is consumed, the environmental emissions are less than that of traditional fossil fuel technologies per megawatt of power generated.

2.4 FACILITY LAYOUT

The CPV Valley Energy Center will be designed to be compatible with site area environmental resources and surrounding land uses. A computer rendering of the Facility as viewed from the Northeast is presented in Figure 2-6. Figure 2-7 provides a general site arrangement of Facility buildings and sub-systems, including the main power generation building, station transformers,

the air cooled condenser, gas metering and compression station and distillate fuel oil and water storage tanks. Figures 2-8 and 2-9 provide elevation cross-sectional views of the Facility.
The construction phase material laydown areas and parking map are shown in Figure 2-10.

2.4.1 Buildings and Structures

The generation building encloses the major power generation equipment, consisting of the two combustion turbines, the two combustion turbine generators, and the HRSGs. The generation building also encloses ancillary mechanical equipment, such as pumps, piping, and electrical equipment needed for plant operation. The building will have overhead cranes to facilitate major equipment maintenance activities. Elevated platforms will be provided for access to equipment and piping. The roof of the structure will be designed to support metal decking and insulating panels. The walls will be insulated metal siding supported on a steel frame. Also enclosed within the main turbine building are office space, a meeting room, kitchen, storage area, and restroom facilities. A maintenance shop/warehouse building will be located immediately south of the administration building. The steam turbine generation building is adjacent and connected to the generation building, and will contain the steam turbine as well as the steam turbine generator.

Approximate building dimensions and heights for major Facility components are as follows:

- Generation Building (High-Bay) 263 feet by 245 feet by 113 feet high
- Generation Building (Low-Bay) 263 feet by 60 feet by 52 feet high
- Steam Turbine Generation Building 220 feet by 212 feet by 102 feet high
- HRSG (located in the Generation Bldg) 144 feet by 40 feet by 90 feet high
- Glycol Fin Fan Cooler 101 feet by 41 feet by 30 feet high
- Generator Step Up Transformer 34 feet by 27 feet by 27 feet high
- Ammonia StorageTank 13 feet by 18 feet high height
- Gas Meter Enclosure 49 feet by 35 feet by 20 feet high (each)
- Air Cooled Condenser 305 feet by 268 feet by 115 feet high
- Demineralized Water Storage Tank 60 foot diameter with 22 foot high
- Filtered/Fire Water Storage Tank 84 foot diameter with 40 foot high
- Fuel Oil Storage Tank 60 foot diameter with 48 foot high
- Fuel Oil Delivery Facilities 60 feet by 27 feet

Major generation equipment is further described in the sections that follow.

2.4.2 Power Generation Equipment

The major pieces of equipment include two combustion turbine generators with an evaporative inlet air cooler, two HRSGs with duct burners, a steam turbine, an air-cooled condenser (main cooling system), a fin-fan cooler (auxiliary cooling system), a fuel gas dew point heater, electric and emergency diesel fire pumps, an emergency diesel generator, an auxiliary boiler, and combustion turbine exhaust stacks. Additional support systems and equipment include the following:

- Feed-water systems;
- Condensate system;
- Water treatment system including a water storage tank;
- Selective catalytic reduction (SCR) system;
- Oxidation (CO) catalyst;
- Chemical storage and injection system;
- Sanitary waste collection and discharge system;
- Fire protection system (including detection and alarm system);
- Domestic (potable) water distribution system;
- Instrument and service air systems;
- Heating, ventilating, and air conditioning systems;
- Wastewater collection, treatment and discharge systems;
- Oil-water separators;
- On-site natural gas interconnection;
- On-site natural gas compressor and conditioning station;
- 345 kV overhead electrical transmission line;
- 345 kV switchyard; and
- Controls and instrumentation.

2.4.2.1 Combustion Turbine Generator

The two combustion turbine generators are internal combustion engines that operate with rotary motion (rotates a shaft to generate electricity) rather than reciprocating motion (i.e., vehicle engines). The turbines are composed of three major components: the compressor, combustor, and power turbine. In the compressor section, ambient air is drawn in and compressed up to 16 times ambient pressure and directed to the combustor section where fuel is introduced, ignited, and burned. Hot gases from the combustion section are diluted with additional air from the compressor section and directed to the power turbine section at high temperature. Energy from the hot exhaust gases, which expand in the power turbine section, is then recovered in the form of shaft horsepower (i.e., horsepower present at turbine shaft). More than 50 percent of the shaft horsepower is needed to drive the internal compressor and the balance of recovered shaft horsepower is available to drive the turbine and generate electricity.

CPV Valley, LLC is proposing to install two F Class combustion gas turbine generators firing primarily natural gas. Use of ultra-low sulfur distillate oil as a backup fuel will be limited to a maximum of 720-hours per year of operation. Each combustion turbine generator will nominally produce approximately 200 MW of electric power at an average annual ambient temperature of 51° Fahrenheit (F).

Additional auxiliary systems provided with the combustion turbine generator package include: static excitation system, electric starting system, inlet silencer, evaporative inlet air cooler, packaged electrical/control systems, FM 200 fire protection systems, vibration monitoring, compressor water wash skids, and engine lubricating oil systems.

2.4.2.2 Heat Recovery Steam Generators (HRSGs)

Exhaust gases in the range of 1,026º to 1,136º F will exit the combustion turbine generators and be routed to the two HRSGs via ductwork. In the HRSGs, the heat from the exhaust gases is transferred to water/steam tubes that are immersed in the HRSG gas flow, first to boil the water into steam and then to superheat the steam for use in the steam turbine. The exhaust gases from the HRSG are routed to the stack.

The two proposed HRSGs are multi-pressure, horizontal units with reheat capacity. The HRSG design includes the following:

- A multi-pressure level heat recovery system;
- An economizer;
- Reheater;
- Steam superheaters;
- Relief valves, stop and check valves and connections for blowdown;
- Chemical injection and drum level instrumentation isolation;
- Silencers for all safety relief valves and power operated start-up vent valves; and
- Boiler re-circulation system.

The HRSGs will have supplemental fuel firing provided by an approximate 500×10^6 Btu/hr natural gas-fired duct burner. The HRSGs will each have a chemical feed system to maintain feedwater pH and oxygen levels in accordance with the Electrical Power Research Institute (EPRI) guidelines. The HRSG chemical feed systems will include a phosphate/polymer feed skid and an oxygen scavenger and neutralizing amine feed skid.

2.4.2.3 Steam Turbine Generator

Steam generated in the HRSGs will be expanded through a steam turbine coupled with a generator (steam turbine generator) to generate additional electricity. The steam turbine generator will be a multi-stage, reheat, condensing turbine and will produce approximately 201 MW of electric power at an average ambient temperature of 51º F, in the non-duct fired mode of operation. The steam turbine generator will be designed for exhaust to an air-cooled condenser. The steam turbine generator will be designed to run continuously, but will also be capable of operating as a cycling unit. The steam turbine generator will be located in the generation building.

Provisions will be made in the design to minimize thermal expansion, stresses, distortion and vibration. The steam turbine will be designed to shut down under any of the following conditions: overspeed, high vibration, high thrust, high differential expansion, low lube oil pressure, and high back pressure. A 100 percent high pressure/low pressure turbine steam bypass system will be provided to dump steam to the condenser, if necessary. The turbine bypass system will be utilized for temperature matching on warm and hot starts in addition to keeping the gas turbine in operation in the event of a steam turbine trip.

2.4.2.4 Main System Cooling (Air-Cooled Condenser)

An air-cooled condenser will be installed just west of the generation building to provide cooling for the steam exhausted from the steam turbine. The air-cooled condenser is located approximately 60 feet west of the generation building (High-Bay) and has dimensions of approximately 305 feet wide, 268 feet long, and 115 feet high.

The air-cooled condenser will rely solely on ambient air as a direct steam-cycle heat sink without the use of any water or other intermediary heat transfer medium. Steam will be routed from the steam turbine exhaust through ducts to a series of fin tube heat exchangers. The steam flows through the tubes and condenses inside the tubes forming condensate while air flows over the outer tube surface. Condensate will be discharged from the air-cooled condenser and returned to the HRSG after the latent heat of vaporization is transferred from the turbine steam directly to the air stream. Air is moved through the air-cooled condensers by a series of fans, with ambient air drawn from below the condenser and the heated warmer air discharged from the top of the condenser.

2.4.2.5 Auxiliary System Cooling (Fin-Fan Cooler)

A fin-fan cooler (auxiliary cooling system), separate and distinct of the air-cooled condenser, will be provided for cooling of plant equipment and sub-systems. The fin-fan cooler is located west northwest of the generation building. The fin-fan cooler is approximately 100 feet long, 41 feet wide, and 30 feet high.

The fin-fan cooler design is based on air-cooled heat exchange technology that rejects heat from a fluid directly to ambient air using a series of tubes, fins, and fans similar to an automobile radiator. Propylene glycol, a non-hazardous regulated coolant, will be used rather than ethylene glycol (antifreeze), which is classified as hazardous. The fin-fan cooling system will be designed to support base load capability of the plant up to an ambient temperature of 105º F. This system will be controlled remotely from the plant control room.

The following equipment and sub-systems will be served by the fin-fan cooler:

- Steam Turbine Generator (STG) Coolers;
- Combustion Turbine Generator (CTG) Coolers;
- STG and CTG Lube Oil Coolers;
- STG and CTG Auxiliaries;
- STG Hydraulic Power Unit Coolers

- Sample Coolers;
- Service and Instrument Air Compressors and Aftercoolers (if water-cooled); and
- HRSG Feed Pump Oil Coolers;

In addition, a second smaller fin fan cooler, also utilizing propylene glycol will be installed south of the generation building to cool the project's gas compressor.

2.4.2.6 Evaporative Cooler

Combustion turbine generators produce up to 20 percent less power during hot weather than in cold weather without the use of an inlet air cooling system; therefore, a cooling system will be incorporated at the air inlet of the combustion turbine generator, downstream of the air filtering system for power output enhancement. The basic theory of an inlet air cooler is that a combustion turbine is a constant volume machine, and at a given shaft speed, the combustion turbine will move the same volume of air. Because the power output of a turbine depends on the flow of mass (air) through it, on hot days when the air is less dense, the power output falls off. By feeding cooler air into the combustion turbine, the mass flow is increased, resulting in higher output.

The inlet air cooler will operate when temperatures exceed approximately 70º F in order to maximize plant efficiency and output. Evaporative coolers lower the compressor inlet air temperature and increase combustion turbine performance. Water is pumped into the evaporative cooling media, which is a cellulose-based material. It is mounted at the inlet of the inlet filter house. The water trickles down and soaks the media, while inlet air is passed through. This causes evaporation of water, causing cooling of the air passing through. The water supply requirements of the inlet air cooler are projected to be a maximum of 52 gallons per minute (gpm) or 75,000 gallons per day (gpd) when operating 24 hours on a hot summer day.

2.4.2.7 Exhaust Stack

The exhaust gas from the HRSGs will flow into two 275 foot (above grade) stacks with a flue diameter of 19 feet, located adjacent to the southwest side of the combustion turbine building. Each exhaust stack will include the following accessories and features:

- Galvanized test platform; stack lighting platform, if necessary; and intermediate platforms;
- Test ports and connections for the Continuous Emissions Monitoring System (CEMS);
- Galvanized ladder with cage to the test platform and stack lighting platform, if necessary;
- Access opening; and
- Silencers for noise abatement.

2.4.2.8 Emergency Diesel Generator

The Facility will be equipped with an emergency diesel generator sized at a nominal 1,500 kWe, prime power rating. If power from the grid is not available, the diesel generator will operate to maintain essential services (lighting, HVAC, communications, etc.) in operation at the Facility until off-site power is restored. The diesel generator set comprises an in-line or V-type multi-cylinder turbocharged diesel engine directly driving an electric generator at 900 or 1200 rpm. Generator output is at 4,160 volts/60 Hz.

The engine is provided with a sealed jacket water system that is cooled by an air-cooled radiator, which also cools the turbocharger aftercooler and the engine lube oil cooler.

2.4.2.9 Natural Gas Auxiliary Boilers

Auxiliary Boiler – A 77,000 pound per hour (lb/hr) auxiliary boiler will primarily be used during the winter months to keep the HRSGs warm during periods of turbine shutdown and provide sealing steam to the steam turbine in case of warm and hot shutdowns. The auxiliary boiler will be fired by natural gas. Total boiler hours for the facility will be limited to 2,000 hours per year. Air pollution control systems for the auxiliary boilers will include a low-NO_x burner and flue gas recirculation.

Fuel Gas Dew Point Heater – The fuel gas dew point heater will be used to maintain the natural gas above its dew point temperature prior to input to the turbine and duct burner. Heating of the gas above its dew point temperature reduces the possibility of the gas "slushing" or condensing into a liquid due to change in pressure and temperature. The temperature of the gas supplied to the gas turbine will be maintained at a temperature of 50°F or more above the dew point of the gas. The fuel gas dew point heater will have a low-NO_x forced draft burner to reduce NO_x emissions.

Emergency Diesel Fire Pump – A diesel driven fire pump will be located at the Facility. The fire pump will be used only to maintain on-site fire fighting capability if electric power was not available from the utility grid. Except for occasional testing to ensure the fire pump is operating properly, the fire pump will not normally operate. To account for short-term testing of the fire pump as well as possible emergency use, it will be permitted to operate up to a total of 500 hours per year.

2.4.2.10 Storage Tanks

Above ground storage tank systems will be located on Project Site for storage of reclaimed water, demineralized water, aqueous ammonia, and ultra-low sulfur distillate fuel oil. Each of these systems is described below:

Fuel Oil – The proposed Project will include a 965,000-gallon fuel oil storage tank and associated off-loading facilities. Consistent with New York State and municipal requirements, the storage tank will be equipped with secondary containment capable of retaining 110 percent of the storage tank capacity. The tank system will be designed in conformance with the requirements of the State's Petroleum Storage Facility Regulations (6 New York Code, Rules and Regulations (NYCRR) 614, State and Town Building Codes; and the Town's Fire Marshal. The tank will be tightness-tested before use and inspected on a regular schedule. Automated level monitoring and leak detection equipment will also be installed. This system will include an audible alarm in the Facility control room as well as overfill detection and prevention devices.

In addition, fuel delivery piping outside of the containment area will be double walled. Fuel oil will be delivered to the site via tanker truck. The fuel off-loading facilities will be capable of handling two trucks simultaneously and will have its own containment capacity.

Ammonia – The selective catalytic reduction system requires aqueous ammonia injection for NO_x emissions control. A 19 percent aqueous ammonia solution will be stored in a 15,000-gallon tank. The 11 foot diameter by 17 foot tall tank will be welded steel construction. The tank will be located within a concrete containment area capable of storing 110 percent of the tank contents. The tank will be tightness tested before use and inspected on a regular schedule. A leak detection system will be installed. The system will have an audible alarm in the control room. The storage tank and containment design will include provisions for overfill detection and prevention.

Water Storage **–** One water storage tank will be located on site for demineralized water. The demineralized water tank will store approximately 400,000 gallons of treated water, and will be approximately 60 feet in diameter and 20 feet high. The tank will be located on the north side of the Water Treatment Building. A 1,000,000-gallon reclaimed water tank will be located on site, and will be approximately 84 feet in diameter and 40 feet high. The reclaimed water tank will also be located on the north side of the Water Treatment Building.

2.4.3 Landscaping and Lighting

2.4.3.1 Landscaping

Sections of the entrance to the Project Site will be graded and seeded after construction. Land to be left as buffer outside the Facility fence line will be restored to its current open space condition after construction.

The Project will incorporate protective measures to protect landscaping and vegetation adjacent to parking areas, loading areas and driveways. To the maximum practical extent, mature shade trees, vegetation, and unique site features such as stone walls will be preserved. A buffer area will be placed along the Route 6 boundary with one shade tree (minimum caliper of three inches at four feet) planted for each 40 feet of lot frontage.

The Project Site's front entrance area will be landscaped with grass, trees and shrubs. Where 20 or more parking spaces are required, at least 10 square feet of interior landscaping will be provided within the paved area for each parking space, and at least one tree will be provided for every ten parking spaces. Each landscaped area will be at least 100 square feet, planted with grass or shrubs, and contain at least one tree. A landscaping area will also be provided along the perimeter of the parking area, except where access is provided.

2.4.3.2 Lighting

Normal plant lighting and emergency temporary lighting will be provided throughout the Facility. The Project's proposed lighting design will minimize off-site impacts, while providing sufficient lighting to ensure worker safety during routine operations and maintenance. The site lighting will be designed to meet the standards of the Illuminating Engineering Society (IES) Lighting Handbook.

Roadway lighting will consist of 400 watt High-Pressure Sodium (HPS) fixtures mounted at 30 feet above grade. These fixtures will include full cut-off optics to reduce unwanted glare and fugitive light. The fixtures will be oriented such that the emitted light is directed inwards toward the plant and be controlled by light sensing switches.

Entry door and truck access doorway lighting are anticipated to consist of 70 watt HPS and 100W HPS wall lighting fixtures, respectively. These fixtures will also include full cut-off optics to reduce unwanted glare and fugitive light. The doorway fixtures will be located above the doors and directed downward. Photovoltaic cells will control these fixtures.

Platform lighting is anticipated to consist of 70 watt, 100 watt and/or 150 watt HPS heavy-duty, stanchion mounted, area lights. The term “platform lighting” includes the top of the air-cooled condenser and associated access stairs, continuous emissions monitoring system (CEMS) equipment access platforms and any other equipment-related platforms. Typically, the stairway fixtures are provided with photovoltaic cell control and the actual platform area lighting is controlled from locally mounted switches. This allows for the reduction of nighttime fugitive light. The fixtures typically are typically mounted 8 feet above the platform elevation.

A Federal Aviation Administration (FAA) Determination of No Hazard to Air Navigation is required for the CPV Energy Center because the stack height will be greater than 200 feet. It is anticipated that the stack light will be in accordance with FAA advisory circular 70/7460-2. Obstruction Marking and Lighting, a med-duel system – Chapters 4, 8 (M-Duel), &12.

2.5 AIR QUALITY CONTROL SYSTEMS

To control the NO_x emissions from the Facility, the combustion turbines will be equipped with an advanced dry low NO_x combustion system. The dry low NO_x combustion system limits NO_x formation by controlling the combustion process through air/fuel optimization. Water injection will be used to control NO_x emissions when the combustion turbine is operating on ultra-low sulfur light distillate oil.

The facility’s NO_x emissions are further reduced to the Lowest Achievable Emission Rates (LAER) by post combustion treatment with a selective catalytic reduction (SCR) system. Low concentration (19 percent) aqueous ammonia will be injected into the flue gas, upstream of the SCR catalyst, where it will mix with the NO_x in the presence of the SCR catalyst to form nitrogen and water vapor. Ammonia that does not react will pass through the HRSG and out of the stack. The SCR system will reduce NO_X concentrations to 2.0 parts per million dry volume (ppmvd) at 15 percent oxygen (O_2) (natural gas firing with and without duct firing), 6.0 ppmvd at 15 percent O_2 (ultra-low-sulfur light distillate oil firing without duct firing) and 8.0 ppmvd at 15 percent O_2 (ultra-low-sulfur light distillate oil firing with duct firing) with an average ammonia slip of 5 parts per million (ppm) or less for both fuels.

The carbon monoxide (CO) emissions from the combustion turbine unit will be reduced using an oxidation catalyst (also referred to as a CO catalyst). Exhaust gases from the turbine are passed over a catalyst bed where excess air oxidizes the CO to carbon dioxide (CO_2). The oxidation catalyst system will reduce CO concentrations to 2.0 ppmvd at 15 percent O_2 (natural gas firing with and without duct firing), 2 ppmvd at 15 percent O_2 (ultra-low sulfur light distillate oil firing without duct firings) and 4.0 ppmvd at 15 percent O_2 (ultra-low-sulfur light distillate oil firing with duct firing).

Natural gas does not contain appreciable amounts of sulfur, so sulfur dioxide (SO_2) emissions will be at de minimis levels without additional controls.

Upon leaving the HRSG, turbine exhaust gases will be directed to the exhaust stack. The stack will be equipped with a Continuous Emissions Monitoring System (CEMS) to monitor the concentrations of NO_x, O_2, and CO. A monitoring system to measure ammonia slip will also be provided. The stack will have a platform to provide access to the monitoring equipment.

The CEMS measures and reports (in appropriate units) the emissions products/release rates of the plant in accordance with the requirements of applicable state and federal codes and standards. Alarms will be generated, printed and displayed on the CEMS monitor for high levels and exceedances for each monitored emission parameter. The CEMS will be designed as a stand-alone system with the capabilities to extract/condition the exhaust gas, transport it to the analyzers, perform the appropriate analysis, record the findings and generate the required reports and alarms.

The proposed Facility will incorporate data acquisition and control systems, which will optimize combustion performance. These same systems will minimize pollutant emissions through a combination of operator and software-driven process adjustments and notifications.

2.6 WATER USE/WASTEWATER GENERATION AND CHEMICALS

The Facility design minimizes both water supply and wastewater discharge requirements through use of an air-cooled condenser for main system cooling, a fin-fan cooler for auxiliary cooling and internal recycle/reuse of process wastewater. The proposed Facility's water supply requirements will typically range from approximately 63,360 gallons per day (gpd) (44 gallons per minute [gpm]) when firing natural gas to 648,000 gpd (450 gpm) when firing oil.

Table 2-2 provides a summary of the various operating scenarios with respect to Facility water use.

Table 2-2
Summary of Water Balance

Operating Condition	Turbine Load Condition (Percent)	Inlet Air Cooler (Fogger)	Water Supply (gpm)	Wastewater Discharge (gpm)	Evaporative Loss (gpm)
Average Annual Case	100	Off	60	50	10
Summer Natural Gas Fired Case	100	On	105	65	40
Winter Oil Fired Case	100	Off	450	175	275

Notes: gpm = gallons per minute; 1 gpm equals 1,440 gpd.

General features of the proposed design are as follows:

- The primary and auxiliary cooling systems are air-cooled and therefore do not require water for system operation and do not generate wastewater.

- Sanitary wastewater, averaging 2 gpm, will be either returned to the municipal waste treatment plant, or discharged to an on-site septic system.

- Site stormwater runoff will be collected and conveyed to an on-site detention basin. Stormwater from secondary containment basins will be visually inspected prior to release to the stormwater collection system (i.e., operated on an inspect and release basis).

Water to support the proposed Facility will be obtained from the City of Middletown Sewage Treatment Plant via a new pipeline. Wastewater from the Facility will be returned to the City of Middletown Sewage Treatment Plant headworks or to the sewage treatment plant outfall pipe in a second pipeline following the same routing as the supply line.

The grey water supply and return pipes from and to, the City of Middletown Sewage Treatment Plant will be co-located within existing rights of way along Route 6 and 17M.

Potable water will be provided through a connection to the municipal distribution system along Route 6 near the site. The on-site potable water and sanitary systems will consist of the following:

- Potable water distribution systems;
- Sanitary plumbing fixtures and drinking fountains;
- Emergency showers and eye wash stations; and
- Backflow prevention device(s).

The potable water system will be designed and constructed to provide potable water, both hot and cold, at the proper pressure, flow rate and temperature, to all plumbing fixtures and equipment listed above. Hot water heaters will be provided in addition to isolation valves, check valves, and balancing valves.

2.6.1 Demineralization Treatment System

Demineralized water is required for process water to prevent scale formation and minimize corrosion of internal system components. During initial startup after construction, demineralized water will be used for chemical cleaning, displacement flushes, and wet storage. During operations, demineralized water will be used for HRSG feedwater makeup (continuous), and on-line and off-line compressor cleaning operations (intermittent).

2.6.2 Chemical Feed Systems

A chemical feed system is needed to supply water-conditioning chemicals to the condensate system and the HRSG. The chemical feed system will consist of an oxygen scavenger injection subsystem and an amine injection subsystem. Each subsystem will be skid-mounted and consist of chemical solution tanks, solution mixers, pumps, piping, instrumentation and controls.

The oxygen scavenger subsystem will be used to minimize corrosion by reducing the dissolved oxygen levels in the condensate system. The oxygen scavenger injection rate will be automatically adjusted according to the level of dissolved oxygen in the condensate. The amine injection subsystem will be used to maintain a high pH level through the injection of amines (alkaline compounds) directly into the steam. Amine injection is used in many energy supply systems to prolong system life. Typical amines include morpholine, diethylaminoethanol, and cyclohexylamine. The neutralizing amine injection rate will be automatically adjusted according to condensate conductivity. The oxygen scavenger and neutralizing amine will each be shipped to the plant in 400-gallon totes.

2.6.3 Liquid Waste Streams

The liquid waste streams generated at the Facility will be low volume and will include HRSG blowdown, off-line compressor washwaters, building floor washwater and miscellaneous wastewater collected in the floor drain system (floor drains).

2.7 STORMWATER MANAGEMENT

A detailed discussion of the facility's stormwater management practices including soil erosion and sediment control, site grading and drainage, infiltration basin design, outfall locations, etc., is provided in Section 12.3, "Infrastructure". Draft Stormwater Pollution Prevention Plans (SWPPP) have been prepared for both construction and operation in compliance with all local stormwater and erosion and sediment control guidelines, and are included in this DEIS.

2.8 INSTRUMENTATION/CONTROL DEVICES

Instrumentation and control devices will be used to sense, indicate, transmit and control process variables as required for safe, efficient and reliable operation of the plant and its systems and components. A Distributed Control System (DCS) will be installed at the Facility to monitor the combustion turbine generator and the steam turbine generator and other associated equipment (i.e., gas compressors, boiler feed pumps, etc.). The DCS system will implement both closed and open loop control to bring the plant from cold start up, to the desired operating condition, and back to cold shutdown.

The DCS system will also be used to monitor, display and record process data received from field sensors and through communication links. This information will then be used for general process supervision, execution of plant equipment and performance calculations, historical record keeping/trending including sequence of events recording and diagnostics for management and maintenance of the plant.

Other process instrumentation and control devices include:

- Control valves;
- Flow instruments (venturies, orifice plates and averaging pitot tubes);

- Level instruments (level indicators, level switches and level transmitters);
- Pressure and differential Pressure Indicators (gauges and switches);
- Process analyzers; and
- Temperature instruments (indicators and sensors).

2.9 ELECTRIC TRANSMISSION INTERCONNECTION

The Project will interconnect to NYPA's 345-kilovolt (kV) transmission system. The Marcy South line is located less than 1 mile north of the Project Site. A combination of underground and overhead transmission line will be constructed between the Project's step up transformers and the NYPA transmission line. The transmission line contained within the Project site will be above ground. Once the transmission leaves the Project Site until just prior to the interconnection with NYPA, the transmission line will be overhead. A new switchyard will be located on the Project Site. A System Reliability Impact Study (SRIS), which includes analyses for thermal, voltage, short circuit and stability, will evaluate the impact of the new plant on the NYPA bulk power system and systems in Southeast New York. The study is currently being conducted in accordance with the New York Independent System Operator (NYISO) approved scope and will be provided to the NYISO for review and approval. Based on initial System Reliability and Impact Study, it is unlikely that the Project will have system impacts and therefore not require system reinforcements. Ongoing discussions with NYPA and the NYISO may yield modifications to the proposed interconnection facilities and routing.

The route for interconnecting to NYPA's Marcy South 345 kV Right-of-Way electric transmission system is via five overhead steel transmission monopoles on a 150 foot on-site wide right-of-way, before the line transitions onsite to an underground duct bank configuration near the intersection with Route 17M. The underground duct bank will be 4 feet wide, located in a 10 foot right-of-way, and will be located, off pavement primarily within the western drainage swale, within the right-of-way of NY Route 17M. The duct bank will terminate next to a riser pole, on, or next to NYPA's Marcy South transmission right-of-way, just north of the intersection of NY Routes 6 and 17M.

Figure 2-2 shows the approximate location of the proposed electric transmission line.

2.10 NATURAL GAS PIPELINE

CPV Valley will utilize clean burning natural gas as its primary source of fuel and will likely utilize a combination of firm and interruptible natural gas transportation to serve the natural gas supply requirements of the Facility. It is intended that that the gas supply and transportation portfolio developed to serve the Facility will minimize gas supply costs and provide high levels of reliability and operational flexibility. CPV Valley's primary upstream transportation path will be the FERC-regulated Millennium Pipeline, currently under construction, which is planned to be operational in late 2008. This upstream transportation path will be linked to the plant via one of two incremental service options currently the subject of on-going evaluation.

CPV Valley is reviewing two discrete options for gas transportation service to link the Facility to the Millennium system. Discussions with each of the two potential service providers, Millennium Pipeline ("Millennium") and Orange & Rockland ("O&R") are in the preliminary stages, and will continue through the development process to fully define the commercial options available to the proposed CPV Valley Energy Center. Both entities have provided initial indications of their ability to provide gas transportation service to CPV Valley Energy Center with the addition of certain facilities to tie the facility to the existing natural gas transportation grid. It is contemplated that any new natural gas pipeline lateral will be developed by the gas supplier under Article VII of the New York State Public Service Law or under the Section 7(c) certificate authority of the Federal Energy Regulatory Commission (FERC). The licensing of a natural gas pipeline lateral ultimately used to provide a natural gas supply to the Project is not part of this SEQRA review because, as an independent project, it will go through its own separate environmental review and approval process.

The two potential options include a direct interconnection with the Millennium system, which will also be the upstream transportation path for the CPV Valley Energy Center, via a new lateral pipeline from the Millennium system to the CPV Valley Energy Center, with an estimated length of 7 to 8 miles. The lateral would be built, owned and operated by Millennium Pipeline Company L.L.C., a FERC-regulated interstate pipeline company, and would be the subject of a separate FERC Section 7(c) permitting and environmental review process. The exact location and routing of the lateral will be determined by Millennium and approved by FERC as part of this process.

The second option for service to the facility is a connection to the O&R distribution system via a new lateral to the CPV Valley Energy Center. Preliminary discussions have indicated that the lateral would be 2 to 3 miles in length and would interconnect with a proposed O&R bulk transportation line that will originate at Minisink and terminate in New Hampton. As is the case with the Millennium option, the O&R lateral would be the subject of its own permitting and environmental review process, with location and final routing to be determined by O&R and approved by the appropriate regulatory agencies.

Due to the preliminary nature of these discussions, the commercial terms related to either of these options, such as service characteristics, operational flexibility and associated costs have yet to be determined or evaluated. CPV Valley LLC will be continuing discussions with both parties over the coming months to establish the most suitable transportation option. Once a service provider is selected, the commercial agreements necessary to support the development of the appropriate gas transportation infrastructure will be negotiated and associated permitting activities will be initiated.

Section 17.0 of this DEIS provides CPV's evaluation of the potential routing options for each natural gas transportation alternatives. As is indicated above, the final design, routing and alternative routings will be the responsibility of the transportation service provider selected and will be the subject of an independent permit review and approval process and, as such, may differ materially from those presented in Section 17.0.

2.11 SECURITY

Prior to commencement of construction, a comprehensive security plan will be developed and implemented. The perimeter of the Project Site will be secured with a chain link fence, sliding gates and surveillance equipment so as to permit only authorized access to the facility's service drive, structures and operations. One gate will provide access into the Project Site, thereby restricting access to this area. The gate will be locked during normal operations with access provided by facility personnel. Normal plant lighting and emergency temporary lighting will be provided throughout the facility. The site security will be controlled by the Facility's operators in the control room 24 hours per day, 7 days per week, and 365 days per year. All site security personnel will be equipped with communication equipment to maintain contact with construction and operations management personnel and/or the New York State Police and the New Hampton Fire, Rescue, and Emergency Services.

2.12 FIRE PROTECTION

A complete fire protection system, designed in accordance with NFPA Code 1, Code 850 and NFPA Code 30; Factory Mutual Data Sheets 7-10 and 504; the Town of Wawayanda Building Code; and the New York State Building Codes will be installed at the proposed facility. The fire water system capacity will be determined in accordance with the criteria in NFPA 850 and will be at least equal to the flow rate required for the largest single fire hazard.

The primary source of water for fire protection will be the 1,000,000 gallon raw water that contains a dedicated capacity of 500,000 gallons specific for the fire protection system. This dedicated on-site storage tank will minimize the potential impacts to the local water supply system. The raw water and fire protection storage tank will be built in accordance with industry standards and governmental regulation. During operations, the plant personnel will be trained as an on-site fire brigade, working cooperatively with the local fire department, to function as the first line of defense in the event of a fire at the plant.

2.13 SCHEDULE

It is expected that the environmental review, planning, preliminary engineering and community approvals will take place in the 2008-2009 timeframe. After receiving all approvals and financing, long lead equipment items will be ordered. Construction activities for the proposed project are anticipated to commence approximately spring of 2010. Online Facility operations are planned for the late spring/summer of 2012. Figure 2-11 provides the preliminary construction schedule for the Project.

3.0 LAND USE AND ZONING

3.1 INTRODUCTION

This section describes the proposed CPV Valley Energy Center's (Project or Facility) relationship to existing land uses, local zoning and development standards, and local and regional planning objectives in the Project area. Potential impacts that may be experienced by existing land uses within the Project vicinity during construction of the Project also are discussed. Mitigation, where practicable, has been identified to reduce the effect of potential impacts.

This assessment includes the following:

- An identification of land uses within a 1-mile radius of the Project site, and a qualitative and quantitative assessment of the Project's compatibility with those land uses;
- A review of the Project's consistency with local and regional planning goals; and
- A review of the Project's compliance with zoning requirements, setbacks, site development details, and local code requirements, appropriate to the zone and the type and scale of the development.

In addition, the following materials were developed as part of this assessment:

- An aerial orthophotograph of the site and Project area indicating existing land uses within a 1-mile radius (primary study area) of the Project site (Figure 3-1).
- A map of existing zoning districts within the Project's primary study area (Figure 3-2);
- A map of existing land uses within the Project's primary study area and secondary study area (5-mile radius) (Figures 3-3a and 3-3b);
- A map of publicly known proposed projects within Project's primary study area (Figure 3-4);
- A map of historic points, parks and recreation areas within the primary and secondary study areas (Figure 3-5);
- A map of community facilities within the primary and secondary study areas (Figure 3-6);
- A map of undeveloped parcels within a 1.5 mile radius of the Project site (Figure 3-7); and
- A map of other land management zones within the primary and secondary study areas (Figure 3-8).

The CPV Valley Energy Center would be located on an approximate 21.25-acre portion of the total 122 acres of site parcel in the northeast portion of the Town of Wawayanda proximate to the boundary with the City of Middletown. An additional 7.68 acres of land within the 122-acre site parcel would be temporarily used during construction for materials lay down, equipment storage, and construction parking. Figure 3-1 presents an aerial view of the proposed Project site illustrating the boundaries of the proposed development site and the relationship to existing area land uses.

3.2 APPLICABLE LAWS, REGULATIONS, AND POLICIES

The primary land use management law applicable to the Project is the Town of Wawayanda's Zoning Code (Chapter 195 of the Town Code), although several other chapters of the Town's Code include aspects that are applicable to land use, such as signs, setbacks, and landscaping requirements. Existing and proposed zoning laws are discussed in Section 3.5. A point by point analysis of consistency with the zoning law is also included in Section 3.5, along with similar analyses of other applicable chapters of the Town Code. The Project's location in Sewer District No. 1 means that the Project would be subject to the Town of Wawayanda's Sewer Code, also discussed in Section 3.5.

Other applicable laws and regulations include the State's Agricultural Districts Law and the SEQR regulations governing the designation of Critical Environmental Areas, both of which are discussed in Section 3.4.

3.3 LAND USE RESOURCES

3.3.1 Existing Land Uses

3.3.1.1 Project Site and Off-Site Interconnections

Figure 3-1 provides an aerial photograph showing the Project site and off-site electrical and water/wastewater supply interconnection corridors and surrounding land use. The Project site, which comprises 122 acres, is currently undeveloped land consisting of tracts used for agricultural purposes, including the growing of hay and corn crops, and wooded areas. Carpenter Creek traverses the northern extent of the site running in an east to west direction. Portions of the site have been identified as wetland areas. Topography generally slopes gently from Route 6 on the north to Interstate 84 on the south.

The Project site is located within the Town of Wawayanda's Manufacturing Industrial (MI) District, which permits electric generating facilities (under "other industrial uses") by special permit issued by the Town Planning Board. Figure 3-2 provides the Zoning Map for the Project site and vicinity.

The off-site electric transmission and water/wastewater lines will be located along and parallel to Route 17M to the northeast of the site. Land use on both sides of Route 17M is commercial. This area is zoned as Highway Commercial for the portion located in the Town of Wawayanda and General Business for the portion located in Middletown. Off-site portions of the water/wastewater lines will also be located along and parallel to Route 6 in the Town of Wawayanda. This area is zoned as Manufacturing Industrial and Highway Commercial.

3.3.1.2 Land Uses within 1-Mile of the Project Site

A 1-mile radius surrounding the proposed Facility location, herein referred to as the primary study area, was used to focus on the specific attributes of the community and neighboring land uses. The land area within the primary study area is within the Towns of Wawayanda and the City of Middletown. Figure 3-1 presents an aerial view of existing land use development within one-mile of the proposed Facility location. The land uses nearby and adjacent to the Project site are commercial, highway, undeveloped, cemetery, and residential.

The Town of Wawayanda is comprised of eight hamlets consisting of Slate Hill, Ridgebury, New Hampton, Millsburgh, South Centerville, Denton, Pellets Island, and Gardnerville. Portions of the CPV Valley Energy Center Site are located in Slate Hill and New Hampton. Adjacent towns/cities include Middletown to the north; Wallkill to the northeast and northwest, Warwick to the south; Goshen to the east; and Deerpark to the west. The Town is supported primarily by agricultural, commercial, residential, industrial, and business uses.

Figure 3-3a depicts land use from the Town of Wawayanda's Comprehensive Plan, and shows the following land uses within the primary study area: vacant, commercial, -industrial, residential, agricultural, community services, and public services. This figure also includes the land use from the City of Middletown Comprehensive Plan and shows the following land uses in the study area: vacant, utilities, commercial, professional/office, light industrial, mixed use, single-family residential, two-family residential, multi-family residential, community services, and parks/open space. Field surveys of the project area were conducted to verify and augment land use information contained in the Comprehensive Plans.

Below is a discussion of the existing land uses within a 1-mile radius of the proposed Facility location as shown on Figure 3-1.

Northeastern Quadrant

The northeastern quadrant of the 1-mile study area consists of developed and undeveloped commercial parcels, highway facilities, with some residential areas.

Route 6 runs adjacent to the Project site to the north. Land uses along Route 6 just north of the Project site consists of undeveloped commercial land and several residences on the north side of Route 6. There is a single residence located on the south side of Route 6 adjacent to the Project site.

Further north of Route 6 are residential neighborhoods along Kirbytown Road and Apple Lane in Wawayanda. North of Kirbytown Road is the City of Middletown. Land uses consist of wooded areas, the New York Power Authority's (NYPA) Transmission Right-of-Way, which contains above ground electric transmission lines and towers, and an abandoned railroad bed. Further north of the electric transmission lines, still in Middletown, are high density residential housing and apartment complexes.

Pine Hill Cemetery and Horizons at Wawayanda, a workforce housing complex currently under construction with some units completed and partially occupied, is located directly northeast of the Project site. Further east are vacant commercial properties, Route 17M, and an Interstate 84/Route 17M cloverleaf interchange (Exit 3). Along Route 17M to the northeast are primarily commercial land uses, including strip malls, food establishments, car dealerships, and other commercial establishments. There is a small residential area on Sunrise Park Road located off Route 17M to east.

To the northeast, but south of Dolsontown Road is open space and the site of a proposed business park. Further east, between the 1 mile and 2 mile radius, land uses become primarily forested or agricultural. To the northeast in Middletown between the 1 mile and 2 mile radius, land use is a mix of high density housing and commercial uses. The Orange-Rockland Utilities facility is located off Dolson Avenue to the northeast. Approximately 1.5 miles northeast of the Project site on Dolsontown Road, is agricultural land that was the location of the previously approved Wawayanda Energy Center, a 530-megawatt natural gas fired combined cycle electric generating plant which was approved under Article X of the New York State Public Service Law as Case 00-F-1256 on October 22, 2002. That approved project was cancelled, by the developer Calpine in 2005.

Northwestern Quadrant

The northwestern quadrant of the 1-mile study area consists of developed and undeveloped commercial parcels, open land, and single family residential areas.

Route 6 continues northwest of the Project site. Immediately northwest of the Project site is commercial undeveloped land, and further west is another undeveloped parcel which is the proposed location of an industrial park. Single family residences abut Kirbytown Road in the Town of Wawayanda. North of Kirbytown Road runs an abandoned railroad bed and the NYPA right-of-way and electric transmission lines and towers. Further north in Middletown are senior apartments on Uhlig Road, a trucking company, and high density residential housing and apartment complexes. The Ben and Paula Amchir Park, a small local playground, is located about 1 mile to the north, in Middletown.

Further northwest between the 1 mile and 2 mile radius, land use is mostly rural, with forested ridges and agricultural use predominating in Wawayanda and Wallkill. Land use in Middletown is higher density residential.

Southwestern Quadrant

The southwestern quadrant of the 1-mile study area consists of developed and undeveloped commercial uses, light industrial uses, open land, agricultural land, and limited low density residential areas.

Immediately west of the Project site contains the parcel for the proposed industrial park mentioned above. Interstate 84 runs directly south and west of the Project site. Route 6 also runs south and then west of the site. A large New York State Transportation Department facility is located off Route 6. Several commercial and light industrial land uses are located along Route 6 further west. South of Route 6, land uses are agriculture, with several single family residences.

Southeastern Quadrant

The southeastern quadrant of the 1-mile study area consists primarily of open, forested, and agricultural land use, with some lower density residential areas.

Interstate 84 runs directly southeast of the Project site. Beyond Interstate 84 is open undeveloped and agricultural land. Further south, residences are located along Bates Gates Road and an adjacent nearby road. A few residences are located along County Route 56.

Further east lies Route 17M in the Hamlet of New Hampton, which consists primarily of commercial land uses on both sides.

3.3.1.3 Publicly Known Proposed Land Uses within Primary Study Area

There are eight (8) proposed development projects being planned or under construction in the immediate Project area that were identified by the Town of Wawayanda or the Orange County Planning Department. Figure 3-4 shows the location of the projects, which are summarized below:

- The proposed Concrete Properties/Panattoni Development will be located on the northwestern side of Route 6 across from the Project site. This proposed project is approximately 0.20 miles from the Project site. This project consists of a warehouse/ industrial facility (two buildings totaling 747,240 square feet) located on the northwest side of Route 6 at Pine Lane.
- Horizons at Wawayanda is a 106 dwelling unit, workforce housing development located on Route 6 adjacent to the Project site. This project is approximately 0.40 miles from the Project site. Construction at this site is completed, some units are already occupied, and additional applications are being accepted for occupancy.
- Simon Business Park consists of 9 commercial lots of 2 to 3 acres in size located on the south side of Dolsontown Road, east of Caskey Lane. This proposed project is approximately 1.10 miles from the Project site.
- Brookfield Resource Management consists of an 80,000 square foot commercial recycling center located on the north side of Dolsontown Road east of Route 17M. This proposed project is approximately 1.30 miles from the Project site.
- Sterling Parc of Middletown, LLC is a 192-dwelling unit townhouse residential development located on County Road 108 just west of Route 17M in Middletown. This proposed project is approximately 0.70 miles from the Project site.
- Sutton Hills Apartments – Phase II is a 116-dwelling unit apartment development located off of County Road 108, west of Route 17M in the City of Middletown. This proposed project is approximately 0.90 miles from the Project site.

- Howard Shapiro consists of a 62-unit, single-family subdivision located off of County Road 56, south and east of Route 6 in Wawayanda. This proposed project is approximately 0.75 miles from the Project site.

- Razzano Commercial is a 23,000 square foot retail development located at the intersection of Route 6 and Ridgebury Hill Road in Wawayanda. This proposed project is approximately 1.50 miles from the Project site.

The Concrete Properties/Panattoni Development, Simon Business Park, Brookfield Resource Management and Razzano Commercial Development are representative of the relatively fast pace of commercial and industrial growth near the Interstate 84/New York Route 17M interchange.

Horizons at Wawayanda is a project built with a combination of private and public funding to provide affordable housing for Orange County's working families at below market rates. Horizons at Wawayanda was constructed on a formerly vacant parcel adjacent to the cemetery.

Regarding future development potential on the site, no future development potential other than the proposed Project in known.

3.3.1.4 Recreational Facilities, Preschools, Schools and Hospitals within the Primary and Secondary Study Area

Recreational Facilities

An inventory and analysis of recreational resources including public parks and recreation areas, nearby historic sites, nature preserves and golf courses that might be affected by the construction or operation of the Project and associated interconnections within the primary study area (1-mile radius) and secondary study area (5-mile radius) was conducted. Figure 3-5 shows the location of these resources relative to the Project site. These recreational facilities are also listed in Table 3-1.

Table 3-1
Historic Sites, Parks, Golf Courses, Public Nature Preserves and Conservation Easements in the Primary and Secondary Study Areas

Name of Facility	City	Distance (mi) from Project Site
Historic Sites		
Webb Horton House	Middletown	1.97
Hillside Cemetery	Middletown	2.02
Dunning House	Wawayanda	2.07
Primitive Baptist Church of Brookfield	Slate Hill	2.27
Paramount Theatre	Middletown	2.42
Oliver Avenue Bridge	Middletown	2.89
Sawyer Farmhouse	Goshen vicinity	4.11
Parks		
Ben and Paula Amchir Park	Middletown	0.98
Heritage Trail - Proposed	Wawayanda	1.84

Table 3-1 Historic Sites, Parks, Golf Courses, Public Nature Preserves and Conservation Easements in the Primary and Secondary Study Areas		
Name of Facility	**City**	**Distance (mi) from Project Site**
Maple Hill Park	Middletown	2.11
Shannen Park	Slate Hill/Wawayanda	2.70
City Park	Walkill	2.90
Francher-Davidge Park	Middletown	2.98
Watts-Memorial Park	Middletown	3.58
City Park	Middletown	4.18
Golf Courses		
Orange County Golf Course	Middletown	3.50
Public Nature Preserves		
Hunter Farm Preserve	Wawayanda	2.30
Orange County Audubon Sanctuary	Goshen	4.60
Conservation Easements		
Mt Orange Easement	Wawayanda	2.50
Orange County Farmland	Goshen	4.70
Bike Trail		
NYS Rt 17 Bike Trail	Wawayanda	0.10

Historic Sites

There are no historic sites within 1.0 mile of the Project site. The closest historic site is approximately 1.97 miles from the Project site.

Webb Horton House (H1) – A historic building on South Street in the City of Middletown, approximately 2.0 miles north of the Project site. The Webb Horton House is a 40-room mansion listed on the National Register of Historic Places that is currently part of Orange County Community College.

Hillside Cemetery (H2) – A historic cemetery located on Mulberry Street in Middletown, approximately 2.0 miles north of the Project site. The cemetery was designed by Calvert Vaux, later noted for his collaboration on Central Park with Frederick Law Olmsted, and opened in 1863. Many of Middletown's prominent citizens of the late 19th century were buried here. In 1994 it was added to the National Register of Historic Places.

Dunning House (H3) – This historic site is located on Ridgebury Road in Wawayanda and is 2.07 miles from the Project site. This historic building is a wooden house first built in the mid-18^{th} century and then renovated in the 19^{th} century and embodies a number of different architectural styles (Wikipedia, 2008).

Primitive Baptist Church of Brookfield (H4) – This historic site is located on NY 6 in Slate Hill and is 2.27 miles from the Project site. This historic building was built in 1792 and is one of the oldest extant church buildings in the county and one of the earliest buildings in the settlement that became Slate Hill (Wikipedia, 2008a).

Paramount Theatre (H5) – This historic site is located on South Street in Middletown and is 2.42 miles from the Project site. This theatre is a 1930s Art Deco movie theatre (HPT, 2008).

Oliver Avenue Bridge (H6) – Oliver Avenue in Middletown is 2.89 miles from the Project site. Information notes that this structure has been demolished (NRHP, 2008).

Sawyer Farmhouse (H7) – This historic site is located on Maple Avenue in the vicinity of Goshen and is 4.11 miles from the Project site. This historic farmhouse was built in the mid-18th century and added to the National Register of Historic Places in 2005 (Wikipedia, 2008b).

Parks

The closest park is approximately 1.0 mile from the Project site.

Ben and Paula Amchir Park (P1) – This is a small local park (approximately 1.5 acres) in Middletown, approximately 1.0 mile north of the Project site.

The Orange Heritage Trail (P2) – A National Recreation Trail approximately 0.9 mile east of the Project site (0.6 mile east of the electrical interconnection). The Orange Heritage Trail is a paved multi-use trail running from Middletown to Monroe along an old railroad bed. The portion closest to the site is not yet constructed.

Maple Hill Park (P3) – This park is located in Middletown approximately 2.11 miles from the Project site. The park area covers approximately 18.75 acres (Middletown RPD, 2008).

Shannen Park (P4) – This park is located in Slate Hill/Wawayanda approximately 2.70 miles from the Project site.

City Park (P5) – This City park is located in Wallkill approximately 2.90 miles from the Project site.

Francher-Davidge Park (P6) – This park is located in Middletown approximately 2-98 miles from the Project site. The park area covers approximately 112.0 acres (Middletown RPD, 2008).

Watts-Memorial Park (P7) – This park is located in Middletown approximately 3.58 miles from the Project site. The park area covers approximately 17.59 acres (Middletown RPD, 2008).

City Park (P8) – This City park is located in Middletown approximately 4.18 miles from the Project site.

Golf Course

There are no golf courses within 1.0 mile of the Project site. The closest golf course is approximately 3.50 miles from the Project site.

Orange County Golf Club (G1) – This 18 hole golf club that was founded in 1899 is located in Middletown and is 3.50 miles from the Project site. This golf club is located at the halfway point between the City of Middletown and the Village of Goshen in an area that was historically known as Midway Park (OCGC, 2008).

Public Nature Preserves

There are no public nature preserves within 1.0 mile of the Project site. The closest public nature preserve is approximately 2.3 miles from the Project site.

Hunter Farm Preserve (O1) – This public nature preserve is located in Wawayanda and is 2.3 miles from the Project site. This preserve was the first purchase of the Orange County Land Trust and is a 60-acre preserve of open, rolling fields, woodlands, and two ponds which is open to the public year-round for walking, photography, birdwatching and fishing (OCLT, 2008).

Orange County Audubon Sanctuary (O3) – This sanctuary is a nature preserve that is located in Goshen and is 4.6 miles from the Project site. This sanctuary is a refuge for wildlife, an important natural water table recharge site, and a place for advancement of knowledge of ecology and environment (ASOC, 2008).

Conservation Easements

There are no conservation easements within 1.0 mile of the Project site. The closest conservation easement is approximately 2.5 miles from the Project site.

Mount Orange Easement (O2) – This conservation easement is adjacent to the Hunter Farm Preserve and is 2.5 miles from the Project site. The easement protects 25 acres of woodlands with intermittent woodland seeps, providing important habitat for the wood thrush and rose breated grosbeak as well the delicate springcress wildflower (OCLT, 2008a).

Orange County Farmland (O4) – This property is a conservation easement that is located in Goshen and is 4.7 miles from the Project site.

Bike Trail

New York State Bike Route 17 – This on-road long distance bicycle route includes the portion of Route 6 that forms the eastern and northern boundary of the site. Bike Route 17 roughly parallels the New York State Route 17/Interstate 86 corridor. It reaches from Lake Erie to the Hudson Valley and is approximately 435 miles long.

Schools

There are no preschools or schools within 1-mile of the Project site. The closest school is approximately 1.34 miles from the Project site.

An inventory and analysis of schools, including preschools, that might be affected by the construction or operation of the Project and interconnections within the primary study area (1-mile radius) and secondary study area (5-mile radius) was conducted. Figure 3-6 shows the location of the schools relative to the Project site. The preschools are listed in Table 3-2 and schools in Table 3-3.

Table 3-2
Preschools in the Primary and Secondary Study Areas

Name of Facility	City/Town	Distance (mi) from Project Site
Peter Pan Nursery School	Middletown	1.37
George Robin Preschool	Middletown	2.16
Field of Dreams Preschool	Slate Hill	2.45
Hilltop Childrens Center	Middletown	2.66
Gymboree Play Music	Middletown	2.85

Preschools within the primary and secondary study area are described below.

Peter Pan Nursery School of Middletown (PS1) - This preschool is located on Karen Drive in Middletown, New York and is 1.37 miles from the Project site. The preschool offers education for children ages 3-5 with full or ½ day academic sessions Monday –Friday (SP, 2008).

George Robin Preschool (PS2) – This preschool is located on Mt. Hope Road in Middletown and is 2.16 miles from the Project site. This preschool offers child day care services (Manta, 2008).

Field of Dreams Preschool (PS3) – This preschool is located on Guinea Hill Road in Slate Hill and is 2.45 miles from the Project site. This preschool offers structured and fun preschool activities (FDP, 2008).

Hilltop Childrens Center (PS4) – This preschool is located on Dorothea Dix Drive in Middletown and is 2.66 miles from the Project site. This preschool offers child day care services (Manta, 2008a).

Gymboree Play & Music (PS5) – This preschool and daycare is located on Highland Avenue in Middletown and is 2.85 miles from the Project site. This preschool offers preschool, daycare, instrumental music instruction and child development programs (Uticaod, 2008).

Table 3-3
Schools in the Primary and Secondary Study Areas

Name of Facility	City	Distance (mi) from Project Site
Our Lady of Mount Carmel School	Walkill	1.34
Truman Moon Elementary School	Middletown	1.86
Orange County Community College	Middletown	1.87
Maple Hill Elementary	Wallkill	2.54
Monhagen Middle School	Wallkill	2.67
BOCES Site	Middletown	2.75
Middletown Christian School	Middletown	2.94
Memorial Elementary School	Middletown	3.01
Montessori New Beginnings	Middletown	3.07
St Joseph's School	Middletown	3.21
Twin Towers Middle School	Middletown	3.28
Chorley Elementary School	Middletown	3.37
Mechanicstown Elementary School	Middletown	3.42
Middletown Senior High School	Middletown	3.60
Minisink Valley High School	Slate Hill/Wawayanda	4.16
Minisink Valley Intermediate School	Slate Hill/Wawayanda	4.38
Minisink Valley Elementary School	Slate Hill/Wawayanda	4.44
Minisink Valley Middle school	Slate Hill/Wawayanda	4.57
BOCES	Goshen	4.86
BOCES	Goshen	5.00

Schools within the primary and secondary study areas are described below.

Our Lady of Mount Carmel School (S1) – This school is located on Wawayanda Avenue in Middletown, New York and is 1.34 miles from the Project site. This private school has grades PK-8 and has approximately 230 students (GS, 2008).

Truman Moon Elementary School (S2) – This school is located on Bedford Avenue in Middletown, New York and is 1.86 miles from the Project site. This public school has grades K-1 and has approximately 554 students (GS, 2008a).

Orange County Community College (S3 – S7) - This college is located on South Street in Middletown, New York and the campus is 1.87- 2.04 miles from the Project site. The college, founded in 1950, was the first count-sponsored community college in the State University of New York system. (OCCC, 2008).

Maple Hill Elementary (S8) – This school is located on County Route 78 in Wallkill and is 2.54 miles from the Project site. This public primary school has grades 2-5 and has approximately 1,158 students (PSR, 2008).

Monhagen Middle School (S9) – This school is located on County Route 78 in Wallkill and is 2.67 miles from the Project site. This public middle school has grades 6-8 and has approximately 821 students (PSR, 2008).

BOCES Site (S10) – This is a Board of Cooperative Educational Services site that is part of a regional educational service provider in New York State which functions as an extension of local school districts (OU BOCES, 2008). This BOCES site is located in Middletown and is 2.75 miles from the Project site.

Middletown Christian School (S11) – This school is located on Highland Avenue in Middletown and is 2.94 miles from the Project site. This private school offers Preschool, Kindergarten and grades 1-8 (MCS, 2008).

Memorial Elementary School (S12) – This school is also known as the Memorial Education Center, is located on Linden Avenue in Middletown and is 3.01 miles from the Project site. This public school offers Prekindergarten and has approximately 144 students (PSR, 2008).

Montessori New Beginnings (S13) – This school is located in Middletown and is 3.07 miles from the Project site. This private school offers Preschool, Pre-K, and grades K-2 (NB, 2008).

St Joseph's School (S14) – This school is located on Cottage Street in Middletown and is 3.21 miles from the Project site. This private school has grades PK-8 and has approximately 245 students (GS, 2008b).

Twin Towers Middle School (S15) – This school is located on Grand Avenue in Middletown and is 3.28 miles from the Project site. This public school has grades 6-8 and has approximately 826 students (PSR, 2008).

Chorley Elementary School (S16) – This school is located in Middletown and is 3.37 miles from the Project site. This public elementary school has grades k-1 (School District of Middletown, 2008).

Mechanicstown Elementary School (S17) – This school is located on East Main Street in Middletown and is 3.42 miles from the Project site. This public school has grades 3-5 and has approximately 644 students (PSR, 2008).

Middletown Senior High School (S18) – This school is located on Gardner Avenue in Middletown and is 3.60 miles from the Project site. This public high school has grades 9-12 and has approximately 1745 students (PSR, 2008).

Minisink Valley High School (S19) – This school is located on Route 6 in Slate Hill/Wawayanda and is 4.16 miles from the Project site. This public high school has grades 9-12 and has approximately 1343 students (PSR, 2008).

Minisink Valley Intermediate School (S20) – This school is located on Route 6 in Slate Hill/Wawayanda and is 4.38 miles from the Project site. This public intermediate school has grades 3-5 and has approximately 914 students (PSR, 2008).

Minisink Valley Elementary School (S21) – This school is located on Route 6 in Slate Hill/Wawayanda and is 4.44 miles from the Project site. This public elementary school has grades K-2 and has approximately 626 students (PSR, 2008).

Minisink Valley Middle School (S22) – This school is located on Route 6 in Slate Hill/Wawayanda and is 4.57 miles from the Project site. This public middle school has grades 6-8 and has approximately 1116 students (PSR, 2008).

BOCES (S23) – This is a Board of Cooperative Educational Services site that is part of a regional educational service provider in New York State which functions as an extension of local school districts (OU BOCES, 2008). This BOCES site is located in Goshen and is 4.86 miles from the Project site.

BOCES (S24) – This is a Board of Cooperative Educational Services site that is part of a regional educational service provider in New York State which functions as an extension of local school districts (OU BOCES, 2008). This BOCES site is located in Goshen and is 5.00 miles from the Project site.

Hospitals

There are no hospitals within 1-mile of the Project site. The closest hospital is approximately 1.30 miles from the Project site.

An inventory and analysis of hospitals that might be affected by the construction or operation of the Project and interconnections within the primary study area (1-mile radius) and secondary study area (5-mile radius) was conducted. Figure 3-6 shows the location of these hospitals relative to the Project site. These hospitals are also listed in Table 3-4.

Table 3-4
Hospitals in the Primary and Secondary Study Areas

Name of Facility	City	Distance (mi) from Project Site
Mid-Hudson Forensic Psychiatric Center	New Hampton	1.30
Middletown Psychiatric Center	Middletown	2.60
Horton Hospital	Middletown	2.69
Orange Regional Medical Center	Middletown	2.69
Valley Columbia Heart Center	Middletown	3.34
The Workplace of St. Francis Hospital	Middletown	4.07

Hospitals within the primary and secondary study areas are described below.

Mid-Hudson Forensic Psychiatric Center (H1) – This facility is located on Route 17M in the hamlet of New Hampton, New York and is 1.30 miles from the Project site. The facility is a secure adult psychiatric center that provides a comprehensive program of evaluation, treatment, and rehabilitation for patients admitted by court order (NYSOMH, 2008).

Middletown Psychiatric Center (H2) – This facility is located on Dorothea Dix Drive in Middletown and is 2.60 miles from the Project site. This facility is an accredited, adult psychiatric center serving Orange and Sullivan counties with inpatient units located in Tuckerman Hall and Outpatient and Residential Services throughout Orange and Sullivan counties (OMH, 2008).

Horton Hospital (H3) – This hospital is located on Prospect Avenue in Middletown and is 2.69 miles from the Project site. This private, acute care hospital is a short term hospital with 247 beds of which 227 are Adult and Pediatric and 20 are Intensive Care (Healthgrades, 2008). This hospital reports jointly with Orange Regional Medical Center (Healthgrades, 2008).

Orange Regional Medical Center, Horton Campus (H3) – This medical center is located on Prospect Avenue in Middletown and is 2.69 miles from the Project site. This medical center was formed by the merger of Arden Hill Hospital and Horton Medical Center and provides 450 beds (ORMC, 2008).

Valley Columbia Heart Center (H4) – This facility is located on East Main Street in Middletown and is 3.34 miles from the Project site. This facility has offices and clinics of medical doctors (Manta, 2008b).

The Workplace of St. Francis Hospital (H5) – This facility is located on East Main Street in Middletown and is 4.07 miles from the Project site. This facility meets occupational health needs of businesses and organizations in the area and is staffed by trained and skilled clinicians who help employers maintain regulatory compliance with OSHA, PESH, DOT, and the Americans with Disabilities Act (ADA) (SFHHC, 2008).

3.3.1.5 Undeveloped Land Use within 1.5 Miles of Project

Ninety-one parcels appear to be undeveloped within a 1.5 mile radius of the Project site (ESRI, 2008; Orange County GIS, 2008). These parcels are shown on Figure 3-7. The undeveloped parcels are those that appear to have no permanent structures. There are 71 parcels in the Town of Wawayanda (1576.75 acres), 12 parcels in Walkill (162.84 acres), and 8 parcels in the City of Middletown (159.07 acres). The total area of the undeveloped parcels is 1,898.66 acres.

3.3.2 Potential Impacts and Mitigation

3.3.2.1 Energy Center

Construction of the CPV Valley Energy Center would result in development of currently vacant land and the siting of an energy facility at an area bounded by an interstate highway (Interstate

84) and New York State roadways (Route 6, Route 17M). It is also adjacent to a clover-leaf exit of Interstate 84 with Route 17M. Approximately 21.25 acres of land formerly used for agriculture would be converted to energy production/utility use. Land acreage used temporarily during construction of the Facility for materials lay down, equipment storage, and parking is in close proximity to the Facility location and consists of approximately 5.6 acres of open field, 1.4 acres of meadow and 1.3 acres of woods.

Operation of the Facility would be compatible with existing and proposed land uses within the 1-mile radius study area, as well as the broader region. To be compatible with an existing land use the Project would need to avoid, or minimize impairments to that land use, including avoiding adverse effects with regard to air quality, water resources, noise, traffic and transportation, visual resources, community facilities and natural resources. The following summary, which relies on the conclusions of various sections of this DEIS, evaluates overall compatibility of construction and operation of the Project with existing land uses

3.3.2.2 Air Quality Impacts

Construction Impacts

Construction-related emissions can be classified into two distinct sources: criteria pollutant emissions from private and construction vehicle internal combustion engines; and fugitive dust that results from vehicle movement over paved and unpaved roads, as well as activities associated with material handling, earth moving/grading, etc. Criteria pollutant emissions from construction equipment will not reach levels that would cause impacts to adjacent and nearby land uses (see Section 9.0 "Air Quality" for more information on criteria pollutant emissions from construction). Fugitive dust from construction projects general comes from heavy construction equipment operation such as grading and transporting loads over dry disturbed areas. Heavy construction activities represented by earth movement during site preparation would occur over a two to three month period. Steel erection would occur over a six month period. As the nearest residence is located about 1900 feet from the center of the Project site, there would be minimal impacts related to fugitive dust emissions.

Operational Impacts

Impacts to the environment in terms of air quality are calculated in terms of air pollutant concentrations at receptor points, which were determined for the study area around the proposed CPV Valley Energy Center. As detailed in the air quality impact analysis included as Section 9.0 of this DEIS, the maximum predicted air quality impacts from the Project are below Significant Impact levels (SILs) established by the United States Environmental Protection Agency (EPA) for CO, NO_x, and SO_2. Air quality impacts for PM_{10} when firing natural gas are also below the SILs. Maximum predicted Project impacts in cases when ultra low sulfur distillate oil is fired in the combustion turbines exceed the 24-hour SIL for PM_{10} at limited points on the modeling receptor grid. However, cumulative impact modeling of the proposed facility along with other facilities demonstrates that predicted concentrations at all locations, including community facilities, would be below the State and National Ambient Air Quality Standard (NAAQS) (see Section 9.0 "Air Quality") for PM_{10} for the limited hours (less than equivalent of 720 hours annually) oil could be used.

Given the demonstrated compliance with the Ambient Air quality Standards, air emissions from the Facility will have no impact on adjacent land uses.

Mitigation Measures

Several measures would be employed during construction activities to ensure that dust emissions are kept low. These include keeping construction vehicle speeds low to reduce dust suspension; covering exposed stockpiles of soil and gravel to eliminate wind-driven dust suspension, or as an alternate, minimizing the height of these piles; the periodic washing of paved surfaces during dry periods as a means to suppress dust suspension; and the application of water on stockpiles and unpaved roads during dry periods as a means to suppress dust suspension. Based on the limited expected duration of heavy construction activities, the good maintenance of the construction vehicles, the use of previously stated measures to control dust suspension, and the distance of the construction area from the nearest residences, air quality-related construction impacts are not expected to impact nearby land uses.

3.3.2.3 Water Use and Quality Impacts

Construction Impacts

Construction activities have the potential to affect nearby land uses through increased stormwater runoff, erosion, or sedimentation of surface waters. Erosion and sediment control measures would be installed prior to beginning other land disturbances and would not be removed until the disturbed land areas are stabilized. The soil erosion and sediment control plan procedures described in Section 13.0 will insure that construction phase runoff impacts are minimized. A description of the spill prevention and control measures to be implemented at the Project site during construction to prevent stormwater contamination is provided in Section 12.0 "Infrastructure." Due to the use of appropriate mitigation measures, no impacts to nearby land uses are expected due to water quality concerns.

Operational Impacts

Potable water will be brought to the Project site area via a lateral from the Town public supply main extension along Route 6. Approximately 2,880 gallons per day (gpd) of potable water will be required. Process grey water would be brought to the site from the Middletown Wastewater Treatment Plant (WWTP) through construction of an underground pipeline along Route 17M. The Facility's operational water supply requirements would typically range from 64,000 gallons per day (gpd) to 613,000 gpd depending on ambient temperature (i.e., summer vs. winter operating conditions) and type of fuel used (i.e., natural gas or low sulfur distillate). The proposed Facility would result in minimal additional demand for potable water from the Middletown Water Supply system given the use of air cooled condensers and gray water. The ability of nearby residential, industrial or commercial customers to meet their water requirements will not be adversely impacted by the Facility operation.

The Project is also considering use of an onsite ground water well for water supply as an alternative. This alternative is further discussed in Section 19.0 of this DEIS.

3.3.2.4 Noise Impacts

Construction Impacts

Construction noise, if excessive, can impact nearby land uses by causing distractions, interruptions, or irritation to residents or workers in nearby areas. Noise is generated during construction primarily from diesel engines which power the equipment. Exhaust noise usually is the predominant source of diesel engine noise, which is the reason that functional mufflers would be maintained on all equipment. The Project currently anticipates construction during primarily daytime hours. Calculations of anticipated construction noise levels are provided in Section 10.0 of the DEIS and are shown to be well below existing daytime Leq noise levels at all receptors, and as such, no significant impact to nearby land uses is expected due to construction of the Project.

Operational Impacts

Operation of the proposed Facility would not result in any significant adverse noise impacts. As shown in Table 10-5, the maximum increase in noise levels at any sensitive receptor location, even during the quietest hours of the night, would be 4 decibels A-weighted (dBA) (see Section 10.0, "Noise" for definition of terms). This is below the New York State Department of Environmental Conservation's 6 dBA criteria for significance. Of the locations studied as part of noise modeling, only two residential locations had an increase over existing late night noise levels with the other locations having no increase (refer to Section 10, Table 10-5). An increase of only two dBA is calculated for the bordering industrial park, which is not considered to be noise sensitive. In addition, operation of the proposed Facility would comply with the Town of Wawayanda Noise standards. Accordingly, significant noise impacts to adjacent land uses would not occur as a result of the operation of the CPV Valley Energy Center.

3.3.2.5 Traffic Impacts

Construction Impacts

Depending on location and type of access roads, major construction projects have the potential to impact nearby land uses by causing increases in the amount and type of local traffic and/or disruption to traffic flow. A detailed traffic report estimating construction related traffic impacts from the Project is discussed in Section 8.0. The Project site is served by three major highways - Interstate 84, Route 6, and State Route 17M. Using Routes 6 and 17M, the site is readily accessible from Interstate 84 without traversing residential or other low traffic areas. The increase in construction related traffic will be temporary in nature and is not expected to significantly affect nearby land uses.

Operational Impacts

Operation of the proposed Facility would not adversely impact traffic conditions in the vicinity of the Project site. The proposed Facility would contribute a small number of vehicle trips to the local roadway network. The Facility would have, typically, 8 to 10 persons on duty during any one shift. During Facility operation, it is anticipated that there would be a maximum of 20 vehicle trips during the morning and evening peak hour periods. The addition of these vehicle trips would not impact traffic flow or result in a significant increase traffic conditions throughout the study area. The results of the detailed traffic impact analysis conducted for the Project are summarized in Section 8.0, “Traffic and Transportation”.

3.3.2.6 Visual Impacts

Construction Impacts

The nature and degree of visual change during construction of the Facility is anticipated to be minimal. Construction of the Project and various interconnections would take place over an approximately 24-month period. Potential visibility of the construction site would be limited to the ground level until building structural erection occurs. The construction areas would be visible primarily from the surrounding highways. After several months of site preparation and foundation construction, steel erection would begin. The maximum visibility at that point would come from cranes on the site and would be similar in scale to operational related impacts. Although construction activities may be visible from the roads and nearby areas, no significant impacts are expected on nearby land uses due to visibility related considerations.

Operation Impacts

Components of the Facility would be visible from certain locations within the primary study area which currently have direct views of the Project site. It is expected that only a limited number of residences, those with open views of the existing Project site, would have some views of the Project once constructed. The visibility of the Facility would not hamper the ability of the public and private facilities in the Project area to continue to operate. Of the land uses present in the primary study area, only two areas are intended for passive recreation or enjoyment of the natural environment. No significant impact is expected on the recreational experiences of these areas.

Mitigation Measures

The Project facility and stack height have been carefully designed to minimize visual intrusion to the surrounding land uses. Section 5.0 of this DEIS summarizes the visual mitigation techniques considered and implemented in the Facility design, including facility siting, layout, and placement within the 122 acre site; building and stack profile downsizing to the extent possible; building appearance incorporating color, and material treatment; site grading and landscaping; and lighting. The Project’s landscaping and layout will fully comply with the Town’s buffer and setback requirements.

3.3.2.7 Electrical Interconnect

Construction Impacts

The preferred route for interconnecting to NYPA’s Marcy South 345 kV Right of Way electric transmission system, less than one half mile to the north of the Project site, is via five overhead steel transmission monopoles on a 150 foot on-site wide right-of-way, before the line transitions onsite to an underground duct bank configuration near the intersection with Route 17M. The duct bank will terminate next to a riser pole, on, or next to NYPA's Marcy South transmission right of way, just north of the intersection of NY Routes 6 and 17M.

Off site construction trenching activities of the underground electrical conduit will be relatively short in duration and would not be expected to result in significant adverse impacts to nearby land uses due to their temporary nature.

Construction of the electrical interconnect would result in development of currently vacant land and commercial land to industrial/utility use. Impacts associated with the construction of the approximate 0.9 mile utility interconnect easement would include conversion of approximately 2.32 acres of beech-maple mesic forest and 0.92 acres of red maple-hardwood swamp to non-forested, maintained communities within a 130 foot wide permanent right-of-way. There would be 3.24 acres of wooded land converted to utility use. A total of approximately 3.24 acres would be affected by construction of the electrical interconnect on site. A total of approximately 1,450 feet of underground electrical interconnect would be installed offsite mainly in the roadway of Route 17M south of and then north of its intersection with Route 6.

Operational Impacts

The operational footprint of the electrical interconnect, beyond what is already accounted for in the CPV Valley Energy Center footprint, would consist of 3.24 acres of formerly wooded land.

Operation of the electrical interconnect would be compatible with existing and proposed land uses within the 1-mile radius study area, as well as the broader region. Operation of the proposed on-site interconnections would not result in any significant impacts to air quality, water use or quality, noise, or traffic. The primary impact for the electrical interconnect would be visual.

The transmission line structures are expected to be approximately 120 to 130 feet high. Based on the existing transmission towers in the immediate Project area that are 125 feet tall, significant visual impacts are not anticipated to occur as a result of the siting of the proposed electric transmission line across Route 17M. Views of the new electric transmission lines are expected to be similar to the existing transmission towers and electric transmission lines in the vicinity.

Mitigation Measures

Due to the minimal nature of impacts to nearby land uses, no specific mitigation measures are suggested for the electrical interconnect.

3.3.2.8 Water/Wastewater Line Impacts

Construction Impacts

Construction of the potable water line will be within Route 6 and interconnect to the potable waterline that is to be extended for another nearby development. The grey water supply and return pipes from and to, the Middletown WWTP will be collocated within existing rights of way along Route 6 and 17M. The grey water pipes will travel past the NYPA ROW and cross Route

17M at juncture of Route 6 and proceed up Route 17M to Dolsontown Road and follow an existing force main corridor to the north and east.

Off site construction activities of the water/wastewater lines will be relatively short in duration and would not be expected to result in significant adverse impacts to nearby land uses due to their temporary nature.

Approximately 500 feet of a mix of woods and open field at the Project site and approximately 400 feet of previously undeveloped land offsite immediately north of Dolsontown Road would be affected by construction.

Operational Impacts

Operational impacts along 17M would be minimal, as the water/wastewater lines would be underground facilities and the above ground land cover would revert to their original condition. The only permanent operational impact would be the conversion of approximately 400 feet of previously undeveloped land to a cleared right-of-way in the stretch of the water/wastewater lines running north and east from Dolsontown Road.

Mitigation Measures

Due to the minimal nature of impacts to nearby land uses, no specific mitigation measures are suggested for water/wastewater lines.

3.3.2.9 Publicly Known Proposed Land Use Developments in Primary Study Area

A discussion of publicly known proposed land use developments in the primary study area was presented in Section 3.3.1.3. Figure 3-4 shows the location of projects. Potential construction and operational impacts related to the Project are discussed below.

The Concrete Properties/Panattoni Development, Simon Business Park, Brookfield Resource Management and Razzano Commercial Development are consistent uses with the proposed Project and representative of the relatively fast pace of commercial and industrial growth near the Interstate 84/New York Route 17M interchange.

The workforce housing project, Horizons at Wawayanda, would be buffered from the Project by a combination of landscaped and wooded open space on both properties. Given the proximity to the Project site, this development will have some views of the Facility and electric transmission lines that run to the south of this complex. However, the Facility and electric transmission lines are being designed and sited to minimize and soften the views from this location. Visual impacts and mitigation are discussed in 5.0 of the DEIS. Noise impacts to this property comply with local and state standards and are discussed in Section 10.0.

Sterling Parc at Middletown, Sutton Hills Apartments, and Howard Shapiro Development may have some limited views of the Facility stack. However, to the extent there are views of the Facility, viewsheds toward the site from these locations already contain manmade features including commercial buildings, electric transmission lines, roads, and signage. The limited views of the Facility from these receptor points would not result in a significantly new modification to the landscape given the distance of these developments from the Project site. Visual impacts and mitigation are discussed in 5.0 of the DEIS. Construction activities are not expected to have noticeable impacts with regard to noise and traffic due to distance from the Project location.

3.3.2.10 Recreational Facilities, Preschools, Schools and Hospitals within the Primary and Secondary Study Area

Recreational Facilities

An inventory and analysis of recreational resources including public parks and recreation areas, nearby historic sites, nature preserves and golf courses that might be affected by the construction or operation of the Project and interconnections within the primary study area (1-mile radius) and secondary study area (5-mile radius) was presented in Section 3.3.1.4. Figure 3-5 shows the location of these resources relative to the Project site. Potential construction and operational impacts on these resources related to the Project are discussed below. Section 5.0, Visual Resources and Aesthetics, addresses the potential visual impacts of the Project to recreational and historic sites within a 5-mile radius of the Project site.

Historic Sites

Primitive Baptist Church of Brookfield (H4) – Construction activities are not expected to have noticeable impacts at this location with regard to noise and traffic due to distance from the Project location. Based on the visual impact assessment, the stacks cannot be seen from this location during leaf-on conditions. There may be some limited views of the stacks during leaf-off conditions at this location.

The other historic sites which are all located in the secondary study area are not expected to have views of the Project due to the existing topography, vegetation, existing structures, and the distance and location from the Project. Construction activities are not expected to have any impacts with regard to noise and traffic due to distance from the Project location.

Bike Trail

New York State Bike Route 17 – Site construction activities may result in minor impacts on bike route users with respect to noise and traffic in the section of the bike route that is in proximity to the Project. These impacts would be relatively short in duration and would not be expected to result in significant adverse impacts due to their temporary nature. Views of the Facility during operations from the bike route are likely in the portion that is in proximity to the eastern most boundary of the site.

Parks

The visual impact analysis indicated that identified parks in the secondary study area are not expected to have views of the Project due to distance, topography, vegetation, and location from the Project. Construction activities are not expected to have noticeable impacts with regard to noise and traffic due to distance from the Project location.

Golf Course

Orange County Golf Club (G1) – The visual impact analysis shows that the Project will not be visible from the golf club. Construction activities are not expected to have noticeable impacts with regard to noise and traffic due to distance from the Project location.

Public Nature Preserves

Hunter Farm Preserve (O1) *and Orange County Audubon Sanctuary* (O3) – The visual impact analysis shows that the Project will not be visible from the preserve or sanctuary. Construction activities are not expected to have noticeable impacts with regard to noise and traffic due to distance from the Project location.

Conservation Easements

Mount Orange Easement (O2) *and Orange County Farmland* (O4) – The visual impact analysis shows that the Project will not be visible from the easement or farmland. Construction activities are not expected to have noticeable impacts with regard to noise and traffic due to distance from the Project location.

Schools

An inventory and analysis of preschools and schools that might be affected by the construction or operation of the Project and interconnections within the primary study area (1-mile radius) and secondary study area (5-mile radius) was presented in Section 3.3.1.4. Figure 3-6 shows the location of these resources relative to the Project site. Potential construction and operational impacts on these resources related to the Project are discussed below. As detailed in the air quality impact analysis included as Section 9.0 of this DEIS, the proposed Facility fully complies with State and National Ambient Air Quality Standards (NAAQS). Further, maximum modeled concentrations at all school locations located within five miles from the proposed Facility would be well below the United States Environmental Protection Agency (EPA) defined Significant Impact Levels (SILs) for all criteria emissions.

Our Lady of Mount Carmel School (S1) – This school is the closest school to the Project site, located about 1.3 miles from the site. Due to existing topography, vegetation, structures, and distance from the Project site, views of the Facility from this school are unlikely. Construction activities are not expected to have noticeable impacts with regard to noise and traffic due to distance from the Project location.

Truman Moon Elementary School (S2) – Based on the visual impact analysis, there would be no views of the Facility from this location due to the distance from the site, topography, vegetation, and existing structures. Construction activities are not expected to have noticeable impacts with regard to noise and traffic due to distance from the Project location.

The other preschools and schools which are all located in the secondary study area are not expected to have views of the Facility due to the existing topography, vegetation, existing structures, and distance and location from the Project. This is based on the viewshed analysis prepared as part of the Visual Assessment presented in Section 5.0 of this DEIS. Construction activities are not expected to have noticeable impacts with regard to noise and traffic due to distance from the Project location.

Hospitals

An inventory and analysis of hospitals that might be affected by the construction or operation of the Project and interconnections within the primary study area (1-mile radius) and secondary study area (5-mile radius) was presented in Section 3.3.1.4. Figure 3-6 shows the location of these resources relative to the Project site. As detailed in the air quality impact analysis included as Section 9.0 of this DEIS, the proposed Facility would not have a significant air quality impact and would fully comply with State and National Ambient Air Quality Standards (NAAQS). Further, maximum modeled concentrations at all locations, including all hospitals located within five miles from the proposed Facility, would be well below the United States Environmental Protection Agency (EPA) defined Significant Impact Levels (SILs) for all criteria emissions.

In addition, the hospitals, which are all located in the secondary study area, are not expected to have views of the Facility due to the existing topography, vegetation, existing structures, and distance and location from the Project. Construction activities are not expected to have noticeable impacts with regard to noise and traffic due to distance from the Project location.

3.3.2.11 Undeveloped Land Use within 1.5 Miles of Project

Construction activities may result in limited increases in noise and traffic for undeveloped land that is in proximity to the Project site; however, these impacts would be relatively short in duration and would not be expected to result in significant adverse impacts due to their temporary nature. For undeveloped land at further distances from the Project area, construction activities are not expected to have noticeable impacts with regard to noise and traffic due to distance from the Project location.

During Project operation, partial views of the Project is likely for undeveloped land parcels in proximity to the Project Site.

3.3.2.12 Summary of Impacts and Mitigation

The proposed CPV Valley Energy Center, which is an allowed Special Permitted Use within the MI District, would serve a vital public need by improving system reliability and providing additional electric power to the lower Hudson Valley communities. The proposed Facility would comply with the substantive requirements of the Town of Wawayanda Zoning Code, with the exception of exceeding the maximum height requirement, due to engineering design and air quality control considerations. The Facility would comply with the Town noise standards. It would not result in adverse impacts to nearby properties or existing or proposed land uses. The Project's operation would not adversely affect the health, safety and welfare of the Town's residents or result in a significant change in the overall character or environmental conditions of the surrounding neighborhood or nearby land uses.

3.4 PUBLIC POLICY

This section provides an assessment of the compatibility of the Facility with the Town of Wawayanda Final Comprehensive Plan and the Orange County Comprehensive Plan.

3.4.1 Comprehensive Plans

Wawayanda Comprehensive Plan, Adopted August, 2006

The Town of Wawayanda Final Comprehensive Plan was adopted in August, 2006. It places emphasis on appropriate economic development together with preservation and protection of natural and community resources. The plan sets forth environmental, cultural, and agricultural priorities. For purposes of land use planning, the Town of Wawayanda is divided into proposed zoning areas in a pending, but unapproved Zoning Revision. For the purposes of this study, Chapter 195, the Zoning Code of the Town of Wawayanda, as amended through September, 2007 was used.

With respect to industrial development, the Wawayanda Final Comprehensive Plan seeks to channel commercial and industrial uses into designated zones.

The site, being large, vacant and near the exit of an Interstate Highway is the type of location sought out by “big box” retail developers. If not used for the proposed Project, developers may seek to develop such retail use in the near future.

While the Comprehensive Plan contemplates the site as being part of a “Mixed Commercial” district, its proximity to the noise and traffic of both Interstate 84 and Route 17M will limit its use to ones similar to the CPV Valley Energy Center or large retail users.

The Town of Wawayanda Final Comprehensive Plan centers around four major themes: promoting economic development and diversity, maintaining and supporting Wawayanda’s rural character, protecting natural resources and open space, and cultivating a sense of community. The Project’s site would aid in economic development and diversity by broadening the community’s revenue base and creating stable new jobs in the energy industry. The siting of the Project allows economic development without threatening the goals of the other themes in the Town’s plan.

One of the recommendations in the Town’s plan is to balance commercial and industrial growth in the town’s three school districts. The Project is located in the Minisink Valley Central School District. The Minisink Valley School District currently has only 11 percent of its taxes coming from non residential sources, as compared with 38 percent (Goshen School District) and 48 percent (Middletown School District) for the other districts. The CPV Valley Energy Center will help expand the non-residential tax base in the local school district.

Orange County Comprehensive Plan: Strategies for Quality Communities, Adopted April 11, 2003

The Orange County Comprehensive Plan, *Strategies for Quality Communities* (Orange County Department of Planning, 2003) applies primarily to county and municipal land acquisitions, improvements, or capital projects, but the plan does include a land use plan for managing and directing growth. The land use plan organizes development by designating priority growth areas; establishing county-wide, community, and neighborhood centers; transportations hubs; interchanges; crossroads; and corridors.

The *Strategies for Quality Communities* primary guiding strategy builds from the "Urban-Rural Concept" from the 1987 County Comprehensive Plan that anticipated future development trends and defined land use priorities. This Orange County Comprehensive Plan continues to recognize the importance of the role of historic communities while adding new considerations for transportation hubs, interchanges, crossroads and corridors linking these with historic centers. Together these land use components are called "priority growth areas."

The Project site is located in a priority growth area near the County Center of Middletown, at a designated Interchange of the intersection of Interstate 84 and New York Route 17M on a roadway corridor designated for Intensive Business Development. Interchange areas in the Plan are described as key locations for development given their immediate Interstate highway accessibility and thus are supportive of major land use facilities including regional retail centers or industrial, business or office parks.

The vision for quality presented in the Plan includes implementing strategies that enhance the quality of the built environment while protecting natural environments. Strategies and priorities for industrial/office parks include encouraging property owners to make the lands ready for economic development projects by conducting environmental reviews that lead to generic environmental approval; promoting well planned economic development projects to create job opportunities; encouraging development of well-designed industrial and office parks that provide attractive settings for business; and encouraging municipalities to support coordinated economic development through preparation of overall business park plans that can be implemented incrementally.

The proposed Facility is compatible with the qualities and strategies conveyed in the Plan. The availability of reliable energy will contribute to the promotion of other industrial growth that is aligned with the Plan concepts.

Orange County Open Space Plan

The Orange County Open Space Plan (Orange County, 2004) is a formal supplement of the Orange County Comprehensive Plan. The Orange County Open Space Plan is designed to define the uniqueness and environmental characteristics of the County as they relate to quality of life, define future open space needs, and recommend County and other priority actions needed to protect key open spaces.

The Orange County Open Space Plan also addresses areas of concern that include better management of development patterns providing guarantees that land development location and design is compatible with open space needs, and that the future of agriculture includes supporting farmland protection efforts that complement lead efforts to support economic, business vitality of agriculture. Development design that complements open space can result in environmental protection and mitigation that is less costly, more efficient infrastructure and capital investment, and increased real estate values where neighborhoods/communities are close to open spaces.

The Project is compatible with concern of placement of development and open space needs in the Project locale.

Orange County Farmland Protection Plan

Orange County adopted an Agricultural and Farmland Protection Plan in 1996 and became the first county to adopt such a plan in the state. The plan was updated (Orange County Agricultural Economic Development Strategy) and accepted by the Orange County Legislature in 2004 and provided County agencies and organizations direction and specific strategies that enable them to effectively address critical issues relating to agriculture in Orange County. The plan identifies and assesses specific strategies, programs, and action projects that encourage agricultural economic development and also foster protection of the County's most strategic farmland. The plan is intended to be modified over time to meet evolving needs.

The Project is compatible with this plan in that the Project will be located in an area that is more appropriate for industrial growth.

Economic Trends and Impacts in Orange County Agriculture

Economic Trends and Impacts of the Agriculture Industry in Orange County, N.Y. (Orange County, 2008) is a section of the *Orange County New York Agricultural Economic Development Strategy* that was accepted by the Orange County Legislature and the Orange County Farmland Protection Board in February 2004. Data from several different sources were assembled to provide a complete picture of the agriculture industry in Orange County. Topics addressed included land use patterns, farm characteristics, agriculture commodity output, farm costs and returns, economic impact of Orange County's agriculture sector, and agricultural service, wholesale, and retail sections. This document noted that although there has been a decline in the dairy sector, the agricultural industry has been transformed from a dairy-commodity industry to an industry capitalizing on its urbanization by producing high-valued agricultural products such as vegetables and greenhouse and nursery products.

This Project would help promote industrial growth in an appropriate area.

3.4.2 Additional Management Zones and Districts

This section identifies and evaluates additional management zones and districts located within a 5-mile radius of the Project, including groundwater management zones, agricultural districts, Wild, Scenic and Recreation Corridors, flood zones; and critical environmental areas Figure 3-3b and 3-8 shows the location of the identified zones referenced herein.

3.4.2.1 Groundwater Management Zones

The Federal Safe Drinking Water Act of 1974 established a program to designate sole source aquifers – zones where groundwater serves as the only source of potable water supply. The Project is not located within an U.S. Environmental Protection Agency designated Sole Source Aquifer.

New York State has acted in several ways to protect groundwater. In order to enhance regulatory protection in areas where groundwater resources are most productive and most vulnerable, the State Department of Health, in 1980, identified eighteen Primary Water Supply Aquifers (also referred to simply as Primary Aquifers) across the state. These are defined in the Division of Water Technical & Operational Guidance Series (TOGS) 2.1.3 as "highly productive aquifers presently utilized as sources of water supply by major municipal water supply systems." The Project site is not within a designated Primary Aquifer.

Another category listed in TOGS 2.1.3 is Principal Aquifers. These are "aquifers known to be highly productive or whose geology suggests abundant potential water supply, but which are not intensively used as sources of water supply by major municipal systems at the present time." The western portion of the Project site is located above an unconsolidated aquifer rated for wells of 10 to 100 gallons per minute that is considered a Principal Aquifer.

Map 2-23 of the Orange County Groundwater Resources Study (Orange County Water Authority, 1995) shows that the area near the confluence of the two tributaries to Monhagen Brook on the property is identified as a favorable location for targeting a high-yield bedrock well.

As discussed in more detail in the Zoning section, the Town of Wawayanda has also established two overlay zones for the purpose of ground water supply protection. The two overlay zones are described as follows:

- Water Supply Protection Overlay Zone (W-1 Overlay Zone) – This zone generally consists of the consolidated or unconsolidated groundwater aquifer dedicated to municipal water supply and the immediate, contiguous areas which drain directly into the aquifer area.
- Watershed Protection Overlay Zone (W-2 Overlay Zone) – This zone generally consists of the remaining land that contributes surface water runoff to the aquifer and the W-1 Overlay Zone.

The Project site is within the W-2 Overlay Zone. The W-2 Overlay Zone prohibits certain uses and contains more restrictive stormwater runoff provisions than the underlying MI zoning district. The W-2 Overlay Zone prohibits the disposal of snow containing deicing salts/chemicals, solid waste, petroleum, radioactive material, hazardous substance, hazardous waste, or non-sewage wastewater into or onto land or a surface water body. Also prohibited is surface land application of septage, sludge, or human excreta and stockpiling of coal, deicing compounds, or artificial fertilizers.

The proposed use of the site is permissible in the W-2 Overlay Zone, subject to the requirements of Section 195-21. The Project as proposed complies with the applicable provisions of the W-2 Overlay Zone.

The Facility's proposed on-site natural gas and electric interconnections would be wholly located within the MI zoning district and W-2 Overlay Zone and are consistent with existing zoning.

The secondary study area has areas noted as public watersheds and wellhead protection areas (see Figure 3-3b) from the Orange County Open Space Plan (Orange County, 2004) that are in the Towns of Walkill and Mount Hope northwest of the proposed Project site. These areas are sufficiently removed from the Facility site so as to not have any potential for impacts.

Overall, the Project is not expected to affect ground water supply or quality as the preferred alternative will be using treated effluent from the Middletown publicly owned treatment works (POTW) for its process water needs and will only have a small amount of potable water needs, which will be provided from the municipal water system. The Project will develop a Spill Prevention Control and Countermeasure Plan to ensure that state and or local designated groundwater resources are not affected by construction or operation of the proposed Project.

3.4.2.2 Agricultural Districts

The western portion of the Project site is a parcel included in Orange County's Agricultural District #2. New York's 1971 Agricultural Districts Law protects and promotes the availability of land for farming purposes.

Agricultural districts provide a right to farm within the district and limit unreasonable local regulation on farm practices and affect public agencies' ability to acquire or modify farmland through eminent domain or publicly funded development. The Agricultural Districts Law provides for reduced property tax bills for land in agricultural production by limiting the assessment of such land to its prescribed agricultural assessment value.

For this Project, it is expected that all or a portion of the parcel would be converted to non-agricultural use. If farmland which has received an agricultural assessment is converted to a non-agricultural use (within five years of last receiving an agricultural assessment if located in an agricultural district and within eight years if located outside an agricultural district), a payment to recapture the taxes forgone for converting such land will be imposed.

Payments for the conversion of agricultural land to a nonagricultural use are added to the taxes levied upon the land so converted. A payment for conversion will be equal to five times the taxes saved in the most recent year that the land received an agricultural assessment. In addition, interest of 6 percent per year compounded annually will be added to the payment amount for each year that the land received an agricultural assessment, not exceeding five years. When only a portion of a parcel is converted, the assessor apportions the assessment and determines the tax savings attributable to the converted portion. The payment for conversion of the portion of the parcel is then computed.

3.4.2.3 Monhagen Brook Flood Plain

No portion of the Project will occupy any portion of the 100-year or 500-year floodplain of Monhagen Brook.

3.4.2.4 Wild, Scenic and Recreation Corridors

New York State Bike Route 17 is a designated recreational route running along the boundary of the property on U.S. Route 6. Bike Route 17 is an on-road long distance bicycle route that runs east-west across the state and through 10 counties. The Project is not expected to affect the experience of recreational bikers on State Bike Route 17.

A portion of the Orange Heritage Trail, a National Recreational Trail is proposed within the 5-mile study area of the Project site. The proposed Project, given the physical separation, will not affect users of the Orange Heritage Trail.

No portion of the Project is within a designated wild or scenic corridor. The Town's Comprehensive Plan Recommendation Map identifies County Route 12 running south from Denton as a possible scenic route within the study area. The Project is not expected to impact the scenic qualities of this route.

3.4.2.5 Critical Environmental Areas

No portion of the Project site proper is located within a State Environmental Qualify Review Act SEQRA designated Critical Environmental Area (CEA). Portions of the Town of Wawayanda's Ridge Preservation Areas are located within the Project's 1- and 5-mile study areas. The Ridge Preservation Area (a designated CEA) is designated as land with an elevation over 600 feet. The nearest portion of the CEA is located just west of the property, on the far side of where U.S. Route 6 crosses Interstate 84.

To be designated as a CEA, an area must have an exceptional or unique character with respect to one or more of the following: a benefit or threat to human health; a natural setting (e.g., fish and wildlife habitat, forest and vegetation, open space and areas of important aesthetic or scenic quality); agricultural, social, cultural, historic, archaeological, recreational, or educational values; or an inherent ecological, geological or hydrological sensitivity to change in character. To protect a CEA, the Town's Comprehensive Plan suggests creating a ridgeline overlay and slope protection to limit new development on steep slopes which can increase stormwater runoff and compromise the aesthetic qualities of the Wawayanda's rural character. The Facility potential impacts to the CEA will be limited to visual considerations associated with the exhaust stack.

3.4.2.6 National Natural Landmarks

No National Natural Landmarks are located in Orange County.

3.4.2.7 Scenic Areas of Statewide Significance

No Scenic Areas of Statewide Significance (SASS) areas are located within the primary and secondary study areas. The nearest SASS is the Hudson Highlands SASS located approximately 21 miles east of the Project site, near West Point and Bear Mountain State Park.

3.4.2.8 Existing Economic Development Zones

Information on existing economic development zones for Orange County in general and the Town of Wawayanda and the City of Middletown specifically is presented below.

The Orange County Comprehensive Plan – Strategies for Quality Communities has recommended actions that include use of the county's land resources that are appropriate for economic development in order to provide strategically located sites for new businesses (Orange County, 2003). Further recommendations include keeping an updated inventory of countywide sites that are in approved business parks that are available for differing types of development and encouragement of organizations such as the Orange County Partnership and Orange County Industrial Development Agency to expand the inventory of land that is pre-approved for development through use of programs such as Build Now New York (Orange County, 2003). Orange County has areas that are designated "Priority Growth Areas" that are preferential for future development in order to maximize efficiency of infrastructure and services and also to minimize open space losses (Orange County, 2003). The City of Middletown and surroundings is such a "Priority Growth Area" given its proximity to interstate connections and availability of water and sewer. "Priority Growth Areas" can include historic cities, villages and hamlets and their immediate surroundings, where public infrastructure such as central water, sewer, and higher capacity roads exist, or could be efficiently extended to accommodate future growth (Orange County, 2003). Residential growth that has higher density and associated civic, commercial and industrial development is preferred in "Priority Growth Areas" (Orange County, 2003).

The Orange County Comprehensive Plan is based on an "urban-rural" growth concept which limits intensive growth to those areas around existing urban concentrations while leaving areas that are not near major highways or water and sewer services relatively free of denser development. The northeast section of Wawayanda extending southward from the City of Middletown is designated as a "Priority Growth Area" as described above (Town of Wawayanda, 2006a). This area extends in a southerly direction along 17M and U. S. Route 6 to the vicinity of its juncture with State Route 284 (Town of Wawayanda, 2006a). Wawayanda residents have expressed concern with high tax rates and to diversify the tax burden, the Town Board has formed an Economic Development Committee to facilitate bringing alternative sources of revenue to the Town with commercial development (Town of Wawayanda, 2006a). Existing commercial development in the town is relatively small with both highway commercial and town commercial districts located along the transportation corridors of State Route 6 and County Route 56 (Town of Wawayanda, 2006a). The town's manufacturing industrial and industrial office/research/business zones are primarily located on the perimeter of town, especially to the north, near Middletown, and to the east, with an additional area southwest of Slate Hill (Town of Wawayanda, 2006a). The Town of Wawayanda's Final Comprehensive Plan notes that the town's location at the intersection of Interstate 84 and Route 17M is excellent in terms of the vehicular accessibility and is a good location for office center development (Town of Wawayanda, 2006a). The Final Comprehensive Plan further notes that Wawayanda must continue to grow its commercial and industrial tax base and that economic growth makes it possible to grow the tax base without placing undesirable burdens on residential property owners (Town of Wawayanda, 2006a).

The economic base of the City of Middletown is derived from several sources: the downtown area, large scale shopping centers and strip commercial uses, industrial development, and institutional uses that include Orange County Community College and the Orange Regional Medical Center (City of Middletown, 2007). The city of Middletown economic regeneration has been aided by the formation of the Downtown Business Improvement District (BID) (City of Middletown, 2007) that is located approximately 1.5 miles northeast of the proposed Project site.

3.5 ZONING

3.5.1 Existing Conditions

3.5.1.1 Project Site

The 122-acre site is located within the Town's Manufacturing Industrial (MI) zone (see Figure 3-2). The intent of the MI zoning district is to provide areas for various industrial and manufacturing enterprises within well-planned complexes on parcels with good access to the regional transportation system, where they can be free of potentially incompatible land uses. Section 195-9 of the Zoning Code contains a list of prohibited uses. The proposed use of this site as an electric generating facility is not among those prohibited uses. The Schedule of Zoning District Regulations for the MI zoning district lists principal permitted uses, special uses, and accessory uses allowed within the zone. The only principal permitted uses in the zoning district are agriculture and minor wireless communications facilities. Among the special uses (uses requiring a Special Use Permit) is "other industrial uses," the category under which this Project would fall. Therefore, CPV Valley, LLC will seek to obtain a Special Use Permit from the Town of Wawayanda Town Board, as well as site plan approval from the Town Planning Board.

Additional details of the Zoning Code are discussed below in Section 3.5.2.1.

3.5.1.2 Surrounding Zoning Districts

Figure 3-2 is a map depicting the existing Town of Wawayanda zoning districts within the primary study area (within a 1-mile radius of the Project site).

Zoning districts within the primary study area include: Manufacturing Industrial (MI), Highway Commercial (HC), Exurban Residential (ER), Industrial Office/Research/Business (IORB), Suburban Residential (SR), and Agricultural Business (AB).

It is noteworthy that no portion of the Agricultural Residential (AR) zoning district, the Town's largest and most rural district, is within the primary study area. Also, the proposed site is not located directly adjacent to any residentially zoned area but is separated from residential areas by highways and commercially and industrially zoned areas.

The proposed Project is not expected to limit or effect permitting uses allowed under the designated zoning for adjacent parcels or within the primary study area.

3.5.1.3 Comprehensive Plan Recommended Zoning

The Town of Wawayanda's Final Comprehensive Plan includes a Plan Recommendations Map that depicts recommended changes to existing zoning. Although not specifically described in the text of the plan, the recommendations map appears to combine the existing MI and HC districts into a new Mixed Commercial (MC) zoning district. The map also eliminates the HC zoning district by merging it into the existing Town Commercial (TC) zoning district.

The Project site would be primarily within the new MC district. The Recommendations Map also shows small areas of proposed TC zoned area extended slightly into two of the Project's three land parcels. The comprehensive plan includes a caution that "the Plan Recommendations Map is generalized and is not meant to convey the specific boundaries of future zoning districts." If the TC zoning district upon adoption divides the parcel, the town's current zoning code permits the extension of activities permitted in one district to the other as a special use on divided lots (Chapter 195, Section 195-7 of the Zoning Code).

The comprehensive plan does not include descriptions of the intents of the new zoning areas; however, a draft zoning law seeking to implement many of the recommendations of the Comprehensive plan is currently under review. The draft zoning law states that the intent of the proposed MC district is "to provide the principal area of the Town for intensive non-residential development such as office, retail, service businesses and, light manufacturing." The draft "Allowable Use Table" lists "Essential Services/Utilities" as permissible with a special use permit in any zone. The Facility would be consistent with the uses associated with the proposed MC district.

3.5.2 Analysis of Consistency with Municipal Codes

3.5.2.1 Code of the Town of Wawayanda

This section discusses the Project's consistency with criteria relevant to issuance of local approvals such as the Site Plan and Special Use Permit approvals, as well as any variances required for the Project and the relevant standards for approval of such variances. Unless otherwise indicated, conformance with specific zoning criteria discussed below is determined in reference to the 122-acre property on which the site is located. CPV's compliance with the different elements of the code of Wawayanda is provided in italicized text following excerpts from the town code. Table 3-5 provides a summary of the Code requirements.

Table 3-5 Summary of Local Law Compliance		
Chapter/Section	**Section Title**	**Compliance**
Code of the Town of Wawayanda		
Chapter 54	**Building Construction, Maintenance and Fire Protection**	
54-4	Building permits	Full, permit from Town
54-5	Construction inpsections	Full
54-7	Certificates	Full
54-10	Operating permits	Full
Chapter 58	**Building, Numbering of**	
58-3	Determination of building to be numbered	Full
58-4	Designation of numbers; review of determination	Full
58-5	Duty of building owners	Full
58-6	Size and display of numbers	Full
58-7	Display of other numbers prohibited	Full
Chapter 82	**Electrical Standards and Inspections**	
82-7	Non-applicability	Full
Chapter 86	**Environmental Quality Review**	Full
Chapter 90	**Fees**	Full
Chapter 92	**Flood Damage Prevention**	Full
Chapter 138	**Sewers**	
138-2	General Purpose; application; Sewer District No. 1	Full
138-14	Connection to public sewer system required	Full, permit from Town
Article V	New Sewers or Sewer Extensions	Full, permit from Town
Article VI	Building Laterals, Street Laterals; Connections; Fees	Full, permit from Town
Article VII; 138-67	Inflow	Full, permit from Town
Article IX	Discharge Restrictions	Full
Article X	Discharge Permits and Pretreatment Requirements	Full
138-86	Wastewater discharge reports	Full
138-88	Wastewater discharge permit required for industrial users; discharge to storm Sewer	Full, permit from Town
138-89	Wastewater discharge permits	Full, permit from Town
138-90	Reporting requirements for permittees	Full
138-91	Flow equalization	Full
138-92	Monitoring stations	Full
138-96	Accidental discharges, SPCC Plan	Full
Chapter 142	**Signs**	
142-3	General standards	Full, permit from Town
142-5	Permitted signs	Full
142-6	Signs subject to permit approval	Full
142-9	Permit application; issuance; fees	Full
142-10	Security deposit	Full
Chapter 152	**Solid Waste**	
Article I	Garbage, Rubbish and Refuse	
152-3	Prohibited disposal	Full
152-4	Littering prohibited	Full
Article II	Waste Management	Full
Chapter 156	**Streets and Sidewalks**	
156-8	Applications; estimate; permit issuance	Full, permit from Town

Table 3-5 Summary of Local Law Compliance		
Chapter/Section	**Section Title**	**Compliance**
Chapter 180	**Vehicles and Traffic**	
180-9, 180-25	Trucks over certain weights excluded	Full
Chapter 189	**Water**	
189-3	Connection to public water supply system; activities not permitted; exceptions	Full, permit from Town
189-6	Service pipe and fixtures	Full
189-7	Alternative sources of water	Full
189-12	Installation of new water mains	Full
189-15	Specifications for new installations	Full
Chapter 190	**Water Pollution**	
190-1	Prohibited discharges; test samples	Full
Chapter 195	**Zoning**	
Article III	Establishment of Districts and Basic District Regulations	
195-8	Schedule of Zoning District Regulations	Full, permit from Town
195-9	Applicability of regulations; prohibited uses	Full
195-11	Height restrictions.	Full, special use exception from Town
195-13	Accessory structure and use standards	Full
Article IV	General Supplementary Regulations	
195-16	Parking, loading, access and traffic standards	Full
195-17	Floodplain development standards	Full
195-19	General commercial and industrial standards	Full
195-20	Landscaping, screening, ridge development and buffer regulations	Full
195-21	Water supply protection	Full
195-23	Stormwater Control	Full
Article VII	Special Use and Site Plan Review Procedures	
195-58	Application and site plan required	Full
195-66	Special use review criteria	Planning Board considerations for review

Chapter 54: Building Construction, Maintenance and Fire Protection

Chapter 54 provides for the administration and enforcement of the New York State Uniform Fire Prevention and Building Code (the Uniform Code) and the State Energy Conservation Construction Code (the Energy Code) in the Town of Wawayanda.

Section 54-4. Building permits. Building permits required. Except as otherwise provided in Subsection B of this section, a building permit shall be required for any work which must conform to the Uniform Code and/or the Energy Code, including, but not limited to, the construction, enlargement, alteration, improvement, removal, relocation or demolition of any building or structure or any portion thereof, and the installation of a solid-fuel-burning heating appliance, chimney or flue in any dwelling unit. No person shall commence any work for which a building permit is required without first having obtained a building permit from the Code Enforcement Officer.

Project construction and design will conform to the Uniform Code and Energy Code. Application will be made to the Code Enforcement Officer for a building permit in an *application containing the required documentation listed in Subsection D. No work will commence until CPV has obtained a building permit, and, once received, the permit will be visibly displayed at the work site in accordance with Subsection G until work has been completed. Should the 24 month time period during which a building permit is valid be insufficient to allow construction of the Project, a renewal will be obtained.*

Section 54-5. Construction inspection. Work to remain accessible and exposed. Work shall remain accessible and exposed until inspected and accepted by the Code Enforcement Officer or by an assistant authorized by the Code Enforcement Officer. The permit holder shall notify the Code Enforcement Officer when any element of work described in Subsection B of this section is ready for inspection.

Work will remain accessible and exposed until it is inspected. The Code Enforcement Officer will be notified when the elements of work listed in Subsection B are ready for inspection.

Section 54-7. Certificates. Certificates required. A certificate shall be required for any work which is the subject of a building permit and for all structure, buildings, or portions thereof which are converted from one use or occupancy classification or sub-classification to another. Permission to use or occupy a building or structure, or portion thereof, for which a building permit was previously issued shall be granted only by issuance of a certificate.

The Project's structures will not be used or occupied until an appropriate certificate has been issued by the Code Enforcement Officer.

Section 54-10. Operating permits. Operating permits required.

An operating permit will be applied for and obtained from the Code Enforcement Officer prior to commencing operation of the Project.

Chapter 58: Buildings, Numbering of Section 58-3. **Determination of building to be numbered.** The local Emergency 911 Coordinator or the Building Inspector is authorized to decide which building or buildings on any particular lot must be numbered.

Consultation will be conducted with both to determine which buildings should be numbered.

Section 58-4. Designation of numbers; review of determination. The local Emergency 911 Coordinator or, in the absence of the local Emergency 911 Coordinator, the Building Inspector is authorized to designate street numbers.

It is intended that the designated number will be accepted.

Section 58-5. Duty of building owners. Building owners are required to display the building number within 25 feet of the edge of the street of address.

This requirement will be complied with by installing a sign readable at night, at the entrance to the Project. The area around the sign will be landscaped.

Section 58-6. Size and display of numbers. Numbers must be at least 6 inches in height placed on a post or building at least 4 feet (but not more than 10 feet) from the ground, unobstructed and, wherever practicable, readily seen at night.

The Project will comply with this requirement.

Section 58-7. Display of other numbers prohibited. The display of any house number other than the authorized number is prohibited.

The Project will comply with this requirement.

Chapter 82: Electrical Standards and Inspections.

Chapter 82 regulates the manner in which electrical wiring is installed for light, heat, power and signal systems in the Town of Wawayanda. The Chapter requires electrical installations to conform to the requirements of the New York State Fire Prevention and Building Code and the National Electrical Code.

Section 82-7. Nonapplicability. The provisions of this Chapter shall not apply to the electrical installations in mines, ships, railway cars, cable television or automotive equipment or the installations or equipment employed by a railway, electrical or communications utility or cable television company in the exercise of its function as a utility or cable television company and located outdoors or in buildings used exclusively for that purpose. This chapter shall not apply to any work involved in the manufacture, assembly, testing or repair of electrical machinery, apparatus, materials and equipment by a person, firm or corporation engaged in electrical manufacturing as its principal business. It shall not apply to any building which owned or leased in its entirety by the United States government or the State of New York.

Electrical equipment servicing the plant falls under this non-applicability provision, whereas the Project's electric generating equipment does not. The Project will be constructed in compliance with applicable provisions of the New York State Fire Prevention and Building Code and the National Electrical Code.

Chapter 86. Environmental Quality Review.

This chapter sets forth the Town of Wawayanda's procedures for complying with the State Environmental Qualify Review Act (SEQRA). Section 86-9 requires the preparation of an environmental impact report for any project that may have a significant impact on the environment.

Since this Project is being processed under SEQRA, it will comply in all respects with this section.

Chapter 90. Fees.

This Chapter includes the Planning Board fees and Escrow Fee Schedule.

The appropriate fees and escrow fees will be included with the application.

Chapter 92. Flood Damage Prevention.

This Chapter regulates areas of special flood hazards (i.e., one hundred-year flood plains). Reference is made to such areas shown on official maps prepared by the Federal Emergency Management Agency.

The Project site is outside the floodplain and no Project buildings will lie within any floodplain areas. Therefore, the provisions of this Chapter do not apply.

Chapter 138. Sewers.

The purpose of this Chapter, also cited as the "Town of Wawayanda Sewer Use Code," is to provide for the maximum possible beneficial public use of the Town's wastewater facilities and to prevent public health problems through regulation of sewer construction, sewer use, wastewater treatment, and wastewater discharges.

Section 138-2. General Purpose; application; Sewer District No. 1.

Subsection C. The Town's Sewer District No. 1 utilizes the City of Middletown's wastewater treatment facilities. Construction within Sewer District No. 1 must also comply with the rules and regulations of the City of Middletown related to sewer uses.

A portion of the Project is located within Sewer District No. 1. CPV proposes to send wastewater to the Middletown POTW. The connection to the POTW will be detailed in the application. Applicable requirements of this Chapter concerning the connection to the Middletown's POTW are discussed below. Applicable requirements of Middletown's rules and regulations related to sewer user are discussed subsequent to Wawayanda's Code.

Section 138-14. Connection to public sewer system required. The owner of all houses, buildings, or property used for human occupancy, employment, recreation, or other purpose situated within a sewer district in the Town is hereby required at his/her/its expense to install sanitary sewer facilities therein and to connect such facilities directly to the appropriate public sewer collection system, provided that said public sewer is within 100 feet of the property line and is operational. Such a connection shall be in accordance with the provisions of this chapter as provided for herein.

A connection to the Middletown POTW is proposed in accordance with this provision, as applicable.

Article V. New Sewers or Sewer Extensions.

This Article contains Sections 138-28 through 138-41 and covers the proper design, approvals, fees, inspections, installation methods, testing and reporting requirements necessary for a new sewer or sewer extensions. In summary, new sewers must meet the Recommended Standards for Sewage Works, as adopted the requirements of NYSDEC. Plans must be submitted to and approvals received from the System Operator, the Town, the Orange County Health Department, and the NYSDEC before constructions. Design, construction, and testing methods must conform to specific requirements listed in the Article. The owner is responsible for all costs and expenses incident to installation and connection of the new sewers, as well as costs associated with review of the plans, and liability insurance coverage for construction.

Any new sewer facilities will be designed in accordance with the appropriate standards and requirements in this Article.

Article VI. Building Laterals; Street Laterals; Connections; Fees

This Article contains Sections 138-42 through 138-66 and covers required permits, siting, construction and design requirements for laterals and connections including materials and siting constraints. Additionally, sewer construction and connection must be provided by a contractor authorized to work within the sewer district.

Sewer system and laterals will be designed in accordance with the requirements of this Article and will use an authorized contractor for its construction.

Article VII. Inflow Section 138-67. New inflow sources prohibited. No connections shall be made to a sanitary or to a combined sewer which are intended to discharge inflow. Such prohibited connections include, but are not limited to, footing drains, roof leaders, roof drains, cellar drains, sump pumps, catch basins, uncontaminated cooling water discharges, or other sources of inflow. Stormwater and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as storm sewers, not sanitary sewers, or to a natural outlet approved by the Town. Industrial cooling water or unpolluted process water may be discharged, upon approval of the Town, to a storm sewer, not sanitary sewers, or natural outlet. Proposed dischargers of cooling water to waters of the state must apply for and obtain a State Pollutant Discharge Elimination System (SPDES) permit.

It will be insured that no discharges from prohibited sources will flow into sanitary sewers. Stormwater and cooling water discharges will be appropriately permitted. SPDES permit approvals, as required, will be obtained.

Article IX. Discharge Restrictions

This article contains Sections 138-76 through 138-85 and sets pretreatment standards, prohibits user contribution of any pollutant or wastewater that will interfere with performance of the POTW, and enumerates prohibited discharges through concentration limits and other means. Users discharging to the Town of Wawayanda's Sewer District No. 1 must also comply with the standards and requirements of the City of Middletown's pretreatment program.

The pretreatment standards identified in this section will be adopted to prevent prohibited discharges. The City of Middletown's pretreatment program will also be complied with.

Article X. Discharge Permits and Pretreatment Requirements.

Section 138-86. Wastewater discharge reports. As a means of determining compliance with this chapter, with applicable SPDES permit conditions, and with applicable state and federal law, each industrial user shall be required to notify the System Operator of any new or existing discharges to the POTW by submitting a completed industrial chemical survey (ICS) form and a completed industrial wastewater survey (IWS) form to the System Operator. The Town may require any user discharging wastewater into the POTW to file wastewater discharge reports and to supplement such reports as the System Operator deems necessary. All information shall be furnished by the user in complete cooperation with the System Operator.

The required wastewater discharge reports will be prepared and submitted when necessary.

Section 138-88 Wastewater discharge permit required for industrial users; discharge to storm sewer.

Subsection A. Wastewater discharges. No significant industrial user shall discharge wastewater to the POTW without having a valid wastewater discharge permit, issued by the Town pursuant to Section 138-89A. Significant industrial users shall comply fully with the terms and conditions of their permits in addition to the provisions of this chapter. Violation of a permit term or condition is deemed a violation of this chapter.

A wastewater discharge permit pursuant to this chapter will be applied for and received.

Subsection B. Significant industrial users. All significant industrial users proposing to connect to or to discharge to the POTW shall obtain a wastewater discharge permit before connecting to or discharging to the POTW. Existing significant industrial users shall make application for a wastewater discharge permit within 30 days after the effective date of this chapter and shall obtain such a permit within 90 days after making application.

A wastewater discharge permit pursuant to this chapter will be applied for and received.

Subsection C. Other industrial users. The Town may issue wastewater discharge permits to other industrial users of the POTW.

A wastewater discharge permit pursuant to this chapter will be applied for and received.

Subsection D. Discharge permits to storm sewers not authorized. The Town does not have the authority to issue permits for the discharge of any wastewater to a storm sewer. This authority rests with the New York State Department of Environmental Conservation (NYSDEC).

Should the Project design involve discharging wastewater to a storm sewer, the appropriate permit from the NYSDEC will be obtained.

Section 138-89. Wastewater discharge permits. Industrial users required to obtain a wastewater discharge permit shall complete and file an application in the form prescribed by the Town.

The wastewater discharge permit application will be completed in accordance with this section.

Section 138-90. Reporting requirements for permittees. This section details reporting requirements, including a baseline monitoring report, a ninety-day compliance report, periodic compliance reports and violation reports.

The reporting requirements of this section will be complied with.

Section 138-91. Flow equalization. No person shall cause the discharge of slugs to the POTW. Each person discharging, into the POTW, greater than 100,000 gallons per day or greater than 5% of the average daily flow in the POTW, whichever is less, shall install and maintain, on his property and at his expense, a suitable storage and flow control facility to insure equalization of flow over a twenty-four-hour period. The facility shall have a capacity for at least 50% of the daily discharge volume and shall be equipped with alarms and a rate of discharge controller, the regulation of which shall be directed by they System Operator in consultation with the Attorney for the Town. A wastewater discharge permit may be issued solely for flow equalization.

This provision will be complied with as applicable.

Section 138-9. Monitoring stations (control manholes).

Subsection A. All significant industrial users, and other industrial users whose industrial waste discharge has caused or may cause interference or pass-through, shall install and maintain a suitable monitoring station, on their premises at their expense, to facilitate the observation, sampling, and measurement of their industrial wastewater discharge.

Subsection B. If there is more than one street lateral serving an industrial user, the System Operator, in consultation with the Town Engineer, may require the installation of a control manhole on each lateral.

Subsection C. The System Operator may require that such monitoring station(s) include equipment for the continuous measurement and recording of wastewater flow rate and for the sampling of the wastewater. Such station(s) shall be accessibly and safely located, and the industrial user shall allow immediate access, without prior notice, to the station by the System Operator.

Should a monitoring station be necessary, CPV will comply with the provision of this section.

Section 138-96. Accidental discharges; SPCC Plan. Each user shall provide for protection from accidental or slug discharges of prohibited materials or discharges of materials in volume or concentration exceeding limitations of this chapter or of an industrial wastewater discharge permit. When required by the Town, detail plans and procedures to prevent accidental or slug discharges shall be submitted to the Town Board for approval. These plans and procedures shall be called a spill prevention, control, and countermeasure (SPCC) plan.

Protection will be provided from accidental discharges of slugs or prohibited materials, and, if required by the town, will provide an SPCC plan in accordance with the provisions of this chapter.

Chapter 142: Signs.

Section 142-3. General standards. No sign or other outdoor devices for the purpose of advertising of any kind may by erected or established in the town except in conformance with the standards in this section or elsewhere in this chapter.

A. All signs that are not permitted by Chapter 142 require a building permit and shall comply with this chapter and Chapter 54, Building Construction.

One construction sign is explicitly permitted under Section 142-5. One permanent sign is allowed with a special permit under Section 142-6. The Project will include several construction signs and a permanent sign, thus requiring approvals under both sections.

B. Signs erected near a street intersection must not cause a traffic hazard. Signs may not be erected at any location so as to interfere with, obstruct or be confused with an authorized traffic sign.

It is proposed that no sign be erected in the vicinity of any street intersection, except traffic signs if directed by Town of Wawayanda. The sign at the site entrance will not cause a traffic hazard or any interference with any authorized traffic sign. Temporary signs utilized during construction will be prepared in consultation with and with approval by the Town to ensure that the signs do not interfere with, mislead or confuse traffic.

C. No sign may be erected or placed above the maximum roofline of a building.

The Project will comply with this requirement.

D. Any freestanding sign may not exceed 20 feet in height.

Freestanding signs will comply with this requirement.

E. Signs must be set back at least 10 feet from the property line.

The Project's signs will comply with this requirement.

H. Illumination of signs may not be intermittent or varying and may not produce glare beyond the property line.

The Project will comply with this requirement.

I. Signs with moving parts are prohibited.

The Project will comply with this requirement.

J. Signs projecting onto a public right-of-way must have a clearance of not less than 10 feet. No signs are permitted over a public driveway or thoroughfare.

No signs projecting onto a public right-of-way are proposed at the site.

Section 142-5. Permitted signs.

A. One temporary non-illuminated construction sign not exceeding 32 square feet in size, not exceeding 8 feet in height, and, unless approval is obtained from the Building Inspector, not remaining on the property for more than 1 year, is permitted without a permit.

Multiple construction signs may be required for longer than one year to ensure efficient and safe movement of construction traffic. There will be several signs internal to the site and not readily visible from the roadway, to which signs this regulation does not apply. However, there may also be several signs of an announcement nature, or ones that give direction to vehicles entering the site. Such signs will be visible from the public way and do fall under this regulation. As stated relative to Section 142-3 above, Town approval for construction signs will be obtained.

Section 142-9. Permit application; issuance; fees. Applications for sign permits must contain information relating to the applicant, the location of the sign, and plans showing the details of the signs. Fees for sign permits correspond to fees for building permit applications.

The required information and fees will be submitted to the Building Inspector prior to the erection of any permanent signs. As stated relative to Section 142-3 above, approval will be sought directly from the Town.

Section 142-10. Security deposit. Any signs for which the estimated cost exceeds $2,500 require a security deposit, the amount of which is determined by the official issuing the permit for the sign.

The security will be provided, if required.

Chapter 152. Solid Waste.

Article I. Garbage, Rubbish and Refuse.

Section 152-3. Prohibited disposal. Garbage or any material, waste or offal of any kind may not be carried or left upon any premises within the Town so as to create a nuisance.

The waste disposal practices for the Project are detailed in Section 12 of the DEIS. The Project will comply with this requirement.

Section 152-4. Littering prohibited. This Section prohibits littering on public or private lands within the Town.

The Project will comply with this requirement.

Article II. Waste Management. This Section prohibits the disposal of hazardous or industrial wastes within the Town. However, this prohibition does not apply to industries that send their hazardous or industrial wastes to appropriately permitted facilities for disposal. Section 152-22 requires any carting business operating in the Town to obtain a permit from the Town Clerk.

Any waste generated at the Project site will be sent to appropriately permitted facilities. Any carters used by the Project will be required to have a permit issued by the Town Clerk.

Chapter 156. Streets and Sidewalks.

Section 156-8. Application; estimate; permit issuance. Prior to the commencement of construction activity in a Town road, street or right-of-way, a permit must be obtained from the Highway Superintendent. An application for such permit must be submitted to the Highway Superintendent and Town Clerk. An estimate of the costs of restoration must be submitted with the application. A security in an amount to be determined by the Highway Superintendent based upon the proposed construction must be posted.

This requirement will be complied with.

Chapter 180. Vehicles and Traffic.

Sections 180-9, 180-25. Trucks over certain weights excluded. These provisions prohibit trucks over certain weights on certain roads. The weight limitations, however, do not apply to trucks used for delivery and pickup of materials on those streets.

During operation, trucks in excess of the above-referenced weight limits will be used only for delivery and pickup of materials to/from the Project site (e.g., waste haulage and supplies). During construction, it is anticipated that most trucks will reach the Project site via Interstate 84 to Route 6. During construction, trucks will be used only to deliver materials, Facility equipment and construction equipment. Therefore, the Project will comply with this requirement.

Chapter 189. Water. This Chapter applies to all water districts (existing or to be established) in the Town.

The Project is within Water and Sewer District No. 1. The Project anticipates obtaining process water from the Middletown POTW. Potable water and, if available, back-up process water supply will be obtained through Water and Sewer District No. 1. The Project's water supply is detailed in Section 12 of the DEIS. Relevant water district requirements are discussed below. The Facility also has an onsite ground water well that, based on preliminary tests, could be used in lieu of water from the City of Middletown.

Section 189-3. Connection to public water supply system; activities not permitted; exceptions. The Town shall have the authority to permit a property to connect to the public water supply system if any portion of that property is within the water district limits, providing that a water main is adjacent to, on or within 100 feet of the property and that no extension of the district's water main is necessary. Service to properties outside the water district limits shall be approved by the Town Board in the manner provided by law and in the discretion of the Town Board.

Plans are to construct a new water connection to the Middletown POTW for transfer of gray water used for plant processes and wastewater.

Section 189-6. Service pipe and fixtures.

A. Mains taps, service connections and service pipes from the mains must be installed at the expense of the customer.

The Project will comply with this requirement.

C. Service lines from the curb stop to the customer's building(s) or meter must be of Type K soft copper tubing, and only compressions fittings that have been approved by the district. Such lines must be installed at the expense of the customer.

The Project will comply with this requirement.

E. Service pipes must be laid not less than 4.5 feet below ground surface.

The Project will comply with this requirement.

F. In areas of rocky excavation, 4 inches of sand ballast below and 12 inches of sand above must protect the service line. Service lines must be inspected prior to backfilling.

The service line will be protected as required in the appropriate areas. It will be ensured that the required inspection is performed.

Section 189-7. Alternative sources of water. This provision prohibits the connection of any other source of water to a facility that is connected to the district.

The Project will employ grey water from the City of Middletown POTW for process water. The required cross connection control will be provided, subject to review and approval by the Town Engineer and the Planning Board, under the provisions of the Site Plan approval and Special Use Permit for the proposed Project.

Section 189-12. Installation of new water mains. New water mains require the consent of the Town Board, and must be installed as directed by the Town or System Operator.

Potable water will be supplied to the Project through a previously planned water main extension (to serve Water and Sewer District No. 1), which will be built under the auspices of the Town, irrespective of whether or not the Project is built.

Section 189-15. Specifications for new installations. This Section sets forth, among other things, the specifications that must be followed for the new installation of mains and other infrastructure for new water districts.

Such installations will be performed under the auspices of Water and Sewer District No. 1, and therefore, are not local requirements with which must be complied with.

Chapter 190. Water Pollution.
Section 190-1. Prohibited discharges; test samples.

A. The discharge of sewage and waste matter into any streams, watercourses or ditches of the Town is prohibited unless the same is (1) free of all noxious odors and gases which may be injurious, disturbing or offensive to people and (2) free of all germs, bacterial pollution and contamination which may impact the health and safety of people or be injurious or destructive to fish in the receiving stream or watercourse.

The Project will discharge all sewage into the Middletown POTW via a new sewer interconnection. These discharges must comply with applicable federal and state health and safety requirements, as described in Section 12 of the DEIS. Project storm water will be collected and routed to a detention basin for solids removal prior to discharge toward adjacent wetlands. Therefore, the Project will comply with this requirement.

B. Tests samples required by state, local, and county laws must be performed.

This requirement will be complied with by following any testing protocols mandated after consultation with Middletown POTW.

Existing Chapter 195. Zoning. This Section sets forth the existing zoning requirements, which will be replaced when the proposed zoning ordinance is adopted.

Article III. Establishment of Districts and Basic District Regulations.

Section 195-8. Schedule of Zoning District Regulations. The restrictions and controls intended to regulate development in each district are set forth in the Schedule of Zoning District Regulations and supplemented by other sections of the Zoning Code. Any use identified as a principal permitted use shall be permitted as a matter of right upon application to the Building Inspector, provided the proposed use is in compliance with these regulations. Special uses are also subject to site plan review and, specifically, Planning Board approval as prerequisites to the Building Inspector issuing a permit for their establishment. Site plan review shall also be required for new nonresidential or nonagricultural uses. Accessory uses are permitted to accompany or precede principal permitted and special uses and permits for these uses shall be issued directly by the Building Inspector.

The requirements of the Schedule of Zoning District Regulations for the MI district are reproduced below:

District Intent: This district is intended to provide areas for various industrial and manufacturing enterprises within well-planned complexes on parcels with good access to the regional transportation system, where they can be free of potentially incompatible land uses.

Principal permitted uses: Agriculture as defined by New York State Department of Agriculture & Markets; minor wireless communication facility.

Special Uses: Bus and truck terminals; essential services; manufacturing; other industrial uses; warehouse, storage and distribution facilities; commercial recreation; mining; major wireless communication facility per Section 195-32; office buildings; equipment & heavy equipment sales & service; commercial nurseries/greenhouses; research, development and testing laboratories.

Accessory Uses: Accessory garages, water & sewage treatment plants, pump houses and water towers, fire protection monitors, and other auxiliary installations; barns, silos, produce storage and packing warehouses; off-street parking; satellite stations/satellite antennas; signs.

Lot Area: A minimum lot area of 2 acres is required.

The Project site is approximately 122 acres. Therefore, the Project complies with this requirement.

Lot Width: A minimum lot width of 200 feet is required.

The Project site is more than 1000 feet in width. Therefore, the Project complies with this requirement.

Front Yard: A minimum front yard of 50 feet is required.

The Project complies with this requirement.

Side Yard: Side yards must be a minimum of 30 feet.

The Project complies with this requirement.

Both Side Yards: Both side yards combined must be equal to or greater than 100 feet.

The Project complies with this requirement.

Rear Yard: A minimum rear yard of 50 feet is required.

The Project complies with this requirement.

Lot Coverage: Lot coverage of up to 60 percent is allowed.

Project buildings and impervious areas such as parking lots total approximately 21.25 acres or approximately 17 % percent of the total Project site (122 acres). Therefore, the Project complies with this requirement.

Building Height: The maximum building height for principal buildings and structures is 35 feet.

A variance from this standard would be required for the Project. The air-cooled condenser is 115 feet tall, the generation building is 108 feet tall, and the Heat Recovery Steam Generator (HRSG) is 90 feet tall. Accessory buildings and structures are discussed under Section 195-43. Stacks may be exempted from this requirement under Section 195-11 (discussed below).

Section 195-9. Applicability of regulations; prohibited uses.

Subsection A. Any owner or occupant must acquire any permits or approvals required by this chapter prior to any change in land use or making any modification or improvements to the property or structures on the property.

All necessary permits or approvals required by the Zoning Code will be acquired.

Subsection C. Any uses which is noxious, offensive or objectionable, by reason of the emission of smoke, dust, gas, odor or other form of air pollution or by reason of the deposit, discharge or dispersal of liquid or solid wastes in any form in a manner or amount as to cause permanent damage to the soil and stream or to adversely affect the surrounding area or by reason of the creation of noise, vibration, electromagnetic or other disturbance or by reason of illumination by artificial light or where light reflection emanates, or which involves any dangerous fire, explosive, radioactive or other hazard or which causes injury, annoyance or disturbance to any of the surrounding properties or to their owners and occupants and any other process or use which is unwholesome and noisome and may be dangerous or prejudicial to health, safety or general welfare is prohibited. Further, the following uses and activities are expressly prohibited: dumps; junkyards; construction and demolition dumps;

commercial stripping of topsoil, permanent installation or use of a sound-amplifier device audible beyond the premises; artificial lights as traffic hazards; or blinking and flashing lights.

The CPV Valley Energy Center will be operated in manner that will not create a nuisance in any manner described above. The Project will utilize the best available control technologies to minimize air pollution and will meet all applicable state and federal air quality requirements. The Project's proposed use does not include any expressly prohibited use or activity.

Section 195-11. Height restrictions.

Subsection A. General application. No building or structure shall exceed in building height the number of feet permitted as a maximum on the Schedule of District Regulations for the district where such building or structure is located.

Subsection B. Permitted exceptions. Height limitations stipulated elsewhere in this chapter shall not apply to church spires, belfries, cupolas, domes, monuments, water towers, chimneys, smokestacks, flagpoles, radio and transmission towers, farm buildings or similar non-inhabited structures under 150 feet in height. Structures over 150 feet in height may be permitted as special uses provided they are sufficiently setback from adjoining properties to avoid any safety hazard connected therewith and meet all state and federal air safety and electronic communications standards. Other height exceptions may also be granted as special uses where fire-fighting capacity will not be threatened and buffers and setbacks are also proportionally greater.

As stated above, the air-cooled condenser and generation building will require a variance to be granted as special uses under this section. The proposed stack height of 275 feet is over the 150-foot limit and will therefore require a variance.

Section 195-13. Accessory structure and use standards. No accessory building is permitted in any required side or front yard except as provided in this article. The aggregate ground area covered by any accessory buildings in a rear yard shall not exceed 50% of the rear yard area. Accessory structures not attached to a principal structure shall be located not less than 10 feet from any side or rear lot line, be located no closer to the street than any principal building unless greater than 100 feet from the street. Accessory structures greater than 1 story in height are subject to special use review if in required side or rear yards. Except as otherwise approved by the Planning Board as part of a site plan, fences shall not exceed 6 feet in height on side or rear yards or 4 feet in height in front yards.

All buildings proposed are essential to the proposed use as an electric generating facility, and would therefore not be considered accessory structures. Appropriate fencing for the Facility will be determined during site plan review.

Article IV. General Supplementary Regulations.

Section 195-16. Parking, loading, access and traffic standards. Off-street parking, loading and unloading facilities shall be provided as necessary in connection with every use. Parking needs with respect to non-residential uses shall be determined in conjunction with site plan review. Adequate access to non-residential off-street parking must be provided. The Planning Board may require a traffic impact study involving an activity likely to generate more than 500 trip-ends per days (for industrial uses, trip-ends are estimated at 3.3 per employee). The Planning Board may require sidewalks as an element of a site development plan.

Adequate parking and access at the Facility will be provided to meet these requirements. A traffic study has been completed, which is discussed in detail in Section 8 of this document, and included as an appendix. Sidewalks will be installed if and as directed by the Planning Board.

Section 195-17. Floodplain development standards. This section creates a floodplain development overlay zoning district congruent with special flood hazard areas on flood hazard boundary maps for the Town of Wawayanda, as issued by the Federal Insurance Administration or its successor. No development shall be permitted in this zone that does not comply with Chapter 92.

No portion of the Project is in the floodplain development overlay zone.

Section 195-19. General commercial and industrial standards.

Subsection A. Where a commercial or manufacturing use is contiguous to an existing residential use in any district (including those situated on the opposite side of a highway), the planning board may require that minimum front, side, and rear yards be increased by up to 50%. The board may also require separating or shielding residences with buffers or landscaping.

Setbacks required by the planning board will be complied with.

Subsection B. All activities involving the manufacturing, production, storage, transfer or disposal of inflammable and explosive materials shall be provided with adequate safety devices against the hazard of fire and explosion.

Adequate fire safety devices will be installed in accordance with the appropriate codes and documentation of such provided to the Planning Board during site plan review. This effort will be coordinated with the Fire District as the Project proceeds through the review process.

Subsection C. No activities shall be permitted which emit dangerous radioactivity or electrical disturbance adversely affecting equipment other than that of the creator of such disturbance.

The Project will be in compliance with this provision.

Subsection D. Noise shall not exceed an intensity of 65 decibels as measured 100 feet from the boundaries of the lot where such use is situated.

The Project will be in compliance with this provision.

Subsection E. No vibration shall be permitted on a regular or continuing basis which is detectable without instruments at the property line.

The Project will be in compliance with this provision.

Subsection F. Lighting. All lighting shall be designed so as to avoid unnecessary or unsafe spillover of light and glare onto operators of motor vehicles, pedestrians, and proximate land uses.

The Project will be in compliance with this provision.

Subsection G. No emission shall be permitted on a regular or continuing basis from any chimney or otherwise, of visible gray smoke.

The Project will be in compliance with this provision.

Subsection H. No emission of fly ash, dust, fumes, vapors, gases and other forms of air pollution shall be permitted on a regular or continuing basis which can cause any damage to health, animals, vegetation, or other forms of property, or which can cause any excessive soiling.

The Project will be in compliance with this provision.

Subsection I. All activities involving the possible contamination of surface or groundwater shall be provided with adequate safety devices to prevent such contamination.

The Project will be in compliance with this provision.

Subsection K. The visual impacts of tanks, cupolas, vents, etc., and outdoor storage shall be considered during the site plan/special use review process. The Planning Board shall assure that adverse visual impacts are adequately mitigated.

The visual impacts of appropriate Project elements and proposed mitigation measures are discussed in Section 5.0 of the DEIS. An assessment of potential visual impacts has been conducted in accordance with NYSDEC Program Policy DEP-00-2.

Section 195-20. Landscaping, screening, ridge development and buffer regulations. To enhance the appearance and natural beauty of the town and protect property values, this section provides general landscaping requirements, as well as requirements for landscaped front and parking areas. The Planning Board may require a landscape plan be prepared as part of any site plan/special use or site plan application.

The landscaping provision in this section will be complied with. A landscaping plan has been prepared, which is included with the preliminary plan set appended to this document.

Section 195-21. Water supply protection. To assist in the preservation of public health, general welfare, and safety of the residents of the Town of Wawayanda and to facilitate the adequate provision of water through the elimination or prevention of groundwater contamination in the vicinity of wells that supply public water, two zoning overly districts are created by this section.

Subsection B. Applicants proposing a use in either overlay zone that requires site plan/special use approval shall include:

- Map(s), plan(s), and a narrative report completed by an engineer licensed to practice in the State of New York which details the location of the premises and all features of the system necessary for the satisfactory conveyance, storage, distribution, use and disposal of storm water, process wastes, wastewater, petroleum, hazardous substances and wastes, solid waste, and incidental wastes.
- A description of the means of water supply. For uses involving withdrawal of groundwater, an estimate of the total daily withdrawal rate.
- A complete list, including an estimate of the volume in pounds dry weight and liquid gallons, of all petroleum, chemicals, pesticides, fuels and other hazardous substances/wastes to be used, generated, and stored on the premises.
- A description of proposed measures as required herein to protect all storage containers or facilities associated with such materials, from vandalism, accidental damage, corrosion and leakage.
- A description of the procedures for containing and cleaning up a spill of hazardous substances/waste and notifying the Town of Wawayanda and other appropriate local and state officials of a spill, leak, or other discharge.
- A description of proposed storage facilities for hazardous wastes and provisions for the disposal of these wastes by licensed waste haulers.

The Project site is located within one of these overlay zones and requires Site Plan and Special Use permit approvals. These additional items will be provided in the application to the Planning Board.

Subsection C. Water supply protection overlay zones. There are hereby established within the Town of Wawayanda, two water supply protection overlay zones. These zones are delineated on a map entitled Official Zoning Map of the Town of Wawayanda 12. These zones are described as follows:

- Water Supply Protection Overlay Zone (W-1 Overlay Zone). This zone generally consists of the consolidated or unconsolidated groundwater aquifer dedicated to municipal water supply and the immediate, contiguous areas which drain directly into the aquifer area.
- Watershed Protection Overlay Zone (W-2 Overlay Zone). This zone generally consists of the remaining land that contributes surface water runoff to the aquifer and the W-1 Overlay Zone.

The Project site is located within the Watershed Protection Overlay Zone (W-2 Overlay Zone). All additional requirements of this zone will be complied with.

Subsection E. Prohibited uses. The following uses are prohibited in the W-2 Overlay Zone:

- Disposal of snow containing deicing salts/chemicals removed from streets, roads, and parking areas to the area within 100 feet of streams and watercourses.
- Disposal of any solid waste, petroleum, radioactive material, hazardous substance, hazardous waste, or nonsewage wastewater into or onto land or a surface water body. Uses which commonly dispose of solid waste, petroleum, hazardous substances, hazardous waste, or non sewage wastewater into or onto land or a surface water body include but are not limited to: appliance/small engine repair shops; auto repair and body shops; boat service, repair, and washing establishments; chemical/biological laboratories; chemical processing/manufacturing plants; cleaning services (dry cleaning, laundromat, commercial laundry); electric/electronic/communications equipment manufacturers; furniture manufacturers/strippers/painters; jewelry and metal platers; machine shops; metal manufacturers/fabricators/finishers; petroleum product refiners and manufacturers; photo processors and printers; and wood preserving/treating establishments.
- Surface land application of septage, sludge, or human excreta.
- Disposal of any solid waste, petroleum, radioactive material, hazardous substance, hazardous waste, or nonsewage wastewater into or onto land or a surface water body.
- Outdoor uncovered stockpiling or bulk storage of coal, deicing chloride compounds (unless bagged), or artificial fertilizers.

No component of the proposed Project use is prohibited in the W-2 Overlay Zone.

Subsection G. Stormwater runoff. Proposed uses within either the W-1 Overlay Zones or the W -2 Overlay Zones shall meet the following standards for stormwater runoff:

- There shall be no exceeding of pre-development peak flow rate for the one-hundred-year-return-frequency storm.

The pre-development peak flow rate for the one-hundred year-return-frequency storm will not be exceeded by the Project.

- The off-site impacts of erosion and sedimentation from the proposed use shall not be any greater during and following land disturbance activities under predevelopment conditions.

Off-site impacts of erosion and sedimentation from the Project will not be greater than predevelopment conditions.

- All stormwater runoff from new impervious surface areas shall be discharged using infiltration basins, pits, trenches or impoundments in accordance with the design criteria for these storm water management techniques as described in Chapter 6 of the NYSDEC manual "Reducing the Impacts of Stormwater Runoff from New Development," as amended or superseded. For commercial/industrial parking lots which produce significant loads of grit and oil, oil/grit separators (water quality inlets) are required to remove sediment and hydrocarbons which would clog soils and lead to failure of the infiltration structure.

Appropriate infiltration basins and other stormwater control mechanisms will be constructed as described in the current NYSDEC manual.

- The applicant shall prepare or have prepared a stormwater management and erosion control plan using the outline presented in Chapter 4 of the NYSDEC manual "Reducing the Impacts of Stormwater Runoff from New Development," as amended or superseded.

A stormwater management and erosion control plan will be provided in accordance with the current NYSDEC manual.

- Dry wells, infiltration trenches, and infiltration basins shall be used to dispose of stormwater only where other methods may not be feasible, as determined by the Planning Board, due to physical constraints of the site. No such infiltration systems for disposal of stormwater shall be located within 1,000 feet of a public water supply well.

The Project does not intend to utilize these disposal methods, unless other means of disposal are not feasible, as determined by the Planning Board.

- Surface infiltration trenches must have grass buffers and dry wells and subsurface infiltration trenches must have oil, grease and sediment traps (water quality inlets) to capture excess loads of sediment, grease, oils, and settleable solids and other objectionable materials including floatable organic materials before stormwater is allowed to enter the infiltration system.

- Dry wells shall be equipped with an accessible cap and underground infiltration trenches shall be equipped with observation well(s). All caps to dry wells and observation wells shall be locked or constructed to prevent vandalism.

- There must be a vertical separation distance of at least four feet between the bottom of the infiltration system and the season high-water table or bedrock. The required separation distance must be verified by test pits/soil borings under the direction on a professional engineer licensed to practice in the State of New York.

Section 195-23. Stormwater Control. No application for approval of a land development activity shall be reviewed until the appropriate board has received a stormwater pollution prevention plan (SWPPP) prepared in accordance with the specifications in this section.

A SWPPP will be provided with the application to the Planning Board in accordance with the specifications of this section.

Article VII. Special Use and Site Plan Review Procedures.
Section 195-58. Application and site plan required. The Planning Board shall be under no obligation to schedule a public hearing or take any action with respect to a special use permit application until formal application has been made on forms provided by the Board and a detailed site plan providing the following information has been submitted:

- The location of all existing watercourses, wooded areas, rights-of-way, roads, structures or any other significant man-made or natural feature, if such feature has an effect upon the use of said property.
- The location, use and floor or ground area of each proposed building, structure or any other land use, including sewage disposal and water supply systems.
- The location of all significant landscaping and ground cover features, both existing and proposed, including detailed planting plans and a visual depiction or rendering of the final appearance of the property after all landscaping and other physical improvements are completed.
- The location, dimensions and capacity of any proposed roads, off-street parking areas or loading berths, including typical cross-sections for all paving or regrading involved.
- The location and treatment of proposed entrances and exits to public rights-of-way, including traffic signals, channelizations, acceleration and deceleration lanes, widenings or any other measure having an impact on traffic safety conditions.
- The location and identification of proposed open spaces, parks or other recreation areas.
- The location and design of buffer areas and screening devices to be maintained.
- The location of trails, walkways and all other areas proposed to be devoted to pedestrian use.
- The location of public and private utilities, including maintenance facilities.

- The specific locations of all signs existing and proposed, including a visual depiction of the latter.
- Preliminary architectural plans for the proposed buildings or structures, indicating typical floor plans, elevations, height and general design or architectural styling.
- A completed SEQR environmental assessment.
- Any other information required by the Planning Board which is clearly necessary to ascertain compliance with the provisions of this chapter and limited to such information.
- Stormwater pollution prevention plan: A stormwater pollution prevention plan consistent with the requirements of Town Code § 195-23. The SWPPP shall meet the performance and design criteria and standards in § 195-23. The site plan shall not be approved unless it is determined to be consistent with the provisions of § 195-23.

Each of these items will be provided to the Planning Board with CPV's special use/site plan application.

Section 195-66. Special use review criteria. The Planning Board, in reviewing the site plan, shall consider its conformity to the Town of Wawayanda Master Plan and the various other plans, laws and ordinances of the Town. Conservation features, aesthetics, landscaping and impact on surrounding development as well as on the entire Town shall also be part of the Planning Board review. The Board, in acting upon the site plan, shall also be approving, approving with modifications or disapproving the special use permit application connected therewith. Traffic flow, circulation and parking shall be reviewed to ensure the safety of the public and of the users of the facility and to ensure that there is no unreasonable interference with traffic or surrounding streets. The Board shall further consider the following:

- Building design and location.
- Large commercial buildings.
- Lighting and signage.
- Parking and accessory buildings.
- Drainage systems.
- Driveway and road construction.
- Construction on slopes.
- Tree borders.
- Development at intersections
- Streets and sidewalks.
- Setbacks.
- Adjacent properties.
- Conditioned approval.
- Community impacts.
- Hamlet areas.

These are the special use review criteria that will be considered by the Planning Board in reviewing the site plan.

3.5.2.2 City of Middletown Sewer Code

The Town of Wawayanda's Sewer District No. 1 is serviced by the City of Middletown POTW, and projects in this district must be in conformance with both Wawayanda's and Middletown's sewer codes. The City of Middletown's Sewer Code is Chapter 389 of the City's Code.

Article II. Use of Public Sewers Required

This article contains section 389-2 through 389-5 and requires connection to sewers when a sewer is within 100 feet of a property line.

Sewer District No. 1 in Wawayanda will be connected to for of sanitary wastes to the Middletown POTW.

Section 389-13. Permit required. No unauthorized person shall uncover, make any connections with or opening into, use, alter or disturb any public sewer or appurtenance thereof without first obtaining a written permit from the Superintendent.

Application will be made to the Superintendent for the necessary connections permits needed for the Project.

Section 389-15. Installation costs and expenses. All costs and expense incident to the installation and connection of the building sewer shall be borne by the owner. The owner shall indemnify the City from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer.

CPV will adhere to this provision.

Section 389-16. Separate sewer required for each building; exception. A separate and independent building sewer shall be provided for every building, except, where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard or driveway, the building sewer from the front building may be extended to the rear building and the whole considered as one building sewer.

This provision will be adhered to for each building that would generate sewage.

Sections 389-18 through 389-24. Building Sewers and Connections. These sections contain materials and design specifications for construction of sewers, connections and joints.

There will be adherence to the construction and design standards in these sections.

Section 389-25. Inspection notice. The applicant for the building sewer permit shall notify the Superintendent when the building sewer is ready for inspection and connection to the public sewer. The connection shall be made under the supervision of the Superintendent or his representative.

Notification will be made to the Superintendent when the sewer and connection is ready for inspections.

Section 389-26. Excavations: safety devices; restoration. All excavations for building sewer installation shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the City of Middletown and in accordance with the Street Excavation Ordinance. Editor's Note: See Ch. 416, Art. VIII, Openings and Excavations.

The sewer and connection will be constructed in a safe manner in accordance with this section.

Section 389-28. Disposition of unpolluted waters. Stormwater and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as combined sewers or storm sewers or to a natural outlet approved by the Superintendent. Industrial cooling water or unpolluted process waters may be discharged, upon approval of the Superintendent, to a storm sewer, combined sewer or natural outlet. Dischargers of cooling water to state waters must apply for a SPDES permit.

It will be insured that all discharges are made to the appropriate locations and receive such permits, including wastewater discharge and SPDES permits that may be necessary for the Project.

Section 389-29. Enumeration of prohibited waters and wastes. This section contains a list of polluted waters and wastes that are prohibited from discharge into the sanitary sewers.

There will be adherence to the provisions of this section.

Sections 389-30 and 389-31. Grease, oil and sand interceptors. Maintenance of interceptors. Grease, oil and sand interceptors shall be provided when, in the opinion of the Superintendent, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts or any flammable wastes, sand and other harmful ingredients. Such interceptors are to be constructed at the owner’s expense and made of impervious materials.

If appropriate or required, there will be construction and maintenance, at the Proponent’s expense, of grease, oil and sand interceptors made of impervious materials.

§ 389-32. Notice of slug discharge required. Notice must be given immediately to the Commissioner of Public Works of any slug discharge into the system.

Timely notice will be given to the Commissioner of Public Works in the event of any slug discharge.

§ 389-33. Waters and wastes subject to approval; preliminary treatment facilities. This section identifies the criteria used to identify discharges requiring Superintendent approval and the pretreatment standards that may be required.

There will be adherence to the pretreatment standards established in this section.

Section 389-34. Control manholes. When required by the Superintendent, the owner of any property served by a building sewer carrying industrial wastes shall install a suitable control manhole in the building sewer to facilitate observation, sampling and measurement of the wastes. The manhole shall be installed by the owner at his expense in the manner described by the Superintendent.

If appropriate or required, there will be construction and maintenance, at the Proponent's expense, of a control manhole.

Section 389-35. Measurements, tests and analyses; accidental discharges. This section establishes standards for measurements, tests and analyses of waters and wastes, and allows the Superintendent to require detailed plans for response in the event of accidental discharges of prohibited materials.

All measurements, tests and analyses for reporting purposes will be made using standards that meet or exceed the standards set in this section. An SPCC plan will be prepared that will be provided to the Superintendent.

Section 389-47. Wastewater discharge reports. As a means of determining compliance with these rules and regulations, with applicable SPDES permit conditions and with applicable state and federal laws, each industrial user shall be required to notify the Superintendent of any new or existing discharges to the POTW by submitting a completed industrial chemical survey form and industrial wastewater survey form to the Superintendent. The Superintendent may require any user discharging wastewater into the POTW to file wastewater discharge reports and to supplement such reports as the Superintendent deems necessary. All information required by the Superintendent shall be furnished by the user in complete cooperation with the Superintendent.

All required discharge reports will be prepared and submitted.

Section 389-49. Wastewater discharge permit required.

Subsection A. No significant industrial user shall discharge wastewater to the POTW without having a valid wastewater discharge permit issued by the Superintendent. Significant industrial users shall comply fully with the terms and conditions of their permits in addition to the provisions of this chapter. Violation of a permit term or condition is deemed a violation of this chapter.

All required wastewater discharge permits will be applied for and received.

Subsection B. All significant industrial users proposing to connect to or to contribute to the POTW shall obtain a wastewater discharge permit before connecting to or contributing to the POTW. All existing significant industrial users connected to or contributing to the POTW shall obtain a wastewater discharge permit within 180 days after the effective date of this article.

All required wastewater discharge permits will be applied for and received.

Section 389-50. Application for permit; terms and conditions. Users required to obtain a wastewater discharge permit shall complete and file with the Superintendent an application in the form prescribed by the City.

An application will be made for the wastewater discharge permit in the form prescribed by the City.

Section 389-51. Reporting requirements. This section contains reporting requirements including a baseline report with 180 days, a compliance report within 90 days, and other periodic reporting requirements.

All required discharge reports will be prepared and submitted.

Section 389-53. Discharge limitations. This section provides discharge limits for certain pollutants.

There will be adherence to the discharge limitations set in this section

3.6 REFERENCES

Audubon Society of Orange County (ASOC). 2008. Sanctuary Sites. http://www.orangecountynyaudubon.com/sanctuaries.asp. Accessed October 13, 2008.

City of Middletown. Code of the City of Middletown. General Code – Ecode. 2008.

City of Middletown. 2007. City of Middletown Comprehensive Plan – Task 1: Existing Conditions Technical Memorandum. Saccardi & Schiff, Inc.

Enlarged City School District of Middletown (School District of Middletown). 2008. John W. Chorley Elementary School. http://middletowncityschools.org/chorley/Chaboutourschool.htm. Accessed October 13, 2008.

ESRI I3 Imagery Prime World 2D (ESRI). 2008. Aerial Photography. http://services.arcgisonline.com/v92. Accessed October 2008.

Field of Dreams Preschool (FDP). 2008. Field of Dreams Preschool. http://www.fieldofdreamspreschool.com/. Accessed October 14, 2008.

GreatSchools (GS). 2008. Our Lady of Mount Carmel School. www.greatschools.net/cgi-bin/ny/private/4365. Accessed October 7, 2008.

GreatSchools (GS). 2008a. Truman Moon School. www.greatschools.net/modperl/browse_school/ny/1655. Accessed October 7, 2008.

GreatSchools (GS). 2008b. St. Joseph's Parochial School. http://www.greatschools.net/. Accessed October 13, 2008.

Healthgrades. 2008. Horton Memorial Hospital. http://www.healthgrades.com/hospital-directory/new-york-ny-poughkeepsie-north-nyc/horton-memorial-hospital-hgst4b0a7b36330001. Accessed October 13, 2008.

Historic Paramount Theatre (HPT). 2008. Historic Paramount Theatre. http://www.middletownparamount.com/History.aspx. Accessed October 13, 2008.

Manta. 2008. George Robin Preschool (Aahrsay Preschool). http://www.manta.com/coms2/dnbcompany_0lv8f. Accessed October 14, 2008.

Manta. 2008a. Hilltop Children's Center. http://www.manta.com/coms2/dnbcompany_j20q5c. Accessed October 14, 2008.

Manta. 2008b. Valley Columbia Heart Center. http://www.manta.com/com2/dndcompany_f2yh7. Accessed October 13, 2008.

Middletown Christian School (MCS). 2008. Middletown Christian School. www.mcssda.org. Accessed October 13, 2008.

Middletown Recreation and Parks Department (Middletown RPD). 2008. General Information. http://www.middletown-ny,com/parks-rec.htm. Accessed October 13, 2008.

National Register of Historic Places Listings in Orange County, New York. 2008. List of Registered Historic Places in Orange County, New York. http://en.wikipedia.org/wiki/National_Register_of_Historic_Places_listings_in_Orange_County_New_York

New Beginnings (NB). 2008. New Beginnings. www.newbeginningsschool.com. Accessed October 13, 2008.

New York State. Department of Environmental Conservation. Map. Critical Environmental Areas in Orange County: Ridge Preservation Areas. 1993.

New York State. Office of Real Property Services. Agricultural Assessments: Partial Reduction in Real Property Taxes for Eligible Farmland in New York State. October 2007.

New York State Office of Mental Health (NYSOMH). 2008. Mid-Hudson Forensic Psychiatric Center. http://www.omh.state.ny.us/omhweb/facilities/mhpc/facility.htm. Accessed October 7, 2008.

Office of Mental Health (OMH). 2008. Middletown Psychiatric Center. http://www.omh.state.ny.us/ombweb/facilities.mipc.facility.htm. Accessed October 14, 2008.

Orange County Community College (OCCC). 2008. SUNY Orange. http://www.orange.cc.ny.us/. Accessed October 7, 2008.

Orange County. Orange County Department of Planning. Orange County Comprehensive Plan: Strategies for Quality Communities. Orange County, New York, 2003.

Orange County. Orange County Department of Planning. Orange County Open Space Plan. Orange County, New York, 2004.

Orange County. Orange County Department of Planning. Maps of Agricultural Districts #1 & #2 as of Completion of 8-year Review in 2005. Orange County, New York, 2005.

Orange County. 2008. Economic Trends and Impacts of the Agriculture Industry in Orange County, N.Y. http://www.co.orange.ny.us/documentView.asp?docID=588. Accessed November 11, 2008.

Orange County GIS Division (Orange County GIS). 2008. Parcels Data sets par5200 (Walkill), par5600 (Wawayanda), par0900 (Middletown) Updated 8/25/08. Accessed October 2008.

Orange County Golf Club (OCGC). 2008. Orange County Golf Club. http://www.orangecountygolfclub.com/welcome.html. Accessed October 13, 2008.

Orange County Land Trust (OCLT). 2008. Protected Lands. http://www.oclt.org/protect.htm. Accessed October 13, 2008.

Orange Regional Medical Center (ORMC). 2008. Orange Regional Medical Center – About Us. http://www.ormc.org/. Accessed October 13, 2008.

Orange Ulster BOCES (OU BOCES). 2008. Orange Ulster BOCES Learning for Life. 2008. http://www.ouboces.org/Admin?FAQ.cfm. Accessed October 13, 2008.

Public Schools Report (PSR). 2008. Orange County Public Schools. http://schools.publicschoolsreport.com/county/NY/Orange.html. Accessed October 13, 2008.

Saint Francis Hospital and Health Centers (SFHHC). 2008. The Workplace. http://www.sfhhc.org/Services/Occupational.aspx. Accessed October 13, 2008.

Super Pages (SP). 2008. Peter Pan Nursery School. http://www.superpages.com/bp/Middletown-NY/Peter-Pan-Nursery-School-L0068506414.htm. Accessed October 7, 2008.

Town of Wawayanda. Saratoga Associates. Town of Wawayanda Draft Zoning Law. Wawayanda, New York, 2006.

Town of Wawayanda. Code of the Town of Wawayanda. General Code Publishers Corp. Rochester, New York, 2007.

Town of Wawayanda. 2006a. Saratoga Associates. Town of Wawayanda Final Comprehensive Plan. Wawayanda, New York.

Town of Wawayanda. Battiato, Patt – Planning Board Secretary. Meeting with Jamie Ann Rivera, TRC. June 17, 2008.

Uticaod. 2008. Gymboree Play & Music. http://yellowpages.uticaod.com/Gymboree+Play+--Music.327672.83118262.home.html. Accessed October 14, 2008.

Wikipedia. 2008. Dunning House. http://en.wikipedia.org/wiki/Dunnng_House. Accessed October 13, 2008.

Wikipedia. 2008a. Primitive Baptist Church of Brookfield. http://en.wikipedia.org/wiki/Primitive_Baptist_Church_of_Brookfield. Accessed October 13, 2008.

Wikipedia. 2008b. Sawyer Farmhouse. http://en.wikipedia.org/wiki/Sawper_Farmhouse.

4.0 CULTURAL RESOURCES

4.1 INTRODUCTION

This section identifies whether known archaeological or historic resources are present within the proposed impact areas of the Project and includes an assessment of the probable impacts on cultural resources from the construction and operation of the proposed Project. The methodology for assessing the potential impacts to cultural resources is in accordance with the standards and methods contained in *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State*, published by the New York Archaeological Council in 1994. Consultation with the New York Office of Parks, Recreation and Historic Preservation (OPRHP), which acts as the State Historic Preservation Office (SHPO) for the State of New York, is ongoing.

Prior to CPV Valley's investigation, no previous cultural resource surveys are known to have been conducted of the proposed Project area. On December 4, 2007, CPV Valley LLC filed a request for information with the OPRHP for the purposes of determining the status of known archaeological and historical resources either on or proximate to the Project site. On December 14, 2007, the OPRHP responded, recommending that a Phase I archaeological survey is warranted for portions of the Project area that involve ground disturbance, unless prior ground disturbance could be documented. The OPRHP assigned Project Review Number 07PR6587 to the Project.

As part of the environmental review for this proposed Project and in accordance with the OPRHP's request, a Phase IA and IB archaeological survey was conducted of the proposed construction impact areas of the Project site in an effort to determine if there would be a potential impact to any cultural resources eligible for inclusion in the National Register of Historic Places (NRHP).

During the archaeological field investigation, a total of 708 shovel tests were excavated at 15-m intervals along survey transects in the proposed construction impact areas. As a result, four previously unrecorded prehistoric archaeological sites (A07119.000197, A07119.000198, A07119.000199 and A07119.000200) and five isolated finds (A07119.000201, A07119.000202, A07119.000204, A07119.000205, and A07119.000206) were identified. TRC recommended to the OPRHP that none of the newly recorded archaeological sites or isolated finds met the criteria of eligibility for inclusion in the NRHP and no further archaeological studies of the Project area were warranted. Appendix 4-A includes the correspondence with the OPRHP on the Project to date.

A survey of historic standing structures—buildings, structures, objects, districts, and sites 50 years or older—was conducted within a 1/2-mile radius of the Project site. The survey's objective was to identify historic resources listed in or eligible for listing in the NRHP; to provide evaluations of NRHP eligibility for the surveyed resources based on historic significance and integrity; and to provide assessments of direct and indirect (primarily noise and visual) effects to historic resources from the Facility. Background research on previously surveyed historic structures included a review of the database of the New York State Office of Parks

Recreation and Historic Preservation (NYSOPRHP), as well as consultation with Town of Wawayanda and City of Middletown Historians to determine the presence of locally designated historic landmarks within the Area for Potential Effect (APE) (Appendix 4-A).

Fieldwork conducted by TRC identified 12 architectural resources 50 years or older within the ½-mile Area for Potential Effect (APE). Based on a survey of resources for NRHP eligibility, one resource, the house and associated barn at 97 DeBlock Road, was determined to be NRHP-eligible. The remaining 11 resources are recommended ineligible for NRHP listing, primarily due to lack of integrity and/or significance. In addition, there are no groupings of buildings potentially NRHP-eligible as historic districts or rural historic districts.

There will be no direct physical effect to this NRHP-eligible resource from the Facility. Because of heavy intervening foliage cover and the slightly rolling surrounding topography, the Facility is expected to be obscured from view of the 97 DeBlock Road property. The Facility is expected to have no effect to historic resources.

4.2 APPLICABLE LAWS, REGULATIONS, AND POLICIES

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended through 2000, requires that federal or federally permitted projects "take into account the effect of the undertaking on any district, site, building, structure or object that is included in or eligible for inclusion in the National Register [of Historic Places]." According to regulations implementing the NHPA, these cultural resources are called historic properties [36 CFR Part 800, Section 800.16 (l) 1] or designated historic properties [33 CFR Part 325, Appendix C 1(a)]. These cultural resources may be prehistoric (pre-European Contact Period) or historic (usually more than 50 years old), and include archaeological sites and historic structures and districts. Historic properties can also be generically termed significant cultural resources.

Potential Project effects are assessed on historic properties, and occur when the Project's effect(s) may alter the characteristics or use of the property that qualified the property for inclusion in the National Register [36 CFR Part 800, Section 800.16(i) and 33 CFR Part 325, Appendix C Paragraph 15 (a)]. Historic properties are defined as archaeological or historic sites that are listed in or eligible for listing in the NRHP. If an adverse effect on a historic property is found, measures to avoid, minimize or mitigate the effects would be sought, in consultation with the OPRHP.

4.3 AREA OF POTENTIAL EFFECT

An Area of Potential Effect (APE) for a project is defined as "that geographic area or areas within which construction, operation, or maintenance of a project may directly or indirectly cause alterations in the character or use of historic properties" [36 CFR Part 800 Section 16(d)]. There are different types of potential effects a project may have on historic properties, including physical effects (such as ground disturbance or destruction), noise effects, or visual effects of aboveground structures on the setting of historic properties.

The APE for the Project includes all upland geographic areas within which the Project may cause potential physical, noise and visual effects on historic properties (as described below). More specifically, the project's APE to archaeological sites includes those areas of physical ground disturbance during construction, operation and maintenance. For historic structures, the APE for direct impacts was defined as the limits of actual construction of the facility; for indirect (visual and noise) impacts, the APE was defined as the area within a ½-mile radius of the facility based on consultation with the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP) (TRC, July 14, 2008)

4.4 ARCHAEOLOGICAL RESOURCES

4.4.1 Methodology

The archaeological investigations involved three tasks: (1) preliminary research, including a literature, records, and map search; (2) field investigations; and (3) reporting.

4.4.1.1 Literature and Records Search

Prior to initiating fieldwork, a thorough records and literature search was conducted to identify previously recorded archaeological sites and/or historic properties in or near the present Project site. Records examined include maps and reports on file at the OPRHP and the Orange County Library. Maps, reports, and other records were used to identify sites in close proximity to the parcel and historic maps of the area were obtained from these repositories.

4.4.1.2 Field Investigation

Assessment

Based on background research, the CPV Valley Project Site was considered to have a moderate to high probability for prehistoric sites based on the occurrence of sites in the surrounding area. Sites were expected to occur on landform types in close proximity to streams and/or wetland where food and water sources could be obtained. Historic map research indicated no historic settlement or structures within the project area.

Initial site inspection identified a uniform topography gently sloping from U.S. Route 6 on the north side of the parcel to Interstate-84 on the south. Elevations ranged from approximately 480 to 460 feet above mean sea level (amsl). The eastern portion of the Project area contained a wooded area supporting stands of ash, maple, and hickory. Open fields and meadows occurred in the central and eastern portions. The parcel is bisected by Carpenter Creek, a tributary of Monhagen Brook, which joins the Wallkill River several miles to the east. Review of soil mapping of the area indicated a predominance of poorly drained soils formed in glaciolacustrine deposits, thereby limiting the potential for permanent human settlement in the area.

Disturbances to the Project site appeared limited to the westernmost corner of the parcel where sand and gravel mining had previously occurred, as well as the easternmost end where road construction, utility installation, and modern development had impacted areas in proximity to Route 17M.

Subsurface Testing

The purpose of the fieldwork was to locate archaeological resources present in the study area that might be impacted by the proposed Project. The field methodology was established based on guidelines set forth in the *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* (New York Archaeological Council 1994). Subsurface testing was employed as appropriate based on the local topography and ground cover. Subsurface testing was conducted in all undisturbed areas that exhibited less than 80 percent ground surface visibility and less than 15 percent slope.

Subsurface testing involved the excavation of 40-cm-diameter shovel tests within natural strata to subsoil, or at least 10 cm into a sterile substratum. Soils were screened through ¼-in hardware cloth, and profiles were described using Munsell color charts and USDA texture classification schemes. All soil profiles were recorded on standardized field forms. When artifact concentrations or isolated finds were encountered, additional shovel tests were excavated at 1-m and 3-m intervals in a cruciform pattern around the positive tests in order to establish the horizontal and vertical extent of the cultural deposit. In total, 708 shovel tests were excavated during the Phase I survey. Detailed notes on the survey methods, any sites or cultural material identified during the survey, and relevant environmental factors were recorded.

Reporting and Curation of Project Materials

A Phase IA/B report was prepared and has been filed with the OPRHP for review and comment. All written records, photographs, and Project materials are currently being curated on a temporary basis at the TRC Environmental Corporation office in Ellicott City, Maryland.

4.4.2 Results

Background research indicated that no archaeological sites existed within the Project Site. Eighteen archaeological sites have been previously recorded within a one-mile radius of the Project site. These sites are summarized in Table 4-1.

Table 4-1
Archaeological Sites Recorded within One Mile of CPV Energy Center Project Area

Site Number/ Name	Site Type	Approximate Distance From APE	Reported by Name/Date	National Register Eligibility
A07119.0000008	Unknown prehistoric; probable Archaic	510 m (1,700 ft) North	Dumont/1979	Not determined/ site destroyed
A07119.0000015	Unknown prehistoric	600 m (1500 ft) East	Dumont/1965	Not determined
A07119.0000016	Unknown prehistoric	450 m (1500 ft) Northeast	Dumont/	Not determined
A07119.0000017	Unknown prehistoric	300 m (1000 ft) Northeast	Dumont/1971	Not determined
A07119.0000019	Unknown prehistoric	900 m (3000 ft) Northwest	Dumont/1979	Not determined
A07119.0000020	Unknown prehistoric	1,350 m (4500 ft) Southwest	Dumont/	Not determined
A07119.0000021	Unknown prehistoric		Dumont/	Not determined

Table 4-1 Archaeological Sites Recorded within One Mile of CPV Energy Center Project Area				
Site Number/ Name	**Site Type**	**Approximate Distance From APE**	**Reported by Name/Date**	**National Register Eligibility**
A07119.0000082/ Uhlig Road Site	Transitional/Late Archaic/Early Woodland; some historic	960 m (3200 ft) Northwest	Hartgen/1984	Not determined
A07119.0000083/ Simon site	Late Archaic, low density scatter	1650 m (5500 ft) Northeast	Hartgen/1984	Not determined
A07119.0000147	Unknown prehistoric	1860 m (6200 ft) Southwest	Hartgen/1989	Not determined
A07119.0000148	Unknown prehistoric	1500 m (5000 ft) Southwest	Hartgen/1989	Not determined
A07119.0000150	Unknown prehistoric	300 m (1000 ft) South	Powell/1989	Not determined
A07119.0000152	Unknown prehistoric; probable Late Archaic	450 m (1500 ft) West	Cohen/1994	Not eligible
A07119.0000153	Late Archaic – Early Woodland	600 m (2000 ft) West	Cohen/1994	Not eligible
A07119.0000186	Late Archaic	180 m (600 ft) North	Landmark/2006	Recommended eligible
A07119.0000187	Late Archaic	30 m (100 ft) North	Landmark/2006	Recommended eligible
NYSM 6169	cemetery	unknown	NYSM	Unknown
NYSM 6170/ Bates site	Unknown prehistoric	150 m (500 ft) East	NYSM	Unknown
Source: OPRHP 2008, Site Files				

The archaeological field survey (Phase IB) of the Project site was conducted in August 2008 (see Figure 4-1). A total of 708 shovel test pits (STPs) were excavated at 15-meter intervals. All of the STPs were excavated at least 10 cm into sterile subsoil. As a result of the survey, four newly recorded prehistoric archaeological sites (A07119.000197, A07119.000198, A07119.000199 and A07119.000200) and five isolated finds (A07119.000201, A07119.000202, A07119.000204, A07119.000205, and A07119.000206) were identified.

All four sites identified in the Project site consist of small and low density lithic scatters indicative of use of the area for resource extraction and subsistence activities during the prehistoric period. In total, 28 artifacts were recovered. All artifacts consist of lithic debitage – the byproduct of stone tool manufacturing and maintenance; one projectile point, typed as a Brewerton Eared-triangle dating to the Late Archaic period was also recovered. Each archaeological site was evaluated with reference to the criteria of eligibility for inclusion in the National Register, as set forth in 36 CFR 60.4, and based on guidelines set forth by the National Park Service (1993) (Table 4-2). The four criteria of eligibility evaluation are:

Criterion A: Properties that are associated with events that have made a significant contribution to the broad patterns of our history; or

Criterion B: Properties that are associated with the lives of persons significant in our past; or

Criterion C: Properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

Criterion D: Properties that have yielded or may likely yield information important to history or prehistory [36 CFR 60.4].

Table 4-2 summarizes the relative significance of the four archaeological site findings.

Table 4-2
Research Potential and National Register Eligibility Recommendations, CPV Valley Energy Center

Site Number	Site Type/Cultural Affiliation	Estimate of Research Potential	National Register Recommendation
A70119.000197	Prehistoric lithic scatter/ Probable Late Archaic	Poor	Not eligible
A70119.000198	Prehistoric lithic scatter/ Probable Late Archaic	Poor	Not eligible
A70119.000199	Prehistoric lithic scatter/ Late Archaic – Brewerton	Poor	Not eligible
A70119.000200	Prehistoric lithic scatter/ Probable Late Archaic	Poor	Not eligible

The four archaeological sites and five isolated finds identified in the Project Site appear to be a local manifestation of general trends known for the Late Archaic period in this region of New York. Each site is considered ephemeral in nature, has a relative paucity of material remains, and low probability for recovering additional materials. As such, the four sites and five isolated finds were recommended as ineligible for inclusion in the National Register and no further work was recommended.

A Draft Phase IA/IB report was submitted to the OPRHP for review, comment, and concurrence with all site eligibility recommendations. Should the OPRHP concur with these findings, then the proposed Project would not adversely impact archaeological resources.

4.5 ARCHITECTURAL RESOURCES

The historic architectural investigations involved four tasks: (1) background research; (2) field investigations; (3) NRHP evaluation; and (4) assessment of effects to historic resources.

4.5.1 Methodology

4.5.1.1 Literature and Records Search

Background research was conducted on previously identified historic architectural resources and NRHP-listed historic resources within a 2-mile radius of the Project Site on-line at https://nysparks.state.ny.us using the State Historic Preservation Historical Information Exchange (SPHINX) and at the NRHP archives in Washington, D.C. As a result of this research, it was determined that there is one NRHP-listed historic property—the Webb Horton House at 115 South Street in Middletown—located 1.97 miles from the Project Site. There are no NRHP-listed historic districts within the 2-mile radius, nor are there any locally designated historic properties or districts present. Within the ½-mile APE for this project, there are no NRHP-listed properties or historic districts. Based on a records review, there are also no locally designated historic sites, districts or structures within a 2-mile radius of the Project Site.

4.5.1.2 Fieldwork

Fieldwork was conducted of the area within one-half (1/2) mile of the Project Site where it appeared that the Project structures might be visible from existing buildings. Fieldwork included recording architectural characteristics at the reconnaissance level on the OPRHP structure survey forms. Digital photographic documentation of the resources included one or more views of the surveyed individual resources, and representative views of buildings and streetscapes within any possible historic districts in the Project APE. The locations of all surveyed resources were mapped on the relevant USGS quadrangle map (Figure 4-2).

4.5.2 Survey Findings and NRHP Evaluation

Fieldwork conducted identified 12 architectural resources 50 years or older in the Project APE. Following background research and fieldwork, the surveyed resources were evaluated for NRHP eligibility and one resource, the house and associated barn at 97 DeBlock Road was identified as a NRHP-eligible under Criterion C for Architecture. The remaining 11 resources are recommended ineligible for NRHP listing, primarily due to their lack of integrity and/or significance. In addition, there are no groupings of buildings potentially NRHP-eligible as historic districts or rural historic districts.

The results of the fieldwork and NRHP eligibility evaluation are reported in the survey matrix in Table 4-3. This table lists each resource by field survey number/name/address and includes an assessment of the resource's integrity based on observed alterations to the building and its setting; and TRC's evaluation of whether the building is eligible for listing in the NRHP based on the NRHP criteria and integrity standards. The OPRHP survey forms for all 12 surveyed architectural resources are in Appendix 4-B.

Table 4-3
NRHP Evaluation of Surveyed Architectural Resources

Address	NRHP Eligible?	Criteria of Eligibility	Aspects of Integrity
Pine Hill Cemetery	No	Lacks significance under Criteria A, B, and C.	Resource retains all aspects of integrity.
3254 US Route 6	No	Lacks significance under Criteria A, B, and C.	Resource retains integrity of location, setting, feeling, and association. Addition of non-historic windows and doors dormer and enclosing of porch impacts integrity of materials, design, and workmanship.
97 DeBlock Road	Yes	NRHP-eligible under Criterion C. Embodies characteristics of vernacular farmhouse with elements of the Italianate and Gothic Revival styles.	Resource retains all aspects of integrity.

Table 4-3 NRHP Evaluation of Surveyed Architectural Resources			
Address	**NRHP Eligible?**	**Criteria of Eligibility**	**Aspects of Integrity**
348 County Road 56	No	Lacks significance under Criteria A, B, and C.	Resource retains all aspects of integrity.
44 Bates Gates Road	No	Lacks significance under Criteria A, B, and C.	Resource retains integrity of location, workmanship, association, materials, setting, and feeling. Application of non-historic vinyl siding impacts integrity of materials.
211 Old Bates Gates Road	No	Lacks significance under Criteria A, B, and C.	Resource retains integrity of location, workmanship, association, materials, setting, and feeling. Application of non-historic vinyl siding impacts integrity of materials.
217 Old Bates Gates Road	No	Lacks significance under Criteria A, B, and C.	Resource retains all aspects of integrity.
223 Old Bates Gates Road	No	Lacks significance under Criteria A, B, and C.	Resource retains integrity of location, setting, association, and feeling. Addition of enclosed front porch and outside stairs, alteration of windows and doors, and installation of vinyl siding impacts integrity of materials, design, and workmanship.
226 Old Bates Gates Road	No	Lacks significance under Criteria A, B, and C.	Resource retains integrity of location, setting, and association, and feeling. Alteration of windows and doors, and installation of vinyl siding impacts integrity of materials, design, and workmanship.
214 Old Bates Gates Road	No	Lacks significance under Criteria A, B, and C.	Resource retains all aspects of integrity.
210 Old Bates Gates Road	No	Lacks significance under Criteria A, B, and C.	Resource retains integrity of location, setting, and association. Application of vinyl siding, replacement of doors and windows, enclosing front porch, and addition of second story impact integrity of design, materials, workmanship, and feeling.
208 Old Bates Gates Road	No	Lacks significance under Criteria A, B, and C.	Resource retains integrity of setting, location, association, workmanship, and feeling. Application of aluminum siding impacts integrity of materials and design.

4.6 CEMETERIES

4.6.1 Methodology

Information on cemeteries on the project site and adjoining properties was researched and field examination of the cemeteries was conducted. Information on the Cooley Cemetery and the Pine Hill Cemetery was evaluated and observations from field visits were compiled and are presented below.

4.6.2 Results

Cooley Cemetery

The Cooley cemetery is located on top of a wooded knoll adjacent to U.S. Route 6 east of the intersection of Pine Lane and north of Interstate 84 (Figure 4-2). Field observations during archaeological survey in the vicinity recorded a scatter of both displaced and upright headstones and footstones within an approximate 9-x-9-m area. The cemetery is depicted on the 1969 USGS 7.5-minute series Middletown, NY quadrangle map, but not on earlier historical maps examined for the project (Sauthier 1779, Burr 1829, Burr 1838, Asher and Adams 1871, Beers 1875, Bien 1895, Lathrop 1903, and USGS Goshen 1908).

A field count revealed 13 headstones and several footstones; grave orientations were in both east-west and north-south directions, though some stones appeared to have been displaced from their original positions. Based on information provided by Dan Myer, former Town Historian, Town of Wawayanda, the cemetery had been disturbed by cows but not from agricultural activity. Table 4-4 shows legible information recorded on headstones. Burial dates on headstones indicate use of the cemetery during the mid-nineteenth century.

Table 4-4
Cooley Cemetery Information on Headstones

Name	Date	Description
Nathaniel Cooley	Died December 31, 1856	Age 71
Jane Cooley (Wife)	July 11, 1844	
Sara Ann, Wife of F.I. Seybolt, Daughter of N. Cooley	October 1844	Age 24
(Hil) Slingerland, Daughter of N. Cooley	April 17, 1837	Age 26
Catherine Grissim, Daughter of Henry Kent	Died in City of New York, January 7, 1845	Age 23

Pine Hill Cemetery

The Pine Hill Cemetery is located on the southeast side of US 6, approximately ¼ mile northwest of the US 6/I-84 interchange in the Town of Wawayanda, Orange County. (Figure 4-2) The surrounding topography is hilly to flat.

The cemetery is located on a promontory and is approached from two entrances on the south side of US 6. A partially paved driveway accesses the cemetery from these two approaches. There appear to be three main sections of the cemetery. The oldest is located on the highest point and is nearly completely encircled by a fieldstone embankment and marked by several cedar trees. At an opening on the north side the stone wall is marked by brick-and-concrete pillars, topped by an arched metal sign with the name “Pine Hill Cemetery.” This section contains approximately 100 headstones, consisting of granite, marble, sandstone, and slate stones. Among the oldest readable stones is one dated 1778, and nearly a dozen others date from the early 1800s. There are several graves marked with granite or marble sculptures. No family names predominate, although the largest and/or oldest marked grave stones are associated with the Dolson, Carpenter, Austin, and Arnolt names.

To the east is located another section of Pine Hill Cemetery containing approximately 150 stones, mostly of marble and granite. These date from the late nineteenth and early twentieth centuries. The newest section of the cemetery is located along a steep embankment to the south of the old section. Most gravestones date from the twentieth century to the present.

Background research indicates that the cemetery has no known historical associations with individuals or events significant on the local, state, or national level and is not eligible for the National Register of Historic Places under Criterion A or B. This cemetery is not known to be the work of an architect or master craftsman and is not eligible for listing in the National Register under Criterion C. The cemetery does not derive its primary significance from graves of persons of transcendent importance, from age, from distinctive features, or from association with historic events and does not meet Criterion Consideration D.

4.7 POTENTIAL IMPACTS OF THE PROJECT AND MITIGATION

4.7.1 Energy Center Impacts

4.7.1.1 Construction

The construction of the CPV Valley Energy Center is not expected to have an impact on the cultural resources at the Site or in the surrounding area. The Phase IB survey of the Project site identified four previously unrecorded archaeological sites and five isolated finds. However, these cultural resources have been recommended to have low research value and to be ineligible for inclusion in the NRHP. Should the OPRHP concur with these recommendations, then no impacts to archaeological or cultural resources are expected from the construction.

Fieldwork conducted identified 12 architectural resources 50 years or older in the APE. Evaluation of the surveyed resources for NRHP eligibility identified one resource, the house and associated barn at 97 DeBlock Road as NRHP-eligible. The remaining 11 resources are recommended ineligible for NRHP listing, primarily due to lack of integrity and/or significance. In addition, there are no groupings of buildings potentially NRHP-eligible as historic districts or rural historic districts. There will be no direct physical effect to this NRHP-eligible resource from the Facility. Heavy intervening foliage cover and the slightly rolling surrounding topography will screen the Facility from view at the 97 DeBlock Road property. The Facility is expected to have No Effect to historic resources.

If archeological resources are discovered during the construction phase, the Unanticipated Discovery Plan described in Section 4.6.5 below will be implemented.

A copy of the final Phase IA/IB Cultural Resources Report submitted to the OPRHP will be included as an Appendix to the FEIS. OPRHP's correspondence will also be included in the Appendix. However, due to sensitive nature of archeological sites, information on their location can not be made available for public review pursuant to the OPRHP policy.

The Cooley Cemetery will not be disturbed by the construction of the proposed CPV Valley Energy Center. Because the land will change ownership, CPV Valley, LLC has proposed to take measures to restore and protect the cemetery. These measures include construction of a gated fence around the cemetery and an access path to the cemetery from the CPV Valley parking area. Broken headstones and footstones would be repaired and placed in their upright positions.

The Pine Hill Cemetery will not be disturbed by the construction of the proposed CPV Valley Energy Center. For both the Cooley Cemetery and Pine Hill Cemetery some view of the Project is likely due to proximity to the Project Site. Construction activities may result in some noticeable noise due to proximity to the Project site; however, these impacts would be relatively short in duration and would not be expected to result in significant adverse impacts due to their temporary nature. No change in access to the cemeteries is anticipated due to construction activities.

4.7.1.2 Operation

The operation of the CPV Valley Energy center is not expected to have an impact on the cultural resources at the Site or in the surrounding area. For both the Cooley Cemetery and Pine Hill Cemetery some view of the Project is likely due to proximity to the Project Site. As noted above, the Phase IB survey of the parcel identified four archaeological sites and five isolated finds. However, these cultural resources have been recommended to have low research value and ineligible for inclusion in the NRHP. Should the OPRHP concur with these recommendations, then no impacts to archaeological resources are expected from the operation and maintenance of the proposed project.

A copy of the final Phase IA/IB Cultural Resources Report submitted to the OPRHP will be included as an Appendix to the FEIS. OPRHP's correspondence will also be included in the Appendix. However, due to sensitive nature of archeological sites, information on their location can not be made available for public review pursuant to the OPRHP policy.

4.7.2 Compliance with Code of the Town of Wawayanda, New York, v30 Updated through: 09-15-2007/Part II General Legislation/Chapter 66, Cemetery Protection/§66-1 – 66-5

Both the Pine Hill and Cooley cemeteries are listed in the code. The requirements are as follows: no building is allowed within 100 feet of the site; a developer is required to erect and maintain a fence, install plantings or otherwise erect a visual and/or physical barrier between developable areas of land which are adjacent or contiguous to a cemetery and/or burial site; a developer must protect the cemetery before receiving a building permit; any proposed building within 200 feet of the cemetery must be referred by the building inspector to the Planning Board.

CPV Valley has obtained a copy of the code and will be in compliance.

4.7.3 Off-Site Electrical Interconnection/Water and Wastewater Pipeline Impacts

4.7.3.1 Construction

The proposed electric transmission line (underground) and water/wastewater pipeline will be located almost entirely within an existing utility corridor along the western shoulder of NY Route 17M. This is a developed area that has been previously disturbed from past road construction and installation of utilities. The only undisturbed portion is a small area at the overhead interconnect and Carpenter Creek crossing. This area was tested for archaeological resources and resulted in no finds. Portions of the water/wastewater pipeline are also located in an existing utility corridor in portions of Route 6 in proximity to the Project site and Dolsontown

Road immediately northeast of the Project site. As such, there will be no impacts to archaeological resources resulting from construction of the electric transmission line (underground) and water/wastewater pipeline.

4.7.3.2 Operation

The operation of the CPV Energy Center (including the electrical interconnect) is not expected to have any impact on cultural resources.

4.7.4 Mitigation

There will be no impacts to cultural resources as a result of construction and operation of the Project; therefore, no mitigation is necessary.

4.7.5 Unanticipated Discovery Plan

It is possible that archaeologically sensitive sites could be discovered during construction. An unanticipated discovery plan will be developed and implemented as part of the construction of the proposed Project. This plan presents the approach that will be employed to address such emergency discoveries and ensures that any potentially significant archaeological resources discovered during construction, including human remains, are dealt with in full accordance with state and federal requirements, including the most recent *Standards for Cultural Resource Investigations and Curation of Archaeological Collections in New York State.* This approach would also ensure that procedures and lines of communication with the appropriate government authorities are clearly established prior to the start of construction so that discoveries can be addressed in a timely manner, minimizing the impacts to the construction schedule to the extent possible.

At present, there are four archaeological sites recorded within the project area. Based on the background research conducted for the Project, the potential for identifying archaeological sites was determined to be moderate. In the event that sites are found during construction, it is important for all involved personnel to follow standardized procedures in accordance with all state and federal regulations.

Both the environmental inspectors and the construction personnel would be provided with a preconstruction briefing regarding potential cultural resources indicators. These indicators would include items such as recognizable quantities of bone, unusual stone deposits and ash deposits, or black-stained earth that could be evident in spoil piles or trench walls during construction. In the event that potentially significant cultural resources or human remains are discovered during construction, the environmental monitors and construction personnel would be instructed to follow the specific requirements and notification procedures outlined below. Cultural resource discoveries that require reporting and notification include any human remains and any recognizable, potentially significant concentrations of artifacts or evidence of human occupation.

If cultural resources indicators are found by construction personnel, the construction supervisor would be notified immediately. The supervisor, in turn, would notify the environmental inspector, who would notify a designated archaeologist, who would be available to respond to this type of find. Based on the information provided, the archaeologist would determine if a visit to the area is required and, if so, would inform the construction crews. No construction work at the site that could affect the artifacts or site would be performed until the archaeologist reviews the site. The site would be flagged as being off-limits for work, but would not be identified as an archaeological site per se in order to protect the resources. The archaeologists would conduct a review of the site and would test the site as necessary. The archaeologist would determine, based on the artifacts found and on the cultural sensitivity of the area in general, whether the site is potentially significant and would consult with the OPRHP regarding site clearance.

4.8 CONCLUSION

No significant archaeological resources have been identified on the proposed CPV Valley Energy Project site or within the off-site electric interconnection and water/wastewater pipeline corridors. As such, no impacts to archaeological resources would result from the construction, operation, and maintenance of the proposed Facility or off-site interconnections. One NRHP-eligible resource, the 97 DeBlock Road property, is located within the ½-mile APE, but as the Facility will not be visible from this property, there will be No Effect to historic resources. For both the Cooley Cemetery and Pine Hill Cemetery some view of the Project is likely due to proximity to the Project Site.

4.9 REFERENCES

Henry, G.
2008 *Architectural Survey Report, CPV Valley Energy Center, Town of Wawayanda, Orange County, New York.*
TRC, Inc., Ellicott City, Maryland. Submitted to CPV Valley, LLC, Braintree, MA.

National Park Service (NPS)
1993 *Guidelines for Evaluating and Registering Historical Archeological Sites and Districts*. National Register Bulletin 36.
U.S. Department of the Interior, National Park Service, Interagency Resources Division, National Register of Historic Places, Washington, D.C.

New York Archaeological Council (NYAC)
1994 *Standard for Cultural Resource Investigations and the Curation of Archeological Collections in New York State*.
Adopted by the New York State Office of Parks, Recreation and Historic Preservation.

Sara, Timothy, and Eric Schmidt
2008 *Phase I Archaeological Survey of the Proposed CPV Valley Energy Center, Wawayanda, Orange County, New York.*
TRC, Inc., Ellicott City, Maryland. Submitted to CPV Valley, LLC, Braintree, MA.

TRC, 2008. TRC Personal Communication (Geoffrey Henry) with the New York Office of Parks, Recreation and Historic Preservation.

5.0 VISUAL RESOURCES AND AESTHETICS

5.1 INTRODUCTION

This section provides a discussion of the visual impact assessment (VIA) performed for the CPV Valley Energy Center (Project or Facility). Identification of potential viewpoints, viewshed analyses, impact assessments, and mitigation analyses are provided for representative viewpoints within a 5-mile radius from the Project site. In addition, an analysis of potential stack plume visibility is also provided. Visual impact is assessed in terms of the anticipated change in visual resources, including whether there would be a change in character or quality of the view.

On July 31, 2000 the New York State Department of Environmental Conservation (NYSDEC) issued a program policy entitled “Assessing and Mitigating Visual Impacts.” This document defines State regulatory concerns and provides the framework for evaluating visual and aesthetic impacts generated from proposed facilities. The analysis performed for this Project uses the technical concepts and methods contained in that policy paper for determining compliance with such aesthetic concerns.

5.2 CHARACTER OF THE PROJECT SITE

The 122-acre Project site is located in the northeast portion of the Town of Wawayanda, Orange County, New York, directly south of the City of Middletown and west of New York Route 17M. The site is bordered by Interstate Route 84 to the south, and by U.S. Route 6, which curves and follows the northern and western end of the site.

The site is currently undeveloped land consisting of tracts used previously for agricultural purposes including hay and corn crops. Fallow areas from hay use can be characterized as upland meadows dominated by goldenrod and meadow grasses. There are several wooded areas that are associated with wetland streams. Carpenter Creek traverses the northern extent of the site running in an east to west direction. The surrounding area becomes increasingly commercial and residential to the north toward the City of Middletown, but otherwise remains open undeveloped, wooded, and rural residential, with isolated areas of industrial or light commercial uses located off U.S. Route 6 and intersecting roads. The CPV Valley Energy Center would occupy approximately 21.25 acres within the 122-acre Project site. The overhead transmission line segment on the Project site will entail clearing of approximately 3.24 acres of forested right-of-way. An additional 1.17 acres of open field area is traversed by the overhead line.

5.3 LOCAL LANDSCAPE AND LAND USE

Currently, a limited number of single-family residences are on property adjacent to the Project site. Vacant undeveloped commercial land, a wooded area and four homes are grouped contiguously together along the north side of Route 6, approximately 0.25 miles from the Facility location. One house in the vicinity of the other four homes is located on the south side of the road. Directly to the west on the opposite side of Route 6 are undeveloped open land and wooded areas as well. Interstate Route 84 is directly south of the site forming the southern boundary. Pine Hill Cemetery and Horizons at Wawayanda, a workforce complex currently under construction, is located along the northeast/eastern boundary of the Project site.

Several development projects are proposed within a 2 mile area near the Project site. The nearest one to the site, Concrete Properties-Panatonni Development, is located 0.25 to 0.5 miles to the west on the opposite side of Route 6.

Wawayanda's physical appearance is primarily characterized by rural open spaces interspersed with small hamlets and residential subdivisions. Open undeveloped and fragmented active agricultural lands in addition to larger expanses of heavily wooded areas lie primarily to the south of Interstate Route 84 in the vicinity of Route 56 and Bates Gates, Deblock and Seward Roads. There are locations of higher density suburban residential homes along Greeves, Ridgebury, and the Post Road areas, south of the agricultural fields approximately 1.0+ miles away.

Route 17M runs in a general north-south orientation, approximately 0.5 east of the site. Along Route 17M are primarily commercial land uses, including strip malls, food establishments, car dealerships, and other commercial establishments.

Further west and northwest of the site are commercial uses, a gravel operation, a large-scale confined housing dairy, a New York State Department of Transportation facility operation, and open undeveloped vacant lots and low-density residential housing.

The population and residential density increases north of the site. Kirbytown Road is a suburban residential area that is one of the first residential roads encountered north of the site. As one proceeds further north, one approaches the City of Middletown where there are more densely populated areas in the form of high-density low and middle income housing developments and senior apartment complexes. Other community oriented facilities such as urban parks, food establishments, and churches are encountered. Aside from the commercial development directly associated with Route 17M, there are also other mixed residential commercial areas and the Middletown Sewage Treatment Plant. Section 3.0 provides a more detailed description of land uses within 1 mile of the Project site.

5.3.1 NYSDEC Visual Policy Resource Inventory

The NYSDEC issued a Program Policy on July 31, 2000 entitled "Assessing and Mitigating Visual Impacts." This document defines State regulatory concerns and provides the framework for evaluating visual and aesthetic impacts generated from proposed facilities. This NYSDEC policy also defines important technical concepts and methods for compliance with the State Environmental Quality Review Act (SEQRA) with respect to environmental aesthetics. With this policy, NYSDEC asserts that the state's interest with respect to aesthetic resources is to protect those resources whose scenic character has been recognized through national or state designations.

This section provides an inventory of visual resources located within a 5-mile Project study area in accordance with the NYSDEC Visual Resources Policy. Identified visual resources are described below and listed in Table 5-1. Figure 5-1A shows the location of the identified visual resources and viewpoints within the 5-mile study area. The map identifier for each resource is given in parentheses following each mention of a resource within the study area.

Table 5-1
Summary of Visual Resources and Viewpoints Selected for Photosimulations

ID #	Distance	Description of Viewpoint	Land Use	Historic-Scenic Significance	Potential Visibility Based on Initial Viewshed Map	Comments	Selected Viewpoint for Photo-Simulations
H1	1.97 miles	Webb Horton House	Developed	NRHP	NO	-	-
H2	2.02 miles	Hillside Cemetery	Cemetery	NRHP	YES	H5 selected as a Viewpoint, which is also representative of this location.	VP1 represents this location
H3	2.07 miles	Dunning House	Developed	NRHP	NO	-	-
H4	2.27 miles	Primitive Baptist Church of Brookfield	Developed	NRHP	YES	Likely not visible, under leaf on based on field assessment. Possibly visible during leaf off conditions.	VP 7
H5	2.42 miles	Paramount Theater	Developed	NRHP	YES	Not visible based on field assessment. Viewpoint selected to further document no views.	VP 1
H6	2.89 mile	Oliver Avenue Bridge	Developed	NRHP	NO	-	-
H7	4.11 mile	Sawyer Farmhouse	Developed	NRHP	NO	-	-
H8	5.36 miles	District School No. 9	Developed	NRHP	NO	-	-
S21	4.44 miles	Minisink Valley Elementary School	School		YES	Not visible based on line of sight location.	-
S22	4.57 miles	Minisink Valley Middle School	School		YES	Not visible based on line of sight location.	-
P1	0.98 miles	Ben and Paula Amchir Park	Recreation		NO	-	VP 3
P2	1.84 miles	Proposed Orange Heritage Trail	Recreation	NRT	YES	Possibly visible.	VP 2
P3	2.11 mile	Maple Hill Park	Recreation		NO	-	-
P4	2.70 miles	Shannen Park	Recreation		NO	Not visible; viewpoint selected to document no views.	VP 4
P5	2.90 miles	City Park – Wallkill	Recreation		NO	-	-
P6	2.98 miles	Francher-Davidge Park	Recreation		NO	-	-
P7	3.58 miles	Watts Memorial Park	Recreation		NO	-	-
P8	4.18 miles	City Park – Middletown	Recreation		NO	-	-
-		New York State Bike Route 17	Developed		YES	Visible from nearfield locations	-
	1.86 miles	Truman Moon School	School		NO	Not visible based on field assessment due to topography, vegetation, and houses/structures blocking views. Viewpoint selected to document no views.	VP 8
	0.5 miles	Residential Area at Kirbytown Road**	Developed		YES	Possibly visible, based on field assessment	VP 6
	0.6 miles	Bates Gates Road**	Rural Developed		YES	Possibly visible based on field assessment	VP 5

*Based on Line-of-Sight analysis performed for Minisink Valley School
**Two additional residential areas were added as candidate viewpoints due to their proximity to the project

1) *A property on or eligible for inclusion in the National or State Register of Historic Places [16 U.S.C. §470a et seq., Parks, Recreation and Historic Preservation Law Section 14.07]*. Seven National Register sites are located within the study area and one additional property is just outside the study area. These properties include the following:

- Webb Horton House (H1) on South Street in Middletown, approximately 2.0 miles north of the Project site. Reference Number 90000690 (1990-04-26).

- Hillside Cemetery (H2), located on Mulberry Street in Middletown, approximately 2.0 miles north of the Project site. No Reference Number is available for this site, although the date it was added to the registry was 1994-09-07.

- Paramount Theater (H5) on South Street in Middletown, approximately 2.4 miles north of the Project site. Reference Number 02000136 (2002-03-06).

- Dunning House (H3) on Ridgebury Road in Ridgebury, approximately 2.1 miles south-southwest of the Project site. Reference Number 01001383 (2001-12-28).

- Primitive Baptist Church of Brookfield (H4) off Route 6 in Slate Hill, approximately 2.3 miles southwest of the Project site. Reference Number 76001260 (1976-11-13).

- Oliver Avenue Bridge (H6) on Oliver Avenue in Middletown, approximately 2.9 miles north of the Project site. Reference Number 84002882 (1994-07-19).

- Sawyer Farmhouse (H7) on Maple Avenue near Goshen, approximately 4.1 miles southeast of the Project site. Reference Number 05000636 (2005-06-30).

- District School No. 9 (H8) in Goshen, approximately 5.4 miles southeast of the Project site.

2) *State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]*. No state parks are located within the study area. The nearest, Highland Lakes State Park, is approximately 5.6 miles northeast of the Project site.

3) *Urban Cultural Parks [Parks, Recreation and Historic Preservation Law Section 35.15]*. The State Heritage Areas program has replaced the urban cultural parks program. No state heritage area is near the Project site.

4) *The State Forest Preserve [NYS Constitution Article XIV]*. The state forest preserve is limited to the Adirondack and Catskill Parks, and some portions of the counties where these two parks are located. No such lands are on located in Orange County.

5) *National Wildlife Refuges [16 U.S.C. 668dd], and State Game Refuges [ECL 11 2105]*. No National Wildlife Refuge (NWR) or state game refuges are within the study area. The nearest NWR is the Wallkill River NWR in Sussex, New Jersey,

approximately 11 miles south of the Project site. No state game refuges are near the Project site. Additionally, the nearest state wildlife management area is the Bashakill Wildlife Management Area approximately 12 miles north-northwest of the Project site.

6) *National Natural Landmarks [36 CFR Part 62]*. No National Natural Landmarks are located within the study area. No National Natural Landmarks are located in Orange County.

7) *The National Park System [16 U.S.C. 1c]*. No national parks are located within the study area or near the Project site.

8) *Rivers designated as National or State Wild, Scenic or Recreational [16 U.S.C. Chapter 28, ECL 15 2701 et seq.]*. The only nationally designated river in Pennsylvania or New York is the Upper Delaware River, which is well outside of the study area. The nearest state designated river is the Shawangunk Kill River, designated as Recreational approximately 18 miles north of the Project site.

9) *A site, area, lake, reservoir or highway designated or eligible for designation as scenic [ECL Article 49]*. Areas subject to Article 49 designation include Scenic Byways (now under the purview of the New York State Department of Transportation), parkways designated by the Office of Parks, Recreation and Historic Preservation, and other areas designated by NYSDEC. The nearest scenic byway is the Shawangunk Mountains Scenic Byway, with the closest portion part of New York State Route 302 north of New York State Route 17K in Bullville, approximately 9.3 miles north of the Project site. The nearest scenic parkway is the Palisades Interstate Parkway approximately 22 miles southeast of the Project near Doodletown. The Project is not in or near any scenic sites or districts otherwise designated through Article 49.

10) *Scenic Areas of Statewide Significance [Article 42 of Executive Law]*. No Scenic Areas of Statewide Significance (SASS) areas are located within the study area. The nearest SASS is the Hudson Highlands SASS located approximately 21 miles east of the Project site, near West Point and Bear Mountain State Park.

11) *A state or federally designated interstate or inter county foot trail, or one proposed for designation [16 U.S.C. Chapter 27 or equivalent]*. The Orange Heritage Trail (P2), a National Recreation Trail, is a paved multi-use trail running from Middletown to Monroe along an old railroad bed. The nearest part of this trail is approximately 0.9 mile east-northeast of the Project site. No other trails are within the study area. The Long Path, a 326-mile hiking path from near the George Washington Bridge to Albany, is approximately 6.8 miles to the northeast at its nearest point. The nearest portion of Appalachian National Scenic Trail is located approximately 12.5 miles to the south-southeast in Bellvale.

12) *Adirondack Park Scenic Vistas*. The Adirondack Park is located in northeastern New York State, far removed from the Project study area.

13) *State Nature and Historic Preserve Areas*. No preserves are located in the Project study area or in Orange County.

14) *Palisades Park*. New York State's portion of the Palisades Park is located primarily in Rockland County, well outside the study area.

15) *Bond Act Properties purchased under Exceptional Scenic Beauty category*. No properties of this nature are within the Project vicinity.

5.3.2 Additional Visual Resources

An inventory of additional visual resources including scenic easements, public parks and recreation areas, and scenic overlooks was developed by CPV Valley. These areas include sensitive community resources and open space areas specifically identified in the Town of Wawayanda Comprehensive Plan and Orange County Open Space Plan. Also considered are nearby parks in Middletown and Wallkill. The additional community visual resources found within the Project study area are:

- *New York State Bike Route 17* – An on-road long distance bicycle route that includes the portion of U.S. Route 6 that forms the eastern and northern boundary of the site.
- *Shannen Park* (P4) – The major town run open space in Wawayanda is a 133-acre park approximately 2.7 miles southwest of the Project site.
- *Minisink Elementary and Middle Schools* (S21 and S22) – These schools and associated recreational facilities are located approximately 4.1 miles southwest of the Project site.
- *Ben and Paula Amchir Park* (P1) – In Middletown, approximately 1.0 mile north of the Project site.
- *Maple Hill Park* (P3) – In Middletown, approximately 2.1 miles north of the Project site.
- *City Park* (P5) – In Wallkill, approximately 2.9 miles northeast of the Project site.
- *Francher-Davidge Park* (P6) – In Middletown, approximately 3.0 miles north of the Project site.
- *Watts Memorial Park* (P7) – In Middletown, approximately 3.6 miles north of the Project site.
- *City Park* (P8) – In Middletown, approximately 4.2 miles north of the Project site.
- *Truman Moon School* – In Middletown, approximately 1.9 miles northeast of the Project site on 53 Bedford Avenue.

In addition, viewpoints from a number of residential developments in the Project study area are included, as noted in Table 5-1 and shown on Figure 5-1A.

The visual resource inventory and proposed viewpoints were provided to the Planning Board in advance of filing the DEIS.

5.4 DESIGN, APPEARANCE AND GENERAL MITIGATION

Some of the visual impact avoidance and mitigation tools recommended for analysis under NYSDEC's visual resources policy require simultaneous consideration of the entire viewshed, and for this reason are addressed in this section as part of the Project design. They are design and siting; alternative cooling technologies; changes to the profile or size of the facility; on-site screening and landscaping; general color and texture of materials; maintenance during operation; and lighting options.

5.4.1 Visual Characteristics of the Project

The overall appearance of the CPV Valley Energy Center is illustrated in the Project rendering shown in Figure 2-6. The most prominent structures associated with the Project are the exhaust stack, air cooled condenser, and the generation building. The generation building would house the combustion turbine generators and the Heat Recovery Steam Generators (HRSG). The tallest structure will be the exhaust stack with a height of approximately 275 feet above grade. The highest portion of the generation building will be 113 feet above grade. The air-cooled condenser will have a height of approximately 115 feet above grade. The Project will also incorporate a 1,000,000-gallon combination raw water/fire water storage tank, a 400,000-gallon demineralized water storage tank, and a 965,000-gallon fuel storage tank and associated off-loading facilities, transfer piping, and pump systems. The Facility's raw/fire water storage will be 40 feet tall and the fuel storage tank will be 48 feet tall. The demineralized water storage tank will be 22 feet tall. Ancillary facilities, such as fuel gas compressor, maintenance building, and a combustion turbine inlet filter would be smaller and less prominent than the aforementioned structures.

The Project will interconnect to the 345 kilovolt (kV) NYPA Marcy South system, located less than 1 mile from the site to the northeast. The interconnection would be made via a new on site 345 kV substation and 345 kV electric transmission cables to be placed on overhead pole structures when crossing the site and in underground conduit between the site boundary and the NYPA transmission lines within the right-of-way of Route 17M.

5.4.2 Siting, Layout and Relocation

In developing the Facility site plan, CPV Valley considered a number of potential site layouts on the 122-acre Project site. Locating the Facility at the southern center portion of the Project site was preferred for three reasons. First, it placed the proposed Facility proximate to nearby Route 6 and Interstate 84 and proposed industrial properties, thereby providing for a continuation of the orderly development of the Project area by avoiding a fragmented development condition. Second, locating the Project in the southwest corner minimizes impacts to wetlands. Third, the Project site location provides maximum buffer from nearby visual and noise receptors, thereby mitigating potential impacts.

5.4.3 Alternative Technologies

For a combined-cycle facility, cooling technology can affect visual impact. The two principal cooling methods for a combined-cycle Facility are wet evaporative cooling and air-cooling. Evaporative cooling relies on the evaporation of cooling water through a mechanical draft cooling tower to provide condenser cooling. However, air-cooling was chosen for a number of reasons, including its beneficial impact with respect to reduced water supply needs and elimination of cooling tower plumes. The trade-off is a larger physical structure with an air-cooled condenser. To maintain adequate air flow, the air-cooled condenser for the project is 115 feet tall, similar in scale to the turbine building.

5.4.4 Low Profile and Downsizing

Concerted efforts were expended by CPV Valley to minimize the visibility of the proposed Facility including changes to the Facility profile and size. The Facility's combustion turbine stacks are the most visually prominent feature. One way to minimize stack height is to limit the height of nearby structures that determine the Good Engineering Practice stack height. Preliminary modeling considered stack heights of up to 325 feet based on Good Engineering Practice stack height associated with an initial Facility design. Project design changes, including the reduction in the height of the air cooled condenser to 115 feet, reduced the Good Engineering Practice stack height to 287.5 feet. The final stack height of 275 feet for the combustion turbines was selected based on modeling that showed that this height was adequate to largely avoid increases in predicted impacts that can result from the effects of building induced downwash on stacks that are below Good Engineering Practice stack height.

5.4.5 Screening and Landscaping

The proposed Landscaping plan is intended to enhance the appearance and natural beauty of the historical agricultural use of the existing property, and to enhance property values in the surrounding areas. Various small sections of the entrance to the Project site will be graded and seeded after construction. Land to be left as buffer outside the Facility fence line after construction will be restored to its current open space use after construction. Approximately 7.6 acres of that buffer land will be temporarily used as equipment and construction materials laydown and parking during construction.

Other landscaping plans include adding trees and shrubs in areas on the site. These landscaping areas will be protected by protective barriers, curbs, or other damage control and from storm water runoff. The Project will incorporate protective measures to protect landscaping and vegetation adjacent to parking areas, loading areas and driveways. To the maximum practical extent and applicable, mature shade trees, vegetation, and unique site features such as stone walls will be preserved. A buffer area will be placed along the Route 6 boundary; one shade tree (minimum caliper of three inches at four feet) will be planted for each 40 feet of lot frontage.

The Project's front lot will be covered with grass, trees and shrubs. Where 20 or more parking spaces are required, at least 10 square feet of interior landscaping will be provided within the paved area for each parking space, and at least one tree will be provided for every ten parking spaces. Each landscaped area will be at least 100 square feet, planted with grass or shrubs, and contain at least one tree. A landscaping area will also be provided along the perimeter of the parking area, except where access is provided.

5.4.6 Color, Texture, and Camouflage

The natural vegetation, large buffer areas surrounding the Facility, and proposed landscaping will help shield full views of the Facility from off site locations. The exterior architectural treatment of the buildings (i.e., windows, doors, siding, etc.) will be painted a neutral beige color to mitigate visibility. The steel stack will be painted a neutral gray tone to complement the generation building. Non-reflective materials will be specified, where feasible, to further soften the Facility appearance and minimize the potential for glare.

5.4.7 Maintenance

Maintenance of the proposed Facility is an important aspect to the visual appearance of the Facility and the continued enhancement of the area aesthetics. The façade of the generation building and other prominent Facility components will be periodically inspected to ensure that the selected materials remain durable and attractive. A program of scheduled maintenance will be followed to repair or replace any façade materials that show accelerated wear. The areas surrounding the Facility will be similarly maintained and kept free from loose debris or other refuse.

Implementation of the landscaping plan will include low-maintenance and drought-resistant plantings, to the extent possible, in order to minimize continued maintenance requirements and re-plantings. Any lawn areas will be mowed on a regular schedule, and annual clean-up programs during the spring and fall would ensure fallen leaves and annual vegetation are properly removed. Landscape plantings that do not survive will be replaced during the next available planting cycle to maintain the integrity of the landscaping plan.

5.4.8 Lighting Plan

Normal plant lighting and emergency temporary lighting will be provided throughout the Facility. The Project’s proposed lighting design will minimize off-site impacts, while providing the sufficient lighting to ensure worker safety during routine operations and maintenance. The site lighting will be designed according to the latest edition of the Illuminating Engineering Society (IES) Lighting Handbook.

Roadway lighting will consist of 400 watt High-Pressure Sodium (HPS) fixtures mounted at 25 feet above grade. These fixtures will include cut-off optics to reduce unwanted glare and fugitive light. The fixtures will be oriented such that the emitted light is directed inwards toward the plant and be controlled by light sensing switches.

Entry door and truck access doorway lighting are anticipated to consist of 70 watt HPS and 100W HPS wall lighting fixtures, respectively. These fixtures will also include full cut-off optics to reduce unwanted glare and fugitive light. The doorway fixtures will be located above the doors and directed downward. Photovoltaic cells will control these fixtures.

Platform lighting is anticipated to consist of 70 watt, 100 watt and/or 150 watt HPS heavy-duty, stanchion mounted, area lights. The term “platform lighting” includes the top of the air-cooled condenser and associated access stairs, continuous emissions monitoring system (CEMS) equipment access platforms and any other equipment-related platforms. Typically, the stairway fixtures are provided with photovoltaic cell control and the actual platform area lighting is controlled from locally mounted switches. This allows for the reduction of nighttime fugitive light. The fixtures typically are mounted 8 feet above the platform elevation.

A Federal Aviation Administration (FAA) Determination of No Hazard to Air Navigation is required for the CPV Energy Center because the stack height would be greater than 200 feet. It is anticipated that stack lighting will be in accordance with FAA advisory circular 70/7460-2. Obstruction Marking and Lighting, a med-duel system – Chapters 4, 8 (M-Duel), &12.

5.5 VISUAL IMPACT ASSESSMENT

The visual impact assessment for this Project was performed using two methodologies; 1) viewshed analysis and 2) realistic photo-renderings (photosimulations). A viewshed analysis is a Geographic Information System (GIS) analytical technique that allows one to determine if and where an object, such as a generating facility, can be seen from geographic vantage points within the visual study area. The viewshed analysis results in preparation of a viewshed map. Although the viewshed map can serve as a stand alone visual impact assessment, CPV Valley used the viewshed map as a precursor to a more sophisticated visual assessment, using photosimulations. Photosimulations were prepared to obtain the best possible visual representation of the proposed Project in terms of size and scale within the landscape, and assists in evaluating the potential visual impact from a given vantage point.

5.5.1 Viewshed Analysis Methodology

A viewshed analysis encompassing an area within a 5-mile radius of the Facility was performed to identify those areas from which the proposed Facility buildings, air cooled condenser, stacks, and other ancillary components would potentially be seen. This evaluation utilized a standard 10-meter resolution USGS digital elevation model (DEM) in order to establish baseline elevations within the Project area. To further enhance the accuracy of the viewshed model, the most recent digital National Land Cover Dataset (NLCD) of 2001 was used. The NLCD is a USGS spatial dataset derived from Landsat Thematic Mapper satellite data. It is a comprehensive land cover database available for the entire U.S. that includes 21 classes of land cover, percent tree canopy, and percent imperviousness. Deciduous and coniferous tree data greater than 15 feet in height was extracted from this dataset and processed as a visual impediment layer to be included with the base DEM. This NLCD vegetation layer was additionally cross-checked against more recent leaf-on aerial photography of the study area dated 2004. In some cases, there were differences in tree cover observed on the aerial photograph that were not present within the NLCD data, and the vegetation layer was subsequently adjusted.

Following the cross-check of data, the vegetated tree layer was then assigned a height of 36-feet, as an average conservative height recorded by biologists in the field. The x, y and z data of the Facility components was then incorporated into the model. These data were controlled within the model to ensure that the surface elevation and the vertical offsets of the Facility components were embedded properly against the vegetation layer. The viewshed model was further developed with the assumption that the Facility is not visible to a viewer who is standing amongst trees in a forested area. The final resulting output grid identified those areas from which viewers would potentially see all or some part of the Facility, and in some cases only the upper portion of a stack.

5.5.2 Results of Viewshed Analysis

The viewshed analysis (Figure 5-1B and Table 5-2) shows that within the 5-mile study area, the most concentrated location of visibility occurs at the site extending out to 2 miles and comprises approximately 2.6 percent of the study area. The remaining 2.2 percent of the viewshed occurs between 2 and 5 miles where most areas of visibility occur northeast of the site.

Table 5-2
Area Within 5 Miles That May Have Potential Views of the Project*

Distance (Miles)	Potential Visibility Acreage (cumulative)	Percent of Study Area* (cumulative)
1.0	707.6	1.4
1.5	1085.2	2.1
2.0	1311.5	2.6
5.0	2388.2	4.8

* The area of 10 miles (5 mile radius surrounding facility) = 50259.0 acres

Approximately 95 percent of the 5-mile radius study area will have no views of the Facility. For the remaining 5 percent area, the viewshed model results show that some part of the Facility is most likely to be seen from open areas in low lying locations and from higher elevations.

Care should be taken when interpreting the results of the viewshed mapping, especially at greater distances from the Project Site, because the model assumes that there is a clear line-of-sight from each location in the viewshed to the Facility. In fact, though, a given location may not have a clear line-of-sight to the Facility because of obstructions not considered in the model. This, and other assumptions built into the viewshed model, cause the viewshed map and corresponding analyses to be very conservative. Because of the conservative assumptions, certain factors in the interpretation need to be considered carefully:

1. The model, because of its computerized aspect, assumes the observer to have perfect vision at all distances. Therefore, a certain amount of reasonable interpretation needs to be considered because of the limitations of human vision at greater distances or those atmospheric obstructions that may cause imperfect vision, such as haze or inclement weather. Additionally, an object is naturally smaller and shows much less detail at distances.

2. The viewshed analysis that was performed show potential visibility when using two 275-foot stacks as a maximum target height. Therefore, some areas of the viewshed map may

prove to be quite conservative. For example, a visible area might only include the upper 30-foot section of a stack at 2 miles.

3. Not all small groups of trees, particularly those that might be along tree lined streets in suburban/urban areas, or the numerous buildings that are present within a 5-mile radius are accounted for in this analysis. Therefore, there may be more visual impediments occurring in the landscape than are represented in the model. This phenomenon is most evident in the Middletown area where the viewshed results show many visible areas. On the ground site surveys performed confirmed that there are more obstructions impeding views of the Project than is represented on the viewshed map, and that the Middletown area, including Environmental Justice (EJ) Community Census Tract #001500 shows highly conservative results.

5.5.3 Photosimulations: Viewpoint Locations

The viewshed modeling results, in combination with on-site surveys was conducted to determine the potential visibility of the proposed Project from specific viewpoints within and proximate to the Project site. If a potentially visible area overlapped with a visual resource listed in Section 6.3.1 or 6.3.2, the location was considered a potential candidate for a documented photosimulation. Table 5-1 provides a summary of the viewpoints selected for the photosimulations and the rationale. Figure 5-2B shows the locations of the selected viewpoints (VP).

5.5.4 Photosimulations: Methodology

Leaf-on photographs were taken in September 2008 at the selected viewpoint locations. Leaf-off photographs were taken in December 2007 at an additional five locations, in relatively close proximity to the Project site.

Photographs were taken using a digital SLR camera set to a 50 millimeter (mm) equivalent focal length from selected viewpoints in order to document baseline conditions (existing views) of the Project site. A specific protocol for photo-documentation was implemented, which included the use of a tripod, global positioning system (GPS) Trimble GEOXT Unit, compass, and survey stakes to record the accurate location of the viewpoint and direction towards the potential view of the Project site.

To create visual simulations, AutoDesk Studio VIZ4 software was used to accurately locate and correctly dimension the image of the Project into the digital photographic image from each viewpoint location. A 3-dimensional model of the Facility or transmission line structure was created in the visualization software program based on engineering specifications. As such, relative dimensions in the model were proportionally represented. These 3-dimensional models were then incorporated into UTM Zone 18 coordinate system configuration and placed at the latitude and longitude specified by the engineering drawings. The elements within the model were then adjusted to the elevation at the given coordinate location.

The model was further developed to position the viewer at the selected vantage point. For a given vantage point, the visualization software is capable of providing and adjusting a camera view that matches that of the actual photograph. In addition to the model being incorporated into a geo-referenced coordinate system, the photo location coordinates and elevations were registered using a sub-meter global positioning system (GPS). This also provides a distance from the camera (viewer) to the Facility as each element has an x, y, and z location. All of these elements and parameters are entered or created within the visualization software to simulate the conditions of the Facility and transmission line layout as well as the camera parameters of the photograph, and location and orientation of the photograph. These perspective views were then superimposed onto the photographs to present a visual representation of the proposed Project.

The results of the leaf-on and leaf-off photosimulations are presented below.

5.5.5 Results of Leaf-On Photosimulations

Potential impact to the visual environment requires consideration of a number of community issues: the presence of public vantage locations; physical characteristics of the site and surrounding area; expectations of viewers from those locations; physical characteristics of the proposed installation; and the manner in which views will change as a result of the proposed Project.

Viewpoint 1 - Paramount Theater

The historic Paramount Theater is located on South Street in Middletown, approximately 2.4 miles north of the site. The photograph shows a view from the sidewalk just outside the theater at the entrance to the parking lot, looking south towards the site. There is a vacant boarded-up building adjacent to the theater, and residential dwellings and commercial business on the opposite side of the street. There will not be a view of the proposed Facility from the Paramount Theater due to obstructions caused by trees and other buildings in the foreground. The photosimulation of this site shows a white outline on the photograph to indicate the location of the Facility if it could be seen. (See Figures 5-2A and 5-2B, before and after photosimulations.) Due to the distance from the Project site and intervening vegetation and structures, views of the Facility from this location during leaf-off conditions are also unlikely.

Viewpoint 2 - Corner of Dolsontown Road and McVeigh Road in Vicinity of Proposed Bike Path

The section of the Orange Heritage Trail bike path in leading to Middletown has not been built yet. Many sections in this area of the proposed rail trail are tree-lined on either side of the current rail bed. Viewpoint 2 in Wawayanda was chosen as a location for a photosimulation, as it lies in an easily accessible, publicly available area where the bike path would cross Dolsontown Road. From this vantage point, there will not be a view of the proposed Facility because trees obstruct the view. Viewpoint 2 is approximately 1.6 miles east of the site. The photosimulation of this site shows a white outline on the photograph to indicate the location of the Facility if it could be seen. (See Figures 5-3A and 5-3B, before and after photosimulations.) Due to the distance from the Project site and intervening vegetation, views of the Facility from this location during leaf-off conditions are expected to be limited.

Viewpoint 3 - Ben and Paula Amchir Park

This local park located along Academy Avenue in Middletown is approximately 1.5 acres and is located approximately 1.0 mile northwest of the site. There are single family residences to the east and apartment complexes south of the park just across the street. There will not be a view of the Facility from this location. The photosimulation of this site shows a white outline superimposed on the photograph to indicate the location of the Facility if it could be seen. (See Figures 5-4A and 5-4B, before and after photosimulations.) Due to the distance from the Project site and intervening vegetation and structures, views of the Facility from this location during leaf-off conditions are unlikely.

Viewpoint 4 - Shannen Park

Shannen Park in Wawayanda is located approximately 2.9 miles southwest of the site. It is approximately 27 acres in size with several access roads for walking and running, a large playground area, and a ballfield. It is interspersed with mowed areas and trees. The receptor photograph was taken from a small parking area located in the center of the park, between the playground area and the ballfield. The view in the photograph is looking northeast across the playing fields to the edge of a large expanse of forested area in the background. There will not be a view of the Facility due to intervening topography and forested area. The photosimulation of this site shows a white outline to indicate the location of the Facility if it could be seen. (See Figures 5-5A and 5-5B, before and after photosimulations.) Due to the distance from the Project site and intervening vegetation, views of the Facility from this location during leaf-off conditions are unlikely.

Viewpoint 5 - Bates Gates Road

This photograph was taken at one of the higher elevation areas along the road in an area not dominated by trees, looking northwest towards the site. This viewpoint is approximately 0.6 miles from the proposed facility. This section of Bates Gates Road can be characterized as rural. Residences in greater density within more wooded areas are located just east of the photo location. The photograph shows a mature cornfield that blocks views of the air cooled condensers and some of the ancillary tanks and buildings, leaving only a view of the stacks and the very top of the combustion turbine building.

At the time of the year in which the photograph was taken, there are distinct vegetative patterns including the cornfield and the surrounding trees offering visual contrast and variation. However, the view above the cornfield attracts the eye and could be considered a focal point in the photograph, as might be expected at 0.6 miles. On the other side of the cornfield exists some narrow tree rows, in addition to Interstate Route 84. (See Figures 5-6A and 5-6B, before and after photosimulations.) Views of the Facility from this location during leaf-off conditions would be similar to the leaf-on conditions.

Viewpoint 6 - Residential Area at Kirbytown Road, Between Uhlig Road and Route 49

The area surrounding Viewpoint 6 is residential with most parcels consisting of 1.0 to 2.5 acre lots. Most of Kirbytown Road itself would have not have views of the Facility during leaf-on conditions as they would be blocked by intervening trees. Viewpoint 6 photograph was taken at one of the most open areas along the road that would potentially have the greatest view of the Facility with no intervening trees. This location is approximately 0.5 miles from the site. The photograph shows an open area between houses, looking in a southeasterly direction. The view of the Facility would consist of a partial view of the upper portion of the stacks and a small portion of the top of the air cooled condensers, as seen behind the white fence in the center of the photograph. If driving along the road, the duration of view at this location would be considered short, and most of the Facility would not be seen. The foreground elements and the house competes with the partial view of the stacks as a focal point. (See Figures 5-7A and 5-7B, before and after photosimulations.) The view of the Facility from this location during leaf-off conditions would be similar to the leaf-on conditions.

Viewpoint 7 - Primitive Baptist Church of Brookfield

The Primitive Baptist Church of Brookfield is located along Route 6 approximately 2.4 miles from the facility. At this location looking in a northeasterly direction there will be no views of the Facility due to a narrow row of intervening trees that border the church property. The photosimulation of this site shows a white outline on the photograph to indicate the location of the Facility if it could be seen. (See Figures 5-8A and 5-8B, before and after photosimulations.) Due to the distance from the Project site and intervening vegetation, views of the Facility from this location during leaf-off conditions are expected to be limited.

Viewpoint 8 - Truman Moon School

Viewpoint 8 is approximately 1.86 miles from the proposed Facility and is located along Bedford Avenue which can be characterized as a suburban street. The photograph was taken at the entrance-way of the school looking southwest towards the facility. The school is located behind the photographer. The school itself and surrounding grounds, drops down in elevation behind some houses located on the same side and does not have a view of the facility. The photosimulation of this viewpoint location shows a white outline on the photograph to indicate the location of the Facility if it could be seen. (See Figures 5-9A and 5-9B, before and after photosimulations.) Due to the distance from the Project site and intervening vegetation, topography, and structures, views of the Facility from this location during leaf-off conditions is unlikely.

5.5.6 Results of Leaf-Off Photosimulations

Viewpoint 9 - Parking Lot of Balchem Corporation

Balchem Corporation is located on Sunrise Park Road adjacent to Route 17M, approximately 0.8 miles east of the facility. This viewpoint is located within a commercially zoned area next to the Route 84 Exit 3 interchange. The view is from the eastern side of the parking lot looking slightly to the southwest. Route 17M can be seen in the middle of the photograph just on the other side of the chain-link fence located at the edge of the property. The elevation drops slightly on the other side of the highway, as noted by the position of the trees in the left portion of the photograph. These trees would block views of the Facility, as well as another group of trees located on the Facility property. Portions of the stacks might be glimpsed through the trees in the foreground when the leaves are off but would not be a dominant focal point from this location. A white outline of the Facility is superimposed on the photograph for the ease of viewing where the stacks and Facility are located. (See Figures 5-10A and 5-10B, before and after photosimulations.)

Viewpoint 10 - Pine Hill Cemetery

Pine Hill Cemetery is located along the northeastern side of the site boundary and adjacent to Route 6. The viewpoint is located at the southern back portion of the property approximately 0.5 miles from the facility. Due to the proximity of the cemetery combined with a view with relatively few trees to act as an impediment, a portion of the Facility will be visible through sparse trees in leaf-off conditions from this location. When turned in that direction, the Facility would likely be a dominant focal point within the landscape. (See Figures 5-11A and 5-11B, before and after photosimulations.)

Viewpoint 11 - Our Lady of Mt. Carmel School

Our Lady of Mt. Carmel School is a Roman Catholic private elementary school in Middletown. The grounds have several buildings and parking areas. There is a playground area and playing fields on either side of Euclid Avenue which travels through the property. This viewpoint is located on the eastern side of Euclid Avenue, approximately 1.2 miles north of the site. The photograph was taken at the backside of the property facing south towards the Project. There will be no views of the Facility due to the close proximity of the forested area, as seen in the photograph. The photosimulation of this site shows a white outline on the photograph to indicate the location of the Facility if it could be seen. (See Figures 5-12A and 5-12B, before and after photosimulations.)

Viewpoint 12 - Residential Area at Kirbytown Road, Between Uhlig Road and Apple Lane Drive

This viewpoint is located along Kirbytown Road in a residential area between Uhlig Road and Apple Lane Drive. It is approximately 0.35 miles from the Facility looking south. The photograph was taken in front of an open field to show a view that did not have intervening houses. There is a forested area at the southern end of the field. There will be a partial view of the Facility during leaf-off conditions. However the view will be minimized due to the fragmentation of the view caused by the density of tree trunks and branches.
(See Figures 5-13A and 5-13B, before and after photosimulations.)

Viewpoint 13 -Residential Area at Kirbytown Road, East of Apple Lane Drive

This viewpoint is located at the eastern end of Kirbytown Road in a residential area adjacent to Apple Lane Drive. From this location the Facility is approximately 0.4 miles away. The Facility can be seen from this viewpoint when in leaf-off conditions. As with Viewpoint 12, the view during leaf-off conditions will be minimized, due to the existing tree trunks and branches. (See Figures 5-14A and 5-14B, before and after photosimulations.)

5.5.7 Potential Visual Impacts Along Route 84

The discussion of visual impacts along Route 84 is concentrated on the approaches between Exit 3 and approximately 600 feet west of the Route 6 overpass. In the vicinity of Exit 3 and as one drives westbound past the site towards the Route 6 overpass, there will likely be views of the facility. Most of the site is open on the Route 84 side, with a few intermittent mature trees, and very few trees along the edge of the highway to impede views. Along this section, the highway is at approximately the same elevation as the Project site (+/-462 feet) and is located between 500 and 1000 feet away. As one approaches the site driving in the eastbound direction advancing towards the Route 6 overpass, views of the Facility will likely be very minimal. Most of the Facility would likely be obscured by a forested area that exists along the highway in this area.

5.5.8 Visual Impacts Associated with Aboveground Electrical Transmission Line

The aboveground portion of the proposed transmission line interconnect will consist of five steel transmission monopoles spaced between 388 to 719 feet apart, within a 150-foot wide right-of-way (130-foot wide clearing). The aboveground alignment will basically parallel Route 84 where it will terminate just to the north and west of the Route 84 Exit 3 interchange. At the fifth monopole, the electrical line will transition to an underground duct bank configuration routing under Route 17M easterly where it will connect to NYPA's Marcy South 345 kV Right of Way electric transmission system. The first pole beginning at the Facility substation is proposed to be 103-feet high. Heading in an easterly direction from the substation, the height of monopoles is as follows: Pole 2, 115 feet; Pole 3, 110; Pole 4, 120 feet, and Pole 5 a riser monopole structure, will be 130 feet high.

Visibility of some structures will occur from locations near the proposed right-of-way, such as from Route 84 and from the Horizons development project. There may be views of the transmission line from nearby areas along Route 17M. There may be some minimal and partial distant views of a transmission structure(s) from Route 6.

5.5.9 Visual Impacts Associated with Night Time Lighting

The photographs selected for the night time simulations are from directly south of the site at Bates Gates Road (Figure 5-15A), and north of the site at Kirbytown Road (Figure 5-16A). Out of the viewpoints represented in this submittal, these viewpoints represent the locations with a view of the stack site. Figures 5-15B and 5-16B provide photosimulations from these same viewpoints to illustrate the lighting on the Facility stack during the evening at these locations. Views of the stack lighting are anticipated to be limited based on the viewshed mapping and field work assessment conducted for the Project.

5.5.10 Visual Impacts Associated with Visible Plumes

Some of the water vapor in the combined cycle stack plumes, during certain atmospheric conditions, may condense into water droplets as the plume exits the stack and cools in the atmosphere. This would produce a visible, white vapor plume. Visible plumes would be more prevalent in the winter when the air is cold or during the spring and fall if the air is moist. Visible plumes would occur much less frequently in the warm summer months. As the plume travels downwind and mixes with drier, ambient air, the water droplets evaporate and are no longer visible.

The potential for visible water vapor plumes from the combined cycle stacks was assessed using the air quality model CALPUFF. The predicted concentrations of water vapor were added to the ambient water vapor concentration for each hour of the five-year period modeled. The length and heights of the visible plume were estimated by comparing the water vapor concentrations along the plume trajectory with the saturation values for the ambient conditions for that hour. The plume was considered to be potentially visible if the saturation concentrations were exceeded.

Several different operating conditions were modeled, one for summer, one for winter, and one for spring and fall. During summer, the case with the highest water vapor emission rate was assumed. This occurs during base load while firing natural gas with duct firing and evaporative cooling at an ambient temperature of 90 ^{o}F. During winter, the operating case corresponding to base load operation while firing natural gas without duct firing at an ambient temperature of -5 ^{o}F was assumed. During spring and fall, the base load operation with natural gas with reduced duct firing and no evaporative cooling at an ambient temperature of 51 ^{o}F was assumed. These cases are associated with the largest water vapor emissions consistent with the season.

Plumes predicted at night were excluded, since these would not be visible to an observer. Hours with ambient relative humidity of 99% or 100%, which have naturally occurring fog, were also excluded, as were calm hours, which have no wind direction or speed. The total number of remaining daylight hours over the five year period was 20,713 (4362 winter hours, 5779 spring hours, 5977 summer hours, and 4595 fall hours). For each season, the number of hours with a predicted visible plume was weighted by the fraction of hours in that season. The resulting weighted percentage of hours with a visible plume over the daylight hours was 11.6% over the entire year.

Figure 5-17 provides a photosimulation from Bates Gates Road (VP5) of the visible water droplet plume during an autumn day with high relative humidity. This photograph has the most direct and open view of the site of all the viewpoints presented in this study. The emitted water vapor condenses as it leaves the stack because of the cool, moist conditions, but re-evaporates about 200 meters downwind. At the same time the plume rises because of buoyancy. During very cold winter days, longer plumes could be possible. Visible plumes would be uncommon and shorter during the summer.

5.5.11 Video of Stack Lighting

Night-time video taping of a waste to energy Facility stack was taken to visually demonstrate the intensity and intervals associated with stack lighting within a 1-mile radius. The stack associated with the waste to energy Facility has a height of 365-feet and has strobe lighting 360 degrees around the tower at both the mid-point and peak areas. Video of the tower was taken for 1-minute at four separate distances to visually demonstrate strobe intensity.

Four still photographs document the existing stack and plant during daylight hours from each of the four sampling locations (Appendix 5-B). Video taping of the stack at the four previously identified locations was undertaken during the evening in order to demonstrate the stack lighting and strobe effect at different distances (0.25, 0.5, 0.75 and 1.0 mile) from the facility. Both sections of stack lighting were visible from each of the four sampling locations during the evening survey with the exception of the 1-mile interval. A compilation DVD of the four video clips is included in this report as Appendix 5-B.

5.6 MITIGATION

The Project has implemented a number of mitigation techniques to minimize off site visual impacts. These were discussed in Section 5.4 and include enclosing much of the Facility components inside buildings, minimizing stack height, preserving the natural vegetation to the extent practicable, landscaping, and neutral coloring.

5.7 CONCLUSIONS

The results of the viewshed analysis and field survey show that the areas with the greatest potential for views of the Project are limited to open areas in both low lying locations and at higher elevations where views are not obscured by hills and vegetation. The most concentrated views occur at the site extending out to 2 miles. Within 1 mile, visibility is fairly evenly dispersed at all compass bearings surrounding the site. The remaining viewshed shows visible areas more toward the northeast.

Views from most parks, schools, and other sensitive receptors considered in this study would be very limited as a result of dense tree cover and intervening topography.

The photosimulations show the type of view that could be seen from various distances to the Project. They are representative of the kinds of views that can be found in the given landscape environment located north, south, east, and west of the site. Although a careful viewpoint selection process was conducted using NYSDEC's guidance document, "Assessing and Mitigating Visual Impacts", most of the specific viewpoint locations provided in this submittal do not have views of the Facility. There will, however, be partial views of the Facility from some residential locations in the vicinity during both leaf-on and leaf-off conditions. In these situations, most of the visibility as shown in the photosimulations can be attributed to the height of the stacks rather than a view of the entire facility. Additionally, with distance and the presence of foreground elements or topography, visual impacts are minimized as the Facility and stacks are not the dominant visual focus of the landscape. Some of the views will be of short duration during travel along roadways due to prevailing topography and vegetation while other areas may show a greater abundance of views.

The CPV Valley Energy Center will create a new visual element in the landscape from certain viewpoints but will not dominate views from the majority of the receptor points. Additionally, there are several industrial and commercial elements in the area as well as many transmission lines that traverse through the landscape. These existing elements contribute to tempering of the uniqueness of the portion of the Facility that may be visible.

6.0 COMMUNITY FACILITIES

6.1 INTRODUCTION

This section assesses the potential impacts of the Project on community facilities and services. The section identifies local community service demands anticipated for the Project, as well as those service providers that are currently responsible for the Project site area. Each town function is examined for possible impact on town service and capital outlay demands resulting from this Project. Particular attention and focus is paid to transportation/highway and emergency services, including police protection, fire, and emergency medical services. The primary service providers of town services have been contacted in an effort to determine their capacity to serve the proposed Project. For each relevant community service, when necessary, an analysis was performed to assess potential impacts of the Project including any suitable mitigation measures.

6.2 APPLICABLE LAWS, REGULATIONS AND POLICES

The Scoping Document specifies the study assessment for community resources. There are no other applicable laws, regulations, or policies related to community resources.

6.3 LOCAL SERVICE PROVIDERS

6.3.1 Local Service Providers Servicing Site

Local service providers, including police protection, fire, and emergency medical services that currently serve the Project site are discussed in the following sections.

6.3.1.1 Police Services

The CPV Valley Project site is located within the Town of Wawayanda, Orange County, New York. There are 36 police agencies in Orange County, which include three city police departments, 16 town police departments, 13 village police departments, the Orange County Sheriff, New York State Police Troops F and T, the New York State Park Police, and the New York State Department of Environmental Conservation Police. The Town of Wawayanda does not have its own police department, but is policed by New York State Troopers, Troop F, headquartered at 55 Crystal Run Road in Middletown, New York. Troop F has approximately 400 sworn police members and 50 to 60 civilian support staff members. Troop F serves Greene, Orange, Rockland, Sullivan, and Ulster counties, with a total population of approximately 980,000 as of 2006 (N.Y. State Division of State Police and U.S. Census Bureau, 2008).

6.3.1.2 Fire and Emergency Medical Services

There are 35 fire departments, mostly volunteer, serving Orange County (Capitol Impact, 2008). The only career-only fire departments are in Newburgh and West Point. The Middletown Fire Department combines full-time firefighters with volunteers. The closest fire departments to the Project are the New Hampton Volunteer Fire Company (1 mile east of the Project, in Wawayanda), the Slate Hill Fire Department (2.6 miles southwest of the Project, in Slate Hill), and the City of Middletown Fire Department (2.7 miles northeast of the Project, in Middletown).

The New Hampton Volunteer Fire Department has one station with 28 volunteer firefighters; the Slate Hill Fire Department has one station with 66 volunteer firefighters; and the Middletown Fire Department has three stations with 32 career firefighters and 80 volunteers (Capitol Impact, 2008). Other fire departments serving Middletown are the Pacatello Fire Department (30 volunteers), the Mechanicstown Engine & Chemical CO #1 (50 volunteers), and the Silver Lake Fire District (45 volunteers) (Capitol Impact, 2008).

The Project's primary structures are located within the New Hampton Fire Company district, which is the closest fire department to the Project. It is located at 5024 Route 17M in New Hampton, NY and provides fire, rescue, and EMS type calls. They answer approximately 200 calls per year. The New Hampton Fire Company has three cars, two engines and one 3,500 gallon tanker.

Emergency ambulance services for Wawayanda are provided by Mobile Life Support Services, a privately owned commercial Paramedic service. Mobile Life Support Services is a nationally accredited Paramedic ambulance service serving the Hudson Valley Region of New York State. Mobile Life operates a fleet of over 32 paramedic ambulances and emergency response vehicles managed by a staff of over 260. It is licensed by New York State in the Hudson Valley counties of Orange, Rockland, Ulster, and Dutchess. With a collective population of over 1,000,000 residents, their units handle approximately 50,000 calls per year.

6.3.2 Potential Impacts to Service Providers

Potential impacts on service providers that may occur as a result of the development of the Project are discussed below.

6.3.2.1 Police

The construction of the CPV Valley Energy Center is expected to generate an estimated 664 temporary construction jobs and 25 permanent operations jobs. Considering a worst case in which a total of 664 new employment positions were required by the Project and these positions were filled by workers from outside the current service area of the New York State Police Troop F, the influx of project workers would represent a less than 0.07% increase in the population currently served by Troop F. In addition, the Project will have private security during construction, thereby requiring minimal to no police services.

Once constructed, the perimeter of the Project site will be secured with a chain link fence, sliding gates and surveillance equipment so as to permit only authorized access to the facility's service drive, structures and operations. One gate would provide access into the Project site, thereby restricting access to this area. The gate would be locked during normal operations with access provided by Facility personnel. Normal plant lighting and emergency temporary lighting would be provided throughout the Facility. The Facility security will be controlled by the Facility's operators in the control room 24 hours per day, 7 days per week, 365 days per year. All site security personnel would be equipped with communication equipment to maintain contact with construction and operations management personnel and/or the New York State Police Troop F and the New Hampton Fire, Rescue, and Emergency Services. Accordingly, CPV Valley anticipates that any increase in the demand for police services resulting from construction and operation of the Project would be negligible.

CPV Valley has discussed the nature of the Project with the New York State Police, Troop F. CPV Valley has also requested the input of the Chief of the New York State Troopers, Troop F in Middletown under a letter dated October 7, 2008 with respect to this issue. The letter provided a brief description of the Project and its proposed location and requested input from the department regarding potential impacts on police services that may occur as a result of the development of the proposed power facility. The verbal response to the letter from the New York State Police did not express any concerns regarding the construction and operation of the Project and suggested a coordinated meeting of the New York State Police and the New Hampton Fire Company to discuss the Project. CPV Valley has made a written request for a meeting with both the New York State Troopers and New Hampton Fire Company to discuss the Project in greater detail.

6.3.2.2 Fire and EMS

The Facility would be equipped with fire supression systems as well as emergency fire protection backup pumping capacity in the unlikely event of a fire. The 1,000,000 gallon raw water/fire water storage tank - of which 500,000 gallons are dedicated solely for fire protection purposes - would provide additional capacity for emergency fire fighting use. The fire supression systems would be used only during emergencies or during periodic testing of emergency systems, as required. The average daily fire suppression flow rate would be zero. The use of the raw water tank would allow the Project to avoid impacting the local water distribution system.

CPV Valley does not anticipate that the Project would result in significant impacts related to fire and emergency services as the Project has been designed to provide a high level of safety and redundancy and to meet all National Fire Protection Association (NFPA), state, and local requirements. CPV Valley intends to have its Facility personnel trained as an on-site fire brigade, working cooperatively with the fire department, to function as the first line of defense in the event of a fire at the Facility. As part of this training effort, a safety orientation program and fire response plan will be in place during Project construction and operation to reduce the likelihood of the need for emergency services. A Preliminary Emergency Response Plan is provided in Appendix 12-C of this DEIS. Prior to the commencement of Project construction and operation, CPV Valley would finalize the Emergency Response Plan to support construction and operational activities at the site. Because the chance of a fire is unlikely and because CPV Valley will have trained personnel on site and the ability to use a raw water tank, there are no anticipated cost impacts to fire and emergency services in the area. Emergency medical services are available via the hospitals described below, and any costs of such ambulance or hospital services (see Section 4.4.1.2) would be addressed by CPV Valley and not result in added costs to the municipality.

CPV consulted with the New Hampton Fire Company regarding emergency planning and fire protection requirements for the Project. No concerns were raised during the meetings regarding the ability of the service providers to provide adequate emergency response services to the Project. Discussions at the meetings focused on the status of the Project, proposed fire suppression devices and requirements, vehicular access to the site, and community outreach efforts. In addition, CPV Valley has provided the New Hampton Fire Company with a copy of the Preliminary Emergency Response Plan and requested input from the department.

CPV Valley spoke to Captain Stephen Nevens from the Monro Barracks of the New York State Police in October, 2007. He referred CPV to the Middletown, Acting Station Commander Robert Downs. CPV sent both a copy of the Draft Emergency Response Plan and requested input from the department. CPV anticipates meeting together with both the State Police and the New Hampton Fire Company to assure coordination, as suggested by Captain Nevins.

6.4 COMMUNITY FACILITIES

6.4.1 Existing Community Facilities

An inventory of other community facilities, including schools, hospitals, and religious facilities has been taken within the vicinity of the Project site to assess the potential impacts, if any, of the proposed CPV Valley Energy Center on these facilities. The facilities identified by the inventory are illustrated on Figure 6-1. The location of Police and Fire Departments are also included on the figure. In general, there are very few community resources within 1-mile of the Project site and offsite interconnections.

6.4.1.1 Schools

The nearest school to the Project is a private school, Our Lady of Mount Carmel Elementary School. It is located on Wawayanda Avenue in Walkill, approximately 1.3 miles north of the Project. Our Lady of Mount Caramel Elementary covers pre-kindergarten to eighth grade and has a total of 216 students. The nearest public school is the Truman Moon Elementary School, located at 53 Bedford Avenue in Middletown, approximately 1.9 miles northeast of the Project. The Truman Moon Elementary School is a primary center of approximately 400 students in kindergarten and first grade and is part of the Middletown City School District.

The Facility will be located in the Minisink Valley Central School District. The Minisink Valley Central District has five public schools including: one high school, one middle school, one intermediate school, and two elementary schools (Town of Wawayanda, 2008). The district comprises approximately 4,700 students.

The Middletown School District has seven public schools, including: one high school, two middle schools, three elementary schools, and one primary center. The district comprises over 6,700 students, 545 teachers, 35 administrators, and nearly 560 support staff members. (Middletown School District, 2008).

6.4.1.2 Hospitals

The hospitals in Orange County currently include the Orange Regional Medical Center Arden Hill Campus (Goshen) and Horton Campus (Middletown), with a combined 450 staffed beds. It should be noted that these two hospitals are merging into one facility that is currently under construction in the Town of Wallkill, very close to the proposed Project, just east of the intersection of I-84 (Exit 4E) and Route 17 (Exit 122). Other hospitals include Saint Luke's Cornwall Hospital with campuses in Cornwall and Newburgh for a combined 183 staffed beds; Bon Secours Community Hospital in Port Jervis with 183 staff beds; and Saint Anthony Community Hospital in Warwick with 73 staffed beds (AHD, 2008). Currently, the nearest hospital to the Project is the Orange Regional Medical Center's Horton Campus, approximately 2.7 miles northeast of the Project site. Refer to Section 3.3.1.4 for additional information on medical offices and facilities.

Although it is possible that a medical emergency among construction crews or operational staff could lead to hospitalization, the number of construction workers and employees do not represent a significant increase in the population served by the hospital; therefore, the Project is not expected to impact the hospital's resources except in the unlikely event of an emergency.

6.4.1.3 Houses of Worship

There are no houses of worship within 1 mile of the Project site. The nearest houses of worship are Our Lady of Mount Carmel Catholic Church; located 1.3 miles directly north of the Project site, at 90 Eculid Avenue in Middletown, and Middletown Alliance, also located about 1.3 miles from the site to the North. Both facilities are located in Wallkill.

6.4.2 Potential Impacts to Community Facilities

The Project will not adversely impact the community facilities identified above. Due to the limited number of operational employees (approximately 25), the proposed Facility will not result in the placement of a significant number of additional students in local schools or impact the ability of local religious institutions to serve their community.

Although construction and operation of the Project is not expected to bring a measurable number of additional school-age children into the districts, when completed the CPV Valley Energy Center will represent a long-term source of additional revenue for the Town of Wawayanda and the Minisink Valley Central School District through a PILOT (Payment in Lieu of Taxes) agreement with the Orange County Industrial Development Agency (IDA).

The number of construction workers and employees do not represent a significant increase in the population served by the closest hospital; therefore, the Project is not expected to impact the hospital's resources.

6.5 ADJACENT HIGHWAYS AND ACCESS

6.5.1 During Construction Activities

6.5.1.1 Maintenance and Protection of Traffic

All construction activities will be subject to applicable local and State Maintenance and Protection of Traffic standards. Such standards are contained in the Manual of Uniform Traffic Control Devices (MUTCD) and various design guidelines and manuals published by the State of New York Department of Transportation.

The Project's proposed transmission line and wastewater/water lines will not have any adverse impacts on the safe operation of Routes 6 and 17M because they will be installed underground, outside of the paved highway area but within the right-of-way. The design and construction of the proposed transmission line and other utilities will be in accordance with applicable local and NYSDOT guidelines. All construction will be conducted within guidelines set forth by the NYSDOT and local ordinances, as applicable, and in conformance with a NYSDOT-approved "Maintenance and Protection of Traffic Plan ("MPT"). Long term lane closures and traffic detours are not anticipated and, as a result, there will be no significant impacts relative to traffic safety due to the construction of the transmission and utility lines. Temporary traffic stoppages or lane shifts may occur; however, these events will be scheduled during off-peak travel hours and will be of short duration.

The Project will not adversely impact roadway structures within the right-of-way of the adjacent roadways. The proposed Project also will not affect other existing land uses along the proposed transmission/utility routes. The use of existing public rights-of-way along virtually the entire length of the proposed routes avoids potential impacts to adjacent and nearby existing as well as future land uses.

6.5.1.2 Access to Adjacent Land Uses

Land uses adjacent to the trenched portion of the proposed transmission and utility routes will experience temporary noise and traffic disruptions during construction. During trench excavation and conduit/pipe installation, access to driveways and parking lots may be temporarily interrupted. CPV will coordinate with those affected in order to minimize the impact of the limited access to driveways and parking lots. Mobilization of a sufficient sized contractor workforce will ensure that construction proceeds as quickly as possible. Trench width and the amount of vegetation disturbed will be kept to a minimum. Backfilling of trenches, soil stabilization, and surface restoration will follow immediately after duct bank and pipe installation.

6.5.1.3 Pedestrian Safety

Appropriate barriers and protective devices per the MUTCD and other guidelines will be utilized as needed to safeguard pedestrians in the vicinity of construction activities. Longitudinal walk areas (road shoulders) may be affected by the installation of the Project's underground transmission and utility lines. Potential pedestrian conflicts may occur at the intersection of Route 17M and Route 6, where trenching activity may temporarily block a pedestrian crosswalk. At such times, pedestrians will be detoured via signs to an alternative crossing at established safe distances around work zones. Field observations indicated that pedestrian activity along the length of the Project is minimal, and construction impacts will be insignificant.

6.5.2 Operational Conditions

There will be no impacts on local highway and access conditions since the Project does not require property acquisition, nor will the Project require any closures, realignment or modifications of any kind to the existing roadway and transportation systems.

6.5.3 Mitigation of Impacts

The following mitigation measures will be implemented to minimize potential construction impacts on adjacent land uses to the extent practicable:

- Provide timely information to the municipality, adjacent land owners and/or tenants regarding the planned construction activities and schedule.

- Coordinate with local officials and NYSDOT, as applicable, to develop and implement a Maintenance and Protection of Traffic Plan to ensure safe and adequate traffic operations along all roads, as well as to provide adequate ingress and egress access to industrial, commercial and residential land uses adjacent to the proposed transmission/utility line routes.

- Construction practices appropriate to suburban areas will be used, such as:

    - The designation of alternative circulation routes around work areas by channelizing vehicles with barriers, cones, and signs;
    - The use of steel plates to cover trenches;
    - The installation of barricades and fencing to secure the construction work area, keeping vehicles and pedestrians from entering construction zones.

To avoid impacts related to an unplanned temporary loss of utility service, CPV or its excavation contractors will notify appropriate utilities prior to conducting excavation activities within 100 feet of an underground facility. In addition, in-the-field meetings will be conducted with appropriate local utility representatives (e.g., sewer, water, telephone and cable television) and New York State Department of Transportation officials, as needed, to further detail all utility and roadway crossings.

Under normal Project operating conditions, there will be no impacts on the adjacent highway and transportation systems. As such, mitigation measures are not required.

CPV Valley LLC will continue to work with the appropriate state and local agencies and officials to ensure that the construction and operation of the Project has minimal impact to existing infrastructure and community services. Adherence to the above-described measures will ensure that all potential land use impacts from the construction and operation of the Project are minimized to the maximum extent practicable.

6.6 REFERENCES

American Hospital Directory (AHD). 2008www.ahd.com/freesearch.php3. Site accessed June, 2008.

Capitol Impact. 2008. [Online] www.capitolimpact.com/gw Site access August 19, 2008.

City of Middletown, New York[Online] http://www.middletown-ny.com/ Accessed September 9, 2008

Enlarged City School District of Middletown [Online] http://middletowncityschools.org/ Accessed September 8, 2008

Fire Departments Net – Orange County Fire Departments [Online] http://newyork.firedepartments.net/county/NY/OrangeCounty.html Accessed September 8,2008

Interment.Net Cemetery Records On-line http://www.interment.net/data/us/ny/orange.htm - accessed 9/9/08

Middletown School District. 2008. [Online] www.middletowncityschools.org. Site accessed August 19, 2008.

New Hampton Fire Company Web site [Online] http://newhamptonfd.com/index.html Accessed September 9, 2008

New York State Division of State Police. 2008. [Online] http://www.troopers.state.ny.us/Contact_Us/Troop_Information/Troop_F/. Site accessed September 2008.

Orange County Division of Geographic Information Systems -[Online] http://gis.orangecountygov.com/ Accessed September 9, 2008

Orange County Office for the Aging- Orange County Nursing Home and Assisted Living facilities [Online] http://www.co.orange.ny.us/orgMain.asp?storyID=3286&sid - Accessed September 11, 2008

Pre-Schools in Orange County [Online] http://www.superpages.com/yellowpages/C-Preschools/S-NY/Y-Orange/
Accessed September11, 2008

Public Pre-Schools in Orange County [Online] http://www.newyorkschools.com/ Accessed September 11, 2008.

Town of Wawayanda. 2008. Town of Wawayanda Website. [Online] www.townofwawayanda.com. Site accessed June, 2008.

U.S. Census Bureau, State and County QuickFacts, 2008. http://quickfacts.census.gov/qfd/states/36/36039.html

7.0 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

7.1 INTRODUCTION

This section assesses direct and indirect social and economic effects and benefits associated with the construction and operation of the CPV Valley Energy Center. Section 7.3 summarizes the existing demographics and socioeconomic conditions of the Project area. Section 7.4 evaluates the local and regional socioeconomic impacts and benefits of construction and operation of the Project. Potential financial impacts to municipal operations and infrastructure are also discussed. An Environmental Justice (EJ) Analysis is provided in Section 7.5, which addresses potential impacts to low-income and minority populations, and impacts from Project environmental externalities.

The Project will result in a capital investment of $800 million for construction of the Facility. Based on the existing marketplace factors, the Project will significantly boost the local economy by generating new jobs regionally, increasing income, and increasing local revenues. When completed, the CPV Valley Energy Center will represent a long-term source of additional revenue for the Town of Wawayanda, Orange County and local school district through a PILOT (Payment in Lieu of Taxes) and Host Community Benefits agreements. The economic benefits to be realized from these agreements have not been reflected in the analyses below, and therefore, are incremental economic benefits generated by the Project.

The Project will also provide a significant boost for the local economy with the creation of well-paying jobs both in the short-term during construction and long-term employment opportunities for people in the area once the Project is completed. It is expected that approximately 664 construction jobs (union) will be created during peak on-site construction, and about 25 well-paying permanent jobs will be created once the Facility is completed.

7.2 APPLICABLE LAWS, REGULATIONS AND POLICIES

There are no applicable laws associated with socio-economic impacts of the Project. With respect to Environmental Justice Executive Order 12898, entitled “Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations” requires Federal agencies (i.e. Federal permitting agencies) to consider disproportionate adverse human health and environmental impacts on minority and low-income populations. In addition, the New York State Department of Environmental Conservation (NYSDEC) has an EJ Policy in place (CP-29, Environmental Justice and Permitting) and requires an evaluation of a Project’s impact on environmental justice areas.

7.3 EXISTING CONDITIONS

Existing socioeconomic conditions for the Town of Wawayanda, Orange County, and New York State are described in the subsequent sections. The socioeconomic data used in this evaluation were obtained from the most recent United States (“U.S.”) Department of Commerce, Bureau of the Census, and Bureau of Labor Statistics online databases. Additional information on community public services and available housing, hotel lodging, and rental units was obtained from publicly available online sources. In addition to the information provided below, further information on Existing Conditions is provided in Appendix 7-A in a separate Report titled "The Economic and Fiscal Impacts of the Construction of the Valley Energy Center" in the Town of Wawayanda, Orange County, New York", dated November 2008.

7.3.1 Population

Table 7-1 provides summary data for selected demographic and socioeconomic parameters for New York State, Orange County, and the Town of Wawayanda. According to the U.S. Census Bureau, the population of Orange County in 2000 was 341,367. The estimated 2006 population was 376,392, resulting in a 10.3 percent population increase since 2000. The population density in Orange County was 418.3 people per square mile in 2000.

New York's population, by contrast, rose from 18,976,457 in 2000 to an estimated 19,306,183 in 2006, a 1.7 percent increase (a significantly lower percent increase than Orange County). The population density in the State of New York was 401.9 people per square mile in 2000. The Town of Wawayanda had a population of 6,273 in 2000. The population density of Wawayanda was 179.3 persons per square mile in 2000. The U.S. Census Bureau website does not provide 2006 population estimates for Wawayanda.

Table 7-1
Demographics of Project Area
Wawayanda, Orange County, New York

State, County, Municipality	Population (2000)	Population Density (Persons/ sq. mi.)	Per Capita Income (1999)	Poverty Rate (percent)	Unemployment Rate, Sept. 2008 (percent)*	Civilian Workforce	Top Three Industries a/
New York	18,976,457	401.9	$23,389	14.6	5.6	9,023,096	E, R, P
Orange County	341,367	418.3	$21,597	10.5	5.8	159,946	E, R, M
Wawayanda	6,273	179.3	$21,856	3.7	Not available	3,128	E, R, A

Source: Census 2000.
a/ A: Public Administration
E: Educational, health, and social services
M: Manufacturing
P: Professional, scientific, management, administrative and waste management services
R: Retail Trade
*Unemployment data source: *New York State Department of Labor*

7.3.2 Economy and Employment

In 1999, Orange County had a per capita income of $21,597. Approximately 10.5 percent of the population was living below the poverty line in 2000. In 1999, Wawayanda had a per capita income of $21,856 and approximately 3.7 percent of the population was living below the poverty line in 2000. Comparatively, the per capita income for New York State as a whole was $23,389 with 14.6 percent of the population living below the poverty line for these same years. Thus, although per capita income in Wawayanda was slightly lower compared to New York State as a whole, the percent of the population living below the poverty line for Wawayanda was much less.

The latest unemployment data shows a relatively low unemployment rate in Orange County. In September 2008, the unemployment rate was 5.8 percent in Orange County and 5.6 percent in New York State, which is slightly lower than the overall U.S. unemployment rate of 6.0 percent.

7.3.3 Housing

In 2000, Orange County had 7,966 vacant housing units with a rental vacancy rate of 4.3 percent, and Wawayanda had 79 vacant housing units with a rental vacancy rate of 4.2 percent. Based on advertisement in Yellowbook (2008), there are 138 hotels in Orange County and 19 campgrounds and RV parks.

7.3.4 Numbers and Composition of the Workforce

The civilian labor force in Orange County in 2000 was 159,946 individuals. The major industries in Orange County from the standpoint of employment were: 1) education, health, and social services, 2) retail trade, and 3) manufacturing. The civilian labor force in Wawayanda in 2000 was 3,128 individuals, with the major industries being: 1) educational, health, and social services, 2) retail trade, and 3) public administration (See Table 7-1).

7.3.5 Public Services

A wide range of public services and facilities are offered in Orange County. Services and facilities include six hospitals (AHD, 2008), paid and volunteer fire departments, and public schools. Details relative to these public services and facilities have been previously provided in the EIS.

7.3.5.1 Cost of Public Services

The cost of the various public services, as well as the yearly increases of these costs, is provided in Tables 7-2 through 7-4. The tables also show the breakdown of costs relative to the total costs for the above-mentioned services. Minisink Valley Central School District historical budget information is provided in Table 7-5. Section 7.3 discusses the economic benefit from the Project that will help address these costs.

Table 7-2
Minisink Valley Central School District
Revenue Trends
1998-2006

Fiscal Year	Real Property Taxes and Assessments	Other Real Property Tax Items	Sales and Use Tax	Charges to Other Governments	Charges for Service	Use and Sale of Property	Other Local Revenues	Total Local Revenues	State Aid	Federal Aid	Total Revenues	Proceeds of Debt	Other Sources	Total Revenues and Other Sources
2006	$15,026,658	$59,864	$0	$15,265	$169,907	$909,187	$35,729	**$16,216,610**	$17,726,626	$765,886	**$34,709,122**	$0	$657,567	**$35,366,689**
2005	$15,911,343	$681,428	$0	$11,380	$116,408	$914,738	$38,048	**$17,673,345**	$18,441,787	$870,109	**$36,985,241**	$0	$597,363	**$37,582,604**
2004	$15,923,456	$1,542,866	$0	$13,800	$98,263	$997,155	$91,954	**$18,667,494**	$19,693,222	$952,533	**$39,313,249**	$31,000,000	$229,799	**$70,543,048**
2003	$16,524,930	$2,454,051	$0	$13,903	$94,389	$2,376,897	$55,606	**$21,519,776**	$24,891,976	$1,024,938	**$47,436,690**	$0	$413,282	**$47,849,972**
2002	$17,158,649	$3,270,072	$0	$12,747	$97,306	$1,024,936	$94,415	**$21,658,125**	$25,562,448	$1,145,377	**$48,365,950**	$0	$739,008	**$49,104,958**
2001	$19,201,075	$3,594,633	$0	$14,127	$223,531	$923,040	$268,290	**$24,224,696**	$25,882,615	$1,305,727	**$51,413,038**	$0	$704,427	**$52,117,465**
2000	$21,338,625	$4,004,325	$0	$14,263	$169,715	$939,126	$158,742	**$26,624,796**	$25,917,016	$1,724,366	**$54,266,178**	$0	$543,125	**$54,809,303**
1999	$24,075,814	$4,307,996	$663	$9,589	$182,149	$1,190,738	$595,577	**$30,362,526**	$27,040,737	$1,815,920	**$59,219,183**	$19,700,000	$467,489	**$79,386,672**
1998	$26,260,414	$4,439,491	$0	$14,119	$186,187	$1,795,462	$150,877	**$32,846,550**	$29,045,919	$1,835,328	**$63,727,797**	$385,000	$1,047,860	**$65,160,657**

Source: New York State Office of the Comptroller, http://www.osc.state.ny.us/

Table 7-3
Town of Wawayanda, New York
Town Expenditure Trends as a Percent of Total Expenditures
1998-2006

Fiscal Year	General Government	Education	Public Safety	Health	Transportation	Social Services	Economic Development	Culture and Recreation	Community Services	Utilities	Sanitation	Employe e Benefits	Debt Servi ce	Total $ Expenditure
2006	24.7%	0.0%	0.0%	0.0%	32.8%	0.0%	0.0%	3.8%	0.0%	3.9%	2.9%	11.6%	19.9%	**$4,461,139**
2005	26.7%	0.0%	0.0%	0.0%	28.9%	0.0%	0.0%	2.6%	0.0%	24.5%	2.9%	9.1%	5.0%	**$5,900,627**
2004	32.3%	0.0%	0.0%	0.0%	29.5%	0.0%	0.4%	2.4%	2.5%	15.5%	2.4%	10.0%	4.5%	**$4,496,495**
2003	16.8%	0.0%	0.0%	0.0%	24.0%	0.0%	0.0%	2.5%	3.7%	43.6%	1.9%	5.3%	2.0%	**$5,528,521**
2002	31.9%	0.0%	0.0%	0.0%	42.0%	0.0%	0.0%	2.3%	1.5%	5.4%	3.6%	8.7%	3.7%	**$2,584,987**
2001	30.5%	0.0%	0.0%	0.0%	45.5%	0.0%	0.0%	2.8%	0.6%	4.7%	4.1%	7.1%	4.2%	**$2,605,150**
2000	31.1%	0.0%	0.0%	0.0%	45.5%	0.0%	0.0%	2.9%	0.6%	5.1%	4.8%	7.7%	1.7%	**$2,395,282**
1999	29.6%	0.0%	0.0%	0.0%	40.2%	0.0%	0.0%	2.7%	0.6%	12.0%	3.9%	9.9%	0.4%	**$2,074,429**
1998	32.5%	0.0%	0.0%	0.0%	46.0%	0.0%	0.0%	2.9%	0.6%	2.0%	5.4%	9.6%	0.3%	**$1,825,143**

Source: New York State Office of the Comptroller, http://www.osc.state.ny.us/

Table 7-4
Orange County, New York
County Expenditure Trends as a Percent of Total Expenditures
1998-2006

Fiscal Year	General Government	Education	Public Safety	Health	Transportation	Social Services	Economic Development	Culture and Recreation	Community Services	Utilities	Sanitation	Employe e Benefits	Debt Service	Total $ Expenditure
2006	10.4%	6.3%	9.0%	12.8%	3.3%	28.2%	0.7%	1.0%	1.1%	0.0%	4.2%	19.8%	3.2%	**$585,334,370**
2005	9.7%	5.9%	8.4%	13.0%	4.4%	28.7%	0.7%	1.0%	1.1%	0.0%	5.2%	18.8%	3.0%	**$564,707,378**
2004	9.9%	5.6%	7.8%	13.0%	3.3%	31.5%	0.7%	1.0%	1.0%	0.0%	4.1%	18.8%	3.2%	**$541,209,770**
2003	11.8%	5.9%	8.1%	13.4%	3.3%	32.8%	0.6%	1.0%	1.1%	0.0%	2.6%	15.9%	3.4%	**$508,543,162**
2002	11.0%	5.8%	7.7%	13.7%	3.6%	33.9%	1.0%	1.1%	1.1%	0.0%	2.9%	14.6%	3.6%	**$486,611,065**
2001	10.5%	5.7%	8.4%	13.5%	3.9%	34.7%	0.8%	1.1%	1.1%	0.0%	2.9%	13.6%	3.9%	**$464,936,123**
2000	9.7%	5.4%	8.2%	12.9%	3.5%	34.6%	0.8%	0.9%	1.0%	0.0%	3.0%	16.2%	3.8%	**$442,568,311**
1999	10.6%	5.6%	12.4%	12.6%	3.5%	31.6%	1.1%	1.0%	1.0%	0.0%	2.5%	14.9%	3.3%	**$449,904,781**
1998	12.7%	5.6%	16.0%	12.0%	3.3%	30.1%	0.8%	0.9%	1.0%	0.0%	2.3%	12.5%	2.6%	**$441,169,283**

Source: New York State Office of the Comptroller, http://www.osc.state.ny.us/

Table 7-5 Minisink Valley Central School District Budget Trends 2003-2009		
School Year	**Budget**	**Percent Increase from Previous Year**
2003-2004	$55,992,447	Not Available
2004-2005	$60,993,114	8.9%
2005-2006	$65,926,718	8.1%
2006-2007	$71,166,852	7.9%
2007-2008	$77,516,449	8.9%
2008-2009	$82,558,319*	6.5%

Source: Minisink Valley Central School District newsletters. http://www.minisink.com/index.php?id=9
*Proposed budget

7.3.5.2 Town Revenues for Public Services

Table 7-6 presents revenue trends by major function for the Town of Wawayanda from 1998 – 2006.

Table 7-6
Town of Wawayanda, New York
Town Revenue Trends
1998-2006

Fiscal Year	Real Property Taxes and Assessments	Other Real Property Tax Items	Sales and Use Tax	Other Non-Property Taxes	Charges for Service	Use and Sale of Property	Other Local Revenues	Total Local Revenues	State Aid	Federal Aid	Total Revenues	Proceeds of Debt	Other Sources	Total Revenues and Other Sources
2006	$1,571,562	$13,940	$912,899	$0	$865,254	$134,213	$184,327	**$3,682,195**	$638,646	$59,062	**$4,379,903**	$310,000	$172,432	**$4,862,335**
2005	$1,638,447	$12,677	$750,276	$0	$698,734	$92,945	$165,408	**$3,358,487**	$552,752	$28,556	**$3,939,795**	$2,121,750	$337,410	**$6,398,955**
2004	$1,390,973	$10,400	$638,161	$0	$566,345	$81,117	$154,532	**$2,841,528**	$591,578	$37,069	**$3,470,175**	$51,865	$165,776	**$3,687,816**
2003	$1,353,563	$7,300	$634,722	$0	$367,457	$59,691	$149,311	**$2,572,044**	$520,397	$46,906	**$3,139,347**	$2,855,000	$303,907	**$6,298,254**
2002	$1,303,998	$7,862	$589,989	$0	$324,800	$54,854	$218,269	**$2,499,772**	$411,384	$0	**$2,911,156**	$105,000	$59,443	**$3,075,599**
2001	$1,015,508	$16,272	$510,911	$0	$242,237	$125,659	$213,656	**$2,124,243**	$260,330	$0	**$2,384,573**	$25,000	$46,616	**$2,456,189**
2000	$994,301	$8,263	$512,634	-$300	$250,380	$130,233	$125,064	**$2,020,575**	$234,472	$0	**$2,255,047**	$204,393	$84,012	**$2,543,452**
1999	$975,310	$10,124	$438,785	$300	$197,068	$98,320	$148,737	**$1,868,644**	$271,985	$0	**$2,140,629**	$300,000	$13,068	**$2,453,697**
1998	$926,871	$9,864	$407,685	$0	$153,550	$91,046	$79,581	**$1,668,597**	$290,883	$0	**$1,959,480**	$95,000	$7,676	**$2,062,156**

Source: New York State Office of the Comptroller, http://www.osc.state.ny.us/

7.4 SOCIOECONOMIC IMPACT

7.4.1 Economic Effects of Project Construction

7.4.1.1 Construction Jobs by Discipline

Figure 7-1 illustrates the estimated construction manpower by month during the construction period. It is expected that the Project would require approximately 664 employees during the peak construction months, and approximately 298 construction employees on average. Construction is expected to be completed within a 24-month timeframe. It is expected that the peak construction period would last approximately four to five months. It is anticipated that the required construction labor force for the Project would be readily met with the available trades and union workforce in Orange County. According to the U.S. Census data for 2000, approximately 10,000 construction trade workers reside within Orange County.

The total construction payroll for the Project is anticipated to be approximately $165 million. This estimate is conservatively based on the anticipated construction trades required to support peak Project construction and corresponding national wage data available from the United States Department of Labor, Bureau of Labor Statistics. Peak construction payroll may be higher than the estimate provided since wages in New York State are generally higher than the national averages provided by the Bureau of Labor Statistics. Table 7-7 provides a breakdown of the anticipated construction jobs by trade to be employed during the peak construction period.

The Project's construction period is expected to be approximately 24 months. During these 24 months, construction is expected to proceed as follows:

- Months 1 and 2 would include site preparation, including: site clearing and rough grading, installation of temporary stormwater management and sediment and erosion control measures, and installation of temporary construction buildings, parking, and underground utilities;

- Months 3 to 6 would include soil excavation and foundation pouring;

- Months 7 to 13 would include erection of structural steel and delivery of major equipment;

- Months 11 to 24 would include installation of equipment followed by labor-intensive installation of piping, wiring, and ductwork; and

- Months 22 to 24 would include systems testing and commissioning.

Table 7-7 Estimated Peak Number of Construction Workers By Trade	
Discipline or Trade	**Number of Workers**
Management	48
Boilermakers	50
Carpenters/Millwrights	121
Laborers	67
Painters	6
Pipefitters/Steamfitters	157
Electricians	146
Operating Engineers and other construction equipment operators	55
Iron and steel workers	3
Insulation Workers	6
Cement masons and concrete finishers	5
Total:	**664**

7.4.1.2 Construction Expenditures

Estimated total payroll expenditures to construct the Project are anticipated to be approximately $165 million.

7.4.1.3 Secondary Economic Impact Due to Project Construction

This study uses an input-output (I/O) methodology to determine the economic and fiscal impacts of the Project on the regional economy. Input-output models trace the linkages of inter-industry purchases and output within a given county, region, state or country. These models use information on the inputs required from all industries in order to produce a dollar of output for a specified industry, as well as how much of the required inputs from industries can be supplied locally within the study area. Details on the methodology are provided in the economic analysis of the Facility in Appendix 7-A.

7.4.1.4 Secondary Revenue Impacts during Construction

In analyzing the Project's direct impact on Orange County and New York, it is estimated that approximately $259.2 million of the $800 million total Facility project expenditures will occur in the Orange County region (Table 7-8). Expenditures for specialized equipment and machinery used in the generation of power (gas turbines are the largest single expenditure of the Project), as well as Project financing, pieces of the engineering, design and other Project costs will not be captured by businesses in the Orange County region.

Some expenditures related to financing and other Project expenditures may well benefit New York. Without some level of certainty, these have been excluded from the assessment of Project impacts on the local and state economy.

Table 7-8 Impact of Project Construction (Over 2+ years) (Millions of 2007 Dollars)	
Orange County	**Total**
Direct	$259.2
Indirect	$55.0
Induced	$79.7
Total	**$393.9**
Remainder of New York	**$72.6**
Total Economic Impact in NY	**$466.5**

The economic analysis conducted indicates that the $259.2 million in direct construction Project expenditures will result in total output of $466.5 million in the state of New York, of which $393.9 million will occur within Orange County. Another $72.6 million will occur in other areas of New York beyond Orange County. Construction phase impacts will be spread over the entire two year construction phase of the Project.

7.4.1.5 Secondary Job Impacts During Construction

The job impacts from construction activity will be large, and with indirect and induced (multiplier) impacts occurring across many industries. A total of 908 construction industry and construction related jobs, including an estimated 690 workers in the construction trades, will be supported as a result of direct Project expenditures in each year of the two year construction phase (Table 7-9).

This estimate of construction employment impacts is derived using standard methodologies with input-output models. The dollar value of the Project's construction expenditures occurring in the region is divided by the average productivity (the value of what each worker produces in one year) of workers employed in non-residential construction industries (commercial, industrial and utility structures) in the region. Data used in calculating the average productivity of construction workers is reported by the U.S. Census Bureau, "Census of Construction Industries" for New York. Data on industry earnings and employment at the county level is used to calculate the productivity of construction workers in the region and is reported by the U.S. Bureau of Economic Analysis (BEA) of the Department of Commerce. With a base estimate of the number of construction industry workers needed to construct the Project, a number of additional adjustments were made to arrive at the final estimate. First, using "Census of Construction Industries" data for the state of New York, the occupational distribution of non-residential construction industries in the region were determined in order to allocate the employment impacts of constructing the CPV Valley Energy Center among construction trades people, management, supervisory personnel, and support workers in the construction industry. From this it was determined that approximately 76 percent of the construction industry employment impacts would be allocated to construction trades people.

A second adjustment is made that has a significant impact on the estimates of the employment impacts. The original estimate of construction employment impacts is based on the productivity of each worker in the region and is based on an average work week of approximately 35 hours. In fact, it is likely that the average work week would be longer on a project such as the CPV Valley Energy Center. Assuming an additional 7 hours per week (to 42 hours) increases the amount that each worker can produce in a year by 20 percent. The net effect is to reduce the estimate of the number of employees needed to construct the Project and the estimated employment impacts by 20 percent. It does not, however, reduce our estimate of the labor income earned from the construction phase because that estimate is derived as a percentage of the dollar value of the construction Project (on average, labor costs in the non-residential construction industry in New York represent just under 40% of the value of the construction put in place.).

The model-based estimates of the employment impacts of the construction phase, adjusted for the factors noted previously, are presented in Table 7-9. The productivity, practices, and staffing patterns of individual companies differ; these employment estimates are based on industry averages in the region and are not specific to any individual company. Thus they are likely to differ from the estimates of any individual construction company. We believe, however, they represent an empirically sound and conservative estimate of the employment impacts of the construction phase of the Project.

Table 7-9
Job Impacts of CPV Valley Construction
(Over 2 years)

Orange County	**Total**
Direct	908
Indirect	199
Induced	369
Total	**1,476**
Remainder of New York	**321**
Total Job Impacts	**1,797**

The number of on-site construction workers will vary during the construction phase with a peak construction employment on site of between 600 and 700. In addition to the direct construction employment impacts from Project expenditures, the indirect and induced expenditures related to the Project will support another 568 jobs in the region in a wide variety of industries. Finally, another 321 jobs will be created outside of Orange County region but within other areas of New York for a total job impact of 1,797 in each year of the construction phase of the Project. Figure 7-2 highlights some industries in addition to construction that are forecast to experience job growth in the county as a result of the construction phase of the Project.

7.4.1.6 Secondary Labor Income Impacts During Construction

The direct, indirect, and induced employment impacts resulting from the construction of the CPV Valley Energy Center will increase labor income in Orange County by $153.6 million over the two year construction phase. In addition, indirect and induced employment impacts from construction that leak out of the county but which remain in New York will increase labor income in other regions of New York by $28.8 million, for a total labor income impacts from construction of $182.4 in the state.

The impacts of the Facility's construction on labor income are presented in Table 7-10.

Table 7-10
Labor Income Impacts of CPV Valley Energy Center Construction
(Over 2 years)
(Millions of 2007 Dollars)

Orange County	**Total**
Direct	$102.4
Indirect	$21.0
Induced	$30.2
Total	**$153.6**
Remainder of New York	**$28.8**
Total Job Impacts	**$182.4**

7.4.2 Economic Effects of Project Operation

This section provides an estimate of the annual secondary employment and economic activity likely to be generated in the vicinity of the Project by its operation.

7.4.2.1 Secondary Revenues During Facility Operation

The annual operations of the Facility will result in an increase in regional economic activity of $19.8 million and will have another $3.5 million impact throughout the rest of New York. The impacts that occur as a result of the operation of the Facility will occur annually and may increase over time. The annual economic impact of Facility operations is presented in Table 7-11.

Table 7-11
Annual Impact of CPV Valley Energy Center Operations
(Millions of 2007 Dollars)

Orange County	**Total**
Direct	$14.3
Indirect	$1.6
Induced	$3.9
Total	**$19.8**
Remainder of New York	**$3.5**
Total Economic Impact	**$23.3**

7.4.2.2 Secondary Jobs during Operation

Once constructed, the Facility is expected to require approximately 25 higher-wage, full-time jobs to operate. In addition, another 49 indirect and induced jobs will be created in the region as a result of operation of the facility and the income earned from the direct and indirect employment impacts for a total annual impact of 74 jobs in the region. Finally, 20 jobs will be created or "leak" from the region in other areas of New York as a result of CPV Valley Energy Center annual operations. Total job impacts in New York resulting from annual Facility operations are estimated to be 94.

Figure 7-3 presents total annual job impacts from the Facility's operations. The job impacts in Orange County resulting from the Facility will create jobs in a number of well-paying industries and significantly increase demand for skilled labor in the county.

7.4.2.3 Secondary Labor Income during Facility Operations

The labor income impacts of the CPV Valley Energy Center operations are presented in Table 7-12. The total direct, indirect and induced income impacts (including all non-wage salary and benefits) in the region are estimated to be $5.24 million with another $940,000 of labor income increases occurring in other New York counties, for a total impact on labor income of $6.18 million. The direct and indirect labor income impacts suggest that the average annual wages resulting from Facility operations will be significantly higher than the current average annual wages in the region.

Table 7-12
Annual Labor Income Impacts From CPV Valley Energy Center Operations
(Millions of 2007 Dollars)

Orange County	**Total**
Direct	$2.91
Indirect	$0.49
Induced	$1.84
Total	$5.24
Rest of New York	**$.94**
Total Labor Income Impacts	**$6.18**

7.4.2.4 Impacts of Potential Revenue for Minisink Valley School District

School aid formulas are based on a number of factors. The three key factors in the foundation aid program are property wealth, income wealth, and number of students. Transportation and BOCES aid use property wealth in their formulas, but not income wealth. The proposed Project will use IDA financing and hence is expected to be treated as tax exempt. As a result, it is reasonable to assume that the value of the CPV Valley Energy Center Project would not be added to the property value of the site, and hence there would be no substantial increase in property values, and no affect on the level of Minisink Valley school aid received from the State.

7.4.3 Projected Taxes

For large capital intensive projects, such as the CPV Valley Energy Center, the State and Counties have established a process to attract the economic development opportunities through PILOT arrangements. The PILOT payments are traditionally in excess of the current tax revenue received from the undeveloped property. Therefore, a more comparative tax basis would be the existing tax revenue generated from the property or another development allowable under current zoning. Without the PILOT, the state and county recognize that projects of this magnitude may not be viable. While the projected taxes are discussed in Appendix 7-A, it is unlikely those projections would be realized.

7.4.4 Project Financing and PILOT Agreement

CPV Valley will seek private financing for the Project through traditional funding sources typical for this type and scale of infrastructure projects. A PILOT agreement is in the process of being negotiated and information on this will be provided when available. The PILOT program is a mechanism which states and local governments can attract economic development to specific areas. In New York, county Industrial Development Agencies (IDAs) are established to negotiate these types of agreements to facilitate economic development opportunities for the county, and provide incremental revenue to the communities in which the development occurs. One recent PILOT agreement that may serve as a general illustrative example (though dollar values may not be applicable) is the Besicorp-Empire Development Company, LLC (BEDCO) Project. In this example, the developer worked with the City of Rensselaer and others to ensure that positive benefits of the Projects would be delivered to the residents of the City of Rensselaer. Under the Agreement, BEDCO agreed to pay the City annual installments, which would be used by the City at its discretion. The City also received in Host Community payments was in addition to the Payment in Lieu of Taxes (PILOT) payments. CPV is in discussions with the Orange County IDA in regard to a PILOT program that will enhance the ability of the local community to realize these economic benefits. In addition, CPV Valley intends to execute a Host Community Benefits Agreement.

7.4.5 Impacts on Insurability

CPV Valley conducted research on whether the construction of the CPV Valley Energy Center could have an effect on insurability of homes nearby. An internet-based search yielded nothing in the public domain indicating that power plant impacts the ability of a nearby resident to obtain homeowners insurance or results in increased insurance rates for such homeowners. In addition, CPV Valley conducted interviews with representatives in the insurance industry, and there appears to be no concerns regarding a homeowner’s ability to obtain insurance or increased insurance rates as a result of power generating facilities. During the course of the interviews, representatives of the insurance industry indicated that insurability was based on the perceived risk of occurrences to and within the home, and specifically, those risks where liability could not be attributed to another party. For example, a fire, lightening strike, water damage, etc., are those types of events where the homeowner does not have the ability to charge fault to another party. The interviews concluded with a review of a traditional homeowner's insurance application, which attempts to identify the potential risks of a particular home. The applications inquired about swimming pools on site, trampolines, etc., which were items that created potential risk and events for the homeowners. These applications also inquired as to proximity to fire hydrants so as to mitigate potential impacts of fire. There were no references to proximity to power facilities on the applications. Also, there are no identified rates of accidents or incidents related to power plant that caused any of the interviewees to be concerned of increased risk associated with a power plant in the region; especially given the large distance from the Project to the nearest residence.

7.4.6 Incremental Costs to the Public

This section evaluates the potential incremental costs to the Town of Wawayanda due to construction and operation of the Project, including potential costs associated with police, fire/emergency services, school district, and water services.

7.4.6.1 Incremental Costs Related to Project's Workforce

The Project is expected to generate an estimated 664 construction jobs during peak onsite activity and 25 permanent jobs to operate the Facility. As indicated previously, it is anticipated that the required construction labor force for the Project would be readily met with the available trades and union workforce in Orange County, and no significant in-migration of construction workers is expected. Accordingly, there would be minimal increase in demand for municipal services during construction due to the construction workforce. Similarly, the existing workforce located in Orange County is expected to provide for the majority of the 25 person operating staff at the Facility without significant in-migration, so there is no expected incremental increase of municipal service costs attributed to employees working there. Further, the Project would provide substantial local tax benefits as described above.

7.4.6.2 Incremental Cost to Police Services

It is anticipated that any increase in the demand for police services resulting from construction and operation of the Project would be minimal. The Project will have private security both during construction and operation, thereby requiring no police services except perhaps in the rare event of an emergency. During road construction, some police may be required to direct traffic. CPV will work with the Town to ensure adequate funding is provided for this service, so there will be no costs incurred to the Town.

7.4.6.3 Incremental Cost to *Fire/Emergency Services*

The Project is located within close proximity to two local fire districts: Wawayanda Fire Company/Slate Hill Fire Department and New Hampton Fire Department. The fire protection for the Project site will be provided by the New Hampton Fire Department.

A 1,000,000-gallon raw water and fire protection storage tank on-site would meet the Facility's firewater requirements in the event of a fire without impacting the local water distribution system.

CPV is in consultation with the New Hampton Fire Company regarding emergency planning and fire protection requirements for the Project. Concerns were raised during discussions regarding the ability of the service providers to provide adequate emergency response services to the Project. Discussions at the meeting focused on the status of the Project, proposed fire suppression devices and requirements, vehicular access to the site, and community outreach efforts. In addition, CPV Valley has provided the New Hampton Fire Company with a copy of the Preliminary Emergency Response Plan and requested input from the department.

It is not anticipated that the Project would result in significant impacts related to fire and emergency services. The Project will be designed to provide a high level of safety and redundancy and will meet or exceed all National Fire Protection Association (NFPA), state, and local safety and emergency codes, regulations, and requirements. No incremental infrastructure costs are expected to be necessary by the New Hampton Fire Department to serve the Facility.

An Emergency Response Plan to support construction and operational activity at the site will be developed and implemented. The Emergency Response Plan will include a safety orientation program and fire response plan to reduce the likelihood of requiring emergency services from the Town. A preliminary plan is included as Appendix 12-C. The Facility personnel will be fully trained as an on-site fire brigade, working cooperatively with the Fire Department, to function as the first line of defense in the event of a fire or emergency at the Facility. In conclusion, the Project will not result in costs to the Town with respect to emergency services, except possibly in the unlikely event of an emergency, in which case such services could be temporarily used. Any costs associated with emergency assistance would be far outweighed by the economic benefits of the Project discussed in this section.

7.4.6.4 Incremental Cost to School Districts

The Project will not have an adverse impact to the Minisink Valley Central School District or the Middletown School District. As indicated above, both the facility's construction workforce and operational staff are expected to be satisfied by the existing qualified workforce located within Orange County. Accordingly, no significant in-migration, temporary or permanent, is anticipated in support of the facility. Therefore, incremental costs to the school district, if any, would be negligible as it is not anticipated that any additional students would be added to the school districts as a result of the Facility's construction or operation. The Facility is not expected to have any adverse impacts on the school districts allocation of state aid. Moreover, the school districts will benefit from local taxes to be paid by the Facility.

7.4.6.5 Incremental Cost to Water Services

As discussed in Chapter 12.0, Infrastructure, the Project proposes to obtain grey water from the City of Middletown Sewage Treatment Plant distribution system to satisfy process and sanitary water supply needs. Accordingly, there will be minimal incremental cost to extend water service, however those costs would be offset by the revenue the City would receive from the Project as a new customer. The Project will use a small quantity of City water for its potable water needs, but the volume will be small and it will have no measurable impact on the City's water supply.

The expected net impact would be that there would not be any incremental cost to current services.

7.4.6.6 Incremental Cost to Solid Waste Services

CPV Valley will contract with private waste haulers to remove solid waste resulting from the Project both during construction and operation, thus not causing any incremental costs to the Town of Wawayanda for waste disposal. Furthermore, waste disposal during construction would be minimized through the employment of a recycling program that would focus on scrap metal and reusable timber.

7.4.6.7 Incremental Cost of Potential Externalities

Construction-Related Externalities

Construction related externalities associated with large construction projects typically include noise, traffic, air, water, wetlands and socioeconomic impacts. These construction related impacts are described below and discussed in more detail in Section 15.0, Construction Impacts.

Noise impacts during construction are generated primarily from diesel engines which power the equipment. Exhaust noise usually is the predominant source of diesel engine noise, which is the reason that maintaining functional mufflers on all equipment will be a requirement of the Project. Noise levels of construction equipment typically utilized for this type of project are presented in Table 10-2, Section 10.0, Noise. It is important to note that the equipment presented is not used in each phase of construction. Further, equipment used is not generally operated continuously, nor is the equipment always operated simultaneously. Construction noise will also be temporary in nature and as such, no adverse or long term externalities or costs associated with construction noise externalities are anticipated. (Refer to Section 10.4.1 for detailed noise impacts associated with the construction phase of the Project).

Traffic impacts during construction will result due to the need for workers to commute to the site and as a result of construction equipment and supply deliveries. Construction related traffic impacts are discussed in detail in Section 8.8, of Section 8.0, Traffic. These impacts were not found to be significant as the construction schedule has been set to avoid peak traffic hours. The traffic analysis found that there will be only a few instances when construction related traffic will cause deterioration in Level of Service (LOS) at a study location. The drop in LOS is generally moderate and will be temporary, lasting only during the 4 to 5 months of peak construction activity. As the construction related traffic will generally only be minor, localized and temporary, no major traffic related externalities or costs are expected.

Air quality impacts during construction will be limited to dust during excavation and small quantities of air emissions from construction machinery and vehicles. These emissions will comply with the National Ambient Air Quality Standards (NAAQS) as well as all other state and local air standards and air pollution control requirements. (Refer to Section 9.0, Air Quality for further details). Construction related air emissions will not cause health impacts and no air related externalities or costs are expected.

With respect to water quality impacts, the Project will utilize erosion control and soil stabilization measures to ensure that disturbed soils do not leave the site during storm events. The Project design includes measures to avoid the release of contaminated materials, and to address contingencies in the event an accident were to occur such that procedures would be in place for control of such an accident and preventing contamination of surface or ground water resources. Accordingly, no major water related externalities or costs are expected during construction.

Construction of the Project will impact limited areas of wetlands and associated habitat immediately in the vicinity of the footprint of the Project. CPV has taken measures to minimize wetland impacts via Project design and measures to ensure wetlands are neither constructed upon nor disturbed (Refer to Section 14.0, Ecology). Such impacts will be small in relation to wetland habitat in the general vicinity of the Project and any incremental contribution of the Project to cumulative loss of wetland habitat in the area will not be significant. Moreover, CPV will provide compensatory wetlands at a ratio of 2:1 so there will be no net loss in wetlands. Accordingly, no major externalities are expected with respect to wetlands habitat.

With respect to socioeconomic externalities, the Project will not result in the in-migration of any measurable number of construction workers. As a result, there will be no impact on schools or municipal services as construction workers are not expected to move to the Town as a result of this Project. Moreover, the construction Project is expected to generate jobs locally and revenues are expected to be spent locally on goods and services to support construction.

A summary of externalities is provided below in Table 7-13. For each of the impacts previously described, the table shows the impact at a representative receptor location. The noise receptor locations described in Section 10.0, Noise, were used for this impact consideration as they are close to the site and provide a conservative estimate of all impacts/externalities (See locations of these receptors in Figure 10-1).

Table 7-13
Construction Noise Externalities Levels (dBA) (1)

Receptor	Distance (feet)	Existing Daytime Leq	Site Clearing	Excavation	Foundations	Building Assembly	Finishing
Uhlig Road	2,500	50 to 60	44	49	37	44	49
Apple Lane Drive	2,500	61	44	49	37	44	49
Pine Hill Cemetery	2,600	59	43	48	36	43	48
Sunrise Park Road	4,500	61	36	41	29	36	41
Bates Gates Road	3,700	54	39	44	32	39	44
Deblock Road	2,200	52	46	51	39	46	51
Horizon Apartments	2,500	59*	44	49	37	44	49
Route 6 Residences	1,500	59*	50	55	43	50	55
Pine Lane Industrial Park	1,300	59*	52	57	45	52	57

(1) The table shows that construction noise generated by the Project will be below the existing daytime Leq and thus no noise impacts/externalities are expected.

Table 7-13 (continued) Other Externalities Associated with Construction						
Receptor	**Distance (feet)**	**Traffic (1)**	**Air (2)**	**Water (3)**	**Wetlands (4)**	**Socio Economics (5)**
Uhlig Road	2,500	No major change in level of service	None	None	None	Positive
Apple Lane Drive	2,500	No major change in level of service	None	None	None	Positive
Pine Hill Cemetery	2,600	No major change in level of service	None	None	None	Positive
Sunrise Park Road	4,500	No major change in level of service	None	None	None	Positive
Bates Gates Road	3,700	No major change in level of service	None	None	None	Positive
Deblock Road	2,200	No major change in level of service	None	None	None	Positive
Horizon Apartments	2,500	No major change in level of service	None	None	None	Positive
Route 6 Residences	1,500	No major change in level of service	None	None	None	Positive
Pine Lane Industrial Park	1,300	No major change in level of service	None	None	None	Positive

(1) Refer to details in traffic Section at Section 8.8. There are only a few instances when construction related traffic will cause deterioration in Level of Service at a study location. The drop in LOS is generally only moderate and will be temporary, lasting only during the 4 or 5 months of peak construction activity. Thereafter, conditions will return to pre-construction levels.
(2) Air emissions comply with NAAQs and will have no health impacts
(3) See Section 13 for details on water impacts
(4) Compensatory wetlands impacts will be developed at a ratio of 2:1. Refer to Section 13.
(5) The construction project is expected to provide revenue via its PILOT program as well as generate jobs locally while at the same time having little impact on municipal services.

Facility Operational Externalities

No potential externality related cost implications are anticipated as a result of emissions, visual impacts, traffic, noise, odors, or socioeconomic impacts generated by Project operations on nearby residential and non-residential properties. These externalities are described below:

With respect to externality costs associated with air emissions during Project operations, it should be noted that the NAAQS are specifically designed to prevent any health related impacts of air pollution to the most sensitive subgroups of the population. Furthermore, it is likely that the Project's operation may in fact displace other more polluting fossil fuel facilities located in the region, and contribute improving air quality in a regional context. Therefore, no externality costs associated with air emissions are expected.

Operation of the proposed Facility would not adversely impact traffic conditions in the Project study area as the operational workforce will consist of only 25 workers across three shifts. Thus, no externality costs associated with traffic are anticipated.

With respect to any costs associated with noise externalities, it should be noted that the Project will comply with the NYSDEC and Town noise impact standards. As the Project modeled results are below these noise impact limits, no costs associated with noise externalities are expected.

With respect to impacts on water, the Project will minimize water use by using treated effluent from the City of Middletown Sewage Treatment Plant. In addition, the Project will discharge process water back to the City of Middletown Sewage Treatment Plant in compliance with any pre-treatment requirements and thus will not affect surface water quality. The Project will not discharge to groundwater and will have a SWPPP and a SPCC plan in place to prevent impacts to surface and groundwater quality. Thus, the Project is not expected to result in any externality costs associated with water impacts.

With respect to socioeconomic externalities, the Project will not result in the in-migration of any significant number of workers. As a result, there will be no impact on schools or municipal services as a result of new workers living in the town. The Project is expected to generate substantial revenues to address the budgetary needs of schools and other important municipal services.

With respect to visual impacts, the Project will be visible from select locations, with most views limited to areas close to the vicinity of the Project where trees, buildings, and topography do not visually shield the structures.

CPV Valley looked at several studies on the effect of power plants on property values. One visual impact study of note that was done in New York evaluated the property values around three power plants that had been constructed (Island Park and Glen Head in Nassau County, and Port Jefferson in Suffolk County) (J.A. Cowen Associates, not dated). The study evaluated property values within ½ mile of a power plant, within ½ to 1 mile, and beyond one mile. The results of the study indicated that the three facilities had no impacts on property values.

Another study looked at residential property values in two Massachusetts communities that were located near power plants (Creative Strategies and Communications, 2007). Based on surveys of the residents in the host communities and discussions with the town assessors and local real estate agents, the study found that the generation plants in the two towns have not posed a problem with the local community image or with home sales or prices.

A summary of externalities related to Facility operation is provided below in Table 7-14. For each of the impacts described above the table shows the impact at a representative sensitive receptor. The noise sensitive receptors described in Section 10.0, Noise, were used as reference locations as these locations are in close proximity to the site, and provide a conservative estimate of potential impacts/externalities.

Table 7-14 **Operation Noise Externalities Levels (dBA) (1)**				
Location	**Calculated Facility Noise Level L_{eq}**	**Measured Ambient Late Night L_{eq}**	**Projected Future Total Noise Level L_{eq}**	**Maximum Increase Over Existing Late Night Noise Level L_{eq}**
Uhlig Road	42	40	44	4
Apple Lane Drive at Kirbytown Road	45	60	60	0
Pine Hill Cemetery	39	59	59	0
Sunrise Park Road	35	55	55	0
Bates Gates Road	38	51	51	0
Deblock Road at Route 56	45	57	57	0
Horizon Apartments	46	59*	59	0
Route 6 Residences	51	59*	60	1
Pine Lane Industrial Park	56	59*	61	2

(1) The Project will comply with the NYSDEC noise impact limits which are based on the lowest noise levels that could have the potential for a noise impact.

Table 7-14 (continued) **Other Externalities Associated with Operation**							
Receptor	**Distance (feet)**	**Traffic (1)**	**Air (2)**	**Water (3)**	**Wetlands (4)**	**Socio Economics (5)**	**Visual Impacts**
Uhlig Road	2,500	None	None	None	None	Positive	Possible during leaf-off conditions.(6)
Apple Lane Drive	2,500	None	None	None	None	Positive	Partial views, During leaf-off conditions. (6)
Pine Hill Cemetery	2,600	None	None	None	None	Positive	Yes
Sunrise Park Road	4,500	None	None	None	None	Positive	No
Bates Gates Road	3,700	None	None	None	None	Positive	Yes
Deblock Road	2,200	None	None	None	None	Positive	No
Horizon Apartments	2,500	None	None	None	None	Positive	Partial views
Route 6 Residences	1,500	None	None	None	None	Positive	Yes
Pine Lane Industrial Park	1,300	None	None	None	None	Positive	Yes

(1) Facility only employs 25 to 30 workers. Refer to details in traffic Section at Section in 8.0
(2) Air emissions comply with NAAQs and will have no health impacts
(3) See Section 13 for details on water impacts
(4) No impact on wetlands related to operation. Refer to Section 13.
(5) The Project is expected to provide revenue via its PILOT program as well as generate jobs locally while at the same time having little impact on municipal services.
(6) Limited to partial views of stack.

7.4.7 Funding for Decommissioning

The typical operating life span for a new electric generating facility ranges from 30 to 40 years. With respect to funding for decommissioning, it is expected that the aboveground portion of the Facility's components would be offered for sale, for salvage or at least scrap value in the event of decommissioning. Even if there were no market for purchasing the Project's components for salvage purposes, the scrap value of the equipment, buildings, and structures on the Project site would be anticipated to be more than sufficient to offset the complete cost of demolition of the Facility.

It should be noted that decommissioning is unlikely to occur under any reasonable scenario during either construction or any period when the Facility is economically viable. During Project construction, there are contractual requirements for the Project to reach commercial operation, and several levels of remedies in place to cure a potential default. During Project operation, as long as the facility remains economically viable, continuing operations would negate any need to pursue decommissioning. Once operational, the Project would be the cleanest, most efficient, and reliable baseload electric generation facility in the region. Thus, one would expect older less efficient plants in the current fleet to be retired well before the CPV Valley Project.

7.5 ENVIRONMENTAL JUSTICE

7.5.1 Introduction

The intent of this environmental justice (EJ) analysis is to determine whether the construction and operation of the proposed Project would have a significant adverse and disproportionate affect on an "environmental justice community." The concept of performing an EJ analysis for the Project is related to the issuance of Executive Order 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" (February 11, 1994). The order requires Federal agencies to consider disproportionate adverse human health and environmental impacts on minority and low-income populations. The methodology used in preparing this analysis is based upon the New York State Department of Environmental Conservation (NYSDEC) EJ Policy (CP-29, Environmental Justice and Permitting, Mar. 19. 2003) and Federal guidance documents prepared by the United States Environmental Protection Agency (USEPA) for use in preparing a National Environmental Policy Act (NEPA) environmental justice analysis.

The NYSDEC EJ Policy was issued on March 19, 2003. This report sets forth guidelines for how environmental justice consideration can be incorporated into permit review, SEQRA procedures, and some components of the NYSDEC's enforcement and public participation programs.

The NYSDEC EJ Policy applies to permits administered under Article 70 of the Environmental Conservation Law (ECL) and Title 6 of the New York Code of Rules and Regulations (NYCRR) Part 621. Any application for a new permit that is classified as a major project (as defined by 6 NYCRR Part 621.4) from applicable programs or an application for a major modification of an existing permit from the same applicable programs are subject to the EJ screening process. The NYSDEC programs that would be the subject of a review for EJ impact, as they relate to the Project include:

- Air Pollution Control-6 NYCRR Parts 201
- SPDES-6 NYCRR Parts 750 through 758

The NYSDEC EJ Policy prescribes a two-step methodology for conducting the preliminary screening analysis. These steps consist of:

- Determine whether the proposed action is in or near a minority or low-income community and identify potential environmental impacts.
- Determine whether impacts are likely to adversely affect a potential EJ community.

The focus of an EJ analysis is the determination of whether the construction and operation of a proposed Project would have both adverse and disproportionate impacts on an environmental justice community.

Notwithstanding the fact that this EIS demonstrates that the impacts of the CPV Valley would not be considered to be "adverse" under any Federal, state, or local guideline or standard, an environmental impact analysis was conducted to determine whether there would be an adverse and disproportionate environmental burdens on minority or low-income populations as defined in the NYSDEC EJ Policy.

7.5.2 Determination of Environmental Justice Communities

The NYSDEC EJ Policy establishes state-specific thresholds in order to identify areas, typically census tracts or block groups, where the representation of low-income and/or minority populations qualifies the area as a "potential environmental justice area." The NYSDEC EJ Policy establishes the New York State urban EJ threshold for minority population at 51.1 percent. For purposes of this policy, an urban threshold applies because the area in question is located within a Census-designated place with a population of 2,500 people or more. The Town of Wawayanda proper has a small minority population of 10.6 percent.

The NYSDEC EJ Policy establishes the New York State EJ threshold for low-income population at 23.59 percent. Income data are part of the US Census "long form" questionnaire and are based on a partial, sample count. For the year 2000 Census, low-income population is defined as the percentage of individuals whose 1999 income was less than 100 percent of the poverty level. Block groups in which more than 23.59 percent of individuals fit this description are potential EJ communities. In the Town of Wawayanda, only 3.7 percent of the population was living below the poverty threshold. Table 7-15 provides a summary of percent minority, poverty rate, and household income data for each Census block group within a two mile radius of the Project site, as well as six Census block groups outside the 2-mile radius that have been identified by NYSDEC as potential EJ sites. Figure 7-4 shows the location of the each Census Block relative to the Project site.

Table 7-15 Environmental Justice Data by Census Block Group			
Area	**Minority Population Percentage**	**Poverty Rate**	**Median Household Income**
New York State	39.5	14.6	$43,393
Orange County	28.6	10.5	$52,058
Wawayanda	10.6	3.7	$61,885
Tract 11, BG 4*	**53.1**	21.9	$27,548
Tract 14, BG 2*	49.0	**39.3**	$14,500
Tract 14, BG 3*	**60.1**	**34.7**	$18,424
Tract 14, BG 6*	**55.4**	**31.7**	$26,786
Tract 15, BG 1*	**57.6**	22.0	$32,292
Tract 15, BG 3	**62.29**	**26.76**	$22,768
Tract 16, BG 1	36.63	12.31	$43,403
Tract 16, BG 2	36.42	6.95	$51,139
Tract 16, BG 3	31.10	5.92	$43,750
Tract 16, BG 4	39.70	6.09	$50,714
Tract 17, BG 1*	**56.7**	**31.4**	$15,341
Tract 112, BG 3	35.00	4.13	$49,450
Tract 114, BG 3	15.37	1.33	$60,536
Tract 118, BG 1	12.12	1.16	$67,417
Tract 118, BG 2	12.43	3.04	$61,250
Tract 118, BG 3	10.89	2.41	$68,942
Tract 118, BG 4	11.40	5.51	$53,021
Tract 118, BG 5	7.25	6.13	$55,809

Notes: BG: Block Group
The NYSDEC minority population percentage threshold in urban areas is 51.1 percent
The NYSDEC poverty rate threshold is 23.59 percent
Bold values indicate percentage above the NYSDEC threshold
* DEC-identified potential EJ area outside 2-mile radius
Sources: U.S. Census, 2000 and Empire State Development Website

The Town of Wawayanda's minority population, 10.6 percent, and poverty rate, 3.7, are well below the NYSDEC's population percentage threshold for minority populations and the population percentage threshold for low income[1]. As shown in Table 7-15, one out of the twelve census block groups within a two-mile radius of the Project is a potential Environmental Justice Area. This Census Block (Tract 15, BG 3) is primarily located in the City of Middletown; a small portion is located in Walkill. The southwestern most point of the census block is 0.94 miles northeast from the Facility Site. Based on the data land use mapping for Middletown and Walkill, the block has the following land use types: Utilities, Industrial, Light Industrial, Commercial, Professional Office, Mixed Use, Single Family Residential, Two-Family Residential, Multi-Family Residential, Parks/Open Space, Community Services, Public/Government, and Vacant.

[1] Minority and income data were obtained from the 2000 Census.

In addition, the NYSDEC identified six potential EJ areas outside the 2-mile radius (Tract 11, BG 4; Tract 14, BG 2; Tract 14, BG 3; Tract 14, BG 6; Tract 15, BG 1; and Tract 17, BG 1.)

Tract 11, BG 4 is located entirely in Middletown. The block group is 2.7 miles northeast from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan, the block has the following landuse types: Single Family Residential, Two-Family Residential, Multi-Family Residential, Commercial, Professional/Office, Mixed Use, Light Industrial, Industrial, Community Services, Public/Government, Transportation, and Vacant.

Tract 14, BG 2 is located entirely in Middletown. The block group is 2.5 miles northeast from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan, the block has the following landuse types: Single Family Residential, Two-Family Residential, Multi-Family Residential, Commercial, Professional/Office, Mixed Use, Light Industrial, Industrial, Parks/Open Space, Community Services, Public/Government, Transportation, Utilities, and Vacant.

Tract 14, BG 3 is located entirely in Middletown. The block group is 2.1 miles northeast from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan, the block has the following landuse types: Single Family Residential, Two-Family Residential, Multi-Family Residential, Commercial, Professional/Office, Mixed Use, Light Industrial, Industrial, Parks/Open Space, Community Services, Public/Government, Transportation, Utilities, and Vacant.

Tract 14, BG 6 is located entirely in Middletown. The block group is 2.5 miles north from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan, the block has the following landuse types: Single Family Residential, Two-Family Residential, Multi-Family Residential, Commercial, Mixed Use, Industrial, Community Services, Public/Government, Transportation, Utilities, and Vacant.

Tract 15, BG 1 is located entirely in Middletown. The block group is 2.2 miles northeast from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan, the block has the following landuse types: Single Family Residential, Two-Family Residential, Multi-Family Residential, Commercial, Professional/Office, Mixed Use, Light Industrial, Industrial, Community Services, Public/Government, Transportation, and Vacant.

Tract 17, BG 1 is located in Middletown and Walkill. The block group is 2.4 miles north from the Project. Based on the data land use mapping from the Middletown Comprehensive Plan and the Walkill Comprehensive Plan, the block has the following landuse types: Agriculture, Commercial, Mixed Use, Light Industrial, Community Services, Transportation, and Vacant.

In addition, a workforce housing project called “Horizons at Wawayanda” is located adjacent to Project site to the northwest of the Project site. Horizons at Wawayanda consists of 106 dwelling units, and is approximately 0.40 miles from where the facility will sit on the site. Construction at this site is nearing completion and applications are being accepted for fall 2008 occupancy. Horizons at Wawayanda is a project built with a combination of private and public funding to develop affordable housing for Orange County’s working families at below market rates. Horizons at Wawayanda was constructed on a formerly vacant parcel adjacent to a cemetery, commercial, and industrial properties and directly bordering the MI Zoning District

7.5.3 Enhanced Public Participation Plan

Public participation in the NYSDEC environmental permit review process encompasses a program of activities that provides opportunities for citizens to be informed about and involved in the review of a proposed action. To ensure meaningful and effective public participation, this policy requires applicants for permits covered by this policy to actively seek public participation throughout the permit review process. CPV is implementing an Enhanced Public Participation Plan in accordance with NYSDEC's EJ Policy. The Plan is provided as Appendix 1-B of this DEIS, and includes the following elements as recommended in NYSDEC's EJ Policy.

- Identify stakeholders to the proposed action, including residents adjacent to the proposed action site, local elected officials, community-based organizations and community residents located in a potential environmental justice area;

- Distribute and post written information on the proposed action and permit review process.

- Hold public information meetings to keep the public informed about the proposed action and permit review status.

- Establish easily accessible document repositories in or near the potential environmental justice area to make available pertinent project information.

7.5.4 Environmental Justice Area Impact Assessment

To evaluate the existing environmental load profile and determine the potential impacts of the proposed facility within the potential environmental justice area, analyses related to air quality, contaminated materials, noise, and transportation impacts were undertaken. These analyses are summarized below.

7.5.4.1 Air Quality

The Project was modeled in accordance with the procedures documented in the revised Air Quality Modeling Protocol, and maximum predicted Project impacts were determined for various pollutants and averaging periods.

Table 7-16 presents the maximum predicted impacts of CO, SO_2, PM-10, and NO_2 for comparison with significant impact levels (SILs) that have been established by EPA. Table 7-16 also presents the sum of maximum Project impacts and conservative background air quality levels so that total predicted concentrations can be compared to the corresponding National Ambient Air Quality Standards (NAAQS).

All predicted Project impacts, except for 24-hour average PM-10 impacts, are below SILs. The sum of maximum predicted impacts and conservative background levels is below the corresponding NAAQS for all pollutants and averaging periods. Therefore, the Project is not considered to have any adverse air quality impacts

Figures 7-5 through 7-12 provide isopleths of maximum predicted Project impacts for each pollutant and averaging period. The outlines of identified EJ areas are also depicted on the plots.

The maximum predicted Project impacts for short-term averaging periods are generally predicted to occur in elevated terrain located to the northwest of the Project in a direction away from identified EJ areas. Therefore, the identified EJ areas will not receive a disproportionate share of the maximum short-term Project impacts.

The maximum predicted annual Project impacts exhibit a pattern that reflects the general southwest/northeast orientation of the surrounding terrain and the corresponding prevailing winds. Although some of the maximum annual Project impacts are predicted to occur near some of the nearest EJ areas or, in some cases, near the Project fence line, the maximum predicted annual impacts are always below the corresponding SIL, so there will be no adverse impact from the Project.

Table 7-16
CPV Valley Energy Center - Maximum Modeled Concentrations a/

Pollutant	Averaging Period	SIL ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Background Concentration b/ ($\mu g/m^3$)	Maximum Ground-Level Project Impact ($\mu g/m^3$)	Total Ground-Level Concentration c/ ($\mu g/m^3$)
CO	1-Hour	2,000	40,000	3,893	563	4,456
	8-Hour	500	10,000	3,206	182	3,382
SO_2	3-Hour	25	1,300	55.0	3.3	58
	24-Hour	5	365	28.8	0.6	29
	Annual	1	80	5.2	0.04	5.2
PM_{10}	24-Hour	5	150	78	9.9	88
	Annual	1	50	35	0.2	35
NO_2	Annual	1	100	41.4	0.8	42

Notes:
a/ Maximum modeled ground-level concentration due to the worst case overall facility operating scenario (i.e., the facility operating scenario that resulted in the maximum modeled air quality impact) for each pollutant.
b/ Background concentrations are the highest second highest short term (1-, 3-, 8-, and 24-hour) and maximum annual concentrations.
c/ Total concentration = background concentration + maximum modeled (i.e., ground-level) concentration.
Source: TRC Environmental Corp.

7.5.4.2 Traffic and Transportation

Operation of the proposed Facility would not adversely impact traffic conditions in the project study area or within the environmental justice area. The proposed facility would contribute a small number of vehicle trips to the local roadway network. The facility would have, at most, 8 to 10 persons on duty during any one shift. It is anticipated that there would be a maximum of 30 vehicle trips during the morning and evening peak hour periods. The addition of these vehicle trips would not impact traffic flow conditions throughout the environmental justice area.

7.5.4.3 Noise

The proposed Facility would not result in adverse or disproportionate noise impacts within the environmental justice area. The environmental justice area is more than one mile away from the proposed Facility. Operation of the Facility will not result in any increase in noise levels at all locations within the environmental justice area. The Project's projected increase in noise levels at the Horizon complex is well within NYSDEC and the Town noise ordinance standards.

7.5.4.4 Visual

The proposed Facility would not result in disproportionate or adverse visual impacts within the EJ environmental justice area. A detailed visual impact assessment for the Project is presented in Section 5.0, Visual Resources and Aesthetics. The results of the visual impact analysis indicate that views from within the environmental justice area are likely to be intermittent, and to the extent they exist at all, would be limited to the tip of the Project stack in the distant horizon. Due to the distance away from the Project and limited views in the environmental justice area, externality costs associated with possible declines in property values are not expected. Most views from the environmental justice area toward the Project, to the extent they exist, already contain many manmade features (i.e., roads, houses, stores, telephone poles, automobiles, etc.) and thus the new visual element of a portion of the Facility's stacks would not result in a significantly new modification to the landscape. As views of the stack would not be limited to those from within the environmental justice area, visual impacts within the environmental justice area are not considered disproportionate.

7.5.4.5 Water

With respect to impacts on water, the Project will minimize water use by using treated effluent from the City of Middletown Sewage Treatment Plant. The Project will not discharge to groundwater and will have a SWPPP and a SPCC plan in place to prevent impacts to surface and groundwater quality. Thus, no disproportionate impacts are expected to EJ communities of concern related to water, and the Project is not expected to result in any externality costs associated with water impacts in or outside of the EJ area.

7.5.5 Conclusion with Respect to Environmental Justice

The above analysis shows that one census block exceeds the NYSDEC thresholds for minority and/or low-income representation within the 2-mile study radius. In addition, the NYSDEC identified six potential EJ areas outside the 2-mile radius (Tract 11, BG 4; Tract 14, BG 2; Tract 14, BG 3; Tract 14, BG 6; Tract 15, BG 1; and Tract 17, BG 1.)

The analysis demonstrates that the Project's potential air emission concentrations do not cause violations of the NAAQS within the EJ study area, and therefore are not adverse. Furthermore, the maximum modeled air quality impact locations do not fall within the potential environmental justice areas and thus are not considered disproportionate.

Regarding hazardous materials and chemical use, the introduction of oil, aqueous ammonia, and other chemicals at the Project site would also not result in a disproportionate or adverse impact to the identified potential environmental justice area as the use and/or presence of fuel oil, chemicals, and other materials is currently occurring throughout the two-mile Project study area and is not concentrated within the environmental justice area. The storage of fuel oil or use of aqueous ammonia or other chemicals at the Project site would also not jeopardize public health or impact groundwater quality.

The proposed Facility would comply with NYSDEC and Town of Wawayanda noise standards at all locations within the Project study area, and therefore, would not cause any adverse impact to any environmental justice area.

Facility views from within the environmental justice area are likely to be intermittent and minimal, limited to the tip of the Project stack along the horizon, set behind the existing development within and north of the environmental justice area. However, views of the stack would not be limited to those from within the environmental justice area. Therefore, visual impacts within the environmental justice area are not considered adverse or disproportionate. Finally, operation of the Facility would not result in disproportionate or adverse impacts related to Project-related traffic.

7.6 REFERENCES

American Hospital Directory (AHD). 2008. www.ahd.com/freesearch.php3. Site accessed June, 2008.

Capitol Impact. 2008. www.capitolimpact.com/gw. Site accessed August 19, 2008.

Creative Strategies and Communications, Inc. 2007. Real Estate Value Impact Report – Prepared for Twin River Energy, LLC.

Empire State Development (ESD). 2002. Empire State Development Website. http://www.empire.state.ny.us/nysdc/download_intro.asp. Site accessed June, 2008.

J.A. Cowen and Associates, Inc. Consulting Report, Proposed Electrical Generating Plan. Spagnoli Road. Melville, NY.

Middletown School District. 2008. www.middletowncityschools.org. Site accessed August 19, 2008.

New York State Department of Environmental Conservation (NY DEC). 2003. *CP-29: Environmental Justice and Permitting.*

New York State Department of Labor. 2008. www.labor.state.ny.us. Site accessed June, 2008.

Rowe, R.D., C.M., Lang., L.G. Chestnut., D.A. Latimer., D.A. Rae., S.M. Bernow., and D.E. White.. The New York Electricity Externality Study. 1995.

Town of Wawayanda. 2008. Town of Wawayanda Website. www.townofwawayanda.com. Site accessed June, 2008.

U.S. Census Bureau, Census 2000. American FactFinder. http://factfinder.census.gov. Site accessed June, 2008.

U.S. Census Bureau, Census 2000. State and County QuickFacts. http://quickfacts.census.gov. Site accessed June, 2008.

Yellowbook. 2008. www.yellowbook.com. Site accessed June, 2008.

8.0 TRAFFIC AND TRANSPORTATION

8.1 INTRODUCTION

This chapter addresses traffic and transportation issues relative to the construction and operation of the proposed CPV Valley Energy Center (Project or Facility). The existing roadway and traffic characteristics in the vicinity of the Project site are described, providing the basis for the assessment of the traffic to be generated by the construction and operation of the Facility and the potential impacts this additional traffic may have on the surrounding roadway network.

With respect to roadway access, the site is bounded on the north and west by U.S. Route 6, on the east by N.Y. Route 17M and on the south by Interstate 84. The site location relative to these access roadway facilities is shown in Figure 8-1.

8.2 APPLICABLE LAWS, REGULATIONS AND POLICIES

The Project will require work in the adjacent roadway right-of-way. As these roads are under NYSDOT jurisdiction, Highway Work Permits (HWP) for the roadway and utility work will be required. NYSDOT approval of proposed curb cuts with Route 6 will also be required.

8.3 STUDY METHODOLOGY

The initial stage of the traffic analysis consisted of a detailed review of existing land-use, roadway, and traffic conditions near the proposed site. Existing traffic volumes were recorded in November 2007 at the following locations:

- N.Y. Route 17M and County Road 108/Dolsontown Road
- N.Y. Route 17M and U.S. Route 6/Sunrise Park Road
- U.S. Route 6 and Kirbytown Road
- U.S. Route 6 and County Road 56
- U.S. Route 6 and N.Y. Route 284
- N.Y. Route 17M Southbound Diverge to Interstate 84 Eastbound Entrance Ramp
- N.Y. Route 17M Northbound Merge with Interstate 84 Eastbound Exit Ramp
- N.Y. Route 17 M Northbound Diverge to Interstate 84 Westbound Entrance Ramp
- N.Y. Route 17M Southbound Merge with Interstate 84 Westbound Exit Ramp
- N.Y. Route 17M Southbound Diverge to Interstate 84 Westbound Entrance Ramp
- N.Y. Route 17M Northbound Merge with Interstate 84 Westbound Exit Ramp

Next, in order to identify potential Project impacts, the study estimated and analyzed future conditions then compared them to existing conditions. The future conditions analyzed consisted of four scenarios:

1 "2011 No-Build (Construction Phase)" – 2011 projected traffic flows and patterns without the Project being constructed.

2 “2011 Construction Phase” – 2011 projected traffic flow and patterns including traffic associated with peak Project Construction activities

3 2012 “No-Build (Operational Phase)” – 2012 projected traffic flows and patterns without the Project in operation

4 “2012 Build Operational Phase” – 2012 projected traffic flows and patterns including traffic associated with the Project’s operation.

In order to determine these future volumes, projected increases in the current background traffic volumes were calculated and traffic generated by identified projects planned or under construction was added. The future volumes were determined by applying a growth rate of 8 percent (2% per year x 4 years) to the existing intersection volumes to obtain the estimated 2011 traffic volumes and a growth rate of 10 percent (2% per year x 5 years) was applied to the existing intersection volumes to obtain the estimated 2012 traffic volumes. The application of a growth rate accounts for increases in population and additional traffic from proposed developments outside the Project area. In addition, nearby projects under construction or in the planning stages were identified through discussions with the Town of Wawayanda and the Orange County Planning Department; the associated traffic from these “other developments” was then added to the future year background traffic volumes at each of the study intersections.

The “2011 Construction Phase” and “2012 Build (Operational Phase)” analyses considered the impact, if any, of the traffic generated by the proposed development. The “2011 Construction Phase” analysis reflects the conditions that would occur during the peak construction period of the Facility. It is expected that the highest level of potential traffic impact would occur during the middle 4 to 5 months of the construction period, when the highest level of workers will be on-site. The entire Facility is projected to be completed and operational in a total of approximately 24 months. Any impacts associated with the construction of the Facility would be temporary in nature, lasting only during the period of peak construction activity. It is projected that the Facility would be fully operational in 2012; therefore, peak construction would occur in the year 2011. The detailed summary of the construction phase impacts is presented in Section 8.7. The “2012 Build Operational Phase” analysis, presented in Sections 8.8 and 8.9, reflects the conditions that would occur when the facility is in operation.

The trips generated by the Project were added to the 2011 No-Build Construction and 2012 Operational conditions at the study intersections. These results were then used to determine the “2011 Construction Phase” and “2012 Build Operational Phase” Levels of Service and to develop mitigation measures where necessary. Using these volume sets, detailed capacity analyses were performed at the proposed driveway and the key intersections to identify their operational characteristics and to measure the traffic impact of the development on the adjacent roadway system.

8.4 EXISTING CONDITIONS

The Project site is located on Route 6 north of Interstate 84, just west of Route 17M. Roadways within the Project area include Interstate 84, Route 6, Route 17M, Route 284, County Road

108/Dolsontown Road, County Road 56, Kirbytown Road, and Sunrise Park Road. The traffic generated by this site would be distributed to many of these roads.

8.4.1 Description of Key Roadways

Interstate 84: Interstate 84 is a two-lane per direction limited access highway that has an east/west alignment in the vicinity of the Project. Interstate 84 originates at Interstate 90 in Sturbridge, Massachusetts, near the Connecticut state line, continues west through Connecticut, New York, and ends in Pennsylvania at Interstate 380. In the vicinity of the site, Interstate 84 has a posted speed limit of 65 mph.

U.S. Route 6: U.S. Route 6 is a one-lane per direction roadway traveling in an east/west direction in the vicinity of the site. The main entrance/exit to the Project Site will be along Route 6. Route 6 is a cross-country roadway; however, the 76-mile segment of Route 6 that traverses New York is under the jurisdiction of the New York State Department of Transportation. Route 6, in New York, originates at Route 202 in Brewster near the Connecticut state line and continues west through Westchester, Putnam, Rockland and Orange Counties. The New York segment ends in Port Jervis, and then continues west into Pennsylvania. Route 6 has a posted speed limit of 55 mph.

New York State Route 17M: Route 17M varies between a two-lane and a three-lane per direction roadway that has a north/south alignment in the vicinity of the Project. Route 17M begins at Route 17 in Harriman, New York and ends at Route 17 in the Town of Wallkill. Route 17M has a posted speed limit of 45 mph and is under the jurisdiction of NYSDOT.

New York State Route 284: Route 284 is a one-lane per direction roadway that exists entirely in Orange County, running in a north/south direction from the New Jersey border/Unionville, New York to Route 6 in Wawayanda, New York. Route 284 has a posted speed limit of 55 mph and is under the jurisdiction of the NYSDOT.

County Road 108 / Dolsontown Road: County Road 108 is a one-lane per direction roadway that runs in an east/west direction. Dolsontown Road is a section of County Road 108; it begins at the intersection with Route 17M and ends at the intersection with Airport Road / Genung Road, where County Road 108 continues under the alternate name of Schutt Road and ends at County Road 92 in East Middletown, New York. County Road 108 has a posted speed limit of 30 mph and is under Orange County jurisdiction.

County Road 56: County Route 56 is a one-lane per direction roadway that runs in an east/west direction. County Road 56 originates at the Route 6/17M overlap in the New Hampton area and ends at Route 6 in Wawayanda, New York. County Road 56 has a posted speed limit of 30 mph and is under Orange County jurisdiction.

Kirbytown Road: Kirbytown Road is one-lane per direction roadway that runs in a north/south direction. Kirbytown Road originates at Route 6 and ends at Mount Orange Road in Wawayanda, New York. Kirbytown Road serves mostly residential neighborhoods. Kirbytown Road has a posted speed of 30 mph and is under the Town of Wawayanda jurisdiction.

Sunrise Park Road: Sunrise Park Road is a one-lane per direction cul-de-sac that runs in an east/west direction starting from Route 17M directly opposite Route 6 and ending in a small, residential neighborhood. Sunrise Park Road is under Town of Wawayanda jurisdiction.

8.4.2 Study Locations

This section addresses the geometry and traffic control devices for each location studied in the traffic impact study. In describing the terminology, when the alignment of two roadways results in their crossing each other, an intersection is formed and the segments of roadway extending from the point of intersection are referred to as "legs" or approaches. The approach is the direction a vehicle is traveling when it reaches the point of intersection. Table 8-1 summarizes the lane configurations and traffic controls at the study locations.

Table 8-1
Intersection Geometry

Intersection	Approach	Lane Designation	Traffic Control
Route 17M & Dolsontown Road / County Road 108	EB	LT-R	Traffic Signal
	WB	L-TR	
	NB	L-T-TR	
	SB	L-T-TR	
Route 17M & Sunrise Park Road / Route 6	EB	LTR	Traffic Signal
	WB	LTR	
	NB	L-T-TR	
	SB	L-2T	
Route 6 and Kirbytown Road	EB	LT	Stop control on Kirbytown Road
	WB	TR	
	SB	LR	
Route 6 and County Road 56	EB	T	Stop control on County Road 56
	WB	L-T	
	NB	LR	
Route 6 and Route 284	EB	TR	Stop control on Route 284
	WB	LT	
	NB	LR	
Route 17M Southbound Diverge to I-84 Eastbound Entrance Ramp	SB	2T-R	None
I-84 Eastbound Exit Ramp Merge with Route 17M Northbound	WB	R	None
	NB	2T	
Route 17M Northbound Diverge to I-84 Westbound Entrance Ramp	NB	2T-R	None
I-84 Westbound Exit Ramp Merge with Route 17M Southbound	EB	R	None
	SB	2T	
Route 17M Southbound Diverge to I-84 Westbound Entrance Ramp	SB	2T-R	None
I-84 Westbound Exit Ramp Merge with Route 17M Northbound	WB	R	Stop control on westbound exit ramp
	NB	2T	

Notes:
KEY: L = Left turn lane: T = Through lane; R = Right turn lane; LT = Combination of left turns and through movements in one lane; TR = Combination of through movements and right turns in one lane; LR = Combination of left turns and right turns in one lane; LTR = Combination of left turns, through movements, and right turns in one lane; EB = Eastbound; WB = Westbound NB = Northbound; SB = Southbound.

N.Y. Route 17M and Dolsontown Road/County Road 108: This signalized intersection is a four-legged intersection with Route 17M forming the northbound and southbound approaches, County Road 108 forming the eastbound approach and Dolsontown Road forming the westbound approach. The northbound and southbound approaches each provide a separate left-turn lane, two through lanes and a shared through/right. The eastbound approach consists of a shared left/through lane and a right-turn lane. The westbound approach consists of a left-turn only lane and a shared through/right-turn lane. All approaches to this intersection have standard 12-foot lane widths. This intersection is under the jurisdiction of the NYSDOT and has appropriate sight distances for a signalized intersection.

N.Y. Route 17M and U.S. Route 6/Sunrise Park Road: This signalized intersection is a four-legged intersection with Route 17M forming the northbound and southbound approaches, Route 6 forming the eastbound approach and Sunrise Park Road forming the westbound approach. The northbound approach consists of a left-turn lane, two through lanes and one shared through/right turn lane. The southbound approach consists of a left-turn lane and two through lanes; right turns are channelized prior to the traffic signal. The eastbound approach consists of a shared left/through lane; right turns are channelized prior to the traffic signal. The westbound approach consists of a single shared left/through/right lane. All approaches to this intersection have standard 12 foot lane widths. This intersection is under the jurisdiction of the NYSDOT and has appropriate sight distances for a signalized intersection.

U.S. Route 6 and Kirbytown Road: This intersection has three approach legs – typically referred to as a "T" intersection. Kirbytown Road is the minor approach and is controlled by a stop sign. Kirbytown Road forms the southbound approach, which consists of a single shared left/right lane. Route 6 forms the eastbound approach - a single shared left/through lane - and the westbound approach - a single shared through/right lane. Kirbytown Road is under local jurisdiction. All approaches to this intersection have standard 12 foot (or greater) lane widths.

U.S. Route 6 and County Road 56: This is a "T" intersection, with Route 6 forming the eastbound and westbound approaches, and County Road 56 forming the northbound approach. The eastbound approach consists of one through lane; right turns are channelized. The westbound approach consists of one through lane and one left-turn lane. The northbound approach consists of one shared left/right turn lane. County Road 56 is under Orange County jurisdiction and is controlled by a stop sign. All approaches to this intersection have standard 12 foot (or greater) lane widths.

U.S. Route 6 and N.Y. Route 284: This is also a "T" intersection, with Route 6 forming the eastbound and westbound approaches and Route 284 forming the northbound approach. The eastbound approach consists of one shared through/right lane; the westbound approach consists of one shared left/through lane; the northbound approach consists of one shared left/right turn lane. This intersection is under the jurisdiction of the NYSDOT with the Route 284 northbound approach being under stop control. All approaches to this intersection have standard 12 foot (of greater) lane widths.

Route 17M Southbound Diverge to Interstate 84 Eastbound Entrance Ramp: A diverge is the term used to describe a roadway condition where vehicles traveling in the same direction along the main, or through lane(s) are allowed to "peel off" onto, initially, a nearly parallel minor roadway – usually a ramp – which becomes or connects to a different road. Typically, a diverge is not signalized. At this diverge, Route 17M forms the southbound approach and the ramp to Interstate 84 forms the westbound departure. Vehicles on the ramp start parallel to Route 17M heading southbound, turn through a circular loop which connects with Interstate 84 eastbound. The southbound approach consists of two through lanes and a third (right) lane that diverges from Route 17M to Interstate 84 eastbound.

Route 17M Northbound Merge with Interstate 84 Eastbound Exit Ramp: A merge is the term used to describe a roadway condition where vehicles initially not traveling in the same direction are brought together on roadways that ultimately are parallel and vehicles from the minor road enter into the stream of traffic on the main road. Typically, a merge is not signalized. At this merge, Route 17M forms the northbound approach and the ramp from Interstate 84 forms the westbound approach. Vehicles on the ramp start parallel to Interstate 84 heading eastbound, turn through a loop heading westbound as they merge with Route 17M northbound. The northbound approach consists of two through lanes, widening to three lanes as the third lane is added at the merge between Route 17M and Interstate 84.

Route 17M Northbound Diverge to Interstate 84 Westbound Entrance Ramp: At this diverge, Route 17M forms the northbound approach, and the ramp to Interstate 84 forms the eastbound departure. Vehicles on the ramp start at Route 17M heading northbound, turn through a circular loop to Interstate 84 westbound. The northbound approach consists of two through lanes, and a third (right) lane that diverges from Route 17M to Intestate 84 westbound.

Route 17M Southbound Merge with Interstate 84 Westbound Exit Ramp: At this merge, Route 17M forms the southbound approach, and the ramp from Interstate 84 forms the eastbound approach. Vehicles on the ramp start parallel to Interstate 84, heading westbound, turn through a loop heading eastbound as they merge with Route 17M southbound. The southbound approach consists of two through lanes, widening to three lanes as the third lane is added at the merge between Route 17M and Interstate 84.

Route 17M Southbound Diverge to Interstate 84 Westbound Entrance Ramp: At this diverge, Route 17M forms the southbound approach, and the ramp to Interstate 84 forms the westbound departure. The southbound approach consists of two through lanes and a third (right) lane that diverges from Route 17M to Interstate 84 westbound.

Route 17M Northbound Intersection with Interstate 84 Westbound Exit Ramp: At this intersection, Route 17M forms the northbound approach, and the ramp from Interstate 84 forms the westbound approach. The northbound approach consists of two through lanes; the second (right) lane is used by traffic from the westbound exit ramp from Interstate 84. The westbound ramp is under STOP control.

8.4.3 Existing Traffic Volumes

In order to establish existing conditions, peak hour turning movement counts and 24-hour daily traffic counts were conducted. Peak hour turning movement counts were collected for the study intersections on a non-holiday weekday morning and afternoon. Field observations and the manual turning movement traffic counts were conducted on Thursday, November 29, 2007, from 6:30 AM – 9:30 AM and from 2:30 PM – 6:30 PM at the key intersections.

Repeat counts were performed on Thursday, December 6, 2007, from 4:00 PM – 6:00 PM for two intersections (Route 17M and Route 6 / Sunrise Park Road, and Route 17M and Interstate 84 West) to verify/update data collected in November.

In conjunction with the manual traffic counts, an automatic traffic recorder (ATR) machine was placed on Route 6 west of Kirbytown Road, near the proposed driveway to the Project site. The ATR was set to collect 24-hour traffic volumes over the course of a week including volumes on Saturday and Sunday. Along with the ATR counts collected by TRC, additional machine count data was obtained from the New York State Department of Transportation for several sections of roadway in the vicinity of the site. The combined results of the machine counts indicate that approximately 8,880 vehicles travel on Route 6 on a weekday, 8,130 vehicles on Saturday and 5,940 vehicles on Sunday. All vehicle totals are two-way volumes.

In addition to the traffic counts, data collected during field observations included roadway geometrics, traffic control devices, and traffic flow characteristics. The manual traffic counts identified the following representative weekday peak traffic hours.

Peak AM Hour: 7:30 AM – 8:30 AM
Peak PM Hour: 4:30 PM – 5:30 PM

Existing traffic volumes for both the morning and evening peak hours are illustrated in Figure 8-2.

8.4.4 Weekday vs. Saturday Peak Hour Comparison

A review of the ATR counts collected by TRC and the machine count data from the New York State Department of Transportation indicated that, at every location near the Project site, the PM Peak Hour traffic volumes exceed both the AM Peak and Saturday Peak Hour volumes. Also, the Saturday peak hour generally occurs mid-day, a time frame when the Facility will generate very little traffic – during both construction and operational phases.

PM Peak Hour conditions reflect the "worst-case scenario". Therefore capacity analyses performed using these traffic volumes will define roadway conditions projected to be exhibited during the critical time period, while for both the AM and Saturday Peak Hours, conditions will be uniformly better. Based on this evaluation, it was concluded that a detailed Saturday peak hour analysis was not warranted. Table 8-2 summarizes these findings, while Appendix 8-A contains copies of all ATR traffic count summaries.

Table 8-2 Machine Count Peak Hour Volumes					
Roadway	**Section**	**Source**	**AM**	**PM**	**SAT**
Route 6	Route 284 to Route 17M	NYSDOT	733	**931**	745
	Site Driveway to Kirbytown Road*	TRC	265	**440**	398
Route 17M	I-84 Access to Route 6	NYSDOT	2,337	**2,549**	2,111
	Route 6 to City of Middletown border	NYSDOT	2,872	**3,213**	2,764

Note:
* Only Westbound data is presented for this section of Route 6.

8.4.5 Existing Level of Service

This section provides a calculation of the Level of Service (LOS) for each study intersection, giving detail for each turning movement. Capacity analyses were performed for each of the study intersections using Highway Capacity Software (HCS) and Synchro7. Both capacity analysis software programs implement methods of the 2000 Highway Capacity Manual (HCM). Levels of Service are determined by HCM procedures when utilizing both programs. Synchro 7 does not analyze merge/diverge segments which are present at some of the study locations. In these instances, HCS capacity analyses were utilized.

The ability of the roadway network to accommodate existing or projected traffic volume demand was measured by examining the capacity of key locations to accommodate such demand. Capacity analyses were conducted for the study locations under existing traffic volume conditions.

The Transportation Research Board – a nationally recognized transportation resource agency – describes the generally-accepted capacity analysis methodology in their 2000 Highway Capacity Manual. In general, the term "Level of Service" is used to describe a "qualitative" measure of capacity based on certain "quantitative" calculations related to physical conditions, traffic volume demand and type of traffic control. The definition of Level of Service as presented in the 2000 Highway Capacity Manual is described as follows:

> Levels of Service are determined by measuring or calculating the average delay time for vehicles traveling along a roadway or through intersections. Delay can be caused by a variety of conditions, such as traffic control devices (stop signs and traffic signals), parking maneuvers adjacent to travel lanes and, at times, high volumes of traffic. Short delays are indicative of very good travel conditions, while very long delays generally reflect conditions considered to be unacceptable to most drivers. At intersections controlled by signals, the analysis must consider a wide range of conditions specific to the study location. These conditions include the traffic volumes and distributions through the location, the make-up of traffic by type/size of vehicle, the geometry of the lanes and approaches and phasing/timing of the signal. The analysis typically provides the Level of Service (LOS) results for individual lanes, lane groups, separate approaches and the intersection as a whole. LOS is evaluated in terms of control delay – a measure of the time vehicles spend not moving at allowable travel speeds, described in terms of "seconds per vehicle". Control delay has several components: the time during initial deceleration as the vehicle approaches a red signal; the time spent moving closer to the

signal as vehicles close in together and form a queue, then stop; the time stopped at the red light; and, the time during which vehicles accelerate from a stop and re-attain travel speed.

At intersections controlled by stop signs, the stop-controlled approaches are referred to as the minor street approaches; they can be either public or private streets or driveways. The approaches with no stop-control are considered the major street approaches. In general, the traffic movements on the major street approaches have the right-of-way and experience unimpeded flow. Traffic movements from the minor street approaches must yield the right-of-way to the major street movements. Drivers of vehicles on the minor streets, therefore, must wait for suitable "gaps" in the flow of traffic on the major streets. The term used for this wait is "delay time". The Highway Capacity manual provides a methodology to measure or predict this delay time based on a theory known as gap acceptance, which has three basic elements: the availability of gaps in the stream of traffic on the major street, the usefulness of these gaps to the drivers on the minor street and the relative priority of the various traffic streams at this intersection. The determination of gap acceptance is based on the physical (geometry) and traffic flow characteristics of the intersection, requiring such information as hourly traffic volumes by approach and movement, number of lanes and the existence of nearby signalized intersections. The primary measure used to provide an estimate of Level of Service is control delay, the time vehicles on the minor street approached must wait – in seconds per vehicle – before turning into or crossing the major street traffic flow.

The 2000 Highway Capacity Manual provides a method of reporting control delay/delay time by establishing a rating system that assigns a range of delay times to a graduated series of service levels. For signal and stop-controlled intersections, there are six service levels labeled "A" (signal)/"a"(stop) through "F"(signal)/"f"(stop) with levels A/a, B/b, C/c, and D/d generally representative of delay times acceptable to most drivers under typical travel conditions. Levels E/e and F/f reflect the higher delay time ranges and can be regarded as approximations of the limits of acceptable delay, especially if found to occur over long periods of time. However, for short time periods, such as the busiest 15 minutes just after 5:00 PM, at an exit driveway from a major facility, longer delays are expected and are generally considered acceptable.

The analysis associated with operations at ramp junctions with the highway or arterial mainline typically involves the effects of vehicles either merging onto or diverging from the mainline. The common methodologies used for analyzing these movements are those from the Highway Capacity Manual. These methodologies focus on an influence area of 1,500 feet - downstream from a ramp if merging and upstream from a ramp if diverging.

Merging Analysis - Merging analysis is often conducted at highway or arterial on-ramps where vehicles from the ramp are entering a lane used by mainline traffic. In following the HCM methodology for merging analysis, there are three primary steps:

1. Predicting the entering flow rates.
2. Determining capacity.
3. Determining the density of flow within the ramp influence area and level of service.

The primary factors influencing the flow rates immediately upstream of the merge influence area are the total highway flow rate approaching the merge area, the total ramp flow rate, the length of the acceleration lane and the ramp free-flow speed at the point of merging. Once the total flow rate entering the merge influence area has been calculated, it can be divided by the maximum desirable flow rate entering the merge influence area and factored by the distance to obtain a vehicle density – in passenger cars per mile per lane - for the merge influence area.

Diverging Analysis - Diverging analysis is often conducted at highway or arterial off-ramps where vehicles from the mainline are departing to the ramp from a lane used by mainline traffic. The HCM methodology for diverging analysis is similar to that discussed above for merging, with three primary steps:

1. Predicting the approaching highway flow.
2. Determining capacity.
3. Determining the density of flow within the ramp influence area and level of service.

For diverging analysis, the approaching flow rate is predicted for a point immediately upstream of the deceleration lane and includes the ramp flow rate.

A vehicle density is calculated similar to the method used for a merge condition. For both merge and diverge analyses, the resulting vehicle densities are related to a graduated series of service levels, from “a” (very low densities) to “f” (very high densities).

It is the comparison of calculated delay times and/or Levels of Service in a “before and after” evaluation that provides insight into the potential traffic impacts of a proposed development.

Capacity analyses were performed for the key study locations without the projected Project-related traffic volumes using the Highway Capacity Manual methodology described above. The capacity analysis worksheets for the study locations are contained in Appendix 8-B.

Tables 8-3 and 8-4 summarize the results of the capacity analyses for the 2007 Existing Traffic condition. Capacity analysis results are listed for the signalized and un-signalized intersections from the Synchro7 analysis. Capacity analysis are listed for the merge/diverge of Route 17M and the I-84 entrance and exit ramps from the HCS. LOS results for signalized intersections are represented by uppercase letters and unsignalized intersections are represented by lowercase letters.

As can be seen by a review of following tables, all of the intersections operate at overall acceptable Levels of Service with two exceptions. At the Route 17M/I-84 westbound off-ramp intersection, long delays are currently experienced on the off-ramp, which is controlled by a “STOP” sign. At the Route 17M/County Road 108 intersection, long delays are experienced by left-turn vehicles on the northbound Route 17M approach.

Table 8-3
Signalized / Unsignalized Intersections Synchro Analysis - 2007 Existing Conditions

Intersection	Approach		AM LOS	AM Delay (sec/veh)	PM LOS	PM Delay (sec/veh)
Route 17M & Dolsontown Road / County Road 108	Eastbound	LT	C	31.6	C	26.5
		R	C	29.3	C	25.1
		Overall	C	29.9	C	25.6
	Westbound	L	C	30.3	C	31.2
		TR	C	29.4	D	39.0
		Overall	C	29.7	D	36.4
	Northbound	L	D	39.6	F	80.9
		TR	C	22.4	C	23.5
		Overall	C	27.8	D	43.1
	Southbound	L	C	26.3	C	31.8
		TR	B	17.5	C	29.4
		Overall	B	18.5	C	29.7
	INTERSECTION		C	26.5	D	35.8
Route 17M & Route 6 / Sunrise Park Road	Eastbound	LT	D	52.5	D	49.2
		R	D	35.8	D	35.0
		Overall	D	43.3	D	43.6
	Westbound	LTR	C	34.5	D	35.7
	Northbound	L	B	12.6	C	24.1
		TR	B	10.7	B	10.2
		Overall	B	10.8	B	12.6
	Southbound	L	C	24.9	C	22.1
		T	C	32.7	C	34.0
		R	C	21.1	C	23.0
		Overall	C	31.8	C	31.5
	INTERSECTION		C	23.7	C	24.2
Route 6 & Kirbytown Road	Eastbound	LT	a	0.3	a	0.4
	Southbound	LR	c	15.6	c	17.8
	INTERSECTION		c	15.6	c	17.8
Route 6 & Route 284	Westbound	LT	a	2.8	a	4.5
	Northbound	LR	c	16.0	c	17.8
	INTERSECTION		c	16.0	c	17.8
Route 6 & County Road 56	Westbound	LT	a	8.1	a	7.8
	Northbound	LR	b	13.2	c	23.3
	INTERSECTION		b	13.2	c	23.3
Route 17M & Ramp from I-84 WB	Westbound	R	f	82.3	f	93.8
	INTERSECTION		f	82.3	f	93.8

Note: LOS results for signalized intersections are represented by uppercase letters.
LOS results for unsignalized intersections are represented by lowercase letters.
Source: TRC, September 2008.

Table 8-4 Merge / Diverge HCS Analysis - 2007 Existing Conditions						
Intersection	**Approach**		**AM**		**PM**	
			LOS	**DENSITY (pc/mi/ln)**	**LOS**	**DENSITY (pc/mi/ln)**
Route 17M SB Diverge to I-84 EB	Southbound	R	a	6.2	a	4.7
Route 17M NB merge with ramp from I-84 EB	Westbound	R	a	8.8	b	10.5
Route 17M NB Diverge to I-84 WB	Northbound	R	a	5.9	a	5.4
I-84 WB Merge with Route 17M SB	Westbound	R	b	10.9	b	10.5
Route 17M SB Diverge to I-84 WB	Southbound	R	b	10.1	a	9.3

Note:
LOS results for merges/diverges are represented by lowercase letters.
Source: TRC, August 2008.

8.5 ACCIDENT HISTORY

The NYSDOT was contacted to obtain the most recent available accident data. The NYSDOT Safety Information Management System provided data on the section of Route 17M from just north of Dolsontown Road to just south of the I-84 Interchange, and along Route 6 from Route 17M to just south of County Road 56. The accident abstracts are contained in Appendix 8-C and include categories such as the year in which the accident occurred, probable cause, and number of injuries. A summary of the accident data from the last three years is presented in Table 8-5. A review of this table indicates that none of the roadway segments or intersections has experienced unusually high accident frequencies as 5 or 6 accidents per year is generally considered a typical upper limit of an acceptable accident history.

Table 8-5
Accident Data Summary (2005-2007)

Study Intersection	Total Accidents	Accidents/Year
Route 17M & County Highway 108 / Dolsontown Road	16	5.33
Route 17M & Route 6 / Sunrise Park Drive	15	5.00
Route 6 & Kirbytown Road	1	0.33
Route 6 & County Route 56	5	1.67
Route 17M SB Diverge to I-84 EB	0	0.00
Route 17M NB Merge with I-84 EB	0	0.00
Route 17M NB Diverge to I-84 WB	4	1.33
Route 17M SB Merge with I-84 WB	3	1.00
Route 17M SB Diverge to I-84 WB	6	2.00
Route 17M NB Merge with I-84 WB	7	2.33

Source: New York State Department of Transportation, 2007.

While accident frequencies are good indicators of the relative safety of a roadway or intersection, accident rates are another useful measure of the safety record of a roadway location.

Average accident rates per year for intersections are measured in yearly accidents per million entering vehicle (MEV); for roadway segments, rates are measured in yearly accidents per million vehicle miles (MVM). Accidents per million vehicle miles were calculated for roadway segments, and accidents per million entering vehicles were calculated for all of the study intersections within the study area. These values were then compared to the statewide averages for similar roadways and intersections as maintained in the files of the New York State Department of Transportation. The following tables illustrate the comparisons.

Table 8-6
Accident Rate Comparison (Intersections)

Intersection	Accidents (ACC)	ACC / Year	Annual MEV	Yearly ACC/MEV	NYS Average Yearly ACC/MEV
Route 17M & County Road 108 / Dolsontown Road	16	5.33	16	0.33	0.39
Route 17M & Route 6 / Sunrise Park Road	15	5.00	15	0.33	0.39
Route 6 & Kirbytown Road	1	0.33	3	0.11	0.10
Route 6 & County Route 56	5	1.67	3	0.56	0.10
Route 17M SB Diverge to I-84 EB	0	0.00	6	0.00	0.17
Route 17M NB Merge with I-84 EB	0	0.00	5	0.00	0.30
Route 17M NB Diverge to I-84 WB	4	1.33	5	0.27	0.17
Route 17M SB Merge with I-84 WB	3	1.00	6	0.17	0.30
Route 17M SB Diverge to I-84 WB	6	2.00	6	0.33	0.17
Route 17M NB Merge with I-84 WB	7	2.33	6	0.39	0.30

Table 8-7
Accident Rate Comparison (Non-Intersections)

Roadway	Accidents (ACC)	ACC / Year	Segment Length	ADT	AADT	MVM	Yearly ACC / MVM	NYS Average Yearly ACC/MEV
Route 17M (MP 300.3 - 300.0)	27	9.00	0.3	34,841	12,716,965	4	2.36	2.72
Route 6 (MP 214.9 - 215.4)	7	2.33	0.5	7,611	2,778,015	1	1.68	1.98
Route 6/Route 17M (MP 215.4 - 261.1)	34	11.33	0.7	31,935	11,656,275	8	1.39	2.20

Notes:
ADT denotes Average Daily Traffic.
AADT denotes Annual Average Daily Traffic.

When compared to Average Accident Rates compiled by NYSDOT, the recorded accident rates at the study intersections/roadways were generally below the statewide averages. All locations with rates higher than the statewide average had low annual frequencies, i.e., 2 or fewer accidents per year. Furthermore, upon closer examination of the accident data in the State's abstracts, it is noted that a majority of the accidents occurred due to driver error. Apparent human factors frequently involved driver inattention, following too closely, passing or improper lane usage, unsafe lane changes and driver distraction. These factors and the resulting accidents are not conditions related to the roadway or traffic control characteristics, but are related to drivers' performance.

8.6 FUTURE TRAFFIC CONDITIONS WITHOUT THE PROJECT

Traffic conditions in the area would change even if the proposed Project is not constructed. The future scenario is termed the No-Build Condition and is developed by considering traffic associated with the following factors:

- Ambient growth that stems from increases in population and from minor development outside the project area.
- Other planned projects located near the study area that have the potential to affect traffic patterns at the locations included in this study.

In order to identify potential Project impacts, the traffic study estimated and analyzed future conditions then compared them to existing conditions. The future conditions analyzed consisted of four scenarios:

1 "2011 No-Build (Construction Phase)" – 2011 projected traffic flows and patterns without the Project being constructed.

2 "2011 Construction Phase" – 2011 projected traffic flow and patterns including traffic associated with peak Project Construction activities

3 2012 "No-Build (Operational Phase)" – 2012 projected traffic flows and patterns without the Project in operation

4 "2012 Build Operational Phase" – 2012 projected traffic flows and patterns including traffic associated with the Project's operation.

In order to determine these future volumes, projected increases in the current traffic volumes were assumed. The future volumes were determined by applying a growth rate of 8 percent (2% per year x 4 years) to the existing intersection volumes to obtain the estimated 2011 traffic volumes and a growth rate of 10 percent (2% per year x 5 years) was applied to the existing intersection volumes to obtain the estimated 2012 traffic volumes. The application of a growth rate accounts for increases in population and additional traffic from proposed developments outside the Project area. In addition, nearby projects under construction or in the planning stages were identified through discussions with the Town of Wawayanda and the Orange County Planning Department; the associated traffic from these "other developments" was added to the existing traffic volumes at each of the study intersections.

8.6.1 Traffic Growth

Based on information from the NYSDOT, an appropriate background growth rate for area traffic is 2 percent per year. Therefore, a growth rate of 10 percent was applied to the 2007 existing intersection volumes to obtain the 2012 Base Traffic Volumes illustrated in Figure 8-3. This growth factor was intended to account for increases in population and additional traffic from proposed developments outside the Project area.

8.6.2 Other Planned Projects

Other planned projects refer to developments located near the Project site that are currently under construction or are in the planning stages. Traffic generated by these projects may significantly influence the operations of the study locations and would not be represented in the field data collected. At the time of the preparation of this report, there were eight (8) other projects being planned in the immediate area that were identified by the Town of Wawayanda or the Orange County Planning Department for inclusion in the study:

- Horizons at Wawayanda, a 106-dwelling unit workforce housing development (8.9 acres) located on Route 6 between Kirbytown Road and Route 17M.
- Concrete Properties/Panattoni Development, a two-building warehouse/industrial facility (approximately 750,000 square feet) located on the northwest side of Route 6 at Pine Lane, opposite the CPV site.
- Simon Business Park, nine commercial lots totaling approximately 88,000 square feet located on the south side of Dolsontown Road east of Route 17M.
- Brookfield Resource Management, an 80,000 square foot commercial recycling center located on the north side of Dolsontown Road east of Route 17M.
- Sterling Parc of Middletown, LLC, a 192-dwelling unit townhouse residential development located on County Road 108 just west of Route 17M in Middletown.
- Sutton Hills Apartments – Phase II, a 116-dwelling unit apartment development located off of County Road 108, west of Route 17M in Middletown.
- Howard Shapiro, a 62-unit, single-family subdivision located off of County Road 56, south and east of Route 6 in Wawayanda.
- Razzano Commercial, a 23,000 square foot retail development located at the intersection of Route 6 and Ridgebury Hill Road in Wawayanda.

The locations of these developments are shown in Figure 8-4. The following table (Table 8-8) shows the Trip Generation associated with each proposed development. These volumes were obtained from the Traffic Impact Studies prepared for each project. A number of Traffic Impact Studies were prepared by John Collins Engineers, Inc. Arrival and departure patterns were developed for each project as illustrated in Figures 8-5 through 8-12. The traffic volumes were then distributed to the roadway network according to the respective arrival and departure patterns. The resulting Adjacent Development Traffic Volumes are illustrated in Figure 8-13.

Table 8-8
Trip Generation Summary for Adjacent Developments

Land Use	Size	Unit	Peak AM Hour			Peak PM Hour		
			Enter	Exit	Total	Enter	Exit	Total
HORIZONS AT WAWAYANDA - RESIDENTIAL CONDOMINIUM/TOWNHOUSE*	106	DWELLING UNITS	10	45	55	42	21	63
CONCRETE PROPERTIES / PANATTONI DEVELOPMENT - WAREHOUSE *	747,240	SF	209	145	354	32	365	397
SIMON BUSINESS PARK - OFFICE PARK*	88,000	SF	106	20	126	31	103	134
BROOKFIELD RESOURCE MANAGEMENT*	80,000	SF	155	67	222	155	67	222
STERLING PARC AT MIDDLETOWN, LLC**	192	DWELLING UNITS	20	78	98	77	42	119
SUTTON HILLS APARTMENTS PHASE II**	116	DWELLING UNITS	12	47	59	47	25	72
HOWARD SHAPIRO**	62	DWELLING UNITS	12	35	47	39	23	63
RAZZANO COMMERCIAL**	23,000	SF	14	9	24	41	45	86

Note:
* Trip Generation based upon information contained in the respective Traffic Impact Studies.
** Trip Generation based upon information contained in ITE's *Trip Generation, 7th Edition.*
Source: TRC, September 2008.

The Adjacent Development Traffic Volumes were added to the growth factored 2012 Traffic Volumes to make up the 2012 No-Build Traffic Volumes. These volumes are illustrated in Figure 8-14. Based on these volumes, Levels of Service that describe the traffic conditions at each study intersection - without the project – were determined.

Tables 8-9 and 8-10 summarize the results of the capacity analyses for the 2012 No-Build Traffic condition. A review of following tables indicates that all of the intersections operate at overall acceptable Levels of Service with the same two exceptions noted for the Existing condition analysis. At the Route 17M/I-84 westbound off-ramp intersection, long delays will continue to be experienced on the off-ramp, which is controlled by a "STOP" sign. At the Route 17M/County Road 108 intersection, long delays would continue to be experienced by left-turn vehicles on the northbound Route 17M approach.

In addition, at the intersection of Route 6 and County Road 56, the minor movements would begin to experience longer delays during the PM peak hour.

Table 8-9 Signalized / Unsignalized Intersections Synchro Analysis - 2012 No-Build Conditions						
Intersection	**Approach**		**AM**		**PM**	
			LOS	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**
Route 17M & Dolsontown Road / County Road 108	Eastbound	LT	C	33.1	C	33.1
		R	C	29.4	C	23.1
		Overall	C	30.4	C	26.5
	Westbound	L	E	56.6	E	68.9
		TR	C	26.7	D	49.3
		Overall	D	41.2	E	56.7
	Northbound	L	E	72.0	F	183.5
		TR	D	36.1	D	37.5
		Overall	D	46.3	F	84.9
	Southbound	L	C	21.5	D	39.1
		TR	C	21.4	E	69.3
		Overall	C	21.4	E	65.3
	INTERSECTION		D	37.5	E	67.2
Route 17M & Route 6 / Sunrise Park Road	Eastbound	LT	D	52.9	D	54.0
		R	D	36.7	D	36.2
		Overall	D	43.3	D	43.5
	Westbound	LTR	C	30.3	C	31.7
	Northbound	L	D	46.4	D	53.5
		TR	B	17.8	B	17.3
		Overall	C	22.3	C	23.4
	Southbound	L	D	35.1	C	24.5
		T	D	41.6	D	45.4
		R	C	21.4	C	23.7
		Overall	D	39.9	D	40.4
	INTERSECTION		C	32.0	C	33.3
Route 6 & Kirbytown Road	Eastbound	LT	a	0.4	a	0.6
	Southbound	LR	d	31.9	e	38.5
	INTERSECTION		d	31.9	e	38.5
Route 6 & Route 284	Westbound	LT	a	3.2	a	5.1
	Northbound	LR	c	21.3	d	29.0
	INTERSECTION		c	21.3	d	29.0
Route 6 & County Road 56	Westbound	LT	a	8.3	a	8.0
	Northbound	LR	c	16.3	f	61.8
	INTERSECTION		c	16.3	f	61.8
Route 17M & Ramp from I-84 WB	Westbound	R	f	387.3	f	350.3
	INTERSECTION		f	387.3	f	350.3

Note: LOS results for signalized intersections are represented by uppercase letters.
LOS results for unsignalized intersections are represented by lowercase letters.
Source: TRC, September 2008.

Table 8-10 Merge/Diverge HCS Analysis - 2012 No-Build Conditions						
Intersection	**Approach**		**AM**		**PM**	
			LOS	**DENSITY (pc/mi/ln)**	**LOS**	**DENSITY (pc/mi/ln)**
Route 17M SB Diverge to I-84 EB	Southbound	R	a	7.4	a	5.9
Route 17M NB merge with ramp from I-84 EB	Westbound	R	b	11.3	b	12.7
Route 17M NB Diverge to I-84 WB	Northbound	R	a	8.6	a	7.4
I-84 WB Merge with Route 17M SB	Westbound	R	b	13.0	b	13.4
Route 17M SB Diverge to I-84 WB	Southbound	R	b	12.4	b	12.2

Note:
LOS results for merges/diverges are represented by lowercase letters.
Source: TRC, August 2008.

8.7 TRAFFIC IMPACTS DURING CONSTRUCTION

During the construction of the proposed Project, additional vehicle trips will be generated by the construction workforce, and as a result of the delivery of equipment and material to the Project site.

The “2011 Construction Phase” analysis considered the impact, if any, of the traffic generated by the proposed development. The “2011 Construction Phase” analysis reflects the conditions that would occur during the peak construction period of the Facility. It is expected that the highest level of potential traffic impact would occur during the middle 4 to 5 months of the construction period (months 12 through 16), when the highest level of workers will be on-site. The entire Facility is projected to be completed and operational in a total of approximately 24 months. Any impacts associated with the building of the Facility would be temporary in nature, lasting only during the period of peak construction activity. It is projected that the Facility would be fully operational in 2012; therefore, peak construction would occur in the year 2011

8.7.1 2011 Pre-Construction Base Traffic

Based on the methodology set forth in previous Sections, base traffic conditions are first established then compared to conditions expected during the peak construction months. Since the facility is projected to open in 2012, the peak construction period is expected to occur in 2011 (i.e., some 12 to 16 months prior to the scheduled opening).

As discussed in Section 8.3, existing traffic conditions were observed in late 2007. Existing Traffic Volumes at the key intersections are illustrated in Figure 8-2. The 2011 Pre-Construction Base Traffic Volumes for the study locations were established by applying a growth rate of 8 percent to the 2007 Existing Traffic Volumes. This accounts for ambient growth which stems from increases in population and from traffic generated by minor developments in and near the project area.

There are eight (8) other projects being planned in the immediate area that were identified by the Town of Wawayanda and Orange County Planning for inclusion in the study; they are listed and described in Section 8.6.2.

The traffic volumes were obtained from the Traffic Impact Studies prepared for each project or determined by TRC Engineers based on data from the Institute of Traffic Engineers.

The background growth factor and area development traffic volumes were incorporated to obtain the 2011 Pre-Construction Base Traffic Volumes illustrated in Figure 8-15. This methodology is detailed in Section 8.6, which contains various figures that illustrate the distribution patterns and resulting traffic volumes from these other developments. These traffic volumes were used to perform capacity analyses on the study intersections, estimating traffic conditions in 2011 without accounting for the project related construction traffic. The results of the capacity analyses are summarized in the following tables. As can be seen by a review of following tables, all of the intersections operate at overall acceptable Levels of Service with the same three exceptions noted for the previous No Build condition analysis. At the Route 17M/I-84 westbound off-ramp intersection, long delays will be experienced on the off-ramp, which is controlled by a "STOP" sign. At the Route 17M/County Road 108 intersection, long delays would be experienced by left-turn vehicles on the northbound Route 17M approach. At the intersection of Route 6 and County Road 56, the minor movements would experience longer delays during the PM peak hour.

Table 8-11
Signalized / Unsignalized Intersections Synchro Analysis - 2011 Pre-Construction Conditions

Intersection	Approach		AM LOS	AM Delay (sec/veh)	PM LOS	PM Delay (sec/veh)
Route 17M & Dolsontown Road / County Road 108	Eastbound	LT	C	33.0	C	33.4
		R	C	28.9	C	23.3
		Overall	C	30.1	C	26.7
	Westbound	L	E	55.6	E	69.2
		TR	C	26.8	D	49.4
		Overall	D	40.9	E	56.9
	Northbound	L	E	66.6	F	174.3
		TR	C	34.0	D	35.4
		Overall	D	43.3	F	80.6
	Southbound	L	C	21.3	D	38.3
		TR	C	21.1	E	60.0
		Overall	C	21.1	E	57.1
	INTERSECTION		D	35.8	E	63.1
Route 17M & Route 6 / Sunrise Park Road	Eastbound	LT	D	53.0	D	53.9
		R	D	36.7	D	36.2
		Overall	D	43.3	D	43.4
	Westbound	LTR	C	30.5	C	31.9
	Northbound	L	D	44.5	D	50.1
		TR	B	17.1	B	16.7
		Overall	C	21.4	C	22.4
	Southbound	L	C	32.3	C	24.0
		T	D	40.3	D	43.4
		R	C	21.4	C	23.6
		Overall	D	38.6	D	38.9
	INTERSECTION		C	31.2	C	32.2
Route 6 & Kirbytown Road	Eastbound	LT	a	0.4	a	0.6
	Southbound	LR	d	30.7	e	36.9
	INTERSECTION		d	30.7	e	36.9
Route 6 & Route 284	Westbound	LT	a	3.2	a	5.1
	Northbound	LR	c	20.7	d	26.9
	INTERSECTION		c	20.7	d	26.9
Route 6 & County Road 56	Westbound	LT	a	8.3	a	8.0
	Northbound	LR	c	16.0	f	55.6
	INTERSECTION		c	16.0	f	55.6
Route 17M & Ramp from I-84 WB	Westbound	R	f	364.6	f	327.4
	INTERSECTION		f	364.6	f	327.4

Note: LOS results for signalized intersections are represented by uppercase letters.
LOS results for unsignalized intersections are represented by lowercase letters.
Source: TRC, September 2008.

Table 8-12 Merge/Diverge HCS Analysis - 2011 Pre-Construction Conditions						
Intersection	**Approach**		**AM**		**PM**	
			LOS	**DENSITY (pc/mi/ln)**	**LOS**	**DENSITY (pc/mi/ln)**
Route 17M SB Diverge to I-84 EB	Southbound	R	a	7.2	a	5.8
Route 17M NB merge with ramp from I-84 EB	Westbound	R	b	11.1	b	12.6
Route 17M NB Diverge to I-84 WB	Northbound	R	a	8.4	a	7.2
I-84 WB Merge with Route 17M SB	Westbound	R	b	12.8	b	13.2
Route 17M SB Diverge to I-84 WB	Southbound	R	b	12.2	b	12.0

Note:
LOS results for merges/diverges are represented by lowercase letters.
Source: TRC, August 2008.

8.7.2 2011 Construction Phase

As noted in the previous Section, the construction of the Facility is expected to take approximately 24 months. The peak construction period for the Project is anticipated to occur for approximately 4-5 months in 2011. During much of the remaining construction period, traffic volumes will be significantly less than during the peak period. The peak construction period was analyzed in order to be conservative in estimating the construction impact.

Construction activity will primarily occur during daytime hours. It is estimated that a significant percentage of the construction workers will arrive at the Project site prior to the typical peak AM roadway hour and leave the Project site prior to the typical peak PM roadway hour. Therefore, most of the peak traffic activity due to the construction workers will offset from the peak roadway hours, occurring when there is generally less traffic on the adjacent roadways. It is possible that extensions of this basic workday, or moderate amounts of evening work where allowable, might occasionally occur. It is expected, however, that evening activities would require only a small number of workers. Although some construction activities, such as pouring concrete for building foundations, may require a prolonged workday, these activities should occur prior to the peak construction period, and will not involve significant traffic.

During construction, there will be two categories of Project-related vehicular trips: worker trips and equipment/supply deliveries. Worker trips consist of the traffic associated with construction workers traveling to and from the Project site. The maximum number of workers and the distribution of workers during the 24 month construction period are illustrated in Chart 8-1. The maximum number of construction workers projected to be employed at any one time is approximately 664 workers.

Trucks delivering construction materials, equipment, and supplies will generally arrive or depart during non-peak periods when traffic on the adjacent roadways is lower. Delivery of any large construction equipment and modular plant components will be made during off-peak times and will be coordinated with local and county officials as well as with the NYSDOT, as appropriate.

Most of the truck trips will include vehicles hauling cut and fill materials to and from the Project site for excavation of bank cuts and underground interconnection areas. Such activities will occur during the entire construction period, with the majority of the cut activities occurring more often at the beginning of the construction period and fill activities occurring at the beginning and towards the end of the construction period.

Some importing of material will be necessary including concrete, bituminous material, aggregate, and crushed stone. The hauling of these materials to the Project site will occur in accordance with the applicable local laws and ordinances during the entire construction period. Use of 12-cubic yard trucks is anticipated. Vehicles hauling the material will access the Project site via the access point on Route 6 and haul the material to/from the predetermined hauling site via the quickest route possible. There is an existing truck weight limit on a number of State roads to the west of the site along Route 6, south of I-84. Truck activities associated with site construction and operation will observe this weight limit and will access the site via Route 6 and other connections east of the Project.

The Project's underground infrastructure interconnections include the potable water line, the water supply/sewer corridor to the Middletown POTW and the underground transmission line connecting the Facility to the nearby electric power grid.

To account for the additional traffic due to the construction work force, a worker vehicle occupancy rate of 1.1 persons per vehicle was assumed. Considering a maximum construction work force of 664 persons and conservatively assuming 30 percent arrive during the peak commuter roadway hours, a total of 181 vehicles would arrive during the Peak AM Hour or depart during the Peak PM Hour. In addition to the arrival of construction workers, an estimated 5 truck trips arriving and departing during each peak roadway hour were added to the 181 trips.

The arrival and departure patterns for the traffic to be generated during construction of the Project were determined based upon a review of New York State Journey to Work data. Project-generated traffic volumes during the peak construction period were distributed along the roadway network in accordance with the arrival and departure distributions shown in Figures 8-16 and 8-17. The resultant Construction-Generated Traffic Volumes are set forth in Figure 8-18. The Construction-Generated Traffic Volumes were added to the 2011 Pre-Construction Base Traffic Volumes to determine the 2011 Construction Phase traffic volumes as shown in Figure 8-19.

8.7.3 Construction-Related Traffic Impact

A comparison of projected future traffic conditions with and without construction related traffic was performed, including a calculation and comparison of the LOS for each study location, giving details for each turning movement.

Capacity analyses were conducted for all key study locations for the 2011 Peak Construction Phase. Tables 8-13 and 8-14 present the results. The analysis conducted is conservative in its approach because it includes 30 percent of the construction worker trips within the peak hours. Based on experience with other projects, most construction related trips will arrive and depart before the respective AM and PM peak commuter roadway hours. In this case 70 percent of the workforce will arrive by 7:00 AM – a full half-hour before the peak hour of the adjacent street, which was determined to be 7:30 to 8:30 AM. Similarly, most of the construction workers will have left the site by 4:00 PM – well in advance of the 4:30 to 5:30 PM peak hour. Table 8-15 shows the comparison between the 2011 Pre-Construction Phase and the 2011 Construction Phase.

There are a few instances when construction related traffic will result in a lower Level of Service at a study location. The drop in LOS is generally moderate and will be temporary, lasting only during the 4 or 5 months of peak construction activity. Thereafter, conditions will return to pre-construction levels. Intersections with approaches that may experience lower peak hour Levels of Service due to Facility related construction traffic include the following from Table 8-15:

- Route 17M and Route 6/Sunrise Park Road
- Route 6 at Kirbytown Road

Table 8-13
Signalized / Unsignalized Intersections Synchro Analysis - 2011 Construction Phase

Intersection	Approach		AM LOS	AM Delay (sec/veh)	PM LOS	PM Delay (sec/veh)
Route 17M & Dolsontown Road / County Road 108	Eastbound	LT	C	32.5	C	32.7
		R	C	30.1	C	23.2
		Overall	C	30.8	C	26.4
	Westbound	L	E	56.6	E	68.3
		TR	C	26.6	D	48.2
		Overall	D	41.4	E	55.8
	Northbound	L	E	70.5	F	187.8
		TR	C	34.8	D	38.8
		Overall	D	44.9	F	87.2
	Southbound	L	C	21.5	D	38.5
		TR	C	21.6	E	63.4
		Overall	C	21.6	E	60.1
	INTERSECTION		D	36.8	E	66.8
Route 17M & Route 6 / Sunrise Park Road	Eastbound	LT	D	53.7	E	57.1
		R	D	37.6	D	41.0
		Overall	D	44.1	D	47.3
	Westbound	LTR	C	30.0	C	29.7
	Northbound	L	F	99.5	F	86.2
		TR	B	17.7	B	19.2
		Overall	C	34.1	C	31.3
	Southbound	L	C	33.2	C	25.2
		T	D	40.3	D	43.4
		R	C	21.8	C	23.7
		Overall	D	38.1	D	38.8
	INTERSECTION		D	37.2	D	37.1
Route 6 & Kirbytown Road	Eastbound	LT	a	0.5	a	0.9
	Southbound	LR	f	50.9	f	56.4
	INTERSECTION		f	50.9	f	56.4
Route 6 & Route 284	Westbound	LT	a	3.3	a	5.2
	Northbound	LR	c	22.4	d	29.6
	INTERSECTION		c	22.4	d	29.6
Route 6 & County Road 56	Westbound	LT	a	8.4	a	8.0
	Northbound	LR	c	16.9	f	68.2
	INTERSECTION		c	16.9	f	68.2
Route 17M & Ramp from I-84 WB	Westbound	R	f	445.6	f	345.1
	INTERSECTION		f	445.6	f	345.1

Note:
LOS results for signalized intersections are represented by uppercase letters.
LOS results for unsignalized intersections are represented by lowercase letters.
Source: TRC, September 2008.

Table 8-14
Merge/Diverge HCS Analysis - 2011 Construction Phase

Intersection	Approach		AM		PM	
			LOS	DENSITY (pc/mi/ln)	LOS	DENSITY (pc/mi/ln)
Route 17M SB Diverge to I-84 EB	Southbound	R	a	7.3	a	6.1
Route 17M NB merge with ramp from I-84 EB	Westbound	R	b	11.6	b	12.7
Route 17M NB Diverge to I-84 WB	Northbound	R	a	9.0	a	7.3
I-84 WB Merge with Route 17M SB	Westbound	R	b	13.0	b	13.8
Route 17M SB Diverge to I-84 WB	Southbound	R	b	12.3	b	12.7

Note:
LOS results for merges/diverges are represented by lowercase letters.
Source: TRC, August 2008.

Table 8-15
2011 Construction Phase LOS Summary Table

Intersection	Pre-Construction		Construction Phase	
PEAK AM HOUR				
	LOS	**DELAY**	**LOS**	**DELAY**
Route 17M & County Road 108 / Dolsontown Road	D	35.8	D	36.8
Route 17M & Route 6 / Sunrise Park Road	C	31.2	D	37.2
Route 6 & Kirbytown Road	d	30.7	f	50.9
Route 6 & County Road 56	c	16.0	c	16.9
Route 6 & Route 284	c	20.7	c	22.4
Route 17M & Ramp from I-84 WB	f	364.6	f	445.6
Route 6 & Site Driveway	N/A	N/A	c	17.3
Merge / Diverge	**LOS**	**DENSITY**	**LOS**	**DENSITY**
Route 17M SB Diverge to I-84 EB	a	7.2	a	7.3
Route 17M NB merge with ramp from I-84 EB	b	11.1	b	11.6
Route 17M NB Diverge to I-84 WB	a	8.4	a	9.0
I-84 WB Merge with Route 17M SB	b	12.8	b	13.0
Route 17M SB Diverge to I-84 WB	b	12.2	b	12.3
PEAK PM HOUR				
	LOS	**DELAY**	**LOS**	**DELAY**
Route 17M & County Road 108 / Dolsontown Road	E	63.1	E	66.8
Route 17M & Route 6 / Sunrise Park Road	C	32.2	D	37.1
Route 6 & Kirbytown Road	e	36.9	f	56.4
Route 6 & County Road 56	f	55.6	f	68.2
Route 6 & Route 284	d	26.9	d	29.6
Route 17M & Ramp from I-84 WB	f	327.4	f	345.1
Route 6 & Site Driveway	N/A	N/A	d	29.3
Merge / Diverge	**LOS**	**DENSITY**	**LOS**	**DENSITY**
Route 17M SB Diverge to I-84 EB	a	5.8	a	6.1
Route 17M NB merge with ramp from I-84 EB	b	12.6	b	12.7
Route 17M NB Diverge to I-84 WB	a	7.2	a	7.3
I-84 WB Merge with Route 17M SB	b	13.2	b	13.8
Route 17M SB Diverge to I-84 WB	b	12.0	b	12.7

Notes:
LOS results for signalized intersections are represented by uppercase letters with average delay in seconds per vehicle.
LOS results for unsignalized intersections are represented by lowercase letters with average delay in seconds per vehicle.
LOS results for merges/diverges are represented by lowercase letters with average density in passenger cars per mile per lane.
Source: TRC, September 2008.

8.8 PROPOSED DEVELOPMENT

8.8.1 Site Access

This section addresses potential traffic impacts that may result from the operation of the proposed Facility. The project is shown in the conceptual site plan, depicting the Project site driveway intersection with Route 6, and includes horizontal geometry, the number of approach lanes, and the proposed traffic control. Sight distances are discussed below.

The site access is proposed to be via a three-legged intersection, with Route 6 forming the eastbound and westbound approaches and the Project Driveway forming the northbound approach. The westbound approach will consist of a shared left/through lane and the eastbound approach will consist of a shared through/right lane. The Project Driveway will consist of a shared left/right lane and be under STOP control.

Site Plan

The "General Arrangement Site Plan – 2 x 1 Combined Cycle" provided by Worley Parsons (site consultants) (Figure 8-20) shows the Overall Site Plan, site driveway, lane configuration and location of intersection with Route 6.

Site Driveway Sight Distance

In the vicinity of the Project site, the posted speed limit of Route 6 is 55 mph. A sight distance analysis was performed for the proposed intersection of Route 6 and the Project Driveway by utilizing the sight distance criteria as established by NYSDOT and the American Association of State Highway and Transportation Officials (AASHTO). The results are summarized in Table 8-16.

Table 8-16
Sight Distances at a Standard Unsignalized Intersection (in feet)

Sightline[1]	Sight Distance 1		Sight Distance 2		Sight Distance 3		Sight Distance 4	
	Provided	Required	Provided	Required	Provided	Required	Provided	Required
Site Driveway	885	610	500 [2]	530	1000+	495	575	445

Notes:
[1] See Figure 8-21 - Sightlines.
[2] Sight Distance as Observed in the Field was 500 ft. – Additional 50 to 100 ft. can be provided with clearing of vegetation.
Source: TRC, 2007.

There are four key sight lines that are considered in an intersection's design. These four key sightlines are illustrated in Figure 8-21. Minimum requirements are listed in Table 8-16.

- Sightline 1 – The distance for a vehicle performing a left turn exiting the Project Driveway looking to the right (along Route 6) for approaching vehicles.

- Sightline 2 – The distance for a vehicle performing a right turn exiting the Project Driveway looking to the left (along Route 6) for approaching vehicles.

- Sightline 3 – The rear end sight distance for a vehicle on the main roadway (Route 6) turning left into the Project Driveway to be seen by a vehicle approaching in the same direction.

- Sightline 4 – The distance for a vehicle on the main roadway (Route 6) turning left into the Project Driveway, looking at vehicles approaching from the opposite direction.

As can be seen by a review of the table above, appropriate sight distance has been designed for vehicles entering and exiting the Project Driveway. Note that Sight Distance 2, the distance for a vehicle turning right from the Site Driveway looking to the left along Route 6 was observed to be just below the standard. However, this measurement was based on existing field conditions. TRC has determined by observation that proper sight distance can be provided by cutting down and maintaining low vegetation on Route 6 along the Project frontage and particularly to the west of the Project Driveway. Figure 8-21 illustrates each sight distance from the site exit.

8.8.2 Trip Generation

The vehicular traffic volumes generated by the proposed development during the Construction and Operational Phases were estimated based on information provided by CPV Valley, Inc. and information related to similar types of facilities. Traffic generated during the operations would consist of employees and deliveries needed to operate the facility. Operation of the proposed facility would contribute a small number of vehicle trips to the local roadway network. The Project is expected to provide an estimated 25 permanent operations jobs. The facility would have typically 8 to 10 persons on duty during any one shift. To be conservative, this analysis assumed that during facility operation there would be a maximum of 20 vehicle trips during the morning (15 entering, 5 exiting) and evening peak hour periods (15 exiting, 5 entering). Truck deliveries would typically range from 3 to 5 per day.

8.8.3 Trip Distribution and Assignment

In order to evaluate the impacts associated with operation of the Project, Project-related trips were distributed to and from the site to determine the amount of traffic each surrounding roadway would receive during the peak hours. Journey to Work Census data was reviewed along with the existing roadway network, travel patterns, and the proximity to major corridors to determine the distribution of site-generated traffic through each study location. This distribution was used to calculate the number of trips assigned to each movement at the study intersections. Projected trip distributions are shown in Figures 8-16 and 8-17. These distribution percentages were applied to the estimated peak hour trip generation.

Figure 8-22 contains the site-generated traffic for the morning and evening peak hours, respectively. The site-generated volumes were then added to the No-Build peak hour volumes to determine the Build volumes. The 2012 Build volumes for the morning and evening peak hours are shown in Figure 8-23.

Tables 8-17 and 8-18 summarize the results of the capacity analyses for the 2012 Build Traffic condition. As can be seen by a review of following tables, all of the intersections operate at overall acceptable Levels of Service with the same three exceptions noted for the No Build condition analysis. At the Route 17M/I-84 westbound off-ramp intersection, long delays will continue to be experienced on the off-ramp, which is controlled by a "STOP" sign. At the Route 17M/County Road 108 intersection, long delays would continue to be experienced by left-turn vehicles on the northbound Route 17M approach. At the intersection of Route 6 and County Road 56, the minor movements would continue to experience longer delays during the PM peak hour.

8.8.4 Site Driveway Capacity Analysis

The planned Project site has a one-lane entry and one-lane exit unsignalized driveway. The site exit approach to Route 6 will operate under STOP sign control. Access to the site will connect to Route 6 approximately 850 feet to the east of the bridge crossing I-84. Table 8-19 presents the capacity analysis results for the Site Driveway and Route 6. As indicated, acceptable Levels of Service will be experienced at the Site Driveway.

8.8.5 Supplemental Site Driveway Capacity Analysis

A possible alignment with CPI Panattoni, to form a "4-legged" intersection was investigated. The results are presented in Table 8-20 for an intersection with minor approaches under "STOP" sign control, and Table 8-21 for an intersection under "Signal" control.

Table 8-17
Signalized / Unsignalized Intersections Synchro Analysis - 2012 Build Conditions

Intersection	Approach		AM LOS	AM Delay (sec/veh)	PM LOS	PM Delay (sec/veh)
Route 17M & Dolsontown Road / County Road 108	Eastbound	LT	C	33.1	C	33.1
		R	C	29.7	C	23.1
		Overall	C	30.6	C	26.5
	Westbound	L	E	56.6	E	68.9
		TR	C	26.7	D	49.3
		Overall	D	41.2	E	56.7
	Northbound	L	E	72.1	F	184.5
		TR	D	36.3	D	37.7
		Overall	D	46.5	F	85.4
	Southbound	L	C	21.5	D	39.1
		TR	C	21.4	E	69.9
		Overall	C	21.4	E	65.8
	INTERSECTION		D	37.6	E	67.6
Route 17M & Route 6 / Sunrise Park Road	Eastbound	LT	D	53.4	D	54.7
		R	D	36.9	D	36.4
		Overall	D	43.6	D	43.9
	Westbound	LTR	C	30.3	C	31.6
	Northbound	L	D	48.6	E	55.6
		TR	B	17.8	B	17.4
		Overall	C	22.7	C	24.0
	Southbound	L	D	35.1	C	24.6
		T	D	41.6	D	45.4
		R	C	21.5	C	23.7
		Overall	D	39.8	D	40.4
	INTERSECTION		C	32.2	C	33.6
Route 6 & Kirbytown Road	Eastbound	LT	a	0.4	a	0.7
	Southbound	LR	d	33.2	e	40.0
	INTERSECTION		d	33.2	e	40.0
Route 6 & Route 284	Westbound	LT	a	3.2	a	5.2
	Northbound	LR	c	21.6	d	29.2
	INTERSECTION		c	21.6	d	29.2
Route 6 & County Road 56	Westbound	LT	a	8.4	a	8.0
	Northbound	LR	c	16.4	f	62.8
	INTERSECTION		c	16.4	f	62.8
Route 17M & Ramp from I-84 WB	Westbound	R	f	393.8	f	352.7
	INTERSECTION		f	393.8	f	352.7

Note:
LOS results for signalized intersections are represented by uppercase letters.
LOS results for unsignalized intersections are represented by lowercase letters.
Source: TRC, September 2008.

Table 8-18 Merge/Diverge HCS Analysis - 2012 Build Conditions						
Intersection	**Approach**		**AM**		**PM**	
			LOS	**DENSITY (pc/mi/ln)**	**LOS**	**DENSITY (pc/mi/ln)**
Route 17M SB Diverge to I-84 EB	Southbound	R	a	7.4	a	6.0
Route 17M NB merge with ramp from I-84 EB	Westbound	R	b	11.3	b	12.8
Route 17M NB Diverge to I-84 WB	Northbound	R	a	8.7	a	7.4
I-84 WB Merge with Route 17M SB	Westbound	R	b	13.1	b	13.4
Route 17M SB Diverge to I-84 WB	Southbound	R	b	12.4	b	12.3

Note:
LOS results for merges/diverges are represented by lowercase letters.
Source: TRC, August 2008.

Table 8-19 Site Driveway Synchro Analysis					
Approach		**AM PEAK HOUR**		**PM PEAK HOUR**	
		2012 Build Conditions		**2012 Build Conditions**	
		LOS	**DELAY (sec/veh)**	**LOS**	**DELAY (sec/veh)**
Westbound	LT	a	0.4	a	0.1
Northbound	LR	b	13.4	c	15.7
INTERSECTION		b	13.4	c	15.7

Note:
LOS results for unsignalized intersections are represented by lowercase letters.
Source: TRC, August 2008.

Table 8-20
Site Driveway Synchro Analysis – 4-Legged Unsignalized Driveway With CPI Panattoni Development

Approach		2012 Build Conditions LOS	2012 Build Conditions DELAY (sec/veh)
AM Peak Hour			
Eastbound (Rt. 6)	LTR	a	8.2
Westbound (Rt. 6)	LT	a	8.3
Northbound (CPV)	LTR	b	12.8
Southbound (Panattoni)	L	d	26.2
	TR	a	9.6
PM Peak Hour			
Eastbound (Rt. 6)	LTR	a	8.7
Westbound (Rt. 6)	LT	a	8.0
Northbound (CPV)	LTR	b	13.1
Southbound (Panattoni)	L	f	215.8
	TR	b	12.9

Note:
LOS results for unsignalized intersections are represented by lowercase letters.
Source: TRC, October 2008.

Table 8-21
Site Driveway Synchro Analysis – 4-Legged Signalized Driveway With CPI Panattoni Development

Approach		2012 Build Conditions LOS	2012 Build Conditions DELAY (sec/veh)
AM Peak Hour			
Eastbound (Rt. 6)	LTR	B	17.0
Westbound (Rt. 6)	LT	B	13.6
	R	B	12.9
	Overall	B	13.4
Northbound (CPV)	LTR	B	16.3
Southbound (Panattoni)	L	B	18.0
	TR	B	16.6
	Overall	B	17.7
INTERSECTION		B	15.8
PM Peak Hour			
Eastbound (Rt. 6)	LTR	B	14.8
Westbound (Rt. 6)	LT	B	17.8
	R	B	11.9
	Overall	B	17.5
Northbound (CPV)	LTR	B	16.4
Southbound (Panattoni)	L	C	22.1
	TR	B	17.1
	Overall	C	21.1
INTERSECTION		B	17.8

Note: LOS results for signalized intersections are represented by uppercase letters.
Source: TRC, October 2008.

Traffic exiting from the Panattoni site will be subject to long delays under "STOP" sign control. The traffic study prepared for that development recommends monitoring of future traffic conditions for possible signalization. The operational traffic components of the CPV project will, in no tangible way, further impact the conditions expected for Panattoni's exiting traffic.

The possible alignment of driveways to form a 4-legged intersection is dependent upon the Panattoni site's ability to accommodate a relocation of their driveway to the east, opposite the proposed CPV driveway, as shown in Figure 8-24. This is necessary because CPV does not own the property directly across from the proposed location of the Panattoni site driveway. This and a pre-existing dedicated easement at the northwest corner of the Project site essentially preclude a relocation of the CPV driveway to the west. In addition, a stream and wetlands to the east prevent any relocation in that direction. Furthermore, the proposed CPV driveway is at a location on Route 6 that optimizes safe sight distances, which would be reduced to unacceptable lengths if the driveway were moved to the west.

8.9 PROBABLE TRAFFIC IMPACTS OF THE PROJECT

8.9.1 Analysis Methodology

As stated previously, the intersection capacity and LOS analyses were based on the procedures and guidelines presented in the Highway Capacity Manual (2000), published by the Transportation Research Board. The FHWA Highway Capacity Software Release 5.21 and Synchro Release 7 were used to analyze the study locations and provide a LOS measurement ranging from LOS A/a (excellent) to F/f (long delays), of the intersection operations.

8.9.2 Identification of Impacts

Table 8-22 summarizes the overall Level of Service results for each study location under existing, No Build and Build volume conditions. **At all locations and under both AM and PM peak hour traffic conditions, the impacts from the proposed Project will be negligible in that no Level of Service determined for the No Build condition would change as a result of the traffic generated by the proposed Facility.**

Table 8-22
2012 Operation – Overall Level of Service Comparison

Intersection	Existing		No-Build		Build	
PEAK AM HOUR						
	LOS	**DELAY**	**LOS**	**DELAY**	**LOS**	**DELAY**
Route 17M & County Road 108 / Dolsontown Road	C	26.5	D	37.5	D	37.6
Route 17M & Route 6 / Sunrise Park Road	C	23.7	C	32.0	C	32.2
Route 6 & Kirbytown Road	c	15.6	d	31.9	d	33.2
Route 6 & County Road 56	b	13.2	c	16.3	c	16.4
Route 6 & Route 284	c	16.0	c	21.3	c	21.6
Route 17M & Ramp from I-84 WB	f	82.3	f	387.3	f	393.8
Route 6 & Site Driveway	N/A	N/A	N/A	N/A	b	13.4
Merge / Diverge	**LOS**	**DENSITY**	**LOS**	**DENSITY**	**LOS**	**DENSITY**
Route 17M SB Diverge to I-84 EB	a	6.2	a	7.4	a	7.4
Route 17M NB Merge with ramp from I-84 EB	a	8.8	b	11.3	b	11.3
Route 17M NB Diverge to I-84 WB	a	5.9	a	8.6	a	8.7
I-84 WB Merge with Route 17M SB	b	10.9	b	13.0	b	13.1
Route 17M SB Diverge to I-84 WB	b	10.1	b	12.4	b	12.4
PEAK PM HOUR						
	LOS	**DELAY**	**LOS**	**DELAY**	**LOS**	**DELAY**
Route 17M & County Road 108 / Dolsontown Road	D	35.8	E	67.2	E	67.6
Route 17M & Route 6 / Sunrise Park Road	C	24.2	C	33.3	C	33.6
Route 6 & Kirbytown Road	c	17.8	e	38.5	e	40.0
Route 6 & County Road 56	c	23.3	f	61.8	f	62.8
Route 6 & Route 284	c	17.8	d	29.0	d	29.2
Route 17M & Ramp from I-84 WB	f	93.8	f	350.3	f	352.7
Route 6 & Site Driveway	N/A	N/A	N/A	N/A	c	15.7
Merge / Diverge	**LOS**	**DENSITY**	**LOS**	**DENSITY**	**LOS**	**DENSITY**
Route 17M SB Diverge to I-84 EB	a	4.7	a	5.9	a	6.0
Route 17M NB Merge with ramp from I-84 EB	b	10.5	b	12.7	b	12.8
Route 17M NB Diverge to I-84 WB	a	5.4	a	7.4	a	7.4
I-84 WB Merge with Route 17M SB	b	10.5	b	13.4	b	13.4
Route 17M SB Diverge to I-84 WB	a	9.3	b	12.2	b	12.3

Notes:
LOS results for signalized intersections are represented by uppercase letters with average delay in seconds per vehicle.
LOS results for unsignalized intersections are represented by lowercase letters with average delay in seconds per vehicle.
LOS results for merges/diverges are represented by lowercase letters with average density in passenger cars per mile per lane.
Source: TRC, September 2008.

8.10 OTHER TRANSPORTATION MODES

Air

No significant adverse impacts to local or regional airport operations or air navigation would result from the operation of the CPV Project as the distance between the site and the nearest local airport (Randall Airport) is approximately 2.5 miles. Randall Airport serves small, single engine airplanes, gliders and ultra-lights. Stewart International Airport is a major commuter facility located approximately 17 miles east of the Project site. Stewart Airport serves larger jet aircraft and military cargo planes. The distances from the Project site and airport runway orientations are such that the proposed Facility will lie outside the glide paths of these airports,

Project generated air travel is not anticipated.

Rail

The Metro North commuter railroad, a division of the Metropolitan Transportation Authority (MTA) operates service through the Project area on the Port Jervis Line. The Middletown Station of the Port Jervis Line is nearest the Project site, located approximately 3 miles from the site.

The proposed project would not impact the operations of the railroad and additional ridership, if any, associated with the Facility would be minimal.

Bus

Transit Orange is administered by the Orange County Planning Department, which coordinates the services of several individual bus operators. Bus service in the Wawayanda/Middletown area includes both commuter (typically between the County and New York City) and local, fixed route buses that run on regular schedules. Two local routes run on Route 17M and County Road 78, about 1.3 miles from the site. Since there is no bus service on Route 6 in Wawayanda, any trips made to the site by bus would include a walk (or ride from a fellow worker) from the bus stop at Route 17M and County Road 78 to the site.

Bicycle

The New York State Department of Transportation maintains three designated long-distance, on-road bicycle routes in the entire State. These routes are designed for use by experienced cyclists; in fact, the State recommends that cyclists “be comfortable sharing the roadway with motorized vehicles and with traveling at higher speeds.”

State Bicycle Route 17 includes the section of Route 6 adjacent to the Project Site. East of the Project, Bicycle Route 17 follows Route 17M south and east to Goshen where it continues east on Route 207 through Orange County to the City of Newburgh. West of the Project, Bicycle Route 17 follows Route 6 to the City of Port Jervis where it turns north on Route 97. Through Sullivan County, this bike route generally follows the Delaware River, continuing on through Delaware County and Broome County in New York’s southern tier.

Shorter trips along the Bicycle Route – and any other public right-of-way – would connect the Project site to the surrounding communities. Paved shoulders are provided along both sides of Routes 6 and 17M, extending northward to the City of Middletown. These shoulders were observed to be sufficient to accommodate the existing bike route along the Project site's frontage. Therefore, improvements are not needed Cyclists (and pedestrians) should follow the rules of the road, share the road with other vehicles and use appropriate clothing and equipment to ensure a safe ride.

The Bicycle Route could be somewhat shielded from the industrial look of the Project by providing certain low-level on-site landscaping. This buffer treatment would mitigate certain visual impacts; however, the landscape plan should avoid placing such low-level plantings in the sight lines at the exit driveway.

The developer is considering providing some passive bike-route amenities such as a rest area and an information sign that describes the bike-route itself and the power plant, and contains other travel and service information of interest in the Town of Wawayanda and adjacent communities. Such amenities must be located in the public right-of-way safely away from traffic flows on the adjacent roadway; they would be subject to design standards, permitting and maintenance agreements acceptable to the New York State Department of Transportation – since these items would be placed on Route 6.

8.11 UTILITY WORK IN THE PUBLIC RIGHT-OF-WAY

The applicant will provide the necessary plans regarding the off-site utility work, which for now includes a potable water supply, gray-water inflow and discharge pipes to the local treatment plant and an underground power transmission line from the site to the nearby New York Power Authority's (NYPA) system.

Potable water will be brought to the Project site via a lateral from the Town public supply main extension along Route 6.

Process gray water would be brought to the site from the Middletown Wastewater Treatment Plant through construction of an underground pipeline along Routes 17M and 6. The wastewater from the Facility will follow this same route back to the Middletown Wastewater Treatment Plant.

The Project would interconnect to the 345 kilovolt (kV) NYPA Marcy South system, located less than one mile from the site to the northeast. The interconnection would be made via a new on-site 345kV substation, with above ground 345 kV transmission lines on site, and underground 345kV electric transmission cables offsite.

The applicant will provide the necessary traffic management plans/specifications for work in the public roadway right-of-way associated with construction of the above mentioned utility work.

8.12 SUMMARY OF IMPACTS AND MITIGATION

There are a few instances when construction related traffic will cause deterioration in Level of Service at a study location. The drop in LOS is generally moderate and will be temporary, lasting only during the 4 to 5 months of peak construction activity. Thereafter, conditions will return to pre-construction levels. It is estimated that a significant percentage of the construction workers will arrive at the Project site prior to the typical peak AM roadway hour and leave the Project site prior to the typical peak PM roadway hour. Therefore, most of the peak traffic activity due to the construction workers will offset from the peak roadway hours, occurring when there is generally less traffic on the adjacent roadways.

Under full time, post construction operating conditions, at all locations and under both AM and PM peak hour traffic conditions, the impacts from the proposed Project will be negligible in that no Level of Service determined for the No build condition would change as a result of the traffic generated by the proposed Facility. The Project site entrance has been located so as to provide sight distances that meet or exceed applicable standards.

If required, traffic officer control will be utilized at the intersection of Route 6 and Kirbytown road during the 4 to 5 month peak on-site construction activity to mitigate impacts on vehicle flow and optimize operational safety.

8.13 REFERENCES

1. Institute of Transportation Engineers. (2003). *Trip Generation, 7th Edition.*

2. New York State Department of Transportation – Traffic volume data and accident reports. (2007).

3. Transportation Research Board. (2000). *Highway Capacity Manual*

4. John Collins Engineers, P.C. (June 7, 2006). *TIS, Horizons at Wawayanda, Town of Wawayanda, New York.*

5. John Collins Engineers, P.C. (May 17, 2007). *TIS, Concrete Properties/Panattoni Development, U.S. Route 6 at Pine Lane, Town of Wawayanda, New York.*

6. Sarna, John L. (January 2007). *TIS, Simon Business Park, Town of Wawayanda, New York.*

7. Chazen Engineering, Land Surveying & Landscape Architecture Co., P.C. (April 2008). *TIS, Brookfield Resource Management, Town of Wawayanda, Orange County, New York.*

9.0 AIR QUALITY

This Chapter presents information related to existing air resources at the Project site and an assessment of the potential air quality impacts of the proposed CPV Valley Energy Center on the existing air quality. A discussion of the area topography is included because the topography can affect local meteorological conditions and air quality impacts. Modeling methodologies that were used to assess the air quality impacts from the proposed project are described in the revised Air Quality Modeling Protocol (TRC, 2008) that is included in Appendix 9-A. The original air quality modeling protocol that was submitted to EPA and NYSDEC in September 2008 was subsequently revised to address agency review comments and to account for project design changes.

Federal, New York State, and local air quality regulatory requirements are also identified in this chapter as well as the measures that would be implemented to ensure the Project complies with the air quality regulatory requirements. Further information on the applicable New York State and federal regulatory requirements and the Project's compliance determinations with the regulatory requirements can be found in the PSD and Part 201 Air Permit Application (TRC, 2008) submitted to the United States Environmental Protection Agency (USEPA) Region 2 and New York State Department of Conservation (NYSDEC) in November 2008.

9.1 EXISTING CONDITIONS

The existing topography, meteorological data, and air quality surrounding the Project site are discussed in this section.

9.1.1 Topography

The proposed CPV Valley Energy Center will be situated within an approximately 15-acre project site within a larger 122-acre parcel. The site is located in the northeast portion of the Town of Wawayanda near the boundary with the City of Middletown. The parcel is located north of Interstate Route 84, east of New York Route 17M, and south and west of New York Route 6.

The site is currently undeveloped land consisting of tracts previously used for agricultural purposes, including the growing of hay and corn crops, and wooded areas. Topography in the immediate area generally slopes gently downward from Route 6 on the north to Interstate 84 on the south. Typical terrain elevations on the Project site are in the range of 450 to 470 feet above mean sea level (MSL).

Land use around the Project site includes two residences to the north along Route 6, and Pinehill Cemetery to the northeast. A work force housing complex is under construction in the area southeast of the cemetery. The Wawayanda Business Center is located to the west off Route 6. A warehouse facility is planned to the west of the Project site across Route 6, and a large New York State Department of Transportation facility is located to the southwest of the Project site south of Route 84 on the north side of Route 6.

The Project site is located within a broad valley with an axis oriented roughly south-southwest to north-northeast. A well defined ridge with typical peak elevations on the order of 1150 feet MSL is located approximately 11.5 kilometers to the west-northwest and has the same orientation. Some higher terrain elevations occur on more northerly portions of this ridge. Smaller hills and ridges with a similar orientation occur to the west-northwest within a few kilometers of the Project site.

Figure 9-1 depicts the terrain surrounding the Project location and clearly shows the well defined ridge to the west-northwest and a broader area of high terrain located further beyond this ridge. Elevated terrain representing the eastern edge of the valley is apparent at greater distances from the Project site. The Hudson River runs north to south and is located approximately 35 kilometers to the east. The nearest portion of Long Island Sound is located approximately 80 kilometers to the southeast.

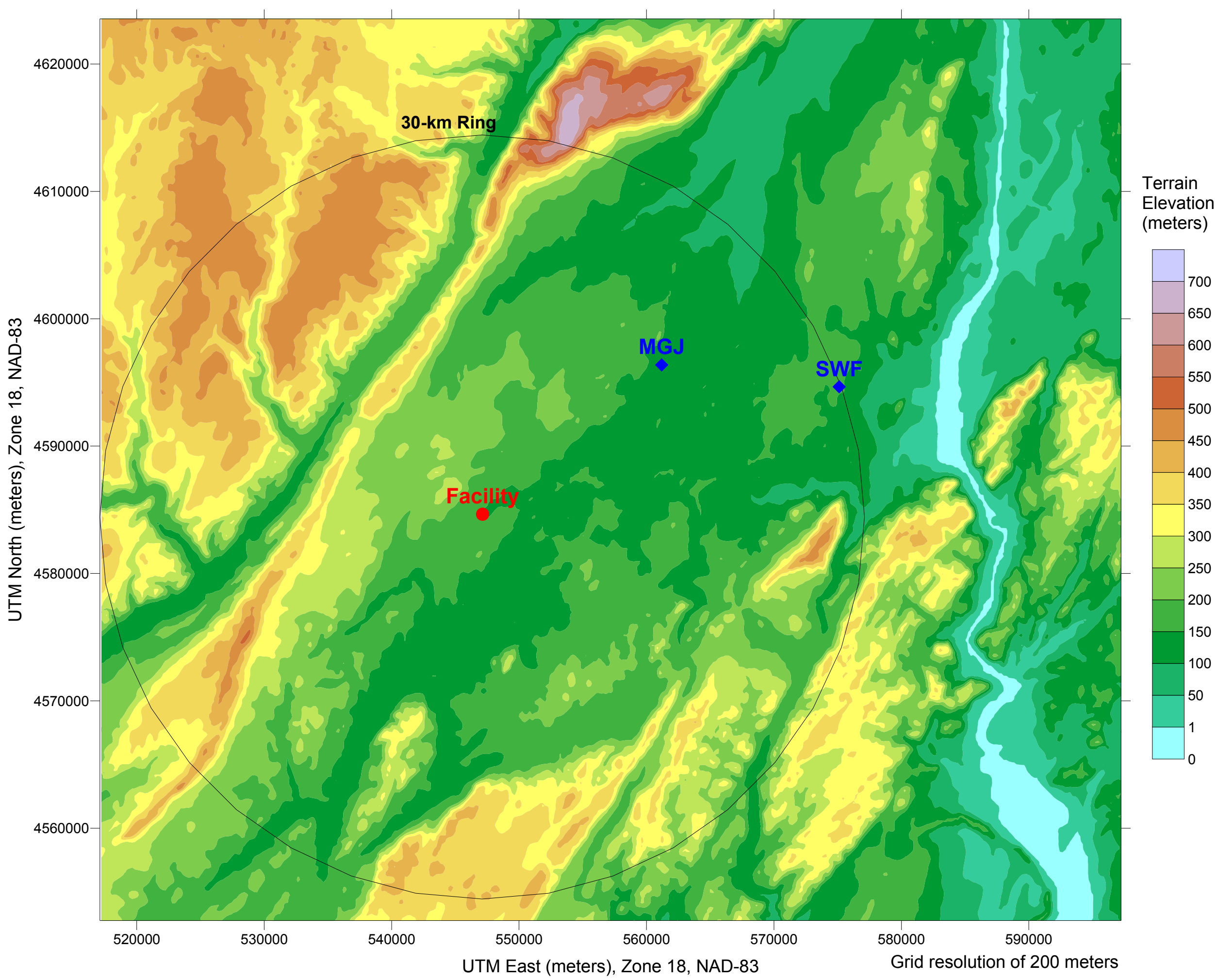


Figure 9-1 Terrain elevations derived from 90-meter USGS Digital Elevation Model data and interpolated to a 200-meter grid. The locations of the proposed facility, Orange County Airport (MGJ), and Stewart International Airport (SWF) are noted.

9.1.2 Climatology

Long-term average temperature and precipitation data for the period 1971-2000 are available for the Middletown 2 NW observing station (COOP ID 305310). This observing station is located approximately 6 kilometers north- the Project site and should be reasonably representative for describing the climatology of the Project site.

Monthly mean temperatures at this station range from 26.5 ^{o}F in January to 73.0 ^{o}F in July, with an annual average temperature of 50.8 ^{o}F. Average minimum daily temperatures range from 17.5 ^{o}F in January to 62.0 ^{o}F in July, with an average annual daily low temperature of 40.4 ^{o}F. Average maximum daily temperatures range from 35.4 ^{o}F in January to 84.0 ^{o}F in July, with an average annual daily high temperature of 61.1 ^{o}F. The annual mean precipitation is about 44.0 inches. Measurable precipitation occurs about 110 days per year, and precipitation of 1 inch or greater occurs approximately 11 days per year.

Snowfall data are not available from the Middletown 2 NW station. Data from the next closest observing station (Port Jervis, COOP ID 306774, located approximately 21 kilometers to the west-southwest of the Project site) indicate a mean annual snowfall of about 42 inches.

9.1.3 Meteorological Data

The nearest sources of hourly surface level meteorological data for modeling impacts from the Project are Orange County Airport (MGJ) in Montgomery, New York and Stewart International Airport (SWR) in Newburgh, New York. Five years of hourly surface level data for the period (2002-2006) were obtained for each site and reviewed to determine their representativeness for the Project location and their suitability for regulatory air dispersion modeling using the AERMOD model.

Orange County Airport is located approximately 18 km northeast of the Project site and has a comparable setting relative to the broad surrounding terrain. The base elevation at Orange County Airport (approximately 360 feet MSL) is comparable to that of the Project site. Hills rising to approximately 500 to 650 feet MSL occur along a southwest to northeast axis approximately 2 to 3 kilometers to the northwest that conforms to the general orientation of the higher terrain that defines the broader valley walls. The well defined ridge of terrain discussed previously is located about 17 kilometers to the west-northwest and has the same orientation before broadening and turning slightly to more of a southwest to northeast orientation as it heads north. The Hudson River is approximately 21 kilometers to the east, and Long Island Sound is located approximately 80 kilometers to the southeast.

A wind rose plot for Orange County Airport based on five years of surface level meteorological data (See Figure 9-2) shows prevailing winds from the south-southwest and the north-northeast, consistent with the orientation of the broad valley. Winds from the west-northwest and southwest are also fairly frequent, likely reflecting larger scale synoptic flows that vary seasonally with frequent winds from the northwest in the winter and winds from the southwest in the summer. Given the similar setting of the Project site and Orange County Airport relative to nearby and larger scale terrain features and the prevailing winds at Orange County Airport consistent with the broad valley orientation, it is concluded that the wind flow data measured at

Orange County Airport should be representative of conditions that would be expected at the Project site.

The five year period of record selected for Orange County Airport satisfies USEPA and NYSDEC requirements related to length of record (i.e., five consecutive years) and currency (most recent, readily available) for the use of off-site meteorological data. As discussed previously, the meteorological data from Orange County Airport should be representative of conditions at the Project site. Finally, the data capture rates for parameters needed for modeling are well above the 90% level required for PSD projects. Therefore, it is concluded that the surface level meteorological data from Orange County Airport are suitable for modeling the Project.

Surface level meteorological data from Stewart International Airport were also considered for modeling the Project. Stewart International Airport is located approximately 30 kilometers east-northeast of the Project site. Although it is located in the same broad valley and has a comparable base elevation (approximately 460 feet MSL), there are some significant differences in its setting relative to the Project site. The well-defined ridge of terrain discussed previously is considerably more distant, approximately 29 kilometers to the northwest of the Project site, and some of the terrain elevations associated with the nearest portion of the ridge are on the order of 2000 feet MSL. Smaller hills with peaks on the order of 650 feet MSL occur 1 to 2 kilometers north and south of the airport. The Hudson River is located approximately 8 kilometers to the east, and the nearest portion of Long Island Sound is approximately 70 kilometers to the southeast.

A wind rose plot for Stewart International Airport (see Figure 9-3) based on five years of surface level meteorological data shows prevailing winds from the west. The wind rose does not show any effect of the broad valley orientation. Rather, the wind rose appears to reflect what may be some strong local flow channeling due to nearby terrain features as well as average larger scale flows from the west. The wind distribution at Stewart International Airport is significantly different from the broad valley orientation and from the distribution observed at orange County Airport. The wind speeds at Stewart International Airport are also higher than those at orange County Airport, indicating greater exposure and a flow less impeded by nearby hills at Stewart International Airport. Given the distinctly different wind rose distribution from that expected at the Project site and given the greater distance of the airport from the Project site, the surface level meteorological data from Stewart International Airport are not as likely to be representative of conditions at the Project site when compared to those from Orange County Airport.

Data capture rates for winds from Stewart International Airport for the five-year period averaged about 80%, well below the 90% data capture rate required for PSD projects. For this reason alone, the data from Stewart International Airport were judged to not be suitable for modeling the Project.

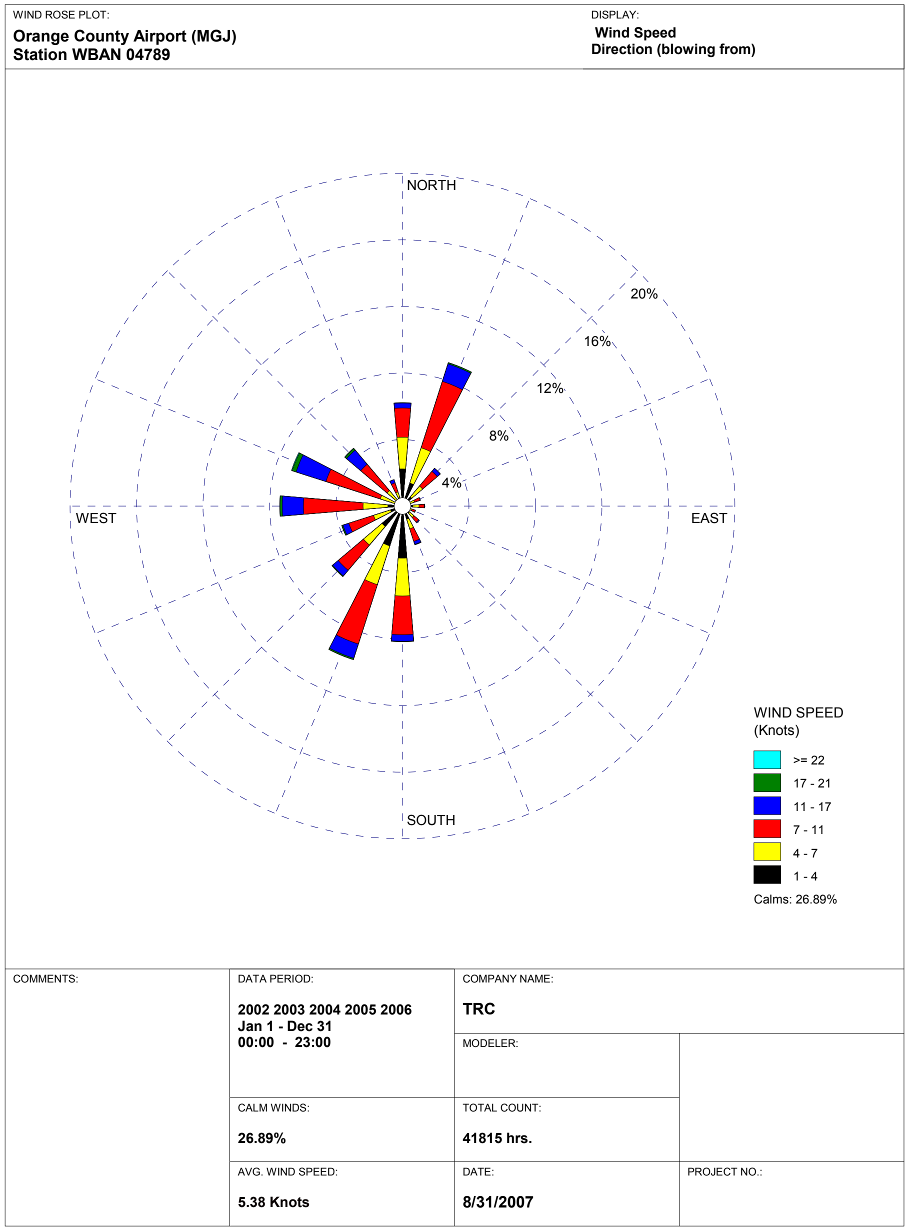


Figure 9-2 Orange County Airport wind rose for five year period 2002-2006.

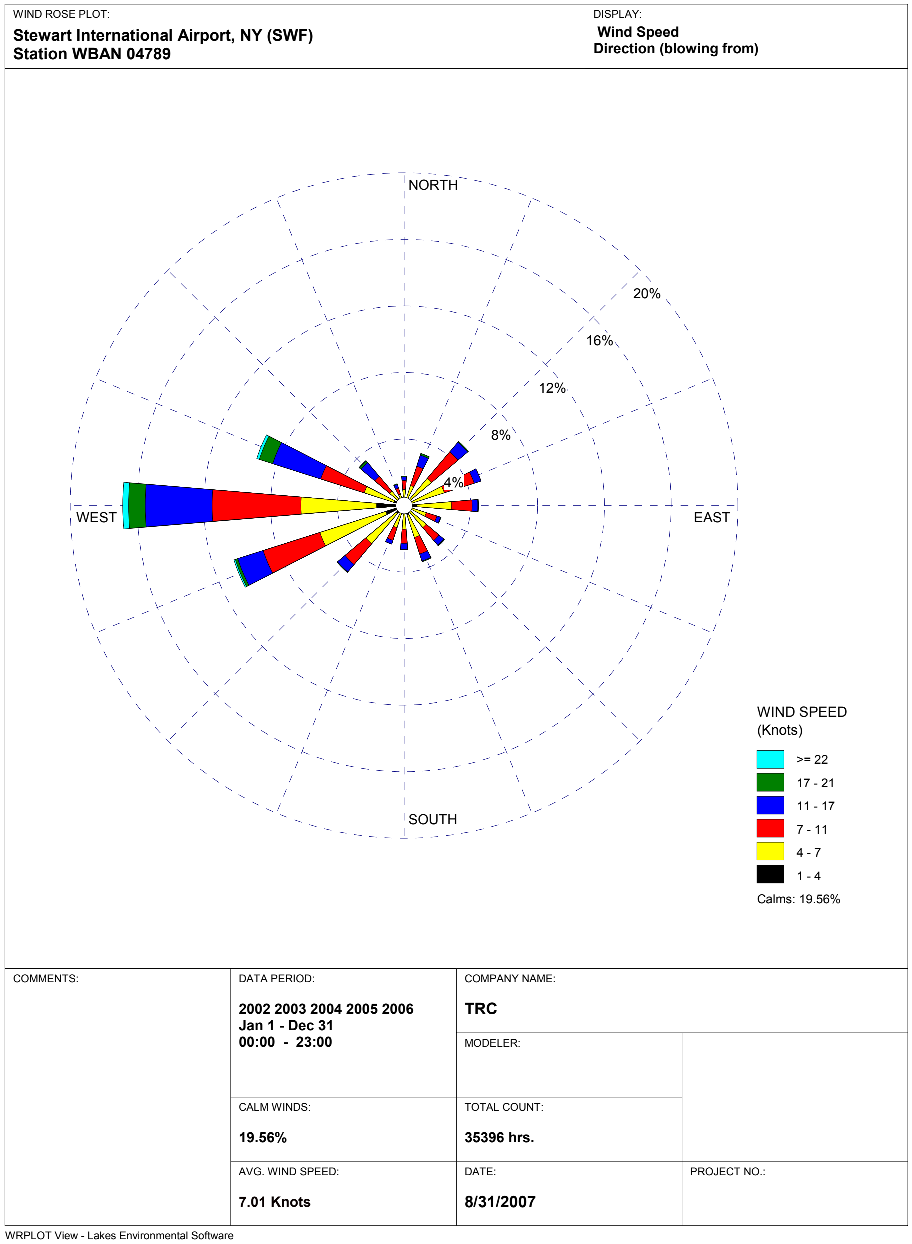


Figure 9-3 Stewart International Airport wind rose for five year period 2002-2006.

A five year period (2002-2006) of upper air data collected from Albany International Airport (ALB) was also selected for use in the air quality impact assessment. Albany International Airport is located approximately 158 kilometers north-northeast of the Project site and represents that nearest source of representative upper air data for the Project site. Other potential sites with upper air data, such as Brookhaven National Laboratory (OKX) and Atlantic City (ACY), are either more distant from the Project site (as is the case for ACY) or located in coastal or near coastal environments (OKX and ACY). Use of data from Brookhaven or Atlantic City would likely introduce marine influences and effects that would not be expected to occur at an inland location like the Project site.

9.1.4 Background Ambient Air Quality

Available ambient air quality data from USEPA and other agencies were reviewed to estimate the existing background ambient air quality in the area surrounding the proposed Project site. Data for criteria pollutants that are not included in the air quality analysis (ozone and lead) are also presented in order to fully establish background air quality conditions. Ozone is not included in the modeling because it is a large-scale (regional) issue, although ozone precursors are included in the analysis. Lead is not included in the modeling because the potential emissions from the Project are well below the emission thresholds that trigger a Prevention of Significant Deterioration (PSD) review. However, the potential lead emissions were included in the non-criteria air impact analysis.

The NYSDEC Bureau of Air Surveillance operates various air quality monitors throughout New York for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), particulate matter with a mean aerodynamic diameter less than 10 microns (PM-10), particulate matter with a mean aerodynamic diameter less than 2.5 microns (PM-2.5), ozone (O_3), lead (Pb), nitric oxides (NO_x), sulfates and nitrates. Agencies in nearby states, such as the New Jersey Department of Environmental Protection and the Pennsylvania Department of Environmental Protection, also operate ambient monitoring sites.

The Project site is located in areas that are considered to be in attainment with ambient air quality standards for criteria pollutants except for ozone and $PM_{2.5}$. Additional information concerning the attainment status of the Project site is provided in Section 9.2.3.

Monitoring sites in New York, New Jersey, and Pennsylvania were reviewed to determine the nearest representative sources of ambient air quality data for the Project site. Table 9-1 summarizes air quality levels for the selected sites for the three most recent years of available data. Table 9-1 presents the maximum annual and quarterly concentrations measured in each year at the selected stations. For most short-term averaging periods, the second highest concentration in each year is listed except for ozone (8-hour averaging period), for which the fourth highest concentration in each year is listed, and $PM_{2.5}$, for which the 98^{th} percentile value is listed. In each case, the selected value is consistent with the form of the corresponding ambient air quality standard and the frequency with which short-term standards can be exceeded without causing a violation. Unless otherwise noted, the data reviewed and summarized in Table 9-1 are based on 2005 through 2007 that was obtained from EPA's AIRDATA on-line database.

Table 9-1 Background Concentrations of Criteria Pollutants							
Pollutant	Averaging Period	Units	Ambient Concentration[1] ($\mu g/m^3$)				Monitor Location
			2004	2005	2006	2007	
CO	1-hour	ppm		**3.4**	2.9	2.2	Hackensack, Bergen County, NJ
	8-hour	ppm		**2.8**	2.2	1.8	
SO_2	3-hour	ppm		**0.021**	0.018	0.017	NYSDEC Field HQ, Gypsy Trail Road, Putnam County, NY
	24-hour	ppm		0.010	**0.011**	0.009	
	Annual	ppm		**0.002**	**0.002**	**0.002**	
PM-10	24-hour	$\mu g/m^3$		**78**	71	59	Fort Lee, Bergen Co., NJ
	Annual	$\mu g/m^3$		**35**	34	33	
PM-2.5	24-hour	$\mu g/m^3$		30	28	30	Newburgh, Orange County, NY
	Annual	$\mu g/m^3$		12.1	9.7	10.6	
NO_2	Annual	ppm	0.020	**0.022**	0.019		Fairleigh Dickinson University, Teaneck, Bergen County, NJ
Pb	3-month	$\mu g/m^3$		0.11	0.03	0.03	Walkill, Orange County, NY
O_3	1-hour[2]	ppm		0.107	0.094	0.131	Montgomery, Orange County, NY
	8-hour	ppm		0.087	0.077	0.084	

Notes:

[1] Highest second-highest short-term (1-, 3-, 8- & 24-hour) and maximum annual average concentrations presented, except for 24-hour PM-2.5, which is the 98th percentile concentration, and 8-hour O_3, which is the fourth highest concentration. Pb concentrations are maximum quarterly value in each year.

[2] 1-hour O_3 concentration provided for informational purposes only.

Bold value identifies the greatest value over the 3-year period and is presented as being a representative background concentration for the study area. Background values for PM-2.5 and O_3 are discussed in text.

Sources: USEPA AirData

9.1.4.1 Sulfur Dioxide (SO_2)

The nearest ambient monitor for SO_2 is located approximately 61 km (38 miles) east of the Project site. The monitor is located at NYSDEC Field Headquarters on Gypsy Trail Road in Putnam County, New York in a rural environment characterized by forests. Give the rural setting of the Project site and the surrounding forested areas, the data from the monitor should be reasonably representative of background SO_2 values for the Project.

The maximum annual SO_2 concentration measured in the last three years at this monitor (0.002 ppm, equivalent to approximately 5 $\mu g/m^3$) is proposed as background and is equal to approximately 7 percent of the corresponding NAAQS. The highest of the second highest 24-hour SO_2 concentrations measured in the last three years at this monitor (0.011 ppm, equivalent to approximately 29 $\mu g/m^3$ is proposed as background and is equal to approximately 8 percent of the corresponding NAAQS. The highest of the second highest 3-hour SO_2 concentrations measured in the last three years at this monitor (0.021 ppm, equivalent to approximately 55 $\mu g/m^3$, is proposed as background and is equal to approximately 4 percent of the corresponding NAAQS.

9.1.4.2 *Inhalable Particulates (PM-10 AND PM-2.5)*

The nearest ambient monitor for PM-10 is located approximately 73 km (46 miles) southeast to south-southeast of the Project site. The monitor is located at the George Washington Bridge Overpass on Lemoine Avenue in Fort Lee, New Jersey in an urban setting dominated by mobile sources. The data from this monitor should provide conservative estimates of PM-10 background air quality for the Project site.

The maximum annual PM-10 concentration measured in the last three years at this monitor (35 $\mu g/m^3$) is proposed as background and is equal to approximately 70 percent of the former annual NAAQS which is no longer in effect. The highest of the second highest 24-hour SO_2 concentrations measured in the last three years at this monitor (78 $\mu g/m^3$ is proposed as background and is equal to approximately 52 percent of the corresponding NAAQS.

The nearest ambient monitor for PM-2.5 is located approximately 37 km (23 miles) east-northeast of the Project site. The monitor is located at 55 Broadway in Newburgh, New York in Orange County. The monitor is located in an urban, center city setting with commercial land uses. The data from this monitor should provide conservative estimates of PM-2.5 background air quality for the Project site.

An annual PM-2.5 background value of 10.8 $\mu g/m^3$ is proposed based on the average annual concentration at this monitor over the last three years. This corresponds to about 72 percent of the corresponding NAAQS. A 24-hour PM-2.5 background value of 29.3 $\mu g/m^3$ is proposed based on the average of the 98^{th} percentile values at this monitor over the last three years. This corresponds to approximately 84 percent of the corresponding NAAQS.

9.1.4.3 *Nitrogen Dioxide (NO_2)*

The nearest NO_2 monitor is located approximately 67 km (about 42 miles) southeast to south-southeast of the Project site. This monitor is located at 1000 River Road at Fairleigh Dickinson University in Teaneck, New Jersey in Bergen County. The monitor is located in a suburban setting characterized by residential land uses where mobile sources are dominant. The data from this monitor should provide values reasonably representative of the Project site. The maximum annual value measured at this monitor during the period (2004-2006), the three most recent years of available data, is equal to 0.022 ppm (approximately 41 $\mu g/m^3$) and is equal to approximately 41 percent of the corresponding NAAQS.

9.1.4.4 *Carbon Monoxide (CO)*

The nearest CO monitor is located approximately 68 km (about 42 miles) south-southeast of the Project site. This monitor is located at 133 River Street in Hackensack, New Jersey in Bergen County. The monitor is in an urban and center city setting with commercial land uses where mobile sources are dominant and should provide conservative estimates of background for the Project site.. The highest of the second-high 8-hour concentrations measured in the last three years (2.8 ppm, equivalent to approximately 3200 $\mu g/m^3$) is proposed as background and represents approximately 31 percent of the corresponding NAAQS. The highest of the second-high 1-hour concentrations in the last three years (3.4 ppm, equivalent to approximately 3890 $\mu g/m^3$) is proposed as background and represents approximately 10 percent of the corresponding NAAQS.

9.1.4.5 Ozone (O_3)

The closest ozone monitor is located approximately 22 km (about 14 miles) northeast to east-northeast of the Project site. This monitor is located at 1175 Route 17k in Montgomery, New York in Orange County. The monitor is located in a suburban setting characterized by residential land uses and should provide representative background ozone concentrations for the Project site.
An 8-hour ozone background value of 0.083 ppm is calculated based on the average of the fourth highest daily maximum 8-hour ozone concentrations within the most recent three years. This exceeds the 1997 standard of 0.08 ppm and the 2008 standard of 0.075 ppm. A 1-hour ozone background value of 0.111 ppm is calculated based on the average of the second highest 1-hour concentrations measured over the last three years. This represents approximately 93 percent of the former 1-hour ozone standard which is no longer in effect in New York State.

9.1.4.6 Lead (pB)

With the phase-out of leaded motor vehicle fuels in the 1980s, the issue of ambient lead has remained only at locations proximate to certain industries (i.e., lead smelters). The closest lead monitors are those located on Ballard Road in Walkill, New York in Orange County. These monitors are located approximately 8 km (about 5 miles) northeast of the Project site in a rural area characterized by agricultural land use. However, it is believed that the existing lead monitors were located to measure lead emissions from Revere Smelting and Refining, a battery recycling facility that includes a secondary lead smelter. Therefore, the lead concentrations measured in the immediate vicinity of Revere Smelting and Refining will provide a very conservative estimate of background lead concentrations in the vicinity of the Project site. Maximum quarterly values of 0.11 $\mu g/m^3$, 0.33 $\mu g/m^3$, and $\mu g/m^3$ have been measured at monitors in Walkill in the last three years. The maximum quarterly value of 0.11 $\mu g/m^3$ in 2005 represents about 7 percent of the corresponding NAAQS.

9.2 APPLICABLE REQUIREMENTS AND REQUIRED ANALYSES

This section contains an analysis of the applicability of federal and New York State air quality regulations to the proposed CPV Valley Energy Center. The specific regulations included in this review are Federal New Source Performance Standards (NSPS), NYSDEC Requirements, Non-Attainment New Source Review (NSR) Requirements, PSD Requirements, Air Quality Impacts Analysis Requirements, Federal Acid Rain Program Requirements, and Federal NO_x Budget Program Requirements.

9.2.1 Federal New Source Performance Standards

The NSPS are technology-based standards applicable to new and modified stationary sources. NSPS requirements have been established for approximately 70 source categories. Five subparts apply to the proposed facility:

- General Provisions (40 Code of Federal Regulations (CFR) Part 60, Subpart A);
- Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units (40 CFR Part 60, Subpart Dc); and
- 40 CFR Part 60, Subpart Kb: Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced after July 23, 1984); and
- Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR Part 60, Subpart IIII); and
- Standards of Performance for Stationary Combustion Turbines (40 CFR Part 60, Subpart KKKK).

The following subsections describe the requirements under the five currently applicable NSPS regulations in greater detail.

9.2.1.1 General Provisions

The combustion turbine, duct burner, auxiliary boiler and fuel oil storage tank are subject to the general provisions for NSPS units in 40 CFR Part 60 Subpart A. These may include the following 40 CFR Parts 60.7 and 60.8 requirements:

40 CFR 60.7 Notification and Record Keeping

(a)(1) A notification of the date of construction start—no later than 30 days after such date.

(a)(3) A notification of actual date of initial startup—within 15 days after such date.

(a)(5) A notification of the date of continuous monitoring system performance commences—not less than 30 days prior to such date.

(b) Maintain quarterly records of the startup, shutdown, or malfunction of facility, air pollution control equipment, or continuous monitor system.

(c) Excess emissions reports - by the 30^{th} day following end of each quarter. (required even if no excess emissions occur).

(f) Maintain file of all measurements, maintenance, reports, and records for two years.

40 CFR 60.8 Performance Tests

(a) Performed within 60 days after achieving maximum production rate but no later than 180 days after initial startup.

(d) Notification of performance tests at least 30 days prior.

9.2.1.2 Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

The auxiliary boiler is subject to the provisions of 40 CFR Part 60, Subpart Dc because its maximum heat input capacity is between 10 and 100 mmBtu/hr. Subpart Dc requires an initial notification for each unit and one-time opacity test for boilers that operate only on natural gas such as the one proposed. In addition, records must be maintained regarding the amount of fuel burned on a daily basis, however since natural gas is the only fuel burned in the proposed boiler, there is no reporting requirement to EPA.

9.2.1.3 40 CFR Part 60, Subpart Kb: Standards of Performance for Volatile Organic Liquid Storage Vessels

The Project would include a volatile organic liquid storage vessel (oil tank) with a capacity greater than 40 cubic meters. As such the tank would be subject to 40 CFR 60 Subpart Kb. Since the vapor pressure of the oil tank is less than 3.5 kilopascals (kPa), the only requirement applicable is the recordkeeping requirement specified in 40 CFR 60.116b(b). The proposed facility would maintain records showing the dimensions and capacity of the oil storage tank.

9.2.1.4 40 CFR Part 60, Subpart IIII: Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The emergency diesel generator and the emergency fire pump are subject to the provisions of 40 CFR Part 60, Subpart IIII. For model year 2009 and later fire pump engines with a displacement less than 30 liters per cylinder and an energy rating between 300 and 600 hp, Subpart IIII limits NMHC + NOx emissions to 4.0 g/kW-hr and PM emissions to 0.2 g/kW-hr. To comply with Subpart IIII, the emergency diesel generator must meet the emission standards for new nonroad CI engines. These limits are 6.4 g/kW-hr for NMHC + NOx, 3.5 g/kW-hr for CO and 0.20 g/kW-hr for PM. In addition to the emission limits, beginning on October 1, 2010 all stationary CI internal combustion engines with a displacement of less than 30 liters per cylinder must use diesel fuel with a maximum sulfur content of 15 ppm. The proposed limits for the emergency engines meet and/or exceed these limits. In addition, CPV Valley will be burning ULSD in these units which meets the 15ppm maximum sulfur in fuel limit.

9.2.1.5 40 CFR Part 60, Subpart Kkkk: Standards of Performance Stationary Combustion Turbines

The combustion turbines and duct burners are subject to the provisions of 40 CFR Part 60 Subpart KKKK by virtue of the maximum firing capacity of the units and the proposed date of installation. For turbines greater than 850 mmBtu/hr firing, this subpart limits flue gas concentrations of NO_x to 15 ppm when firing natural gas and 42 ppm when firing fuels other than natural gas. The air pollutant emission standard for SO_2 emissions limits the turbine emissions to 0.90 lb/MWh gross output or 0.060 lb/mmBtu heat input. The proposed emissions based on natural gas and fuel oil operations are well below these levels.

Additionally, the provisions of this subpart require continuous monitoring of water-to-fuel ratio, but allow for the use of either a 40 CFR Part 60 or Part 75 certified NO_x CEMS in lieu of this monitoring requirement. CPV Valley is proposing to use 40 CFR Part 75 certified NO_x CEMS to comply with this requirement.

9.2.2 NYS Department of Environmental Conservation Regulations and Policy

Applicable NYSDEC Air Regulations and the associated proposed means of project compliance are identified below:

- Part 200 defines general terms and conditions, requires sources to restrict emissions, and allows NYSDEC to enforce NSPS, PSD, and National Emission Standards for Hazardous Air Pollutants (NESHAP). Part 200 is a general applicable requirement; no action is required by the facility.

- Part 201 requires existing and new sources to evaluate minor or major source status and evaluate and certify compliance with all applicable requirements. The Project would represent a new major Part 201 source, and is seeking a construction/operation permit under 201-5, and would apply for a Title V operating permit under 201-6 within one year of commencing operation.

- Part 202-1 requires a source to conduct emissions testing upon the request of NYSDEC. NYSDEC has the right to require stack testing of new or existing sources. Permit conditions covering construction of the proposed project would likely require stack testing as a condition of receiving permission to operate.

- Part 202-2 requires sources to submit annual emission statements for emissions tracking and fee assessment. Pollutants are required to be reported in an emission statement if certain annual thresholds are exceeded. Project emissions would be reported as required.

- Part 204 regulates the NO_x Budget program for the year 2003 ozone season and beyond. Program requirements, including allowance allocations, new source set-asides, banking, trading, and account reconciliation, NO_x monitoring and reporting, and regulatory time lines are addressed in Part 204. (NO_x Budget program requirements are more fully addressed in Section 9.2.6 of this Chapter).

- Part 211-3 defines general opacity limits for sources of air pollution in New York State. General applicable requirement facility-wide visible emissions are limited to 20 percent opacity (6-minute average) except for one continuous six-minute period per hour of not more than 57 percent opacity. Note that the opacity requirements under Part 227-1 (see below) are more restrictive and supersede the requirements of Part 211-3.

- Part 225-1 regulates sulfur content of fossil fuels. For facilities located in Orange County, fuel sulfur is limited to 2% by weight for fuel oil. CPV Valley, however, proposes to use much cleaner 0.0015% sulfur ULSD. The Project will not fire residual oil.

- Part 227-1.2 sets a 0.10 lb/mmBtu particulate limit for oil-fired stationary combustion installations with a maximum heat input capacity exceeding 250 mmBtu/hr. CPV Valley proposes to comply with this emission limit by proposing a maximum particulate limit of 0.0368 lb/mmBtu when the combustion turbine is operating on fuel oil.

- Visible emissions (opacity) for stationary fuel-burning equipment are regulated under 6 New York Code of Regulations and Rules (NYCRR) Subpart 227-1.3. Facility stationary combustion installations must be operated so that the following opacity limits are not violated; 227-1.3(a) 20 percent opacity (six minute average), except for one six-minute period per hour of not more than 27 percent opacity.

- Part 227-2 sets NO_x RACT emission limits for combustion sources. Under 227-2.4(e), the combined cycle combustion turbine must meet a NO_X RACT limit of 42 ppm and 65 ppm, dry volume, corrected to 15% O_2, when firing natural gas and oil, respectively. The proposed NO_x emission limits for this Project (2.0 ppm for gas firing without/with duct firing and 6.0 ppm for oil firing) will be significantly more restrictive. Recordkeeping and reporting requirements under Part 227-2 will apply.

- Part 231 requires new source review of new major sources and/or major modifications of existing facilities in USEPA-designated non-attainment areas. Under Subpart 232-2, which regulates sources that were operational after November 14, 1992, CPV Valley must address LAER for NO_x and VOC, since potential annual emissions of each of these pollutants are greater than the respective major source thresholds. Non-attainment emission offsets will need to be purchased for NO_x and VOC. See Section 3.5 of the PSD and Part 201 Air Permit Application (Appendix H) for a complete analysis of all Part 231 requirements.

- New York State has promulgated its Acid Deposition Reduction Program (ADRP). As such, the SO_2 and NO_x Budget trading programs established in 6 NYCRR Parts 237 and 238 are in effect, and would apply to the facility (25 MW threshold) once operation commences. As with the Federal NO_x and SO_2 Trading Programs, affected facilities must hold allowances in their account equal to emissions. The ADRP NO_x Budget Program will extend NO_x allowances requirements to a year-round basis.

- New York State has promulgated its CO_2 Budget Trading Program in 6 NYCRR Part 242. The Project combined cycle units will be subject to the requirements of this section, including the need to obtain a permit, to appoint an authorized account representative, to monitor and report CO_2 emissions, to hold and surrender sufficient CO_2 allowances to account for its emissions, and to certify compliance with program requirements.

- Under 6 NYCRR 257, New York's ambient air quality standards, project emissions must be such as not to exceed state ambient air standards for SO_2, PM, CO, photo-chemical oxidants, NO_2, fluorides, beryllium and hydrogen sulfide.

- To meet NYSDEC guidelines for ammonia (NH_3) "slip", combined cycle stack emissions of NH_3 would be limited to 2 ppm when the turbines are firing natural gas and 5 ppm when the turbines are firing oil, by controlling the NH_3 injection rate and employing good operating practices.

Other NYSDEC requirements, not directly related to emissions from the proposed facility, but potentially related to the new facility in general, including 6 NYCRR Parts 207, Part 215, and

Part 221, would be addressed and/or incorporated into the Part 201-6 Title V permit pursuant to established regulatory deadlines.

9.2.3 Attainment Status and Compliance with Air Quality Standards

USEPA has established NAAQS for seven criteria pollutants for the protection of public health and welfare: SO_2, PM-10, PM-2.5, NO_2, CO, ozone O_3, and Pb. USEPA has set both primary and secondary NAAQS for these pollutants. The results of clinical and epidemiological studies established the primary NAAQS to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. The secondary NAAQS protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. USEPA has established both short-term and long-term standards.

The NYSDEC has adopted the NAAQS as the New York Ambient Air Quality Standards (NYAAQS), as shown in Table 9-2. In addition, NYSDEC has NYAAQS for TSP, gaseous fluoride, beryllium, and hydrogen sulfide.

The proposed location of the Project is an area currently designated as attainment or unclassifiable for SO_2, CO, NO_2, and PM-10. Therefore, for these pollutants, the Project is required to demonstrate compliance with the NYAAQS and NAAQS shown in Table 9-2. Orange County is located in the ozone transport region. Therefore, facilities emitting more than 100 tons/year of NO_x or 50 tons/yr of VOC are subject to Non-Attainment NSR requirements for these pollutants. Orange County is also designated as non-attainment for PM-2.5.

In order to identify those new sources with the potential to impact ambient air quality, the USEPA and the NYSDEC have adopted Significant Impact Levels (SILs) for NO_2, SO_2, CO, and PM-10, as shown in Table 9-2. New sources that have maximum modeled air quality impacts that exceed SILs require a more comprehensive analysis that considers the combined impacts of the new source, existing sources, and measured background levels, in order to evaluate compliance with NAAQS, and compliance with PSD increments.

According to the NYSDEC and the USEPA, sources with concentrations below the SILs do not warrant such an assessment. The Project has predicted maximum air quality impacts that are less than the SILs for NO_2, CO, and SO_2 as demonstrated in Section 9.5.3. The Project has also predicted maximum impacts that are less than SILs for PM-10 for cases when the combined cycle units are firing natural gas. Therefore, no cumulative impact modeling of the Project with other facilities is required for NO_2, CO, and SO_2, and no cumulative impact modeling is required for PM-10 for natural gas firing in the combined cycle units. Maximum predicted Project impacts of PM-10 during ULSD firing in the combined cycle units exceed the 24-hour SIL, so that cumulative impact modeling of the Project with other facilities is required for PM-10 for cases for ULSD is fired in the combined cycle units.

Table 9-2
National and New York Ambient Air Quality Standards,
PSD Increments and Significant Impact Levels (µg/m3)

Pollutant	Averaging Period	NAAQS	NYAAQS	PSD Increments Class II	Significant Impact Level
Sulfur Dioxide (SO_2)	3-hour	1,300[1]	1,300[1]	512[1]	25
	24-hour	365[1]	365[1]	91[1]	5
	Annual	80[2]	80[2]	20[2]	1
Nitrogen Dioxide (NO_2)	Annual	100[2]	100[2]	25[2]	1
Particulate (PM-10)[3]	24-hour	150[4]	N/A	30[1]	5
	Annual	50[5]	N/A	17[1]	1
Total Suspended Particulate (TSP)	24-hour	N/A	250[6]	N/A	N/A
	Annual	N/A	45[7]	N/A	N/A
Carbon Monoxide (CO)	1-hour	40,000[1]	40,000[1]	N/A	2,000
	8-hour	10,000[1]	10,000[1]	N/A	500
Ozone (O_3)	1-hour	235[5]	235[8]	N/A	N/A
	8-hour	160[9]	N/A	N/A	N/A
Lead (Pb)[3]	Quarterly	1.5[2]	N/A	N/A	N/A
Fine Particulate (PM-2.5)[3]	24-hour	35[10]	35	N/A	5[11]
	Annual	15[12]	15	N/A	0.3[11]
Gaseous Fluorides (as F)[13]	12-hour	N/A	3.70[2]	N/A	N/A
	24-hour	N/A	2.85[2]	N/A	N/A
	1-week	N/A	1.65[2]	N/A	N/A
	1-month	N/A	0.80[2]	N/A	N/A
Beryllium[13]	1-month	N/A	0.01[2]	N/A	N/A
Hydrogen Sulfide[13]	1-hour	N/A	14[2]	N/A	N/A
Settleable Particulates[13,14]	Annual	N/A	0.30[15]	N/A	N/A
	Annual	N/A	0.45[16]	N/A	N/A

Notes:
[1] Not to be exceeded more than once per year.
[2] Not to be exceeded.
[3] Federal standard not yet officially adopted by NYS, but is currently being applied to determine compliance status.
[4] Fourth highest concentration over a three-year period.
[5] Average of three annual average concentrations.
[6] Not to be exceeded more than once per year on average.
[7] Geometric mean of the 24-hour average concentrations over 12-month period. Based on assumption that the most stringent standard associated with Level 1 areas could apply.
[8] Former NYS standard for 1-hour ozone of 160 ug/m^3 was not officially revised via regulatory process to coincide with the federal standard, however NYS currently using federal standard to determine compliance status.
[9] Not effective until June 15, 2005.
[10] Average 98^{th} percentage over a three year period.
[11] Based on NYS Interim Policy CP-33.
[12] Average annual mean concentration over a three-year period.
[13] Pollutant would not be emitted from the Project.
[14] Based on assumption that the Project site could be located in a Level I air quality area.
[15] Units of milligrams per centimeter squared per month (mg/cm^2/mo). Fifty percent of the monthly values shall not exceed.
[16] Units of mg/cm^2/mo. Eighty-four percent of the monthly values shall not exceed.
Source: 40 CFR 50; 6 NYCRR 257; 40 CFR 52.

No SILs have been formally established by EPA or NYSDEC for $PM_{2.5}$. EPA has proposed a range of possible SILs for $PM_{2.5}$ but has not taken final action on its proposed rulemaking. NYSDEC Commission's Policy 33 (CP-33), "Assessing and Mitigating Impacts of Fine Particulate Matter Emissions" was issued on December 29, 2003 for use with projects for which NYSDEC is the lead agency conducting a review for purposes of the State Environmental Quality Review Act (SEQRA). For projects with emissions exceeding a *de minimis* emissions threshold of 15 tpy for PM-10, CP-33 uses 24-hour and annual Project impact levels of 5 micrograms per cubic meter ($\mu g/m^3$) and 0.3 for $\mu g/m^3$, respectively, to determine if a Project has a "potentially significant adverse impact."

9.2.4 Prevention of Significant Deterioration (PSD)

Combined cycle power plants with emissions of one or more criteria pollutants in excess of 100 tons per year are considered a new major stationary source subject to PSD review. As shown in Table 9-3, regulated criteria pollutant emissions of at least one pollutant would exceed this threshold. Thus, the proposed facility will be subject to PSD review.

The PSD regulations state that facilities subject to PSD review must perform an air quality analysis (which can include atmospheric dispersion modeling and pre-construction ambient air quality monitoring), a Best Available Control technology (BACT) analysis, and an additional impact analysis, for those pollutants having potential emissions that exceed the pollutant-specific significant emission rates identified in the regulations. Table 9-3 shows that PSD review is required for NO_x, CO, PM/PM-10, SO_2, and sulfuric acid mist (H_2SO_4) emissions. Since the LAER requirements are at least as stringent as BACT, the LAER analysis would satisfy the technology requirements for NO_x. A discussion of the BACT analysis for CO, PM/PM-10, SO_2, and H_2SO_4 is included in Section 9.3.

Table 9-3
PSD and Non-Attainment NSR Significant Emission Rates and Project Potential Emission Rates

Pollutant[1]	PSD Significant Emission Rates (tons/year)	NSR Significant Emission Rates (tons/year)	Annual Facility Emissions (tons/year)	PSD/NSR Triggered? (Yes/No)
Carbon Monoxide	100	N/A	344.0	Yes
Sulfur Dioxide	40	100/40	41.3	Yes
TSP	25	N/A	95	Yes
PM-10	15	N/A	95	Yes
PM-2.5	10	100/10	95	No
Nitrogen Oxides	40[2]	100[3]	187.0	Yes
VOC	40	50[3]	64.6	Yes
Sulfuric Acid Mist	7	N/A	12.6	Yes
Lead	0.6	N/A	0.02	No

Notes:
[1] Regulated substances not emitted by the proposed project (e.g., fluorides and total reduced sulfur) have not been included in the table.
[2] PSD threshold is for NO_2.
[3] Ozone non-attainment major source threshold.

Source: TRC Environmental, 2008; 6 NYCRR 231-2 and 40 CFR 52.21 (b)(23)(i).

In addition to assessing impacts on NAAQS, facilities subject to PSD review must demonstrate compliance with the PSD increments established for SO_2, NO_2, and PM-10. The proposed CPV Valley Project site is located in a PSD Class II area and will be subject to the PSD Class II increments, as well as the NAAQS. The Class II PSD increments are presented in Table 9-2.

9.2.4.1 Ambient Air Quality Monitoring

Proposed facilities subject to PSD review may have to perform up to one year of pre-construction ambient air quality monitoring for those pollutants with emission rates exceeding the thresholds specified in 40 CFR 52.21(b)(23)(i) and shown in Table 9-3, unless granted an exemption by the reviewing agency. USEPA may grant an exemption from monitoring if the proposed source demonstrates that it will have maximum impacts below the pollutant-specific Significant Monitoring Concentrations that are presented in Table 9-4, or if representative quality-assured data already exist. CPV Valley demonstrated that maximum predicted impacts from the Project will be below the corresponding SMCs and submitted a request to USEPA in November 2008 for a waiver from pre-construction air quality monitoring. Results of the air quality modeling included in the PSD and Part 201 Air Permit Application (TRC, 2008) and in this report demonstrate that the Project's final design supported the requested waiver from pre-construction air quality monitoring.

Table 9-4
USEPA Significant Monitoring Concentrations

Pollutant	Averaging Period	Significant Monitoring Concentration ($\mu g/m^3$)
Carbon Monoxide	8-hour	575
Nitrogen Dioxide	Annual	14
Sulfur Dioxide	24-hour	13
Particulates (PM-10)	24-hour	10
Lead	3-month	0.1

Note:
[1] SMCs exist for the following pollutants not emitted by the Project: fluorides, total reduced sulfur, hydrogen sulfide, and reduced sulfur compounds.

Source: 40 CFR 52.21(i)(5)(i).

9.2.4.2 Impact Area Determination

The impact on air quality must be determined for each pollutant subject to PSD review. When modeled concentrations of applicable pollutants are greater than the SILs shown in Table 9-2, significant impacts are deemed to result. The impact area is defined as the area within the greatest distance from the facility at which the modeled concentrations are greater than the PSD SILs. As shown in Section 9.5.3, calculated impacts of all pollutants except for PM-10 are less than the corresponding SILs established by EPA. Therefore, additional cumulative impact modeling is required for PM-10 for those operating cases in which ULSD is fired in the combined cycle units. The maximum extent of the area in which the Project is predicted to have significant 24-hour PM-10 impacts is approximately 4.6 kilometers. The maximum predicted annual Project impacts of PM-10 are below the corresponding SIL established by EPA.

9.2.4.3 Additional Impact Analyses

As explained in the draft USEPA Guidance Document New Source Review Workshop Manual (USEPA, 1990) certain additional analyses are required as part of PSD review and NYSDEC regulations. These include a growth analysis (and estimation of any growth-related emissions) and modeling to assess potential for impacts to visibility, soils and vegetation in the area surrounding the proposed project.

9.2.4.4 Impacts on Class I Areas

According to published USEPA guidance, proposed major sources within 100 km of a Class I area must perform an assessment of potential impacts in the Class I area. The closest Class I area to the Project is the Brigantine Wilderness Area in New Jersey. The closest portion of the Brigantine Wilderness Area is approximately 206 km from the Project site. The next closest Class I area is the Lye Brook Wilderness Area. The closest portion of the Lye Brook Wilderness Area is approximately 215 km from the Project site. Other Class I areas are well beyond 300 km from the Project site.

Given the potential to emit of the Project and the distance to the nearest Class I areas, it is expected that the Project will qualify for an exemption from potential Class I impact modeling requirements for air quality related values (AQRVs) and visibility. The Project has consulted with the Federal Land Managers for the nearest Class I areas to request a determination that the Project would be exempt from any Class I modeling requirement.

Even though the Project will likely be exempt from the need for any Class I impact modeling, a Level-1 visibility impact screening analysis using the EPA VISCREEN model with default assumptions was conducted using maximum proposed short-term (lb/hr) emission rates of NO_x, PM, and primary sulfate as represented by sulfuric acid mist (H_2SO_4) emissions for the Project. The resulting visibility impacts inside the Brigantine Wilderness Area and the Lye Brook Wilderness Area due to maximum proposed emissions from the Project are below screening thresholds for Class I areas. Additional information and results concerning Class I impacts are presented in Section 9.5.4.

9.2.4.5 Environmental Justice

The purpose of the Environmental Justice (EJ) program is to evaluate whether minority (and in USEPA Region 2—low-income) communities are affected adversely or disproportionately by the actions of federal agencies, including approvals under the PSD program. The EJ analysis is presented in Chapter 7 of this DEIS.

9.2.5 Non-Attainment New Source Review Requirements

The Project is subject to non-attainment review for NO_x and VOC. The pre-construction review requirements for major new sources or major modifications located in areas designated non-attainment pursuant to Section 107 of the Clean Air Act Amendments of 1990 (CAAA) differ from the PSD requirements. Based upon the provisions of 6 NYCRR Subdivision 231-2.4: “Permit Requirements”, facilities subject to the provisions of 6 NYCRR Subpart 231-2 (i.e., major sources or major modifications located in areas designated by USEPA as non-attainment or transport areas) must demonstrate, as part of the permit application, that several special conditions are met. These include the need to apply LAER and obtain offsets, (i.e., ERCs). Additional requirements specific to offsetting are provided in 6 NYCRR 231-2.4:

1. The identification of each emission source from which an emission offset will be obtained. Information required must include the name and location of the Facility, emission point identification number, and the mechanism(s) proposed to effect the emission reduction credit (i.e., shutdown, curtailment, installation of emission control equipment) (from 6 NYCRR 231-2.4(a)(1)).

2. The certification that all emission sources which are part of any major facility located in New York State and under the applicant’s ownership or control (or under the ownership or control of any entity which controls, is controlled by, or has common ownership or control of any entity which controls, is controlled by, or has common control with the applicant) are in compliance, or are on a schedule for compliance, with all applicable emission limitations and standards under Chapter III of Title 6 (Environmental Conservation) (from 6 NYCRR 231-2.4(a)(2)(i)).

3. The submission of an analysis of alternative sites, sizes and production processes, and environmental control techniques which demonstrate that benefits of the proposed source project or proposed major facility significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification within New York State (from 6 NYCRR 231-2.4(a)(2)(ii)).

9.2.5.1 Emissions Offset Requirements

A major source or major modification planned in a USEPA-designated non-attainment area must obtain emissions reductions as a condition for approval. The emissions reductions, generally obtained from existing sources located in the vicinity of a proposed source, must (1) offset the emissions increase from the new source or modification, (2) provide a net air quality benefit on balance (for CO, PM-10 and PM-2.5 offsets only), and (3) satisfy a “contribution test” for VOC and NO_x offsets. These offsets, obtained from existing sources that implement a permanent, enforceable, quantifiable and surplus emissions reduction, must equal the emissions increase from the new source or modification multiplied by an offset ratio.

9.2.5.2 Emission Reduction Credit Requirements

The Project is located in a non-attainment area for ozone and will be required to purchase ERCs. The USEPA allows ERCs to be traded across state lines and the State of New York has reciprocal trading agreements with Pennsylvania and Connecticut for NO_x and VOC. The calculation of required offsets for the proposed project is presented in Table 9-5.

Table 9-5 Calculation of Offsets			
Non-Attainment Pollutant	**Potential Emissions (tons/year)**	**Proposed Offset Ratio**	**Required Offsets (Rounded Up)**
Nitrogen Oxides	187.0	1.15:1	216
Volatile Organic Compounds	64.6	1.15:1	75
Source: TRC, 2008.			

9.2.5.3 Availability and Certification of Emission Reduction Credits

As was previously noted, each emission source providing offsets must be identified along with the proposed mechanism to effect the emission reduction. After the sources of the emission offsets are identified, the offsets will need to be certified pursuant to the requirements of 6 NYCRR Subpart 231-2.6 "Emission Reduction Credits." If the source identification is not made prior to the issuance of a draft permit for the Project, then the offset transaction will be subject to a separate notice and hearing process from the air permit application itself. ERCs may be created from past or future facility shutdowns, emission unit shutdowns or other reduction mechanisms acceptable to NYSDEC.

NYSDEC maintains a registry of emission reduction credits for sources that have fulfilled the requirements for certifying emission reduction credits through enforceable permit modifications. This registry may be utilized by CPV Valley in obtaining the required offsets. As of October 1, 2008, the ERC Registry reported more than 9,900 tons of NO_x offsets and over 2,770 tons of VOC offsets available within New York.[1] CPV Valley is currently in discussions relating to NO_x and VOC offsets and will identify the source of offsets prior to issuance of a draft permit.

9.2.5.4 Compliance Status of CPV Valley, LLC's New York Facilities

CPV does not own, but operates the Athens Generating Plant, a 1080 MW natural gas combined cycle plant located in Athens, Greene County, New York. At the present time, the Athens facility is operating in full compliance with Title III (Environmental Conservation).

9.2.5.5 Analysis of Alternatives

Based upon the NYSDEC requirements at 6 NYCRR 231-2.4(a)2(ii), the Project is required to conduct an analysis of "alternative sites, sizes, production processes and environmental control techniques for the proposed facility, which demonstrates that the benefits of the proposed facility significantly outweigh the environmental and social costs" imposed as a result of the proposed construction. Alternative emission control technologies are identified and evaluated for this high-efficiency advanced technology combined cycle equipment in the BACT and LAER control technology analyses in the air permit application and the alternatives analysis included in Chapter 19.0 of this EIS.

[1] The ERC Registry is available on the Internet at http://www.dec.ny.gov/chemical/8946.html.

9.2.5.6 Public Need for the Project

The public need for this project is discussed in Chapter 1.0, “Project Purpose and Need.”

9.2.5.7 Benefits of the Proposed Facility

The purpose of the proposed, approximately 630-MW CPV Valley Energy Center is to provide economical, reliable, efficient and environmentally safe electricity to residents of New York and Orange County. See Chapter 1.0, “Project Purpose and Need.”

9.2.6 NO_x SIP Call (NO_x Budget Program) Requirements

In October 1998, USEPA finalized the “Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone” (commonly called the NO_x State Implementation Plan (SIP) Call.) The NO_x SIP Call was designed to mitigate significant transport of NO_x, one of the precursors of ozone. For those states opting to meet the obligations of the NO_x SIP Call through a cap and trade program, USEPA included a model NO_x Budget Trading Program rule (Part 96). This trading program was developed to facilitate cost effective emissions reductions of NO_x from large stationary sources. Part 96 provides sources with a complete trading program including provisions for applicability, allocations, monitoring, banking, penalties, trading protocols and program administration. States choosing to participate in the NO_x Budget Trading Program have the flexibility to modify certain provisions within the model rule.

Regulations covering New York State’s implementation of the NO_x SIP Call have been codified in Parts 204 and 237. Allowances for an affected unit will be based on actual operations during specific, preceding baseline periods, and will be “self-adjusting” based on the affected unit’s operating history. Quantities of NO_x allowances will be set aside for new sources and to reward energy efficiency measures. The allowances that have been set aside will be provided to new sources to cover actual NO_x emissions; new sources will continue to have these allowances provided until the new facility is able to establish a 3-year baseline of operations.

A facility subject to the provisions of the NO_x SIP Call must identify an Authorized Account Representative (AAR) and establish a NO_x Allowance Trading Account. The AAR is responsible for maintaining the facility account, including ensuring that enough allowances are in place in time to meet the regulatory deadline. Shortfalls in the account can be made up by either transferring allowances from another facility account or outright purchase of the needed allowances.

In order to ensure that NO_x emissions do not exceed allowances, budget sources are required to monitor and report NO_x emissions during the control period of each year. The preferred method of emissions monitoring includes utilization of sophisticated CEMS, as approved under 40 CFR 75 (the Acid Rain Program). Although Part 75 need not be followed for the NO_x SIP Call (the program allows for monitoring at a “near Part 75” level of effort), the issue becomes moot given that the Project would need to comply with Part 75 under the Acid Rain program (see Section 9.8). Any budget source currently subject to Part 75 monitoring must maintain and use that monitoring system for emissions tracking under the NO_x SIP Call. The NO_x SIP Call permit application is included in the PSD and Part 201 Air Permit Application (TRC, 2008).

9.2.7 Federal Acid Rain Regulations

Title IV of the CAAA required USEPA to establish a program to reduce emissions of acid rain forming pollutants, called the Acid Rain Program. The overall goal of the Acid Rain Program is to achieve significant environmental benefits through reductions in SO_2 and NO_x emissions. To achieve this goal, the program employs both traditional and market-based approaches for controlling air pollution. Under the market-based part of the program, existing units are allocated SO_2 allowances by the USEPA. Once allowances are allocated, affected facilities may use their allowances to cover emissions, or may trade their allowances to other units under a market allowance program. In addition, applicable facilities are required to implement CEMS for affected units.

9.2.7.1 Monitoring Requirements

The CEMS requirements of the Acid Rain Program include: an SO_2 concentration monitor, a NO_x concentration monitor, a CO_2 concentration monitor, a volumetric flow monitor, an opacity monitor, a diluent gas (O_2) monitor, and a computer-based data acquisition and handling system for recording and performing calculations. Title IV Acid Rain NO_x emission limits have only been established for coal-fired utility boilers at this time. Therefore, the proposed project is not subject to the NO_x emission limitations, although NO_x (and CO_2) needs to be continuously monitored to satisfy agency "data gathering" requirements. CO_2 emissions, as measured by an O_2 diluent monitor, are an acceptable source of data for the Acid Rain program. The Acid Rain program allows for alternate methods of SO_2 monitoring for facilities that fire only low-sulfur gaseous fuels or primarily fire low-sulfur gaseous fuels (i.e., at least 90 percent of the unit's average annual heat input during the previous three calendar years and for at least 85 percent of the annual heat input in each of those calendar years). An allowable alternate method would include fuel flow monitoring and mass balance reconciliation of SO_2 emissions from fuel sulfur content.

Implementation of the Acid Rain Program by the USEPA has been broken into two phases. Phase I of the program required 110 sources identified in the 1990 CAAA to operate in compliance by January 1, 1995. Facilities identified in Phase II of the program were required to operate in compliance by January 1, 2000. Additionally, existing Phase II facilities were required to install and operate a certified CEMS by January 1, 1995. The CPV Valley Energy Center is subject to the Acid Rain Program based upon the provisions of 40 CFR 72.6(a)(3) since the combustion turbine is considered a utility unit under the program definition and does not meet the exemptions listed under paragraph (b) of this Section. The Project would be subject to Phase II Acid Rain requirements and CPV Valley would be required to submit an acid rain permit application by the 24 months prior to the date on which the unit expects to begin service as a generator. The Phase II Acid Rain permit application for this project is included in the PSD and Part 201 Air Permit Application (TRC, 2008).

9.2.7.2 Calculation of SO_2 Allowances Required

Based upon the regulatory impact analysis presented above, the CPV Valley Energy Center would be required to obtain SO_2 allowances in order to comply with the requirements of the Acid Rain regulations as promulgated in 40 CFR 72 and 40 CFR 73. At the end of each operating year, affected emission units must hold in their compliance subaccounts a quantity of allowances equal to or greater than the amount of SO_2 emitted during that year. To account for emissions for the previous year, such units must finalize allowance transactions and submit them to USEPA by January 30 to be recorded in their unit accounts. The quantity of emissions is determined in accordance with the monitoring and reporting requirements described in 40 CFR 75.

After the January 30 deadline and the recording of the final submitted transfers, USEPA deducts allowances from each unit's compliance subaccount in an amount equal to its SO_2 emissions for that year. If the unit's emissions do not exceed its allowances, the remaining allowances are carried forward, or banked, into the next year's subaccount, which then becomes the current compliance subaccount. If a unit's emissions exceed its allowances, the unit must pay a penalty and surrender allowances for the following year to USEPA as excess emission offsets. Unless otherwise provided in an offset plan, USEPA deducts allowances from the compliance subaccount in an amount equal to the excess emissions.

The Project would be required to obtain SO_2 allowances. Based upon potential emission calculations, the Project would be required to purchase no more than 42 tons of allowances per year. Project emission calculations were included in Appendix B of the PSD and Part 201 Air Permit Application (TRC, 2008) and in Appendix 9-B.

9.2.7.3 Sources of Allowances

In addition to annual allocations from the USEPA, allowances are also available upon application to three USEPA reserves. In Phase I, units can apply for and receive additional allowances by installing qualifying Phase I technology (a technology that can be demonstrated to remove at least 90 percent of the unit's SO_2 emissions) or by reassigning their reduction requirements among other units employing such technology. A second reserve provides allowances as incentives for units achieving SO_2 emissions reductions through customer-oriented conservation measures or renewable energy generation. The third reserve contains allowances set aside for auctions, which are sponsored yearly by USEPA. In addition, allowances are given as incentives for utilities that replace boilers with new, cleaner and more efficient technologies.

Units that began operating in 1996 or later (such as the proposed project) will not be allocated allowances. Instead, they will have to purchase allowances from the market or from the USEPA auctions and direct sales to cover their annual SO_2 emissions.

Allowances may be bought, sold, and traded by any individual, corporation, or governing body, including brokers, municipalities, environmental groups, and private citizens. The primary participants in allowance trading are officials designated and authorized to represent the owners and operators of electric utility plants that emit SO_2. Other potential participants are utility power pools, or groups of units choosing to aggregate some or all of the allowances held by the individual units within the pool. The parties involved in the pool determine the details of these allowance-pooling arrangements. There is an ample supply of SO_2 allowances available to the Project.

9.2.8 Maximum Achievable Control Technology (MACT) Applicability

The CPV Valley Energy Center combustion turbine and auxiliary boiler are among the source categories regulated under Maximum Achievable Control Technology (MACT) by USEPA at facilities that are major sources of hazardous air pollutants pursuant to 40 CFR Part 63. On March 5, 2004, USEPA published the final NESHAP for stationary combustion turbines (40 CFR 63, Subpart YYYY), and then proposed to de-list lean pre-mix gas-fired combustion turbines and certain other subcategories from the NESHAP on April 7, and issued a stay on the effectiveness of the emission limits on lean pre-mix and diffusion-flame gas-fired combustion turbines on August 18, 2004. Lean-premix and diffusion-flame oil-fired gas combustion turbines are subject to requirements that include a formaldehyde emission standard and monitoring of either oxidation catalyst inlet temperature or other operating conditions. Likewise on September 13, 2004, USEPA finalized the NESHAP for industrial, commercial and institutional boilers (Subpart DDDDD) that include CO emission limits for large (> 10 mmBtu/hr) gas and oil-fired boilers and TSP and hydrochloric acid (HCl) emissions limits for large oil-fired boilers.

Current USEPA AP-42 emission factors, other emission factors and correspondence from the Siemens Westinghouse combustion turbine vendor were reviewed in determining if the Project was subject to MACT. Based upon potential emissions calculation, the maximum single hazardous air pollutant emissions would be less than the 10 tons/year MACT applicability threshold (for a single pollutant). In addition, combined hazardous pollutant emissions likewise would be below the applicability threshold of 25 tons/year. Therefore, the MACT requirement does not apply to the proposed project.

9.2.9 Section 112(R) RISK MANAGEMENT PROGRAM

Aqueous ammonia would be used as the reducing agent in the Project's SCR system for controlling NO_x emissions from the combustion turbine/duct burner. The NO_x reduction achieved by the SCR system is affected by the ratio of NH_3 to NO_x. Section 112(r) of the Clean Air Act and the USEPA's Risk Management Program regulations (40 CFR Part 68) require modeling a catastrophic release of any stored ammonia at 20 percent concentration or above in order to ensure the protection of the off-site public. Furthermore, based on the "general duty" clause of Section 112(r), such analyses can be required even if the aqueous ammonia solution is diluted below 20 percent. CPV Valley proposes to store aqueous ammonia at a maximum ammonia concentration of 19 percent as the means of complying with Section 112(r).

9.3 CONTROL TECHNOLOGY ANALYSIS

Pre-construction review for new major stationary sources involves an evaluation of BACT and/or LAER. If an area is designated by USEPA as attainment or unclassifiable for a particular pollutant, then new major sources would require permitting under the PSD program, including a BACT demonstration for pollutants emitted in quantities greater than the regulatory thresholds. If an area is designated by USEPA as non-attainment for a given pollutant and the major source has the potential to emit the non-attainment pollutant at levels greater than the pollutant-specific regulatory thresholds, then non-attainment NSR applies. Non-attainment NSR requires the application of LAER technology and the requirement to obtain emission offsets.

A control technology analysis has been performed for the proposed facility based on guidance presented in the draft USEPA Guidance Document New Source Review Workshop Manual (USEPA, 1990). The detailed analyses are included in the PSD and Part 201 Air Permit Application.

Application of LAER will be required for NO_x and VOC for the Project. BACT will be required for CO, SO_2, PM/PM-10, and H_2SO_4. The following tables (9-6 through 9-10) summarize the control technologies that are proposed.

Table 9-6
Summary of Proposed BACT/LAER – Combustion Turbine/Duct Burner

Pollutant	Section	Limit	Method	Basis
NO_x	4.4	2.0 ppm (CT – gas firing with & without DB) 6.0 ppm (CT– oil firing)	DLN & SCR Water Injection & SCR	LAER
VOC	4.5	0.7 ppm (CT – gas firing) 0.7 ppm (CT– oil firing) 1.8 ppm (CT– gas firing with DB)	Good combustion controls & oxidation catalyst	LAER
CO	4.6	2.0 ppm (CT – gas firing) 2.0 ppm (CT– oil firing) 3.4 ppm (CT– gas firing with DB)	Good combustion controls & oxidation catalyst	BACT
PM/PM-10/ PM-2.5	4.7	0.0073 lb/mmBtu (gas firing with & without DB) 0.0368 lb/mmBtu (oil firing)	Low-sulfur fuels	BACT
SO_2	4.8	0.0022 lb/mmBtu (gas firing with & without DB) 0.0015 lb/mmBtu (oil firing)	Low-sulfur fuels	BACT
H_2SO_4	4.8	0.0007 lb/mmBtu (gas firing with & without DB) 0.0005 lb/mmBtu (oil firing)	Low-sulfur fuels	BACT

Table 9-7
Summary of Proposed BACT/LAER – Auxiliary Boiler

Pollutant	Section	Limit	Method	Basis
NO_x	4.4	0.0450 lb/mmBtu	LNB & FGR?	LAER
VOC	4.5	0.0038 lb/mmBtu	Good combustion controls	LAER
CO	4.6	0.0721 lb/mmBtu	Good combustion controls	BACT
PM/PM-10/ PM-2.5	4.7	0.0063 lb/mmBtu	Low-sulfur fuel	BACT
SO_2	4.8	0.0022 lb/mmBtu	Low-sulfur fuel	BACT
H_2SO_4	4.8	0.0002 lb/mmBtu	Low-sulfur fuel	BACT

Table 9-8 Summary of Proposed BACT/LAER – Fuel Gas Heater				
Pollutant	**Section**	**Limit**	**Method**	**Basis**
NO_x	4.4	0.058 lb/mmBtu	Forced draft LNB	LAER
VOC	4.5	0.011 lb/mmBtu	Good combustion controls	LAER
CO	4.6	0.084 lb/mmBtu	Good combustion controls	BACT
PM/PM-10/ PM-2.5	4.7	0.0076 lb/mmBtu	Low-sulfur fuel	BACT
SO_2	4.8	0.0022 lb/mmBtu	Low-sulfur fuel	BACT
H_2SO_4	4.8	0.0002 lb/mmBtu	Low-sulfur fuel	BACT

Table 9-9 Summary of Proposed BACT/LAER – Emergency Diesel Fire Pump				
Pollutant	**Section**	**Limit**	**Method**	**Basis**
NO_x	4.4	0.857 lb/mmBtu	Good combustion controls	LAER
VOC	4.5	0.3612 lb/mmBtu	Good combustion controls	LAER
CO	4.6	0.75 lb/mmBtu	Good combustion controls	BACT
PM/PM-10/ PM-2.5	4.7	0.043 lb/mmBtu	Low-sulfur fuel	BACT
SO_2	4.8	0.0014 lb/mmBtu	Low-sulfur fuel	BACT
H_2SO_4	4.8	0.00003 lb/mmBtu	Low-sulfur fuel	BACT

Table 9-10 Summary of Proposed BACT/LAER – Emergency Diesel Generator				
Pollutant	**Section**	**Limit**	**Method**	**Basis**
NO_x	4.4	4.97 g/hp-hr	Good combustion controls	LAER
VOC	4.5	0.0331 lb/mmBtu	Good combustion controls	LAER
CO	4.6	0.45 g/hp-hr	Good combustion controls	BACT
PM/PM-10/ PM-2.5	4.7	0.03 g/hp-hr	Low-sulfur fuel	BACT
SO_2	4.8	0.0014 lb/mmBtu	Low-sulfur fuel	BACT
H_2SO_4	4.8	0.00003 lb/mmBtu	Low-sulfur fuel	BACT

9.4 SOURCES AND SOURCE EMISSION PARAMETERS

The Project will include two combustion turbines (CTs) that will be capable of combusting natural gas and ultra-low sulfur diesel oil (ULSD). Each CT will have an associated heat recovery steam generator (HRSG). Each HRSG will have supplemental fuel firing provided by a natural gas-fired duct burner with a heat input capacity of approximately 500 million British thermal units per hour (MMBtu/hr) on a higher heating value (HHV) basis. Duct firing would only occur with natural gas and only when natural gas was also being combusted in the CTs.

The CTs incorporate advanced dry low-NO_x combustion techniques when firing natural gas and water injection when firing ultra low sulfur distillate oil. Additional emissions controls on the combined cycle units consist of SCR systems to reduce emissions of NO_x and oxidation catalyst systems to reduce emissions of CO and VOC.

The proposed emissions controls will be designed to reduce emissions from the CTs to the following concentration levels in parts per million (ppm) on a dry volume basis (ppmvd) at 15 percent oxygen (15% O_2):

- 2.0 ppmvd NO_x when firing natural gas;
- 6.0 ppmvd NO_x when firing ULSD;
- 2.0 ppmvd CO when firing natural gas;
- 2.0 ppmvd CO when firing ULSD.

These emissions of NO_x and CO are based on ammonia slip levels of 2.0 ppmvd when firing natural gas and 5.0 ppmvd when firing ULSD. A sulfur content of 0.8 grains per 100 standard cubic feet (scf) of natural gas is assumed along with a SO_2 to SO_3 conversion rate of 20% in the emissions calculations for the combined cycle units.

Each CT will have a maximum heat input capacity of approximately 2,145 million British thermal units per hour (MMBtu/hr) when firing oil at an ambient temperature of -5 ^oF and a maximum heat input capacity of approximately 2,234 MMBtu/hr when firing natural gas at an ambient temperature of -5 ^oF. Each HRSG will have a maximum duct burner heat input capacity of approximately 500 MMBtu/hr when firing natural gas. The listed heat input capacities are on a HHV basis.

The ancillary sources of air emissions consist of some additional small combustion sources (an auxiliary boiler, an emergency diesel generator, a diesel fire water pump, and two fuel gas "dew point" heaters) and a 965,000 gallon oil storage tank. The auxiliary boiler will fire natural gas and will have a heat input capacity of approximately 73.5 MMBtu/hr. The emergency generator will fire only ULSD and will have an output rating of approximately 1,500 kilowatts (kW). The fire water pump will fire only ULSD and will have an output rating of approximately 325 brake horsepower (bhp). The diesel fire water pump will serve as a backup unit for an electric fire water pump. The fuel gas heaters will fire only natural gas and will have a heat input capacity of approximately 5 MMBtu/hr per heater.

Additional information concerning air emission sources and their emissions is provided in the PSD and Part 201 Air Permit Application (TRC, 2008) and/or in the revised Air Quality Modeling Protocol. However, some information on emissions from Project sources is provided in this section. In addition, emissions calculations used to develop the emission estimates for Project sources are provided in tables in Appendix 9-B.

Emissions of air contaminants from the proposed CPV Valley Energy Center have been estimated based upon vendor emission guarantees, emission factors presented in USEPA's Compilation of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources (USEPA, 2000), other published emission factors, mass balance calculations and engineering estimates.

9.4.1 Combustion Turbine Criteria Pollutant Emissions

The combined cycle unit would typically operate at or near full load to meet electricity demand as needed. Depending upon demand, the unit can operate at loads ranging from 60 percent to 100 percent of full capacity. Combustion turbine performance and emissions are affected by ambient temperature with combustion turbine fuel consumption, power output and emissions (on a lb/hr basis) increasing at lower ambient temperatures.

Because of the different emission rates and exhaust characteristics, a matrix of operating modes is employed in the various analyses presented in this Chapter, including air quality impact analysis and potential emission calculations. Exhaust and emission parameters for three ambient temperatures (-5°F, 51°F and 90°F), three turbine loads, duct burner operation, and two fuels (natural gas and ULSD oil) are accounted for in this DEIS.

Exhaust characteristics and emission rates for the combined cycle units are provided in Tables 9-11 and 9-12, respectively. Emission rates for all criteria pollutants and ammonia slip for the combustion turbine/duct burner are based upon vendor emission estimates. The PM-10 emissions estimates obtained from the vendor include condensable particulate matter and an allowance for sulfuric acid and/or ammonia salt formation due to reaction of SO_3 with water or excess NH_3. More detailed information for combustion turbine emissions are provided in Tables B-1 and B-2 in Appendix 9-B.

Startup emissions and associated stack parameters for the combustion turbines have also been estimated for each fuel and for three varieties of startup (cold, warm, and hot) based on available vendor data and engineering judgment. Startup emissions and emission rates based on the average of two combined cycle units during startup were calculated. The resulting startup emissions and parameters are summarized in Table 9-13. More detailed information concerning turbine startup emissions is provided in Tables B-3, B-4, and B-5 in Appendix 9-B.

9.4.2 Combustion Turbine Emissions OF Other Pollutants

Potential annual emissions of HAPs from the operation of the combustion turbine have been quantified based on AP-42 emission factors with the exception of formaldehyde, which is based on California Air Resources Board (CARB) emissions test data that is more appropriate for advanced-technology DLN model units such as the Siemens Westinghouse SGT6-5000F.

Potential annual emissions of non-criteria pollutants are presented in the PSD and Part 201 Air Permit Application (TRC, 2008) and in Tables B-12 and B-13 in Appendix 9-B.

Table 9-11 Combustion Turbine Exhaust Parameters[1]							
Operating Case	**Fuel Type**	**Ambient Temperature[2] (°F)**	**Load (Percent)**	**Evaporative Cooler (On/Off)**	**Duct Firing ((MMBtu/hr)**	**Exhaust Temperature (K)**	**Exhaust Velocity (m/s)**
SG01	Gas	-5	Base	Off	Off	363.7	22.1
SG02	Gas	-5	Base	Off	500	363.7	22.2
SG03	Gas	-5	80	Off	Off	356.5	18.7
SG04	Gas	-5	60	Off	Off	354.8	15.6
SG05	Gas	51	Base	Off	185.37	356.5	20.1
SG06	Gas	51	Base	Off	500	356.5	20.2
SG07	Gas	51	Base	Off	Off	360.4	20.1
SG08	Gas	51	80	Off	Off	354.3	17.0
SG09	Gas	51	60	Off	Off	353.2	14.4
SG10	Gas	90	Base	On	500	357.0	19.0
SG11	Gas	90	Base	On	Off	357.0	18.9
SG12	Gas	90	Base	Off	500	364.3	19.0
SG13	Gas	90	Base	Off	Off	364.3	18.9
SG14	Gas	90	80	Off	Off	352.6	15.5
SG15	Gas	90	60	Off	Off	351.5	13.3
FO01	Oil	-5	Base	Off	Off	371.5	22.8
FO02	Oil	-5	85	Off	Off	362.0	19.9
FO03	Oil	-5	70	Off	Off	362.0	17.5
FO04	Oil	51	Base	Off	Off	368.7	20.6
FO05	Oil	51	85	Off	Off	358.2	18.0
FO06	Oil	51	70	Off	Off	358.2	16.0
FO07	Oil	90	Base	On	Off	368.2	19.2
FO08	Oil	90	Base	Off	Off	368.2	19.2
FO09	Oil	90	85	Off	Off	358.2	16.0
FO10	Oil	90	70	Off	Off	358.2	14.8

Notes:

[1] Physical parameters of the combustion turbine stack include a height of 275 feet (83.82 meters) at a ground elevation of 464 feet above mean sea level and a diameter of 19 feet (5.79 meters).

[2] Ambient temperatures were selected using NYSDEC guidance.

Table 9-12 Combustion Turbine Short-term Emission Rates (grams/second)				
Operating Case	CO	SO_2	PM-10	NO_x
SG01	1.285	0.614	1.400	2.117
SG02	2.545	0.751	2.086	2.621
SG03	1.084	0.572	1.244	1.774
SG04	3.503	0.426	1.184	1.441
SG05	1.626	0.600	1.527	2.082
SG06	2.419	0.686	1.959	2.399
SG07	1.159	0.549	1.272	1.895
SG08	0.958	0.511	1.219	1.583
SG09	3.150	0.375	1.163	1.290
SG10	2.318	0.647	1.905	2.258
SG11	1.058	0.510	1.218	1.754
SG12	2.293	0.647	1.905	2.208
SG13	1.033	0.510	1.218	1.704
SG14	0.882	0.464	1.199	1.441
SG15	2.873	0.341	1.149	1.179
GO01	0.936	0.412	6.470	6.480
FO02	1.714	0.359	5.692	5.634
FO03	2.948	0.308	7.309	4.860
FO04	1.159	0.364	5.820	5.724
FO05	1.537	0.319	5.172	5.022
FO06	2.646	0.276	6.666	4.338
FO07	1.084	0.337	5.305	5.310
FO08	1.033	0.326	5.175	5.130
FO09	1.386	0.289	4.655	4.554
FO10	2.394	0.250	6.025	3.942

Table 9-13 Combined Cycle Unit Startup Emissions Scenarios							
	Startup	**Duration**	**Emissions Per Start (lb)**			**Velocity**	**Temperature**
Fuel	Event	(hr)	CO	PM	SO_2	(m/s)	(K)
Gas	Cold	2.158	580.7	20.9	6.4	7.2	318.4
Gas	Warm	1.617	539.3	15.6	4.8	7.2	318.4
Gas	Hot	1.383	456.1	13.0	4.1	7.2	318.4
Oil	Cold	2.325	752.1	123.4	5.1	8.0	320.9
Oil	Warm	1.783	670.1	93.5	3.9	8.0	320.9
Oil	Hot	1.550	572.8	80.9	3.4	8.0	320.9

SCR control for NO_x reduction involves the use of ammonia, which acts to remove NO_x as the flue gas passes through a catalyst. Some of the ammonia does not react with the NO_x and ends up being emitted into the atmosphere. The emission of unreacted ammonia from an SCR is known as “ammonia slip”. The maximum emission of ammonia slip would not exceed 2 ppm when the combustion turbines are firing natural gas and 5 ppm when the combustion turbines are firing oil.

Potential HAP and ammonia slip emissions are discussed further in Section 9.6.3, as are the air quality impacts associated with these emissions.

9.4.3 Combustion Turbine/Duct Burner ANNUAL Emissions

Annual operation of the Facility is limited on the basis of a PM-2.5 emissions cap of 95 tons per year. The potential to emit for all criteria pollutants other than PM/PM-10/PM-2.5 were based on the following worst-case operating scenarios for the combustion turbines:

- Year-round (8,760 hours), full load operation of the combustion turbine on natural gas (at 51^{o}F ambient temperature);
- An annual duct burner capacity factor of 30%, equivalent to 2,628 hours of duct firing for each combustion turbine;
- The equivalent of up to 720 hours per year per turbine of ULSD firing; and
- A total of 275 annual combined cycle shutdown/startup events per turbine, including up to 40 cold starts, were also included for each case.

9.4.4 Auxiliary Boiler Emissions

Emission rates for NO_x, CO, VOC, SO_2, and PM/PM-10/PM-2.5 from the gas-fired auxiliary boiler have been estimated based upon vendor emission estimates. Total boiler hours for the Facility will be limited to 2,000 hours per year. Potential HAP emissions are based on emission factors from AP-42 Chapter 1.4 (July 1998) and Chapter 1.3 (September 1998). Exhaust characteristics and criteria pollutant emission estimates for the auxiliary boiler are presented in Table 9-14. Additional information concerning emissions from the auxiliary boiler is provided in Tables B-7 and B-13 in Appendix 9-B.

9.4.5 Fuel Gas Heater Emissions

Emission rates for NO_x, CO, VOC, SO_2, and PM/PM-10/PM-2.5 from the natural gas-fired fuel gas heaters are estimated based upon vendor emission estimates. The fuel gas heaters would use a low-NO_x forced draft burner to reduce emissions of NO_x by approximately 50 percent and are proposed to operate all year. Potential HAP emissions are based on emission factors from AP-42 Chapter 1.4 (July 1998). Table 9-14 shows the stack parameters and criteria pollutant emission estimates for the proposed fuel gas heaters. Additional information concerning emissions from the fuel gas heaters is provided in Tables B-8 and B-13 in Appendix 9-B.

Table 9-14 Stack Parameters and Emission Rates for the Auxiliary Boiler and Fuel Gas Heaters			
Parameter	**Units**	**Auxiliary Boiler**	**Fuel Gas Heaters**
Stack Parameters			
Stack Height	Meters	83.82	38.1
Stack Diameter	Meters	5.79	0.61
Exhaust Temperature	K	422.0	727.6
Exhaust Velocity	m/sec	0.35	4.9
Emission Rates[1]			
NO_x	g/s	9.52×10^{-2} (annual)	7.2×10^{-2}
CO	g/s	6.67×10^{-1} (1-hour) 6.67×10^{-1} (8-hour)	1.06×10^{-1}
SO_2	g/s	2.02×10^{-2} (3-hour) 2.02×10^{-2} (24-hour) 4.61×10^{-3} (annual)	2.8×10^{-3}
PM-10/PM-2.5	g/s	5.84×10^{-2} (24-hour) 1.33×10^{-2} (annual)	9.6×10^{-3}

Note:
[1] Because the auxiliary boiler will be limited to 2,000 hours/year operation, both short-term and annual emissions presented. The annual emissions presented reflect the hourly emissions scaled for 2,000 hrs/yr (2,000/8,760).

9.4.6 Emergency Diesel ENGINE AND FIRE PUMP Emissions

Emission rates for NO_x, CO, VOC, SO_2, and PM/PM-10/PM-2.5 from the emergency diesel engine and fire water pump have been estimated based upon vendor emission estimates with SO_2 emissions adjusted to the 15 ppm sulfur oil proposed for this project. Both the emergency diesel generator and the fire pump would only be used for emergency situations, except for occasional testing to ensure that it is operating properly. Thus, operation of each unit is limited to less than 500 hours per year. Potential HAP emissions are based on emission factors from AP-42 Chapter 3.3 (October 1996). Emergency diesel engine and fire pump stack parameters and criteria pollutant emission estimates are included in Table 9-15. Additional information concerning emissions from the emergency diesel engine and the fire pump is provided in Tables B-15, B-10, and B-13 in Appendix 9-B.

Table 9-15 Stack Parameters and Emission Rates for the Emergency Diesel Generator and Fire Pump			
Parameter	**Units**	**Emergency Diesel Generator**	**Emergency Diesel Fire Pump**
Stack Parameters			
Stack Height	Meters	15.24	15.24
Stack Diameter	Meters	0.46	0.15
Exhaust Temperature	K	679.5	784.3
Exhaust Velocity	m/sec	31.8	41.5

Table 9-15 Stack Parameters and Emission Rates for the Emergency Diesel Generator and Fire Pump			
Parameter	**Units**	**Emergency Diesel Generator**	**Emergency Diesel Fire Pump**
Emission Rates[1]			
NO_x	g/s	$1.67x10^{-1}$ (annual)	$1.40x10^{-2}$ (annual)
CO	g/s	$2.65x10^{-1}$ (1-hour) $2.65x10^{-1}$ (8-hour)	$2.15x10^{-1}$ (1-hour) $2.15x10^{-1}$ (8-hour)
SO_2	g/s	$2.69x10^{-3}$ (3-hour) $2.69x10^{-3}$ (24-hour) $1.53x10^{-4}$ (annual)	$4.10x10^{-4}$ (3-hour) $4.10x10^{-4}$ (24-hour) $2.34x10^{-5}$ (annual)
PM-10/PM-2.5	g/s	$1.76x10^{-2}$ (24-hour) $1.01x10^{-3}$ (annual)	$1.23x10^{-2}$ (24-hour) $7.01x10^{-4}$ (annual)

Note:
[1] Because the emergency diesel generator and fire pump will each be limited to 500 hours/year operation, both short-term and annual emissions presented. The annual emissions presented reflect the hourly emissions scaled for 500 hrs/yr (500/8,760).

9.4.7 Miscellaneous Sources Emissions

Potential VOC emissions from the ULSD storage tank have been estimated at 0.17 tons/year, as calculated using the USEPA computer program TANKS 4.09b, based upon estimated storage tank dimensions, color, throughput and other parameters, including local climatology, venting parameters, etc. TANKS 4.09d printouts are included in the PSD and Part 201 Air Permit Application (TRC, 2008).

9.4.8 construction related emissions

Chapter 15, "Construction Impacts," contains an analysis of the potential impacts that could be expected during construction. Project-related air quality impacts during the construction phase are expected to include fugitive dust emissions and vehicle emissions from ground excavation, cut-and-fill operations, removal of debris, concrete pouring, and equipment erection. However, because the construction period is limited and activities change during the construction phases, these emissions are only temporary and vary throughout this period.

Emissions of fugitive dust would depend on such factors as soil properties (e.g., moisture content, volume of spoils, and soil silt content), meteorological variables, and construction practices employed. For airborne particulates such as fugitive dust the New York State Department of Transportation (NYSDOT) recommends the use of control measures to minimize these emissions. Consistent with the NYSDOT's Environmental Procedures Manual (EPM) (NYSDOT, 2001), emissions of fugitive dust would be mitigated using the following measures:

- Water or other wetting agents on areas of exposed and dry soils;
- Covered trucks for soils and other dry materials;
- Controlled storage of spoils on the construction site; and
- Final grading and landscaping of exposed areas as soon as possible.

The NYSDOT reports that such measures have "proved effective" in limiting fugitive dust during the construction period.

Emissions from vehicles would include onsite equipment and those from construction workers. As noted in the NYSDOT's EPM, these emissions are "temporary" and "self-correcting once the Project is completed." Nevertheless, NYSDOT recommends in the EPM that mitigation measures should be implemented to minimize emissions. Such measures would include proper maintenance of construction equipment, controlling unnecessary idling of equipment, and providing sufficient parking for construction workers.

9.5 AIR QUALITY IMPACT ASSESSMENT

This section details the air quality analyses conducted in support of the PSD and Part 201 Application, and additional analysis conducted for this EIS. These analyses include the Good Engineering Practice (GEP) stack height determination, the modeling for normal facility operation and combustion turbine start-up, and the PSD additional impact analyses. The modeling methodology used for these analyses and the results of these analyses are presented in this section.

9.5.1 Stack Height

The USEPA provides specific guidance for determining GEP stack height and for determining whether building downwash will occur in the Guidance for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations), (USEPA, 1985). GEP is defined in Section 123 of the Clean Air Act as "the height necessary to insure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, and wakes which may be created by the source itself, nearby structures, or nearby terrain obstacles."

The GEP definition is based on the observed phenomenon of atmospheric flow in the immediate vicinity of a structure. It identifies the minimum stack height at which significant adverse aerodynamics (downwash) are avoided.

The USEPA GEP stack height regulations specify that the formula GEP stack height is calculated in the following manner:

$$H_{GEP} = H_B + 1.5L$$

where: H_B = the height of adjacent or nearby structures, and
L = the lesser dimension (height or projected width of the adjacent or nearby structures)

The CPV Valley Energy Center has been designed with separate exhaust stacks for the combustion turbines, emergency diesel generator, fire water pump, and fuel gas heaters. The auxiliary boiler will exhaust to the southern combustion turbine stack. The stacks would be located within the downwash zones caused by the proposed structures at the facility. The controlling structure (i.e., the structure with the highest associated GEP formula height) for the proposed stacks would be the air-cooled condenser (ACC). The ACC has a height of 115 ft AGL and results in a formula GEP stack height of 287.5 feet AGL. The stack heights of the combustion turbines (275 ft), fuel gas heaters (125 ft), emergency diesel generator (50 ft), and fire water pump (50 ft) are all less than the formula GEP stack height (287.5 ft). Thus, direction-specific building downwash parameters were included in the modeling analysis for each source. The direction-specific downwash parameters for the modeling analyses were determined using the USEPA-approved Building Profile Input Program for Prime (BPIPPRM, Version 04274) and are presented in Appendix A of the Revised Air Quality Modeling Protocol that is included as Appendix 9-A of this report. A detailed plot plan of the proposed facility has also been provided in Appendix 2-A of this DEIS.

The feasibility of combustion turbine, auxiliary boiler, fuel gas heater, emergency diesel generator, and diesel fire pump stacks being constructed to the formula GEP stack height of 287.5 ft was considered. To construct 287.5 ft tall stacks for the auxiliary equipment (fuel gas heater, emergency diesel generator, and diesel fire water pump) would be infeasible from an engineering standpoint. These sources have small exhaust flows and very small exhaust openings (2 ft or less) from the combustion chambers. Thus, a 287.5-foot stack would result in excessive backpressure on these units; in addition, the construction of 2 ft or smaller diameter stacks that to a height of 287.5 ft would be structurally unsound.

The construction of 287.5 ft tall combustion turbine and auxiliary boiler stacks would be feasible from an engineering standpoint, but to minimize the aesthetic impact and height variance necessary from the local zoning regulations, the Project design proposes to exhaust the auxiliary boiler to the southern combustion turbine stack and to reduce the height of the combustion turbine stacks to 275 ft based on modeling results that show that there would be little or no additional benefit to building these stacks to full GEP height. Conversely, modeling results show that further reducing the height of the combustion turbine stacks could lead to increased impacts due to building downwash effects and to plume interaction with higher terrain located to the northwest. The original project design was also modified to reduce the height of the ACC (the controlling structure for determining GEP formula height) to help minimize the heights needed for the combustion turbine stacks. Furthermore, New York State requires that any request for a variance be the minimum variance necessary without increasing the environmental and public safety impacts. The heights of the ACC and combustion turbine and auxiliary boiler stacks have been minimized as much as possible in this respect.

9.5.2 Air Quality Assessment Methodology

Modeling was performed consistent with the procedures found in the NYSDEC's DAR-10 (NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis) and various USEPA guidance documents including EPA's New Source Review Workshop Manual and EPA's Guideline on Air Quality Models (which appears in the Code of Federal Regulations (CFR) at Appendix W of 40 CFR Part 51). A detailed discussion on the modeling methodology that which was used for the air quality analysis is contained in the revised Air Quality Modeling Protocol (TRC, 2008) which is included in Appendix 9-A. The original protocol was submitted to USEPA and NYSDEC for review in September 2008. The protocol was subsequently updated to account for Project design changes, agency comments, and changes in methodology.

As described in the modeling protocol, preliminary modeling of the combined cycle units over a matrix of operating conditions, including startup, was conducted to identify the operating conditions for each pollutant and averaging time with the maximum predicted impacts. These operating conditions and those with maximum emissions were then included along with ancillary sources in modeling to determine the maximum predicted Project impacts. Maximum predicted Project impacts were then compared to significant impact levels (SILs) established by EPA to determine whether additional cumulative modeling analyses including emissions from other facilities would be required to demonstrate compliance with NAAQS and PSD increments. As described later in this section, cumulative impact modeling was only required for PM-10 for oil firing scenarios in the combined cycle units, since maximum predicted Project impacts were below SILs for CO, SO_2, and NO_2 in all cases and below SILs for PM-10 for natural gas firing scenarios in the combined cycle units.

9.5.2.1 Model Selection and Options

The AERMOD model (version 07026) was used to determine predicted impacts from the proposed Project. AERMOD is identified by EPA in the "Guideline on Air Quality Models" (40 CFR 51, Appendix W) as a recommended refined model for a wide range of regulatory applications in all types of terrain and in cases where aerodynamic downwash is important. AERMOD includes the PRIME downwash algorithm which accounts for potential building wake and cavity effects on stack emissions. AERMOD also includes a refined complex terrain algorithm and can provide predicted impacts in all terrain regimes.

The proposed stack heights are below the maximum GEP formula height calculated based on proposed buildings and structures, so building downwash may affect stack emissions. In addition, some stack heights are short enough relative to nearby structures that building cavity effects on stack emissions may be important. As mentioned above, AERMOD can account for building wake and cavity effects on stack emissions. The receptor grid, described later, includes some receptors in simple terrain and others that are in complex terrain (i.e., terrain that exceeds the height of the stacks). In complex terrain, AERMOD employs the dividing streamline concept to treat the effects of plume and terrain interactions. As mentioned previously, AERMOD is recommended for use in all terrain regimes. For these reasons, AERMOD is an appropriate and recommended model to use for estimating impacts from Project emissions. Therefore, AERMOD with regulatory default model options was used for to predict Project air quality impacts.

9.5.2.2 Meteorological Data

As discussed in Section 9.1.3, a five-year database including hourly surface meteorological data for the years 2002 through 2006 from Orange County Airport in Montgomery, New York was used in the modeling analyses. Concurrent upper air data, from Albany International Airport were incorporated in the meteorological data base used in the modeling analyses.

9.5.2.3 Receptor Grid and Terrain Processing

The basic receptor grid for the AERMOD analyses was defined by the intersections of concentric circles and radial lines paced at ten degree intervals from the center of the circles. The circles were centered on a point in the power generation area of the Project. The grid was "polar" in nature, but the receptor coordinates were be provided to AERMOD as discrete Cartesian receptors in UTM coordinates referenced to zone 18 (NAD 83). The basic grid origin was centered on a point with the following coordinates: (545,909.0 meters E, 4,584,682.75 meters N). Receptors were located every 10 degrees at the following distances from the origin:

- At 100m intervals from 200m to 5,000m;
- At 200m intervals from 5,000m to 10,000m;
- At 500m intervals from 10,000m to 15,000m; and
- At 1,000m intervals from 15,000m to 30,000m.

Fence line receptors were included at intervals of 10 meters or less surrounding the facility. Grid receptors within fenced plant property were excluded from the grid.

The final proposed receptor grid consisted of 3,552 grid receptors and 180 fence line receptors for a total of 3,732 model receptors. Figures 3-1, 3-2, and 3-3 in the Revised Air Quality Modeling Protocol in Appendix B provide plots showing the model receptors. Specifically, Figure 3-1 displays the fence line along with the locations of proposed Project stacks and major buildings and structures, Figure 3-2 shows the grid receptors out to 5,000 meters, while Figure 3-3 shows the entire receptor grid out to 30,000 meters. The receptor grid points are plotted over a background that depicts the underlying terrain field.

The AERMAP (Version 06341) preprocessor program was used to extract receptor elevations and hill heights based on 10m Digital Elevation Model (DEM) data. The analysis used 7.5-minute DEM data obtained from the US Geological Survey (USGS).

9.5.3 Air Quality Assessment Results

A variety of modeling analyses were conducted to determine Project impacts relative to various regulatory thresholds. The following sections summarize the results and their meaning in a regulatory context.

9.5.3.1 Comparison of Project Impacts with SILs

Modeling to determine maximum Project impacts for comparison to SILs defined by EPA at 40 CFR 51.165(b)(2) was conducted in accordance with procedures in the revised Air Quality Modeling Protocol. The modeling included combustion turbine operating cases with the highest emission rates as well as turbine operating conditions that had the highest associated predicted impacts, including startup conditions where applicable.

The maximum predicted Project impacts are provided in Tables 9-16, 9-17, and 9-18. Table 9-16 provides results for cases with gas firing only in the combustion turbines, while Table 9-17 provides results for cases for which oil only is fired in the combustion turbines. The results in Table 9-17 account for proposed limits on annual firing of ULSD. Table 9-18 provides overall worst-case impacts, including the effect of startup emissions on short-term impacts and annual impacts reflecting the potential use of both natural gas and ULSD during the year. The results in these tables show that maximum predicted Project impacts are below SILs for NO_2, CO, and SO_2. The results also show that maximum predicted Project impacts of PM-10 are below SILs for cases where natural gas is fired in the combustion turbines. A demonstration that maximum Project impacts are less than SILs for a given pollutant establishes that the Project will not be capable of causing or contributing to any violation of a corresponding NAAQS or PSD increment.

Table 9-16
Maximum Project Impacts - Gas Firing in Combustion Turbines

Pollutant	Averaging Period	Impact (ug/m^3)	X (km)	Y (km)	time	Turbine case	SIL (ug/m3)
NO_2	annual	0.63	546.983	4584.538	2002	SG10	1
CO	1	45.92	546.739	4585.116	2006029300	SG04	2,000
	8	21.41	546.816	4584.719	2006131800	SG09	500
SO_2	3	3.28	545.318	4586.674	2005038300	SG10	25
	24	0.60	545.318	4586.674	2003083	SG06	5
	annual	0.04	547.389	4585.375	2002	SG10	1
PM-10	24	1.71	545.318	4586.674	2003083	SG06	5
	annual	0.18	546.982	4584.747	2002	SG15	1

Notes:
SIL = significant impact level

Table 9-17
Maximum Project Impacts - ULSD Firing in Combustion Turbines

Pollutant	Averaging Period	Impact (ug/m^3)	X (km)	Y (km)	time	Turbine case	SIL (ug/m3)
NO_2	annual	0.52	546.983	4584.538	2002	SF09	1
CO	1	45.92	546.739	4585.116	2006029300	SF03	2,000
	8	21.41	546.816	4584.719	2006131800	SF06	500
SO_2	3	1.83	545.318	4586.674	2005038300	SF09	25
	24	0.31	545.318	4586.674	2003083	SF02	5
	annual	0.003	546.988	4584.752	2002	SF09	1
PM-10	24	6.93	545.318	4586.674	2005037	SF06	5
	annual	0.04	547.389	4585.375	2002	SF10	1

Notes:
SIL = significant impact level

Table 9-18 Maximum Project Impacts							
Pollutant	**Averaging Period**	**Impact (ug/m^3)**	**X (km)**	**Y (km)**	**time**	**Turbine case**	**SIL (ug/m3)**
NO_2	annual	0.85	546.982	4584.747	2003	g10f09	1
CO	1	562.80	545.511	4586.445	2004010123	ColdFO06	2,000
	8	181.88	545.446	4586.521	2005020708	ColdFO06	500
SO_2	3	3.28	545.318	4586.674	2005038300	SG10	25
	24	0.60	545.318	4586.674	2003083	SG06	5
	annual	0.04	547.389	4585.375	2002	SG10	1
PM-10	24	9.89	545.446	4586.521	2005020724	ColdFO06	5
	annual	0.18	546.982	4584.747	2002	SG15	1

Notes:
SIL = significant impact level
Startup emissions included for short-term impacts

Under longstanding EPA guidance and interpretations, the SILs are used to determine if a source makes or could make a significant contribution to a predicted violation of a NAAQS or Class II PSD increment. If a major source or major modification is predicted to have maximum impacts that are below the SILs, then a cumulative (or “full”) impact analysis that includes other facilities is not required, and the impacts of the project are considered to be *de minimis* or insignificant. By showing that maximum predicted Project impacts will be below the corresponding SILs for a given pollutant, the Project is exempt from the requirement to conduct any additional analyses to demonstrate compliance with NAAQS and/or Class II PSD increments for that pollutant.

The maximum predicted 24-hour impacts of PM-10 for cases with ULSD firing in the combustion turbines exceed the 24-hour SIL. Therefore, additional cumulative impact modeling to demonstrate compliance with NAAQS and PSD increments was required. This additional modeling is described in a later section.

The maximum extent of the predicted significant PM-10 impacts was approximately 4.6 km and was associated with an operating condition that included turbine startup emissions. As described elsewhere, model receptors included in the cumulative modeling for PM-10 covered the maximum radial extent of the Project’s significant impacts.

Appendix 9-D contains graphical plots showing the pattern of maximum predicted Project impacts.

9.5.3.2 Comparison of Project Impacts with SMCs

Modeling to determine maximum Project impacts for comparison to significant monitoring concentrations (SMCs) defined by EPA was conducted in accordance with procedures in the revised Air Quality Modeling Protocol. If a new major source or major modification can demonstrate that impacts from a project are less than the SMCs defined at 40 CFR 52.21(i)(5)(i), then a source can be exempted from preconstruction monitoring requirements that might otherwise apply under the PSD program.

Table 9-19 provides a summary of maximum predicted Project impacts relative to the SMCs and supports the requested waiver request from preconstruction monitoring that was submitted to EPA. The maximum predicted Project impacts are below all associated SMCs.

Table 9-19
Maximum Project Impacts -- Comparison to SMCs

Pollutant	Averaging Period	Concentration (ug/m^3)	SMC (ug/m^3)
CO	8-hour	182	575
NO_2	Annual	0.8	14
SO_2	24-hour	0.6	13
PM-10	24-hour	9.9	10
Pb	3-month	0.009	0.1

Notes:
a. SMC = significant monitoring concentration
b Short-term impacts of CO and PM-10 account for higher impacts that may occur during combustion turbine startup.
c. Predicted impacts for Pb represent maximum 24-hour impacts during oil firing in combustion turbines. Impacts for 3-month averaging period would be much smaller.

9.5.3.3 Cumulative Impact Modeling Results for PM-10

Cumulative impact modeling analyses were conducted for PM-10 consistent with procedures described in the revised Air Quality Modeling Protocol. The cumulative impact analyses included the Project along with other facilities and incorporated consideration of background air quality. The modeling was conducted to demonstrate that impacts from the Project and other large PM-10 sources would comply with NAAQS and PSD increments for PM-10.

The multi-source PM-10 emission inventory included large PM-10 sources within a region extending 50 km beyond the less than 5 km Project significant impact area (or out to approximately 55 km from the Project). Appendix 9-C contains additional details concerning the development of the cumulative PM-10 emissions inventory as well as summary tables of emissions and stack parameters that were used in the modeling. The Project was included in the cumulative modeling analyses using the operating scenario that had previously been determined to yield the maximum 24-hour PM-10 Project impact and included consideration of turbine startup emissions. Receptors within the maximum radial extend of the Project SIA were included in the cumulative PM-10 modeling. The modeling used the full 5-year meteorological data base.

Table 9-20a provides a summary of the high second-high 24-hour and maximum annual cumulative predicted impacts of PM-10 for each year. Table 9-20b provides a comparison to NAAQS and PSD increments. For comparison with PSD increments for PM-10, it is conservatively assumed that all emissions in the multi-source PM-10 inventory are increment consuming. The results show that the total predicted impacts do not exceed PSD increments for PM-10 and that the sum of total predicted impacts and background PM-10 levels do not exceed NAAQS for PM-10. Therefore, compliance with PSD increments and NAAQS for PM-10 is demonstrated.

Table 9-20a
Cumulative PM-10 Modeling Results for PSD/Large Source Inventory and Project

Year	Averaging Period	Rank	Impact (ug/m^3)	X (meters)	Y (meters)	Day
2002	24-Hour	H2H	6.26	548139	4586675	20-Jun
2003	24-Hour	H2H	5.89	548139	4586675	16-Mar
2004	24-Hour	H2H	7.15	551233	4587133	13-Sep
2005	24-Hour	H2H	7.22	547953	4585832	25-Oct
2006	24-Hour	H2H	7.82	551687	4586393	27-Aug
2002	Annual	MAX	1.00	548239	4586848	
2003	Annual	MAX	0.98	548189	4586761	
2004	Annual	MAX	1.02	548189	4586761	
2005	Annual	MAX	0.96	548189	4586761	
2006	Annual	MAX	1.05	548189	4586761	

Notes:
H2H = high second-high

Table 9-20b
Compliance with PM-10 PSD Increments and NAAQS (PSD/Large Source Inventory)

Averaging Period	Rank	Impact (ug/m^3)	PSD Increment (ug/m^3)	Background (ug/m^3)	Total Concentration (ug/m^3)	NAAQS (ug/m^3)
24-hour	H2H	7.8	30	78	85.8	150
Annual	MAX	1.1	17	35	36.1	50

Notes:
H2H = high second-high

9.5.4 Additional Impact Analyses

The following sections present the results of additional analyses required under the PSD regulations. The additional analyses include the determination of facility impacts to soils and vegetation, impacts to visibility, impacts to Class I areas, and impacts to industrial, commercial and residential growth. The results presented below satisfy the requirements of the PSD program.

9.5.4.1 Impacts to Soils and Vegetation

A component of the PSD review includes an analysis to determine the potential air quality impacts on sensitive vegetation types that may be present in the vicinity of the proposed project. The evaluation of potential impacts on vegetation was conducted in accordance with A Screening Procedure for the Impacts of Air Pollution Sources on Plants, Soils, and Animals, (USEPA, 1980). Calculated air quality concentrations of various constituents from the proposed project are added to ambient background concentrations and compared to screening concentrations (levels at which change has been reported) to provide an assessment regarding the potential for adversely impacting vegetation with significant commercial and/or recreational value.

Screening concentrations used in this assessment represent the minimum ambient concentrations reported in the scientific literature for which adverse effects (e.g., visible damage or growth retardation) to plants have been reported. Of the potential pollutants generated by the proposed project, vegetative screening concentrations are available for SO_2, NO_2, and CO. Screening concentrations for other potential constituents generated by the facility (e.g., particulate matter) are not currently available. Table 9-21 presents a comparison of the maximum modeled concentrations plus background to the screening concentrations. Inspection of the table reveals that the proposed CPV Valley Energy Center would not adversely impact vegetation in the site area.

9.5.4.2 Impact on Visibility – Class II Areas

In response to comments from NYSDEC, a visibility impact analysis was conducted for the Catskills State Park. Class II areas are not subject to the stringent protection that is provided to Class I areas. Nonetheless, potential impacts on visibility due to Project emissions were assessed for those locations in the Catskills State Park for which impacts from Project plumes would be most likely to be discerned (i.e., from prominent elevation peaks). The analysis considered locations associated with all high peaks (those with elevations equal to or greater than 3500 feet MSL) in the Catskills State Park as identified on the Catskills GIS website). The high peaks in Catskills State Park are listed in Table 9-22.

Table 9-21
Comparison of Maximum Predicted Concentrations of Pollutants to Vegetation Screening Concentrations

Pollutant	Averaging Period	Maximum Modeled Ground-Level Concentration ($\mu g/m^3$)	Background[1] Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Vegetation Screening Concentrations ($\mu g/m^3$)		
					Sensitive	Intermediate	Resistant
CO	1-week	181.9[2]	3,206[2]	3,387	1,800,000	--	18,000,000
SO_2	1-hour 3-hour	7.3 3.2	76[5] 55[5]	83 58	917 786	-- 2,096	-- 13,100
NO_2	4-hour 8-hour Annual	217[3] 217[3] 0.14	214[4] 214[4] 41	431 431 41	3,760 3,760 --	9,400 7,520 94	16,920 15,040 --

Notes:
[1] Background concentrations represent the highest second-highest short term (1-, 3-, 8-, and 24-hour) and maximum annual concentrations recorded during the latest three years of available monitoring data (2005-2007 for CO and SO_2 and 2004-2006 for NO_2). See Table 9-1 for more information concerning sources of monitoring data.
[2] Maximum modeled and background concentrations conservatively based on 8-hour averaging period. Factor of 1,145 $\mu g/m^3$ per ppm used to convert ppm background values for CO.
[3] Maximum modeled concentration conservatively based on sum of individual maximum source 3-hour predicted impacts unpaired in time or space and accounts for higher startup emissions from combustion turbines.
[4] Maximum background concentration conservatively based on 1-hour averaging period. Factor of 1,880 $\mu g/m^3$ per ppm used to convert ppm background values for NO_2.
[5] Factor of 2,620 $\mu g/m^3$ per ppm used to convert ppm background values for SO_2.

Table 9-22 Catskills State Park -- High Peaks			
Peak Name	**Elevation (feet MSL)**	**USGS Map Name**	**Distance (km)**
Peekamoose	3843	Peekamoose Mountain	60
Table	3847	Peekamoose Mountain	61
Lone	3721	Peekamoose Mountain	62
Rocky	3508	West Shokan	62
Balsam Cap	3623	West Shokan	63
Friday	3694	West Shokan	64
Cornell	3860	Phoenicia	66
Wittenberg	3780	Phoenicia	67
Slide	4180	Peekamoose Mountain	65
Panther	3720	Shandaken	72
Fir	3620	Shandaken	68
Big Indian	3700	Shandaken	69
Double Top	3860	Seager	69
Graham	3868	Seager	70
Balsam Lake	3723	Seager	72
Eagle	3600	Seager	72
Balsam	3600	Shandaken	75
Indian Head	3573	Woodstock	83
Twin	3640	Bearsville	83
Sugarloaf	3800	Hunter	83
Plateau	3840	Hunter	88
Kaaterskill High Peak	3655	Kaaterskill	88
Southwest Hunter	3740	Hunter	85
Hunter	4040	Hunter	87
West Kill	3880	Lexington	85
Rusk	3680	Lexington	88
North Dome	3610	Lexington	85
Sherrill	3540	Lexington	85
Halcott	3537	West Kill	85
Thomas Cole	3840	Hensonville	99
Black Dome	3980	Freehold	99
Blackhead	3940	Freehold	99
Windham High Peak	3524	Hensonville	103

Notes:
1. Information on Catsill peak heights and locations obtained from Catskills GIS Atlas website: http://www.catskillcenter.org/atlas/geomorphology/geo_2_3dhighpeaks.htm

A Level-1 screening analysis for impacts on local visibility was performed based upon procedures described in USEPA's Workbook for Plume Visual Impact Screening and Analysis (USEPA, 1988). The screening procedure involves calculation of three plume contrast coefficients using emissions of NO_x, PM/PM-10, and sulfates (i.e., H_2SO_4). The Level-1 screening procedure determines the light scattering impacts of particulates, including sulfates and nitrates, with a mean diameter of two micrometers. The analysis was run assuming that all emitted particulate would be as PM-10, which results in a conservative assessment of visibility impact. These coefficients consider plume/sky contrast, plume/terrain contrast, and sky/terrain contrast.

The Level-1 screening analysis using the USEPA VISCREEN (Version 1.01) model was performed for the worst possible operating scenario, i.e., the scenario with the highest emission rates of NO_x, PM/PM-10, and H_2SO_4 corresponding to ULSD firing in the combustion turbines. The analysis assumed an observer would be present at the nearest high peak to the Project and considered distances corresponding to the nearest and most distant peaks in the Catskills State Park relative to the Project. A background visual range of 40 km was assumed consistent with recommended values provided in Figure 4-3 of EPA's "Tutorial Package for the VISCREEN Model."

The results of this analysis are presented in Table 9-23. The predicted visibility impacts as observed from high peaks in the Catskills State Park were compared to the stringent Class I screening thresholds even though these thresholds do not apply in Class II areas. The predicted impacts were below the Class I screening thresholds, indicating that the Project would not impact visibility in the Class II areas in the Catskills State Park.

9.5.4.3 Class I Area Analysis

There are no Class I areas located within 100 km of the Project site. The closest Class I area to the Project is the Brigantine Wilderness Area in New Jersey. The closest portion of the Brigantine Wilderness Area is approximately 206 km from the Project site. The next closest Class I area is the Lye Brook Wilderness Area in Vermont. The closest portion of this area is approximately 215 km from the Project site. Other Class I areas are well beyond 300 km from the Project site.

Given the potential to emit of the Project and the distance to the nearest Class I areas, it is expected that the Project will qualify for an exemption from potential Class I impact modeling requirements for air quality related values (AQRVs) and visibility. The Project has consulted with the Federal Land Managers for the nearest Class I areas to request a determination that the Project would be exempt from any Class I modeling requirement.

Even though the Project will likely be exempt from the need for any Class I impact modeling, a Level-1 visibility impact screening analysis using the EPA VISCREEN model with default assumptions was conducted using maximum proposed short-term (lb/hr) emission rates of NO_x, PM, and primary sulfate as represented by sulfuric acid mist (H_2SO_4) emissions for the Project. The resulting visibility impacts inside the Brigantine Wilderness Area and the Lye Brook Wilderness Area due to maximum proposed emissions from the Project were compared to the established Class I default screening thresholds of 2.00 for plume perceptibility (Delta-E) and 0.05 for plume contrast.

The VISCREEN analysis was conducted using the standard Level-1 default parameters. A visual range of 159 km for Brigantine Wilderness Area and 195 km for Lye Brook Wilderness Area were used based on the annual average of monthly natural conditions visual range values provided in Table V.1-6 of the June 2008 draft "Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Phase I Report – Revised."

Table 9-23
VISCREEN Maximum Catskills State Park Class II Visual Impacts[1]

Background	Theta (degrees)	Azimuth (degrees)	Distance (km)	Alpha (degrees)	Delta E[2]		Contrast[3]	
					Criteria	Plume	Criteria	Plume
Inside Surrounding Area								
Sky	10	84	60	84	2.0	1.071	0.05	0.011
Sky	140	84	60	84	2.0	0.261	0.05	-0.009
Terrain	10	84	60	84	2.0	0.554	0.05	0.007
Terrain	140	84	60	84	2.0	0.1132	0.05	0.005
Outside Surrounding Area								
Sky	10	30	45.5	139	2.0	1.286	0.05	0.013
Sky	140	30	45.5	139	2.0	0.236	0.05	-0.011
Terrain	10	45	51.0	124	2.0	0.710	0.05	0.008
Terrain	140	45	51.0	124	2.0	0.157	0.05	0.006

Notes:
[1] Based on the total project emissions.
[2] Color difference parameter (dimensionless).
[3] Visual contrast against background parameter (dimensionless).

The results, presented in Tables 9-24 and 9-25 for Brigantine Wilderness Area and Lye Brook Wilderness Area, respectively, show that predicted visibility impacts are below the Class I default screening thresholds for plume perceptibility and plume contrast. Therefore, it is concluded that the Project will have no significant effect on visibility in Class I areas.

9.5.4.4 Impact on Industrial, Commercial and Residential Growth

The proposed project's location within an industrial area would result in minimal impact to services, existing land uses, and infrastructure. The Project would utilize natural gas as the primary fuel with provisions to use low sulfur distillate fuel oil for up to the equivalent of 720 hours per combustion turbine as a back-up fuel. It is contemplated that natural gas supply would be provided by a new natural gas pipeline lateral developed by Millennium or Orange &Rockland Gas Company. To accommodate short-term operation on oil, the proposed project would include a 965,000-gallon fuel storage tank and associated off-loading facilities, transfer piping, and pump systems. Both fuels would be used for the efficient production of electricity. The Project would interconnect to NYPA's 345-kilovolt (kV) transmission system, less than one mile from the Facility via a newly constructed 345 kV switchyard on site and overhead and underground electric transmission lines. The new switchyard would be located in the western portion of the 122-acre parcel. The preferred interconnection to the 345 kilovolt (kV) NYPA Marcy South system, would be made via a new on-site 345kV substation, with above ground 345 kV transmission lines on site, and underground 345kV electric transmission cables offsite.

The preferred route is via five overhead steel transmission monopoles on a 150 foot on-site wide right-of-way, before the line transitions onsite to an underground duct bank configuration on the west side of Route 17M. The underground duct bank will be 4 feet wide and will be located off pavement primarily within the western drainage swale, within the right-of-way of NY Route 17M. The duct bank will terminate next to a riser pole on or next to NYPA's Marcy South transmission right of way, just north of the intersection of NY Routes 6 and 17M.

The existing roads and services would easily be able to handle the 25 person workforce, which would be spread over 3 shifts. There would not be significant in-migration to the Wawayanda area. Therefore, there is no expected incremental increase of municipal service costs attributed to the operations employees. Field construction activities are expected to have a duration of approximately 26 months.

The Project is designed to result in low emission levels of air contaminants. The electricity generated by the Project would be directed to the power distribution system in the lower Hudson Valley Area. Finally, since the air emissions from the Project are predicted to result in insignificant impacts of all pollutants (except for PM-10 during limited oil firing conditions in the turbines), new industry desiring to locate in the area would not be prohibited due to unacceptable air pollution levels caused by the proposed plant. Therefore, the proposed project should have no effect on either existing or future industrial, commercial, or residential growth in the region.

Table 9-24
VISCREEN Maximum Class I Visual Impacts – Brigantine Wilderness Area[1]

Background	Theta (degrees)	Azimuth (degrees)	Distance (km)	Alpha (degrees)	Delta E[2]		Contrast[3]	
					Criteria	Plume	Criteria	Plume
Inside Surrounding Area								
Sky	10	84	206	84	2.0	0.493	0.05	0.007
Sky	140	84	206	84	2.0	0.107	0.05	-0.004
Terrain	10	84	206	84	2.0	0.275	0.05	0.003
Terrain	140	84	206	84	2.0	0.050	0.05	0.001
Outside Surrounding Area								
Sky	10	5	64.2	164	2.0	0.790	0.05	0.007
Sky	140	5	64.2	164	2.0	0.189	0.05	-0.004
Terrain	10	5	64.2	164	2.0	0.366	0.05	0.003
Terrain	140	5	64.2	164	2.0	0.137	0.05	0.003

Notes:
[1] Based on the total project emissions.
[2] Color difference parameter (dimensionless).
[3] Visual contrast against background parameter (dimensionless).

Table 9-25
VISCREEN Maximum Class I Visual Impacts – Lye Brook Wilderness Area[1]

Background	Theta (degrees)	Azimuth (degrees)	Distance (km)	Alpha (degrees)	Delta E[2]		Contrast[3]	
					Criteria	Plume	Criteria	Plume
Inside Surrounding Area								
Sky	10	84	215	84	2.0	0.647	0.05	0.010
Sky	140	84	215	84	2.0	0.130	0.05	-0.005
Terrain	10	84	215	84	2.0	0.411	0.05	0.004
Terrain	140	84	215	84	2.0	0.064	0.05	0.002
Outside Surrounding Area								
Sky	10	5	67	164	2.0	1.519	0.05	0.015
Sky	140	5	67	164	2.0	0.333	0.05	-0.007
Terrain	10	5	67	164	2.0	0.649	0.05	0.005
Terrain	140	5	67	164	2.0	0.250	0.05	0.005

Notes:
[1] Based on the total project emissions.
[2] Color difference parameter (dimensionless).
[3] Visual contrast against background parameter (dimensionless).

9.6 NEW YORK STATE ENVIRONMENTAL QUALITY REVIEW ANALYSES

This section details the air quality analyses conducted as part of the State Environmental Quality Review (SEQRA) process. These analyses include:

- Fine Particulates (PM-2.5);
- Acid Deposition;
- Toxic Air Pollutants;
- Accidental Releases;
- Visible Plumes;
- Local Source Cumulative Analysis;
- Impacts at Nearby Sensitive Receptors; and
- Global Warming.

The following sections discuss the modeling methodology used for these analyses and the results of these analyses.

9.6.1 Fine Particulates (PM-2.5)

Fine particulate (PM-2.5) refers to any microscopic liquid or solid particle or aerosol with an aerodynamic diameter equal to or less than 2.5 microns. The USEPA proposed and promulgated ambient air quality standards for PM-2.5 in 1997 and subsequently rivsed the 24-hour standard for PM-2.5 on September 21, 2006.

Even though the PM-2.5 monitor in Newburg, Orange County, New York has historically shown PM-2.5 levels that are below the associated NAAQS for PM-2.5, Orange County was included in the 10-county New York City Metropolitan Nonattainment Area for PM-2.5 primarily based on EPA guidance recommending the presumptive use of Metropolitan Statistical Area (MSA) boundaries for defining the boundaries for PM-2.5 nonattainment areas. The nonattainment status of the New York City Metropolitan Nonattainment Area for PM-2.5 is based on the PS 59 monitor in Manhattan.

Until a State Implementation Plan (SIP) is created for PM-2.5, the NYSDEC is regulating PM-2.5 emissions under an interim policy, <u>CP-33/Assessing and Mitigating Impacts of Fine Particulate Matter Emissions</u> (NYSDEC, 2003).

9.6.1.1 NYSDEC PM-2.5 Policy

The NYSDEC interim policy requires any proposed facility with potential annual PM-10 emissions greater than 15 tons per year (tons/year) to conduct an air quality modeling analysis for PM-2.5. Unless a source can demonstrate that a reasonably accurate measure of the PM-2.5 fraction of PM-10 is available, the NYSDEC requires an applicant to conservatively assume that all PM-10 is PM-2.5. Because the CPV Valley Energy Center would have potential annual PM-10 emissions greater than 15 tons/year, the proposed project is subject to PM-2.5 air quality modeling requirements under CP-33.

Results of the PM-2.5 air quality modeling analysis are summed with the representative background ambient PM-2.5 concentrations for the area surrounding the proposed project. The total 24-hour and annual PM-2.5 concentrations (i.e., the modeled concentration plus the background concentration) are then compared to the 24-hour and annual PM-2.5 NAAQS to assess compliance. The NYSDEC has also developed ambient thresholds for 24-hour (5 $\mu g/m^3$) and annual (0.3 $\mu g/m^3$) PM-2.5 air quality concentrations to determine if a project will have a potentially significant adverse impact. If the Project's maximum modeled PM-2.5 concentrations are less than the NYSDEC SILs, then the Project will be considered to have insignificant impacts for PM-2.5 and no further analyses are required. For projects with potentially significant impacts, an assessment of the severity of the impacts, alternatives, and reasonable and necessary mitigation measures to minimize PM-2.5 emissions and impacts to the maximum extent possible must be provided.

In addition to the air quality modeling, the potential project impacts due to secondary formation must be addressed per the NYSDEC interim policy. This assessment must: 1) provide a quantitative measure of potential PM-2.5 precursor emissions and a qualitative discussion on potential secondary PM-2.5 formation; and 2) demonstrate that the Project will comply with all state and federal regulations and programs applicable to the emissions of PM-2.5 precursor pollutants.

9.6.1.2 NYSDEC PM-2.5 Monitoring Data

In the third quarter of 1999, the NYSDEC established a fine particulate monitoring program for the state of New York. The PM-2.5 monitor nearest the proposed project site is the Newburg, New York monitor in Orange County. This monitor is located approximately 23 miles east-northeast of the Project site and has been in operation since the first quarter of 2000.

The USEPA has set the annual PM-2.5 NAAQS at 15 $\mu g/m^3$ based on the three year average of annual mean concentrations and the 24-hour PM-2.5 NAAQS at 35 $\mu g/m^3$ based on the three year average of the 98th percentile of the 24-hour concentrations. Using the latest three years of PM-2.5 monitoring data (2005, 2006, and 2007) from the Newburg monitoring site, the three-year average annual PM-2.5 concentration was 10.8 $\mu g/m^3$, while the three-year average 98th percentile 24-hour PM-2.5 concentration was 29.3 $\mu g/m^3$. Both of these values are less than their respective PM-2.5 NAAQS. The

9.6.1.3 CPV Valley Energy Center PM-2.5 Impact

In order to assess the Project's potential contribution to ambient PM-2.5 concentrations, an air quality modeling analysis was prepared using procedures described in the revised Air Quality Modeling Protocol. This analysis assumed that the PM-2.5 emissions from the combustion turbine, auxiliary boiler, dew point fuel gas heater, and diesel fire pump would be equivalent to their respective PM-10 emissions.

The Project's maximum annual and 98th percentile (corresponding to the highest 8th high) 24-hour predicted PM-2.5 impacts were determined and added to the background PM-2.5 values for comparison to the NAAQS. The maximum predicted Project annual PM-2.5 impact was approximately 0.2 μg/m^3. This is less than the corresponding annual ambient threshold of 0.3 μg/m^3 in CP-33 for determining potentially significant impacts. The sum of the maximum predicted annual Project impact for PM-2.5 to background levels yields a total of 11.0 μg/m^3 which is below the corresponding annual standard of 15 μg/m^3.

The maximum predicted 24-hour Project PM-2.5 impact was 9.9 μg/m^3. This impact was predicted to occur in elevated terrain located a few km to the northwest. This exceeds the corresponding 24-hour ambient threshold of 2.0 μg/m^3 for determining potentially significant impacts under CP-33.

The predicted highest 8th-high 24-hour value, corresponding to the 98th percentile value, was 2.85 μg/m^3. The sum of the predicted 98th percentile 24-hour Project impact to background yields a value of 32.2 μg/m^3 which is below the corresponding 24-hour standard of 35 μg/m^3.

Table 9-26 provides a summary of predicted Project PM-2.5 impacts. Graphical plots showing the predicted maximum annual, maximum 24-hour, and high 8th-high 24-hour Project impacts of PM-2.5 are provided in Appendix 9-D.

Table 9-26
Project PM-2.5 Impacts

Averaging Time	Rank	Project Impact (ug/m^3)	Background (ug/m^3)	Total Concentration (ug/m^3)	NAAQS (ug/m^3)
24-hour	H8H	2.85	29.3	32.2	35
Annual	MAX	0.2	10.8	11.0	15

Note:
H8H = high 8th high; corresponds to 98th percentile value

9.6.1.4 Secondary PM-2.5 Formation from the Project

While the Project would emit primary PM-2.5 due to the combustion of fossil fuels (natural gas and distillate fuel oil), potential PM-2.5 precursor pollutants also would be emitted due to combustion. These potential PM-2.5 precursor pollutants include: SO_2, NO_x, and NH_3. The Project would have the potential to emit up to 41.3 tons per year (tons/year) of SO_2, 187.0 tons/year of NO_x, and 47.2 tons/year of NH_3.

The formation of secondary particulate involves many complex processes and cannot be modeled accurately. The transformation of SO_2, NO_x, and NH_3 to secondary particles occurs slowly, typically on the order of 1 to 3 percent per hour (USEPA, 2002). As such, most of the SO_2, NO_x, and NH_3 emitted from the Project would be transported away from the Project area before any appreciable transformation to secondary PM-2.5 could occur. Because of the transporting of the Project's emissions, the slow reaction time of the PM-2.5 precursor pollutants, and the dispersion of the Project's plume as it travels, it is anticipated that the secondary PM-2.5 formed due to the Project would be non-measurable. Thus, the proposed project is expected to have no significant impact as a result of secondary PM-2.5 formation.

To minimize potential PM-2.5 precursor pollutant emissions, the Project has been designed to meet all New York State and USEPA emission requirements. Namely, the Project's NO_x emissions would meet the USEPA LAER, SO_2 emissions would meet the USEPA BACT levels, and NH_3 emissions would comply with the NYSDEC guidelines for ammonia slip. The USEPA LAER and BACT emission levels are more restrictive than any NYSDEC emission limits for NO_x and SO_2, thus the Project would comply with the NYSDEC regulations for these pollutants. The proposed facility impacts for PM-2.5, when added to background levels, would be below the associated NAAQS. Therefore, it is concluded that the Project would not have any significant adverse public health impacts with regard to PM-2.5.

9.6.2 Acid Deposition Study

In accordance with the New York State Acid Deposition Control Act, a "Source Specific Acidic Deposition Impacts" analysis was conducted to provide quantification of the Project's contribution to the New York State total deposition of sulfates and nitrates at eighteen defined receptors in New York State, New England, and Canada.
The analysis followed the methodology presented in the March 4, 1993 memorandum from Leon Sedefian (of NYSDEC) to IAM Staff. The basic elements of the analysis are as follows:

1. Select a representative source that best represents the proposed (new) source. If a representative source cannot be found, then select the New York county in which the Project is located.

2. Reference the tables contained in the memorandum, determine the proposed source NO_x and SO_2 impacts by scaling the reference source or county NO_x and SO_2 impacts at each of the eighteen receptors by the ratio of the new source NO_x and SO_2 emissions over the reference source or county NO_x and SO_2 emissions.

3. Calculate the percentage contribution of new source NO_x and SO_2 impacts to the total impacts determined for each of the eighteen receptors from all sources.

The results of the analysis are presented in Table 9-27. The reference source used in the analysis was Orange County. New source emissions were scaled as described above, and percent contribution of total values were determined. Given the firing of natural gas ultra low sulfur distillate oil and the use of LAER NO_x control, the new facility's contribution to the New York State total deposition of sulfates and nitrates at each of the eighteen receptors are all below 0.21 percent.

Local impacts from acid precipitation formed due to the proposed project are highly unlikely because the process of altering the sulfur dioxide and nitrogen oxide gases into their acid counterparts can take several days. During this time, the pollutants would have traveled hundreds of miles from the original source. Thus, the emissions from the proposed project would have little or no contribution to the acidity of the precipitation that falls on the surrounding area. Furthermore, impacts at greater distances would be negligible due to the wide dispersion of these gases.

Table 9-27
Source Specific Acidic Deposition Impacts

Reference Source =	**Orange County**	
Reference SO_2 Emissions =	3,338.000	1,000 tons/yr
Reference NO_x Emissions =	9,382	tons/year
Proposed Source =	**CPV Valley Energy Center**	
Potential SO_2 Emissions =	0.0413	1,000 tons/yr
Potential NO_x Emissions =	187	tons/year

Receptor Name	**Receptor SO_2 Impact ($g/m^2/yr$)**				**Receptor NO_x Impact (Kg/Ha)**			
	Reference Source	**All NY Sources**	**Proposed Source**	**% of All NY**	**Reference Source**	**All NY Sources**	**Proposed Source**	**% of All NY**
Whiteface	0.000616	0.143425	0.00000001	0.0000%	0.045065	4.136114	0.00089823	0.0217%
W. Adirondacks	0.000618	0.201734	0.00000001	0.0000%	0.038782	5.179167	0.00077299	0.0149%
Catskills	0.001778	0.263758	0.00000002	0.0000%	0.110809	7.107259	0.00220862	0.0311%
West Point	0.003543	0.332539	0.00000004	0.0000%	0.241563	11.260204	0.00481478	0.0428%
Chautauqua	0.000356	0.178049	0.00000000	0.0000%	0.00922	1.581787	0.00018377	0.0116%
Brookhaven	0.113367	0.671944	0.00000140	0.0002%	1.868847	18.500769	0.03724946	0.2013%
Bennett's Bridge	0.000585	0.409691	0.00000001	0.0000%	0.030332	7.170561	0.00060457	0.0084%
Green Mountains	0.00069	0.121215	0.00000001	0.0000%	0.057964	3.440833	0.00115533	0.0336%
Berkshires	0.002177	0.32963	0.00000003	0.0000%	0.195805	8.233134	0.00390274	0.0474%
Connecticut	0.00647	0.291966	0.00000008	0.0000%	0.898317	9.387031	0.01790506	0.1907%
Muskoka	0.000204	0.03358	0.00000000	0.0000%	0.00688	0.589719	0.00013713	0.0233%
S. New Hamphire	0.001155	0.065597	0.00000001	0.0000%	0.072368	1.366437	0.00144242	0.1056%
New Hampshire	0.000727	0.090665	0.00000001	0.0000%	0.067505	2.380087	0.00134550	0.0565%
SW Quebec	0.000153	0.016791	0.00000000	0.0000%	0.007991	0.499722	0.00015927	0.0319%
S Quebec	0.000267	0.024986	0.00000000	0.0000%	0.026585	1.015349	0.00052989	0.0522%
NE Quebec	0.000128	0.008503	0.00000000	0.0000%	0.013489	0.368393	0.00026886	0.0730%
Newfoundland	0.000225	0.012184	0.00000000	0.0000%	0.011406	0.24335	0.00022734	0.0934%
Hubbard Brook	0.001043	0.138607	0.00000001	0.0000%	0.090467	3.27392	0.00180317	0.0551%

The proposed project, like any other fossil-fuel fired plant, would emit small quantities of sulfuric acid mist. Potential emissions of sulfuric acid mist from the proposed project would be scavenged out of the atmosphere during precipitation events. However, the amount of potential sulfuric acid mist emissions would be diluted by the amount of precipitation that falls over the entire area. Thus, the acidity of the precipitation would not be expected to increase substantially due to the sulfuric acid mist being emitted from the proposed project.

9.6.3 Non-Criteria Pollutant Analysis

An air quality modeling analysis was conducted for potential non-criteria pollutant emissions from the proposed combustion turbines, auxiliary boiler, fuel gas heaters, emergency diesel generator, and fire water pump at the CPV Valley Energy Center. Each source was modeled individually using a unit emission rate, and impacts for particular pollutants were obtained by scaling by the respective emission rate. Maximum impacts from each source for each pollutant were then added together to yield conservative estimates of total impacts for each pollutant, since the individual values were not necessarily paired in time or space. Maximum annual impacts were based on the higher of combustion turbine contributions for gas firing for the entire year or a weighted average of impacts from gas and ULSD firing. The resulting upper bound estimates of impacts were compared to the NYSDEC's short-term guideline concentration (SGC) and annual guideline concentration (AGC), respectively, for each non-criteria pollutant. The

NYSDEC SGCs and AGCs used in the analysis are those listed in the NYSDEC's DAR-1 (formerly Air Guide-1) tables that were most recently revised in September 2007.

9.6.3.1 Non-Criteria Pollutant Emissions

Potential non-criteria pollutant emissions from the operation of the combustion turbines were quantified based on USEPA AP-42 emission factors with the exception of formaldehyde, which was based on California Air Resources Board (CARB) emissions test data that is more appropriate for advanced-technology DLN model units such as the Siemens Westinghouse 501F, and ammonia and sulfuric acid, which were from vendor provided information. Potential non-criteria pollutant emissions from the auxiliary boiler and duct burner were based on emission factors from AP-42 Chapter 1.4 (July 1998) and Chapter 1.3 (September 1998), while potential non-criteria pollutant emissions from the fuel gas heater and emergency diesel engines were based on emission factors from AP-42 Chapter 1.4 (July 1998) and Chapter 3.3 (October 1996), respectively. Tables B-12 and B-13 in Appendix 9-B provide additional details concerning potential emissions of non-criteria pollutants from Project sources.

9.6.3.2 Non-Criteria Pollutant Impacts

Table 9-28 presents a summary of maximum predicted non-criteria pollutant impacts relative to the associated SGC and AGC values. Predicted Project impacts of non-criteria pollutants are all well below the associated SGC and AGC values.

Table 9-28
Non-Criteria Pollutant Impacts and NYSDEC Guideline Concentrations

	Maximum 1-hour Concentrations									Maximum Annual Concentrations								
	Aux. Boiler	Emerg. Diesel Gen	Diesel Fire Pump	Gas Heater	Maximum Turbine Impact	Maximum Turbine Impacts	*Maximum Total Impacts*	*Maximum Total Impacts*	*SGC Standard*	Aux. Boiler	Emerg. Diesel Gen	Diesel Fire Pump	Gas Heater	Maximum Turbine Impact	Maximum Turbine Impacts	*Maximum Total Impacts*	*Maximum Total Impacts*	*AGC Standard*
					Gas Firing	Oil Firing	Gas Firing	Oil Firing						Gas Firing	Oil Firing	Gas Firing	Gas/Oil Firing	
Non-Criteria Pollutants	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)	(ug/m3)
1,3-Butadiene	0.0E+00	4.5E-03	2.4E-03	0.0E+00	1.2E-03	3.8E-02	8.1E-03	4.5E-02	---	0.0E+00	1.3E-05	5.5E-06	0.0E+00	6.1E-06	1.5E-05	2.5E-05	4.0E-05	3.3E-02
1,4 - Dichlorobenzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.3E-02	0.0E+00	6.3E-02	---	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.7E-05	0.0E+00	2.7E-05	9.0E-02
2-Methylnapthalene	2.2E-06	0.0E+00	0.0E+00	1.5E-06	1.5E-05	0.0E+00	1.9E-05	3.7E-06	---	2.1E-08	0.0E+00	0.0E+00	1.8E-07	7.2E-08	0.0E+00	2.8E-07	2.7E-07	7.1E+00
3-Methylchloranthrene	1.6E-07	0.0E+00	0.0E+00	1.1E-07	1.2E-06	0.0E+00	1.4E-06	2.8E-07	2.2E+04	1.5E-09	0.0E+00	0.0E+00	1.4E-08	5.4E-09	0.0E+00	2.1E-08	2.0E-08	9.0E+01
Acrolein	0.0E+00	1.1E-02	5.6E-03	0.0E+00	1.9E-02	0.0E+00	3.5E-02	1.6E-02	1.9E-01	0.0E+00	3.2E-05	1.3E-05	0.0E+00	1.1E-04	0.0E+00	1.5E-04	1.4E-04	2.0E-02
Ammonia	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.0E+00	1.4E+01	6.0E+00	1.4E+01	2.4E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.0E-02	5.7E-03	3.0E-02	3.4E-02	1.0E+02
Anthracene	2.2E-07	2.2E-04	1.1E-04	1.5E-07	3.2E-04	1.9E-03	6.5E-04	2.2E-03	---	2.1E-09	6.5E-07	2.6E-07	1.8E-08	1.6E-06	7.4E-07	2.6E-06	3.2E-06	2.0E-02
Arsenic	1.8E-05	0.0E+00	0.0E+00	1.2E-05	1.3E-04	2.6E-02	1.6E-04	2.6E-02	---	1.7E-07	0.0E+00	0.0E+00	1.5E-06	6.0E-07	1.0E-05	2.3E-06	1.3E-05	2.3E-04
Barium	4.0E-04	0.0E+00	0.0E+00	2.7E-04	2.8E-03	0.0E+00	3.5E-03	6.7E-04	---	3.8E-06	0.0E+00	0.0E+00	3.4E-05	1.3E-05	0.0E+00	5.1E-05	4.9E-05	1.2E+00
Benz(a)anthracene	1.6E-07	1.9E-04	1.0E-04	1.1E-07	2.4E-04	6.1E-03	5.4E-04	6.4E-03		1.5E-09	5.8E-07	2.4E-07	1.4E-08	1.2E-06	2.4E-06	2.0E-06	4.4E-06	2.0E-02
Benzene	1.9E-04	1.1E-01	5.7E-02	1.3E-04	2.3E-01	1.3E-01	4.0E-01	2.9E-01	1.3E+03	1.8E-06	3.2E-04	1.3E-04	1.6E-05	1.3E-03	5.2E-05	1.8E-03	1.8E-03	1.3E-01
Benzo(a)pyrene	1.1E-07	2.2E-05	1.1E-05	7.5E-08	1.6E-04	0.0E+00	1.9E-04	3.3E-05	---	1.0E-09	6.5E-08	2.7E-08	9.2E-09	8.1E-07	0.0E+00	9.1E-07	8.5E-07	9.1E-04
Beryllium	1.1E-06	0.0E+00	0.0E+00	7.5E-07	7.7E-06	7.3E-04	9.5E-06	7.3E-04	1.0E+00	1.0E-08	0.0E+00	0.0E+00	9.2E-08	3.6E-08	2.9E-07	1.4E-07	4.3E-07	4.2E-04
Butane	1.9E-01	0.0E+00	0.0E+00	1.3E-01	1.3E+00	0.0E+00	1.7E+00	3.2E-01	---	1.8E-03	0.0E+00	0.0E+00	1.6E-02	6.3E-03	0.0E+00	2.4E-02	2.4E-02	5.7E+04
Cadmium	1.0E-04	0.0E+00	0.0E+00	6.8E-05	7.1E-04	1.1E-02	8.7E-04	1.1E-02	---	9.5E-07	0.0E+00	0.0E+00	8.4E-06	3.3E-06	4.5E-06	1.3E-05	1.7E-05	2.4E-04
Carbon Tetrachloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.5E-02	0.0E+00	6.5E-02	1.9E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.8E-05	0.0E+00	2.8E-05	6.7E-02
Chlorobenzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.3E-02	0.0E+00	5.3E-02	---	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.3E-05	0.0E+00	2.3E-05	1.1E+02
Chloroform	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.4E-02	0.0E+00	5.4E-02	1.5E+02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.3E-05	0.0E+00	2.3E-05	4.3E-02
Chromium	1.3E-04	0.0E+00	0.0E+00	8.7E-05	9.0E-04	2.6E-02	1.1E-03	2.6E-02	---	1.2E-06	0.0E+00	0.0E+00	1.1E-05	4.2E-06	1.0E-05	1.6E-05	2.6E-05	1.2E+00
Chrysene	1.6E-07	4.1E-05	2.1E-05	1.1E-07	2.4E-04	3.6E-03	3.0E-04	3.7E-03	---	1.5E-09	1.2E-07	5.0E-08	1.4E-08	1.2E-06	1.5E-06	1.4E-06	2.8E-06	2.0E-02
Cobalt	7.6E-06	0.0E+00	0.0E+00	5.2E-06	5.4E-05	0.0E+00	6.7E-05	1.3E-05	---	7.2E-08	0.0E+00	0.0E+00	6.4E-07	2.5E-07	0.0E+00	9.7E-07	9.4E-07	1.0E-03
Copper	7.7E-05	0.0E+00	0.0E+00	5.3E-05	5.5E-04	0.0E+00	6.8E-04	1.3E-04	1.0E+02	7.3E-07	0.0E+00	0.0E+00	6.5E-06	2.6E-06	0.0E+00	9.8E-06	9.6E-06	2.0E-02
Dibenzo(a,h)anthracene	1.1E-07	6.7E-05	3.5E-05	7.5E-08	1.6E-04	2.5E-03	2.6E-04	2.6E-03	---	1.0E-09	2.0E-07	8.2E-08	9.2E-09	8.1E-07	1.0E-06	1.1E-06	2.1E-06	2.0E-02
Dichlorobenzene	1.1E-04	0.0E+00	0.0E+00	7.5E-05	7.7E-04	0.0E+00	9.5E-04	1.8E-04	---	1.0E-06	0.0E+00	0.0E+00	9.2E-06	3.6E-06	0.0E+00	1.4E-05	1.3E-05	9.0E-02
Ethane	2.8E-01	0.0E+00	0.0E+00	1.9E-01	2.0E+00	0.0E+00	2.5E+00	4.7E-01	---	2.7E-03	0.0E+00	0.0E+00	2.4E-02	9.3E-03	0.0E+00	3.6E-02	3.5E-02	2.9E+03
Ethylbenzene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.0E-02	0.0E+00	9.0E-02	0.0E+00	5.4E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.6E-04	0.0E+00	4.6E-04	4.2E-04	1.0E+03
Ethylene Dichloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.3E-02	0.0E+00	4.3E-02	---	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-05	0.0E+00	1.8E-05	3.8E-02
Formaldehyde	6.8E-03	1.4E-01	7.2E-02	4.7E-03	3.5E-01	6.6E-01	5.7E-01	8.8E-01	3.0E+01	6.4E-05	4.1E-04	1.7E-04	5.7E-04	1.6E-03	2.7E-04	2.8E-03	2.9E-03	6.0E-02
Hexane	1.6E-01	0.0E+00	0.0E+00	1.1E-01	1.2E+00	0.0E+00	1.4E+00	2.8E-01	---	1.5E-03	0.0E+00	0.0E+00	1.4E-02	5.4E-03	0.0E+00	2.1E-02	2.0E-02	7.0E+02
Lead	4.5E-05	0.0E+00	0.0E+00	3.1E-05	3.2E-04	3.3E-02	4.0E-04	3.3E-02	---	4.3E-07	0.0E+00	0.0E+00	3.8E-06	1.5E-06	1.3E-05	5.7E-06	1.9E-05	3.8E-01
Manganese	3.4E-05	0.0E+00	0.0E+00	2.4E-05	2.4E-04	1.9E+00	3.0E-04	1.9E+00	---	3.3E-07	0.0E+00	0.0E+00	2.9E-06	1.1E-06	7.5E-04	4.4E-06	7.5E-04	5.0E-02
Mercury	2.4E-05	0.0E+00	0.0E+00	1.6E-05	1.7E-04	2.8E-03	2.1E-04	2.9E-03	1.8E+00	2.2E-07	0.0E+00	0.0E+00	2.0E-06	7.8E-07	1.1E-06	3.0E-06	4.1E-06	3.0E-01
Methylene Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.5E-02	0.0E+00	4.5E-02	1.4E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-05	0.0E+00	1.9E-05	2.1E+00
Molybdenum	1.0E-04	0.0E+00	0.0E+00	6.8E-05	7.1E-04	0.0E+00	8.7E-04	1.7E-04	---	9.5E-07	0.0E+00	0.0E+00	8.4E-06	3.3E-06	0.0E+00	1.3E-05	1.2E-05	1.2E+00
Nickel	1.9E-04	0.0E+00	0.0E+00	1.3E-04	1.3E-03	3.4E-02	1.7E-03	3.5E-02	6.0E+00	1.8E-06	0.0E+00	0.0E+00	1.6E-05	6.3E-06	1.5E-05	2.4E-05	3.8E-05	4.2E-03
PAH	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.2E-03	9.4E-02	6.2E-03	9.4E-02	---	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-05	3.8E-05	3.1E-05	6.7E-05	2.0E-02
Pentane	2.4E-01	0.0E+00	0.0E+00	1.6E-01	1.7E+00	0.0E+00	2.1E+00	4.0E-01	---	2.2E-03	0.0E+00	0.0E+00	2.0E-02	7.8E-03	0.0E+00	3.0E-02	2.9E-02	4.2E+03
Phenanathrene	1.5E-06	3.4E-03	1.8E-03	1.1E-06	2.3E-03	1.6E-02	7.4E-03	2.1E-02	---	1.5E-08	1.0E-05	4.2E-06	1.3E-07	1.1E-05	6.4E-06	2.6E-05	3.1E-05	2.0E-02
Propane	1.5E-01	0.0E+00	0.0E+00	9.9E-02	1.0E+00	0.0E+00	1.3E+00	2.4E-01	---	1.4E-03	0.0E+00	0.0E+00	1.2E-02	4.8E-03	0.0E+00	1.8E-02	1.8E-02	4.3E+04
Propylene	0.0E+00	3.0E-01	1.6E-01	0.0E+00	0.0E+00	0.0E+00	4.5E-01	4.5E-01	---	0.0E+00	8.9E-04	3.6E-04	0.0E+00	0.0E+00	0.0E+00	1.3E-03	1.3E-03	3.0E+03
Propylene Oxide	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.2E-02	0.0E+00	8.2E-02	0.0E+00	3.1E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-04	0.0E+00	4.1E-04	3.8E-04	2.7E-01
Pyrene	4.5E-07	5.5E-04	2.9E-04	3.1E-07	6.7E-04	6.5E-03	1.5E-03	7.3E-03	---	4.3E-09	1.7E-06	6.8E-07	3.8E-08	3.4E-06	2.6E-06	5.7E-06	8.1E-06	2.0E-02
Selenium	2.2E-06	0.0E+00	0.0E+00	1.5E-06	1.5E-05	6.1E-02	1.9E-05	6.1E-02	---	2.1E-08	0.0E+00	0.0E+00	1.8E-07	7.2E-08	2.6E-05	2.8E-07	2.7E-05	2.0E+01
Sulfuric Acid	1.6E-02	7.0E-02	3.7E-02	1.1E-02	1.9E+00	1.1E+00	2.0E+00	1.2E+00	1.2E+02	1.5E-04	2.1E-04	8.5E-05	1.3E-03	9.5E-03	4.4E-04	1.1E-02	1.1E-02	1.0E+00
Tetrachloroethylene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.9E-02	0.0E+00	6.9E-02	1.0E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.0E-05	0.0E+00	3.0E-05	1.0E+00
Toluene	3.1E-04	4.7E-02	2.5E-02	2.1E-04	3.7E-01	0.0E+00	4.4E-01	7.2E-02	3.7E+04	2.9E-06	1.4E-04	5.8E-05	2.6E-05	1.9E-03	0.0E+00	2.1E-03	1.9E-03	5.0E+03
Trichloroethylene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.9E-02	0.0E+00	5.9E-02	1.4E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.5E-05	0.0E+00	2.5E-05	5.0E-01
Vanadium	2.1E-04	0.0E+00	0.0E+00	1.4E-04	1.5E-03	0.0E+00	1.8E-03	3.5E-04	---	2.0E-06	0.0E+00	0.0E+00	1.8E-05	6.9E-06	0.0E+00	2.6E-05	2.6E-05	2.0E-01
Vinyl Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-01	0.0E+00	1.1E-01	1.8E+05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.8E-05	0.0E+00	4.8E-05	1.1E-01
Vinylidene Chloride	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.3E-02	0.0E+00	4.3E-02	---	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-05	0.0E+00	1.8E-05	7.0E+01
Xylenes	0.0E+00	3.3E-02	1.7E-02	0.0E+00	1.8E-01	0.0E+00	2.3E-01	5.0E-02	4.3E+03	0.0E+00	9.8E-05	4.0E-05	0.0E+00	9.1E-04	0.0E+00	1.1E-03	9.8E-04	1.0E+02
Zinc	2.6E-03	0.0E+00	0.0E+00	1.8E-03	1.9E-02	0.0E+00	2.3E-02	4.4E-03	---	2.5E-05	0.0E+00	0.0E+00	2.2E-04	8.7E-05	0.0E+00	3.3E-04	3.3E-04	4.5E+01

9.6.4 Assessment of Accidental Ammonia Release

Aqueous ammonia will be stored on site for use in the Selective Catalytic Reduction (SCR) emissions control system for nitrogen oxides. An aqueous ammonia solution containing less than 20 percent ammonia by weight will be stored in a 15,000-gallon tank. The tank will be vertically oriented with an approximate diameter of 11 feet and an approximate height of 17 feet. The tank will be located within an impermeable concrete containment area. The containment area will be approximately 20 feet long and 20 feet wide and will be surrounded by a wall. The containment basin is designed to contain 110% of the tank contents in the event of a total tank failure that would release the tank contents. The floor of the containment area will be covered with plastic balls designed to float on the liquid surface in the event of a spill. The plastic balls would reduce the surface area of the exposed liquid and thereby reduce the rate of evaporation of ammonia to the atmosphere.

Facilities that store aqueous ammonia solutions containing less than 20 percent ammonia by weight are not subject to the United States Environmental Protection Agency (EPA) Risk Management Planning (RMP) Rule. However, the EPA "Risk Management Program Guidance for Offsite Consequence Analysis" provides some guidance for estimating the potential consequences of an accidental spill of aqueous ammonia.

The rate of evaporation from a pool of aqueous ammonia is a function of the surface area of the liquid, the partial pressure of ammonia, the temperature, and the wind speed. The partial pressure of ammonia increases as temperature increases. The evaporation rate also increases with higher wind speeds. However, downwind concentrations due to evaporation from a pool depend on dispersion characteristics in addition to evaporation rate. If other factors, including evaporation rate, are held constant, then downwind concentrations are inversely proportional to wind speed. The EPA Risk Management Planning Rule stipulates the use of a relatively low wind speed of 1.5 meters per second (m/s) to evaluate the toxic endpoint for a "worst-case" release.

Atmospheric dispersion also depends on atmospheric stability. Very stable conditions (stability class F) result in the highest downwind concentrations from a given release rate for a ground level source. Stability class F occurs only at night. Neutral stability (Class D) is the most stable condition that occurs during daylight hours. The EPA risk management planning guidance specifies the use of F stability with a wind speed of 1.5 m/s for assessing worst-case impacts from pools of toxic liquids and recommends the use of D stability with a wind speed of 3.0 m/s for an alternate release scenario, if needed.

Both a worst-case and an alternate scenario were defined and modeled to assess potential impacts from an accidental release of aqueous ammonia. In each case, the rupture and complete failure of the ammonia tank resulting in the spilling of its entire contents into the containment area was considered. The worst-case scenario assumed F stability and a wind speed of 1.5 m/s. The alternate scenario assumed D stability and a wind speed of 3.0 m/s. In accordance with guidance, the option for urban/forest roughness was assumed due to the presence of buildings in the vicinity of the storage tank.

Ambient temperatures were assigned based on a consideration of the maximum temperature that might occur for each combination of stability and wind speed. A review of a 5-year (2002-2006) representative meteorological data base from Orange County Airport that had been processed for other modeling analyses for the Project showed that the maximum temperature associated with any stable, low wind speed (1.5 m/s) hour was 81 ^{o}F. This temperature (81 ^{o}F) was specified for the worst-case scenario. Review of the five-year meteorological data base for Orange County Airport showed a maximum ambient temperature of 97 ^{o}F. For the alternate scenario, an even higher ambient temperature of 100 ^{o}F was specified.

The most recent version of the Areal Locations of Hazardous Atmospheres (ALOHA) model (version 5.4.1) was used for the modeling analysis. ALOHA was developed by EPA and the National Oceanic and Atmospheric Administration (NOAA) and is designed for use for emergency response to chemical releases and for emergency planning and training.

As mentioned previously, the bottom of the containment area will be fully covered with impermeable plastic balls with a density lower than that of aqueous ammonia. In the event of a spill, the balls would float on the surface of the liquid pool and reduce the exposed surface area available for evaporation. A close packing of plastic balls in a horizontal layer in which each ball touches six of its adjacent neighbors in the same layer yields an open area equal to $(1 - \pi/2\sqrt{3})$ times the total area without the balls. The exposed surface area in the absence of the plastic balls would be 20 feet x 20 feet, or 400 ft^2. Therefore, the resulting exposed area with the use of the plastic balls would be approximately 0.0931 x 400 ft^2 $\approx$ 37.24 ft^2.

ALOHA was used to calculate the emission rate of ammonia that would result from a hypothetical ammonia tank failure under conditions corresponding to the defined worst-case and alternate scenarios. It was assumed that a pool of aqueous ammonia would fill the containment area and that the exposed surface area would be only 37.24 ft^2 due to the use of the impermeable plastic balls. An ammonia concentration of 20 percent by weight was assumed even though the actual concentration will be below this level.

ALOHA was also used to calculate the downwind distances at which the ammonia concentration resulting from the modeled accidental releases would decrease to less than the Emergency Response Planning Guideline Level 2 (ERPG-2) threshold. The ERPG-2 is defined as the maximum airborne concentration to which nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action. This threshold was defined by the American Industrial Hygiene Association (AIHA) and is recommended by EPA for calculating endpoint distances for the RMP Rule. The original RMP Rule in 1998 defined the toxic endpoint as the ERPG-2 threshold then in effect. For ammonia, the ERPG-2 value was 200 ppm. The ERPG-2 for ammonia was subsequently revised to 150 ppm by AIHA. Although the RMP Rule has not revised the numerical value of the toxic endpoints, the more stringent ERPG-2 value of 150 ppm for ammonia recommended by AIHA was used in this assessment.

ALOHA predicted endpoint distances relative to the ERPG-2 value of 150 ppm for ammonia. The predicted endpoint distances were 103 meters for the worst-case scenario and 68 meters for the alternate scenario.

These predicted endpoint distances can be considered conservative (i.e., to overestimate the likely distance at which concentrations would equal to toxic endpoint) for several reasons. They are based on ambient conditions that will rarely if ever occur. Evaporation rates at lower ambient temperatures would be smaller and would yield lower predicted downwind concentrations and even shorter threat zones. In addition, the modeling analysis conducted by ALOHA is effectively based on a square area source with sides of 6.1 feet consistent with the exposed surface area of 37.24 ft^2. The actual horizontal dimensions of the area source would be 20 feet by 20 feet (i.e., the dimensions of the containment area). Therefore, the modeling conducted by ALOHA neglects the initial dispersion represented by the actual size of the area source and yields larger predicted concentrations and longer distances to the toxic endpoint than would be predicted if the initial size of the source were accounted for.

The RMP rule defines public receptor as "offsite residences, institutions (e.g., schools, hospitals), industrial, commercial, and office buildings, parks, or recreational areas inhabited or occupied by the public at any time without restriction by the stationary source where members of the public could be exposed to toxic concentrations, radiant heat, or overpressure, as a result of an accidental release." The closest public receptor to the ammonia tank is the nearest residence, which is located approximately 1545 feet (or approximately 472 meters) away.

The predicted distances to the toxic endpoint for the worst-case (103 meters) and alternate release scenarios (68 meters) are much shorter than the distance to the nearest public receptor (473 meters). Therefore, it can be concluded that impacts associated with a total failure of the ammonia storage tank would not cause any irreparable harm at the nearest public receptor.

9.6.5 Combustion Plume Visibility

Some of the water vapor in the combined cycle stack plumes may condense to form visible plumes under some atmospheric conditions. If the ambient air is cold and moist, a portion of the emitted water vapor will condense to form water droplets. This may produce a visible, white plume. Visible plumes would be expected to be more prevalent in the winter when the air is cold or during the spring and fall if the air is moist. Visible plumes would be expected to occur much less frequently during the warm summer months. As plumes travels downwind and mix with drier ambient air, water droplets would evaporate and the plume would no longer be visible.

The potential for visible water vapor plumes from the combined cycle stacks was assessed using the CALPUFF model. The predicted concentrations of water vapor were added to the ambient water vapor concentration for each hour of the five-year period that was modeled. The length and height of visible plumes were estimated by comparing the water vapor concentrations along the plume trajectory with the saturation values for the ambient conditions for each hour. The plume was considered to be potentially visible if the saturation concentrations were exceeded.

Three different operating conditions were modeled, one for summer, one for winter, and one for spring and fall. During summer, the case with the highest water vapor emission rate was assumed. This occurs during base load while firing natural gas with duct firing and evaporative cooling at an ambient temperature of 90 ^{o}F. During winter, the operating case corresponding to base load operation while firing natural gas without duct firing at an ambient temperature of -5

°F was assumed. During spring and fall, the base load operation with natural gas with reduced duct firing and no evaporative cooling at an ambient temperature of 51 °F was assumed. These cases are associated with the largest water vapor emissions consistent with the season and expected operations.

Plumes predicted at night were excluded, since these would not be visible to an observer. Hours with ambient relative humidity of 99% or 100%, which have naturally occurring fog, were also excluded, as were calm hours, which have no wind direction or speed. The total number of remaining daylight hours over the five year period was 20,713 (4362 winter hours, 5779 spring hours, 5977 summer hours, and 4595 fall hours). For each season, the number of hours with a predicted visible plume was weighted by the fraction of hours in that season. The resulting weighted percentage of hours with a visible plume over the daylight hours was 11.6%.

Table 9-29 provides a summary of predicted visible plume frequencies by season, length, and height. The most common predicted visible plumes would be between 50 and 250 meters in length and would be between stack height and 200 meters above stack height.

9.6.6 Local Source Cumulative Analysis

A cumulative air quality modeling analysis was conducted to assess the impact of the proposed project along with nearby (i.e., within 5 miles of the Project site) sources. The cumulative modeling was only necessary for pollutants and averaging times for which Project impacts were predicted to exceed established significant impact levels. As described in Section 9.5, maximum Project impacts were predicted to exceed SILs only for PM-10 for the 24-hour averaging period and only for cases for which the combustion turbines would fire ULSD. Therefore, cumulative modeling involving the Project and nearby sources was conducted only for PM-10. Project impacts are insignificant for other pollutants, for PM-10 for gas firing scenarios in the combustion turbines, and for PM-10 annual impacts.

A preliminary list of potential emissions sources was provided by the Town of Wawayanda. The Project requested emissions inventory data for PM-10 sources from NYSDEC, and these data were used as the basis for defining the local source emission inventory for the local cumulative impact analysis. Information in Appendix 9-C describes the development of the local PM-10 emissions inventory and documents the emissions and stack parameters that were used in the modeling for the local sources.

The modeling was performed using the same modeling procedures that were used for assessing compliance with air quality standards of the proposed project alone. A subset of the receptor grid covering the maximum radial extent of the Project SIA was used for the local cumulative impact modeling. Table 9-30a provides the predicted maximum annual and high second-high 24-hour PM-10 cumulative impacts from the local PM-10 and the Project. Maximum total 24-hour PM-10 concentrations were determined by summing the highest second-high predicted source impacts and the highest second-high background values. Maximum annual PM-10 concentrations were determined by summing the maximum annual background and predicted cumulative impacts. Table 9-30b provides a comparison of predicted local PM-10 impacts with

Table 9-29
CPV Valley Visible Plume Analysis Summary

Total Number of Hours:	20713
Winter Hours	4362
Spring Hours	5779
Summer Hours	5977
Fall Hours	4595

Plume Height	Percentage of Modeled Winter Hours	Percentage of Modeled Spring Hours	Percentage of Modeled Summer Hours	Percentage of Modeled Fall Hours	Percentage of Modeled Hours (Full Year)
No Visible Plume	72.67%	87.45%	96.87%	93.65%	88.43%
Between Stack Height and 200 meters	19.35%	8.38%	2.31%	4.33%	8.04%
Between 200 and 300 meters	6.51%	3.06%	0.70%	1.83%	2.83%
Between 300 and 500 meters	1.42%	1.04%	0.12%	0.20%	0.67%
Greater than 500 meters	0.05%	0.07%	0.00%	0.00%	0.03%

Visible Plume Length	Percentage of Modeled Winter Hours	Percentage of Modeled Spring Hours	Percentage of Modeled Summer Hours	Percentage of Modeled Fall Hours	Percentage of Modeled Hours (Full Year)
No Visible Plume	72.67%	87.45%	96.87%	93.65%	88.43%
Between 50 and 250 meters	15.06%	6.39%	1.62%	2.96%	6.08%
Between 250 and 500 meters	6.95%	3.82%	1.02%	2.05%	3.28%
Between 500 and 1000 meters	3.39%	1.52%	0.23%	0.72%	1.37%
Between 1000 and 2500 meters	1.31%	0.61%	0.25%	0.50%	0.63%
Between 2500 and 5000 meters	0.48%	0.19%	0.00%	0.13%	0.18%
Greater than 5000 meters	0.11%	0.02%	0.00%	0.00%	0.03%
Visible plumes					11.6%

Notes:
Five years modeled with CALPUFF using Orange County Airport observations (2002-2006)
Modeled daylight hours (1 hour before sunrise to 1hour after sunset) (25,587 hours of a possible 43,824 hours)
Removed hours with reported calm conditions and hours with RH>98% since natural fog would occur (20,713 hours remaining)

the NAAQS. The modeling results of the cumulative impact analysis are presented in Table 9-30 and show that the combined modeled air quality impacts, even when added to conservative background concentrations, would not exceed ambient air quality standards. Thus, compliance with PM-10 NAAQS in the local Project area is demonstrated.

Table 9-30a
Cumulative PM-10 Modeling Results for Local Source Inventory and Project

Year	Averaging Period	Rank	Impact (ug/m^3)	X (meters)	Y (meters)	Day
2002	24-Hour	H2H	20.20	551687	4582973	8-Jul
2003	24-Hour	H2H	27.10	551815	4583832	2-Sep
2004	24-Hour	H2H	25.43	551687	4582973	19-Nov
2005	24-Hour	H2H	31.15	550540	4586733	13-Aug
2006	24-Hour	H2H	39.45	551312	4586256	28-Aug
2002	Annual	MAX	2.27	551815	4583832	
2003	Annual	MAX	3.05	551815	4583832	
2004	Annual	MAX	2.92	551687	4586393	
2005	Annual	MAX	2.70	551687	4582973	
2006	Annual	MAX	2.63	551687	4586393	

Notes: H2H = high second-high

Table 9-30b
Cumulative Local PM-10 Impacts -- Compliance with NAAQS

Averaging Period	Rank	Impact (ug/m^3)	Background (ug/m^3)	Total Concentration (ug/m^3)	NAAQS (ug/m^3)
24-hour	H2H	31.2	78	109.2	150
Annual	MAX	3.1	35	38.1	50

Notes: H2H = high second-high

9.6.7 Impacts at Sensitive Receptors

Maximum predicted Project impacts at identified sensitive receptors within a radius of 5 miles from the Project were determined using the same modeling procedures described elsewhere,except that impacts are based on results for a single year of meteorological data. For each combination of pollutant and averaging period, the year for which the Project had overall predicted maximum impacts was used for the modeling to predict impacts at the sensitive receptors. Receptors representing historic parks, other parks, golf courses, public nature preserves, conservation easements, cemeteries, churches, fire stations, hospitals, nursing homes, police stations, schools, pre-schools, and other recreational areas within 5 miles were identified and included as receptors for the modeling.

Maximum Project impacts were predicted for NO_2, CO, PM-10, and SO_2. Summary results showing maximum predicted Project impacts at each receptor are provided in Table 9-31. All predicted impacts are below significant impact levels established by EPA.

Table 9-31
Maximum Impacts at Sensitive Receptors

Category	Name	City	X	Y	NO_x	CO		SO_2			PM_{10}	
			UTM	UTM	annual	1-hour	8-hour	3-hour	24-hour	annual	24-hour	annual
			km	km	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
Historic Park	Horton, Webb, House	Middletown	547.974	4587.602	7.9E-02	55.00	12.75	3.1E-01	8.1E-02	1.4E-02	1.33	3.9E-02
Historic Park	Hillside Cemetery	Middletown	547.625	4588.065	6.3E-02	52.65	5.90	2.6E-01	7.9E-02	1.0E-02	0.75	2.7E-02
Historic Park	Dunning House	Wawayanda	545.426	4581.618	7.4E-02	42.42	8.34	5.0E-01	8.3E-02	9.4E-03	1.28	2.6E-02
Historic Park	Primitive Baptist Church of Brookfield	Slate Hill	544.054	4582.211	2.6E-02	33.74	1.68	1.5E-01	5.3E-02	4.0E-03	0.37	9.6E-03
Historic Park	Paramount Theatre	Middletown	548.378	4588.221	6.5E-02	38.39	10.01	2.8E-01	7.0E-02	1.2E-02	1.15	3.1E-02
Historic Park	Oliver Avenue Bridge	Middletown	547.373	4589.291	4.7E-02	46.22	5.87	1.8E-01	7.0E-02	6.8E-03	0.56	1.8E-02
Historic Park	Sawyer Farmhouse	Goshen vicinity	551.917	4580.575	2.2E-02	26.68	3.19	1.9E-01	3.5E-02	4.6E-03	0.51	1.1E-02
Historic Park	District School No. 9	Goshen	554.414	4580.742	2.2E-02	18.00	4.43	9.3E-02	3.2E-02	3.7E-03	0.55	8.8E-03
Historic Park	Pine Hill Cemetery	Wawayanda	547.418	4585.351	2.5E-01	165.61	29.04	7.0E-01	3.7E-01	4.4E-02	3.28	1.5E-01
Historic Park	Potential NRHP Property	Wawayanda	546.724	4584.212	3.0E-01	57.05	16.07	4.4E-01	1.9E-01	1.6E-02	1.59	7.3E-02
Historic Park	Potential NRHP Property	Wawayanda	548.256	4584.646	1.3E-01	53.87	7.66	4.5E-01	1.7E-01	2.0E-02	1.76	5.9E-02
Historic Park	Potential NRHP Property	Wawayanda	548.286	4584.668	1.2E-01	52.18	6.99	4.5E-01	1.6E-01	2.0E-02	1.59	5.7E-02
Historic Park	Potential NRHP Property	Wawayanda	548.322	4584.697	1.2E-01	48.56	6.38	4.5E-01	1.6E-01	1.9E-02	1.39	5.5E-02
Historic Park	Potential NRHP Property	Wawayanda	548.346	4584.728	1.1E-01	43.22	5.78	4.5E-01	1.5E-01	1.8E-02	1.35	5.2E-02
Historic Park	Potential NRHP Property	Wawayanda	548.289	4584.608	1.2E-01	49.92	8.81	4.3E-01	1.6E-01	2.0E-02	1.94	6.0E-02
Historic Park	Potential NRHP Property	Wawayanda	548.313	4584.629	1.2E-01	50.90	7.75	4.2E-01	1.6E-01	2.0E-02	1.81	5.8E-02
Historic Park	Potential NRHP Property	Wawayanda	548.334	4584.647	1.2E-01	50.76	7.28	4.2E-01	1.6E-01	1.9E-02	1.69	5.6E-02
Historic Park	Potential NRHP Property	Wawayanda	547.245	4584.024	5.4E-02	8.04	2.59	4.7E-01	8.7E-02	8.3E-03	1.32	2.8E-02
Historic Park	Potential NRHP Property	Wawayanda	547.148	4583.818	4.8E-02	9.85	2.29	3.7E-01	7.2E-02	6.7E-03	1.13	2.1E-02
Historic Park	Potential NRHP Property	Wawayanda	548.215	4584.610	1.3E-01	52.78	9.81	4.5E-01	1.7E-01	2.1E-02	2.01	6.3E-02
Historic Park	Potential NRHP Property	Wawayanda	548.275	4584.595	1.3E-01	48.53	9.32	4.3E-01	1.7E-01	2.1E-02	2.02	6.1E-02
Park	Ben and Paula Amchir Park	Middletown	546.801	4586.297	7.7E-02	22.95	13.10	4.0E-01	1.2E-01	1.1E-02	2.51	3.3E-02
Park	Heritage Trail - Proposed	Wawayanda	549.255	4586.196	5.8E-02	30.57	4.44	2.6E-01	9.1E-02	8.6E-03	0.64	2.2E-02

Table 9-31 Maximum Impacts at Sensitive Receptors												
Category	**Name**	**City**	**X**	**Y**	**NO_x**	**CO**		**SO_2**			**PM_{10}**	
			UTM	**UTM**	**annual**	**1-hour**	**8-hour**	**3-hour**	**24-hour**	**annual**	**24-hour**	**annual**
			km	**km**	**μg/m^3**	**μg/m^3**	**μg/m^3**	**μg/m^3**	**μg/m^3**	**μg/m^3**	**μg/m^3**	**μg/m^3**
Park	Maple Hill Park	Middletown	546.695	4588.246	4.6E-02	25.65	6.46	1.8E-01	5.4E-02	5.9E-03	1.13	1.5E-02
Park	Shannen Park	Slate Hill/Wawayanda	543.642	4581.349	2.9E-02	30.87	2.81	1.5E-01	5.8E-02	4.5E-03	0.35	1.1E-02
Park	City Park	Wallkill	550.322	4587.754	3.9E-02	27.02	3.26	2.4E-01	5.0E-02	6.3E-03	0.56	1.6E-02
Park	Francher-Davidge Park	Middletown	547.375	4589.981	4.1E-02	53.78	6.75	1.6E-01	6.2E-02	6.2E-03	0.52	1.6E-02
Park	Watts-Memorial Park	Middletown	548.740	4590.224	4.9E-02	21.15	11.45	2.5E-01	4.5E-02	8.1E-03	1.10	2.1E-02
Park	City Park	Middletown	549.068	4591.149	4.4E-02	19.66	11.42	2.3E-01	4.2E-02	7.4E-03	1.05	1.8E-02
Golf Course	Orange County Golf Club	Middletown	552.324	4586.966	1.9E-02	19.31	2.40	8.5E-02	3.4E-02	3.4E-03	0.24	8.1E-03
Public Nature Preserve	Hunter Farm Preserve	Wawayanda	542.925	4583.158	1.4E-02	26.10	0.81	2.3E-01	6.4E-02	2.0E-03	0.48	4.7E-03
Conservation Easement	Mt Orange Easement	Wawayanda	542.643	4583.484	1.3E-02	25.11	1.44	2.9E-01	6.8E-02	1.8E-03	0.52	4.1E-03
Public Nature Preserve	Orange County Audubon Sanctuary	Goshen	554.273	4583.825	1.9E-02	20.45	2.26	9.4E-02	3.3E-02	3.8E-03	0.48	9.2E-03
Conservation Easement	Orange County Farmland	Goshen	553.304	4580.198	2.0E-02	18.67	3.55	1.7E-01	3.1E-02	4.0E-03	0.39	9.7E-03
Recreation	NYS Rt 17 Bike Trail	Wawayanda	546.738	4584.739	1.4E-01	29.65	11.68	1.5E-01	7.0E-02	3.6E-03	0.41	2.4E-02
Cemetery	Pine Hill Cemetery	Wawayanda	547.475	4585.371	2.5E-01	134.94	27.65	5.8E-01	3.5E-01	4.1E-02	3.01	1.4E-01
Cemetery	Grace Hill Methodist Church	Slate Hill	545.667	4582.007	8.3E-02	49.48	10.28	4.9E-01	9.0E-02	1.0E-02	1.57	2.9E-02
Cemetery	Primitive Baptist Church of Brookfield	Slate Hill	544.070	4582.232	2.6E-02	33.59	1.66	1.5E-01	5.3E-02	4.0E-03	0.37	9.6E-03
Cemetery	Hillside Cemetery	Middletown	548.040	4588.082	6.3E-02	27.09	8.50	3.1E-01	6.8E-02	1.2E-02	1.11	3.1E-02
Cemetery	Wallkill Cemetery	Middletown	553.285	4587.376	1.7E-02	16.65	2.55	7.6E-02	3.0E-02	3.0E-03	0.20	7.2E-03
Church	Mt Carmel Church	Wallkill	547.178	4586.651	8.8E-02	63.45	11.20	2.7E-01	1.4E-01	1.4E-02	1.19	4.2E-02
Church	Middletown Alliance	Wallkill	546.784	4586.704	6.5E-02	19.43	10.91	3.2E-01	9.5E-02	9.0E-03	2.08	2.6E-02
Church	Kingdom Hall	Wallkill	545.410	4587.829	2.6E-02	35.51	9.10	3.1E-01	5.4E-02	3.9E-03	1.19	1.0E-02

Table 9-31
Maximum Impacts at Sensitive Receptors

Category	Name	City	X	Y	NO_x	CO		SO_2			PM_{10}	
			UTM	UTM	annual	1-hour	8-hour	3-hour	24-hour	annual	24-hour	annual
			km	km	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$	$\mu g/m^3$
Church	St. Johns Lutheran Church	Wallkill	546.132	4588.115	3.2E-02	65.75	13.34	2.1E-01	7.5E-02	4.8E-03	1.19	1.2E-02
Church	Cornerstone Baptist	Wallkill	550.188	4586.927	3.9E-02	29.35	2.63	2.3E-01	6.8E-02	5.7E-03	0.53	1.4E-02
Fire Station	New Hampton Fire Dept.	Wawayanda	548.862	4584.447	9.2E-02	45.31	8.06	2.9E-01	1.2E-01	1.6E-02	1.68	4.2E-02
Fire Station	Pocatello Fire Dept.	Middletown	545.651	4587.966	2.9E-02	77.14	16.30	2.1E-01	7.3E-02	4.1E-03	1.25	1.0E-02
Fire Station	Slate Hill Fire Dept.	Wawayanda	543.561	4581.973	2.3E-02	25.89	1.62	1.5E-01	5.4E-02	3.4E-03	0.34	7.9E-03
Fire Station	Middletown Fire Dept.	Middletown	548.824	4588.435	6.0E-02	36.99	7.90	2.2E-01	5.6E-02	1.1E-02	0.92	2.9E-02
Fire Station	Mechanicstown Engine & Fire Co.	Middletown	550.086	4588.096	4.2E-02	26.41	4.95	2.1E-01	4.2E-02	7.3E-03	0.53	1.9E-02
Fire Station	Silver Lake Fire District	Middletown	550.764	4589.644	3.4E-02	20.02	2.96	1.5E-01	3.8E-02	6.7E-03	0.38	1.7E-02
Hospital	Mid-Hudson Forensic Psych Ctr	New Hampton	548.838	4584.414	9.6E-02	49.89	8.41	3.1E-01	1.2E-01	1.6E-02	1.70	4.3E-02
Hospital	Middletown Psychiatric Center	Middletown	546.722	4588.840	4.3E-02	43.77	9.17	1.6E-01	4.9E-02	5.5E-03	0.88	1.5E-02
Hospital	Horton Hospital	Middletown	549.298	4588.079	5.9E-02	56.24	11.47	1.8E-01	6.6E-02	1.1E-02	0.65	2.9E-02
Hospital	Orange Regional Medical Center	Middletown	549.298	4588.079	5.9E-02	56.24	11.47	1.8E-01	6.6E-02	1.1E-02	0.65	2.9E-02
Hospital	Valley Columbia Heart Center	Middletown	550.723	4588.300	3.4E-02	25.02	2.89	2.1E-01	4.6E-02	5.8E-03	0.51	1.4E-02
Hospital	The Workplace of St. Francis Hospital	Middletown	552.516	4587.771	2.0E-02	15.20	2.31	1.2E-01	3.2E-02	3.3E-03	0.26	7.7E-03
Nursing Home	Southwinds Retirement Home	Middletown	548.400	4587.865	6.9E-02	38.72	8.03	2.6E-01	7.4E-02	1.3E-02	1.02	3.4E-02
Nursing Home	Elant at Erie Station	Middletown	548.476	4588.700	5.8E-02	29.47	11.13	2.9E-01	5.8E-02	1.0E-02	1.19	2.7E-02
Nursing Home	Park Manor Rehab. & Health Care	Middletown	551.508	4589.048	2.7E-02	23.40	2.80	1.9E-01	4.2E-02	4.8E-03	0.45	1.2E-02
Police Station	Middletown Police Dept.	Middletown	548.309	4588.398	6.2E-02	28.79	10.42	3.0E-01	6.0E-02	1.1E-02	1.19	3.0E-02
Police Station	New York State Highway Patrol	Middletown	553.176	4588.630	1.8E-02	18.28	2.63	1.5E-01	3.1E-02	3.0E-03	0.30	7.0E-03
Police Station	Wallkill Police Dept.	Middletown	552.125	4590.699	3.0E-02	18.26	2.50	1.4E-01	2.7E-02	5.2E-03	0.34	1.2E-02
Preschool	Peter Pan Nursery School	Middletown	546.047	4586.794	4.1E-02	37.12	8.85	2.7E-01	1.1E-01	5.3E-03	1.60	1.4E-02
Preschool	George Robin Preschool	Middletown	546.302	4588.157	3.5E-02	68.95	12.52	2.1E-01	6.3E-02	5.1E-03	1.32	1.3E-02
Preschool	Field of Dreams Preschool	Slate Hill	545.805	4580.845	6.2E-02	31.82	8.00	5.3E-01	8.0E-02	8.8E-03	1.37	2.4E-02

Table 9-31
Maximum Impacts at Sensitive Receptors

Category	Name	City	X	Y	NO_x	CO		SO_2			PM_{10}	
			UTM	UTM	annual	1-hour	8-hour	3-hour	24-hour	annual	24-hour	annual
			km	km	μg/m^3	μg/m^3	μg/m^3	μg/m^3	μg/m^3	μg/m^3	μg/m^3	μg/m^3
Preschool	Hilltop Childrens Center	Middletown	546.670	4588.962	4.1E-02	27.28	6.79	1.5E-01	4.6E-02	5.3E-03	0.88	1.4E-02
Preschool	Gymboree Play & Music	Middletown	548.368	4588.996	6.1E-02	24.94	11.55	2.9E-01	5.6E-02	1.0E-02	1.20	2.7E-02
School	Our Lady or Mount Carmel School	Wallkill	547.159	4586.802	8.1E-02	54.50	8.36	2.4E-01	1.3E-01	1.3E-02	1.07	3.7E-02
School	Truman Moon Elementary School	Middletown	548.058	4587.362	8.3E-02	44.35	11.34	2.8E-01	9.7E-02	1.5E-02	1.11	4.2E-02
School	Orange County Community College	Middletown	547.959	4587.486	8.2E-02	56.12	13.29	3.0E-01	8.4E-02	1.5E-02	1.36	4.1E-02
School	Orange County Community College	Middletown	547.775	4587.509	7.8E-02	52.84	10.34	3.1E-01	8.3E-02	1.4E-02	1.05	3.8E-02
School	Orange County Community College	Middletown	547.880	4587.548	7.9E-02	58.52	11.94	3.1E-01	8.3E-02	1.4E-02	1.26	3.9E-02
School	Orange County Community College	Middletown	547.948	4587.606	7.8E-02	56.43	12.30	3.1E-01	8.1E-02	1.4E-02	1.31	3.9E-02
School	Orange County Community College	Middletown	548.046	4587.691	7.7E-02	46.12	12.39	3.0E-01	7.9E-02	1.4E-02	1.24	3.8E-02
School	Maple Hill Elementary	Wallkill	545.838	4588.661	2.7E-02	11.50	10.36	1.8E-01	6.4E-02	4.0E-03	0.85	9.7E-03
School	Monhagen Middle School	Wallkill	546.108	4588.936	2.9E-02	18.00	10.20	2.0E-01	4.9E-02	4.2E-03	1.05	1.0E-02
School	Boces Site	Middletown	548.226	4588.844	6.1E-02	23.61	10.66	3.0E-01	5.8E-02	1.0E-02	1.16	2.7E-02
School	Middletown Christian School	Middletown	548.335	4589.144	5.8E-02	21.52	11.14	2.9E-01	5.5E-02	9.8E-03	1.16	2.6E-02
School	Memorial Elementary School	Middletown	548.683	4589.116	6.0E-02	45.44	11.74	2.7E-01	5.7E-02	9.9E-03	1.17	2.6E-02
School	Montessori New Beginnings	Middletown	549.342	4588.891	5.5E-02	27.13	6.58	1.9E-01	5.1E-02	9.8E-03	0.67	2.6E-02
School	St Joseph's School	Middletown	549.214	4589.214	5.2E-02	34.44	8.34	2.0E-01	4.8E-02	9.4E-03	0.87	2.4E-02
School	Twin Towers Middle School	Middletown	549.731	4589.036	4.7E-02	29.66	5.19	1.7E-01	4.9E-02	8.9E-03	0.45	2.3E-02
School	Chorley Elementary School	Middletown	548.240	4589.890	5.0E-02	30.78	7.64	2.5E-01	5.5E-02	7.8E-03	0.88	2.0E-02
School	Mechanicstown Elementary School	Middletown	550.836	4588.363	3.2E-02	25.57	2.86	2.1E-01	4.6E-02	5.6E-03	0.51	1.4E-02
School	Middletown Senior High School	Middletown	550.416	4589.163	3.8E-02	22.93	3.59	1.6E-01	4.2E-02	7.3E-03	0.41	1.8E-02
School	Minisink High School	Slate Hill/Wawayanda	540.846	4581.523	1.2E-02	15.67	0.57	1.1E-01	4.6E-02	1.7E-03	0.35	3.8E-03
School	Minisink Intermediate School	Slate Hill/Wawayanda	540.461	4581.473	1.2E-02	18.91	0.70	9.9E-02	4.1E-02	1.6E-03	0.34	3.5E-03
School	Minisink Elementary School	Slate Hill/Wawayanda	540.371	4581.442	1.2E-02	18.93	0.64	9.8E-02	4.1E-02	1.6E-03	0.34	3.5E-03

Table 9-31 Maximum Impacts at Sensitive Receptors													
Category	Name	City	X	Y	NO_x	CO		SO_2			PM_{10}	
			UTM	UTM	annual	1-hour	8-hour	3-hour	24-hour	annual	24-hour	annual
			km	km	μg/m³	μg/m³	μg/m³	μg/m³	μg/m³	μg/m³	μg/m³	μg/m³
School	Minisink Middle School	Slate Hill/Wawayanda	540.303	4581.132	1.2E-02	14.81	0.55	1.1E-01	4.5E-02	1.7E-03	0.33	3.6E-03
School	BOCES	Goshen	554.170	4581.580	2.3E-02	21.90	3.53	1.2E-01	3.6E-02	3.9E-03	0.52	9.5E-03
School	BOCES	Goshen	554.009	4581.798	2.4E-02	23.14	3.95	1.2E-01	3.7E-02	4.1E-03	0.50	1.0E-02
School	John S. Burke Catholic High School	Goshen	555.021	4584.469	1.6E-02	16.00	2.54	8.4E-02	2.2E-02	3.4E-03	0.43	8.3E-03

9.6.8 Global Warming

An assessment of the proposed project emissions of carbon dioxide (CO_2) and other global warming gases was conducted based on publicly available information on global warming. Although the United States has not agreed to the Kyoto Protocol, the proposed emission target levels of global warming gases has also been summarized in this section.

9.6.8.1 Summary of the Kyoto Protocol

For more than a century scientists have known about the possibility that man-made CO_2 emissions may cause an increase in the average temperature of the atmosphere. However, widespread public concern about global warming did not exist until the late 1980s when high temperatures, predictions from general atmospheric circulation computer models, and concern about the greenhouse effect jointly attracted public attention. In 1988 the United Nations (UN) established the Intergovernmental Panel on Climate Change (IPCC), which issued its first climate report in 1990. In late 1989 the UN approved a resolution calling for an environmental summit, which was held in Rio de Janeiro in June 1992. At that meeting, the attending nations agreed to participate in the Framework Convention on Climate Change, an ongoing series of meetings the purpose of which is to develop agreements that reduce greenhouse gas emissions. The summit held in Kyoto, Japan in December 1997, set targets for North America, Europe, Japan, Australia, and New Zealand. These targets for reducing greenhouse (Global Warming) gases are summarized as follows.

1. Targeted Greenhouse Gases. It was decided to direct emission reduction efforts to six types of gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).
2. Treatment of Sinks. Absorption and emission of carbon dioxide by newly created forests and by changes in land use since 1990 are to be taken into consideration.
3. Reduction Targets. The base year against which to determine emission reduction was set at 1990 (it may be 1995 for HFCs, PFCs, and SF_6). The commitment period is five years from 2008 through 2012. Annex I countries (developed countries including the former Soviet Union and East European countries) are obliged to cut CO_2 equivalent emissions of the six designated gases by at least 5 percent on the whole on average during the commitment period. In addition, the following differentiated reduction targets are assigned to participating countries:

    - Japan: −6 percent
    - USA: −7 percent
    - EU: −8 percent
    - Other nations: −8 percent to −10 percent

4. Flexibility Mechanisms. The Kyoto Protocol included tools (flexibility mechanisms) for achieving the reduction targets through international cooperation and concerted action. Specific guidelines for these mechanisms, however, have yet to be examined by international conferences.

- Emission Trading
    - A part of emissions may be traded in the form of "emission permits" among Annex I countries. When one country finds it difficult to attain a given target on its own, this system allows that country to make up for any deficient part of the target by purchasing emission permits from another country, which has excess capacity in order to achieve its target.

- Joint Implementation
    - Similar to the above, this system enables Annex I countries to apportion among themselves those emission cuts gained in projects designed to reduce greenhouse gases.

- Clean Development Mechanism
    - This mechanism allows Annex I countries and non-Annex I countries (developing countries) to share among themselves greenhouse gas emissions reduction by jointly implementing projects to achieve emission cuts through a certain certification.

9.6.8.2 Project Emissions of Global Warming Gases

Greenhouse or Global Warming gases (GWGs) contribute to climate change by increasing the ability of the atmosphere to trap heat. The principal GWGs are CO_2, methane (CH_4), and nitrous oxide (N_2O). Because these gases differ in their ability to trap heat, one ton of CO_2 in the atmosphere has a different effect on warming than one ton of CH_4. To express emissions of the different gases in a comparable way, atmospheric chemists often use a weighting factor called global warming potential. The heat-trapping ability of one metric ton (1,000 kilograms) of CO_2 is taken as the standard, and emissions may be expressed in terms of metric tons of carbon dioxide equivalent (abbreviated MTCDE). More commonly, emissions are expressed in terms of metric tons of carbon equivalent (MTCE). Carbon comprises 12/44 of the mass of carbon dioxide; thus to convert from CO_2 equivalent to C equivalent, one multiplies by 12/44. This section uses the units of MTCE, or million MTCE (MMTCE).

The proposed CPV Valley Energy Center would be primary fueled by natural gas with provisions to use low sulfur distillate fuel oil as the back-up fuel. The greatest proportion of the potential global warming gas emission from the Project would be as CO_2 from the combustion process. Trace amounts of VOCs, expressed as methane, would be emitted in varying quantities depending on the operating conditions. Emissions of VOCs are considered negligible, when compared to the total CO_2 emissions, and would not be considered as significant to the Global Warming issues.

Overall facility wide CO_2 emissions would range from approximately 150 to 343 tons per hour depending on the facility operating scenario, with a maximum annual average of about 67.8 MTCE per hour. Assuming the maximum emission rate of 67.8 MTCE per hour, the maximum annual CO_2 emission rate from the proposed project would be approximately 539,928 MTCE per year. Assuming a 30-year life cycle for the Project, a total of approximately 17.8 MMTCE of carbon equivalent would be released by the Project during its lifetime.

9.6.8.3 *Comparison to State, National and Global Emissions*

The proposed CPV Valley Energy Center would conservatively emit approximately 0.59 MMTCE per year. This value is based on the worst-case facility wide full load operation with a 100 percent capacity factor. The annual emissions of CO_2 for the State of New York for the years 1990 through 2000 are shown in Table 9-32. The total annual inventory of CO_2 (expressed as carbon equivalents) for New York State has fluctuated around 53 MMTCE. On the state level, the annual emissions from proposed project would compare to a level of approximately 1.1 percent of the total New York CO_2 inventory.

Table 9-32
New York State—CO_2 Emission Inventory by Sector (MMTCE)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
New York (Total)	56.7	53.6	52.9	52.1	51.2	52.3	54.4	55.3	54.9	56.0	57.9
Commercial	7.1	7.0	7.3	7.6	7.4	7.3	7.6	8.1	7.6	8.4	9.5
Industrial	5.7	5.7	6.4	6.7	7.3	8.0	9.3	8.9	8.3	11.7	14.4
Residential	8.5	8.5	9.3	9.5	9.2	9.2	10.0	9.5	8.6	9.3	10.5
Transportation	17.4	16.9	16.5	16.9	16.6	17.1	17.9	17.9	18.0	18.4	18.5
Utility	17.1	15.6	13.5	11.4	10.7	10.7	9.7	10.8	12.4	8.2	5.0

Source: http://yosemite.epa.gov/oar/globalwarming.nsf/content/EmissionsStateEnergyCO2Inventories.html, USEPA, 2004.

The annual emissions of CO_2 for the United States are presented in Table 9-33. As shown in this table, the annual emissions have gradually increased each year to a value of 1,577 MMTCE. On a national scale, the proposed project would contribute only 0.037 percent to the total national emissions of CO_2.

Table 9-33
United States CO_2 Emission Inventory by Sector (MMTCE)

	1990	1996	1997	1998	1999	2000	2001	2002
U.S. (Total)	1,364.3	1,499.6	1,521.2	1,527.9	1,548.1	1,597.9	1,563.2	1,577.0
Transportation	397.7	438.5	441.2	449.5	465.3	478.1	472.9	482.0
Coal Fired Utility	377.9	417.2	421.3	405.6	402.7	406.3	379.4	381.5
Residential	252.4	287.2	284.6	285.7	290.9	307.5	304.8	313.4
Commercial	206.1	228.6	239.8	244.3	246.6	263.1	265.8	264.7
Natural Gas Fired Utility	43.9	49.6	52.2	56.0	58.1	60.3	60.0	61.1
Petroleum Fired Utility	25.0	15.7	17.6	23.4	21.4	19.4	20.8	14.8
Iron and Steel Manufacturing	23.3	18.6	19.6	18.4	17.6	17.9	16.1	14.8
U.S. Territories	9.2	11.3	11.6	11.6	11.9	12.5	12.3	12.7
Cement Manufacturing	9.1	10.1	10.4	10.7	10.9	11.2	11.3	11.7
Ammonia Production and Urea Application	5.3	5.5	5.6	6.0	5.6	5.3	4.4	4.8
Waste Combustion	3.0	4.7	4.9	4.7	4.8	4.9	5.1	5.1
Lime Manufacturing	3.1	3.7	3.7	3.8	3.7	3.6	3.5	3.4
Natural Gas Flaring	1.6	2.3	2.2	1.8	1.9	1.6	1.5	1.4
Aluminum Production	1.7	1.5	1.5	1.6	1.6	1.6	1.1	1.1
Limestone and Dolomite Usage	1.5	2.1	2.0	2.0	2.2	1.6	1.6	1.6

Table 9-33 United States CO_2 Emission Inventory by Sector (MMTCE)								
	1990	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Soda Ash Manufacture and Consumption	1.1	1.1	1.2	1.2	1.1	1.1	1.1	1.1
Titanium Dioxide Production	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Phosphoric Acid Production	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Carbon Dioxide Consumption	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.4
Ferroalloys	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.3
Source: U.S. Greenhouse Gas Emissions and Sinks: 1990-2002. USEPA, 2004.								

The annual emissions of GWG from the proposed project may be compared to the global anthropogenic emissions of CO_2 strictly due to the combustion of fossil fuels. An estimate places the global annual carbon emission rate from the combustion of fossil fuels to be on the order of 6,500 MMTCE. On this scale, the proposed emissions of carbon equivalents would be less than 0.009 percent of the total annual global emission rate.

9.6.8.4 Importance of Emissions

It is difficult to quantify the importance of the emissions of the proposed project as it relates to increasing the emissions of GWG for the benefit of the common good. To be sure, the clearing of land through open burning generates substantial emissions of GWG from developing nations. These emissions from open burning may be considered extremely important because such burning clears land, which may be used for farming and ultimately feed the population of the country. However, the emissions of this proposed project can be related to existing emissions of GWG. In general, because of the regulated daily and hourly markets operated by the New York State Independent System Operator (NYSISO)- for the matching of generation with load, there is a very high likelihood that energy generated by the CPV Valley Energy Center would primarily displace electricity that would have been generated by less efficient oil, gas, coal or heavy fuel oil power plants. These sources result in more emissions of GWG on a per megawatt basis than those that result from the proposed project due both to the higher efficiency of the Project and (with respect to oil and coal plants) to the lower emission of greenhouse gases from the Project's source of fuel which is primarily natural gas. Therefore, a general statement can be made regarding the importance of high efficiency combined cycle generation of electricity. The nature of the regulated ISO electricity market favors high efficiency combined cycle generation. This is in direct agreement with the Kyoto Protocol. Displacement and reduction of emissions of CO_2 (and other GWG) is a key tenant of the Protocol. In this way, the development of efficient power generation facilities, such as this project, is not only important in achieving a national reduction in greenhouse gas emission, but vital.

9.6.8.5 Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort by Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont to limit greenhouse gas emissions. RGGI hopes to reduce CO_2 emission from power plants in the participating states, while maintaining affordability and reliability and accommodating, to the extent feasible, the diversity in policies and programs in individual states.

These states have agreed to cap CO_2 emissions from the power sector and to subsequently require a 10 percent reduction in these emissions by 2018.

NYSDEC has promulgated regulations in Part 242 (CO_2 Budget Trading Program) that implement the goals of the RGGI Initiative in New York State, including a cap-and-trade system for CO_2 emissions from subject units. The Project will be subject to Part 242 and will be required to obtain a CO_2 budget permit for the combined cycle units, to appoint an authorized account representative, to hold and surrender sufficient CO_2 allowances to cover its emissions, to certify compliance with program requirements, and to satisfy the recordkeeping and reporting requirements of Part 242. Additional information concerning Part 242 is provided in the PSD and Part 201 Air Permit Application.

10.0 NOISE

10.1 INTRODUCTION

This section presents the results of the noise assessment conducted for the proposed CPV Valley Energy Center (Project or Facility). The assessment conducted consisted of two parts: 1) an ambient noise monitoring program in the vicinity of the Project site in order to establish a baseline to characterize the existing noise environment; and 2) a noise modeling/impact evaluation of construction and operation of the Project. The background ambient noise monitoring program was conducted on January 28-29, 2008. The noise impact evaluation consisted of performing computer noise modeling of the major noise producing equipment and evaluating the increased noise due to the proposed Facility based upon project impact criteria (i.e., a 6 dB or more increase in the A-weighted sound level, L_{eq}, was considered to be a significant impact). Modeled Project noise levels were also compared against the noise ordinance of the Town of Wawayanda to determine compliance. Appendix 10-A provides the full noise assessment report.

General Information on Noise

Noise is defined as unwanted sound. Excessive noise can cause annoyance and adverse health effects. Annoyance can include sleep disturbance and speech interference. It can also distract attention and make activities more difficult to perform (USEPA, 1978).

The range of pressures that cause the vibrations that create noise is large. Noise is therefore measured on a logarithmic scale, expressed in decibels (dB). The frequency of a sound is the "pitch." The unit for frequency is hertz (Hz). Most sounds are composed of a composite of frequencies. The normal human ear can usually distinguish frequencies from 20 Hz (low frequency) to about 20,000 Hz (high frequency), although people are most sensitive to frequencies between 500 and 4,000 Hz. The individual frequency bands can be combined into one overall dB level.

Noise is typically measured on the A-weighted scale, commonly abbreviated as dBA. The A-weighting scale has been shown to provide a good correlation with the human response to sound and is the most widely used descriptor for community noise assessments. (Harris, 1991). The faintest sound that can be heard by a healthy ear is about 0 dBA, while an uncomfortably loud sound is about 120 dBA. In order to provide a frame of reference, some common sound levels are listed below.

- Pile Driver at 100 feet — 90 to 100 dB(A)
- Chainsaw at 30 feet — 90 dB(A)
- Truck at 100 feet — 85 dB(A)
- Noisy Urban Environment — 75 dB(A)
- Lawn Mower at 100 feet — 65 dB(A)
- Average Speech — 60 dB(A)
- Typical Suburban Daytime — 50 dB(A)
- Quiet Office — 40 dB(A)

- Quiet Suburban nighttime 35 dB(A)
- Soft Whisper at 15 feet 30 dB(A)

Common terms used in this noise analysis are defined below:

L_{eq} – The equivalent noise level over a specified period of time (i.e., 1-hour). It is a single value of sound that includes all of the varying sound energy in a given duration.

Statistical Sound Levels – The A-weighted sound level exceeded a certain percentage of the time. The L_{90} is the sound level exceeded 90 percent of the time and is often considered the background or residual noise level. The L10 is the sound level exceeded 10 percent of the time and is a measurement of intrusive sounds, such as aircraft overflight.

10.2 APPLICABLE LAWS, REGULATIONS AND POLICIES

The noise assessment of the Project utilized the 6 dBA Leq relative impact criterion contained in the New York State Department of Environmental Conservation's (NYSDEC) noise guidance document. No state or federal noise standards are directly applicable to the proposed Project. The Town of Wawayanda has a noise ordinance which was evaluated for compliance. Both of these noise evaluation criteria are described below.

10.2.1 NYSDEC Noise Guidance Document

NYSDEC issued a program guidance document entitled "Assessing and Mitigating Noise Impacts" on October 6, 2000. The guidance document discusses various aspects of noise and suggested steps for performing noise assessments. Further, it provides suggestions for evaluating significant increases in noise levels. The guidance notes that an increase in ambient noise of 10 dBA is perceived by the majority of people to be a doubling of the loudness of a sound. For example, if the ambient sound level is 50 dBA, and is then increased to 60 dBA, most people would perceive the new noise level as twice as loud. The guidance recommends that, for non-industrial settings, the A-weighted SPL (Sound Pressure Level) should probably not exceed ambient noise levels by more than 6 dB(A) at a given receptor in order to avoid complaints. The guidance also recommends, again to avoid citizen complaints, that addition of any noise source, in a non-industrial setting, should not raise the total future ambient noise level above a maximum of 65 dB(A). This would be considered the "upper end" limit since 65 dBA allows for undisturbed speech at a distance of approximately three feet. Noise levels in industrial or commercial areas should not exceed 79 dBA.

The NYSDEC guidance explicitly states that the 6 dBA increase is to be used as a general guideline. There are other factors that should also be considered. For example, in settings with very low ambient sound levels, a greater increase may be acceptable since sound levels are so low. For purposes of evaluating impacts for the CPV Valley Energy Center, the NYSDEC guidance of an increase in noise levels of 6 dBA or more is considered to be an appropriate level for determining whether an adverse noise impact may be significant.

10.2.2 Town of Wawayanda Noise Ordinance

The Town of Wawayanda has adopted a noise ordinance in Chapter 195 of the Town Zoning Code. The ordinance limits facility generated noise levels to no greater than 65 decibels at a distance of 100 feet from the project lot line. Although not specified in the ordinance, it is assumed for the purposes of this analysis that the 65 decibel level is A-weighted (e.g., 65 dBA).

10.3 EXISTING CONDITIONS

Major highways, including Interstate 84, Route 6, and Route 17M, are located adjacent to the Project Site on the south, west, and east sides of the site, respectively. The Project Site is surrounded by a mixture of land uses. Commercial uses are located to the east and northeast of the Project Site along Routes 6 and 17M. To the north of the site is a residential area along and north of Kirbytown Road. Pine Hill Cemetery is located immediately adjacent to the northeastern portion of the Project Site. A parcel of land immediately to the south is undeveloped, with additional residential uses further south. Some commercial and scattered residential uses are to the west of the Project Site. The nearest residential community is located to the north on Kirbytown Road and Apple Lane Drive, 2,500 feet from the approximate center of the Project Site. A few residences are located along Route 6, with the nearest single residence located approximately 1,900 feet from the center of the Project. A new residential area, Horizons at Wawayanda, is located immediately to the east of the Project Site, east of the Pine Hill Cemetery. Horizons at Wawayanda is a 106 dwelling unit, workforce housing development. Once occupied, this development will represent the nearest residential use to the proposed Project.

The existing noise environment was characterized through ambient noise monitoring (conducted on January 28-29, 2008) at six selected noise sensitive areas, which were identified through the use of aerial maps and later confirmed during the noise monitoring program. The location and distance of each of the receptor sites from the approximate center of the Project site is described below and the location of the receptor sites are shown on Figure 10-1.

- Uhlig Road 2,500 feet, northwest of the site (24-hour meter)
- Apple Lane Drive at Kirbytown Road – 2,500 feet, north of the site
- Pine Hill Cemetery – 2,600 feet, northeast of the site
- Sunrise Park Road – 4,500 feet, east of the site
- Bates Gates Road – 3,700 feet, southeast of the site
- Deblock Road at Route 56 – 2,200 feet, south of the site

Short-Term Measurements

Short-term monitoring (20 minutes in duration) was conducted during the day and late night at all of the above locations, while continuous 24 hour monitoring was conducted at Uhlig Road. The short-term monitoring was conducted with a RION NA-27 precision Type 1 octave band analyzer. The instrument was configured to measure and store the L_{eq}, $L_{90,}$ and L_{10} one-third octave band levels. A summary of the overall A-weighted L_{eq}, $L_{90,}$ and L_{10} data collected during noise monitoring is presented in Table 10-1 below.

Table 10-1 Measured Ambient Noise Level Data (dBA)						
Location	**Daytime**			**Late Night**		
	L_{eq}	L_{10}	L_{90}	L_{eq}	L_{10}	L_{90}
Apple Lane Drive at Kirbytown Road	61	58	44	60	65	46
Pine Hill Cemetery	59	62	56	59	64	47
Sunrise Park Road	61	63	49	55	58	51
Bates Gates Road	54	55	48	51	52	46
Deblock Road at Route 56	52	52	40	57	60	47
Measured values obtained January 28-29, 2008 by TRC.						

The existing noise environment in the area during all hours is dominated by vehicular traffic noise from I-84, Route 6, Route 17M, and local roads, and these sources of noise are reflected in the elevated measured L_{eq} levels. Other sources of noise include aircraft overflights and natural sounds (birds). No insect noise was present. The data in the above table reveal that daytime and late night L_{eq} levels were similar at each location. Measured ambient L_{eq} levels ranged from 51 dBA to 61 dBA. L_{90} noise levels, which are the residual levels in the absence of intrusive noise sources such as vehicular traffic, were lower and varied widely, ranging from 40 dBA to 56 dBA. Maximum short-term noise levels (not presented in the table) of between 85 dBA and 90 dBA were measured at all locations.

Continuous 24-Hour Measurements

Continuous monitoring (over a 24-hour period) of the existing overall L_{eq}, L_{90}, and L_{10} noise levels was also conducted in the Kirbytown Road residential area (on Uhlig Drive). This location was chosen to characterize noise levels in this residential development, and was off of Kirbytown Road. This location was also at a lower elevation than Kirbytown Road, and therefore shielded from I-84 and Route 17M traffic noise, and intermittent traffic noise from Kirbytown Road. Data collected at this location are therefore conservative. Continuous data were collected utilizing a RION NL-21 integrating sound level meter. The data summary from this monitoring program is presented graphically in Figure 10-2.

The data presented in this figure reveal that A-weighted L_{eq} noise levels were between 50 dBA and 60 dBA during daytime hours, but did diminish late at night to a range of 40 to 50 dBA. These are the lowest noise levels that were measured at any of the monitoring locations. As noted above, it was anticipated that the lowest levels would be measured at this location, due to shielding and the additional distance from traffic sources on Kirbytown Road.

Comparative Noise Levels in the Area

The area surrounding the proposed project site currently experiences noises and noise levels that are typical of suburban type areas with major roadways present. These include vehicular traffic (cars, school buses, trucks), landscaping activities (lawnmowers, leaf blowers), and garbage trucks, among other sources. The sound level generated by these sources varies based on the observer's distance from the source, and the method in which the source is in use. For example, a school bus accelerating from a stop will generate more noise than when the bus is cruising at 25 miles per hour. As a means of providing a more site specific frame of reference for noise levels, noise levels of sources that currently exist are provided below. The noise levels are all provided as would be experienced by a person standing 50 feet from the source. The noise levels would be higher for those standing closer, and lower for those further away.

Noise Source	Approximate Sound Level at 50 Feet (dBA)
Garbage Truck compressing garbage	85
School Bus accelerating from a stop	80
Leaf Blower	75
Lawn Mower	65
Average Car cruising at 35 mph	65
Typical Truck cruising at 50 mph	85
Average Pool Filter Pump	50
Average Central Air Conditioner	50

10.4 PROJECT RELATED NOISE IMPACTS

10.4.1 Construction Impacts

The construction process for power plant construction projects generally occurs in the following phases:

- Initial grading and excavation;
- Concrete pouring;
- Building assembly;
- Siding and machinery installation; and
- Exterior finish and cleanup.

Construction equipment utilized will differ from phase to phase. In general, heavy equipment (bulldozers, dump trucks, cement mixers) will be used during excavation and concrete pouring activities. Noise is generated during construction primarily from diesel engines which power the equipment. Exhaust noise usually is the predominant source of diesel engine noise.

Noise levels of construction equipment typically utilized for this type of project are presented in Table 10-2 (BBN, 1971). It is important to note that the equipment presented is not used in each phase of construction. Further, equipment used are not generally operated continuously, nor are the equipment always operated simultaneously. Site average sound levels for each phase of construction (BBN, 1971) are presented in Table 10-3. The highest site average sound levels (89 dBA at 50 feet) are associated with excavation and finishing activities.

Table 10-2 Noise Levels of Major Construction Equipment	
Equipment Type	**Noise Level at 50 Feet (dBA)**
Trucks	91
Crane	83
Roller	89
Bulldozers	80
Pickup Trucks	60
Backhoes	85
Source: BBN, 1971	

Table 10-3 Typical Site Average Noise Levels at 50 Feet by Construction Activity	
Construction Phase	**Noise Level at 50 Feet (dBA)**
Site Clearing	84
Excavation	89
Foundations	77
Building Assembly	84
Finishing	89
Source: BBN, 1971	

The residential receptors are located at various distances from where noise will be produced. The noise levels presented in Tables 10-2 and 10-3 are for a distance of 50 feet, but noise actually transmitted from the construction site will be attenuated by a variety of mechanisms. The most significant of these is the diversion of the sound waves with distance (attenuation by divergence). In general, this mechanism will result in a 6 dBA decrease in the sound level with every doubling of distance from the source.

The construction noise levels for each sensitive receptor location were calculated by determining the reduction in noise that will occur considering distance and atmospheric absorption, and were compared to the existing daytime L_{eq} noise levels in Table 10-4 below.

Table 10-4 Construction Noise Levels (dBA)							
Receptor	**Distance (feet)**	**Existing Daytime Leq**	**Site Clearing**	**Excavation**	**Foundations**	**Building Assembly**	**Finishing**
Uhlig Road	2,500	50 to 60	44	49	37	44	49
Apple Lane Drive	2,500	61	44	49	37	44	49
Pine Hill Cemetery	2,600	59	43	48	36	43	48
Sunrise Park Road	4,500	61	36	41	29	36	41
Bates Gates Road	3,700	54	39	44	32	39	44
Deblock Road	2,200	52	46	51	39	46	51
Horizon Apartments	2,500	59*	44	49	37	44	49
Route 6 Residences	1,500	59*	50	55	43	50	55
Pine Lane Industrial Park	1,300	59*	52	57	45	52	57

*Ambient data from the Pine Hill Cemetery monitoring location were used to characterize ambient conditions at these locations. The noise environment at these locations is significantly affected by traffic on Route 6, as is the Pine Hill Cemetery location.

The Project currently anticipates primarily daytime construction for the Project. The calculated construction noise levels are shown to be well below existing daytime L_{eq} noise levels at all locations.

Construction equipment is not generally operated continuously, nor are the equipment always operated simultaneously. There will therefore be times when no equipment is operating and noise will be at ambient levels. Also, it should be noted that the construction noise levels presented above are those which would be experienced for people outdoors. A building (house) will provide significant attenuation for those who are indoors. Sound levels can be expected to be up to 27 dBA lower indoors with the windows closed. Even in homes with the windows open, indoor sound levels can be reduced by up to 17 dBA (USEPA, 1978). Construction noise will also be temporary in nature. As such, no adverse or long term noise impacts from construction noise are anticipated.

10.4.2 Operational Impacts

Computer noise modeling of the major Facility sources was conducted using the CadnaA model. Estimated sound power level data for the major Facility noise sources were obtained from Siemens, the anticipated equipment supplier. Modeling was conducted for the Project under full load, steady state conditions.

The modeling considered hemispherical spreading and atmospheric absorption for this analysis with standard atmospheric conditions assumed. Area topography was included in the model. Although specified in the Scoping Document, no credit was taken for directivity effects from the exhaust stack or air cooled condensers in order to remain conservative in the analysis (directivity effects would act to lower calculated Project noise levels). Also, no credit was taken for any existing offsite commercial buildings, which in reality would act as physical buffers that further reduce noise levels at locations farther away. Minimal credit was taken for the existing undeveloped ground cover in the area, however, since a large part of the area consists of undeveloped land, and assuming that the ground cover in the entire area was reflective (e.g., a paved area or a water body), would be overly conservative and not realistic.

Modeling receptors were chosen in the same residential locations as where monitoring was performed, in order that direct comparison to existing noise levels could be made.

Modeling Results

The noise modeling results for the sensitive receptor locations are presented in Table 10-5 below. Also presented in the table are the measured late night L_{eq} noise levels, and projected increases at each location. The late night period, when ambient noise levels were lowest, was selected for comparison in order to provide a more conservative assessment. A noise contour map, depicting the modeled noise levels in the area surrounding the Project, is provided as Figure 10-3.

Table 10-5
Noise Modeling Results (dBA)

Location	Calculated Facility Noise Level L_{eq}	Measured Ambient Late Night L_{eq}	Projected Future Total Noise Level L_{eq}	Maximum Increase Over Existing Late Night Noise Level L_{eq}
Uhlig Road	42	40	44	4
Apple Lane Drive at Kirbytown Road	45	60	60	0
Pine Hill Cemetery	39	59	59	0
Sunrise Park Road	35	55	55	0
Bates Gates Road	38	51	51	0
Deblock Road at Route 56	45	57	57	0
Horizon Apartments	46	59*	59	0
Route 6 Residences	51	59*	60	1
Pine Lane Industrial Park	56	59*	61	2

*Ambient data from the Pine Hill Cemetery monitoring location were used to characterize ambient conditions at these locations. The noise environment at these locations is significantly affected by traffic on Route 6, as is the Pine Hill Cemetery location.

A review of the data in Table 10-5 above reveals that no increases over late night L_{eq} noise levels are projected for any locations except for at the houses on Route 6, where a minimal one dBA increase is shown, and at Uhlig Road, where lower ambient noise levels were measured. At the Uhlig Road location, increases are shown to be 4 dBA, which is below the NYSDEC impact criterion. No significant noise impacts would therefore be anticipated at any residential areas due to Project operation.

The future noise level at the Pine Lane Industrial Park location (61 dBA) is well below the NYSDEC criterion of 79 dBA for industrial areas. Notably, the increase at this location is even below the six dBA increase criterion for residential areas.

Compliance With Town of Wawayanda Noise Ordinance

The Town of Wawayanda limits Project generated noise to no greater than 65 dBA at a distance of 100 feet from the Project lot line. Figure 10-4 provides a close-up view of the Project noise contours. A review of this figure reveals that Project noise levels would be below 65 dBA even within the Project lot line, and are well below 65 dBA 100 feet from the lot line. Accordingly, Project noise levels would be in compliance with the Town of Wawayanda noise ordinance.

10.4.3 Mitigation Measures

Construction

Calculated construction noise levels were shown to be below measured average (Leq) noise levels at all locations. No mitigation measures are therefore anticipated to be required. However, the project will nonetheless require the use of functional mufflers on all equipement engine exhausts. Further, construction activities are currently scheduled to occur primarily during daytime hours.

Operation

The CadnaA noise model was used as a design tool, in order to determine the degree of silencing that would be required to meet all applicable standards. The conceptual design of the proposed Facility includes the following noise attenuation features:

- Locating major Facility sources, including the combustion turbines, HRSGs, steam turbine and ancillary sources within buildings;
- Building walls will be designed to provide a nominal 20 dBA attenuation of interior noise;
- HRSG exhaust stack silencers;
- Acoustically treated building ventilation louvers; and
- An air cooled condenser (ACC) with a noise specification not to exceed 59 dBA at a distance of 100 meters from the edge of the ACC.

10.5 SUMMARY OF IMPACTS AND MITIGATION

A detailed noise assessment of the proposed Project was conducted. The assessment included an ambient noise monitoring program, conducted during the leaf off season when no insect noise was present (January 28-29, 2008) and a computer noise modeling study. The ambient program was conducted in order to quantify the existing noise environment, including during the late night hours when ambient noise levels are typically lowest. The computer modeling study included source specific noise emission data as provided by the proposed equipment manufacturer. Modeling included topographic features, and was conservative in that no credit was taken for tree cover or any intervening off site structures that would act to reduce noise levels. Conceptual noise control measures, including enclosing most major sources inside buildings, acoustical specifications for building walls, and noise limits for the air cooled condensers, were included in the model.

The resulting calculated Facility noise levels were compared to minimum late night ambient noise levels from each noise monitoring location in order to determine if any increases in noise would occur, and if so, if those increases would be below the NYSDEC noise impact criterion. The criterion establishes increases in noise of six dBA and greater to have the potential for impact. This analysis revealed that no increases in noise would be expected at any of the noise monitoring locations, with the lone exception being at the Uhlig Road location, where an increase of 4 dBA was projected, which is below the NYSDEC impact criterion. The Town of Wawayanda noise standard will be complied with. Accordingly, no significant noise impacts are anticipated due to Project operation.

10.6 REFERENCES

American National Standards Institute. 1986. ANSI S1.11-1986 (R1998). American National Standard Specification for Octave-Band and Fractional-Octave-Band Analog and Digital Filters. New York, New York.

Barnes, J.D., L. Miller, E. Wood. 1977. Prediction of Noise from Power Plant Construction. Prepared for Empire State Electric Energy Research Company.

Berglund, B., and T. Lindvall. 1995. Community Noise. Prepared for the World Health Organization. ISSN 1400-2817. ISBN 91-887-8402-9.

Bolt, Beranek and Newman, Inc. 1971. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.

Miller, L.N., E.W. Wood, R.M. Hoover, A.R. Thompson, and S.L. Patterson. 1984. Electric Power Plant Environmental Noise Guide. Prepared for Edison Electric Institute by Bolt, Beranek and Newman, Inc., Cambridge, Massachusetts

New York State Department of Environmental Conservation (2001). Assessing and Mitigating Noise Impacts.

Town of Wawayanda Zoning Code. Chapter 195.

United States Environmental Protection Agency, 1978. Protective Noise Levels. Office of Noise Abatement & Control. Report Number EPA 550/9-79-100. Washington, D.C. 20460.

United States Environmental Protection Agency, 1975. Model Community Noise Control Ordinance. Office of Noise Abatement & Control. Report Number EPA 550/9-76-003. Washington, D.C. 20460.

11.0 SOIL, GEOLOGY, AND SEISMOLOGY

11.1 INTRODUCTION

This section describes the geologic setting for the CPV Valley Energy Center (Project or Facility) including topography and slopes, soils, depth to bedrock, depth to groundwater, and the seismic setting. A map based on the most recent 1:24,000 scale United States Geological Survey (USGS) quadrangle maps showing topographic contours, the Project Site, and the interconnection routes was presented previously as Figure 1-1.

11.2 APPLICABLE LAWS, REGULATIONS, AND POLICIES

There are no applicable laws or regulations associated with the information addressed in this Section. However, national building codes do address the construction of structures in certain seismic zones and draft seismic provisions have been prepared to support the New York State Uniform Fire Prevention and Building Code. These provisions have not been legally incorporated into the Code. At the time of construction, the Facility will be built to meet or exceed all applicable building codes regarding seismic provisions.

11.3 EXISTING CONDITIONS

11.3.1 Topography and Slopes

11.3.1.1 Project Site

The topography of the Project Site is nearly flat, with a gentle slope decreasing from west to east approximately. The elevation change is approximately 10 feet.

11.3.1.2 Electrical Interconnections

The topography along the electrical interconnection route above ground is gently sloping with a topographic elevation increase of approximately 10 feet from the Project Site to the start of the underground route, west of Route 17M. From that point, the underground electrical interconnection runs north over gently sloping terrain with an elevation gain of approximately 10 feet to the vicinity of the NYPA transmission lines.

11.3.1.3 Water/Wastewater Interconnections

The topography along the water/wastewater interconnection route is gently sloping along the entire run, increasing in elevation from the Project Site to the interconnections. Site stabilization during construction will be completed with standard construction techniques.

11.3.1.4 Laydown Areas

The Laydown Areas are located on gently sloping terrain, slightly steeper than the Project Site. Within each designated laydown area, changes in topographic elevation are minor.

11.3.2 Soils

11.3.2.1 Project Site

The Orange County Soil Survey (USDA, 2008) includes mapped soils for the Project area. The soils at the proposed CPV Valley Energy Center are a mix of silty loams, sandy loams, and gravelly loams (USDA, 2008). The soil map units for the CPV Valley Energy Center and interconnections are presented in Figure 11-1.

A summary of the on-site soil units, range of slopes, hydrological group, and hydric classification for the CPV Valley Energy Center and the interconnections is presented in Table 11-1. The primary soils to be encountered during site development are described in additional detail below.

Rhinebeck silty loam (identified in Figure 11-1 as RbA) is present over a large portion of the Project Site. The Rhinebeck series consists of very deep, somewhat poorly drained soils formed in clayey glaciolacustrine sediments. They are on glacial lake plains and uplands mantled with lake sediments (USDS, 2008).

The Hoosic gravelly sandy loam is present adjacent to the Rhinebeck silty loam. The Hoosic series (identified as HoA and HoC in Figure 11-1) consists of very deep, somewhat excessively drained soils formed in glacial outwash. They are nearly level to very steep soils formed on outwash plains, terraces, kames, eskers, and moraines (USDA, 2008).

Madalin silt loam (identified as Ma in Figure 11-1) is located in the eastern portion of the Project Site. This soil series consists of deep, poorly drained and very poorly drained, nearly level soils. Like the Rhinebeck, these soils formed in clayey glaciolacustrine deposits, but have slightly more clay (USDA, 2008).

Raynham silt loam (identified as Ra in Figure 11-1) is located in the northwestern portion of the Project Site. This soil series is similar to Rhinebeck, like the Madalin, but with a lower clay content than Rhinebeck (USDA, 2008).

Nassau channery silt loam (identified as NaD in Figure 11-1) is located in the extreme western portion of the Project Site. This soil is typically shallow, somewhat excessively drained, undulating to very steep soils. These soils form in glacial till deposits and are associated with rock outcroppings. Cobbles and boulders are located at the surface in this area (USDA, 2008).

Table 11-1 Soil Unit Summary								
Surficial Unit	**Soil Symbol**	**Soil Map Unit/Soil Texture/Slope**	**Hydric Rating**	**Drainage Class**	**Geomorphology**	**Depth Bedrock (Ft)**	**Depth Water Table (Ft)**	**Acres Within Site**
al	BnC	Bath-Nassau channery silt loams, 8 to 15 percent slopes	No	Well drained	drumlinoid ridges, hills, till plains	>5	2.3	0.06
al	Du	Loamy-skeletal, mixed, nonacid, mesic Udorthents	No	Well drained	not recorded	>5	Not recorded	N/A
al	ErA	Erie gravelly silt loam, 0 to 3 percent slopes	No	Somewhat poorly drained	drumlinoid ridges, hills, till plains	>5	1.0	4.84
al	HoC	Hoosic gravelly sandy loam, 8 to 15 percent slopes	No	Somewhat excessively drained	deltas, outwash plains, terraces	>5	Not recorded	2.43
al	Ma	Madalin silt loam	Yes	Poorly drained	depressions	>5	0.0	25.34
al	MdB	Mardin gravelly silt loam, 3 to 8 percent slopes	No	Moderately well drained	drumlinoid ridges, hills, till plains	>5	1.8	N/A
al	RbA	Rhinebeck silt loam, 0 to 3 percent slopes	No	Somewhat poorly drained	lake plains	>5	1.0	11.50
al	Sb	Scarboro mucky sandy loam	Yes	Very poorly drained	depressions	>5	0.0	N/A
al	UnB	Unadilla silt loam, 0 to 8 percent slopes	No	Well drained	lake plains	>5	0.0	N/A
k	Ab	Alden silt loam	Yes	Very poorly drained	depressions	>5	0.0	0.35
k	ErB	Erie gravelly silt loam, 3 to 8 percent slopes	No	Somewhat poorly drained	drumlinoid ridges, hills, till plains	>5	1.0	11.55
k	HoA	Hoosic gravelly sandy loam, 0 to 3 percent slopes	No	Somewhat excessively drained	deltas, outwash plains, terraces	>5	Not recorded	12.29
k	HoC	Hoosic gravelly sandy loam, 8 to 15 percent slopes	No	Somewhat excessively drained	deltas, outwash plains, terraces	>5	Not recorded	0.67
k	HoD	Hoosic gravelly sandy loam, 15 to 25 percent slopes	No	Somewhat excessively drained	deltas, outwash plains, terraces	>5	0.0	N/A
k	Ma	Madalin silt loam	Yes	Poorly drained	depressions	>5	0.0	15.87
k	Ma	Madalin silt loam	Yes	Poorly drained	depressions	>5	0.0	3.07
k	NaD	Nassau channery silt loam, 15 to 25 percent slopes	No	Somewhat excessively drained	benches, ridges, till plains	>5	Not recorded	2.03
k	Ra	Raynham silt loam	No	Somewhat poorly drained	lake plains	>5	1.3	19.40
k	RbA	Rhinebeck silt loam, 0 to 3 percent slopes	No	Somewhat poorly drained	lake plains	>5	1.0	11.03
k	RhB	Riverhead sandy loam, 3 to 8 percent slopes	No	Well drained	deltas, terraces	>5	1.0	0.86
k	UnB	Unadilla silt loam, 0 to 8 percent slopes	No	Well drained	lake plains	>5	0.0	N/A
t	Du	Loamy-skeletal, mixed, nonacid, mesic Udorthents	No	Well drained	not recorded	>5	Not recorded	N/A
t	MdC	Mardin gravelly silt loam, 8 to 15 percent slopes	No	Moderately well drained	drumlinoid ridges, hills, till plains	>5	1.8	N/A

11.3.2.2 Electrical Interconnections

The electrical interconnection overhead poles on the Facility site will be installed through soils similar to those found on the Project Site and Erie gravelly loam (as found on flat terrain). The underground portion will also run through Erie gravel for a short run until paralleling Route 17M (USDA, 2008). At that point the excavation will be in areas where soils have been removed to support historical development.

11.3.2.3 Water/Wastewater Interconnections

Water and wastewater lines will be installed in previously disturbed soils from the Project Site, along Route 6 (where the water line interconnection will be completed), Route 17M, and Dolsontown Road. Where the wastewater interconnection leaves Dolsontown Road to the wastewater treatment plant, gravelly silty loam will be encountered.

11.3.2.4 Laydown Areas

The soil types for proposed Laydown Areas are illustrated on Figure 11-1. The loamy soils are the same as those described for the Project Site in 11.3.2.1. These soils are very deep and somewhat poorly drained. The potential for surface runoff is low to very high (USDA, 2008).

11.3.3 Surficial Geology

11.3.3.1 Project Site

The surficial geology at the CPV Valley Energy Center and along the interconnections is mapped by the State of New York as a mix of kame deposits and recent alluvium over outwash sand and gravel. The kame deposit typically consists of coarse to fine gravel and/or sand. The recent alluvium typically consists of silts, clays, and oxidized fine sand to gravel and is associated with flood plains within a valley (NYSU, 1989). The surficial geologic materials present at the CPV Valley Energy Center and the interconnections are presented in Figure 11-1.

A site specific geotechnical investigation was completed at the CPV Valley Energy Center site. Seven widely space soil borings were advanced within the boundary of the Project Site (see Geotechnical Analysis, Section 11.4). Continuous samples were collected from ground surface to a depth of 16 feet; samples were collected every five feet thereafter. The soil samples recovered were observed to be consistent with materials described in geologic literature and presented above and on Figure 11-1. Specifically, the surficial geologic materials present at the Project Site are of variable grain size, with layers of silt and clay observed in the recent alluvium.

The total thickness of the unconsolidated materials was confirmed at a range of 50 - 82 feet below ground surface during the preliminary geotechnical investigation (see Appendix 11-B)(GZA, 2008).

11.3.3.2 Electrical Interconnections

The electrical interconnection will be constructed in recent alluvium along the entire run. This material is described in Section 11.3.3.1. This is illustrated on Figure 11-1.

11.3.3.3 Water/Wastewater Interconnections

The water/wastewater interconnections will be constructed in recent alluvium and a kame deposit as described in Section 11.3.3.1. In addition, a short section, as illustrated on Figure 11-1, will traverse till, an unsorted/unstratified mixture of clay, silt, sand, gravel, and boulders.

11.3.3.4 Laydown Areas

The laydown areas will be located on top of kame deposits and recent alluvium. These geologic materials are described in Section 11.3.3.1. This is illustrated on Figure 11-1.

11.3.4 Depth to Groundwater

11.3.4.1 Project Site

Four groundwater observation wells were installed at the Project Site to document the depth to groundwater. Groundwater is present in the unconsolidated surficial geologic material at a depth of 3.9 to 5.6 feet below ground surface across the Project Site (GZA, 2008).

11.3.4.2 Electrical Interconnections

Groundwater may be encountered during installation of the underground electrical interconnection. Groundwater resources and mitigation measures are discussed in Section 13.

11.3.4.3 Water/Wastewater Interconnections

Groundwater may be encountered during installation of the water/wastewater interconnections. Groundwater resources along the water/wastewater interconnections and mitigation measures are discussed in Section 13.

11.3.4.4 Laydown Areas

All equipment in the laydown areas will be above ground. Groundwater will not be encountered at the laydown areas.

11.3.5 Bedrock Geology

11.3.5.1 Project Site

At the CPV Valley Energy Center, the depth to bedrock is 50 – 82 feet. Based on soil and well analysis, bedrock surface may be variable across the Project Site. The bedrock underlying the site is the Normanskill Formation (Ordovician Age), which consists of shale, siltstone, and argillite (Fisher et al., 1970). During the site geotechnical investigation, bedrock at the Project Site was confirmed to be shale (GZA, 2008).

Except where foundations will be purposely advanced deep below ground surface to encounter bedrock, bedrock is not anticipated to be encountered during development of the Project Site.

11.3.5.2 Electrical Interconnections

The alluvial valley present under the Project Site, extends east and north. As a result, encountering bedrock is not anticipated during installation of the electrical interconnection.

11.3.5.3 Water/Wastewater Interconnections

Bedrock is not anticipated to be encountered during installation of the water/wastewater interconnections.

11.3.5.4 Laydown Areas

Blasting of bedrock will not be required to prepare the laydown areas.

11.3.6 Seismic Setting

New York State is characterized as a location of moderate level seismicity and seismic hazard. The highest levels of seismicity in the state are located in Metro-New York City, the northern Adirondacks, and Western New York (Jacob, 1993).

The Project Site is located in the middle of a tectonic plate. Earthquakes at plate boundaries are more frequent and more intense than earthquakes in the middle of a tectonic plate.

During an earthquake, seismic waves travel out from an earthquake epicenter through the surrounding rock. Ground motion is higher closer to the location of the event. In general, ground motion decreases away from the epicenter, though the amount of ground motion at the surface is related to more than just distance from the epicenter. In general, some natural materials can amplify ground motion, that is, ground motion is less on solid bedrock and greater on thick deposits of clay, sand, or artificial fill.

During an earthquake, a particle attached to the earth will move back and forth irregularly. The horizontal force a structure must withstand during an earthquake is related to ground acceleration. Peak acceleration is the maximum acceleration experienced by a particle during an earthquake.

The United States Geological Survey (USGS) produces probabilistic Seismic Hazard Maps for the United States with peak horizontal acceleration values represented as a factor of “g”. The factor “g” is equal to the acceleration of a falling object due to gravity. These USGS Seismic Hazard Maps were reviewed for the Project area and they indicate the following (USGS, 2008):

- There is a 2 percent probability of a 10 – 15 “g” exceedance in 50 years; and,

- There is a 10 percent probability of a 3 – 4 “g” exceedance in 50 years.

Seismic hazard maps are provided in Appendix 11-A.

11.4 GEOTECHNICAL ANALYSIS

A preliminary geotechnical investigation was completed at the Project Site. The objective was to gather geotechnical data to understand the subsurface characteristics and develop preliminary geotechnical engineering recommendations to support conceptual design and construction of foundations and earthworks at the Project Site. A report detailing the geotechnical investigation results is provided in Appendix 11-B. Work included the following:

- Completing eleven test borings with monitoring by a geotechnical engineer;
- Performing soil electrical resistivity testing at two of the boring locations;
- Collecting representative soil samples;
- Completing engineering analysis of the data; and,
- Completing preliminary geotechnical engineering recommendations for foundation design.

A report detailing the specifications, analysis completed, and results is presented in Appendix 11-B.

11.4.1 Conceptual Design Requirements for the Geologic Conditions

Settlement sensitive power generating equipment and select transformer pads will need to be placed on deep foundations. Support structures and utilities are likely to be supported by shallow foundations, subject to final design criteria. Fill from offsite sources will be used to develop the property.

11.4.2 Foundations

Based on the geotechnical investigations completed to date, the foundation types required for critical structures are as follows:

Structure	Foundation Type
Combustion Turbine/Generator	Deep
Steam Turbine/Generator	Deep (additional borings required for final design)
Heat Steam Recovery Generator	Deep (additional borings required for final design)
Tank Foundations	Shallow
Transformers	Deep (additional borings required for final design)

Deep foundations will likely be concrete filled closed-end steel pipes with a nominal diameter range of 10-12 inches. The piles would be driven closed-end to refusal on top of bedrock, then filled with concrete. Other pile designs may be ultimately used, but piles on bedrock are proposed (GZA, 2008).

Shallow foundations will consist of spread or continuous concrete footings bearing on the native surficial materials, below the upper loamy soils. Where fine grained surficial material is present at the foundation subgrades, an additional 6 inches of material will be removed and at least 6-inches of compacted sand and gravel fill, crushed stone, or lean concrete working mat will be installed (GZA, 2008).

11.4.3 Dewatering

Due to the relatively shallow groundwater at the Project Site, dewatering will likely be required to support foundation construction at some locations. Groundwater will be brought down approximately 1-foot below the proposed sub-grade, prior to excavating to final subgrade. The groundwater will be maintained at that level until the subgrade is prepared and concrete placed in order to minimize disturbance of the ground (GZA, 2008). This will be temporary and will only be a localized condition. Mitigation for the discharge of the groundwater effluent is discussed in Section 13, Water Resources.

11.4.4 Seismic Assessment

Based on the information gathered to date, a seismic site coefficient of "D" will be used for calculating seismic loading and the response spectrum for conceptual design of the Facility. Based on the relative density of the surficial materials and relatively high fine grained material, general liquefaction conditions do not seem probable (GZA, 2008).

11.4.5 Blasting

No blasting of bedrock is expected to support construction of the Project (GZA, 2008).

11.5 ENVIRONMENTAL CONDITIONS

11.5.1 Site Assessment

A site assessment was completed for the Project Site in general accordance with American Society for Testing and Materials (ASTM) standard E 1527-05, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. The purpose of the assessment was to identify Recognized Environmental Conditions, as defined in the ASTM E 1527-05 standard, in connection with the Subject Property.

The term "recognized environmental conditions" refers to the presence or likely presence of any hazardous substances or petroleum products, as defined by the ASTM standard, on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.

The objective of the environmental site investigation was as follows:

- Interview local officials;
- Review environmental records for the property and nearby properties that may have the potential to impact the Project Site;
- Complete a site inspection to assess environmental conditions associated with contaminated materials; and,
- Identify Recognized Environmental Conditions

Site Vicinity

The Project Site is located in a predominately undeveloped and residential area of the Town of Wawayanda, New York. According to local officials, the land has not been previously developed. In the recent past, portions of the site were used for agricultural purposes including the growing of hay and corn crops.

To the north of the site are residential houses located along Route 6 including one house that includes an active automobile salvage and repair garage identified as Eason's Auto Body, Inc. To the east is Pinehill Cemetery. Located to the west is a site identified as the Wawayanda Business Center.

Site Inspections

On August 21, 2007, TRC completed a site inspection of the Project Site. No hazardous materials or petroleum containers were identified. No evidence of hazardous material disposal was observed.

On July 1, 2008, TRC returned to the site to do a follow-up on-site inspection to observe current conditions. The site continued to be undeveloped, with no hazardous material or petroleum storage. No evidence of hazardous material disposal was observed.

Environmental Database Review

A computerized radius search of Federal and state environmental record databases was performed to investigate sites with known adverse environmental conditions that have the potential to impact the site and surrounding vicinity. The search was performed pursuant to ASTM Standard E1527 using an electronic database search provided by EDR.

The Project Site was not identified in any Federal or state database. Additionally, no nearby or adjacent properties were identified in the database search. However, the EDR database search provided an "orphan sites summary" which is a list of properties that are in various Federal and state databases but cannot be mapped or identified due to inadequate information from the source database. TRC reviewed the orphan sites summary and found one site to be of interest that is described below.

Martine's Service Center (EDR Site ID No. S108145985). This orphan site was identified under the state Solid Waste Facilities/Landfill Sites (SWF/LF) database. This listing identifies solid waste disposal facilities or open dumps that may or may not be active and that failed to meet Resource Conservation and Recovery Act (RCRA) Subtitle D criteria for solid waste landfills or disposal sites.

TRC contacted the Town of Wawayanda Assessors office to determine the location of the address provided by EDR (3418A Route 6). The Town Assessor indicated the property is owned by a Michael Martine and identified the property as the previously documented automobile salvage and repair garage identified as Eason's Auto Body Inc. that abuts the site (Lot 38.33). Based on the location of this site, the listing of the site on the SWF/LF database, there may have been solid waste disposal on the property. This property is located to the north of the site and based on topographic analysis, may be hydrogeologically upgradient of a portion of the site.

A copy of the Environmental Database search results is provided in Appendix 11-C.

11.5.2 Intrusive Investigation of Soil and Groundwater

To confirm the findings of the site inspection and to assess for potential unknown contamination, such as an upgradient offsite source of contaminated groundwater, an intrusive investigation was completed to sample soil and groundwater.

Soil Sampling

At each boring location, 2-inch diameter split spoons for soil screening and sampling were collected and screened until the water table was reached.

Soils were collected from the following locations:

- Boring B-1;
- Boring B-2;
- Boring B-6; and
- Boring B-7.

Split spoon samples were screened for volatile organic compounds (VOCs) with a photoionization detector (PID). Soils were characterized and recorded on boring logs. Boring locations and boring logs are provided in Appendix 11-D.

Soil samples were collected from 0-2 feet below ground surface and the next soil interval with the highest headspace reading, if present. If VOCs were not detected, the soil sample was collected from the 2-foot sampling interval just above the water table. No VOCs were detected during soil headspace screening. The actual soil sample depths are recorded on the boring logs presented Appendix 11-D.

All soil samples were packed on ice and sent to a New York State certified laboratory under chain-of-custody procedures. Laboratory analysis included:

- Volatile Organic Compounds (VOCs) including MTBE, (EPA Method 8260; grab sample; methanol persevered).
- Total petroleum hydrocarbons (TPH) Gasoline Range Organics (GRO) (EPA Method SW8015B; methanol preserved).
- TPH Diesel Range Organics (DRO) (EPA Method SW8015B).
- Herbicides (EPA Method SW8151A).
- Pesticides (EPA Method SW8081A).
- Moisture.

A review of all laboratory sampling results indicates all potential contaminants analyzed were not detected. Laboratory sampling results are provided in Appendix 11-D.

Groundwater Sampling

After completion of each boring, monitoring wells were constructed in each boring location. Wells were constructed with 2-inch diameter, schedule 40 PVC, 0.010 slot screens, and threaded PVC casing. The wells were screened across the water table, with approximately 2-feet of screen above the water table. Medium grained sand was used for the filter pack and bentonite was used to seal the well. Permanent protective casing was installed with a locking well cap to complete the installation at the surface. Well construction details are provided on the boring logs presented in Appendix 11-D.

The wells were developed with a submersible pump by sweeping, surging, and purging slightly with the pump. Field water quality parameters (pH, Eh, conductivity, temperature, dissolved oxygen, and turbidity) were recorded, and development continued for a minimum of three well volumes, until field water quality parameters stabilized, and turbidity levels dropped to visibly clear. If turbidity did not meet the level of visibly clear, the well was purged for up to one hour.

Monitoring wells were installed at the following locations and identified as follows:

- Boring B-1; as MW-1;
- Boring B-2; as MW-2;
- Boring B-6; as MW-3; and
- Boring B-7; as MW-4.

Groundwater samples were collected via low-flow sampling techniques in accordance with U.S. Environmental Protection Agency Region I *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells* (SOP # GW-0001; July 1996). A multi-meter outfitted with a flow cell was utilized to measure field stabilization parameters (pH, Eh, conductivity, temperature, turbidity, and dissolved oxygen) in groundwater during the collection of low flow samples. Groundwater sampling field logs are presented in Appendix 11-D.

All groundwater samples were packed on ice and sent to a New York State certified laboratory under chain-of-custody procedures. Laboratory analysis included:

- VOCs (US EPA method 8260; HCL pH< 2);
- TPH-GRO (EPA Method SW8015B; HCL pH< 2); and
- TPH-DRO (EPA Method SW8015B HCL pH< 2).

Analysis of the groundwater sampling results indicates all the sampling parameters analyzed were not detected.

11.6 PROJECT RELATED IMPACTS AND MITIGATION MEASURES

11.6.1 CPV Valley Energy Center

11.6.1.1 Construction Impacts

No unique geologic resources have been identified at the CPV Valley Energy Center. Where site development will include the excavation and stockpiling of soils, the natural agricultural soil resource will be lost. The site location is isolated and adjacent to significant development and Interstate 84. The loss of this limited agricultural resource is not part of a larger agricultural tract.

Based on the preliminary geotechnical analysis, the soils and unconsolidated material at the site are suitable to support the proposed Facility. Construction of the CPV Valley Energy Center will require the excavation of soils and the reworking of the unconsolidated surficial material. Site preparation would require heavy equipment for grading and excavation. This would include excavators, bulldozers, graders, front-end loaders, concrete trucks, and dump trucks. This will not impact the geologic setting. The soils are not contaminated chemically or physically and should be suitable for multiple uses. A summary of the approximate cut and fill need to support construction is presented below.

SUMMARY OF APPROXIMATE CUT AND FILL ACTIVITIES				
Location	**Excavation of Existing Soils (cubic yards)**	**Backfill Requirements (cubic yards)**	**Off-site Backfill/Top Soil for Project (cubic yards)**	**Off-site Recycling of Cut Materials (cubic yards)**
CPV Valley Energy Center	1,231	183,665	182,434	0

11.6.1.2 Mitigation Measures

The topography of the Project Site is nearly flat. The gentle slopes allow for cut and fill activities to be easily managed throughout construction. Soil and overburden materials will be reused on-site wherever possible. Standard construction equipment will be used to cut, fill, and re-grade the CPV Valley Energy Center site. Sediment and erosion of soils will be mitigated during construction with common engineering controls.

Excavation and grading for the proposed facilities will include re-working to promote good site drainage and runoff control. Given the flat topography that exists at the Project Site, some excavation and fill activity will likely be needed to achieve a site level suitable for construction, and then removal, where necessary, of those soils unsuitable as structural fill. It is anticipated that unsuitable soils will be recycled offsite for landscaping or non-engineering grade fill.

The seismic setting will allow construction of the proposed facilities with standard building techniques. Earthquakes are not anticipated to have an impact on operation of the proposed Project.

Due to the relatively shallow groundwater at the Project Site, dewatering will likely be required to support foundation construction at some locations. Groundwater will be brought down approximately 1-foot below the proposed sub-grade, prior to excavating to final subgrade. The groundwater will be maintained at that level until the subgrade is prepared and concrete placed in order to minimize disturbance of the ground. This will be temporary and will only be a localized condition. Erosion and sediment control will be installed to prevent impacts to soil and exposed surficial materials. Mitigation for the discharge of groundwater effluent is further discussed in Section 13, Water Resources.

11.6.1.3 Operational Impacts

During operation, commonly used oils (e.g., fuel oil, lube oil) and chemicals (e.g., aqueous ammonia, water treatment chemicals) will be utilized. The state of the art storage and containment facilities proposed will be operated with management plans to prevent a release to the environment. The mitigation measures to protect geologic resources, as well as other resources, is presented in Section 12.4.2.1 *Spill Prevention and Contingency Plan - Construction* and 12.4.2.2 *Spill Prevention and Contingency Plan – Operation.*

11.6.2 Electrical Interconnect

11.6.2.1 Construction Impacts

A combination of underground and overhead transmission line will be constructed between the Project’s step up transformers and the NYPA transmission line. The transmission line contained within the Project Site will be above ground. Once the transmission leaves the Project Site until just prior to the interconnection with NYPA, the transmission line will be underground.

No unique geologic resources have been identified along the electrical interconnect route. The soils, largely re-worked at the off-site locations, are suitable for construction. Excavation and temporary stockpiling of soils at the point of excavation will be necessary. The majority of the below grade electrical interconnection will be in soils previously disturbed. The electrical interconnection will require the use of excavators, bulldozers, graders, front-end loaders, dump trucks and utility line trucks. The seismic setting will not impact construction and will not require unique construction techniques. A summary of the approximate cut and fill need to support construction is presented below.

SUMMARY OF APPROXIMATE CUT AND FILL ACTIVITIES				
Location	**Excavation of Existing Soils (cubic yards)**	**Backfill Requirements (cubic yards)**	**Off-site Backfill/Top Soil for Project (cubic yards)**	**Off-site Recycling of Cut Materials (cubic yards)**
Electric Interconnection Corridor	3,111	3,111	155	0

All impacts to geologic resources will be temporary during construction.

11.6.2.2 Operational Impacts

No impacts to geologic resources will be realized during operation.

11.6.2.3 Mitigation Measures

Soils and surface topography will be re-established to original conditions following the installation of the electrical interconnect. Cut material not suitable for re-use as backfill will be recycled off-site.

The environmental inspector present during construction will be trained to screen cut material for evidence of contamination. If contaminated soils are identified, they will be stockpiled separately and sampled for chemical parameters required by the licensed receiving facility permit.

11.6.3 Water/Wastewater Lines

11.6.3.1 Construction Impacts

Water to support the proposed Facility would be obtained from the City of Middletown Public Owned Treatment Works (POTW) Authority via a new pipeline. Wastewater from the plant will be returned in a second new pipeline following the same routing as the supply line.

No unique geologic resources have been identified along the water/wastewater interconnect route. Much of the construction will be along an existing roadway, minimizing the removal of soils suitable for growing plants. Where the route is not along a roadway, the interconnection traverses soils previously disturbed during installation of an existing sanitary sewer connection. All soils on this route are suitable for construction. Excavation and temporary stockpiling of soils at the point of excavation will be necessary. The interconnection will be below grade. The seismic setting will not impact construction and will not require unique construction techniques. A summary of the approximate cut and fill need to support construction is presented below.

SUMMARY OF APPROXIMATE CUT AND FILL ACTIVITIES				
Location	**Excavation of Existing Soils (cubic yards)**	**Backfill Requirements (cubic yards)**	**Off-site Backfill/Top Soil for Project (cubic yards)**	**Off-site Recycling of Cut Materials (cubic yards)**
Water/Wastewater Lines	7,590	7,590	380	0

11.6.3.2 Operational Impacts

No impacts to geologic resources will be realized during operation.

11.6.3.3 Mitigation Measures

Soils and surface topography will be re-established to original conditions following the installation of the water/wastewater lines interconnect. As with the electrical interconnection, cut material not suitable for re-use as backfill will be recycled off-site.

As with the electrical interconnection, the environmental inspector present during construction will be trained to screen cut material for evidence of contamination. If contaminated soils are identified, they will be stockpiled separately and sampled for chemical parameters required by the licensed receiving facility permit.

11.6.4 Laydown Areas

11.6.4.1 Construction Impacts

The Laydown Areas will require the temporary removal of or stabilization of loamy soils to accept heavy equipment. Erosion and sediment control techniques will be utilized to prevent impacts to soils and the unconsolidated surficial materials.

11.6.4.2 Operational Impacts

No operational impacts will be realized in the Laydown Areas.

11.6.4.3 Mitigation Measures

Erosion and sediment controls will be maintained throughout construction and during post-construction restoration. Vehicle exits will be designed to prevent unconsolidated surface materials from being transported to offsite local roadways.

11.7 SUMMARY OF IMPACTS AND MITIGATION

11.7.1 Project Site

The topography of the Project Site is nearly flat, with a gentle slope decreasing from west to east approximately. The elevation change is approximately 10 feet. The soils at the proposed CPV Valley Energy Center are a mix of silty loams, sandy loams, and gravelly loams.

Based on the preliminary geotechnical analysis, the unconsolidated material at the site is suitable to support the proposed Facility. Foundations will be shallow and deep, depending upon the requirements of the specific equipment component. The surficial geology at the CPV Valley Energy Center consists of coarse to fine gravel and/or sand, and silts, clays, and oxidized fine sand and gravel. The depth to bedrock is 52 to 80 feet below ground surface. Foundation construction will be completed with standard construction techniques and no blasting of bedrock will be required.

The excavation of soils and the reworking of the unconsolidated surficial materials will occur to support development. This will not impact the geologic setting. The soils are not contaminated chemically or physically and should be suitable for multiple uses on or offsite.

Prevention of contamination to soils due to operation of the Facility will be completed in part by development and implementation of the best management practices incorporated in the Storm Water Pollution Prevention Plan (SWPPP).

11.7.2 Electrical Interconnections

The electrical interconnections will be both above ground and underground. The aboveground portion will require pole foundations. The majority of the underground run will be completed at shallow depths within existing rights of way. No impact to geologic resources will be realized from construction or operation.

No known areas of contamination will be encountered during installation of the electrical interconnections.

11.7.3 Water/Wastewater Interconnections

The water/wastewater interconnections will run along existing rights of ways and previously undeveloped areas. The shallow excavations will not impact geologic resources. Site stabilization during construction will be completed with standard construction techniques.

No known areas of contamination will be encountered during installation of the water/wastewater interconnections.

11.7.4 Laydown Areas

The laydown areas are located on gently sloping terrain, slightly steeper than the Project Site. Within each designated laydown area, changes in topographic elevation are minor. The areas will be stabilized to allow for heavy equipment access and to prevent erosion.

The laydown areas were assessed for potential contamination. No contamination issues were identified.

11.8 REFERENCES

Fisher, D. W., Y. W. Isachsen, and L. V. Rickard. 1970. *Geologic Map of New York, Lower Hudson Sheet*. University of the State of New York, The State Education Department.

GZA GeoEnvironmental of New York (GZA). 2008. Preliminary Subsurface Exploration and Conceptual Foundation Engineering Report CPV Valley Energy Center. New York, N.Y.

Jacob, K. 1993. Seismic Vulnerability of New York State: Code Implications for Buildings, Bridges and Municipal Landfill Facilities. National Center for Earthquake Engineering Research (NCEER), Buffalo, N.Y.

NYSU, 1989. Surficial Geology Map of New York, Lower Hudson Sheet. The University of the State of New York, The State Department of Education.

U.S. Department of Agriculture (USDA). 2008. Web Soil Survey, Orange County New York, (Online) http://websoilsurvey.nrcs.usda.gov/app/. Accessed October 20, 2008.

U.S. Geological Survey (USGS). 2008. 2008 United States National Seismic Hazard Maps: U.S. Geological Survey, http://gldims.cr.usgs.gov/nshmp2008/viewer.htm. Accessed October 20, 2008.

12.0 INFRASTRUCTURE

12.1 INTRODUCTION

This section addresses the infrastructure requirements for the proposed Facility. Topics include water supply requirements, water supply availability; wastewater generation and disposal requirements; stormwater runoff/erosion control, stormwater pollution prevention, emergency response; solid waste generation; and energy usage.

Several advanced technologies coupled with sound water resources management policies and practices have been incorporated into the Facility's overall design to minimize impacts to water resources during both construction and operation. These include:

- Using combined-cycle technology for power generation, thereby increasing the overall water and fuel efficiency of the Facility when compared to traditional steam electric generating plants serving New York State;
- Selecting air-cooled condensers to dissipate heat, thereby eliminating the need for large volumes of water for cooling purposes;
- Reusing tertiary treated effluent from the City of Middletown's Sewage Treatment Plant to satisfy process makeup requirements for power generation, thereby minimizing water withdrawals from the municipal distribution system;
- Use of inlet air cooling to enhance the overall performance characteristics of the combustion turbines during the peak summer electrical demand season, thereby decreasing reliance on older generating assets within the Lower Hudson River Basin that require large amounts of water for cooling purposes (*i.e.*, existing facilities currently using surface waters of the State in once-through cooling systems);
- developing and implementing Best Management Practices (BMPs), including both structural and non-structural controls, to ensure the proper storage, handling and management of fuel oils, lubricants, transformer oils, water treatment additives and boiler additives; and
- Developing and implementing an erosion and sediment control plan to ensure that applicable site specific controls are in place and properly maintained throughout the construction process.

To minimize water supply demands on the municipal distribution system, process makeup water for the Facility, which is estimated to range from approximately 44 gallons per minute (gpm) (~63,360 gallons per day) up to 435 gpm (~626,000 gpd), would be satisfied through reuse of tertiary treated effluent from the City of Middletown Sewage Treatment Plant. Under the preferred water supply plan, treated effluent currently discharged to the Wallkill River would be filtered and chlorinated for reuse as process makeup water. Effluent pretreatment operations (i.e., filtration followed by chlorination) would be performed at the City of Middletown Sewage

Treatment Plant. The tertiary treated effluent would then be pumped to the site through a newly constructed 4-inch diameter non-potable water supply line.

As an alternative to reuse of tertiary treated effluent, CPV has also investigated the potential for redevelopment of an existing on-site groundwater well to satisfy all or a portion of the Facility's process makeup requirements. The existing well taps the bedrock aquifer at a depth of 238 feet below ground surface. Based on preliminary pump test results, the well appears to have adequate water supply development potential to yield up to 250 gpm or approximately 360,000 gallons per day (gpd).

Potable water for the Facility, which is estimated to average 2 gpm (~2880 gpd), would be obtained through an interconnect to the municipal distribution system along Route 6. Although a potable water main does not currently exist along Route 6 in the site vicinity, CPV understands that construction plans are currently being finalized to extend the municipal distribution system from its current terminus on Route 6 past the proposed entrance road to the project site.

Process wastewater requiring off-site disposal would typically range from approximately 35 gpm (~50,000 gpd) to 65 gpm (~94,000 gpd) during gas-fired operation. When the combustion turbines are operated using very low sulfur distillate, the process wastewater generation rate approaches 155 gpm (~223,000 gpd). Process wastewater would either be directed to the headworks of the City of Middletown Sewage Treatment Plant or discharged to the City of Middletown Sewage Treatment Plant outfall pipe (Wallkill River) under an individual SPDES permit. Sanitary wastewater would either be directed to an on-site septic system or the City of Middletown Sewage Treatment Plant. Site stormwater runoff would be routed to an on-site detention basin prior to discharge to on-site wetlands that ultimately drain to Monhagen Brook.

Solid waste generated at the facility would typically be limited to small quantities of office waste and general plant refuse. All solid waste would be loaded into on-site dumpsters and removed from the site under a contract with a local private vendor. Newspapers, corrugated cardboard and metals used at the facility during operation would be recycled to the maximum extent practicable.

Other wastes typical of power generation activities include oils collected in the oil/water separator, spent lubricating oils, oil filters from the combustion turbines and air filters. These wastes would be transported off-site by an outside contractor and properly recycled or disposed.

With proper storage, handling and management of fuels, lubricating oils and other hazardous materials coupled with implementation of a site-wide Best Management Practices (BMP) Plan addressing stormwater management, the facility would not result in significant adverse impacts to groundwaters or surface waters of Orange County.

The proposed Facility would result in the generation of additional electric capacity to assist in addressing the need for additional electricity, increased competition, and improved system reliability in the lower Hudson Valley region. The Facility operation would consume approximately 23 MW of electricity and produce a net Facility electric output of 630 MW.

12.2 WATER SUPPLY

12.2.1 Introduction

Water would be required for several functions associated with the operation of the proposed Facility. Water is used for steam cycle makeup, plant maintenance, inlet air-cooling, turbine injection for nitrous oxides (NO_X) control (limited to oil-fired operation), compressor cleaning, and to satisfy the Facility's potable water needs. The proposed Facility would be one of the most water-efficient combined-cycle electric generation facilities statewide. This is primarily attributable to the selection of an air-cooled condenser for heat dissipation rather than relying on once-through or evaporative cooling technologies. In addition, water supply and wastewater discharge requirements would be minimized through installation of a finfan cooler to manage the Facility's auxiliary cooling loop.

Process makeup requirements for the facility would be met by using reclaimed tertiary-treated effluent from the City of Middletown Sewage Treatment Plant. The municipal distribution system is available in the project vicinity and is the preferred source of supply for satisfying the facility's potable water demands.

12.2.2 Water Supply Requirements

12.2.2.1 Process Makeup Requirements

Table 12-1 and
2-1 present preliminary water balance information for the Facility over the projected range of operating conditions. Figure 12-1 schematically illustrates the primary water supply and wastewater pathways through the Facility. Table 12-1 identifies process makeup requirements and wastewater generation rates for each pathway shown.

Cases A through E in Table 12-1 are associated with use of the primary fuel, natural gas. When firing natural gas, process makeup requirements will vary with variations in ambient air temperature. Ambient air temperature is listed in Table 12-1 as the dry bulb temperature (DBT) in degrees Fahrenheit. Cases A through C reflect typical operating conditions during the fall, winter, and spring seasons, when process makeup requirements would typically range between 44 gpm (~60,000 gpd) and 50 gpm (72,000 gpd). Cases D and E reflect peak summer operating conditions assuming use of inlet air evaporative cooling, both with and without supplemental duct firing.

Facility water use would increase under peak summer operating conditions when inlet air evaporative cooling is used to optimize combustion turbine performance. On hot summer days, inlet air evaporative cooling increases the density of the inlet air stream, thereby increasing the mass flow rate of air through the combustion turbine. Inlet air evaporative cooling would typically be used when ambient air temperature exceeds 70^{o} Fahrenheit. Inlet air evaporative cooling makeup requirements are estimated to total up to 52 gpm (~75,000 gpd), with up to 35 gpm (~50,000 gpd) lost to evaporation.

When the backup fuel is used, Case F in Table 12-1, additional water is required for air emissions control purposes. During oil firing demineralized water would be injected into the combustion turbine to limit the formation of nitrous oxides (NO_X) in the exhaust gas. NO_X injection water requirements for oil firing are estimated to total up to 265 gpm or 381,460 gpd, which would be lost to evaporation. (Note that oil firing would be limited to 720 hours per year).

Table 12-2 summarizes facility water use, wastewater generation and consumptive water use (i.e., evaporative loss) for the range of operating conditions reflected Table 12-1.

Table 12-1
Preliminary Water Balance
CPV – VALLEY
COMBINED CYCLE

(Prepared by: Aquagenics incorporated)

REV. 4 10-Nov-08								
	DAILY AVERAGE PROCESS FLOWS, GPM							
	CASES	**A**	**B**	**C**	**D**	**E**	**F**	**Comments**
	Fuel	NG	NG	NG	NG	NG	OIL	
	DBT, deg F	-5	51	51	90	90	-5	
	REL. Humidity, %	70	63	63	59	59	70	
	Duct Firing	OFF	OFF	ON	OFF	ON	OFF	
	Inlet Air Evaporative Cooling	OFF	OFF	OFF	ON	ON	OFF	
	Number of GTs	2	2	2	2	2	2	
	GT Load, %	98	100	100	100	100	99	
Stream Numbers								
1	Municipal Water Supply (Potable Uses)	2.0	2.0	2.0	2.0	2.0	2.0	Aquagenics' estimate
2	Plant Sanitary Wastewater	2.0	2.0	2.0	2.0	2.0	2.0	
3	Raw Water Supply (tertiary-treated)	45.3	44.1	47.7	95.3	104.3	426.2	
4	Raw Water Makeup to Plant	48.3	47.0	50.9	98.1	107.8	434.5	
5	Service Water	5.0	5.0	5.0	5.0	5.0	5.0	Aquagenics' estimate
6	OWS Sludge Water	0.0	0.0	0.0	0.0	0.0	0.0	Assume negligible
7	OWS Effluent	5.0	5.0	5.0	5.0	5.0	5.0	
8	Service Water Wastewater to Discharge	5.0	5.0	5.0	5.0	5.0	5.0	
9	Raw Water Makeup to BOP	43.3	42.0	45.9	93.1	102.8	429.5	
10	Evaporative Cooler Feed	0.0	0.0	0.0	51.7	51.7	0.0	
11	Evaporative Cooler Evaporation	0.0	0.0	0.0	34.4	34.4	0.0	From WP Heat Balances
12	Evaporative Cooler Blowdown to Discharge	0.0	0.0	0.0	17.2	17.2	0.0	Assume 3 COC
13	Feed to Mobile MDS	0.0	0.0	0.0	0.0	0.0	308.7	

Table 12-1
Preliminary Water Balance
CPV – VALLEY
COMBINED CYCLE

(Prepared by: Aquagenics incorporated)

14	Mobile MDS Product Water to DM Storage	0.0	0.0	0.0	0.0	0.0	216.1	70% recovery
15	Mobile MDS Wastewater to Discharge	0.0	0.0	0.0	0.0	0.0	92.6	
16	Feed to Permanent MDS	43.3	42.0	45.9	41.5	51.2	120.8	
17	MF Filtrate	43.3	42.0	45.9	41.5	51.2	120.8	92% recovery
18	MF Backwash In	3.5	3.4	3.7	3.3	4.1	9.7	
19	MF Backwash to Discharge	3.5	3.4	3.7	3.3	4.1	9.7	
20	RO Feedwater	39.8	38.7	42.2	38.2	47.1	111.1	75% recovery
21	RO Product Water / EDI Feedwater	29.9	29.0	31.7	28.6	35.3	83.3	
22	RO Reject to Discharge	10.0	9.7	10.6	9.5	11.8	27.8	
23	EDI Product Water to DM Storage	26.9	26.1	28.5	25.8	31.8	75.0	90% recovery
24	EDI Concentrate	3.0	2.9	3.2	2.9	3.5	8.3	
25	DM Water to Cycle Makeup	26.9	26.1	28.5	25.8	31.8	26.6	
26	DM Water to Injection	0.0	0.0	0.0	0.0	0.0	264.5	From WP Heat Balances
27	HRSG Blowdown	25.7	24.3	28.4	23.7	34.1	25.2	1%, from WP Heat Balances
28	Miscellaneous Steam Losses	6.0	6.0	6.0	6.0	6.0	6.0	Aquagenics' estimate
29	Sampling Losses	6.0	6.0	6.0	6.0	6.0	6.0	Aquagenics' estimate
30	HRSG Blowdown Flash to LP Drum	10.8	10.2	11.9	10.0	14.3	10.6	Estimated from Walpole; needs calculation and correction by WP
31	HRSG Blowdown Flash Tk Drain to Blowdown Tank	14.9	14.1	16.5	13.8	19.8	14.6	
32	Blowdown Tank Flash	1.0	1.0	1.2	1.0	1.4	1.0	Estimated from Walpole; needs calculation and correction by WP
33	Heat Exchanger Feedwater	13.8	13.1	15.3	12.8	18.4	13.6	
34	Heat Exchanger Outlet	13.8	13.1	15.3	12.8	18.4	13.6	
35	Cycle Wastewater to Discharge	19.8	19.1	21.3	18.8	24.4	19.6	
36	Total Wastewater to Discharge	38.3	37.1	40.6	53.9	62.5	154.6	
37	Total Feed to DM Water Tank	26.9	26.1	28.5	25.8	31.8	291.1	

NOTES:
1. Turbine washwaters not included in wastewater discharge
2. Permanent MDS production capacity = 75 gpm

Table 12-2 Facility Water Use and Wastewater Generation Rates under Indicated Operating Conditions					
Case	**Operating Condition**	**Turbine Load Condition (percent)**	**Facility Process Water Supply (gpm)**	**Process Wastewater Discharge (gpm)**	**Evaporative Loss (gpm)**
A	Natural Gas; - 5 deg F; DF & EC Off	98	45	38	7
B	Natural Gas; 51 deg F; DF & EC Off	100	44	37	7
C	Natural Gas; 51 deg F; DF On & EC Off	100	48	41	7
D	Natural Gas; 90 deg F; DF Off & EC On	100	95	54	41
E	Natural Gas; 90 deg F; DF & EC On	100	104	63	42
F	Oil; -5 deg F; DF & EC Off	99	426	155	271
Notes: DF = Duct Firing; EC = Inlet Air Evaporative Coolers gpm = gallons per minute Water balance assumes 2 gpm sanitary wastewater flow to on-site septic system					

Table 12-3 provides an estimate of the projected daily peak and the projected daily average water supply needs, and consumptive water losses of the Project, in gpm, for the following operating conditions: average annual, peak summer, and winter. The projected daily peak values are based on a 24-hour operating day, while the projected daily average values are based on the anticipated operation profile. The projected daily average value for the winter operating condition includes both gas-fired and oil-fired operation.

Table 12-3 Projected Peak and Average Day Water Use					
Operating Condition	**Water Balance Cases Used**	**Peak Facility Process Water Supply (gpm)**	**Peak Evaporative Loss (gpm)**	**Average Facility Process Water Supply (gpm)**	**Average Evaporative Loss (gpm)**
Average Annual	A, B, D	NA	NA	63.2	23.9
Peak Summer	D, E	101.3	41.7	101.3	41.7
Winter	A, F	426.2	271.6	88.8	44.2
Notes: NA = not applicable					

Table 12-3 assumes that the Facility would be capable of operating as a baseload Facility and, therefore, 98 to 100 percent combustion turbine load was assumed for plant operations. Further, the average hourly water requirements for power production represent the daily average usage divided by 24 hours. Note that water use during a maintenance outage would vary based on the maintenance activities being performed.

Peak hourly demand (i.e., the hourly instantaneous demand) during Facility operation is projected to total up to 450 gpm (~648,000 gpd).

During commissioning, a temporary condition lasting for approximately 4 months preceding commercial operation, the Project's average daily water supply requirements are estimated to range from 50 gpm to 300 gpm. The projected water demand during commissioning would be used for cleaning and component flushing. Typical uses would include: cleaning of boiler components; flushing of water supply and treatment systems; flushing of steam and condensate pipelines; and testing of steam cycle components. Testing and inspection of the combined cycle system requires more frequent blowdown of the HRSG during initial commissioning activities than during normal operating conditions.

12.2.2.2 Potable Water Requirements

It is estimated that 2 gpm (~2880 gpd) would be required to meet the average daily potable and sanitary water needs for on-site staff and visitors.

12.2.2.3 Firewater Demand

The Facility would be equipped with fire supression systems as well as emergency fire protection backup pumping capacity. Approximately 50 percent of the 1,000,000 gallon reclaim water/fire water storage tank would be dedicated soley for fire protection purposes. The installed backup pumping capacity would be designed to satisfy National Fire Protection Association (NFPA) recommendations for quantity and pressure. The estimated fire suppression water supply requirements for the Facility would be 2000 gpm. The fire supression systems would be used only during emergencies or during periodic testing of emergency systems, as required. The average daily fire suppression flow rate would be zero.

12.2.2.4 Water Chemistry Requirements

The Project requires demineralization of the reclaimed effluent prior to use in the combustion turbine or steam cycle. High purity demineralized water is required for steam cycle makeup, combustion turbine injection water, and compressor wash water to limit scale formation and minimize corrosion of internal system components.

Two support gas-fired operation, demineralization would be performed using a permanently installed makeup demineralizer system (MDS). This system would be located in the water treatment building and consist of the following major processes: microfiltration (MF), reverse osmosis (RO), and electrodeionization (EDI). Processed water would be directed to a 400,000-gallon demineralized water storage tank.

To support oil-fired operation, the permanent MDS system design capacity would be augmented through use of a leased, truck-mounted demineralization system. The truck mounted demineralization system would use reverse osmosis followed by mixed bed ion exchange (IX) or electrodeionization (EDI). The 400,000-gallon demineralized water storage tank would be used to damp out fluctuations in demineralized water production capacity.

12.2.3 Proposed Water Supply Source

12.2.3.1 Process Makeup Water

Because potable water supply capacity is limited on a regional basis, proposals for major industrial developments in central Orange County over the past 10 years have focused on the reuse of treated effluent from the City of Middletown Sewage Treatment Plant to satisfy all or a portion of projected process makeup requirements. Reuse of treated effluent from the City of Middletown Sewage Treatment Plant represents CPV Valley's preferred option for meeting all of the Facility's process makeup requirements. The City of Middletown Sewage Treatment Plant is located approximately 1.5 miles northeast of the Project Site off Dolson Avenue in the City of Middletown.

The City of Middletown Sewage Treatment Plant is permitted for a flow of 6.0 mgd under NY SPDES Permit No. 0026328, which was last renewed in August, 2007. The receiving body for the sewage treatment plant is the Wallkill River, a NYSDEC Class B stream. The plant serves a population of approximately 30,000 people. Based on discussions with the City of Middletown's Commissioner of Public Works, the Sewage Treatment Plant is scheduled to undergo a 2.5 mgd upgrade over the next few years, allowing for a permitted flow of 8.5 mgd. Construction of the upgrade is expected to be completed in February of 2011.

Average monthly effluent flow over the period August 2004 through June 2006 has ranged from a low of 3.6 mgd to a high of 7.1 mgd (See Figure 20 in Appendix 12-D, City of Middletown Sewage Treatment Plant Effluent Data). Based on this, the minimum daily flow through the treatment plant under drought conditions would be expected to be approximately 1.5 mgd. By comparison, the maximum instantaneous water demand for the proposed Facility would be approximately 0.65 mgd. Therefore, adequate capacity is available to meet CPV's projected process makeup requirements through reuse of treated effluent.

The treatment train at the plant currently includes a barminutor, grit classifier, primary clarifier, high rate trickling filter, oxidation ditch, secondary clarifier, rapid sand filtration system and UV disinfection. In a previous upgrade, the former primary clarifiers were converted into side stream surge tanks to reduce peak flow during wet weather events. Disinfection is seasonal based on the recreational uses of the Wallkill River.

The plant routinely monitors its effluent for the following parameters: flow, total suspended solids, carbonaceous biochemical oxygen demand, oxygen demand, pH, temmperature, settable solids, ammonia nitrogen and keldahl nitrogen. In general, the plant produces a good quality secondary treated effluent. Time history plots of plant performance based on effluent monitoring data available through the EPA permit compliance system (PCS) database and the EPA ECHO database are included in (City of Middletown Sewage Treatment Plant Effluent Data, Appendix 12 –D) .

In addition, CPV has initiated with participation of the Treatment Plant an effluent monitoring program to test the effluent quality for conventional constituents, priority pollutant heavy metals, volatile organic compounds, semivolatile organic compounds, PCBs and pesticides. Results indicate that, with the exception of very low concentrations of copper (0.036 mg/l total Cu) and zinc (0.097 mg/l total Zn), none of the other priority pollutants are present in detectable concentrations in the treatment plant effluent.

Following completion of the plant upgrade, the treatment train would include: new bar screens, existing grit removal, a new activated sludge plant consisting of oxidation basins and secondary clarifiers, and a new UV disinfection system. The existing sand filters would be retired in place.

It is expected that reclaim water would be drawn from the effluent of the new UV disinfection system. From this point, it would be chlorinated and forwarded to a new packaged, multimedia filter system or to a portion of the existing (but retired) sand filters, which would be refurbished for this purpose. After tertiary filtration, the reclaim water would be pumped to the CPV Valley Facility via a new 4-inch diameter pipeline.

Reclaim water supplied by the City of Middletown Sewage Treatment Plant would be of suitable quality for CPV Valley's process water needs. As such, no additional treatment would be required, other than for satisfying the Project's demineralized water demands as detailed previously. A sodium hypochlorite feed system would be provided on-site to adjust the chlorine content of the reclaim water storage tank.

All process makeup water (reclaim water) would be routed through the proposed 1,000,000-gallon reclaim water/fire water storage tank. Use of on-site water storage for reclaim water and demineralized water serves to damp out day-to-day fluctuations in demand, thereby limiting peak system withdrawal rates under all operating conditions.

12.2.3.2 Potable Water

The proposed CPV Valley Site is located within the Town of Wawayanda's Water and Sewer District No. 1. Water and Sewer District No. 1 obtains water from the City of Middletown and is currently allocated to withdraw up to 200,000 gpd from the Middletown distribution system. Water allocations for the Middletown distribution system are regulated by the NYS Department of Health (NYSDOH) and the NYS Department of Environmental Conservation (NYSDEC). The City of Middletown is the largest water purveyor in the site vicinity. Operation and maintenance of this system falls under the direction of the City of Middletown, Commissioner of Public Works.

The Middletown water system consists of surface water reservoirs, a groundwater well, water treatment facilities, and a distribution system. The distribution system contains approximately 7,165 service connections, which serve a population of approximately 26,400 people. Of these accounts, 316 are located outside the City limits in the Town's of Wallkill and Wawayanda.

The City of Middletown obtains its raw water from surface supplies consisting of three (3) reservoirs, one small impoundment and one groundwater well. The combined watershed for the surface water reservoirs is mostly owned by the City and encompasses approximately 1,500 acres, which is considered small relative to the population served. The City's distribution system, which includes pipes ranging from 4 inches to 24 inches in diameter, extends approximately 75 miles. The distribution system also contains five finished water storage tanks. The tanks are located within the City of Middletown and in neighboring sections of the Towns of Wallkill, Wawayanda and Mount Hope.

Raw water for the Middletown system is processed through two water treatment plants:

- The Monhagen Treatment Facility, which was initially built at the turn of the century and incrementally expanded and upgraded, consists of pre-chlorination, aluminum sulfate addition for coagulation, flocculation and sedimentation. The settled water is then filtered by gravity through sand filters. Chlorine is added for residual disinfection and sodium hydroxide is added for pH adjustment.

The Monhagen Treatment Facility is scheduled to be replaced by a new 5.0 million gallon per day (mgd) Water Treatment Facility. Design plans and specifications are being finalized for review and approval by the New York State Department of Health and the Environmental Protection Agency. The existing Monhagen Water Treatment Facility will be abandoned following commissioning of the new Facility. The new Facility will tap the same water supply sources as the existing water treatment plant. As such, the raw water supply capacity will not change.

- A new package water treatment plant, capable of producing 1.5 mgd, went on line in November of 2003. The treatment train consists of aluminum sulfate addition to enhance coagulation, potassium permanganate addition to reduce iron and manganese, dissolved air floatation to remove flocculated matter, rapid sand filtration, and ultraviolet disinfection. Sodium hypochlorite is added to the finish water to maintain chlorine residual within the distribution system and sodium hydroxide is used for pH adjustment.

Routine testing of the finished water is performed for the following constituents: total coliform, turbidity, inorganic compounds, nitrate, nitrite, lead and copper, volatile organic compounds, total trihalomethanes, and synthetic organic compounds.

12.2.4 Water Supply Infrastructure

Based on discussions between CPV and Officials from the Town of Wawayanda, adequate water supply capacity is available through Water and Sewer District No. 1 to meet the projected potable water demands for the Facility, which are expected to average 2 gpm or 2880 gpd. CPV will continue to work with Town Officials to select a mutually acceptable interconnection point.

Required infrastructure for the reclaimed water supply from the City of Middletown Sewage Treatment Plant would include:

- Approximately 1.5 miles of interconnecting pipeline (4-inch) directly from the wastewater treatment plant; and

- Installation of a filtration system (a new packaged multimedia pressure filtration plant or use of a portion of the Sewage Treatment Plant's existing sand filter system after the planned upgrade is completed); installation of a new pumping station with chlorination equipment; and installation of a water meter, valve and related equipment at the metering station.

All costs for these improvements would be the responsibility of CPV.

12.2.4.1 Pipeline Construction

CPV would take all necessary precautions for protection of work and safety of the public during trenching activities along public thoroughfares such as the use of barricades, danger signals, fencing, traffic cones, flag men, warning signs, etc. All barricades, danger signals, fencing, warning signs and obstructions would be adequately illuminated at night (sunset to sunrise).

12.2.4.2 Trenching Equipment

Trenching would be performed by rubber-tired or tracked backhoe, excavator, or other type of ditching machine. The type and size of the equipment depends upon criteria such as trench configuration, trench width, soil conditions, and topography. Suitable precautions and safeguards would be used in operating the heavy equipment so pavement adjacent to trench areas is not damaged. Pumping equipment would also be available to properly dewater all excavated trenches, openings and existing structures to prevent flooding of adjacent properties. Dewatering effluent would be properly managed based on soil type, to minimize impacts to surface waters.

12.2.4.3 Trench Width and Cover Requirements

All trenches and openings would be made by open cut from the surface or by jack and bore. The trench width at the bottom would be sufficient to ensure safe installation of the pipelines and allow for padding and backfill to appropriate specifications. The trench wall would be tapered outward at an angle appropriate to soil type, moisture, and trench depth, in conformance with OSHA requirements (29 CFR 1910 et al.). Excavations 5 feet or more in depth or where a danger of slides or cave-in exist as a result of excavation shall be shored, sheeted, braced or sloped to the angle of repose. In addition, sides of trenches in unstable or soft material shall be shored, sheeted, braced, sloped or otherwise supported by means of sufficient strength to protect employees working within them. Generally, 3 to 5 feet of cover above pipelines would be provided along most of the route.

12.2.4.4 Repairs and Restoration

Restoration of any road surface would follow the sequence outlined below.

a. Road shoulders (maximum 15 feet) would be returned to original grade immediately following backfill.

b. Placement of a temporary road surface would take place immediately after backfill in accordance with state or municipal standards or permit requirements.

c. Permanent repair of asphalt roads would take place as soon as practicable, but in any event within six months of backfill. All temporary pavement, broken pieces of pavement, or other materials with which trenches and openings have been temporarily surfaced would be removed and disposed.

d. Permanent repair of other road damage would take place during final restoration.

e. Permanent repair of dirt and gravel roads (ruts, potholes, and loss of grade) would take place during final restoration.

12.2.5 Water Supply Minimization Measures

The Project avoids adverse impacts on water supply through:

- Use of combined-cycle technology for power generation, thereby increasing the overall water and fuel efficiency of the Facility when compared to traditional steam electric generating plants serving New York State;

- Selection of air-cooled condensers to dissipate waste heat, thereby eliminating the need for large volumes of water for cooling purposes; and

- Reuse of tertiary treated effluent from the City of Middletown's Sewage Treatment Plant to satisfy process makeup requirements for power generation, thereby minimizing water withdrawals from the municipal distribution system.

Under the preferred water supply plan, treated effluent currently discharged to the Wallkill River would be filtered and chlorinated for reuse as process makeup water. Effluent pretreatment operations (i.e., filtration followed by chlorination) would be performed at the City of Middletown Sewage Treatment Plant. The tertiary treated effluent would then be pumped to the site through a newly constructed 4-inch diameter non-potable water supply line.

As an alternative to reuse of tertiary treated effluent, CPV has also investigated the potential for redevelopment of an existing on-site groundwater well to satisfy all or a portion of the Facility's process makeup requirements. The existing well taps the bedrock aquifer at a depth of 238 feet below ground surface. Based on preliminary pump test results, the well appears to have adequate water supply development potential to yield up to 250 gpm or approximately 360,000 gallons per day (gpd).

In addition, the Project includes installation of a reclaimed water/fire water storage tank and demineralized water storage tank, which would both serve to minimize short-term peak water demands and ensure continued Facility operation during any temporary curtailment in water supply services.

Potable water for the Facility, which is estimated to average 2 gpm (~2880 gpd), would be obtained through an interconnect to the municipal distribution system along Route 6. Although a potable water main does not currently exist along Route 6 in the site vicinity, CPV understands that construction plans are currently being finalized to extend the municipal distribution system from its current terminus on Route 6 past the proposed entrance road to the project site.

12.3 WASTEWATER GENERATION

Process wastewater requiring off-site disposal would typically range from approximately 35 gpm (~50,000 gpd) to 65 gpm (~94,000 gpd) during gas-fired operation. When the combustion turbines are operated using very low sulfur distillate, the process wastewater generation rate approaches 155 gpm (~223,000 gpd). Process wastewater would either be directed to the headworks of the City of Middletown Sewage Treatment Plant or discharged to the City of Middletown Sewage Treatment Plant outfall pipe (Wallkill River) under an individual SPDES permit. Sanitary wastewater would either be directed to an on-site septic system or the City of Middletown Sewage Treatment Plant. Site stormwater runoff would be routed to an on-site detention basin prior to discharge to on-site wetlands that ultimately drain to Monhagen Brook.

Several features of the proposed Facility design are targeted at minimizing water use and, consequently, wastewater requiring off-site disposal. The primary and auxiliary cooling systems are air-cooled. Therefore, they do not require water for system operation and do not generate wastewater. Nevertheless, the project would generate low volume process and sanitary wastewater requiring proper handling and management. The low volume process waste streams include:

- Treated effluent from the Service Water System oil/water separator;
- Blowdown from the inlet air evaporative coolers (seasonal, during summer operation);
- Backwash water from the Makeup Demineralizer System's microfiltration unit;
- Reject water from the Makeup Demineralizer System's reverse osmosis unit (both the permanently installed MDS and the supplementary mobile MDS);
- Plant Sampling System drains; and
- Unrecovered HRSG blowdown (a portion of the HRSG blowdown is recovered to the LP drum in the steam cycle).

The following sections describe the proposed methods for managing wastewater generated at the Facility.

12.3.1 Sanitary Wastewater

Sanitary wastewater would be managed using either an on-site septic system or through discharge to the City of Middletown Sewage Treatment Plant. The estimated average daily sanitary wastewater design flow for the Facility is 2 gpm or 2880 gpd. The sanitary collection systems serving the Facility would be designed in accordance with all applicable state and local codes, including: the New York State Uniform Fire Prevention and Building Code and Sanitary Code, the County Sanitary Code and the Town of Wawayanda Building Code.

12.3.2 Process Wastewater

12.3.2.1 Floor Drains

Trench type floor drains would be used to collect and convey equipment and floor wash water from the generation building. In potentially oily areas of the Facility, floor drains would be directed to an oil/water separator. Prior to treatment, this waste stream may contain low levels of oil or grease and low levels of suspended solids. Remaining constituents in the wastewater are anticipated to be at concentrations approximately equivalent to the quality of the reclaim water makeup supply from the City of Middletown Sewage Treatment Plant. Treated effluent, estimated to average 5 gpm, would be managed as a permitted low volume waste stream.

Oil and grease concentrations in the wastewater would be maintained at or below acceptable levels for discharge through the use of an oil/water separator. The separator would be sized to provide low velocities and adequate retention times to allow any oil or grease to separate from the water. Oil/water separators consist of several chambers: an inlet stilling chamber, a separator chamber, and an outlet chamber. Water enters the stilling chamber, where flow is slowed and admitted to the separation chamber. In the separation chamber the oil and grease are collected at the surface through flotation. The clean water remains at the bottom where it passes under an inverted weir into the outlet chamber for release.

Oil trapped in the oil/water separators would be collected for off-site treatment and disposal by a licensed contractor. If the oil were determined to be hazardous, it would be temporarily stored pursuant to NYSDEC regulations prior to transportation off-site and disposal by a licensed contractor.

12.3.2.2 Demineralization Wastewater

The permanent and supplementary demineralization systems would typically generate two low volume waste streams: microfiltration backwash water and reverse osmosis (RO) reject water. Microfiltration would be used to remove residual suspended solids from the reclaim water to prevent fouling of reverse osmosis membranes. The microfiltration unit is expected to have a 90% recovery rate. Backwash water would contain low levels of suspended solids, with remaining constituents at concentrations similar to those of the reclaim water makeup supply. Reverse osmosis reject water would contain the dissolved constituents present in the reclaimed water, but at a concentration roughly 4 times higher.

12.3.2.3 Mixed Bed Ion Exchange Demineralizer Rinse Water

When a mobile demineralization trailer arrives on-site to support oil firing, the mixed bed ion exchange resin bed would be rinsed using reclaimed water. This initial rinse water would either be returned to the reclaimed water storage tank or discharged to the process wastewater collection system. This initial rinse water may not meet the stringent demineralized process makeup requirements for use in the combustion turbine, and cannot be directed to the demineralized water storage tank. The volume of initial rinse water is estimated to range between 600 and 1200 gallons during each trailer change out.

Also, prior to exiting the Project site, the water contained in resin beds would need to be drained (i.e., only empty exchange beds are transported over-the-road). Since residual water within the treatment bed would not pass through the entire bed, it would not meet the stringent makeup requirements for use in the combustion turbine. Therefore, residual water from the beds would be drained to either the reclaimed water tank or discharged to the process wastewater collection system. The estimated volume would be approximately 100 to 500 gallons.

Both of the above are intermittent waste streams.

12.3.2.4 Off-line Compressor Wash Water

The compressors serving the combustion turbines require periodic cleaning to maintain operating efficiency and prevent excessive wear and tear on internal components. Compressor cleaning can be performed when the combustion turbines are on-line or off-line. During an on-line wash, no wastewater is generated (water is evaporated). Off-line washes are generally performed on a weekly or bi-weekly basis. An off-line compressor wash consists of injecting a demineralized water/detergent mixture into the compressor when the combustion turbine is off-line to remove accumulated dust, dirt or other contaminants that cannot be removed during an on-line wash. In general, the cleaning solution would consist of 25 percent detergent and 75 percent demineralized water. The resultant wastewater (approximately 500 gallons per wash) would be collected in the CT Wash Water Drain Tank for off-site processing at an appropriately licensed facility. This is an intermittent waste stream.

12.3.2.5 Cleaning Wastewaters – Membrane-based Processes

The membrane-based processes used in the permanent MDS may require infrequent, periodic chemical cleaning. These processes include the microfiltration membrane elements, the reverse osmosis membrane elements, and the electrodeionization stacks. The various chemical solutions that may be used include acid solutions (such as citric acid), caustic solutions (such as sodium hydroxide), detergent solutions, and chelant solutions (such as EDTA). The spent solutions will be collected, neutralized (if necessary) and directed to a holdup tank. If the composition of these cleaning solutions is not acceptable for discharge to either the City of Middletown Sewage Treatment Plant headworks or the City of Middletown Sewage Treatment Plant outfall, this waste stream would be trucked for off-site disposal at a suitably licensed Facility. This is an intermittent waste stream.

12.3.2.6 Inlet Air Evaporative Cooler Blowdown

During the summer, inlet air cooling would be used to optimize combustion turbine performance. To prevent excessive buildup of dissolved solids caused by evaporation, the inlet air cooler would be blown down. The blowdown rate would range from 15 to 20 gpm. Blowdown from the evaporative coolers would contain the dissolved constituents contained in the reclaimed makeup water, but at a concentration roughly three times higher.

12.3.2.7 HRSG Blowdown and Plant Sampling System Drains

HRSG blowdown would be required to maintain the purity of the demineralized water in order to prevent scale formation on heat exchange surfaces. The blowdown rate for the HRSG would range from approximately 12 gpm to 20 gpm. HRSG blowdown contains low levels of boiler treatment additives, which are commonly used to limit scale forming potential. Sampling system drains contain the same constituents as HRSG blowdown. Discharge from sampling systems drains is estimated to total 6 gpm.

12.3.2.8 Summary

Process wastewater requiring off-site disposal would typically range from approximately 35 gpm (~50,000 gpd) to 65 gpm (~94,000 gpd) during gas-fired operation. When the combustion turbines are operated using very low sulfur distillate, the process wastewater generation rate approaches 155 gpm (~223,000 gpd). Process wastewater would either be directed to the headworks of the City of Middletown Sewage Treatment Plant or discharged to the Middletown Sewage Treatment Plant outfall pipe (Wallkill River) under an individual SPDES permit. Sanitary wastewater would either be directed to an on-site septic system or the City of Middletown Sewage Treatment Plant. To be conservative and to account for any uncertainties in wastewater generation rate projections, for wastewater permitting purposes CPV has assumed that the average wastewater generation rate for the Facility would be 50 gpm (72,000 gpd) and that the maximum wastewater generation rate would be 175 gpm or approximately 250,000 gpd.

Table 12-4 lists the estimated quantities of wastewater that would routinely be generated by the Project under typical operating conditions.

Table 12-4
Wastewater Generation

Source	Rate (1)	Daily Volume (1)	Monthly Volume (1)
Continuous Generation			
Sanitary waste	1.6 gpm	2,260 gallons	67,900 gallons
Miscellaneous Floor Drains (Oil/Water Separator Effluent)	3.9 gpm	5,660 gallons	170,000 gallons
MF Backwash	2.7 gpm	3,850 gallons	115,000 gallons
RO reject	7.6 gpm	11,000 gallons	329,000 gallons
HRSG Blowdown	10.3 gpm	14,800 gallons	445,000 gallons
Samping System Losses	4.7 gpm	6,790 gallons	204,000 gallons
Total	**30.8 gpm**	**44,400 gallons**	**1,331,000 gallons**
Periodic Generation			
Evaporative Cooler Blowdown (1)	4.34 gpm	6,250 gallons	188,000 gallons
Membrane Cleaning Solutions	Small volumes intermittently (2)		
Off-line Compressor Wash Water	<1 gpm	~500 gallons/wash	1,000 gallons

Notes:
1) Annualized Average based on Case B, except for Evaporative Cooler Blowdown (Cases D & E)
2) Estimated frequency of 2 to 4 times per year

Projected discharge quality characteristics for the Facility, exclusive of compressor wash water and membrane cleaning solutions which would be trucked off-site to an appropriately licensed facility, are listed in Table 12-5.

Table 12-5 CPV Valley Project - Wastewater Quality Estimate - Preliminary	
CASE - NG Fired, 51 deg F, 63% RH, DF & Evap. Coolers OFF, 1% HRSG BLOWDOWN	
Constituent (mg/L, unless noted)	**(as ion)**
SODIUM	128.3
POTASSIUM	7.7
CALCIUM	43.7
MAGNESIUM	7.1
AMMONIUM (as NH4+)	2.9
BARIUM	0.02
STRONTIUM	0.18
ALKALINITY (total) (as CaCO3)	81.7
CARBONATE	0.0
BICARBONATE	99.7
HYDROXIDE	0.0
CHLORIDE	168.0
SULFATE	55.5
NITRATE (as NO3)	63.0
NITRITE (as NO2)	0.1
ORTHOPHOSPHATE (as PO4)	5.7
FLUORIDE	0.33
Temperature	90^{o}F
pH (SU)	6.0 - 8.5
TSS	7.9
SILICA (total)	10.6
SILICA (reactive)	10.0
BOD	9.7
COD	30.4
TOTAL RESIDUAL CL_2	ND
TDS (calc.)	592
TOTAL ORGANIC CARBON (TOC)	8.40
DISSOLVED ORGANIC CARBON	7.40
TOTAL P (as P)	1.54
TOTAL KJELDAHL N	1.73
OIL & GREASE	ND
TOTAL PETROLEUM HYDROCARBONS	ND
SURFACTANTS (MBAS)	ND
TOTAL SULFIDES	ND
ALUMINUM (total)	0.332
ALUMINUM (dissolved)	0.182
COPPER (total)	0.076
COPPER (dissolved)	0.018
IRON (total)	0.852
IRON (dissolved)	ND

Table 12-5 CPV Valley Project - Wastewater Quality Estimate - Preliminary	
CASE - NG Fired, 51 deg F, 63% RH, DF & Evap. Coolers OFF, 1% HRSG BLOWDOWN	
Constituent (mg/L, unless noted)	**(as ion)**
MANGANESE (total)	0.206
MANGANESE (dissolved)	ND
ZINC (total)	0.111
ZINC (dissolved)	0.046
PCBs	ND
Pesticides	ND
OTHER PRIORITY POLLUTANTS DETECTED - None	

12.3.3 Discharge to City of Middletown Sewage Treatment Plant Headworks

Discharge of process wastewater to the City of Middletown Sewage Treatment Plant would require review and approval by the Middletown Department of Public Works (DPW) to ensure compliance with local sewer use regulations.

The City of Middletown has established sewer use limits for several types of pollutants, including specific metals, toxic organics, and other parameters, as listed in Table 12-6. The sewer discharge limits are applicable to new wastewater discharges in the City of Middletown. The table also lists projected average daily and projected maximum daily discharge concentrations for individual constituents based on available sampling data obtained to date to characterize makeup water quality. Where makeup water quality data indicated the constituent was not detected (ND), insufficient data were available to project a maximum discharge concentration. CPV Valley believes, however, that maximum daily discharge limits for these constituents would not be exceeded at any time.

Table 12-6
City Of Middletown Sewer Discharge Limits and Projected Discharge Concentrations

Parameter	Daily Maximum Limit (mg/l)	Monthly Maximum Average Limit (mg/l)	Projected Avg. Discharge (mg/l)[1]	Projected Peak Discharge (mg/l)[1]
pH	5.5 to 9.0		6.0 – 8.5	6.0 – 9.0
Temperature. °F	150		< 90	<95
Cadmium, total	0.69	0.26	ND	TBD
Chromium, Hexavalent total	2.77	1.71	ND	TBD
Copper, total	3.38	2.07	0.076	<1.0
Lead, total	0.69	0.26	ND	TBD
Nickel, total	3.98	2.38	ND	TBD
Silver, total	0.43	0.24	ND	TBD
Zinc, total	2.61	1.48	0.111	<1.0
Fats, Oil, & Grease	100	100	ND	<15
BOD(5)	300	300	< 10	<30
Total Suspended Solids	350	350	8	<30

Notes:
1. Unless otherwise noted
2. BA – Believed absent
3. Potentially present in raw water supply

The wastewater characterization has been based on samples from the City of Middletown Sewage Treatment Plant effluent, engineering specifications for demineralized water, water uses on-site, wastewater treatment on-site (i.e., oil water separator), and disposal processes. Comparison of projected wastewater discharge characteristics with sewer use limits indicates that the discharge would comply with all applicable sewer use limits.

The discharge of process waste streams to the City of Middletown Sewage Treatment Plant is also regulated under Pretreatment Standards for New Sources (PSNS) for the Steam Electric Generating Point Source Category (40 CFR 423.17). The wastewater discharge standards applicable to the proposed Facility are listed below.

- No discharge of polychlorinated biphenyl compounds such as those used in transformer fluids; and

- The pollutants discharged in metal cleaning wastes shall not exceed 1.0 mg/l for total copper.

PCBs

Although PCBs were historically used as a dielectric fluid in transformers, these compounds are no longer manufactured or used for this purpose. Since PCB manufacture was banned by the EPA over 25 years ago, none of the on-site equipment, including station transformers, would contain PCBs. In addition, PCBs were not detected in the City of Middletown Sewage Treatment effluent. Therefore, based on available data and information, CPV Valley would comply with this limit.

Copper

PSNS criteria require that pollutants contained in metal cleaning wastewaters not exceed a copper concentration of 1.0 mg/l. For the proposed Facility, metal cleaning wastewaters would typically be generated once or twice per year. Under the proposed plan, periodic metal cleaning activities would be performed by outside vendors and any waste streams would be captured for off-site treatment and disposal. As such, the Facility would comply with PSNS criteria for copper.

Given the low volumes of process wastewater proposed for discharge (i.e., representing less than 4% of current design capacity of the treatment plant on a peak day basis) and projected waste stream characteristics, the proposed Facility would not result in a violation of applicable discharge limitations or standards and would not cause a significant adverse impact on treatment plant operations.

The Facility would also require authorization to transport compressor wash water and membrane cleaning solutions) to a local sewage treatment plant or appropriately licensed facility and comply with applicable sewer use limits for pollutants, including specific metals, toxic organics and other parameters.

12.3.4 Discharge to City of Middletown Sewage Treatment Plant Outfall Pipe

The discharge of Facility process waste streams to the City of Middletown Sewage Treatment Plant outfall would require an industrial wastewater discharge permit from the NYSDEC. The City of Middletown Sewage Treatment Plant discharges to the Wallkill River, which is classified as a Class B warm water fishery at the discharge location. The discharge would also be required to comply with New Source Performance Standards (NSPS) for the Steam Electric Generating Point Source Category (40 CFR 423.15).

The Facility's compliance with Federal New Source Performance Standards for the steam electric generating category (§423.15) are summarized below.

- *The pH of all discharges except once through cooling water shall be within the range of 6.0 to 9.0.*

  The Facility will comply with this requirement.

- *There shall be no discharge of PCBs such as those commonly used for transformer fluid.*

  Although PCBs were historically used as a dielectric fluid in transformers, these compounds are no longer manufactured or used for this purpose. Since PCB manufacture was banned by the EPA over 25 years ago, none of the on-site equipment, including station transformers, would contain PCBs. In addition, PCBs were not detected in the City of Middletown Sewage Treatment Plant effluent. Therefore, based on available data and information, CPV Valley would comply with this limit.

- *The quantity of pollutants discharged from low volume waste sources shall not exceed the quantity determined by multiplying the low flow volume waste sources times the concentration listed below:*

  - *TSS: Maximum for any 1 day of 100 mg/l; Average 30-day value shall not exceed 30 mg/l.*

  - *Oil and Grease: Maximum for any 1 day of 20 mg/l; Average 30-day value shall not exceed 15 mg/l.*

  The Facility will comply with the above limitations for low volume process wastewater discharged to the City of Middletown Sewage Treatment Plant outfall. In general, the Facility does not expect that the TSS concentration of the discharge would exceed 30 mg/l under normal operating conditions based on review of typical makeup water quality characteristics from the City of Middletown Sewage Treatment Plant.

- *The quantity of pollutants discharged in chemical metal cleaning wastes shall not exceed the quantity determined by multiplying the flow of chemical metal cleaning wastes times the concentrations listed below:*

- *TSS: Maximum for any 1 day of 100 mg/l; Average 30-day value shall not exceed 30 mg/l*

- *Oil and Grease: Maximum for any 1 day of 20 mg/l; Average 30-day value shall not exceed 15 mg/l.*

- *Copper, total: Maximum for any 1 day of 1.0 mg/l; Average 30-day value shall not exceed 1.0 mg/l.*

- *Iron, total: Maximum for any 1 day of 1.0 mg/l; Average 30-day value shall not exceed 1.0 mg/l.*

Metal cleaning waste streams are typically generated only during maintenance shutdowns (i.e., for boiler cleaning operations performed once or twice per year). All metal cleaning wastes will be discharged to a temporary holding tank and disposed off-site. No metal cleaning wastes will be discharged to the City of Middletown Sewage Treatment Plant outfall. Therefore, the Facility will comply with this provision.

Because process makeup requirements would be satisfied through reuse of treated effluent from the City of Middletown Sewage Treatment Plant (representing a net reduction in the discharge of pollutants to the Wallkill River from the Treatment Plant), blending process wastewater generated by the facility back into the City of Middletown Sewage Treatment Plant outfall pipe would not result in a significant net change in the mass loading rate of pollutants discharged to the Wallkill River. For pollutants such as total suspended solids (TSS), the additional processing of the makeup water (filtration and chlorination), may result in a decrease in the mass loading rate of TSS to the river. This may also be true for biochemical oxygen demand (BOD).

Conservatively assuming an average daily process wastewater discharge rate of 50 gpm, the proposed discharge would represent only 2% of lowest average monthly flow (3.6 mgd) recorded for the City of Middletown Sewage Treatment Plant over the period March 2002 through June 2006. Conservatively assuming a maximum daily discharge flow of 175 gpm, the proposed discharge would represent less than 7% of the lowest monthly average flow from the City of Middletown Sewage Treatment Plant over the same period.

Given the low volume of process wastewater proposed for discharge when compared with average daily treatment plant flow even under drought conditions, blending of process wastewater from the site with Sewage Treatment Plant effluent would result in an effective dilution factor ranging between 15 (maximum day) and 50 (average day). Based on the above, the net change in pollutant concentrations in the Sewage Treatment Plant outfall would be negligible.

Draft SPDES permit application forms for the discharge of industrial wastewater to the City of Middletown Sewage Treatment Plant outfall pipe are attached as Appendix 12-B.

Under this option, the Facility would also require authorization to transport compressor wash water and membrane cleaning solutions to the local wastewater treatment plant or appropriately licensed facility.

12.4 STORMWATER

12.4.1 Applicable Laws, Rules and Regulations

The Clean Water Act (CWA) provides that stormwater discharges associated with industrial activity from a point source to waters of the United States are unlawful, unless authorized by a National Pollutant Discharge Elimination System (NPDES) permit. In New York, EPA has approved the state program which is enacted through the administration of the State Pollutant Discharge Elimination System (SPDES) program. Construction activities that disturb one or more acres of land must also be authorized under a State Pollutant Discharge Elimination System Permit for Stormwater Discharges for Construction Activity.

For Facility operations, CPV would seek coverage under the NYSDEC Multi-Sector General Permit for Stormwater Associated with Industrial Activity. In accordance with general permit requirements, CPV has prepared a Draft Storm Water Pollution Prevention Plan (SWPP Plan) to describe the structural and non-structural Best Management Practices (BMPs) to be followed to minimize the potential for pollutants in storm water runoff from discharging to receiving waters (See Appendix 12-A, Stormwater Pollution Prevention Plans). Coverage under this permit may be requested through submittal of a Notice of Intent (NOI) to the NYSDEC. Key components of the SWPP Plan are presented in Section 12.5.

For Facility construction, CPV would seek coverage under the NYSDECs General Permit for Stormwater Discharges from Construction Activity. A separate Construction Stormwater Pollution Prevention Plan (CSWPP Plan) has also been developed. The CSWPP Plan describes the BMPs that would be used to minimize sediment wash off from the site during construction activities (See Appendix 12-A, Stormwater Pollution Prevention Plans.) Key components of the Facility's CSWPP Plan are presented in Section 12.6.

12.4.2 Stormwater Management System

The Facility's storm water management system would be designed to address both the quantity and quality aspects of stormwater runoff from the developed portion of the site (i.e., the area encompassed by the Facility fence line). As shown in the General Arrangement Site Plan (Figure 2-7), site stormwater runoff would be managed using a gravity collection system. The gravity collection system consists of:

- Curbs and swales to collect and convey runoff to drop inlet catchbasins; and
- A subsurface collection system to divert runoff to a stormwater management basin.

The stormwater management basin would be equipped with a sediment forebay. The purpose of a sediment forebay is to allow sediment to settle from the incoming stormwater runoff before it is delivered to the balance of the BMP. A sediment forebay helps to isolate sediment deposition in an accessible area to facilitate basin maintenance efforts. The stormwater management basin would be sized to provide for peak flow attenuation for the 100-year, 24-hour design storm. Because of this, the basin also functions as a treatment device to remove suspended solids from stormwater runoff prior to discharge.

The permanent storm water system would be regulated under the NYSDEC Multi-Sector General Permit for Industrial Activity. To prevent storm water contamination, the Project has been designed to place virtually all of the major generating components within buildings. Building rooftop areas will comprise a significant portion of the site. The remaining area would include both paved, gravel and landscaped surfaces.

12.5 STORMWATER POLLUTION PREVENTION – FACILITY OPERATIONS

This section provides an overview of the techniques that would be used to minimize the potential for pollutants in stormwater runoff from the site during Facility operation. It addresses chemical storage areas, product delivery, plant maintenance, waste handling activities, vehicle maintenance, and SWPP Plan monitoring requirements. The complete Draft Operational SWPP Plan is contained in Appendix 12-A.

12.5.1 Oil and Chemical Storage

The oil and hazardous materials (OHM) required to support facility operation would include materials (e.g. natural gas, fuel oil, aqueous ammonia) that are well known and have been safely used by commercial and industrial facilities throughout New York State in a wide range of applications, including electrical power generation. The majority of the OHM required to support operations would be consumed in the electrical generation process (e.g. fuel, aqueous ammonia) or recycled offsite (e.g. lube oils).

Table 12-7 lists projected bulk oil and bulk chemical storage volumes, storage locations and provisions for secondary containment and related BMPs. Table 12-8 lists water treatment chemicals, identifies storage locations and provisions for secondary containment. Storage locations for oil and chemicals are referenced to the General Arrangement Site Plan, (See Figure 2-7). As noted in Tables 12-7 and 12-8, outdoor bulk oil and bulk chemical storage tanks and major oil bearing equipment would be located within concrete containment berms capable of storing 110 percent of the tank contents.

Whenever practicable, CPV Valley has limited the potential exposure of oil or hazardous materials storage and handling areas. Outdoor storage of oil and hazardous materials has been effectively limited by locating major processing equipment indoors. In addition, indoor storage areas would be installed for water treatment chemicals in the water treatment buildings. By positioning the gas turbines, gas turbine generators and steam turbine within buildings, covered storage areas have been provided for hydraulic and lubricating oils contained within the referenced equipment.

Table 12-7 Bulk Oil and Chemical Storage List					
Name	**Location on GA**	**Storage Quantity**	**Secondary Containment**	**Indoor or Outdoor**	**Notes**
Ultra Low Sulfur Distillate Fuel Oil	16	965,000 gallons, AST	Concrete berm	Outdoor	Level Indicator, High Level Alarm
Aqueous Ammonia Storage Tank	23	15,000 gallons, AST	Concrete berm	Outdoor	Level Indicator, High Level Alarm
Bearing Oil for Combustion Turbines, Generators (each)	1 & 2	1,500 gallons/ integral	Concrete berm	Indoor	Low Pressure Sensor
Transformer Oil for Main Transformers (3 total)	8,9 &10	20,000 gallons/ integral	Concrete berm	Outdoor	
Transformer Oil for Auxiliary Transformers (2 total)	11	4,000 gallons	Concrete berm	Outdoor	
Steam Turbine - Generator Lube Oil	3	5500 gallons/integral	Concrete berm	Indoor	Low Pressure Sensor
Emergency Diesel Generator Fuel Oil	38	TBD gallons/ integral	Double wall tank	TBD	Level Indicator
Waste oil tank	TBD	500 gallon AST	Double wall tank	TBD	Level Indicator
Air Cooled Condenser Fan Lube Oil	13	TBD gallons/integral	NA	Outdoor	Drip Pans, when serviced
Maintenance Oils	29	TBD gallons	Portable storage containment	Indoor	
Hazardous Waste Storage Area	TBD	55 gallon drums	Portable storage containment	Indoor	
CT Water Wash Mixing Tank	near 14	500 gallons	Portable storage containment	Indoor	
CT Wash Water Drain Tank	near 14	500 gallons	Portable storage containment	Indoor	
Oil Water Separator	30	1,000 gallons	Double wall tank	Outdoor (below grade)	
Diesel Fire Pump	near 19	TBD gallons/ integral	Double wall tank	TBD	Level Indicator

Table 12-8 Process Water Treatment Chemical List					
Name	**Location on GA**	**Storage Quantity**	**Secondary Containment**	**Indoor or Outdoor**	**Notes**
Sodium hypochlorite (12.5%, trade) - Raw Water	28	15 gallon carboy (Raw Water Tank)	Concrete berm	Indoor	
Sodium hypochlorite (12.5%, trade) - MF Backwash	28	15 gallon carboy (at MDS)	Concrete berm	Indoor	
Sodium Bisulfite (38.8%) - RO Feedwater	28	15 gallon carboy (at MDS)	Concrete berm	Indoor	
Sodium Bisulfite (38.8%) - WW Discharge	28	15 gallon carboy (at Discharge)	Concrete berm	Indoor	
RO Antiscalant	28	30 gallon portable tank	Portable storage containment	Indoor	
Carbohydrazide	near 4 & 5	1 - 100 gallon tote (at HRSG)	Concrete berm	Indoor	
Trisodiumphosphate	near 4 & 5	1 - 200 gallon tote (at HRSG)	Concrete berm	Indoor	
Ammonium Hydroxide (18% aqueous ammonia)	near 4 & 7	1 - 400 gallon tote (at HRSG)	Concrete berm	Indoor	
Membrane Cleaners (intermittent use)					
RO Acid Cleaner	28	approximately 5 gallons (at MDS)	Portable storage containment	Indoor	
RO Caustic Cleaner	28	approximately 5 gallons (at MDS)	Portable storage containment	Indoor	
RO Biocide	28	approximately 5 gallons (at MDS)	Portable storage containment	Indoor	
MF Acid Cleaner	28	approximately 5 gallons (at MDS)	Portable storage containment	Indoor	
MF Detergent Cleaner	28	approximately 5 gallons (at MDS)	Portable storage containment	Indoor	
Oil-fired Plant Operating Case					
Sodium Bisulfite (38.8%) - Mobile RO	near 28	55 gallon drum (in Mobile DI Trailer)	Integrated secondary containment	Indoor	
RO Antiscalant - Mobile RO	near 29	55 gallon drum (in Mobile DI Trailer)	Integrated secondary containment	Indoor	

Chemicals, used oils and other lubricants would be located in a designated storage enclosure within the gas turbine building, the maintenance warehouse and the water demineralization building. The enclosures would be constructed with a chemically resistant pad on which to place portable containers. The pad would be impervious to the materials being stored and would provide sufficient storage volume to contain at least 30% of the total volume within the enclosure with capacity to contain 110% of the contents of any individual container.

The portable containers within the storage enclosures would not be stacked more than two high without using a properly designed storage rack for that purpose. In addition, portable containers would not be stacked without adequate equipment. The storage of portable containers would also provide for all sides of the containers to be available for inspection.

All drums would be arranged on pallets to allow for easy access by forklifts. Employees responsible for the handling, storage and management of oil or chemicals would be thoroughly familiar with proper drum handling methods and procedures in order to prevent spills or leaks from oil or chemical storage drums when in use outside of containment areas. All employees would receive training in the management of toxic and hazardous materials according to Occupational Safety and Health Act (OSHA) requirements and the respective manufacturer's recommendations.

Containers or drums that previously contained oil or hazardous materials that are empty and no longer in use would be labeled as such. These containers would not be reused unless they are properly relabeled with their contents. Unless containers are labeled "empty," they would be treated as active containers. Containers labeled "empty" would be stored in a way that would prevent precipitation from entering the containers. Any water or material observed in a container labeled as "empty" would be presumed to be contaminated with the previous contents of the container.

12.5.1.1 Ultra-Low Sulfur Distillate Oil Tank

The above ground storage tank would store a total of 965,000 gallons of ultra-low sulfur oil and would be provided with an impervious containment basin. The containment basin, capable of holding 110 percent of the storage volume of the tank, would be constructed using concrete with appropriate additives to ensure that it is impervious to ultra-low sulfur oil. The secondary containment would not have manholes with gaskets, which may be subject to degradation. The tank would be tightness-tested before use and inspected on a regular schedule. Automated level monitoring and leak detection equipment would also be installed. This system would include an audible alarm in the control room as well as overfill detection and prevention devices.

The fuel unloading area for delivery trucks would be located just west of the tank containment area. The off-loading area would be paved and curbed with an impervious material, and drained into the containment area.

All fuel pipelines outside of the containment berm would be of double wall construction. The double walled pipe would be equipped with cathodic protection and product sensors would be installed at key locations within the interstitial space between the inner and outer walls to detect a release. That is, if a release from the piping occurs, the leak would be contained between the first and second walls and an alarm would be triggered.

12.5.1.2 Aqueous Ammonia Storage Tank

Aqueous ammonia (19%) would be stored in a 15,000 gallon above ground storage tank. The tank would be vertically oriented with an approximate diameter of 13 feet and an approximate height of 18 feet. The containment basin would be designed to contain 110% of the tank contents in the event of a tank failure. The storage tank and containment design would include provisions for overfill detection and prevention. The tank would also undergo tightness-testing before use and would be inspected on a regular basis. In addition, the tank would be equipped with automated level monitoring gages, intermediate level warning indicators, as well as visual and audible high-level alarms.

Aqueous ammonia is not flammable or reactive if released into the secondary containment berm. However, a release of aqueous ammonia would potentially result in ammonia evaporating into the air. Though not required by regulation or manufacturer operating procedures, the secondary containment berm would be filled with two layers of closely packed plastic spheres. In the unlikely event of an accidental release, they would float on top of the spilled liquid reducing its surface area. Reducing the surface area of the release reduces the evaporation rate.

12.5.2 Tank Truck Unloading Procedures

A fuel oil and aqueous ammonia tank truck unloading area would be located adjacent to the fuel oil tank secondary containment. The off-loading area would be paved and curbed with an impervious material.

Truck unloading operations would be conducted under the direct supervision of Facility personnel to ensure that proper procedures are followed and that a Facility representative is present in the unlikely event of a spill or release.

Upon arrival at the Facility, operators would check in with security personnel. Unloading would only occur in the designated area for that compound or constituent. Any delivery vehicle that cannot meet minimum requirements for the safe, clean and efficient transfer or pickup of materials would not be permitted to enter the site. For delivery vehicles that enter the site, inspection procedures are identified to ensure the overall integrity of the vehicle body; as well as procedures to deal with a leak or accidental spill.

A Standard Operating Procedure for truck loading/unloading is provided in Appendix A of the Draft SWPP Plan. In general, during the transfer of bulk materials to storage tanks or equipment reservoirs via truck, inspections of the tank truck and the receiving tank would be conducted to ensure that spillage and overfilling do not occur. Mandatory practices would include hose inspection, securing manifolds and valves, and use of chock blocks to prevent premature disconnect of the delivery vehicle. In addition, the level gauge on the Above Ground Storage Tank (AST) would be checked prior to filling to ensure that adequate volume is available in the tank for the volume of material to be transferred. Tank trucks in the process of being unloaded would be attended to at all times during the procedure.

12.5.3 Piping, Fittings and Connections

All piping, fittings and connections associated with the transfer of oil or hazardous materials would be fabricated, constructed and installed in a manner that would prevent the escape of any potentially toxic materials to the ground, ground water or surface waters. The piping, fittings and connections would be:

- Protected against corrosion by the use of non-corrodible materials;
- Provided with cathodic protection, where appropriate;
- For double walled piping installed underground or in areas where piping is not clearly visible, it would be constructed and installed with a simple, effective, reliable means of

monitoring for leakage including a warning device to indicate the presence of a leak, spill or other failure;

- Constructed in durable product-tight galleries; and
- Where appropriate, underground metal piping would be provided with cathodic protection.

12.5.4 Discharge from Secondary Containment Systems

Stormwater would be removed from secondary containment systems before it compromises the required containment system capacity. Each discharge may only proceed with the prior approval of the facility representative responsible for ensuring SPDES permit compliance. Bulk storage secondary containment drainage systems would be locked, other than during a supervised discharge event. Transfer area secondary containment drainage systems would be locked in a closed position during all transfers and would not be reopened unless the transfer area is clean of contaminants. Stormwater discharges from secondary containment systems would be avoided during periods of precipitation. A logbook would be maintained on site noting the date, time and personnel supervising each discharge.

12.5.4.1 Discharge Screening

Prior to each discharge from a secondary containment system, the stormwater would be screened for contamination. (Note: All stormwater would be inspected for visible evidence of contamination.) If the screening indicates potential contamination, CPV Valley would collect and analyze a representative sample of the stormwater. If the water contains no pollutants, the stormwater may be discharged. Otherwise it would either be disposed of at an off-site wastewater treatment plant designed to treat and permitted to discharge such wastewater, or the NYSDEC Regional Water Manager would be contacted to determine if it may be discharged without treatment.

12.5.4.2 Discharge Monitoring

CPV Valley would monitor discharges from secondary containment systems as follows:

Storage Area Secondary Containment

The volume of each discharge from each outlet would be monitored. Discharge volume may be calculated by measuring the depth of water within the containment area times the wetted area converted to gallons or by other suitable methods. As noted above, a representative sample would be collected of the first discharge following any spill or release. The sample would be analyzed for pH, the substance(s) stored within the containment area and any other pollutants CPV Valley knows or has reason to believe are present. If the stored substance is kerosene, diesel fuel, fuel oil, or lubricating oil the sample would be analyzed for oil & grease and polynuclear aromatic hydrocarbons (EPA method 610). Discharge includes stormwater discharges and snow and ice removal.

Transfer Area Secondary Containment

The first discharge following any spill or leak would be sampled for flow, pH, the substance(s) transferred in that area and any other pollutants CPV Valley knows or has reason to believe are present. If the stored substance is kerosene, diesel fuel, fuel oil, or lubricating oil the sample would be analyzed for oil & grease and polynuclear aromatic hydrocarbons (EPA method 610). Discharge includes stormwater discharges and snow and ice removal.

12.5.4.3 Discharge Reporting

Any results of monitoring required above, would be maintained with the facility's SWPP Plan and retained in accordance with Part IV.C of the Multi-Sector General Permit for Stormwater Associated with Industrial Activity.

12.5.5 Quarterly Visual Monitoring

CPV would perform and document a quarterly visual examination of stormwater discharged from the stormwater management basin. The examination would be made at least once in each of the following three month periods: January through March, April through June, July through September, and October through December. The examination would document observations of color, odor, clarity, floating solids, settled solids, suspended solids, foam, oil sheen, and any obvious indicators of stormwater pollution. The visual examination would be made during daylight hours (e.g., normal working hours) and the examination would be conducted in a well-lit area. Where practicable, the same individual would carry out the collection and examination of discharge for the entire permit term for consistency.

12.5.6 Benchmark Monitoring and Reporting

Steam electric power generating facilities are required to periodically monitor stormwater discharges for oil and grease, PCBs and total iron. CPV Valley would comply with required monitoring and reporting requirements of the general permit.

12.5.7 Prohibited Discharges

Under the terms and conditions of the Multi-Sector General Permit for Stormwater Associated with Industrial Activity, any discharge which contains a visible sheen, foam, or odor, or may cause or contribute to a violation of water quality is prohibited.

12.5.8 Sediment and Erosion Control (Facility Operation)

Given the sites low topographic relief and structural storm water collection and conveyance systems, post-development erosion and sediment deposition into waterways or wetland resource areas should not be problematic. Nevertheless, should signs or evidence of erosion or sedimentation develop it would be noted in monthly inspection reports and appropriate corrective action(s) would be identified and implemented.

12.5.9 Vehicle Maintenance Activities

Routine vehicle maintenance activities would not be performed at the Project site. Therefore, BMPs associated with vehicle maintenance activities are not applicable to the Facility.

12.5.10 Inspections

A preventive maintenance program that includes timely inspection and maintenance of all storm water pollution prevention equipment and/or systems would be developed. Facility personnel would complete daily visual inspections, in-depth monthly inspections, and annual compliance testing. Objectives for each type of inspection are discussed below. The inspections are intended to uncover any conditions that may adversely impact spill potential or release controls.

12.5.10.1 Daily Inspections

Integrity inspections of the oil and aqueous ammonia storage tanks, above ground valves and pipelines, and secondary containment areas would be completed by designated Facility personnel daily. The inspections would consist of a visual integrity check directed at identifying evidence of leaks or any malfunctions of oil or hazardous materials storage, transfer, or handling equipment. Any signs of leakage or conditions that could result in a spill would be promptly reported to the Emergency Coordinator.

12.5.10.2 Monthly Inspections

Detailed monthly inspections of the above ground storage tank systems (i.e., tanks, containment dikes, and piping, etc.) would be conducted by maintenance personnel familiar with the systems. Detailed monthly inspections are directed at ensuring that all equipment is maintained in a clean, operational, and environmentally safe condition.

The following items would be inspected on a monthly basis at all above ground storage tank and bulk petroleum storage locations and noted on the inspection log:

- Fill connection/spill catch basin/containment sump/spill box;
- Tank vent riser and cap;
- Fill cap;
- Containment system/tank exterior;
- Above ground piping;
- Valves;
- Tank/storage system supports; and
- Foundation.

If evidence of spills or deteriorated conditions which could potentially lead to a release are noted, they would be explained and a follow-up action recommended, as appropriate. Any evidence of material spillage or leakage would be reported to the Emergency Coordinator.

Monthly inspections would include visual inspections of fueling areas, loading, and unloading areas, transformer areas, storm water management systems, bulk storage areas, and long term and short term material storage areas, including above ground valves and piping, for any signs of leakage, corrosion or potential failure. This would also include visual examination of items such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking valves, and metal surfaces.

An inspection log sheet would be filled out during each monthly inspection and would be kept as a record of the inspection. Inspection records shall be kept on file and made available to the regulatory officials upon request.

A set of tracking or follow-up procedures would be used to ensure that appropriate actions are taken in response to the inspections. Equipment integral to or supporting the oil spill discharge prevention system (e.g., lighting, instrumentation, and communication systems) would be monitored and tested, as appropriate, and any operational problems reported.

A copy of the completed inspection log would be submitted to the Emergency Coordinator for the inspection record files at the Facility.

12.5.10.3 Tank Integrity Testing

In addition to visual inspections of the above ground tank systems, federal regulations (40 CFR Section 112.7(e)(2)(vi)) require that above ground petroleum storage tanks be subject to periodic integrity testing, taking into account tank design and using such techniques as hydrostatic testing, visual inspection or a system of non-destructive shell thickness testing. Such periodic integrity testing of the above ground tanks would be conducted at the recommended frequency of every five years and when material repairs are performed on the tank. Tank testing records would be kept on file for the life of the tank.

12.5.11 Annual Plan Review

A documented review and evaluation of the SWPP Plan, including a Facility walk through, would be completed at least once per year from the date of commercial operation. The annual review and evaluation would be conducted in accordance with the Comprehensive Site Compliance Evaluation requirements of the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges Associated with Industrial Activity.

12.6 STORMWATER POLLUTION PREVENTION – FACILITY CONSTRUCTION

This section provides an overview of the techniques that would be used to minimize the potential for pollutants in stormwater runoff from the site during Facility construction. It addresses chemical use, chemical storage, fuel use, waste handling activities, and CSWPP Plan erosion and sediment control techniques.

12.6.1 Nature and Sequence of Construction Activities

The construction sequence would proceed in a series of overlapping phases. The general sequence for construction activities follows, with some activities occurring concurrently. Activities are listed in the order in which they would generally occur.

- Installation of stabilized construction entrances;
- Installation of erosion and sedimentation control measures (silt fencing, as necessary);
- Set-up and assembly of temporary office and warehouse;
- Preparation of construction parking and equipment staging areas;
- Installation of temporary utilities (electricity and phone);
- General Site grading;
- Placement and compaction of fill to raise site grades;
- Construction of retaining walls, where required;
- Installation of drainage system (outfalls, stormwater management basin, catch basins, piping, etc.);
- Construction of foundations;
- Erection of permanent Facility equipment and buildings;
- Installation of off-site Project components;
- Stabilization of areas disturbed by construction (ongoing, as construction permits);
- On-going inspections and maintenance of erosion and sediment controls until final Site stabilization;
- Removal of temporary erosion and sediment controls; and
- Records retention for 3 years.

Proper sequencing of construction activities represents a key element in the Project's CSWPP Plan. BMPs for sediment and erosion control would be implemented early in the construction process and prior to the start of major earthwork activities. These include installation of stabilized construction entrances and installation of silt fencing. Temporary sedimentation basins and diversion swales would also be used as construction progresses. In addition, procedures for the stabilization of soil stockpiles and for protecting catch basins would be implemented on an as needed basis.

Major elements the Project's Sediment and Erosion Control plan are described below.

12.6.2 Construction Entrances and Site Access Roadways

Stabilized construction entrances would be established at all access and egress points to local roadways. Internal Site access drives and construction trailer parking areas would be covered with recycled concrete aggregate or crushed stone during construction activities, as appropriate, to prevent rutting. The stabilized construction entrances coupled with the use of recycled concrete aggregate or crushed stone along internal Site access drives will limit the potential for off-site tracking of soil by construction vehicles.

12.6.3 Clearing and Grading

Structurally suitable soil on the Project site would be used for backfilling. Existing site grades would be raised an average of 5 to 8 feet over the proposed development area using clean fill. Cut material deemed structurally unsuitable for use would be temporarily stockpiled in a laydown area with appropriate stabilization and erosion controls. Road base material, and any necessary additional fill would be imported from off-site on an "as needed" basis. Crushed stone for finish grading would be delivered to the Site toward the end of the construction process.

12.6.4 Construction Laydown Areas

Construction laydown areas would be established on existing farm fields adjacent to the site. Areas in the immediate vicinity of individual structures would also be used for limited laydown. To prepare construction laydown areas, top soil would be removed and temporarily stockpiled. The subsoil would then be graded and a recycled concrete aggregate or crushed stone surface would be applied. Additional crushed stone or recycled concrete aggregate would be placed, as necessary, to control rutting along the access drives between the Project site and laydown areas. Silt fencing would be used in conjunction with gravel berms to filter stormwater prior to discharge. Storm water runoff in construction laydown areas is not expected to change from existing conditions.

12.6.5 Installation of Drainage System

The engineering, procurement and construction contractor (EPC Contractor) would install the drainage system while existing site grades are being raised. Roof drains would be added to the drainage system, as needed, based on building construction. During construction, geotextile inlet filters would be placed over all catch basins to minimize transport of sediment into the site stormwater management basin. The EPC Contractor would clean each inlet filter on an as needed basis. Once construction activities have ended, the inlet filters would be removed. In addition, sediment forebays and the stormwater detention basin would be cleaned of any accumulated sediment. Accumulated sediment removed from the control measures will be exported from the site as general fill, stockpiled for use in revegetation, or used immediately for revegetation purposes.

12.6.6 Outfall Construction

The storm water outlet would be located to the north and east of the primary site development area. The outlet pipe would be equipped with rock rip rap for energy dissipation.

Construction of the discharge outfall pipe would be performed in a managed sequence of activities such that disturbance of the surrounding environment is minimized. The drainage system would be installed starting from the most northern structure (i.e. outfall) to the most southern structures (i.e., stormwater management basin, catch basins, collection pipes, etc.).

12.6.7 Oil and Chemical Use during Construction

Table 12-9 summarizes the quantities and types of oils and chemicals likely to be required on the Project Site to support construction activities.

Table 12-9 Oil and Chemical Materials Needed to Support Construction Activities		
Oil and/or Chemical	**Quantity**	**Container and Storage Description**
Medium-Weight Oil (New)	1,400 gallons	5-gallon steel containers, on pallets located inside a secondary containment area
Waste Oil	200 to 400 gallons	55-gallon drums inside a secondary containment area
Aerosol Spray Lubricant (WD-40) ™	110 gallons	1-gallon containers and spray cans inside a secondary containment area
Thinners/ Solvents/ Xylene/ Methyl Ethyl Ketone/Acetone	Less than 250 gallons	1-gallon steel containers and 55-gallon steel drums on pallets located inside a secondary containment area
Paint	Less than 1,000 gallons	55-gallon steel drums and 5 gallon steel containers located inside a secondary containment area
Gasoline	500 gallons	Mobile fueling truck, no full-time storage
Diesel Fuel	300 to 500 gallons	Mobile fueling truck, no full-time storage

As outlined in Table 12-9, all oils and chemicals would be properly stored and managed during construction activities to prevent a release to the environment. The following good housekeeping practices would be followed:

- All material stored on-site would be stored in a neat, orderly manner in appropriate containers and, if reasonably possible, under a roof or other enclosure.
- Products would be kept in their original containers with the original manufacturer's label, unless the containers are not re-sealable.
- Original labels and Material Safety Data Sheets would be retained for the period of time that the product is being utilized on-site in accordance with all applicable Occupational Safety and Health Administration (OSHA) regulations (29 CFR 1926.33).
- Manufacturer's recommendations for proper use and disposal would be followed.
- A representative from the Contractor's staff would conduct weekly inspections to confirm the continued proper use and disposal of on-site materials and containers.
- Substances would not be mixed unless necessary for the construction activity and as recommended by the manufacturer.
- Whenever possible, all of a product in a container would be used before proper disposal of the container.

The following product specific practices will be adhered to:

- *Petroleum*: All on-site construction vehicles would be monitored for leaks and receive regular preventative maintenance to reduce the risk of leakage. Petroleum products that are not in vehicles would be stored in tightly sealed containers that are clearly labeled. Equipment fueling would be conducted with extreme care, under continual surveillance and away from conveyance channels. Drip pans would be used and a supply of absorbent pads would be maintained on hand and utilized, as required. In the unlikely event of a release, all spills would be promptly cleaned up.

- *Paints*: All paints would be kept tightly sealed and neatly stored out of conveyance channels when not in use. Excess paint would be disposed of according to manufacturers' instructions and State and local regulations.

12.6.8 Erosion and Sediment Controls – Surface Stabilization

This section presents surface stabilization techniques that will be used during construction to reduce sediment loading in the Facility's storm water discharge.

Surface stabilization measures used during project construction include:

- ***Protection of Vegetation.*** Natural vegetation would be preserved to the extent practicable. Where feasible, preserving natural vegetation provides an aesthetic buffer, preserves habitat, and reduces soil erosion.

- ***Mulching***. Mulching is the placement of material including hay, grass, woodchips, straw, or gravel on the surface to cover and hold in place disturbed soils. All construction parking areas and internal roadways would be covered using recycled concrete aggregate or crushed stone, as necessary, to prevent rutting and control erosion.

- ***Revegetation.*** Revegetation would be on-going and sequential as construction activities are completed to minimize areas susceptible to erosion. Affected areas would be reclaimed by the application of topsoil and the establishment of vegetation. All disturbed areas would be seeded and mulched within 30 days of final grading.

Stabilization measures would be initiated as soon as practicable in portions of the Site where construction activities have permanently or temporarily ceased, but in no case more than 14 days after the construction activity in that portion of the Site has stopped. There are two exceptions to this requirement. First, when snow cover precludes the initiation of stabilization within 14 days, then such measures shall be undertaken as soon as practicable. Second, when construction activity will resume on a portion of the Site within 21 days after the cessation of prior construction activities, then stabilization measures need not be initiated on that portion of the Site.

Records would be retained as part of the CSWPP Plan. The records would include the dates of major grading activities, cessation and initiation of construction activities, and initiation of stabilization measures.

12.6.9 Erosion and Sediment Controls – Structural Practices

Structural controls would be used to divert storm water runoff flows away from disturbed areas, or otherwise limit the discharge of pollutants from exposed surfaces of the Site to the degree attainable. For the Project Site, appropriate structural controls include the following:

- Stabilized construction entrances;
- Silt fence;
- Temporary diversion swales;
- Infiltration/Detention Ponds
- Control Dikes/Earthen Berms; and
- Installation of the permanent on-site drainage system.

Descriptions of the structural control measures that would be used at the Site follow:

12.6.9.1 Stabilized Construction Entrance

To prevent the deposition of materials onto traversed public thoroughfare(s), stabilized construction entrances would be installed and maintained at all points of construction ingress and egress. Accumulated sediment would be removed when 60% of the storage capacity of the retention structure is filled with sediment. This is a standard construction practice, and would be used at the Project site.

12.6.9.2 Silt Fencing

Silt fences are used as a temporary measure and consist of posts with filter fabric. The fence is installed along the down slope or side slope of a disturbed area. Runoff passes through the openings in the fabric, while sediment is trapped and settles on the uphill side. Silt fences would be placed, as appropriate, along perimeter areas that drain away from disturbed surfaces.

Silt fencing may extend into non-impact areas to ensure adequate protection of surface waters. Initial clearing and grubbing would only be performed as necessary for the installation of the barrier. To ensure effectiveness of the silt fencing, regular inspections and inspections after significant storm events would be performed by site personnel. Maintenance of the fence would be performed as needed until they are replaced by permanent measures or rendered unnecessary through re-vegetation. Silt fencing would remain downgradient from all temporary stockpiles.

12.6.9.3 Temporary Infiltration/Detention Ponds

During the initial period of activity within each phase, temporary sedimentation ponds would be installed. As grades are reached for the permanent infiltration/sedimentation ponds, they would be constructed and all runoff from the affected area channeled to them. These facilities would provide stormwater sedimentation control during the construction period until final site stabilization is achieved.

12.6.9.4 Temporary Stormwater Diversion Swales

Temporary stormwater diversion swales would be established sequentially during the construction process, as necessary. Steeper sections would be stabilized with stone lined check dams/berms. Runoff from disturbed areas would be diverted to the temporary sedimentation ponds as noted above. Periodic inspection and maintenance would be performed weekly and after each significant storm event.

12.6.9.5 Control Dikes/Earthen Berms

Crushed stone dikes may be established, as appropriate, and can be used in lieu of silt fencing for trapping sediment.

12.6.9.6 Straw Bales

Straw bales act as a temporary measure similar to a silt fence. If required, straw bales would be tightly packed in a linear or crenellated fashion, and each bale would be secured with two stakes. Bales with broken strings or wires would be replaced. Straw (hay) bales can be used interchangeably with silt fences.

12.6.10 Construction Management Practices

In addition to the erosion and sedimentation controls discussed above, additional controls and practices would be undertaken to reduce the potential for pollution in storm water runoff from reaching receiving waters. These include:

- Dust suppression practices;
- Proper material storage and handling;
- Proper sanitary waste disposal;
- Solid waste management;
- Hazardous waste management; and
- Spill prevention and control measures.

12.6.10.1 Dust Suppression

To minimize dust generation, high traffic areas would be covered with gravel or recycled concrete aggregate. Fine water sprays would also be used when necessary to control dust during extended dry periods. Chemical dust suppressants will not be used.

12.6.10.2 Material Handling Practices

Construction materials would be stored in a manner that minimizes exposure to precipitation and runoff, where appropriate, or otherwise to prevent the contamination of storm water. For pollutant materials that must be kept dry (fertilizers, plaster, dry ingredients, etc.), indoor storage, temporary shelters, storage trailers, tarpaulins, or other means would be employed. Building component materials that are normally allowed to be exposed to precipitation while being stored would be placed in upland areas away from storm water conveyances. They would be stored and in a manner that would not concentrate runoff. Stockpiles of earthen materials would be stored away from storm water conveyance areas and in a manner that prevents erosion and transport of sediments.

12.6.10.3 Sanitary Wastes

A licensed sanitary waste management contractor would collect all sanitary waste from on-site portable units.

12.6.10.4 Hazardous Waste

Potentially hazardous wastes would be separated from other waste through segregation of storage areas and proper labeling of containers. All hazardous waste would be removed from the Site by licensed contractors in accordance with applicable regulatory requirements and disposed at an approved/licensed facility. During Project construction and pre-operational cleaning, some solvents and flushing materials would be used as a one-time event. Such materials would be provided by the construction contractor, and would be removed by the contractor for appropriate off-site disposal. Among the steps to be taken with respect to hazardous wastes are the following:

- The EPC Contractor (or CPV, where appropriate) would acquire a unique hazardous waste generator identification number issued by the EPA, pursuant to RCRA and 6 NYCRR 372.2(3).

- The EPC Contractor (or CPV, where appropriate) would ensure that hazardous waste transporters servicing the Project have their own EPA identification number prior to releasing hazardous wastes.

- The EPC Contractor, if so designated, would be contractually obligated to follow accurate record-keeping requirements as to the quantity and nature of hazardous wastes generated on-site, and maintain a file of Material Safety Data Sheets (MSDS) for all on-site chemicals.

- All hazardous waste would be transported under a cradle-to-grave system of manifests.

- Appropriate storage and transportation containers would be used, along with secondary containment measures where applicable.

12.7 SPILL PREVENTION AND CONTROL PLAN

Oil and hazardous materials (OHM) would be utilized by the Project to support Facility construction and operations. Petroleum and synthetic oil and paints would be the primary materials used during construction. During operation, the majority of OHM would include natural gas, backup fuel oil, lube oils, hydrogen, water treatment chemicals, and aqueous ammonia to support the air pollution control system. CPV Valley is committed to operating the Facility in a safe manner, with systems in-place for spill prevention and spill control.

12.7.1 Applicable Laws, Regulations, and Policies

12.7.1.1 Emergency Planning and Community Right-to-Know

The United States Environmental Protection Agency (EPA) Emergency Planning, Community Right-to-Know regulations, 40 CFR 355-372, require facilities to notify their State Emergency Response Commission (SERC) and Local Emergency Planning Committee (LEPC) of the presence of extremely hazardous substances, and to report spills or releases of a wide range of hazardous substances. Listed chemicals located at a Facility in quantities above reporting thresholds must be reported to the SERC and LEPC. CPV Valley has no plans to store any extremely hazardous substance above reporting thresholds.

Although not required by reporting thresholds, CPV Valley representatives would notify the LEPC and meet specifically with the local Fire Chief to discuss OHM storage and use at the Facility, emergency planning, and training exercises with local emergency management teams.

12.7.1.2 Chemical Accident Prevention Provisions

EPA's Chemical Accident Prevention Provisions regulations, 40 CFR 68, are also referred to as the Risk Management Program. This regulation requires stationary sources with processes that contain prescribed threshold quantities of 140 listed substances to develop and implement a Risk Management Program and submit a Risk Management Plan to EPA on how the chemicals are managed.

The specific requirements outlined in the Risk Management Program regulations do not apply because the Facility will not utilize or store any of the listed substances in amounts above the applicable thresholds. The Facility will comply with the General Duty Clause of the Standard, which applies to all facilities containing hazardous materials. Annual review of the applicability of this program will be completed.

12.7.1.3 Process Safety Management

In accordance with Occupational Safety and Health Administration (OSHA) Process Safety and Risk Management regulations (29 CFR 1910.119), CPV Valley reviewed the types and quantities of oil and chemicals that would be required for the proposed Facility. Based on this analysis, the Facility does not have a process, as defined by OSHA, which involves an extremely hazardous substance, or a flammable material above 10,000 pounds (4535.9 kilograms) or more, or other oil and chemicals above risk management threshold quantities. Therefore, the Process Safety Management and Risk Management requirements of 29 CFR 1910.119 are not applicable to the Facility.

12.7.1.4 Aboveground Storage Tanks – Hazardous Materials

All new above ground storage tanks constructed and installed for the storage of hazardous materials other than petroleum and greater than 185 gallons would be registered, constructed, and operated in accordance with industry standards and the regulations of 6 NYCRR Part 595, 596, 597, 598, and 599.

The storage tanks, piping, loading pad, and containment systems would be designed by a New York State Licensed Professional Engineer. The plans for the system would be submitted to the NYS DEC for review and approval prior to construction and operation.

Registration and permitting of the bulk petroleum storage facility would be completed in accordance with 6 NYCRR 612, Registration of Bulk Petroleum Storage Tanks.

12.7.2 Spill Prevention, Control, and Countermeasures Plan

As part of final design and in accordance with New York State regulations, a Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) would be prepared for the Facility with as-built drawings. Elements of the plan are presented below.

Training of Facility personnel is essential to ensure that personnel involved with the operation and maintenance of the oil and chemical storage systems know the proper actions to take in the event of a spill or release. Facility personnel responsible for accompanying product deliveries during unloading operations and those responsible for regular inspection and maintenance of the storage systems would be trained in the proper procedures for the transfer of product and in the use of spill containment equipment. These personnel would also be familiar with the SPCC Plan and SWPP Plan to ensure that, in the event of a spill, they are capable of following the appropriate procedures for spill cleanup and reporting.

Employee training would be conducted upon initial assignment to the Facility and whenever the SPCC Plan or SWPP Plan were modified. Spill prevention briefings would be conducted on an annual basis and, where possible, would describe known spill events or failures, malfunctioning components, and recently developed precautionary measures.

12.7.2.1 Emergency Response Training Program

Training of response personnel is essential for maximizing preparedness. Personnel at the Facility would be trained to one of several standards depending on their assigned Facility response program role. Qualified staff in accordance with state and federal training requirements would provide training. Employees at the site who are likely to witness or discover a release would have sufficient training or sufficient experience to demonstrate competency in the following areas:

- An understanding of what the potential risks are associated with oil or hazardous materials in an incident.
- An understanding of the potential outcomes associated with an emergency created when oil or hazardous materials are present.
- The ability to recognize the presence of oil or hazardous materials in an emergency.

- The ability to identify the type of oil or hazardous material, if possible.

- The ability to realize the need for additional resources, and to make appropriate notifications.

The site response personnel would receive training in accordance with the OSHA standards for Hazardous Waste Responders, but are only responsible for providing the first line of defensive actions in the event of a release. These individuals would have the proper awareness training to initiate the appropriate response.

All Facility personnel would be trained to immediately notify the control room. The lead operator on duty would assess the magnitude of the situation and initiate an in-house emergency response. The lead operator would also mobilize local emergency response personnel or contractors, when necessary, to initiate an outside emergency response.

12.7.2.2 Spill Response Procedures

Should a Facility employee observe a release from an AST, pipeline or associated tank unloading activity, the employee should immediately notify the control room of the following:

- Nature of the spill or leak;
- Location of the spill or leak;
- Size and extent of the spill or leak;
- Approximate amount spilled;
- Direction the liquid flow is moving;
- Materials involved; and
- Injury to personnel.

The control room operator would be responsible for mobilizing the appropriate response personnel.

For a spill or leak which is small enough to be absorbed, neutralized or otherwise controlled at the time of release by employees in the immediate release area or by maintenance personnel, and which does not pose an adverse exposure hazard to employees, then the spill would be handled in the following manner:

a. Make sure all unnecessary persons are removed from the hazard area. Workers involved in the clean up would put on protective clothing and equipment.

b. If flammable material is involved, remove all ignition sources, and use spark and explosion proof equipment and clothing in containment and clean up.

c. If possible, try to stop the leak.

d. Use absorbent pads, booms, earth, sandbags, sand, and other inert materials to contain, divert, neutralize and clean up the spill. If spilled material reaches a storm sewer, try to stop the flow from the source by using sand, earth, sandbags, etc.

e. Place all containment and clean-up materials in drums for proper disposal.

f. Place all recovered liquid wastes in drums for removal to an approved disposal facility.

Following cleanup, all emergency equipment and spill containment equipment would be returned to ready status (restocked).

For spills or leaks which Facility personnel cannot control, the CPV Valley Emergency Coordinator would initiate the following procedures.

a. Call the ambulance service (9-1-1) for any injured personnel.

b. Call the fire department (9-1-1) for any emergency response involving a fire that cannot be extinguished by Facility personnel.

c. Contact the site's commercial clean-up contractor and dispatch emergency personnel to the site to take appropriate action.

d. Contact the proper authorities to report the spill or release as indicated in the SWPP Plan.

12.7.2.3 Releases of Reportable Quantities of Hazardous Substances or Oil

In the unlikely event of a spill or release of a hazardous substance or oil through a storm water outfall in an amount equal to or in excess of a reporting quantity established under the Determination of Reportable Quantities for Hazardous Substances, 40 CFR 117, or Designation, Reportable Quantities and Notification, 40 CFR Part 302 during a 24-hour period, the following actions would be taken by the Plant Manager or his/her designee:

- The National Response Center (NRC) would be notified by calling (800) 424-8802 in accordance with the requirements of 40 CFR Part 117 and 40 CFR Part 302 as soon as he or she has knowledge of the discharge.

- The SPCC Plan and SWPP Plan for the Facility would be reviewed and modified within 14 calendar days of knowledge of the release to provide a description of the release, an account of the circumstances leading to the release, and the date of the release. In addition, the plan would be reviewed to identify measures to prevent the recurrence of such releases and to provide better response to such releases in the future.

The Plant Manager or his/her designee would be responsible for reporting to regulatory agencies the circumstances surrounding the event in accordance with the reporting criteria described above. The State of New York requires that all releases and spills of petroleum and most hazardous materials be reported to:

NYSDEC Spill Hotline (800) 457-7362

within 2 hours of the time at which facility staff becomes aware of the release.

Under the New York State Petroleum Bulk Storage regulations (6 NYCRR Section 613.8), "Any person with the knowledge of a spill, leak or discharge of petroleum would report the incident to the NYSDEC within two hours of discovery. The result of any inventory record, test, or inspection which shows a facility is leaking would also be reported to the NYSDEC within two hours of the discovery. Notification would be made by calling the telephone hotline." The NYSDEC spill hotline telephone number is provided above. This Part of the regulations applies to all storage facilities with a combined storage capacity of over 1,100 gallons, including all facilities registered under 6 NYCRR Part 612. This requirement applies to fuel oil, transformer and lubricating oils stored at the Facility.

Under New York State Hazardous Substance regulations (6 NYCRR Part 595), a "release" is defined as "any unauthorized pumping, pouring, emitting, emptying, overfilling, spilling, leaking, leaching, or disposing, directly or indirectly, of a hazardous substance or any other substance which results in the formation of a hazardous substance upon release so that the substance or any related constituent thereof, or any degradation product of such a substance or of a related constituent thereof, may enter the environment." Under these regulations, a "spill" is defined as "any escape of a substance from the containers employed in the normal course of storage, transfer, processing, or use."

The person notifying the NYSDEC would provide all of the following information, when available:

- Name of the person making such report and his/her relationship (agent, employee, etc.) to any person (corporation, company, etc.) which might be responsible for causing such discharge;
- Time and date of the discharge;
- Probable source of the discharge;
- Location of the discharge, both geographic and in relation to bodies of water;
- Type of petroleum discharged;
- Possible health or fire hazards resulting from the discharge.
- Amount of petroleum discharged;
- All actions that are being taken or will be taken to clean up and remove the discharge;
- Personnel presently on the scene; and
- Other government agencies that have been or will be notified.

In the event that a spill has reached navigable waters in “harmful quantities,” in accordance with federal regulations (40 CFR Section 110.6), the Emergency Coordinator or person with any knowledge of such conditions would immediately notify the Federal NRC at:

National Response Center
(800) 424-8802 (24 hours per day)

When contacting the NRC, the following information should be provided:

- Time, location, and source of the spill;
- Type and quantity of material spilled;
- Cause and circumstances of the spill;
- Hazards associated with the spill;
- Personal injuries;
- Corrective action taken or planned to be taken;
- Name and telephone number of individual reporting the spill; and
- Any additional pertinent information.

In addition, the United States Environmental Protection Agency (EPA) Region II Response Center would be contacted immediately for any spill that reaches navigable waters (per 40 CFR Section 110.6) at the following number:

EPA Region II Hotline
(732) 548-8730 (24 hours per day)

12.7.3 Emergency Response Plan

An emergency response plan is being developed to detail procedures to prevent a release of OHM to the environment and to direct response actions at the Facility in the event of an emergency. The plan will evolve as part of final design and construction, ultimately completed using as-built plans and implemented with Facility staff. The plan would include, at a minimum, the following elements:

- A description of emergency procedures to be followed by facility personnel in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous materials.

- Notification and reporting procedures.

- An up-to-date list of all personnel qualifications and responsibilities in the event of an emergency.

- An up-to-date list of all emergency equipment at the Facility, including the location and physical description of each item.

- An evacuation plan for Facility personnel where there is a possibility that evacuation could be necessary. This plan will describe signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes.

- Procedures to be followed by employees who remain to operate critical plant operations before they evacuate.

- Procedures to account for all employees (including visitors and contractors) after emergency evacuation have been completed.

- Reporting procedures for fires and other incidents.

- Description of the alarm system.

- Training requirements.

- Minimum plan review and modification requirements.

CPV's Preliminary Emergency Reponses Plan is provided in Appendix 12-C. CPV Valley does not anticipate that the Project would result in significant impacts related to fire and emergency services as the Project has been designed to provide a high level of safety and redundancy and to meet all National Fire Protection Association (NFPA), state, and local requirements.

The Project would be served by the New Hampton Fire Company district, which is the closest fire department to the Project. It is located at 5024 Route 17M in New Hampton, NY and provides fire, rescue, and EMS type calls. The New Hampton Fire Company has three cars, two engines and one 3,500 gallon tanker.

CPV Valley has consulted with the New Hampton Fire Department regarding emergency planning and fire protection requirements for the Project. No concerns were raised during the meetings regarding the ability of the Fire Department to provide adequate emergency response to the Project. Discussions at the meetings focused on the status of the Project, proposed fire suppression devices and requirements (summarized in Section 6.0, Community Facilities), vehicular access to the Facility and community outreach efforts.

CPV Valley intends to have its Facility personnel trained as an on-site fire brigade, working cooperatively with the fire department, to function as the first line of defense in the event of a fire at the Facility. As part of this training effort, a safety orientation program and fire response plan will be in place during Project construction and operation to reduce the likelihood of the need for emergency services. Finally, prior to the commencement of Project construction and operation, CPV Valley would finalize an Emergency Response Plan to support operation of the Facility.

A routine Site Familiarization and Training Program with the New Hampton Fire Company will be part of the annual training at the Facility. The program will be designed and updated annually after consultation with the New Hampton Fire Company and will contain provisions for a coordinated response plan, simulated drills, and periodic reviews of the plan to include both New Hampton Fire Company and CPV Valley Facility personnel.

The combination of CPV Valley's onsite responders, emergency response contractor, and if necessary, the local emergency responders, would be able to effectively manage predicted potential incidents at the Facility.

In addition, Orange County has a hazardous materials response team based at the Fire Training Center in Goshen, NY. A volunteer agency, the team is made up of personnel from the fire service as well as industry. The team was established in 1981, as mandated by New York State law. At the request of a fire chief, the hazardous materials response team will respond to the scene of a hazardous materials incident and assist the local fire department in mitigating the incident. All members of the hazardous materials response team are specially trained to operate at hazardous materials incidents. At a hazardous materials incident, team members operate as a sector of the local fire department under a unified incident command structure.

12.8 SOLID WASTE MANAGEMENT

12.8.1 Waste Generation – Construction

12.8.1.1 Land Clearing Debris

The Project site would require land clearing. It is anticipated the material would be recycled offsite for timber, wood chips and/or mulch. No open burning would be performed for tree waste disposal.

12.8.1.2 Construction Site Waste

Construction Site waste would be segregated and collected in dumpsters/containers designated for aluminum, steel, paper, glass, and miscellaneous trash. These materials would be recycled or properly disposed of offsite. Dumpsters/containers would be removed and replaced with empty containers weekly, as needed.

Sanitary waste would be managed with the following:

- Portable toilet trailers;
- Individual toilet trailers, and,
- Portable holding tanks for the construction office trailer complex.

Sanitary waste would be removed by mobile sanitation equipment on a daily or weekly basis.

12.8.2 Waste Generation – Operations

The proposed facility would generate small quantities of hazardous and non-hazardous wastes as a result of operation and maintenance activities. The process of electrical generation does not produce appreciable amounts of hazardous and non-hazardous wastes when natural gas is utilized as the primary fuel source, as compared to coal or No. 6 fuel oil.

12.8.3 Hazardous Waste and Waste Oil

The Facility would be classified as a small quantity generator of Resource Conservation and Recovery Act (RCRA) hazardous waste (generation of > 100 kg and < 1,000 kg in a given month). The hazardous waste generated would primarily be related to maintenance of the Facility and include items such as spent aerosol cans, waste cleaning solvents, and waste paint.

Waste oil would be generated at the proposed Facility as a result of equipment maintenance. The main source of this material is machinery lubricants, which are not consumed but are needed to be replaced every 1-4 years. This waste oil would be recycled. Lube oil does not wear out, it just gets dirty. Waste oil, when recycled by separation and filtration, is refined into lubricants, processed into fuel oils, and used as raw materials.

12.8.4 Non-Hazardous Solid Waste

Solid waste would be generated at the Facility. The solid waste would be related mainly to office and plant worker trash, including paper, cardboard, aluminum, and glass. A recycling program, in accordance with local solid waste vendor programs, would be implemented for these non-hazardous waste streams. It is estimated the facility would generate less than 1-5 cubic yards of general trash per week. Solid waste containers would be sized appropriately to minimize the need for waste transportation related trips to the facility and would include recycling options.

Solid waste containers would be sized appropriately to minimize the need for waste transportation related trips to the facility

12.9 ENERGY

The proposed Facility would address the need for additional electricity, increased competition, and improved system reliability in the lower Hudson Valley region.

The steam turbine generator would provide approximately 288 MW, the balance of the Facility's gross output. Approximately 23 MW are consumed within the Facility to power necessary Facility systems, which leaves a net Facility electric output of 630 MW.

The Project would interconnect to NYPA's 345-kilovolt (kV) transmission system less than one mile from the Project area via an onsite overhead transmission line and an offsite underground transmission conduit ban on Route 17M, to be constructed between the project's step up transformers and the new 345 kV switchyard to be constructed in the eastern portion of the project's 122-acre parcel.

A System Reliability Impact Study (SRIS) is underway, which includes analyses for thermal, voltage, short circuit and stability, would evaluate the impact of the new plant on the NYPA system. The study is being conducted in accordance with the NYISO SRIS Criteria and Procedures provided to the New York State Independent System Operator (NYISO) for review and approval.

The Facility would utilize natural gas as its primary fuel with ultra low sulfur distillate (0.04 percent) as a backup fuel. Natural gas would be provided to the project site through a new natural gas pipeline. It is contemplated that the new lateral would be developed by an entity other than CPV and would require either PSC (Article VII of the Public Service Law) or the Federal Energy Regulatory Commission (FERC) approval, depending on which of the alternatives currently under consideration is pursued.

Based on full year Facility operation, including operation of the Facility for 720 hours on ultra-low sulfur distillate, the proposed Facility would consume approximately 34,164,000 Million Million British thermal units (mmbtu) per year of natural gas on an annual basis. A million British thermal units is a commonly used measure of natural gas usage. This natural gas demand would not impact regional energy systems nor would they impact or preclude service to other users. Moreover, the natural gas pipeline lateral that would be constructed by others to serve the facility would improve the distribution of natural gas in the area.

The Facility would be permitted to allow the use of ultra-low sulfur distillate for up to 720 hours as the back-up fuel for the combustion turbine and facility auxiliary boiler. Assuming operation of both of the auxiliary boiler and combustion turbine on low sulfur distillate for 720 hours per year, the proposed Facility would consume approximately 1.5 mm btu per year of low-sulfur distillate on an annual basis. Ultra-low sulfur distillate would be stored in a new 965,000-gallon on-site storage tank.

The provision of backup fuel supply is necessary to ensure the reliable operation of the Facility. Without a backup fuel source, should natural gas supply be interrupted for any reason, the facility would shut down and no longer supply electricity to the grid. Although termination of natural gas supply is unlikely, it is necessary to have the capability to operate on alternate fuel during such contingencies. Further, the Project’s ability to operate on ultra-low sulfur distillate would allow the natural gas that would otherwise be consumed by the Facility to be used by other users in the region, without impacting the Project’s ability to generate electricity.

13.0 WATER RESOURCES

13.1 INTRODUCTION

This section evaluates the effects of the proposed Project on water resources in the Project vicinity. Included is a description of existing topography, surface water, hydrogeology, and groundwater resources. Impacts to these resources from construction and operation of the Project are described and measures to avoid, minimize, or mitigate potential Project impacts are provided.

The Project will use an air cooled condenser for heat dissipation to minimize both water supply and wastewater discharge requirements. The preferred option for satisfying the Facility's process makeup water requirements would be to use tertiary treated effluent from the Middletown Sewage Treatment Plant. Process wastewater would be discharged to either the Middletown Sewage Treatment Plant or returned to the Middletown Sewage Treatment Plant's outfall pipe. The Middletown Sewage Treatment Plant currently discharges treated effluent to the Wallkill River. Potable water for on-site staff and visitors would be obtained from the municipal distribution system. Sanitary wastewater would either be discharged to the Middletown Sewage Treatment Plant or processed through an on-site septic system and leach field. Stormwater runoff from construction and operation would discharge to on-site wetlands, which ultimately drain to Monhagen Brook.

The proposed Facility and temporary construction laydown areas will occupy approximately 29 acres within the 122-acre project site. The site topography is characterized as gently sloping with elevations that range from approximately 452 feet to 550 feet above mean sea level (msl). Grades in the developed portion of the site would be raised an average of 5 to 8 feet to accommodate the power generation facility, stormwater detention basin and switchyard. Construction laydown areas will remain at essentially existing grades.

The power facility area will be covered in gravel, except for designated roads, tanks, and buildings, and will be approximately 23 percent impervious (i.e., approximately 8 acres will be impervious). The switchyard area and area beneath the air cooed condenser will be covered with crushed rock.

The onsite electrical right-of-way will require approximately 4.5 acres. The underground off site portion will require 0.46 acres.

13.2 APPLICABLE LAWS, REGULATIONS, AND POLICIES

Developments of a certain size (*e.g.*, those which disturb 1 or more acres) are subject to federal stormwater regulations under the National Pollutant Discharge Elimination System (NPDES) program. The New York State Department of Environmental Conservation (NYSDEC) has been delegated by the U.S. Environmental Protection Agency (EPA) to implement this program in New York State pursuant to the Clean Water Act as the State Pollutant Discharge Elimination System (SPDES) program. The SPDES permit program regulates point-source and non-point source discharges into waters of the State, which includes groundwater.

The Project is eligible to seek authorization to discharge stormwater during construction and operation under the NYSDEC's General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-08-001) and the Multi-Sector General Permit for Stormwater Discharges Associated with Industrial Activity (GP-0-06-002), respectively. To obtain general permit coverage requires filing a Notice of Intent with the NYSDEC. In addition, coverage under either permit requires the preparation of a Stormwater Pollution Prevention Plan (SWPP Plan). Draft Storm Water Pollution Prevention Plans for construction and operation have been developed and are included in Appendix 12-A.

Should CPV discharge process wastewater to the Middletown Sewage Treatment Plant outfall pipe, an industrial wastewater discharge permit would also be required from NYSDEC under the SPDES program. Permit application forms for an industrial wastewater discharge permit are included in Appendix 12-B.

Receiving waters within the Project vicinity are classified as either Class B or Class C by the NYSDEC. The best usages of Class B waters are primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival. The best usage of Class C waters is fishing. These waters shall be suitable for fish, shellfish, and wildlife propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

General water quality criteria applicable to Class B and Class C waters are listed in Table 13-1:

Table 13-1
General Water Quality Criteria Applicable to Class B and Class C Waters

Parameter	Standard
Taste-, color-, and odor-producing, toxic and other deleterious substances	None in amounts that will adversely affect the taste, color or odor thereof, or impair the waters for their best usages.
Turbidity	No increase that will cause a substantial visible contrast to natural conditions.
Suspended, colloidal and settleable solids	None from sewage, industrial wastes or other wastes that will cause deposition or impair the waters for their best usages.
Oil and floating substances	No residue attributable to sewage, industrial wastes or other wastes, nor visible oil film nor globules of grease.
Phosphorus and nitrogen	None in amounts that will result in growths of algae, weeds and slimes that will impair the waters for their best usages.
Flow	No alteration that will impair the waters for their best usages.
pH	Shall not be less than 6.5 nor more than 8.5.
Dissolved oxygen (DO)	For non-trout waters, the minimum daily average shall not be less than 5.0 mg/L, and at no time shall the DO concentration be less than 4.0 mg/L.
Total Dissolved Solids	Shall be kept as low as practicable to maintain the best usage of waters but in no case shall it exceed 500 mg/L.

General thermal criteria applicable to Class B and Class C waters include:

(1) The natural seasonal cycle shall be retained.

(2) Annual spring and fall temperature changes shall be gradual.

(3) Large day-to-day temperature fluctuations due to heat of artificial origin shall be avoided.

(4) Development or growth of nuisance organisms shall not occur in contravention of water quality standards.

(5) Discharges which would lower receiving water temperature shall not cause a violation of water quality standards and section 704.3 of this Part.

(6) For the protection of the aquatic biota from severe temperature changes, routine shut down of an entire thermal discharge at any site shall not be scheduled during the period from December through March.

13.3 SURFACE WATERS

The Project site is located within the Wallkill River Subbasin of the Roundout Creek Watershed. Rondout Creek is a tributary of the Lower Hudson River, joining the Hudson River near Kingston, NY.

Climatic characteristics in Orange County are moderate, with average daily temperature during the winter ranging between 20^{o}F to 32^{o}F and during the summer ranging between 70^{o}F and 90^{o}F. Mean annual precipitation over the Wallkill River watershed totals approximately 42 inches per year (USGS, 2008). In general, mean monthly precipitation is relatively evenly distributed, ranging from a low of about 2.5 inches per month in February to a high of approximately 3.75 inches per month during the summer.

13.3.1 Wallkill River

The Wallkill River originates at Lake Mohawk in Sparta, New Jersey and flows in a northeasterly direction approximately 94 miles to its confluence with Rondout Creek near Rosendale, NY. Through Orange County, its broad valley lies between the main Appalachian Mountains and the New York-New Jersey Highlands, where it is used to support local agriculture; particularly through the area know locally as the Black Dirt Region.

The nearest USGS flow gaging stations on the Wallkill River are located at Pellets Island, NY and Phillipsburg, NY. The Pellets Island gage (USGS Station No. 01370000) was used to collect daily stream flow data over a 48 year period beginning in 1921 and extending through 1968. The drainage area to the gage is 385 square miles (sq. mi.). The USGS gage at Phillipsburg (USGS Station No. 01370500) is located approximately 4.3 miles downstream of the gage at Pellets Island and has a drainage area of 419 sq. mi. Daily stream flow data at the Phillipsburg gage were collected over a 23 year period extending from 1937 through 1959. Mean annual flow past the Pellets Island and Phillipsburg gages are reported to be 550 cubic feet per second (cfs) (USGS, 2008a) and 650 cfs (USGS, 2008b), respectively.

Mean monthly flow for the Wallkill River at Pellets Island and Phillipsburg is graphically shown in Figure 13-1. Mean monthly flow reaches a high exceeding 1250 cfs in the spring, and drops to a low of about 250 cfs during the late summer and early fall. A frequency distribution for flow in the Wallkill River at Pellets Island and Phillipsburg is shown graphically in Figure 13-2. Low flow statistics for each gage are listed in Table 13-2.

Table 13-2
Low Flow Statistics for the Wallkill River at Pellets Island, NY and Phillipsburg, NY[1]

Duration, Frequency	Pellets Island, NY DA[2] = 385 sq. mi.	Phillipsburg, NY DA = 419 sq. mi.
1 day, 2 year low flow	32.84	42.33
1 day, 10 year low flow	11.51	19.69
1 day, 20 year low flow	8.37	16.28
3 day, 2 year low flow	34.43	44.07
3 day, 10 year low flow	12.03	20.42
3 day, 20 year low flow	8.74	16.84
7 day, 2 year low flow	37.03	47.32
7 day, 5 year low flow	19.08	27.84
7 day, 10 year low flow	13.41	21.69
7 day, 20 year low flow	9.99	17.89
14 day, 2 year low flow	42.03	52.73
14 day, 10 year low flow	14.84	24.18
14 day, 20 year low flow	11.05	20.11
30 day, 2 year low flow	51.76	62.99
30 day, 10 year low flow	18.58	29.03
30 day, 20 year low flow	13.91	24.23

1. USGS StreamStats Data for Stations 01370000 and 01370500
2. DA = Drainage Area

13.3.2 Monhagen Brook

Monhagen Brook originates from a small pond just west of Middletown, New York. It flows east and south through Middletown before merging with the Wallkill River approximately 8 miles from its origin. The main stem of Monhagen Brook is classified by the NYSDEC as Class C, which denotes fishing as the best use. Tributaries to Monhagen Brook are listed as Class B waters. Monhagen Brook has a drainage area of approximately 25.9 square miles. The stream channel is generally broad and shallow at most locations. There are no USGS flow gaging stations located within the Monhagen Brook watershed.

Two tributaries to Monhagen Brook traverse the site and flow east toward Route 17M: Carpenter Creek, which crosses the northern portion of the site and an unnamed tributary that joins Carpenter Creek approximately 600 feet southwest of Route 17M.

Carpenter Creek enters the western part of the site near the existing site access road off Route 6 and flows east through forested wetland and wet meadow communities. A number of small, man-made drainage swales join this stream from the adjacent agricultural fields. The drainage area of Carpenter Creek is approximately 3.73 square miles and includes agricultural, residential, and transportation land uses.

Through the site, Carpenter Creek is relatively uniform in width, depth, and flow characteristics to its confluence with the unnamed tributary. The channel is approximately 4 to 6 feet wide and ranges from 4 to 6 inches deep during normal flow periods (observed in the months of January, May and July). Channel velocity is typically 0.5 to 1 foot per second. The channel bed contains mostly sand and gravel, with frequent cobbles both above and below the water surface. The banks, which average 4 to 5 feet above the channel bottom, are generally steep with 2:1 side slopes It appears that the channel has been dredged and straightened in the past to support agricultural activities. Several dug drainage channels join the main channel at perpendicular angles from the adjacent hayfields.

The unnamed tributary enters the site from the south via a culvert beneath I-84. From the culvert it flows approximately 1,000 feet northeast, parallel to the I-84 west-bound on-ramp, and then veers north. This channel was observed to have a width ranging from 10 to 12 feet and a depth ranging from 6 to 10 inches. Velocity was observed to range between 0.1 and 0.5 feet per second. The banks of this reach are nearly vertical and 1 to 1.5 feet high. The adjacent wetlands are characterized as wet meadow/shallow marsh community.

The streams join together in the eastern part of the site, then flow beneath Route 17M via a culvert and join Monhagen Brook approximately 1,000 feet east of Route 17M. Through this reach, the channel bottom is mostly silt and mud, with communities of aquatic vegetation commonly present. The channel banks are 1 to 1.5 feet high and nearly vertical, with gently sloping meadow/marsh and shrub swamp community beyond. Where it enters the culvert at Route 17M, the stream channel broadens to approximately 15 feet wide. The culvert under Route 17M is approximately 10 feet wide and 8 feet high. It is an open-bottom concrete box culvert with wingwalls.

13.3.3 Existing Water Quality

Several studies have been conducted by the NYSDEC and the Orange County Water Authority to characterize water quality conditions in the Wallkill River and its major tributaries. Overall, water quality conditions in Orange County generally meet applicable water quality criteria. However, biological assessments on stream segments have concluded that agricultural practices, use of pesticides and herbicides, and urban development have all contributed to biologically stressed conditions along several stream reaches. These studies have also uncovered isolated problem reaches, with recommendations to place certain reaches on the State’s Impaired Waters List (303d List).

The biological monitoring assessments indicate that along stream reaches impacted by agricultural runoff, including the main stem of the Wallkill River, aquatic life, recreational uses, and habitat conditions have experienced minor impacts. Stream channelization and other channel modifications to support agricultural operations are also suspected to effect water quality and use support.

13.3.4 Existing Watersheds

Under pre-development conditions, the surface drainage network on the proposed developed area of the CPV Valley site is currently directed to two watershed areas. These watersheds discharge to Army Corps of Engineers (ACOE) and ultimately to NYSDEC regulated wetlands in northerly and southerly directions from the watershed divide. The subject wetlands are hydraulically connected, so, the watershed can be modeled as one area, consisting of 25.5 acres of proposed final development, and approximately 4 acres of contributing area outside the proposed development boundaries and off-site. Of the area proposed for ultimate development, approximately 11 acres drains to the ACOE wetlands to the south, along I-84 while the remaining 14.5 acres drains to the ACOE wetlands to the north, along Carpenter Creek. These wetlands, north and south of the development site are hydraulically connected immediately off-site and on-site to the east. Site walkovers conducted during the months of May through October indicate that the hydroperiod of the wetlands in and adjacent to the proposed development area is negligible. Evidence of bank overflow during two storm events over 1" during the summer of 2008 suggest that the wetlands within 50' of Carpenter Creek in the eastern portion of the site do exhibit several inundation events annually. Similar leaf staining and drift lines were not observed on the western half of the site.

The following briefly describes the watersheds, which are discussed in depth within the Stormwater Pollution Prevention Plan found, in Appendix 12-A.

Watershed Area A comprises the bulk of the affected area of the Project site. Located throughout the northern portion of the plant site proper, this watershed receives a negligible amount of runoff from other tributary lands off-site. Runoff from the site accumulates within this watershed which discharges to the east, through the adjacent wetlands and ultimately to the above referenced tributary of Monhagen Brook. Watershed Area A is vegetated by hay fields, idle row crop field, meadow, and some scrub/brush with mature trees at the margins and along fence rows.

Watershed Area B is a much smaller portion of the Project site, located on the southern edge of the property. Area B also receives runoff from tributary lands off-site to the south. Discharge is by sheet flow to the wetlands on the southern edge of the site. As noted above, the hydraulic connectivity of the existing discharge points indicates that stormwater modeling should be consolidated into one watershed.

With respect to the quantity of surface water runoff generated on-site, a detailed study of both pre and post development conditions was made of the watersheds to be affected by the proposed project. Existing stormwater runoff discharge rates for each watershed were determined in accordance with procedures found in Urban Hydrology for Small Watersheds, Technical Release No. 55[1] (TR 55). Utilizing stormwater modeling, a TR-55 analysis was performed which considered watershed size and shape, soil type, land use or ground cover and condition, existing physical features and conditions such as slope, drainage patterns and structures, buildings and impermeable surfaces, and local rainfall values.

Runoff calculations were performed for the 1, 2, 10, and 100 year, 24 hour storm events using Type III synthesized rainfall. Existing peak flows are provided in a comparative table in the following section. Details of the existing condition runoff calculations including variables used,

---

[1] USDA Soil Conservation Service.

routing diagrams, hydrographs, etc., are provided in the Stormwater Pollution Prevention Plan (SWPPP) located in Appendix 12-A.

The SWPPP indicates the measures which will be implemented on-site to reduce pollutants in stormwater which will be either discharged from the site or infiltrated on site, and to ensure compliance with the General Permit. In particular, the plan identifies and details temporary and permanent erosion and sediment control measures to be implemented prior to and during construction operations and the permanent on-site stormwater management system. The control of stored fuel materials and fuel spills will be addressed within a Spill Prevention Control and Countermeasure Plan (SPCC).

All erosion and sediment control measures and stormwater management structures/practices to be implemented on-site have been developed in conformance with Federal and State guidelines.

13.3.5 Potential Impacts

Approximately 25% of the site's total area will be directly impacted by construction activities, some of which will be temporary. Potential impacts resulting from both Project construction and operation are discussed below, along with proposed mitigation measures associated with site stormwater management.

Construction Impacts

Short-term impacts predicted for wetlands and watercourses on the property and along the proposed transmission lines are primarily related to the erosive potential of exposed soils during construction. Construction activities would remove vegetative cover and topsoil, which binds the soil and prevents erosion. Erosion of the soil surface if left uncontrolled, can lead to siltation, increased water temperatures, reduction of dissolved oxygen levels, and increased turbidity. The construction SWPPP, for the project, contained in Appendix 12-A details the proposed conversion of cropland to impervious area, a total of 8.12 acres of the total site development. The site incorporates significant areas of high permeability finished surfaces, 6.31 acres of gravel, as well as stormwater ponds, created wetlands and landscaped areas.

The Project will require excavation and construction for the proposed electrical interconnect, as well as process water supply and return lines. Process water is proposed to be transported to and from the site via subsurface transmission lines, which will generally be constructed within existing public rights of way. Potential impacts to watercourses along this proposed route include the possibility of discharged sediments to these resources from temporary excavations for installation of the transmission lines. Within the watershed of Monhegan Brook and the unnamed tributaries in the vicinity of the site, the areas proposed for disturbance on site are minor and temporary in nature.

The proposed process water transmission lines generally follow an established transportation corridor. Considering that prevailing erosion/sedimentation control measures will be employed in the final installation, no significant adverse impacts are anticipated. A portion of the electrical interconnect will cross the wetlands. Impacts to these wetlands are expected to be minimal due to the fact that the pole foundations represent the only permanent disturbance and their spatial extent is small.

Considering that that the hydroperiod of the wetlands in and adjacent to the proposed development area is negligible, and that Project generated runoff will closely replicate the pre-development condition, impacts to wetland conditions, water levels, and hydroperiod related to the construction and operation of the site are expected to be insignificant.

Operational Impacts

Post development discharge from the site will be maintained in the off-site drainage points currently existing and at peak rate volumes not exceeding those which currently exist. The interconnected nature of the on site wetlands provides for internal balancing of stormwater flows. In this manner, pre-development drainage patterns will be maintained. The pre and post development watershed areas are indicated on the appropriate figures in the SWPPP. With respect to the rate of stormwater runoff generated on-site under post development conditions, the post development off-site discharge point (ODP) was analyzed for the 2, 10, 25, 50, and 100 year return frequency storm events (per TR-55, Type III synthesized, 24 hour rainfall) using the total developed area contributing watershed basins. The post development peak rate discharge value for the ODP was compared to its respective existing peak rate discharge value. The proposed site plan will not result in an increased peak rate of discharge.

Peak discharge rates will be somewhat reduced by the re-direction of runoff away from the predevelopment areas due to the gradient and direction of the proposed site development. Site development will utilize treatment and detention basins, sized to compensate for the storage volume lost due to site development as well as to accommodate sediment loads. By nature of its design, the basins will also store runoff volumes for the low-intensity, high-frequency rainfalls, thereby acting effectively as a "first-flush" control mechanism. The basin will improve runoff quality by allowing sediment and other undesirable pollutants that are picked up from the surface at the beginning of a rainfall event to settle out, prior to the stormwater reaching a level of discharge to the downgradient stream and off-site lands. The detention/sedimentation basin will be further addressed in the mitigation section. Specifically, both the rate of soil erosion and volume of sediment transported downgradient will be reduced as a result of the design of the stormwater management system. Pre-development and post development stormwater discharge rates for the affected watersheds under the 100 year return frequency storm are presented in Table 13-3 below.

Table 13-3
CPV Valley Energy Project Pre-development and Post Development Stormwater Discharge Rates
100 Year Storm Event

Watershed	A. Pre-Development	B. Post-Development
Pre-Development Peak Discharge Rate; cubic feet/sec.	48.3	31.2

With respect to the size or capacity of the Facility basins, they will not exceed the threshold for which a NYSDEC dam safety permit would be required.

Industrial site development has the potential to lead to water resource impacts resulting from increased sediment and pollutant loadings. In order to assess this potential on the subject site, the existing land use was evaluated and contrasted with the potential loadings from the developed site.

Agricultural lands are recognized as significant non-point source (NPS) generators of pollutants. Agricultural models for evaluating water quality impacts are keyed to soil loss (erosion) and plant nutrient migration. The principal nutrients modeled are nitrogen, phosphorus, and potassium (N, P, K). Nitrogen and phosphorus in their various forms present the potential for significant adverse water quality impacts. This is not the case for potassium, which is fixed by illite clays and other soil colloids when it is used in excessive amounts as an agricultural soil amendment. Fecal coliforms are discharged from agricultural lands in proportion to the tonnage of biosolids applied, temperature, rainfall, and poor management practices such as spreading on frozen fields. The project site has historically been subject to heavy applications of biosolids and will undoubtedly discharge a much smaller fecal coliform profile in the developed condition.

Historically, pesticides have contributed significantly to adverse water quality impacts, however, the reduced environmental life of modern herbicides and insecticides has greatly reduced this impact over the past twenty years. Considering this fact, that the pesticide management history of the site is unknown, and that pesticide use will be eliminated on site with assumption of the proposed use, the effects of pesticide use on site were not evaluated.

Approximately 21.25 acres of cropland is proposed for conversion to an industrial use. Of this area, approximately 60% (15 acres) is currently fallow, with the balance in hay crop production. The fallow ground has been in continuous corn production for an extended period of time. The agricultural lands on site have been subject to moderate to heavy applications of biosolids. As reported by the American Water Resources Association at their 2006 proceedings, nitrogen losses from cropland averaged 135.3 lb./ac./yr., while phosphorus losses averaged 99 lb./ac./yr.

In order to model soil erosion losses from the project site, the USDA NRCS Revised Universal Soil Loss Equation (RUSLE, 1997) was employed. Because of the varied agricultural use. A composite “C” factor of 0.09 was selected, based on the area historically in corn production and currently in hay crop production. Using the southeastern NY rainfall intensity coefficient of 75 and a Practice “P” factor of 1 (there are no existing conservation measures such as diversions or field inlets on site), the RUSLE yields a probable soil loss of 5.23 tons per acre per year. This translates into 133.4 tons per year of sediment transported to the on-site wetlands and streams annually.

The potential pollutant loadings from the developed site were evaluated using the standard NYSDEC “Simple Method to Calculate Urban Stormwater Loads” Table 13-4, below, contrasts the expected pollutant loading from the site in the developed condition, with the limited parameters for agricultural runoff noted above.

Table 13-4 Stormwater Pollutant Loadings		
Constituent	**Pre-Development Discharge**	**Post-Development Discharge**
Total Suspended Solids*	2162 mg/L	334.7 mg/L
Total Phosphorus	24.7 mg/L	0.81 mg/L
Total Nitrogen	33.4 mg/L	4.5 mg/L
Copper	N/A	0.57 mg/L
Lead	N/A	3.03 mg/L
Zinc	N/A	262.7 mg/L
Fecal Coliform	Varies by management practices, biosolids application rate, etc.	N/A
* Ice control sand is not considered in the post development scenario because it is generally trapped in the sumps of the catch basins and removed during annual maintenance of the stormwater system.		

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the Town of Wawayanda the affected portion of the project site does not lie within the designated 100 or 500 year flood boundary of Carpenter Creek.

Mitigation Measures

In order to mitigate the potential impacts of the proposed action, such as the increased surface water runoff, peak rate of discharge, and erosion and sedimentation, the site plan for the Facility includes a series of structural and non-structural stormwater management and erosion control measures.

With respect to stormwater runoff, a series of curbs and swales has been incorporated into the site design, directing surface water flow from affected areas into the stormwater management system, with most points of entry being drop inlet catch basins. In this manner, the adverse affects of overland flow coupled with increased exposed surface and increased stormwater volume will be significantly reduced. Additionally, the site design integrates significant areas of porous surfaces in areas where a high wear pavement is not required, such as under the air cooled condenser. In this manner, infiltration is promoted and runoff from the developed site is reduced.

In order to reduce the energy of stormwater during construction, flow within temporary swales will be interrupted by a series of stone check dams. The effects of stormwater runoff will also be controlled through the use of temporary filter fencing installed to protect areas downgradient of construction activity.

As previously indicated, sedimentation/detention basins, properly sized and located, have been included in the plan. The purpose of the basins is threefold. In addition to providing a controlled location for sediment deposition and retention, the basins will provide storage volume to compensate for that lost through development of the site and will serve to limit peak flows of stormwater runoff to levels which do not exceed current or pre development peak discharge rates (for the 100 year design storm). As the basins are multi-functional (i.e., sedimentation and treatment as well as stormwater detention), they have been designed to control runoff during the

100 year storm event. Dredging of accumulated sediments contained within the basins will be performed as needed. The SWPPP, provided in Appendix 12-A, details the pre and post developmental drainage conditions as well as the stormwater runoff model and calculations used in development of the basin design.

All stormwater management, erosion and sediment control measures proposed for the CPV Valley site have been designed in accordance with the April 2008 *New York State SMDM*, NYSDEC's Division of Water TOG 5.1.8 and 5.1.10 and NYSDEC's *Reducing the Impacts of Stormwater Runoff from New Development*. Furthermore, in accordance with Article 17 of the Environmental Conservation Law (which mandates SPDES permit authorization for stormwater discharges associated with construction activity), a comprehensive erosion and sediment control/stormwater management plan is required for the proposed development. The plan under development will detail through both narrative and drawings, each of the erosion and sediment control measures to be utilized on-site during the construction phase.

13.4 HYDROGEOLOGY AND GROUNDWATER WATER RESOURCES

13.4.1 Existing Conditions

The Project site is located in the Wallkill River Valley, within the central section of the Hudson-Mohawk Lowlands. The Wallkill Valley forms an approximate 65-mile long and 20-mile wide southwest to northeast drainage basin. This basin is characterized as a broad open valley covered by glacial drift. The Wallkill Valley is drained northward by the Wallkill River, a major tributary of the Hudson River.

The sand and gravel deposits within close proximity to the Wallkill River and its tributaries are discontinuous, and overlain by fluvial and/or lacustrine deposits. In cases where a hydrologic connection to surface waters is present, and confining sediments exist above, the deposits may operate in either a semi-confined or artesian, confined state.

The preliminary geotechnical investigation completed at the Project site (See Section 11.4) indicates that the unconsolidated aquifer on-site is vertically bounded to the surface by silts and clays which are less permeable than the underlying ice contact sand and gravel deposits. The soil boring investigation carried out on-site has confirmed that the unconsolidated aquifer on-site is vertically bounded by relatively impermeable materials. In order to characterize the groundwater profile over site area proposed for development, groundwater elevations were recorded in the piezometers installed during the soil boring program. Figure 13-3 shows the observed occurrence of groundwater on site.

13.2.2 Potential Impacts

Potential impacts to on-site groundwater resources during facility operations include potential for introduction of hazardous bulk liquids stored on-site, as well as piped wastewater, to the groundwater. Other potential impacts include withdrawal of groundwater for on-site usage (as a water supply alternative).

The proposed Facility will require the following distinct bulk liquids, at a minimum:

1. 965,000 gallons of ultra-low sulfur fuel oil as a back-up fuel source for reliability purposes.

2. Diesel fuel/gasoline for maintenance vehicles in standard commercial formulation for the season.

3. 15,000 gallons of aqueous ammonia to be used as a catalyst for air pollution control.

4. Extraction of an average daily demand up to 300,000 gpd for plant cooling if the groundwater alternative is selected.

The ultra-low sulfur fuel tank and ammonia tanks will be housed within dike containment systems providing 110% tank volume containment and leak detection in accordance with prevailing NYSDEC regulations. Truck unloading areas for both the fuel oil and ammonia tank locations will be diked as well, in order to preclude release from a truck piping, pump, or equipment failure.

Under the applicant's preferred alternative, the process water needs of the proposed Facility will be met through the use of grey water from the City of Middletown Sewage Treatment Plant. Groundwater has been considered as an alternative source of supply, in the event that grey water from the Sewage Treatment Plant is not available, or the supply is interrupted. The water balance for the project is presented in Table 12-1. The proposed Facility has been designed to specifically incorporate measures to provide for maximum conservation of water.

A study of the aquifer beneath the Project site was conducted to determine the actual quantity of water available for use and the quality of that supply. The soil boring program (reference Appendix 11-B) indicated a significant potential for development of wells in the unconsolidated aquifer under the Project site proper. An existing deep rock well was available on site for testing. The subject well was reportedly drilled in the 1980's and extends to a depth of 238' below land surface. The depth of casing is unknown; however, the depth to bedrock was located 50 – 82 feet below ground surface during the Preliminary Geotechnical Investigation. To determine the expected safe yield, a 72 hour pump test was conducted at the site. Results of those tests indicated that the production test well is capable of producing sustained flows of at least 250 gpm, or 360,000 gpd. Based on the monitoring program conducted during the pump test, this rate of flow can readily satisfy the project demand, without adverse impacts on adjoining well water supplies, or the aquifer in the vicinity of the project site.

The estimated groundwater storage capacity of the aquifer is extensive due to the fractured nature of the bedrock aquifer. High volume wells have been developed in the same strata at Elvree Farms and on McBride Road. The 3.7 square mile watershed is recharged at an average rate of up to 16" per year. Based on these capabilities, the aquifer system in the project area offers ample reserves for the proposed Project, with a withdrawal rate of up to 360,000 gpd or 1.3% of the daily recharge of this aquifer on an annualized basis. Subsidence or the lowering of the water table as a result of this proposed Project is therefore not anticipated.

The 72 hour continuous pumping test at the Project site indicates that the test production well(s) are capable of producing continuous flows well in excess of 250 gpm for sustained periods of time. Under normal rainfall conditions of 40-50 inches of rain per year, recharge should be routinely available to the formation such that the normal radius of influence around the proposed well field is expected to remain between 400 and 1,000 feet. During dry periods exceeding 4 weeks, the radius of influence may expand to as much as 1,000 feet with measurable impacts of several feet in the monitoring wells on site. Since neighboring wells are also deep bedrock wells, the impact of the CPV production well interference is not expected to decrease yields in any nearby wells.

There are no municipal groundwater withdrawals within the aquifer capture zone of the on site well. The groundwater assessment demonstrates the potential recharge to the groundwater aquifer system and the storage capacity of the system. The closest nearby public water supply well is the Town of Wawayanda well field for the Arluck water system. The Facility's use of a separate and distinct aquifer will not be impacted by the proposed withdrawals, as demonstrated in the hydrogeological study.

Existing water quality of the aquifer beneath the site was investigated. The project's production test well was sampled for testing during the 72-hour pump test. Additionally, the potential for a hydraulic connection between the production well and the site’s streams and surface waters was evaluated during the test. Monitoring wells placed upstream and down in the surface waters and piezometers in the wetlands were monitored using recording pressure transducers, pre-test, during the test, and during the post-test well recovery. Detailed results are presented in the appended Groundwater Study (Appendix 13-A). In summary, these data indicate that extraction of the groundwater resource necessary to serve the Project would not have an adverse impact on surface waters or wetlands in the vicinity of the site.

The testing and monitoring program carried out in the Groundwater Study (Appendix 13-A) for the Facility demonstrates that withdrawal of up to 360,000 gpd will not have an adverse impact on adjoining well water supplies, or the aquifer in the vicinity of the Project site. Implementation of the proposed plan will include installation of separate production wells and back-up wells for process systems.

The potential for impacts to the site’s surface waters and wetlands resulting from the extraction of groundwater was evaluated during the aquifer test. During the test, staff gauges were monitored by continuous recording pressure transducers in Carpenter Creek, upstream and downstream of the test site. Potential connection to, and therefore, impacts to the adjoining wetlands were evaluated by continuous pressure transducer monitoring of piezometers placed in the adjoining wetlands. The results of the monitoring indicate that the bedrock aquifer is not hydraulically connected to the wetlands or Carpenter Creek. Generally, the aquifer is controlled and protected by a low permeability barrier of glacial till and lacustrine/fluvial sediments, which at points extends to 20+ feet thick. The hydraulic conductivity of the overlying sediments was evaluated through assessing the potential for surface water intrusion into the aquifer. Temperature gradient and stream monitoring data was gathered during the 72 hour continuous pump test. These data were evaluated to determine the potential for water inflow. Test results and analysis are appended to this document under the respective pump test reports. The analysis showed the overlying sediments to have a low permeability, which will fully filter any suspended sediments and will also slow downward vertical migration. Minimal volumes of surface water are expected to enter the formation under pumping conditions.

The Facility will not generate industrial liquid waste as all process water streams will be recycled. Sewage generated by employee restrooms and kitchen facilities will be treated through subsurface sanitary disposal systems (SDS's) or discharged to the Town Sewer District and ultimately to the Middletown Sewage Treatment Plant. If pursued, a SDS will be located on-site to serve the plant and the proposed office uses. As the systems will be designed in accordance with prevailing NYSDOH and NYSDEC design criteria, no adverse impacts are anticipated.

Given that the site will require a significant volume of fill material to achieve the grades necessary for site development, no dewatering of excavations is proposed.

The Project is located within the Watershed Protection Overlay Zone (W-2) Under Chapter 195 of the Town Code. The requirements of Section 195-21 will be met by the conditions established under the Site Plan and Special Use review conducted by the Planning Board. The proposed action implements specific limitations with respect to road de-icing and chemical use on site. The project site plan precludes the use of de-icing chemicals or pesticides on the project site. In this manner, potential impacts to the broader aquifer are avoided.

Cumulative Impacts

The cumulative impacts to water resources include those identified above, related to the construction of the Project and the respective interconnects, as well as the long term use of process water and discharge of treated stormwater. These impacts fall into three categories. Impacts attributed to construction of the Project will be minimized and mitigated by the design features, including erosion and sediment control, wetland creation, etc., incorporated in the plan. Impacts attributed to operation of the Facility's stormwater management system will be reduced through the maintenance and operation of a system that meets all regulatory guidelines at the time of construction. Impacts related to the long term use of process water for cooling are expected to be minimal for either of the alternatives identified. The use of grey water from the Middletown Sewage Treatment Plant will have no impact on water resources in general, or on the operation of the Sewage Treatment Plant in particular. As a supply alternative, the groundwater study conducted for the Project indicates that there is an adequate supply of groundwater on site to meet the project's needs and that extraction of the resources will not impact off-site users of the groundwater resource.

Considering the resource evaluation and analyses prepared for the Project, it is anticipated that implementation of the proposed action will have a negligible cumulative impact on the water resources identified.

Mitigation Measures

Potential groundwater impacts attributable to the proposed Project are related to the storage of fuel oil and ammonia, process water usage, and stormwater runoff from the Project site.

Mitigation measures proposed to reduce/eliminate potential water quantity and quality impacts include:

1. Aboveground fuel storage to facilitate leak detection will be provided with secondary containment capable of containing 110% of the tank contents. A leak detection system will be incorporated into this containment area.

2. Ammonia tanks to be underlain and surrounded by a concrete dike for containment, maintenance and leak detection.

3. The proposed detention ponds will incorporate measures to provide stormwater treatment in accordance with the 2003 NYSDEC Manual, revised in 2008.

4. Water quality inlets in heavily trafficked areas of the site will serve to remove sediments from the stormwater stream.

5. No de-icing chemicals will be used on site roadways or parking areas.

6. The site will not use pesticides or herbicides for site maintenance.

Considering the extent of agricultural, commercial and industrial uses within the watershed, and the mitigation measures proposed by the project sponsor, the proposed action should not generate significant negative impacts to water supply or quality in the aquifer or the vicinity in general.

13.5 REFERENCES

Cadwell *New York State Museum Chart Series 40* (1989).

Connally and Sirkin *Pleistocene Geology of the Wallkill Valley* (1972).

Conally and Sirkin *Late Glacial History of the Upper Wallkill Valley* (1982).

Connally, Sirkin, and Cadwell *Deglacial History and Environments of the Upper Wallkill Valley* (1989).

Drake and Epstein *Bedrock Geologic Map.* (1967).

NYSDEC (2008a). *New York State Stormwater Management Design Manual.*

NYSDEC (2008b). *Reducing the Impacts of Stormwater Runoff from New Development*.

RUSLE *USDA Revised Universal Soil Loss Equation*(1997, Rev. 2008)

14.0 ECOLOGY

14.1 INTRODUCTION

This section provides a description of ecological resources within the Project Area such as vegetation, ecological communities, state and Federal jurisdictional wetlands, wildlife, and potential rare species habitats. Potential direct and indirect impacts to these resources from construction and operation of the Project are also described. A summary of the Federal and state regulatory framework for assessing ecological impacts is also provided, along with proposed measures to avoid, minimize, and mitigate for potential Project impacts.

Site vegetation and ecological communities are described in accordance with Ecological Communities of New York State (Edinger et al., 2002) (the current, revised version based on Reschke, 1990) and wetland areas are identified based on site-specific wetland delineation mapping as approved by the NYSDEC and the US Army Corps of Engineers under a formal Jurisdictional Determination process. Potential occurrences of rare, threatened, and endangered species and associated habitats have been identified in accordance with correspondence received from the New York State Department of Environmental Conservation's (NYSDEC) Natural Heritage Program Database and the U.S. Fish and Wildlife Service.

14.2 APPLICABLE LAWS, POLICIES, AND REGULATIONS

The Project site and the overall Project Area contain state regulated wetlands subject to the NYSDEC Freshwater Wetlands (FWW) Program, regulated under Article 24 of the Environmental Conservation Law and Regulations (6NYCRR Parts 663, 664 and 665). The site and Project Area also contain Federal jurisdictional waters of the U.S. and wetland areas subject to Sections 401 and 404 of the Clean Water Act, Water Quality Certification (WQC) Program, as well as the U.S. Army Corps of Engineers (ACOE) Section 404 General, or Nationwide Permit (NWP) Program. Each of these programs is described in more detail below.

NYSDEC Freshwater Wetlands Program

The site contains NYSDEC Freshwater Wetlands (FWW). Site-specific mapping of on-site NYSDEC FWW was conducted in 2006 and approved by the NYSDEC in 2007 (See Figure 2-3, Existing Conditions Plan). Regulated activities within FWW includes filling, draining, excavating, grading and dredging, construction of buildings, roadways, other structures, and clear-cutting of timber and other vegetation. A 100 foot Adjacent Area (AA) also extends from the boundary of FWWs, which are also regulated areas under the FWW program with similar restrictions. The Adjacent Area is viewed in a regulatory context as a buffer between developed areas and the wetland areas proper.

Proposed impacts to both FWWs and AAs would require a Freshwater Wetlands Permit. Since multiple permits are required for the Project (e.g., FWW, ACOE General Permit, 401 Water Quality Certification, etc.), a Joint Application for Permit must be submitted under the Uniform Procedures Act (UPA) (Article 70 of the Environmental Conservation Law (ECL)).

Section 404 Nationwide Permits

The site contains Federal waters of the U.S. and associated Federal jurisdictional wetlands (See Figure 2-3, Exiting Conditions Plan). For proposed discharges of dredged or fill material to Federal wetlands and waters of the U.S., the ACOE New York District administers a Nationwide Permit (NWP) program. The Project likely falls under NWP 12 for Utility Line Activities (including substations and access roads). NWP 39 for the Facility site development, and NWP 33 for temporary impacts related to the development of the laydown areas. For NWP's 12 and 39, loss of up to ½ acre of waters of the U.S. (including wetlands) are authorized for foundations for overhead utility line towers, poles and anchors, construction of substation facilities and construction of the Energy Facility proper, respectively. Temporary structures (e.g., swamp mats or similar structures), fills and work necessary to conduct the utility line activity are also authorized under NWP 12.

401 Water Quality Certification

The NYSDEC also administers 401 Water Quality Certification (WQC) required for the discharge of dredged or fill material into Federal wetlands/waters of the U.S. Utility line projects (NWP 12) are authorized as pre-approved WQCs; however, this is limited to no greater than 1/10 acre of discharges or 200 feet of stream disturbance. As proposed, construction of the Project filling exceeds this amount; therefore, an individual 401 WQC would need to be obtained through the UPA Joint Application.

Rare Species

U.S. Fish and Wildlife Service – Endangered Species Act

The Federal Endangered Species Act of 1973 (ESA) (16 U.S.C. § 1531 et seq.) conserves the ecosystems on which endangered and threatened species depend. Species are protected under the ESA as either endangered or threatened. Endangered means a species is in danger of extinction throughout all or a significant portion of its range. Threatened means a species is likely to become endangered within the foreseeable future. The National Oceanic and Atmospheric Administration/Fisheries (NOAA Fisheries), which is responsible for marine species, and the U.S. Fish and Wildlife Service (USFWS), which is responsible for terrestrial and freshwater species, jointly administer the law.

Federal agencies are required by Section 7 of the ESA to ensure that any actions authorized, funded, or carried out by the agency do not jeopardize the continued existence of a federally-listed endangered or threatened species or result in the destruction or adverse modification of the designated critical habitat of a federally-listed species. The Federal agency, which is taking an action, is required to consult with the USFWS and/or NOAA Fisheries to determine whether federally-listed endangered or threatened species or designated critical habitat are found in the vicinity of the proposed Project, and to determine the Project's potential effects on those species or critical habitats. Potential occurrences of rare, threatened, and endangered species and associated habitats have been identified in accordance with correspondence received from the USFWS (Niver, 2008) (See Appendix 14-A).

NYS Natural Heritage Program

The New York Natural Heritage Program (NYNHP) is a partnership between the NYS Department of Environmental Conservation (NYSDEC) and The Nature Conservancy. The New York Natural Heritage Program enables and enhances conservation of New York's rare animals, rare plants, and significant ecosystems. Guidance from USFWS for determining whether any listed, proposed, or candidate species (Threatened/Endangered species) are likely to occur within the proposed Project Area included contacting the NYNHP and any appropriate NYSDEC Regional Office for additional information on federally- and state-listed species. Potential occurrences of rare, threatened, and endangered species and associated habitats have been identified in accordance with correspondence received from the NYNHP (Seoane, 2008). In addition, the NYS list of endangered threatened, rare, and exploitably vulnerable plant species which occur in Orange County has been reviewed for the potential for these species to occur on-site.

14.3 EXISTING CONDITIONS

14.3.1 Ecological Communities

The ecological communities associated with the site have been categorized in accordance with Ecological Communities of New York State (Edinger et al,, 2002). Table 14-1 presents the site's ecological communities and their approximate areas:

Table 14-1
Ecological communities of the CPV Valley Energy Center

Ecological Communities	Location on Site	Approx. Area on Site, acres [1]
V. Palustrine Communities		
A.2. Shallow emergent marsh	Eastern end	31.35
A.3 Shrub swamp	Northeastern part – fringe areas	10.40
C.2. Red maple-hardwood swamp	Eastern-central part	26.48
VI. Terrestrial Communities		
A.25 Successional old field	Western end	5.62
C.17 Beech-maple mesic forest	Central and western areas	8.94
C.27 Successional southern hardwoods	Various site areas	6.84
D.1. Cropland/row crops	Eastern part (Energy Center)	22.32
D.2. Cropland/field crops	Northwestern part	28.27
D.13 Mowed roadside/path	Along adjacent roads/highways	9.41

[1] Approximate acreage includes some immediately adjacent off-site areas such as Shrub swamp and the Mowed roadside along I-84, Rt. 17M and Rt. 6.

Each of these communities is defined below in accordance with Edinger et al. (2002) along with their location on the site and typical and observed associated vegetative species. A map of the on-site ecological communities is found on Figure 14-1. A discussion of invasive species observed on the site is also included below.

Shallow Emergent Marsh

This is a marsh meadow community that occurs on mineral soil or deep muck soils (rather than true peat), that are permanently saturated and seasonally flooded. Shallow emergent marshes typically occur in lake basins and along streams often intergrading with deep emergent marshes, shrub swamps, and sedge meadows, and they may occur in a complex mosaic in a large wetland. On-site, this community occurs in the eastern end of the site, closest to Route 17M and the I-84 westbound on-ramp.

Dominant vegetation includes bulrushes (*Scirpus* sp.), bluejoint grass (*Calamagrostis canadensis*), cattails (*Typha latifolia*), and sedges (*Carex* sp.) amongst others. Vegetation observed within the shallow emergent marsh included meadowsweet (*Spiraea latifolia*), boneset (*Eupatorium perfoliatum*), purple loosestrife (*Lythrum salicaria*), golden rod (*Solidago* sp.), narrow-leaved mountain mint (*Pycnanthemum tenuifolium*), swamp milkweed (*Asclepias incarnate*), sensitive fern (*Onoclea sensibilis*), and tussock sedge (*Carex stricta*). Scattered shrubs included gray-stem dogwoods (*Cornus racemosa*) and slippery elm (*Ulmus rubra*).

Shrub Swamp

A shrub swamp is an inland wetland dominated by tall shrubs that occurs along the shore of a lake or river, in a wet depression or valley not associated with lakes, or as a transition between a marsh, fen, or bog and a swamp or upland community. The substrate is usually mineral soil or muck. This is a very broadly defined type that includes several distinct communities and many intermediates. Shrub swamps are very common and quite variable. The main shrub swamp on the site occurs in fringe areas in a transition between the shallow emergent marsh and the forested swamp to the east and south. A smaller shrub swamp is located in the central northern area of the property, just north of the northernmost unnamed stream.

Common shrub swamp vegetation includes speckled meadowsweet, steeplebush (*Spiraea tomentosa*), gray-stem dogwood, swamp azalea (*Rhododendron viscosum*), highbush blueberry (*Vaccinium corymbosum*), and willows (*Salix* sp.). Vegetation observed during site visits included arrow-wood (*Viburnum recognitum*), slippery elm, and tartarian honeysuckle (*Lonicera tatarica*).

Red maple-Hardwood Swamp

This is a hardwood swamp that occurs in poorly drained depressions, usually on inorganic soils. This is a broadly defined community with many regional and edaphic variants. In any one stand red maple (*Acer rubrum*) is either the only canopy dominant, or it is codominant with other hardwoods such as ashes (*Fraxinus pennsylvanica*), elms, yellow birches (*Betula alleghaniensis*), and swamp white oaks (*Quercus bicolor*). This community occurs in the eastern-central part of the site, and is in an upland-wetland complex with an upland forest community, described below.

The red maple-hardwood swamp on the site is dominated by a red maple canopy with ash and swamp white oak co-dominants. Shagbark hickory (*Carya ovata*) and pin oaks (*Quercus palustris*) were also noted. The herbaceous layer is composed primarily of jewelweed (*Impatiens pallida*), poison ivy (*Toxicodendron radicans*), cinnamon fern (*Osmunda cinnamomea*), and sensitive fern with scattered areas of phragmites (*Phragmites australis*). The shrub/sapling layer consisted of willows, slippery elms, ashes, and gray-stem dogwoods.

Successional Old Field

Successional old field is a meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned. Shrubs may be present, but collectively they have less than 50% cover in the community. On-site, this community occurs in the western site corner, adjacent to Route 6 and the site access road. Other portions of the site that may qualify as successional old field include field edges and vegetated upland areas along ditches and older hayfields that are occasionally cleared of woody vegetation but not regularly cultivated.

Common vegetation in the successional old field communities consisted of mugwort (*Artemisia vulgaris*), knapweed (*Centaurea* sp.), thistle (*Cirsium* sp.), common mullien (*Verbascum thapsus*), yarrow (*Achillea millefolium*), ox-eye daisy (*Chrysanthemum leucanthemum*), and pokeweed (*Phytolacca americana*).

Wetter portions of the successional old field communities consisted of dock (*Rumex* sp.), sedges, goldenrods, broad-leaved cattails, broom sedge (*Carex scoparia*), soft rush (*Juncus effusus*), twig rush (*Cladium mariscoides*) , and reed canary grass (*Phalaris arundinacea*).

Beech-maple Mesic Forest

This is a hardwood forest with sugar maple (*Acer saccharum*) and beech (*Fagus grandifolia*) codominant. This is a broadly defined community type with several regional and edaphic variants. These forests occur on moist, well-drained, usually acid soils. On-site, this upland forest located in the central-eastern part, is patchy and fragmented, and is intermixed with the forested swamp.

Herbaceous vegetation observed in the beech-maple mesic forest community includes may-apple (*Podophyllum peltatum*), tussock sedge, wood fern (*Dryopteris* sp.), and nettle (*Urtica* sp.). The shrub/sapling layer included northern arrow-wood, iron wood (*Carpinus caroliniana*), slippery elm and red maple. Other trees observed included black birch (*Betula lenta*), swamp white oak, pin oak, white oak (*Quercus alba*), shagbark hickory, white ash (*Fraxinus americana*), tulip tree (*Liriodendron tulipfera*), basswood (*Tilia americana*), and green ash.

Successional Southern Hardwoods

This community is a hardwood or mixed forest that occurs on sites that have been cleared or otherwise disturbed. Small patches of this community occur on the site along slopes adjacent to roadways (e.g., along Rt. 6 in the western corner of the site), and in other formerly agricultural areas (hayfield, pasture, etc.) that have not been recently disturbed.

Characteristic trees and shrubs include American elm (*Ulmus americana*), slippery elm (*Ulmus rubra*), box elder (*Acer negundo*), silver maple (*Acer saccharinum*), sassafras (*Sassafras albidum*), gray birch (*Betula populifolia*), black locust (*Robinia pseudo-acacia*), hawthorns (*Crataegus* spp.) and common buckthorn (*Rhamnus cathartica*).

Cropland/Row Crops

This is an agricultural field planted in row crops such as corn, potatoes, and soybeans. The majority of the Project site is located within this community type, which has most recently been cultivated as corn.

Hedgerows in these areas consist of red oak (*Quercus rubra*), black cherry (*Prunus serotina*), multiflora rose (*Rosa multiflora*), and common buckthorn (*Rhamnus cathartica*).

Ditches that have historically been excavated in this area are generally vegetated with red maple and common reed.

Cropland/Field Crops

This is an agricultural field planted in field crops such as alfalfa, wheat, timothy, and oats. This community includes hayfields that are rotated to pasture. On-site, hayfields are located along the northwestern part of the site, along Route 6. Due to the presence of hydric (wetland) soils within these hayfields that have been drained via drainage ditches, portions of the hayfields have been mapped as state (NYSDEC) and Federal jurisdictional wetlands.

Mowed Roadside/Path

This community is a narrow strip of mowed vegetation along the side of a road, or a mowed pathway through taller vegetation, and is dominated by grasses, sedges, rushes, forbes, vines and/or low shrubs that can tolerate infrequent mowing. Mowed roadside areas are found along the adjacent highways that abut the site, including I-84, Route 17M and Route 6.

Invasive Species

Stands of common reed and purple loosestrife were observed on the Project site. Common reed is located within the Cropland/Row Crops and Mowed Roadside/Path communities situated in disturbed areas that are adjacent to the I-84 highway. Purple loosestrife was observed in the shallow emergent marsh on the eastern end of the site, closest to Route 17M and the I-84 westbound on-ramp.

The proposed Project will avoid the introduction and further spread of invasive species to the maximum extent possible. A small area of common reed within the croplands will be filled as part of the construction process. For wetland impacts, a wetland mitigation area will be constructed. Native saplings and shrubs will be planted within the wetland replication; the replication will also be seeded to quickly establish herbaceous growth. The rapid establishment of native vegetation will lessen the opportunity of invasive species colonization on the site.

Patches of purple loosestrife will generally be avoided during the construction process, though some plants adjacent to the unnamed stream will be cut to provide access for the establishment of electric lines and poles. These disturbed areas will re-vegetate naturally and it is likely that purple loosestrife will remain in the area.

Table 14-2 lists the plant species observed at the Project Site, laydown areas, and interconnections by cover type.

Appendix 14-B of this Section contains the NYS list of Endangered threatened, rare, and exploitably vulnerable plant species which occur in Orange County, along with their general habitat and the potential for the plant to occur on the Project site.

14.3.2 Wetlands

The site contains wetlands under both state and Federal jurisdiction. A NYSDEC Freshwater Wetland (FW) (#MD-23) regulated under Article 24 of the Environmental Conservation Law and Regulations (6NYCRR Parts 663, 664 and 665) occurs in the northern and eastern part of the site (See Figure 2-3, Existing Conditions Plan). A Federal jurisdictional wetland under Section 404 of the Clean Water Act, administered by the ACOE, occurs in much of the same area as the NYSDEC FWW, but also in several other areas of the site such as along I-84, along drainage swales and in small pockets in and around the agricultural fields (See Figure 2-3, Existing Conditions Plan). The delineation of the location and extent of both the NYSDEC and Federal wetlands was initiated by the current landowner, and has been confirmed through a review and approval process with NYSDEC and a Jurisdictional Determination by the ACOE. The final NYSDEC wetland boundary approval was received by the landowner on December 28, 2007. The final approved ACOE Jurisdictional Determination mapping was issued on March 26, 2008.

Two main streams traverse the site and flow east toward Route 17M. The main channel, Carpenter Creek, enters the site near the existing site access road along Route 6 in the western part of the site, and flows east through the center of the site. A number of small, man-made drainage swales join this stream from the adjacent fields, both from the north and south of Carpenter Creek. A second stream enters the site from the south via a culvert beneath I-84, and flows northeast along the site's southern/eastern boundary with I-84. The streams join together in the far eastern part of the site, then flows beneath Route 17M via a culvert and joins Monhagen Brook approximately 1,000 feet to the east of Route 17M.

As described above, site wetland communities consist of shallow emergent marsh/ meadow, located in the eastern part of the site, forested swamp in the eastern-central part, and cultivated wet meadow areas along the stream in the northern part. In order to further evaluate on-site wetland resources and potential impacts associated with project development, a Wetland Functional Assessment of on-site wetlands is provided in Appendix 14-C. The original wetland data sheets submitted with the wetland mapping (by others) are included in Appendix 14-D.

Table 14-2 Plant Species Observed at Project Site, Laydown Areas and Interconnections, by Cover Type								
TREES			VEGETATION COVER TYPES[a]					
Scientific Name[b]	**Common Name**	**Relative Abundance[c]**	**AC**	**OF**	**DFU**	**DFW**	**EW/ WM**	**SSW**
Acer platanoides	Maple, norway	C		X		X		
Acer rubrum	Maple, red	A			X	X		X
Acer saccharum	Maple, sugar	C			X			
Ailanthus altissima	Tree-of-heaven	C		X	X			
Betula populifolia	Birch, black	C			X	X		X
Carpinus caroliniana	Hornbeam, American	C				X		
Carya ovata	Hickory, shag-bark	C			X	X		
Catalpa speciosa	Catalpa, northern	U		X				
Fraxinus americana	Ash, white	C			X			
Fraxinus pennsylvanica	Ash, green	C		X	X	X	X	X
Liriodendron tulipifera	Tulip tree	S						
Nyssa sylvatica	Black gum	U			X			
Populus deltoides	Cottonwood, eastern	U			X			X
Prunus serotina	Cherry, black	A			X			
Quercus bicolor	Oak, swamp white	A			X	X		X
Quercus palustris	Oak, pin	C			X	X	X	X
Quercus rubra	Oak, red	C		X				
Salix nigra	Willow, black	C						
Tilia americana	Basswood	C			X	X		
Ulmus rubra	Elm, slippery	C			X	X	X	X

[a] AC – Agricultural Cropland, OF – Open Field, DFU – Deciduous Forest Upland, DFW – Deciduous Forest Wetland, EW/WM – Emergent Wetland/Wet Meadow, SSW – Scrub-Shrub Wetland.
[b] Nomenclature follows Mitchell and Tucker (1997).
[c] Relative abundance in appropriate habitat. A – Abundant, C – Common, U – Uncommon, S – Scarce

Table 14-2 Plant Species Observed at Project Site, Laydown Areas and Interconnections, by Cover Type (Cont'd)								
SHRUBS			**VEGETATION COVER TYPES[a]**					
Scientific Name[b]	**Common Name**	**Relative Abundance[c]**	**AC**	**OF**	**DFU**	**DFW**	**EW/ WM**	**SSW**
Betula populifolia	Birch, Gray	S				X		
Cornus foemina ssp. *Racemosa*	Dogwood, gray	A			X	X	X	X
Lonicera tatarica	Honeysuckle, tartarian	C				X		X
Parthenocissus quinquefolia	Creeper, Virginia	A			X	X		X
Rhamnus cathartica	Buckthorn, common	C		X	X			X
Rhus typhina	Sumac, staghorn	S		X				
Rosa multiflora	Rose, multiflora	C		X	X			X
Toxicodendron radicans	Ivy, poison	A			X	X		X
Viburnum recognitum	Arrow-wood	C				X	X	X
Vitis sp.	Grape	C			X	X		X

(a) D/R – Developed/Residential, AC – Agricultural Cropland, OF – Open Field, DFU – Deciduous Forest Upland, OW – Open Water, EW/WM – Emergent Wetland/Wet Meadow, SSW – Scrub-Shrub Wetland.
(b) Nomenclature follows Mitchell and Tucker (1997).
(c) Relative abundance in appropriate habitat. A – Abundant, C – Common, U – Uncommon, S – Scarce.

14.3.3 Wildlife

This section discusses the species of mammals, birds, amphibians and reptiles reasonably likely to occur at and around the Project site and interconnections, based on observations and supplemented by publicly available resources. Wildlife and wildlife habitats on the Project site and interconnections were characterized based on reconnaissance and research of available data from the New York State Amphibian and Reptile Atlas Project, the NYS Breeding Bird Atlas and range maps, and other similar references. In addition, to address species of regional concern ("Conservation Concern species"), the NYSDEC list of Species of Greatest Conservation Need, NYS Comprehensive Wildlife Strategy (NYSDEC, 2008a) was consulted and reviewed with respect to the potential occurrence of these species on-site and any potential impacts associated with construction. A compilation and review of these species relative to their potential occurrence on the site is provided in Appendix 14-B.

The site and laydown areas are primarily agricultural. Surrounding areas are generally agricultural, moderately developed or rural/residential. Most wildlife species found in such areas are tolerant of human activity and disturbance. The species present on site are likely to be relatively common agricultural, suburban and forest edge species with little potential for forest interior species.

14.3.3.1 Survey Methodology

The following text discusses the wildlife survey conducted and wildlife species that would be expected to breed on site, as well as those species that might be expected during migrations or as winter residents.

The information review for amphibians and reptiles consisted of reviewing interim maps produced from the NYSDEC Herp Atlas Project. These maps identify species by county, in which the species were recorded between 1990 and 1998. These distribution maps were used to provide information on those species of amphibians and reptiles found in the vicinity of the study area and likely to be present in the study area.

Birds in the study area were identified using the 5 km x 5 km "block" in which the site was found according to the New York Breeding Bird Atlas. Data for the Atlas was collected between 2000 and 2005. The species list for the block in which the site is located was used as the basis for determining those species likely to be breeding birds on the site.

Mammal data were collected by visual observations of individuals or their sign (i.e. tracks, scat, and trails) in each vegetation cover type. Additional information regarding what mammal species have the potential to occur on the Project site was collected from existing, available references such as DeGraff and Rudis (1986) - *New England Wildlife, Habitat, Natural History and Distribution* and Whitaker and Hamilton (1998) - *Mammals of the Eastern United States*. No trapping effort was undertaken.

14.3.3.2 Reptiles and Amphibians

Table 14-3 presents information on the species of amphibians and reptiles recorded during the Herp Atlas Project in the topographic quad in which the site is found, or in at least one of the eight adjacent topographic quads. The table provides a list of species likely to be found in the vicinity of the site. The "Possible" column indicates those species that could possibly occur on-site or on the laydown area, based on the habitats and their configurations.

The ditches, two streams, and wetlands on the site are habitats in which most of the amphibians might be found, although species such as the eastern American toad, the northern spring peeper, the juvenile form (eft) of the red-spotted newt, and the wood frog may wander far from the waterbodies in which they breed and could be found in many different vegetation cover types. Painted turtles were observed in a few locations within the stream flowing east toward the Monhagen Brook in the eastern portion of the site.

All of the "Possible" species of salamanders, except for the northern redback salamander, require open water (ponds, streams or springs) in which to breed. The northern redback salamander is usually associated with forested habitats, but can be found in moist soils in open areas and in otherwise disturbed areas such as residential areas.

Most of the salamander species recorded in the site topographic quad or adjacent quads are not likely to be found on the site. The several mole salamanders (*Amybstoma* sp.) are usually associated with wet, forested areas where they breed in vernal pools (those that dry up regularly). The two dusky salamanders, northern red salamanders, northern spring salamanders and longtail salamanders are found in small, rocky streams or springs, usually in wooded areas. Four-toed salamanders are found in wet woods and sphagnum wetlands and slimy salamanders are usually found on hillsides in wooded ravines. Of the above mentioned habitat types, only forested areas adjacent to vernal pools are found on the site.

Several other amphibian species of toads and frogs are possibly found on the site and all are relatively common. All of the toad and frog species potentially present on the site require waterbodies to breed and most of the below mentioned species are usually associated with permanent waterbodies (ponds or streams). Two species which are likely present on the property include the eastern American toad and the northern leopard frog. The toad is found in almost any habitat with cover and damp soil while the northern leopard frog is commonly found in wet meadows, which are abundant on the site. The northern spring peeper and the wood frog are usually associated with marshy or wet woods though the wood frog may wander far from waterbodies during the summer. These species may inhabit the woods adjacent to the wetlands on the site. The gray treefrog requires forested areas with small trees and shrubs located in or near shallow water; an aquatic site is required for breeding. The lack of a permanent, shallow water wetland on the property makes it unlikely that this species is present. The bullfrog requires large, permanent bodies of water with emergent vegetation. This habitat type is not found on the site; therefore the presence of bullfrogs is unlikely. The green frog often inhabits margins of shallow permanent and semipermanent fresh water areas including streams and creeks, which are present on the site. Pickerel frogs require shallow, clear water of bogs and woodland ponds for breeding. They are often found in the colder waters of clear streams and springs, though in summer they can be found in pastures and fields a distance from water.

Table 14-3
Reptiles and Amphibians Observed or with Potential to Occur on the Site, Interconnections and Construction Laydown Areas

Common Name[(a)]	Scientific Name	ATLAS[(b)]	Possible[(c)]	Observed on Site	State Listed[(d)]
SALAMANDERS					
Marbled salamander	*Ambystoma opacum*	IN			SPEC
Jefferson salamander	*Ambystoma jeffersonianum*	IN			SPEC
Blue-spotted salamander	*Ambystoma laterale*	ADJACENT			SPEC
Spotted salamander	*Ambystoma maculatum*	IN			
Red-spotted newt	*Notophthalmus v. viridescens*	ADJACENT			
Northern dusky salamander	*Desmognathus fuscus*	ADJACENT			
Allegheny dusky salamander	*Desmognathus ochrophaeus*	ADJACENT			
Northern redback salamander	*Plethodon cinereus*	IN			
Northern slimy salamander	*Plethodon glutinosus*	IN			
Four-toed salamander	*Hemidactylium scutatum*	IN			
Northern red salamander	*Pseudotriton r. ruber*	ADJACENT			
Northern two-lined salamander	*Eurycea bislineata*	ADJACENT			
Northern spring salamander	*Gyrinophilus porphyriticus*	ADJACENT			
Longtail salamander	*Eurycea l. longicauda*	ADJACENT			SPEC
TOADS AND FROGS					
Eastern American toad	*Bufo a. americanus*	IN	X		
Gray treefrog	*Hyla versicolor*	IN			
Northern spring peeper	*Pseudacris c. crucifer*	IN	X		
Bullfrog	*Rana catesbeiana*	IN			
Green frog	*Rana clamitans melanota*	IN	X		
Wood frog	*Rana sylvatica*	IN	X		
Northern leopard frog	*Rana pipiens*	IN	X		
Pickerel frog	*Rana palustris*	IN	X		
TURTLES					
Common snapping turtle	*Chelydra s. serpentina*	IN	X		
Common musk turtle –distribution map not found	*Sternotherus odoratus*	ADJACENT			
Spotted turtle	*Clemmys guttata*	IN			SPEC
Bog turtle	*Clemmys muhlenbergii*	IN			END

Table 14-3
Reptiles and Amphibians Observed or with Potential to Occur on the Site, Interconnections and Construction Laydown Areas

Common Name[a]	Scientific Name	ATLAS[b]	Possible[c]	Observed on Site	State Listed[d]
Wood turtle	*Clemmys insculpta*	IN	X		SPEC
Eastern box turtle	*Terrapene c. carolina*	IN	X		SPEC
Eastern redbelly turtle	*Pseudemys rubriventris*	IN	X		
Red-eared slider	*Trachemys scripta*	ADJACENT	X		
Eastern painted turtle	*Chrysemys p. picta*	IN	X	X	
SNAKES					
Northern water snake	*Nerodia s. sipedon*	IN	X		
Northern brown snake	*Storeria d. dekayi*	IN	X		
Northern redbelly snake	*Storeria o. occipitomaculata*	ADJACENT	X		
Common garter snake	*Thamnophis sirtalis*	IN	X		
Eastern ribbon snake	*Thamnophis sauritus*	ADJACENT	X		
Eastern hognose snake	*Heterodon platirhinos*	ADJACENT			SPEC
Northern ringneck snake	*Diadophis punctatus edwardsii*	ADJACENT	X		
Northern black racer	*Coluber c. constrictor*	IN	X		
Smooth green snake	*Liochlorophis vernalis*	ADJACENT	X		
Black rat snake	*Elaphe o. obsoleta*	ADJACENT	X		
Eastern milk snake	*Lampropeltis t. triangulum*	IN	X		
Northern copperhead snake	*Agkistrodon contortix*	IN			
Timber rattlesnake	*Crotalus horridus*	ADJACENT			THR

(a) Common and scientific names according to DeGraff et. al (1986).

(b) Species recorded during the New York Amphibian and Reptile Atlas (1990-2007 INTERIM DATA). "IN" = Recorded in 7½ minute quad in which the site is found, "ADJACENT" = Recorded in an adjacent quad.

(c) Possible inhabitant of site, based on available on-site habitats.

(d) State listed species: END = Endangered, THR = Threatened, SPEC = Special Concern Species.

Several turtle species are possible on the site and all but the eastern box turtle are generally associated with waterbodies (ponds or streams). Painted turtles are especially common and are inhabitants of the eastern portion of the stream flowing through the site. At least three were observed during site visits. Even largely aquatic species of turtles lay their eggs in upland areas. Two turtle nests were observed (the eggshell remains were found) in the grassy area on the northern side of the stream directly adjacent to the 17M culvert. The turtle species that dug the nests and laid the eggs could not be determined from the remains. The juxtaposition of open, upland vegetation communities adjacent to the stream in this area provides good nesting habitat for several species of turtles.

The bog turtle is a state and federally listed endangered/threatened (respectively) species that the Herp Atlas has identified as being potentially located on the property. An extensive assessment of the habitats on the site determined that it is unlikely that bog turtles inhabit the site due to a lack of emergent wetlands dominated by tussock sedge.

A number of snake species are possible inhabitants of the site. The northern water snake and the eastern ribbon snake are usually associated with waterbodies. Northern brown snakes and eastern milk snakes are often found in open fields and near farms and residential areas. Black racers are generally associated with open-field type habitats, where they prey on rodents, other small mammals and nesting birds. Smooth green snakes are also found in open habitats such as meadows where they feed largely on insects. Garter snakes can be found in virtually any habitat and are a very common species in New York. Northern ringneck and black rat snakes are usually associated with wooded habitats and field edges.

Other snake species on the list are found in habitats that are not present on the site. Hognose snakes are usually found in areas with sandy soils, often associated with upland pine or mixed forests. Timber rattlesnakes and northern copperhead snakes inhabit areas with rocky outcroppings and rocky/forested hillsides.

14.3.3.3 Birds

Table 14-4 provides a list of bird species that were recorded during the 2000-2005 New York Breeding Bird Atlas Project in the 5 km x 5 km “block” in which the site is found (Block 5458A). Atlas data provide a degree of confidence in breeding status, with most of the listed species being confirmed breeders in the block.

The assessment of the potential for species to be breeders on-site is based on available habitats. The Atlas data are attributable to a much wider variety of habitats than are found on site /laydown areas. The block that includes the site contains far more types of habitat, including large tracts of wooded habitats, than are present on the site.

Table 14-4 Bird Species with Potential to Occur on the Project Site, Interconnections and Construction Laydown Area				
BIRDS		**ATLAS[b]**	**On-site[c] Potential Breeder**	**State Listed[d]**
Common Name[a]	**Scientific Name**			
Great blue heron	*Ardea herodias*	POS		
Carolina wren	*Thryothorus ludovicianus*	PRO		
Turkey vulture	*Cathartes aura*	POS		
Canada goose	*Branta canadensis*	CON	X	
Bank swallow	*Riparia riparia*	CON		
Eastern screech owl	*Megascops asio*	CON		
Mallard	*Anas platyrhynchos*	CON	X	
Cooper's hawk	*Accipiter cooperii*	PRO		SPEC
Broad-winged hawk	*Buteo platypterus*	POS		
Red-tailed hawk	*Buteo jamaicensis*	CON	X	
Fish crow	*Corvus ossifragus*	CON		
Northern rough-winged swallow	*Stelgidopteryx serripennis*	POS		
Killdeer	*Charadrius vociferus*	PRO	X	
Orchard oriole	*Icterus spurius*	PRO		
Ruby-throated hummingbird	*Archilochus colubris*	PRO		
American woodcock	*Scolopax minor*	PRO	X	
Warbling vireo	*Vireo gilvus*	CON		
Rock dove	*Columba livia*	CON	X	
Mourning dove	*Zenaida macroura*	CON	X	
Wild turkey	*Meleagris gallopavo*	PRO		
Chimney swift	*Chaetura pelagica*	CON	X	
Belted kingfisher	*Ceryle alcyon*	CON		
Red-bellied woodpecker	*Melanerpes carolinus*	CON	X	
Downy woodpecker	*Picoides pubescens*	CON	X	
Hairy woodpecker	*Picoides villosus*	PRO	X	
Northern flicker	*Colaptes auratus*	CON	X	
Pileated woodpecker	*Dryocopus pileatus*	POS		

Table 14-4 Bird Species with Potential to Occur on the Project Site, Interconnections and Construction Laydown Area				
BIRDS		**ATLAS[b]**	**On-site[c] Potential Breeder**	**State Listed[d]**
Common Name[a]	**Scientific Name**			
Eastern wood-pewee	*Contopus virens*	CON		
Willow flycatcher	*Empidonax traillii*	CON	X	
Eastern phoebe	*Sayornis phoebe*	CON	X	
Great crested flycatcher	*Myiarchus crinitus*	PRO		
Eastern kingbird	*Tyrannus tyrannus*	CON	X	
Yellow-throated vireo	*Vireo flavifrons*	POS		
Red-eyed vireo	*Vireo olivaceus*	PRO	X	
Blue jay	*Cyanocitta cristata*	CON	X	
American crow	*Corvus brachyrhynchos*	CON	X	
Tree swallow	*Tachycineta bicolor*	POS	X	
Barn swallow	*Hirundo rustica*	CON	X	
Black-capped chickadee	*Poecile atricapilla*	CON	X	
Tufted titmouse	*Baeolophus bicolor*	CON	X	
White-breasted nuthatch	*Sitta carolinensis*	CON	X	
House wren	*Troglodytes aedon*	CON	X	
Eastern bluebird	*Sialia sialis*	CON	X	
Veery	*Catharus fuscescens*	CON		
Wood thrush	*Hylocichla mustelina*	CON	X	
American robin	*Turdus migratorius*	CON	X	
Gray catbird	*Dumetella carolinensis*	CON	X	
Northern mockingbird	*Mimus polyglottos*	CON	X	
Brown thrasher	*Toxostoma rufum*	CON	X	
European starling	*Sturnus vulgaris*	CON	X	
Cedar waxwing	*Bombycilla cedrorum*	CON	X	
Yellow warbler	*Dendroica petechia*	CON	X	
Chestnut-sided warbler	*Dendroica pensylvanica*	POS	X	
Pine warbler	*Dendroica pinus*	PRO		

Table 14-4
Bird Species with Potential to Occur on the Project Site, Interconnections and Construction Laydown Area

BIRDS		ATLAS[b]	On-site[c] Potential Breeder	State Listed[d]
Common Name[a]	**Scientific Name**			
American redstart	*Setophaga ruticilla*	POS	X	
Ovenbird	*Seiurus aurocapillus*	PRO		
Common yellowthroat	*Geothlypis trichas*	CON	X	
Scarlet tanager	*Piranga olivacea*	PRO		
Eastern towhee	*Pipilo erythrophthalmus*	CON		
Chipping sparrow	*Spizella passerina*	CON	X	
Field sparrow	*Spizella pusilla*	CON	X	
Song sparrow	*Melospiza melodia*	CON	X	
Swamp sparrow	*Melospiza georgiana*	CON	X	
Northern cardinal	*Cardinalis cardinalis*	CON	X	
Rose-breasted grosbeak	*Pheucticus ludovicianus*	POS	X	
Indigo bunting	*Passerina cyanea*	PRO	X	
Red-winged blackbird	*Agelaius phoeniceus*	CON	X	
Eastern meadowlark	*Sturnella magna*	CON	X	
Common grackle	*Quiscalus quiscula*	CON	X	
Brown-headed cowbird	*Molothrus ater*	CON	X	
Baltimore oriole	*Icterus galbula*	PRO	X	
House finch	*Carpodacus mexicanus*	CON	X	
American goldfinch	*Carduelis tristis*	CON	X	
House sparrow	*Passer domesticus*	CON	X	

[a] Common and Scientific Names according to the New State Breeding Bird Atlas (2000-2005). Block 5458A.
[b] Breeding Bird Atlas Data for block in which site is found: POS = Possible breeder, PRO = Probable breeder, CON = Confirmed breeder.
[c] Based on available habitats on site.
[d] State listed species: END = Endangered, THR = Threatened, SPEC = Special Concern Species.

Potential breeding bird species that may use the site include species that use beech-maple mesic forests, such as American redstart, red-eyed vireo, and red-bellied woodpecker. The open field and agricultural lands may provide habitat for breeding birds such as eastern meadowlark, American robin, and eastern bluebird. The red maple hardwood swamps provide breeding habitat for downy woodpeckers, veery, and wood thrush while the adjacent forest edges provide habitat for gray catbirds, American goldfinches, and northern flickers. Wet meadows are inhabited by common yellowthroats, and red-winged blackbirds. Brushy areas containing shrubs provide nesting areas for willow flycatchers, common yellowthroats, eastern kingbirds, yellow warblers, and song sparrows. Species associated with residential areas, farms, buildings, and driveways such as those nearby include: brown headed cowbird, barn swallow, American robin, common grackle, European starling, and house sparrow.

There is some on-site breeding potential for species that nest in trees that are not necessarily within a large tract of forest. Bird species that use the hedgerows on-site or the edges of the deciduous forest include: red-tailed hawk, blue jay, house wren, common flicker, and Baltimore oriole. The site lacks forest cover that would provide breeding habitat for most of the warbler species listed in the table.

The deciduous forest upland hedgerow provides habitat for the following bird species: red-eyed vireo, American robin, northern cardinal, downy woodpecker, blue jay, gray catbird, and house wren. Wild turkeys and a red-tailed hawk were observed during site visits to the property.

14.3.3.4 Mammals

Table 14-5 lists the species of mammals that are likely to be present on the site. The habitats found on the Project site/laydown area are expected to support a number of mammal species. Rodents, such as the white-footed mouse and meadow vole, and other small mammals, such as shrews and moles, have small home ranges likely to be entirely on the property. Medium-sized mammals, such as the raccoon, skunk, and opossum, and larger species, such as the red fox and white-tailed deer, range farther, and the site/laydown area is likely to constitute only part of their home ranges. It should be noted that a black bear (*Ursus americanus*) was observed during one of the site visits to the property. Black bears are a relatively common animal in rural areas in upstate New York and they are continuing to expand their home ranges. It is likely that the site only constitutes a small portion of their home range.

Several species listed in Table 14-5, including meadow jumping mouse and meadow vole, are characteristic of open habitats such as open fields, hay fields, and wet meadows. Star-nosed moles are often associated with moist habitats such as wet meadows, and muskrats are always associated with open waterbodies and adjacent emergent wetlands. Short-tailed shrews are not restricted to a particular vegetation cover type and can be found virtually anywhere, including in residential areas. The eastern gray squirrel and the white-footed mouse are usually associated with forested areas, although the hedgerows with large, old trees (especially oaks) can provide suitable habitat. Species generally associated with large tracts of forest, such as the porcupine and some bats, are not likely inhabitants of the site.

Table 14-5
Mammals with Potential to Occur on the Project Site, Interconnections and Construction Laydown Areas

MAMMALS		
Common Name[a]	**Scientific Name**	**Possible[b]**
Virginia opossum	*Didelphis virginiana*	X
Masked shrew	*Sorex cinereus*	X
Short-tailed shrew	*Blarina brevicauda*	X
Star-nosed mole	*Condylura cristata*	X
Eastern cottontail	*Sylvilagus floridanus*	X
Eastern chipmunk	*Tamias striatus*	X
Woodchuck	*Marmota monax*	X
Eastern gray squirrel	*Sciurus carolinensis*	X
Meadow jumping mouse	*Zapus hudsonius*	X
White-footed mouse	*Peromyscus leucopus*	X
Meadow vole	*Microtus pennsylvanicus*	X
Common muskrat	*Ondatra zibethicus*	X
House mouse	*Mus musculus*	X
Coyote	*Canis latrans*	X
Red fox	*Vulpes vulpes*	X
Raccoon	*Procyon lotor*	X
Short-tailed weasel	*Mustela erminea*	X
Striped skunk	*Mephitis mephitis*	X
White-tailed deer	*Odocoileus virginianus*	X
Black bear	*Ursus americanus*	X

[a] Common and scientific names according to Whitaker and Hamilton (1998).
[b] Based on available habitats on site.

14.3.4 Rare, Threatened, and Endangered Species

According to the most recent USFWS letter guidance (Niver, 2008), determination of whether any listed, proposed, or candidate species are likely to occur within the proposed Project action area was based on location of the Project and then access to the Orange County, New York listing of federally listed endangered and threatened species and candidate species. Species listed for Orange County are presented in Table 14-6.

According to the most recent NYNHP letter (Seoane, 2008), the federally endangered and New York State endangered Indiana bat has been documented within two miles of the Project site (Seoane, 2008). The Natural Heritage Report on Rare Species indicated that these animals can move two miles or more from documented locations (Seoane, 2008).

Table 14-6 Orange County, New York: Federally Listed Endangered and Threatened Species and Candidate Species (USFWS, 2008)		
Common Name	**Scientific Name**	**Status**
Atlantic Sturgeon[1]	*Acipenser oxyrinchus oxyrinchus*	C
Bald eagle[2]	*Haliaeetus leucocephalus*	D
Bog turtle	*Clemmys muhlenbergii*	T
Indiana Bat (S)	*Myotis sodalis*	E
Dwarf wedge mussel	*Alasmidonta heterodon*	E
Shortnose Sturgeon[1]	*Acipenser brevirostrum*	E

Status Codes: E=Endangered; T=Threatened; C=Candidate; D=Delisted; S=Summer

[1]Primarily occurs in Hudson River. Principal responsibility for this species is vested with the National Oceanic and Atmospheric Administration/Fisheries.
[2]The bald eagle was delisted on August 8, 2007. While there are no ESA requirements for bald eagles after this date, the eagles continue to receive protection under the Bald and Golden Eagle Protection Act.

A brief overview of the life history characteristics for these species is provided below, and a summary overview of the potential impacts is provided in Section 14-4. In addition, a compilation and review of species or Conservation Concern relative to their potential occurrence on the site, including plant species, has been prepared and is provided in Appendix 14-B.

14.3.4.1 Atlantic Sturgeon (Acipenser oxyrinchus oxyrinchus)

The Atlantic sturgeon is a species that is listed as a candidate under the ESA though in New York State it is listed as protected (NYNHP, 2008d). This species' range is restricted to the Atlantic seaboard in North America occurring from Labrador, Canada to the Saint Johns River in Florida (NYNHP, 2008d). In New York State, this species is found only in the lower section of the Hudson River from the southern tip of Manhattan (river mile 0) upriver to the Federal dam at Troy (river mile 152) (NYNHP, 2008d). The Atlantic sturgeon is anadromous, migrating from salt water areas to spawn in freshwater (NOAA, 2008; NYNHP, 2008d). In the Hudson River, this species spawns from April-June with the adult sturgeon migrating upriver from the mid-Hudson overwintering areas to freshwater spawning sites to the north (NYNHP, 2008d). The proposed Project is located approximately 20 miles west of the Hudson River, therefore this species is not expected to occur in the proposed Project Area.

14.3.4.2 Bald Eagle (Haliaeetus leucocephalus)

The bald eagle was delisted from the ESA on August 8, 2007. While there are no ESA requirements for bald eagles after this date, the eagles continue to receive protection under the Bald and Golden Eagle Protection Act (BGEPA).

The bald eagle is a species that is listed as threatened in New York State (NYSDEC, 2008f). Bald eagles are found throughout the entire Unites States except for Hawaii (NYSDEC, 2008f). Eagles prefer habitat consisting of undisturbed areas near sources of open water such as large lakes, reservoirs, wetlands, and rivers where they can hunt their primary food, fish (NYSDEC, 2008f). Bald eagles mate for life and typically produce one or two offspring per year (NYSDEC, 2008f). In New York, in mid to late summer, the young fledge at about 12 weeks of age and are largely independent by 20 weeks (NYSDEC, 2008f). Wintering grounds are located from southern Canada south, along major water bodies including major rivers and areas near some hydroelectric plants (NYSDEC, 2008f). The Bald Eagle is not expected to occur in proposed Project area.

14.3.4.3 Bog Turtle (Clemmys muhlenbergii)

The bog turtle is a species that is listed as threatened under the ESA and endangered in New York State (NYSDEC, 2008b). The bog turtle occurs in twelve states within the eastern United States and has a discontinuous distribution throughout its range (NYNHP, 2008a). Records indicate that small portions of six counties in the lower Hudson River Valley (Columbia, Dutchess, Putnam, Ulster, Orange and Sullivan) of New York State are know to support extant populations of bog turtles (NYNHP, 2008a). This semi-aquatic species prefers habitat with cool, shallow, slow moving water, deep soft muck soils and tussock forming herbaceous vegetation (NYSDEC 2008a). This species is generally found in open, early successional types of habitats such as wet meadows or open calcareous boggy areas (NYSDEC, 2008b). As with other cold-blooded species, the bog turtle requires habitats with substantial amounts of solar penetration for baking and nesting (NYSDEC, 2008b). In New York, the bog turtle typically emerges from hibernation by mid-April (NYSDEC, 2008a). Mating primarily occurs in the spring when both the water and air temperature exceeds 50 degrees F; though mating in the fall may also occur (NYSDEC, 2008b). Bog turtles typically nest in early to mid-June with a clutch of two to four eggs generally located inside the upper part of an unshaded tussock (NYSDEC, 2008b). The eggs hatch around mid-September, with some young turtles overwintering in the nest, emerging the following spring (NYSDEC, 2008b). Bog turtles in New York typically enter hibernation in late October (NYSDEC, 2008b). Based on the site survey, this species is not expected to occur in proposed Project area.

14.3.4.4 Dwarf Wedge Mussel (Alasmidonta heterodon)

The dwarf wedge mussel is a species that is listed as endangered under the ESA and also in New York State (NYSDEC, 2008c). This species is discontinuously distributed along the Atlantic seaboard drainages in North America from New Hampshire to North Carolina (NYNHP, 2008b). In New York State, only two populations of this species are known to occur. These two populations are in the upper Delaware River in Sullivan and Delaware Counties on one of its major downstream tributaries, the lower Neversink River in Orange County (NYNHP, 2008b). The dwarf wedge mussel is a small freshwater mussel (usually less than 1.8 inch (45 mm) in length and 1 inch (25 mm) in height) that is sexually dimorphic (Natureserve, 2007; NYSDEC, 2008c). This species is a long term brooder that spawns in late summer and becomes gravid in the fall (Natureserve, 2007). Possible glochicial hosts include the tessellated darter (*Etheostoma olmstedti*), the Johnny darter (*E. nigrum*), and the mottled sculpin (*Cottus bairdi*) (Natureserve, 2007). This species is found in shallow to deep quick running water on cobble, fine gravel, or on firm silt or sandy substrates (Natureserve, 2007). Other habitat areas can include among submerged aquatic plants and near stream banks underneath overhanging tree limbs (Natureserve, 2007). Adult mussels are filter feeders, feeding on algae and other small particles that are suspended (NYSDEC, 2008c). The proposed Project is located in areas that cross Monhagen Brook which is located in the Walkill Watershed that is part of the Hudson River

Drainage Basin. Due to the lack of suitable habitat conditions on-site, this species is not expected to occur in proposed Project area.

14.3.4.5 Indiana Bat (Myotis sodalis)

The Indiana bat is a species that is listed as endangered under the ESA and also in New York State (NYNHP, 2008c) This species is approximately two inches (51 mm) long and weighs approximately 0.2 - 0.3 ounces (6-9 gm) (NYNHP, 2008c). Indiana bats are uniformly dark grey to grayish-brown in color and often have a pinkish colored nose (NYNHP, 2008c). In spring, Indiana bats disperse from their winter homes (hibernacula), some going hundreds of miles (NYSDEC, 2008d). This species feeds solely on flying insects and food items reflect the environments where they forage (NYNHP, 2008c; NYSDEC, 2008d). Females congregate in nursery colonies and a single young is born to each female, usually late in June, and is capable of flying within a month (NYSDEC, 2008d). During August or early September, this species swarms at entrances of selected caves or mines and mating takes place (NYSDEC, 2008d). Winter months are spent in secluded caves or mines that average temperatures of 37 to 43°F (NYSDEC, 2008d). Criteria for hibernacula selection are not well understood, but where this species is found it can be very abundant, congregating in densities of more than 300/ft^2 (NYSDEC, 2008d). Bats often return year after year to the exact same spots within individual mines or caves, with hibernation starting as early as September and extending nearly until June (NYSDEC, 2008d). In New York, knowledge of distribution is limited to known wintering locations (mines or caves) that include hibernacula currently known in Albany, Essex, Warren, Jefferson, Onondaga and Ulster (adjacent to Orange county) counties (NYSDEC, 2008d). Summer range of this species extends beyond these counties since animals disperse to breeding areas and other habitats for feeding and raising young (NYSDEC, 2008d).

According to the NYS NHP, a known winter hibernacula occurs approximately 2 miles from the Energy Center site. Based on preliminary regional presence/absence studies, the NHP anticipates that Indiana bat populations utilize summer roosting habitat or could be found passing through much of the lowlands between Middletown, NY (project vicinity) and the New Jersey border (Al Hicks, personal communication, 2008). Therefore, although the site contains small forested patches of 25 acres or less, some use of the site's forested habitat by Indiana bat could be assumed. Information regarding potential impacts to Indiana bat habitat is discussed further in Section 13.4.2.

14.3.4.6 Shortnose Sturgeon (Acipenser brevirostrum)

The shortnose sturgeon is a species that is listed as endangered under the ESA and also in New York State (NYSDEC, 2008e). This species' range is restricted to the Atlantic seaboard in North America occurring from the Saint John's River in New Brunswick, Canada to the Saint John River in Florida (NYSDEC, 2008e). In New York State, this species is found only in the lower section of the Hudson River from the southern tip of Manhattan (river mile 0) upriver to the Federal dam at Troy (river mile 152) (NYSDEC, 2008e). The shortnose sturgeon is anadromous, migrating from salt water areas to spawn in freshwater (NOAA, 2008; NYSDEC, 2008e). In the Hudson River, this species spawns from April-May with the adult sturgeon migrating upriver from the mid-Hudson overwintering areas to freshwater spawning sites north of Coxsackie

(NYSDEC, 2008e). The proposed Project is located approximately 20 miles west of the Hudson River, therefore this species is not expected to occur in the proposed Project Area.

14.4 PROJECT RELATED IMPACTS AND MITIGATION MEASURES

This section provides an analysis of the potential impact of the construction and operation of the Project and interconnections on the vegetation identified, including a delineation of the vegetation areas to be removed or disturbed. It also provides an analysis of the impact of the construction and operation, including air emissions, of the Project and interconnections on the wildlife, wildlife habitats, and wildlife travel corridors, as identified above.

This section describes both construction-related and operational impacts that are anticipated as a result of development of the Project, as well as proposed mitigation measures to address unavoidable impacts. The discussion of impacts is divided into project components including the Energy Center itself, the electrical interconnect, and the water supply/wastewater lines, and other project-related impacts.

The NYSDEC list of Species of Greatest Conservation Need, NYS Comprehensive Wildlife Strategy (NYSDEC, 2008) was consulted and reviewed with respect to the potential occurrence of these species or their habitat on-site and any potential impacts associated with construction. This list is provided in Appendix 14-B. Potential impacts to these species due to project construction and operation are discussed below.

14.4.1 Energy Center

The CPV Valley Energy Center would be located on approximately a 21.25-acre portion of 122 acres of open land comprising the site, consisting primarily of agricultural cropland and hayfield (See Figure 2-7, Site Plan). An additional 7.6 acres of land, primarily old field and hayfields, within the 122-acre parcel would be temporarily disturbed during construction for materials lay down, equipment storage, and construction parking (See Figure 2-10, Laydown Area Map). Additional details of the development are provided in the following sections.

Ecological Communities

Construction Impacts

The developed Energy Center site will include the generating facility turbine enclosures and emission stacks, access roads, a parking lot, paved chemical and fuel storage yards, the air-cooled condenser, an electrical substation, stormwater facilities, perimeter fencing and landscaped areas. Due to the presence of the 100’ Adjacent Area to the NYSDEC freshwater wetland adjacent to the building area to the north and east, the limits of construction and disturbance will be tightly controlled along this boundary. Construction of the Energy Center will result primarily in the permanent loss of agricultural fields (Cropland/row crops and field crops), Successional old fields, and portions of Beech-Maple mesic forest (Figure 14-2). Several isolated tree rows individual trees within the agricultural field will also be removed. As discussed in Section 14.4.4 Laydown Areas, a portion of the on-site Cropland/row crops and field crops (hayfields), also within the 100 foot Adjacent Area to NYSDEC Freshwater Wetlands, will be used temporarily for construction laydown areas.

The impacts to ecological communities at the Project site are generally a direct result of land clearing (habitat loss), increase in human activity, and habitat fragmentation. A total of approximately 21.25 acres of land will be permanently disturbed at the Project site to allow for the proposed development. This includes permanent fill of 0.34 acres of Federal jurisdictional wetland (Shallow emergent marsh – wet meadow swales) (See Figure 2-7, Site Plan), which will be replaced on-site at a 2:1 ratio. A vegetated buffer zone, totaling approximately 8 acres, will be preserved to the north and east of the Project along the 100' Adjacent Area to the NYSDEC freshwater wetland in the area of proposed construction. The NYSDEC wetland areas themselves will not be impacted. Perimeter fencing to be erected around the Energy Facility will have a negligible impact on ecological communities where a narrow line of vegetation must be cleared (where necessary) for fence installation.

For temporary site disturbances such as the construction laydown areas, a total of 7.6 additional acres of land will be disturbed on-site. These areas will be established in the western part of the site within primarily Successional old field and Cropland/field crops communities (Figure 14-2). These areas will be replanted after construction is complete. Following construction, the laydown areas will be graded, revegetated and stabilized to various environmental specifications. Thus, following revegetation of the disturbed areas, a total of approximately 100 acres of vegetated area will remain following project development.

Construction of the on-site portion of the electrical transmission line, discussed further below, will result in the conversion of 3.24 acres of forested upland and wetlands to permanently non-forested, maintained ROW areas (Figure 14-3), and a total of 1.93 acres of temporary disturbance for construction of the line (not including forest conversion). The remaining on-site portion of the electrical ROW will be maintained in its current state as open wet meadow (Shallow emergent marsh) and Shrub swamp communities.

In summary, a total of approximately 95 acres within the overall 122-acre Project site and construction laydown areas will remain undeveloped. Of the 95 acres, a total of 7.6 acres temporarily disturbed for laydown areas will be revegetated. This represents approximately 71% preservation of vegetation and approximately 6% revegetation. The following sections examine in detail the impact of the proposed site use and development with regard to both vegetation and wildlife.

The vegetative communities adjacent to any major construction project can be diminished as a result of the effects of erosion and sedimentation. The deposition of material in vegetated areas first affects herbaceous species by covering the base of plants, resulting in the depletion of oxygen from the root zone and the death of the plant. Woody species, including trees, can also be affected in this manner, although the species involved and the extent, duration, and nature of the deposited material influence the severity of the impact. In addition, the deposited material from erosion is usually heavier subsoils or fine clays and silts, which makes it difficult for natural reclamation to take place. Measures to prevent these potential impacts are discussed below.

Operational Impacts

Once the Energy Center is constructed and operating, no additional impacts to or loss of ecological communities will occur, however; the construction of the Energy Center will result in the permanent loss of 21.25 acres of agricultural fields and associated adjacent areas (tree rows and individual trees).

Mitigation Measures

All practicable measures have been taken to minimize disturbance to existing ecological communities for the construction of the Energy Center and construction lay-down area. The Facility layout has been developed in a manner to avoid where possible and minimize impacts to wetland areas. The Facility has been located in a relatively flat area. Facility components, access roads, storm water management features and laydown areas have been designed to avoid wetland areas, with the exception of impacts to portions of small, linear wetland swales and pockets located in and adjacent to the agricultural fields. The nonstructural portions of the Energy Center will be stabilized and landscaped as part of project construction. Forested areas surrounding the Facility will be maintained to provide a visual buffer from the highway, local roads and neighborhoods, and site re-vegetation will include replication of shrub and ultimately forested wetland communities.

Once construction is completed, the laydown area in the western part of the site will be re-graded as necessary, and the site will be re-vegetated with native vegetative meadow, shrub and tree species.

Erosion and sedimentation will be controlled by practical construction techniques and control measures, as discussed in the Stormwater Pollution Prevention Plan (Appendix 12-A). With the proper installation and maintenance of erosion control barriers and other control measures, the extent of any indirect impacts from erosion and sedimentation should be minor to non-existent. During Project operation, the storm water management system, coupled with the landscaping program, will ensure that erosion and sedimentation is minimized.

Wetlands

Construction Impacts

Project construction will result in the filling of approximately 0.34 acres of several linear and pocketed wetland swales located within the agricultural fields around the perimeter of the Energy Facility (See Figure 2-7). These areas are Federal-jurisdictional wetlands based on the Army Corps Wetland Jurisdictional Determination completed in 2008. The wetlands contain mostly herbaceous, disturbance tolerant vegetation, a shallow, perched groundwater table, and some were frequently tilled in the recent past as part of the crop field. The installation of a perimeter fence partially within on-site wetlands (mostly agricultural fields) will have a negligible impact on the wetland communities.

Operational Impacts

Once construction of the Energy Center is completed, no on-going, operational impacts to wetlands will occur. Potential, indirect impacts to wetlands such as stormwater runoff will be addressed as part of the site's stormwater management system.

The Project will slightly change existing hydrological patterns on-site (See Section 13.0 Water Resources and Figure 2-7). Impervious Project surfaces will drain to the storm water management system and discharge to a new detention pond that will subsequently discharge to the on-site wetlands. Pervious surfaces will continue to drain toward the on-site tributary to Monhagen Brook and surrounding wetlands. Nutrient retention will not be significantly affected because the Project will reduce the amount of nutrified runoff attributable to agricultural cropland. Thus, the on-site wetlands and downstream waterbodies will experience a reduction in sediment discharge, nitrogen and phosphate.

The storm water management system for the Project is designed such that discharge rates under major storm events will not exceed pre-development rates. As required under the General SPDES permit guidelines, the first-flush will also be detained for the required 24-hour period. Further, discharge from the storm water management system will be directed to the remaining undisturbed wetland areas on the site, where storm water currently discharges. Thus, drainage patterns will be maintained. Based on the maintenance of overall site drainage to these remaining areas, and the limited magnitude of impacts to these areas, overall flood attenuation function for the wetland areas on the Project site and laydown areas is not expected to be impacted.

Mitigation Measures

As a result of the loss of 0.34 acres of a Federal jurisdictional wetland, the wetland will be replaced on-site on a 2:1 area basis, totaling 0.80 acres (30,500 sq. ft.) of wetland replacement (Figure 14-4). The wetland mitigation area will be located along existing wetlands to the northeast of the Energy Facility, and will be hydrologically connected to the large on-site wetland system, including both state and Federal jurisdictional wetlands.

As described in Appendix 14-C Wetlands Functional Assessment, the functions associated with site wetlands considered to be of primary importance include:

- Groundwater Recharge/Discharge
- Fish and Shellfish Habitat
- Sediment/Toxicant/Pathogen Retention
- Nutrient Removal/Retention/Transformation
- Production (Nutrient) Export
- Wildlife Habitat
- Visual Quality/Aesthetics

Therefore, the assessment of unavoidable wetland impacts due to the Project has recognized these primary functions, and the site layout been designed to avoid or minimize impacts to these functions. Examples of this include minimizing conversion loss of forested wetland, avoiding alteration or blockage of stream flow, maintaining vegetated buffers and controlling stormwater volumes and peak flow discharges to wetlands. Accordingly, wetland mitigation planning has been developed to replace or enhance these wetlands functions to the extent possible.

The wetland mitigation area will be planted with native tree, shrub and herbaceous species with wildlife habitat value such as seed and berry food sources, and cover/shelter characteristics. Additional features such as dead woody debris will be included to provide additional wildlife habitat value.

Erosion and sedimentation will be controlled by practical construction techniques and control measures, as discussed in the Stormwater Pollution Prevention Plan (Appendix 12-A). With the proper installation and maintenance of erosion control barriers and other control measures, the extent of any indirect impacts from erosion and sedimentation should be minor to non-existent. During Project operation, the storm water management system, coupled with the landscaping program, will ensure that erosion and sedimentation does not occur.

Wildlife/Habitat

Construction Impacts

The extent to which land clearing will affect the wildlife species identified in Section 14.3 above depends upon the use each species makes of the areas to be impacted and, to some extent, on the size and characteristics of the home range of each species. Similar habitat is available in abundance in the immediate vicinity. Considering the abundance of agricultural habitat in the area, the permanent loss of 21.25 acres of agricultural area due to the construction of the Energy Center and associated appurtenances in Orange County represents a minimal reduction.

The construction laydown area proposed for the western portion of the Project site will impact agricultural cropland and open field (Figure 14-2). A construction road will be developed along the existing dirt farm road from the laydown area on the Project site to the site access roadway. The edge of this roadway will impact a limited amount of agricultural cropland. Wildlife species which nest, feed, or take cover within these habitats will be affected. Although local impacts are expected, similar habitat exists elsewhere on the site and in the general area. Regional impacts are expected to be negligible.

The construction of the Energy Center and its associated appurtenances will result in direct, permanent impacts to agricultural field habitat. During and after construction of the Energy Center, wildlife currently utilizing the developed portion of the developed portion of the site will be displaced. Since most of the proposed Energy Center parcel currently consists of agricultural fields and an access drive, most of the on-site wildlife habitat to be disturbed is not significant residence or shelter/cover/nesting habitats. Therefore, no significant resident habitat areas will be lost as a result of the Project. Existing habitat within the construction laydown area will be temporarily lost, but will be restored and enhanced following construction.

Additional loss of vegetation as a result of erosion and sedimentation can also affect wildlife species. A reduction in the quantity and quality of wildlife food and cover within the area of actual construction is the inevitable result of any construction project. Typically, small mammals, reptiles, amphibians, and birds that feed or nest on the ground are affected. Examples of wildlife species that could be impacted in this manner include the spring peeper, garter snake, meadow vole, short-tailed shrew, and passerine species. Since large areas adjacent to the construction zone are similar habitat to that which will be impacted, however, it is expected that overall impacts to these species will be minimal and limited to the immediate construction area. Furthermore, no rare, threatened, or endangered species are reported as occurring on the Project site. For these reasons, none of the species listed above as being reasonably likely to be on the site would be significantly and adversely affected regionally by the proposed land clearing.

Operational Impacts

On-going operation of the Project will result in no additional significant loss or reduction of wildlife habitat. Perimeter fencing will be installed around the Energy Center to prevent wildlife from entering the developed portions of the site.

Mitigation Measures

All practicable measures have been taken to minimize disturbance to existing wildlife habitats for the construction of the Energy Center and construction lay-down area. The Facility layout has been developed in a manner to avoid where possible and minimize impacts to wetland areas. The Facility has been located in a relatively flat area. Facility components, access roads, storm water management features and laydown areas have been designed to avoid wetland areas, with the exception of impacts to portions of small ditches, swales, and low areas located in and adjacent to the agricultural fields. The nonstructural portions of the Energy Center will be stabilized and landscaped as part of project construction. Forested areas surrounding the Facility will be maintained and enhanced to provide a visual buffer from the highway, local roads, and neighborhoods.

Once construction is completed, the laydown area in the western part of the site will be smoothed and regraded as necessary, and the site will be re-vegetated with native vegetation. The revegetated areas will be planted with native tree, shrub, and herbaceous species with wildlife habitat value such as seed and berry food sources, and cover/shelter characteristics.

Erosion and sedimentation will be controlled by practical construction techniques and control measures, as discussed in the SWPP Plan (Appendix 12-A). With the proper installation and maintenance of erosion control barriers and other control measures, the extent of any indirect impacts to wildlife habitat from erosion and sedimentation should be minor to non-existent. During Project operation, the storm water management system, coupled with the landscaping program, will ensure that erosion and sedimentation does not occur.

Threatened & Endangered Species

As indicated in Section 14.3 above, no Federal or state rare, threatened, or endangered species (plant or animal) or their habitats have been found on the Project site. Coordination with USFWS and NYSDEC's Natural Heritage Program reveals no known presence of such species within the Energy Facility site proper. Therefore, no impact to such species is expected.

14.4.2 Electrical Interconnect

The electrical interconnect will extend from the Energy Facility's electrical substation to the northeast toward Route 17M, and then north to the NYPA Marcy South overhead power line (Figure 14-3). Between the substation and Route 17M, the interconnect will consist of a double-circuited, overhead line on single poles (or dual poles if required by NYPA) within a 130 foot-wide cleared corridor. As the interconnect reaches Route 17M, it will be transitioned to a set of underground conduits within a trench. The interconnect will then continue north, parallel to Route 17M within a roadside corridor, cross beneath the Route 6 interchange, and continue 500 feet to join the NYPA 345 kV lines. From the on-site substation to the Marcy South line, the total length of the interconnect route is less than 1 mile.

Ecological Communities

Construction Impacts

The impacts to ecological communities due to the clearing of a utility easement at the Project site will directly result in minimal forested habitat loss and potential habitat fragmentation. For construction of the electrical interconnect, approximately 2.32 acres of both Beech-Maple mesic forest (upland) and 0.92 acres of Red maple-hardwood swamp (wetland) will be converted to maintained successional old field and/or successional shrubland upland communities, and shrub swamp wetland and/or shallow emergent marsh communities within a 130 foot wide permanent ROW (Figure 14-2). In addition, construction of the electrical interconnect will temporarily impact 1.93 acres within on-site wetlands (overhead lines and poles), and 0.32 acres of Mowed roadside uplands (underground lines) located along Route 17M. Except for the permanent installation of structures (i.e., poles, see below), these ROW areas will be restored following construction.

The construction of the transition area from overhead to underground lines, and the crossing of Carpenter Creek will result in temporary disturbance of 6,000 sq. ft. of Shallow emergent marsh community, with an open-cut crossing of Carpenter Creek. Areas adjacent to the interconnect route that will be used for construction staging will be cleared of trees and shrubs but not existing herbaceous vegetation (grasses, etc.). These areas will be allowed to re-vegetate naturally, and re-seeded if necessary. The vegetation within the easement would be permanently maintained as a low stature plant community dominated by shrubs, grasses and herbs.

In addition to the permanent change in the nature of the forested plant community, impacts associated with the construction process would include those associated with the overhead installation of the power line pole structures themselves, requiring 225 sq. ft. of fill in wetlands per structure, and 900 sq. ft. (0.02 acre) in total fill in wetlands (Figure 14-3). The clearing of the proposed utility easement for the electric interconnect will fragment areas of contiguous forested vegetation. However, the interconnect route was selected to minimize clearing of forested communities by locating the ROW at the narrowest point of the forested area, and by keeping as far south toward I-84 as possible without unduly lengthening the route. Thus, it is essentially the edge of the forested communities that will be converted to open right-of-way.

Operational Impacts

Once the utility easement is constructed and operating, regular maintenance will be required within the easement to ensure that vegetation does not interfere with the electrical transmission interconnect. The easement will be subject to regular cutting of tree saplings to limit the height and type of vegetation.

Mitigation Measures

All practicable measures have been taken to minimize disturbance to existing ecological communities for the construction of the utility easement. The easement layout has been developed in a manner to avoid where possible and minimize impacts to wetland areas. Areas cleared for the utility easement will be allowed to re-vegetate naturally from the existing seed stock in the soil.

In order to mitigate for the conversion of forested wetland, the wetland mitigation area discussed in Section 14.4.1 will include tree saplings in order to promote the replacement of the forested wetland community.

Erosion and sedimentation will be controlled by practical construction techniques and control measures, as discussed in the Stormwater Pollution Prevention Plan (See Appendix 12-A). With the proper installation and maintenance of erosion control barriers and other control measures, the extent of any indirect impacts from erosion and sedimentation should be minor to non-existent.

Wetlands

Construction Impacts

New utility pole installation will result in the filling of approximately 675 sq. ft of wetlands located within the proposed utility easement. Installation of the underground conduit at the eastern end of the site will result in temporary disturbance of 6,000 sq. ft. of shallow emergent marsh wetland community and Carpenter Creek, which will be restored following construction. The vegetation clearing of the proposed utility easement will result in the conversion of approximately 0.92 acres of existing Red maple-hardwood swamps to shrub swamp wetland and/or shallow emergent marsh communities. The new electrical lines themselves will aerially cross the on-site tributary to Carpenter Creek but will not impact the stream.

Operational Impacts

Once the utility easement is constructed and operating, regular maintenance will be required within the easement to ensure that vegetation does not interfere with the interconnect. The shrub swamp and/or shallow emergent marsh wetlands within the easement will be subjected to regular mowing or cutting to limit the height and type of vegetation.

Mitigation Measures

As a result of the loss of 900 sq. ft. (0.02 acres) of Federal and state jurisdictional wetland, the wetland area will be replaced on-site on a 2:1 area basis (Figure 14-4). The large area includes mitigation for filling of Federal wetlands associated with the Energy Center (See Section 14.4.1). The wetland mitigation area will be located in the central part of the site, to the northeast of the Energy Center facilities, adjacent to existing wetlands. This mitigation area will include emergent, shrub and eventually forested wetlands (sapling trees to be planted).

The wetland mitigation area will be planted with native tree, shrub and herbaceous species with wildlife habitat value such as seed and berry food sources, and cover/shelter characteristics.

Erosion and sedimentation will be controlled by practical construction techniques and control measures, as discussed in the Stormwater Pollution Prevention Plan (See Appendix 12-A). With the proper installation and maintenance of erosion control barriers and other control measures, the extent of any indirect impacts from erosion and sedimentation should be minor to non-existent.

Minimizing the duration of work and restoring the pre-construction topographic and hydrologic conditions will expedite re-establishment of wetland areas. Removal of stumps in wetlands will be limited. The stumps that are left in place may promote natural regeneration within the utility easement depending on the species.

The general wetland construction and mitigation actions, as outlined below, are intended to minimize adverse environmental impacts to wetlands. The Applicant will use the best available technology by:

- Using the most appropriate equipment or machinery, including hand-cutting;
- Implementing appropriate maintenance and operation on the equipment or machinery, including adequate training, staffing, and working procedures;
- Using machinery and techniques that are designed to reduce drainage impacts to wetlands;
- Designing appropriate wetland crossings that will maintain water flows and accommodate fluctuating water tables;
- Routing the interconnect to minimize the number of wetland crossings;
- Maintaining adequate flow in wetlands to protect aquatic life and prevent the interruption of downstream uses;

- Limiting equipment operating in wetlands;
- Limiting removal of vegetation;
- Using low-ground-weight construction equipment if standing water or saturated soils are present;
- Dewatering trenches in such a manner that no heavy silt-laden water flows into any wetland;
- Utilizing temporary sediment barriers; and
- Provide post-construction maintenance and monitoring to establish success of revegetation

Wildlife/Habitat

Construction Impacts

All practicable measures have been taken to minimize disturbance to existing wildlife habitats for the construction of the utility easement. The construction of the utility easement will permanently impact wildlife habitat within the Beech-Maple mesic forest (upland) and Red maple-hardwood swamp (wetland) (Figure 14-2). These forested communities comprise approximately 1/3 of the total easement. These linear areas will be converted to maintained successional old field and/or successional shrubland upland communities, and shrub swamp wetland and/or shallow emergent marsh communities.

A 130 foot wide linear easement will be cleared through the eastern portion of the property. Wildlife species which nest, feed or take cover within these habitats will be directly affected. During and to some extent after construction of the utility easement, wildlife currently utilizing the site will be displaced. Existing habitat within the utility easement area will be converted to maintained successional old field and/or successional shrubland upland communities, and shrub swamp wetland and/or shallow emergent marsh communities. Approximately 25 acres of adjacent upland and wetland forested habitat will remain unaffected on the site.

The extent to which land clearing will affect the wildlife species identified in Section 13.3 above depends upon the use each species makes of the areas to be impacted and, to some extent, on the size and characteristics of the home range of each species. Since the entire on-site forested community (both upland and wetland) is relatively small (<25 acres) and isolated by highways, it would be considered a habitat "patch" in scientific ecosystem literature (summarized in The Environmental Law Institute's Conservation Thresholds for Land Use Planners) (ELI, 2003). Therefore, its primary function is to provide "edge" (vs. interior) habitat and "stepping stones" for wildlife passage from one community to another. Similar patch habitat is available in the immediate vicinity and will not be significantly reduced or impacted by construction of the easement.

A reduction in the quantity and quality of wildlife food and cover within the area of actual construction is the inevitable result of any construction project. Typically, small mammals, reptiles, amphibians, and birds are affected. Examples of wildlife species that could be impacted in this manner include the spring peeper, wood frog, white-tailed deer and various bird species including turkeys. The existing habitats will be somewhat fragmented by the utility easement; however, since large areas adjacent to the construction zone are similar habitat to that which will be impacted, it is expected that overall impacts to these species will be minimal and limited to the immediate construction area. The easement will also be located adjacent to I-84, so that the majority of the overall small forested patch on-site will be left intact. Furthermore, no known occurrences or habitat for rare, threatened, or endangered species exist on the Project site.

Operational Impacts

On-going operation of the Project will result in no additional significant loss or reduction of wildlife habitat. The easement will be regularly maintained to keep the vegetation at a low stature; however, maintenance is typically limited to occasional cutting of tree saplings and promotion of shrub and herbaceous cover. The regular maintenance will temporarily impact wildlife using the vegetation in the easement. Maintenance is only likely to occur once every 2-3 years. This will allow the vegetation within the easement to grow between maintenance intervals. Wildlife using the easement will likely be temporarily displaced while the area re-grows, however; other wildlife that prefer recently cut habitats will likely migrate to and use the newly mowed areas.

Mitigation Measures

In order to enhance wetland function and value on the site (See also Section 14.4.1 Energy Facility), the Project applicant will be replacing wetland habitat that will be lost and enhancing wildlife habitat values such as shrub and forest cover, nesting habitat and food production. The wetland replacement area will provide 0.8 acres of wetland within existing upland cropland and old field habitat (Figure 14-4).

All practicable measures have been taken to minimize disturbance to existing wildlife habitats for the construction of the utility easement, however; direct temporary and permanent impacts to wildlife will occur. Wetland areas will generally remain intact however, these areas will be converted from red maple-hardwood swamps to shrub swamps and/or shallow emergent marshes, thereby continuing to provide important wildlife habitat.

After clearing of trees in the easement, disturbance to the ground will be minimal. Stumps will be left in the ground and all vegetation except trees will be left in place in the easement. Only vehicles necessary to install the structures and string the electrical conduits will be present in the easement, and a single travel corridor will be established to prevent wider disturbance of the easement and any wildlife occupying the area. Once installation of the line is completed, the easement will be re-vegetated by existing seed and root stock in the soils, and any unvegetated areas will be seeded with native species.

Erosion and sedimentation will be controlled by practical construction techniques and control measures, as discussed in the Stormwater Pollution Prevention Plan (See Appendix 12-A). With the proper installation and maintenance of erosion control barriers and other control measures, the extent of any indirect impacts to wildlife habitat from erosion and sedimentation should be minor to non-existent.

Threatened & Endangered Species

As indicated in Section 14.3 above, no Federal or state rare, threatened, or endangered species (plant or animal) or their specific habitats have been documented or found to occur on the Project site. Coordination with USFWS and NYSDEC's Natural Heritage Program reveals no known presence of such species, although the presence of on-site forest within two miles of a known Indiana bat winter hibernacula raises the possibility of on-site use as summer roosting habitat.

Construction and Operational Impacts

The permanent loss of 3.24 acres of forested wetland and upland habitat for construction of the electrical interconnect could reduce the potential summer roosting habitat of Indiana bat on the site by a small percentage. Given the limited existing habitat on-site and the abundance of forest patches in the vicinity which could be used by bats, this potential impact is considered to be negligible.

Mitigation Measures

In order to minimize the potential for impacts to Indiana bat summer roosting habitat, in conjunction with other forest preservation goals for the project, removal of forest cover for the project has been minimized to the extent possible by locating the majority of the Project facilities within non-forested areas (Figure 14-2). While it is necessary to locate the overhead electrical interconnect line in a portion of existing forested area, this route has been located within the narrowest possible portion of on-site forest along I-84. The majority (5 acres, or 60-65%) of the approximately 2,800 foot (8.24 acre total) on-site easement occupies open meadow and shrubby areas with no forest cover presently. Therefore, impacts to potential on-site summer roosting habitat has been minimized to the extent possible. Based on this approach and conclusion, the NYS NHP indicated that no further studies regarding the potential presence of Indiana bat on-site would likely be necessary (A. Hicks, pers. comm.).

Loss of trees within the forested wetland component of the interconnect easement will be mitigated by planting of trees with the wetland replacement area adjacent to the existing forested community. This area will be managed to grow to a mature forested swamp.

14.4.3 Water/Wastewater Lines (Off Site)

The proposed water supply and wastewater lines extending to the site from the Middletown Wastewater Treatment Plant (WWTP) have been designed to primarily utilize existing roadways and road shoulders, including Route 6, Route 17M and Dolsontown Road (Figure 14-3). The northern 1,300 foot (0.25 mile) segment of the line would share an existing force main sewer line corridor in an undeveloped area extending north between Dolsontown Road and the WWTP. The Ecological Community present along the route include primarily Mowed Roadside/Path in various stages of management, or actual portions of paved roadway. As the water/wastewater route crosses to the east side of Rt. 17M, it parallels Monhegan Brook but is still within the road shoulder. As the route extends east along Dolsontown Road it crosses a culverted section of Monhegan Brook within the roadway. Turning north, this segment then parallels Monhagen Brook on its west side, and would pass near a riparian wetland area that is currently maintained as part of the existing sewer force main.

The sections below discuss the potential construction and operational impacts and proposed mitigation measure associated with the water/wastewater lines in terms of ecological communities, wetlands, wildlife habitat and rare, threatened and endangered species.

Construction Impacts

The main, northern portion of the water/wastewater line route north of Dolsontown Road, would cross previously disturbed, primarily shrubby areas and successional forest patches, along with existing maintained electrical ROW (Figure 14-3). This part of the route would also pass near but not impact an approximately 300 foot portion of existing riparian wetland associated with Monhagen Brook. Given that this area is a maintained easement for the existing sewer force main, impacts associated with this route would be minimal and temporary.

Construction of the line would involve clearing of any woody vegetation, excavation of the pipe trench and temporary soil stockpiling, installation of the water/wastewater lines, and replacement of soils in the trench. Grades along the route would be returned to existing grades, and wetland soils containing an existing seed bank would be returned to the trench. The disturbed soils would be seeded with seed mix consisting of native herbaceous species. Erosion controls will be installed around the work area to prevent erosion and sedimentation of soils into the adjacent areas, including Monhagen Brook.

In upland portions of the route, a similar approach to clearing, excavation, pipe installation and soil replacement and re-grading would be conducted. All disturbed areas would be restored to existing grades and seeded with native herbaceous species.

Given the existing roadways and the maintained corridor, impacts to wildlife habitats would be minimal and temporary. It is anticipated that species utilizing the existing corridor would be displaced during line installation, but would return following construction.

Based on the absence of habitats identified for rare, threatened or endangered species associated with the project site and the surrounding vicinity (a county-wide assessment), no such species habitats are anticipated to occur along the highly disturbed water/wastewater route.

Operational Impacts

Once the water/wastewater line has been installed, on-going vegetative maintenance (i.e., occasional mowing) of the easement will occur. Since the easement already contains an existing sewer force main, no significant, additional operational impacts to ecological communities, wetlands, wildlife habitats or threatened and endangered species are anticipated.

Mitigation Measures

The proposed routing of the water/wastewater lines route has been designed to utilize existing, developed corridors, including roadways, to avoid crossing of natural areas and wetlands to the extent possible. As described above, for portions of the lines that will involve construction in existing overland corridors, soils will be replaced and the areas returned to existing grades and re-vegetated.

14.4.4 Laydown Areas

The construction laydown areas totaling 7.6 acres are shown on Figure 2-10. These areas will be used during construction. These areas are temporary in nature and would be restored to preexisting conditions following construction.

The sections below discuss the potential construction and operational impacts and proposed mitigation measure associated with the on-site construction laydown in terms of ecological communities, wetlands, wildlife habitat and rare, threatened and endangered species.

Laydown area 1 would be located within an existing Successional old field community west of the site entrance road. Laydown area 2 would be located within the existing Cropland/field crops community (hayfield) east of the site entrance road. Laydown area 3 would be located within Cropland/field crops community (hayfield) north of the main facility. Laydown areas 4, 5 and 6 would occur in Cropland/row crops community (agricultural field) adjacent to and east of the Energy Facility.

Construction Impacts

For Laydown area 1, very little ground disturbance would be required since the area has a gravel base from past uses. Existing Successional old field (primarily herbaceous and shrub-scrub) vegetation would be removed. In order to access Laydown area 2, there would be two potential access points – access from the adjacent Route 6, and access from the main facility on-site. Access from Route 6 would require minimal improvements such as constructing a graded access road from Route 6 into the laydown area. A permit from the DOT would be required for this option. For access from the site, Carpenter Creek would have to be crossed using a temporary bridge. This would require a temporary wetland impact of 0.02 acres, which will be restored follow construction. The area would require temporary removal of the top 6" of topsoil and 6" of subsoil (vegetation is currently grass), and placement of gravel to provide a stable ground surface for equipment and vehicles. The topsoil and subsoil would be stored separately for staged replacement back in the area following construction. A gravel base would then be laid down and compacted. Erosion controls will be placed around the area to prevent runoff of sediment into the adjacent field and wetlands/watercourses. In order to fully utilize the uplands in this area and avoid additional impacts to wetlands elsewhere on the site, a portion of the 100' Adjacent Area (buffer zone) of NYSDEC FWW, identified along the main stream channel, will be temporarily converted to laydown area. The outer 50' of the Adjacent Area will be utilized, with all appropriate erosion controls placed between this area and the inner 50' of Adjacent Area.

Topsoil and subsoil removed from Laydown area 2 will be kept separated and stored in Laydown area 3. Stockpiles shall be sized according to the stripped area, and will be piled up to 20 feet high. Each pile will be surrounded by erosion controls and will be temporarily vegetation with an annual grass to prevent erosion and soil loss.

In order to access Laydown area 3, a small swale identified as Federal wetlands must be temporarily crossed. This normally dry swale will be crossed using a culvert and gravel access road base, require 3,240 square feet (0.07 acres) of temporary wetland filling. This area will be restored following construction. An approximately 4,070 sq. ft. portion of existing trees within this area will be cut to accommodate the laydown area.

Laydown areas 4, 5 and 6 will essentially be part of the construction disturbance envelope in the eastern part of the Facility. These will occur within the existing agricultural field areas and will not require cutting of trees except where associated with the substation and the permanent electrical interconnect easement. As necessary, topsoil and subsoil will be removed from portions of these areas and stockpiled within their boundaries. Erosion controls will be placed around the stockpiles, and the stockpiles will be temporarily seeded.

Wildlife habitat impacts associated with the laydown areas will include temporary displacement of any species using the existing hayfields and agricultural fields. Since these open areas tend to not to support continuous use by most species, except for ground burrowing field species, wildlife species are expected to utilize other areas, including on-site hayfields, to fulfill any habitat requirements provided by these areas. Once the laydown areas are restored, wildlife habitat usage is expected to resume as previously.

No impacts to rare, threatened or endangered species are anticipated within the proposed laydown areas.

Operational Impacts

Following construction of the Facility, each of the laydown areas will be restored to pre-existing conditions. There will be no operation impacts to these areas following construction.

Mitigation Measures

In general, all laydown areas will be restored to pre-existing conditions. Temporary bridge and culvert crossings used for Laydown areas 2 and 3 will be removed from Carpenter Creek and the drainage swale/wetland upon completion of construction. Laydown areas 2 and 3 will be returned to use as hayfields, and any non-field areas will be allowed to revegetate naturally. Portions of areas 4 and 5 will be used for the wetland mitigation area (Section 14.4.1) and area 6 will be revegetated with native herbaceous species.

14.5 SUMMARY OF IMPACTS AND MITIGATION

As a result of the CPV Valley Energy project construction, permanent impacts will occur to 21.25 acres of Cropland/row crop ecological community. The Facility development results in the permanent filling of 0.34 acres of Federal jurisdictional wetland, and an additional 0.02 acre of both Federal and state jurisdictional wetlands for electric interconnect structures. For construction laydown/parking areas, approximately 6 acres of successional old field and hayfield will be temporarily impacted, and will be restored upon completion of construction. Approximately 0.09 acres of wetland will be temporarily impacted to provide access to the laydown areas. For the electrical interconnect, construction related impacts include the permanent conversion of 0.92 acres of Red maple-hardwood swamp (also Federal/state jurisdictional wetlands) to non-forested wetlands, conversion of 2.32 acres of upland Beech-maple mesic forest to non-forested upland, and up to 0.14 acre (6,000 sq. ft.) of temporary impacts to Shallow emergent marsh and associated Carpenter Creek for installation of the underground electrical conduit. Overall construction of the electrical interconnect will temporarily impact 1.93 acres within on-site wetlands (overhead lines and poles), and 0.32 acres of Mowed roadside uplands (underground lines).

Impacts to wildlife habitat will be minimized due to utilization of agricultural fields for the majority of the proposed Energy Facility. Losses of forested habitat will be minimized through the southern routing of the overhead electrical interconnect and the use of roadway shoulders for the underground portion. No impacts to Federal or state listed Threatened or Endangered species are anticipated. By locating the electrical interconnect route in a corridor requiring the least amount of tree removal, losses of potential forested summer roosting habitat of the Indiana bat will be minimized to the extent possible. The water/wastewater line route will use existing roadways and existing overland utility corridors to minimize use of any new overland routes/corridors.

Permanent impacts to wetlands will be mitigation through on-site replication of 0.8 acres of wetlands, providing a wetland replacement ratio of 2:1. This wetland replication area will also provide enhanced wildlife habitat functions for the site.

14.6 REFERENCES

DeGraaf, R.M. and D.D. Rudis. 1986. New England Wildlife: Habitat, Natural History and Distribution. USDA Technical Report NE-108.

Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2002. Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for review). New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

Environmental Law Institute. 2003. Conservation Thresholds for Land Use Planners.

Hicks, Al. 2008. Personal Communication. New York State Natural Heritage Program. Telephone conversation regarding Indiana Bat in Orange County, NY.

Mitchell, R. S. and G. C. Tucker. 1997. Revised checklist of New York State Plants. New York State Mus. Bull. 490: 1-400.

NatureServe. 2007. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.2. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer. (Accessed: January 14, 2008).

New York Natural Heritage Program (NYNHP). 2008a. NYNHP Conservation Guide – Bog Turtle. [Online] http://www.acris.nynhp.org/report.php?id=7507. Accessed May 7, 2008.

New York Natural Heritage Program (NYNHP). 2008b. NYNHP Conservation Guide – Dwarf Wedgemussel. [Online] http://www.acris.nynhp.org/guide.php?id=8375. Accessed January 14, 2008.

New York Natural Heritage Program (NYNHP). 2008c. NYNHP Conservation Guide – Indiana Bat. [Online] http://www.acris.nynhp.org/report.php?id=7405. Accessed January 14, 2008.

New York Natural Heritage Program (NYNHP). 2008d. NYNHP Conservation Guide – Atlantic Sturgeon. [Online] http://www.acris.nynhp.org/report.php?id=7170. Accessed May 20, 2008.

New York State Department of Environmental Conservation (NYSDEC). 2008a. List of Species of Greatest Conservation Need, NYS Comprehensive Wildlife Strategy. [Online] http://www.dec.ny.gov/animals/9406.html. Accessed October 2008.

New York State Department of Environmental Conservation (NYSDEC). 2008b. Bog Turtle Fact Sheet. [Online] http://www.dec.ny.gov/animals/7164.html. Accessed May 7, 2008.

New York State Department of Environmental Conservation (NYSDEC). 2008c. Dwarf Wedge Mussel Fact Sheet. [Online] http://www.dec.ny.gov/animals/25384.html?showprintstyles. Accessed January 14, 2008.

New York State Department of Environmental Conservation (NYSDEC). 2008d. Indiana Bat Fact Sheet. [Online] http://www.dec.ny.gov/animals/6972.html?showprintstyles. Accessed January 14, 2008.

New York State Department of Environmental Conservation (NYSDEC). 2008e. Shortnose Sturgeon Fact Sheet. [Online] http://www.dec.ny.gov/animals/26012.html. Accessed May 20, 2008.

New York State Department of Environmental Conservation (NYSDEC). 2008f. Bald Eagle fact Sheet. [Online] http://www.dec.ny.gov/animals/9383.html. Accessed May 7, 2008.

Niver, R. A. 2008. Personal Communication. United States Department of the Interior, Fish and Wildlife Service. Letter from Robyn A. Niver (USFWS) to Beverly Schultz (TRC), January 3, 2008.

Seoane, T. 2007. Personal Communication. New York State Department of Environmental Conservation, Division of Fish, Wildlife & Marine Resources, New York Natural Heritage Program. Letter from Tara Seoane (NYNHP) to Beverly Schultz (TRC), December 28, 2007.

U. S. Department of Commerce- National Oceanic and Atmospheric Administration (NOAA). 2008. Species of Concern-Atlantic Sturgeon. [Online] http://www.nmfs.noaa.gov/pr/pdfs/species/atlanticsturgeon_highlights.pdf. Accessed May 20, 2008.

U.S. Fish and Wildlife Service (USFWS). 2008. Orange County – Federally Listed Endangered and Threatened Species and Candidate Species. [Online] http://www.fws.gov/northeast/nyfo/es/CountyLists/OrangeDec2006.htm. Accessed May 7, 2008.

Whitaker, Jr., J. O. and W. J. Hamilton, Jr. 1998. *Mammals of the Eastern United States*. Cornell University Press, Ithaca, NY.

15.0 CONSTRUCTION IMPACTS

15.1 INTRODUCTION

This section discusses construction impacts which are temporary in nature. The following will be discussed in this section: 1) a description of the anticipated phasing for construction activity of the Project, including the expected starting and ending dates; 2) a narrative description of each phase of construction, including an identification of the number of employees per shift for the peak phase of construction, a description of the construction equipment to be used during each phase of construction, the hours during which it is planned that construction and component transportation vehicles would operate; material lay-down and employee parking area descriptions; and a preliminary identification of which state, county, and town roads that would be utilized for transportation of construction equipment and Project components; 3) a description of planned site security measures during construction, as well as the measures planned to deal with solid and sanitary waste generated by construction activities; 4) an assessment of potential traffic, air quality, noise, water quality, natural resources and hazardous material impacts that may be created by or encountered during Project construction; and 5) an identification of mitigation measures design to minimize the significant construction impacts identified.

15.2 DESCRIPTION OF CONSTRUCTION AND CONSTRUCTION PHASING

The Project's construction period is expected to be approximately 24 months starting December 2009. During the construction period numerous types of construction activity would occur at the Project site. The construction sequence will proceed as follows:

- Months l and 2 would include site preparation, including: site clearing and rough grading, installation of temporary stormwater management and sediment and erosion control measures, and installation of temporary construction buildings, parking, and underground utilities;
- Months 3 to 6 would include soil excavation and foundation pouring;
- Months 7 to 13 would include erection of structural steel and delivery of major equipment;
- Months 11 to 24 would include installation of equipment followed by labor-intensive installation of piping, wiring, and ductwork; and
- Months 22 to 24 would include systems testing and commissioning.

Proposed construction phasing is described in more detail in the following sections. Information on material lay-down areas and construction parking is provided as Figure 2-10.

15.2.1 Preconstruction Site Preparation

The construction sequence proceeds in a series of overlapping phases. It begins with site preparation. This would include clearing, grubbing, and initial grading of the Project site. Site preparation also includes excavation of the storm water basin. These tasks would be conducted early in the construction schedule. The construction plans for these activities are illustrated on the Erosion Control Plans as discussed in the Stormwater Pollution Control Plan (See Appendix 12-A).

As site preparation progresses, the delivery and installation of temporary buildings to house offices and worker lockers would occur. An on-site area would be set aside for temporary lay down and storage of Facility materials and equipment and construction parking. A parking area would be constructed to serve workers and park construction vehicles when not in use. Temporary electric and phone utilities would be installed. The construction laydown and parking areas comprise approximately 7.6 acres and are shown Laydown Area Map provided as Figure 2-10.

Site preparation would require heavy equipment for grading and excavation. This would include excavators, bulldozers, graders, front-end loaders, and dump trucks. During this period, which should last about two months, there would be an estimated 54 workers at the site.

15.2.2 Excavation and Foundation Pouring

The next major step in the construction sequence would be excavation and compaction for foundations for the plant buildings, and excavation for and placement/backfilling of underground pipes and conduits. Excavated materials would be stored on-site and reused as fill and topsoil material in final grading to the extent possible.

Immediately following excavation, the building foundations would be formed, rebar and conduit would be installed, and concrete would be poured. At this juncture, approximately six months of the construction period would have elapsed. Dust from construction activities would be controlled by measures such as wetting of exposed soils on a regular basis and stabilizing storage piles by wetting and/or seeding. These measures would be implemented as standard practice for the construction effort.

Site preparation would require heavy equipment for pad and foundation construction. This would include excavators, bulldozers, graders, front-end loaders, dump trucks, and concrete trucks. During this period, which should last about three months (months 3 to 6), there would be an estimated 96 to 230 workers at the site.

15.2.3 Erection of Structural Steel and Delivery of Major Equipment

Following site preparation and installation of foundations, erection of structural steel would begin. Concurrently, major equipment—the gas turbine, steam turbine generators and Heat Recovery Steam Generator (HRSG)—would be delivered and set in place. On-site cranes are required to lift the components from the transport vehicles for placement on the individual equipment pads. Transport would be by truck. Field-erected tanks and vessels would be constructed.

During this period, which should last about six months, there would be an estimated 274 to 664 workers at the site. Equipment required during this construction phase includes cranes, compressors, welding machines, and hand held equipment.

15.2.3.1 Unit Assembly and Site Finish

Following the erection of structural steel and delivery of major equipment, the labor-intensive process of installing a complex array of interconnecting piping, electrical and instrument wiring and ductwork would begin. The peak labor force of 664 workers would be required in this phase.

As the erection of building walls, finish work and final connections of piping and wiring is nearing completion, the process of checking the electrical and control systems, starting up major equipment, cleaning pipelines, and testing all systems would begin.

Final site finishing activities would include construction of the paved perimeter drive providing access to equipment, installation of a protective chain link fence and other security systems, site lighting, and implementation of the site landscaping plan. Equipment required during this construction phase includes cranes, compressors, welding machines, and hand held equipment. This construction phase is anticipated to start in Month 11 and continue through the end of construction (about 13 months) and would require a construction workforce of 664 to 32 workers.

15.2.4 Utility Connections

The proposed Facility requires connections to natural gas, electrical transmission, water supply, and water discharge. This work is described in detail in Section 2. The on-site utility connections would require the use of excavators, bulldozers, graders, front-end loaders, dump trucks and utility line trucks. This construction period would overlap with the unit assembly and site finishing activities described above and coincide with the Project’s peak construction workforce.

15.2.5 Systems Testing and Commissioning

The culmination of Project construction would be the firing and initial synchronization of the gas turbine and generators, followed by the production of steam, free blow of steam lines, and initial synchronization of the steam turbines. During this phase of the work, new equipment and systems would be prepared for operation, followed by initial operation and performance testing. In preparing new equipment for operation, appropriate cleaning, testing, lubrication, and alignments would be performed. The initial operation involves operating individual pieces of equipment within the manufacturer’s recommended limits and as an integrated system.

During the start-up phase, air or steam-blows of the HRSG, high-energy steam piping, and gas-blows of the on-site natural gas pipeline would be required to prepare new pipes for service. These scheduled blows generally occur over a one-week period and utilize silencers to reduce the noise generated. Hand cleaning to remove any construction debris is performed first. The HRSG steam-generating surfaces are then chemically cleaned, and the cleaning waste is disposed of at a licensed facility. Finally, integrated combined-cycle operation would commence, and enter a rigorous test and shakedown period. The shakedown period is anticipated to last two to three months. The Project would then enter commercial service.

15.2.6 Employees Needed during Peak Construction Time and Employees per Shift

The employees needed during the peak construction time would be approximately 664. Construction activity will primarily occur during daytime hours. Work hours during the construction of the Project generally are from 6:00 AM to 6:00 PM. A typical work day shift would be from approximately 7:00 AM to 3:00 PM. It is possible that extensions of this basic workday, or moderate amounts of evening work where allowable, might occasionally occur. It is expected, however, that evening activities would require only a small number of workers. Although some construction activities, such as pouring concrete for building foundations, may require a prolonged workday, these activities should occur prior to the peak construction period, and will not involve significant traffic. Based on the targeted work shift noted above, it is estimated that a significant percentage of the construction workers will arrive at the Project site prior to the typical peak AM roadway hour and leave the Project site prior to the typical peak PM roadway hour. Therefore, most of the peak traffic activity due to the construction workers will be offset from the peak roadway use hours, occurring when there is generally less traffic on the adjacent roadways. See Section 8.0, Traffic and Transportation.

15.2.7 Transportation Routes for Construction Equipment and Facility Components

Route for delivery of construction equipment and facility components will vary depending on the source of the geographic location of the source of the deliveries and the size of the trucks delivering the equipment. CPV will endeavor to stay off smaller roads and will arrange to deliver large facility components during non-peak traffic hours to the extent possible. The primary route for deliveries is expected to be via Route 84 to Route 17M to Route 6.

15.2.8 Site Security Plan

Prior to commencement of construction, a comprehensive security plan will be developed and implemented. The security plan will be provided to the Orange County Police Department, New York State Police, and the Town of Wawayanda for review.

The perimeter of the Project site will be secured with a chain link fence, sliding gates and surveillance equipment so as to permit only authorized access to the construction site. All site security personnel would be equipped with communication equipment to maintain contact with construction management personnel and/or the New York State Police and other emergency service providers.

15.2.9 Solid and Sanitary Waste Generation During Construction

CPV will contract with private waste haulers to remove solid waste resulting from the project during construction. Waste disposal during construction will be minimized through the employment of a recycling program that would focus on scrap metal and reusable timber.

During the normal course of construction, the Facility will generate minimal amounts of wastes that are classified as hazardous and subject to the Resource Conservation and Recovery Act of 1976 (RCRA), the Environmental Conservation Law Article §27 and the New York Hazardous Waste Regulations (6 NYCRR 370 et seq.) To minimize the quantities of solid and hazardous waste generated at the Facility, CPV would implement a solid waste management program during Facility construction that incorporates waste minimization strategies such as recycling and the selection of solvents, paints, and other maintenance chemicals to produce non-hazardous wastes at the construction site.

The potentially hazardous wastes generated on-site will be separated from normal waste through segregation of storage areas and proper labeling of containers. All hazardous waste would be removed from the Project site by licensed contractors in accordance with applicable regulatory requirements and disposed at either local or regional approved facilities.

Sanitary waste during construction will be handled through the installation of portable toilets. All sanitary waste would be removed from the Project site by licensed contractors in accordance with applicable regulatory requirements and disposed at either local or regional approved facilities.

15.2.10 Construction Traffic Impacts

Traffic impacts during construction will result due to the need for workers to commute to the site and as a result of construction equipment and supply deliveries. Construction related traffic impacts are discussed in detail in Section 8.8. These impacts were not found to be significant as the construction schedule has been set to avoid peak traffic hours. The traffic analysis found that there will be only a few instances when construction related traffic will cause deterioration in Level of Service at a study location. The drop in LOS is generally moderate and will be temporary, lasting only during the 4 to 5 months of peak construction activity. Thereafter, conditions will return to pre-construction levels.

15.2.11 Air Quality Impacts During Construction

Air quality impacts during construction will be limited to dust during excavation and small quantities of air emissions from construction machinery and vehicles. These emissions will comply with the NAAQS as well as all other state and local air standards and air pollution control requirements. Refer to Section 9.0, air Quality, for further details.

15.2.12 Water Quality impacts During Construction

The Project will utilize erosion control and soil stabilization measure to ensure that disturbed soils do not leave the site during storm events. Refer to the Stormwater Pollution Prevention Plan in Appendix 12-A. As well, the Project has taken measure to avoid the release of contaminated materials, and to address contingencies in the event an accident were to occur such that procedures would be in place for control of such an accident and preventing contamination of surface or ground water resources.

15.2.13 Natural Resource Impacts

Construction of the Project will impact wetlands and associated habitat immediately in the vicinity of the footprint of the Project. However, CPV has taken measure to minimize wetland impacts via Project design and measure to ensure wetlands that are not to be constructed upon are not disturbed. Please refer to Section 14.0, Ecology, for more detail regarding wetlands impacts.

15.2.14 Socio-Economic Impacts during Construction

The Project will not result in the in-migration of construction workers. As a result, there will be no impact on schools or municipal services as a result of new construction workers living in the town. Moreover, the Project is expected to generate jobs locally and revenues are expected to be spent locally on goods and services to support construction. Detail on the socioeconomic impacts associated with construction are provided in Section 7.0.

15.2.15 Noise

Noise impacts during construction are generated primarily from diesel engines which power the equipment. Exhaust noise usually is the predominant source of diesel engine noise, which is the reason that maintaining functional mufflers on all equipment will be a requirement of the Project. Noise levels of construction equipment typically utilized for this type of Project are presented in Table 10-2. It is important to note that the equipment presented is not used in each phase of construction. Further, equipment used is not generally operated continuously, nor is the equipment always operated simultaneously.

Construction noise will also be temporary in nature. As such, no adverse or long term noise impacts from construction noise are anticipated. Refer to Section 10.4.1 for detailed noise impacts associated with the construction phase of the Project.

15.3 CONSTRUCTION MITIGATION

Where construction impacts have been identified, CPV has taken measures to mitigate to the maximum extent possible. Below is a brief summary of construction mitigation to be taken.

15.3.1 Traffic

Construction workforce and construction related trips will occur during off peak traffic times in order to mitigate potential construction related traffic impacts. In addition, construction related trips will avoid small local roads to the extent possible. See Section 8.8.3 for more detailed information.

15.3.2 Wetlands

CPV has taken measures to minimize wetland impacts by avoidance via design. Facility components, access roads, storm water management features and laydown areas have been designed to avoid wetland areas. CPV will also ensure wetlands that are not to be constructed upon are not disturbed. Refer to Section 14.4.

15.3.3 Noise

Exhaust noise usually is the predominant source of diesel engine noise; as such CPV will require maintaining functional mufflers on all equipment used during construction the Project. In addition, CPV currently anticipates only daytime construction for the Project. The calculated construction noise levels are shown to be well below existing daytime L_{eq} noise levels at all locations. Refer to Section 10.0.

15.3.4 Water Quality

In order to minimize erosion and ensure that disturbed soils do not leave the site during storm events, CPV has implemented a sediment control site plan. The site plan includes a series of structural and non-structural stormwater management and erosion control measures. See Section 13.0, Water Resources, for details.

16.0 COMMUNITY CHARACTER

16.1 INTRODUCTION

This section describes the community character of the general Project area and then evaluates the impacts that may result from the proposed Project. Community character is defined as:

- The built environment which may include historic buildings, development and land-use patterns, architectural landscape, roads, sidewalks, and visual character. The natural, or "un-built," environment often encompasses stream corridors, open spaces, farms, geographical features, critical habitats, and air and water quality. The interaction between the built and un-built environment is also an element of community character.

- The social and cultural characteristics of a community can include those attributes that reflect its overall quality of life (i.e., quality of schools, poverty and crime rates, demographics, etc.) and represent its cultural resources (i.e. hospitals, museums, social gatherings, local arts, community activities, etc.).

- The community's economic environment may include the number and quality of jobs, unemployment rates, type of business, and presence and/or vitality of a downtown area.

16.2 BUILT ENVIRONMENT

This section provides information on the built environment in the vicinity of the proposed Project, including historic buildings, development, and land use patterns that are elements of community character.

16.2.1 Historic Buildings

An inventory and analysis of nearby historic sites that might be affected by the construction or operation of the Project was conducted within the primary study area (1-mile radius) and secondary study area (5-mile radius). Figure 3-5 in Section 3.0 shows the location of these resources relative to the Project site.

There are no historic sites within 1.0 mile of the Project site. The closest historic site is approximately 1.97 miles from the Project site. The historic sites within a 5.0 mile radius of the Project are:

Webb Horton House (H1) – A historic building on South Street in Middletown, approximately 2.0 miles north of the Project site. The Webb Horton House is a 40-room mansion listed on the National Register of Historic Places that is currently part of Orange County Community College.

Hillside Cemetery (H2) – A historic cemetery located on Mulberry Street in Middletown, approximately 2.0 miles north of the Project site. The cemetery was designed by Calvert Vaux, later noted for his collaboration on Central Park with Frederick Law Olmsted, and opened in 1863. Many of Middletown's prominent citizens of the late 19th century were buried here. In 1994 it was added to the National Register of Historic Places.

Dunning House (H3) – This historic site is located on Ridgebury Road in Wawayanda and is 2.07 miles from the Project site. This historic building is a wooden house first built in the mid-18th century and then renovated in the 19th century and embodies a number of different architectural styles (Wikipedia, 2008).

Primitive Baptist Church of Brookfield (H4) – This historic site is located on NY 6 in Slate Hill and is 2.27 miles from the Project site. This historic building was built in 1792 and is one of the oldest extant church buildings in the county and one of the earliest buildings in the settlement that became Slate Hill (Wikipedia, 2008a).

Paramount Theatre (H5) – This historic site is located on South Street in Middletown and is 2.42 miles from the Project site. This theatre is a 1930s Art Deco movie theatre (HPT, 2008).

Oliver Avenue Bridge (H6) – Oliver Avenue in Middletown is 2.89 miles from the Project site. Information notes that this structure has been demolished (NRHP, 2008).

Sawyer Farmhouse (H7) – This historic site is located on Maple Avenue in the vicinity of Goshen and is 4.11 miles from the Project site. This historic farmhouse was built in the mid-18th century and added to the National Register of Historic Places in 2005 (Wikipedia, 2008b).

16.2.2 Development

Information on existing economic development zones for Orange County and the Town of Wawayanda is presented below.

In Orange County, the Comprehensive Plan – Strategies for Quality Communities has recommended actions that include use of the county's land resources that are appropriate for economic development in order to provide strategically located sites for new businesses (Orange County, 2003). Further recommendations include keeping an updated inventory of countywide sites that are in approved business parks, which are available for differing types of development, and encouraging organizations such as the Orange County Partnership and Orange County Industrial Development Agency to expand the inventory of land that is pre-approved for development through use of programs such as Build Now New York (Orange County, 2003). Orange County has "Priority Growth Areas" that are general areas of preference for future development in order to maximize efficiency of infrastructure and services and also to minimize open space losses (Orange County, 2003). "Priority Growth Areas" can include historic cities, villages and hamlets and their immediate surroundings, where public infrastructure such as central water, sewer, and higher capacity roads exist, or could be efficiently extended to accommodate future growth (Orange County, 2003). Residential growth that has higher density and associated civic, commercial and industrial development is preferred in "Priority Growth Areas" (Orange County, 2003). The Middletown City area and surroundings are such a "Priority Growth Area" because they possess elements such as locations with immediate interstate connections (Orange County, 2003). Strategies and priorities related to industrial/office parks include encouraging property owners to make their lands ready for economic development projects by conducting environmental reviews leading to generic environmental approval; promoting well planned economic development projects in local municipalities to create job opportunities; encouraging development of well-designed industrial and office parks that provide attractive settings for business; and encouraging municipalities to support coordinated economic development by preparation of overall business park plans that can be implemented incrementally (Orange County, 2003).

The Orange County Comprehensive Plan is based on an “urban-rural” growth concept, which limits intensive growth to areas around existing urban concentrations while leaving areas that are not near major highways or water and sewer services relatively free of denser development (Town of Wawayanda, 2006a). The northeast section of Wawayanda extending southward from the City of Middletown is designated as a “Priority Growth Area” as described above (Town of Wawayanda, 2006a). This area extends in a southerly direction along 17M and U. S. Route 6 to the vicinity of its juncture with State Route 284 (Town of Wawayanda, 2006a). Wawayanda residents have expressed concern with high tax rates. To diversify the tax burden, the Town Board has formed an Economic Development Committee to facilitate bringing alternative sources of revenue to the Town with commercial development (Town of Wawayanda, 2006a). Some commercial districts in the town are relatively small with both highway commercial and town commercial districts located along the transportation corridors of State Route 6 and County Route 56 (Town of Wawayanda, 2006a). The town’s manufacturing, industrial, and industrial office/research/business zones are primarily located on the perimeter of town, especially to the north, near Middletown, and to the east, with an additional area southwest of Slate Hill (Town of Wawayanda, 2006a). The Town of Wawayanda’s Final Comprehensive Plan notes that the town’s location at the intersection of Interstate 84 and Route 17M is excellent in terms of the vehicular accessibility and is a good location for office center development (Town of Wawayanda, 2006a). The Final Comprehensive Plan further notes that Wawayanda must continue to grow its commercial and industrial tax base and that economic growth makes it possible to grow the tax base without placing undesirable burdens on residential property owners (Town of Wawayanda, 2006a).

16.2.3 Land Use Patterns

A 1-mile radius surrounding the proposed Facility location was used to focus on the specific attributes of the community and neighboring land uses. The land area within this primary study area is within the Towns of Wawayanda and the City of Middletown. Figure 3-1 in Section 3.0 - Land Use provides an aerial view of existing land use conditions within one mile of the proposed Project. The land uses nearby and adjacent to the Project site are commercial, highway, undeveloped, cemetery, and residential. Figure 3-1 also shows that there are areas of commercial development, residences, roadways, densely settled areas, rural areas, and agricultural (farm/open) areas within a 1-mile radius. These land uses together and their associated visual quality, traffic and noise, along with the demographic of the people living there, define the community character. The land uses that make up the community character are described in detail in Section 3.0 - Land Use. In general, the area south of Interstate 84 is rural and agricultural in character, and the area north of Interstate 84 has more of a variable community character ranging from low to high density residential neighborhoods, and with commercial development along Route 17M.

16.3 NATURAL ENVIRONMENT

As indicated in Section 16.2.3 above, the area south of Interstate 84 is rural and agricultural in character, and the area north of Interstate 84 has more of a mixed use community character ranging from low to high density residential neighborhoods, with commercial development along Route 17M.

Ecological communities associated with the Project site include palustrine communities such as marsh meadows, shrub swamp and hardwood swamp and terrestrial communities such as successional old field, agricultural fields, hardwood or mixed forest and mowed roadside/path. These communities are described in greater detail in Section 14.0 - Ecology.

Two main streams traverse the Project site and flow east toward Route 17M. The main channel enters the site near the existing site access road along Route 6 in the western part of the site, and flows east through the center of the site. A number of small, man-made drainage swales join this stream from adjacent fields, both from the north and south of the main channel. A second stream enters the site from the south via a culvert beneath Interstate 84, and flows northeast along the site's southern/eastern boundary with Interstate-84. The streams join together in the far eastern part of the site, then flow beneath Route 17M via a culvert and joins Monhagen Brook approximately 1,000 feet to the east of Route 17M.

No portion of the Project is located within a designated Critical Environmental Area (CEA). However, portions of the Town of Wawayanda's Ridge Preservation Areas are located within the Project's 1- and 5-mile study areas. The Ridge Preservation Area (a designated CEA) is designated as land with an elevation over 600 feet. The nearest portion of the CEA is located just west of the property, on the far side of where U.S. Route 6 crosses Interstate 84.

To be designated as a CEA, an area must have an exceptional or unique character with respect to one or more of the following: a benefit or threat to human health; a natural setting (e.g., fish and wildlife habitat, forest and vegetation, open space and areas of important aesthetic or scenic quality); agricultural, social, cultural, historic, archaeological, recreational, or educational values; or an inherent ecological, geological or hydrological sensitivity to change that may be adversely affected by any change. To protect the Ridge Preservation Area CEA, the Town's Comprehensive Plan suggests creating a ridgeline overlay and slope protection to limit new development on steep slopes which can increase stormwater runoff and compromise the aesthetic qualities of the Wawayanda's rural character.

Within a 1.5 mile radius of the Project site approximately ninety-one parcels appear to be undeveloped (ESRI, 2008; Orange County GIS, 2008). These parcels are shown on Figure 3-7 in Section 3.0 - Section 3.0. The undeveloped parcels are defined as those that appear to have no permanent structures. Seventy-one of the undeveloped parcels are in the Town of Wawayanda (1576.75 acres), 12 parcels are in Walkill (162.84 acres), and 8 parcels are in the City of Middletown (159.07 acres). The total area of the undeveloped parcels is 1,898.66 acres.

16.4 SOCIAL CHARACTERISTICS AND ECONOMIC ENVIRONMENT

The socio-economic character of the area is variable and includes a low-income environmental justice population in the urban areas of Middletown to the northeast, and more affluent populations living in other areas around the Project site. A more rural farming community exists to the south of Interstate 84.

Existing socioeconomic conditions for the Town of Wawayanda, Orange County, and New York State are summarized below and addressed in greater detail in Section 7.0 of the DEIS.

16.4.1 Population

Table 16-1 provides summary data for selected demographic and socioeconomic categories for New York State, Orange County, and Wawayanda. According to the U.S. Census Bureau, the population of Orange County in 2000 was 341,367. The estimated 2006 population for the County was 376,392, resulting in a 10.3 percent population increase since 2000. The population density in Orange County was 418.3 people per square mile in 2000.

Table 16-1
Demographics of Project Area - Wawayanda, Orange County, New York and Tracts within 1 Mile of Proposed Project

State, County, Municipality, Census BG	Population (2000)	Population Density (Persons/ sq. mi.)	Per Capita Income (1999)	Poverty Rate (percent)	Unemployment Rate, Sept. 2008 (percent)*	Civilian Workforce	Top Three Industries a/
New York	18,976,457	401.9	$23,389	14.6	5.6	9,023,096	E, R, P
Orange County	341,367	418.3	$21,597	10.5	5.8	159,946	E, R, M
Wawayanda	6,273	179.3	$21,856	3.7	Not available	3,128	E, R, A
Tract 118, BG 1	1,634	205.4	$22,080	1.16	Not available	953	E, R, C
Tract 118, BG 2	872	214.2	$25,419	3.04	Not available	543	E, P, M
Tract 118, BG 3	1,118	399.0	$25,998	2.41	Not available	402	E, M, R
Tract 16, BG 2	777	303.9	$18,067	6.95	Not available	361	E, M, F
Tract 16, BG 4	1,806	2,837.9	$23,945	6.09	Not available	1,028	E, R, A
Tract 15, BG 3	1,050	2,081.3	$12,203	26.76	Not available	392	E, R, Ar

Source: Census 2000.
a/ A: Public Administration
Ar: Arts, entertainment, recreational, accommodation and food services
C: Construction
E: Educational, health, and social services
F: Finance, insurance, real estate and rental and leasing
M: Manufacturing
P: Professional, scientific, management, administrative and waste management services
R: Retail Trade
*Unemployment data source: *New York State Department of Labor*

New York's population, by contrast, rose from 18,976,457 in 2000 to an estimated 19,306,183 in 2006, a 1.7 percentage increase (a significantly lower percent increase than Orange County). The population density in the State of New York was 401.9 people per square mile in 2000. The Town of Wawayanda had a population of 6,273 in 2000. The population density of Wawayanda was 179.3 persons per square mile in 2000. The U.S. Census Bureau website does not provide 2006 population estimates for Wawayanda.

16.4.2 Economy and Employment

In 1999, Orange County had a per capita income of $21,597 and approximately 10.5 percent of the population was living below the poverty line in 2000. In 1999, Wawayanda had a per capita income of $21,856 and approximately 3.7 percent of the population was living below the poverty line in 2000. Comparatively, the per capita income for New York State as a whole was $23,389 with 14.6 percent of the population living below the poverty line for these same years. Thus, although per capita income in Wawayanda was slightly lower compared to New York State as a whole, the percent of the population living below the poverty line for Wawayanda was much less.

In September 2008, the unemployment rate was 5.8 percent in Orange County and 5.6 percent in New York State, which is slightly lower than the overall U.S. unemployment rate of 6.0 percent.

16.4.3 Housing

In 2000, Orange County had 7,966 vacant housing units with a rental vacancy rate of 4.3 percent, and Wawayanda had 79 vacant housing units with a rental vacancy rate of 4.2 percent. Based on advertisement in Yellowbook (2008), there are 138 hotels in Orange County and 19 campgrounds and RV parks.

16.4.4 Numbers and Composition of the Workforce

The civilian labor force in Orange County in 2000 was 159,946 individuals. The major industries in Orange County from the standpoint of employment were: 1) education, health, and social services, 2) retail trade, and 3) manufacturing. The civilian labor force in Wawayanda in 2000 was 3,128 individuals, with the major industries being: 1) educational, health, and social services, 2) retail trade, and 3) public administration (see Table 16-1).

16.4.5 Crime Rates

Area crime rates for all of New York State, the non-New York City portion of New York State and Orange County are shown in Table 16-2. Orange County has an Index Crime rate (rate per 100,000 population) that is slightly less than the rate for all of New York State and the non-New York City portion of New York State. Violent crime rates in Orange County are slightly more than the non-New York City portion of New York State and considerably less than that for all of New York State. Property crime rates are slightly less than the non-New York City portion of New York State and slightly more than that for all of New York State.

The New York State (NYS) Division of Criminal Justice Services (see http://criminaljustice.state.ny.us/crimnet/ojsa/indexcrimes/orange.htm for further information) indicates that the Town of Wawayanda does not have its own police force and as such does not report their crime totals to the NYS Division of Criminal Justice Services. They are covered by the Sheriff and State police in Orange County and the NYS Division of Criminal Justice Services cannot break down their counts further by locations within the Town.

Table 16-2
2007 Area Crime Rates*

		Index Crime		Violent Crime		Property Crime	
Area	**Population**	**Count**	**Rate**	**Count**	**Rate**	**Count**	**Rate**
Town of Wawayanda	NA	NA	NA	NA	NA	NA	NA
Orange County	380,352	8,765	2,304.4	1,042	274.0	7,723	2,030.5
New York, Non-NYC	11,073,389	260,500	2,352.5	29,349	265.0	231,151	2,087.4
New York State Total	19,293,585	460,441	2,386.5	79,802	413.6	380,639	1,972.9

*Rates per 100,000 population
Source: DCJS, Uniform Crime/Incident-Based Reporting System
NA = not available by specific location.

16.4.6 Public Services and Facilities

A wide range of public services and facilities are offered in Orange County. Services and facilities include several hospitals (AHD, 2008) and public schools.

Hospitals

The hospitals in Orange County include the Orange Regional Medical Center with an Arden Hill Campus (Goshen) and a Horton Campus (Middletown) with a combined 450 staffed beds; Saint Luke's Cornwall Hospital with campuses in Cornwall and Newburgh for a combined 183 staffed beds; Bon Secours Community Hospital in Port Jervis with 183 staff beds; and Saint Anthony Community Hospital in Warwick with 73 staffed beds (AHD, 2008). There are no hospitals within 1-mile of the Project site. The closest hospital is approximately 1.30 miles from the Project site. An inventory and analysis of hospitals that might be affected by the construction or operation of the Project within the primary study area (1-mile radius) and secondary study area (5-mile radius) was conducted. Figure 3-6 in Land Use Section 3.0 shows the location of these facilities relative to the Project site. These facilities are described in some detail below.

Mid-Hudson Forensic Psychiatric Center (H1) – This facility is located on Route 17M in the hamlet of New Hampton, New York, 1.30 miles from the Project site. The facility is a secure adult psychiatric center that provides a comprehensive program of evaluation, treatment, and rehabilitation for patients admitted by court order (NYSOMH, 2008).

Middletown Psychiatric Center (H2) – This facility is located on Dorothea Dix Drive in Middletown, 2.60 miles from the Project site. This facility is an accredited, adult psychiatric center serving Orange and Sullivan counties with inpatient units located in Tuckerman Hall and Outpatient and Residential Services throughout Orange and Sullivan counties (OMH, 2008).

Horton Hospital (H3) – This hospital is located on Prospect Avenue in Middletown, 2.69 miles from the Project site. This private, acute care hospital is a short term hospital with 247 beds of which 227 are Adult and Pediatric and 20 are Intensive Care (Healthgrades, 2008). This hospital reports jointly with Orange Regional Medical Center (Healthgrades, 2008).

Orange Regional Medical Center, Horton Campus (H3) – This medical center is located on Prospect Avenue in Middletown, 2.69 miles from the Project site. This medical center was formed by the merger of Arden Hill Hospital and Horton Medical Center and provides 450 beds (ORMC, 2008).

Valley Columbia Heart Center (H4) – This facility is located on East Main Street in Middletown, 3.34 miles from the Project site. This facility has offices and clinics of medical doctors (Manta, 2008b).

The Workplace of St. Francis Hospital (H5) – This facility is located on East Main Street in Middletown, 4.07 miles from the Project site. This facility meets occupational health needs of businesses and organizations in the area and is staffed by trained and skilled clinicians who help employers maintain regulatory compliance with OSHA, PESH, DOT, and the Americans with Disabilities Act (ADA) (SFHHC, 2008).

Schools

Orange County contains 19 school districts (Capitol Impact, 2008). The Town of Wawayanda is served by three school districts: the Minisink Valley Central School District, the Middletown School District, and the Goshen School District. The Energy Facility site is within the Minisink Valley Central School District. The Minisink Valley Central District has five public schools including: one high school, one middle school, one intermediate school, and two elementary schools (Town of Wawayanda, 2008). The district comprises approximately 4,700 students. The schools in this district are described as having a child-centered philosophy designed to meet individual needs of students K-12 and offering a strong academic program in five school buildings (Minisink Valley CSD, 2008). Further, the educational program is supported by academic intervention services, celebration of artistic and musical talents of children, impressive athletic and extracurricular programs, and focus on developing children ethically, emotionally, and intellectually (Minisink Valley CSD, 2008). Additional detailed information can be found in Appendix A.

The Middletown School District has seven public schools, including: one high school, two middle schools, three elementary schools, and one primary center. The district comprises over 6,700 students, 545 teachers, 35 administrators, and nearly 560 support staff members. (Middletown School District, 2008). The nearest school to the Project is a private school, Our Lady of Mt. Carmel Elementary School approximately 1.3 miles north of the Project. Our Lady of Mt. Caramel Elementary covers pre-kindergarten to eighth grade and has a total of 216 students. The nearest public school is the Truman Moon Primary School, approximately 1.9 miles northeast of the Project. Truman Moon is a primary center of approximately 400 students in kindergarten and first grade.

Figure 3-6 in Land Use Section 3.0 shows the location of schools relative to the Project site. Detailed descriptions of the school facilities are also presented in Land Use Section 3.0.

16.5 CULTURAL CHARACTERISTICS

Museums

There are two museums located in the vicinity of the proposed Project (Orange County Museums, 2008). The Harness Racing Museum & Hall of Fame is located in Goshen and has historic information of America's first sport and the largest collection of Currier & Ives trotting prints in the country (Orange County Museums, 2008). The Pines Museum located in Slate Hill is a 1700s home that has family history information and memorabilia (Orange County Museums, 2008)

Local Arts

Orange Arts in Goshen is the headquarters for the arts in Orange County and has a mission to raise awareness of the arts, help promote local artists, and enhance cultural horizons of Orange County (Orange County, 2008). Orange Arts assists with the organization of various exhibits, performances, receptions and the call for artists, classes and workshops (Orange County, 2008). Such exhibitions in the Project vicinity have included various art exhibitions at Orange County Community College – State University of New York (SUNY) Orange located in Middletown (Orange County, 2008).

16.6 IMPACTS TO COMMUNITY CHARACTER

16.6.1 Construction Impacts

The community character during construction of the Project would be affected only relatively close to the Project site as a result of traffic and noise. However, such impacts would be relatively minor and temporary, and will be mitigated (e.g., by offsetting construction work day hours from peak traffic periods on local roads, use of noise attenuation measures on construction equipment). Refer to traffic impacts in Section 8.0, and noise impacts in Section 10.0. The construction workforce is not expected to result in any required in-migration of workers, and thus no temporary impacts to community character are expected from the need to accommodate such workers in homes in the area or provide municipal services to these workers.

16.6.2 Operation Impacts

As the Project will not result in any discernible in-migration of workers, it will not have an effect on the character of the area in terms of changing the number or type of people living in the area, or affecting costs associated with additional school enrollment or other town services. As well, traffic impacts during operation will be negligible compared to existing traffic volumes. Other environmental factors such as changes in noise levels, air emissions, and water impacts will generally not be discernible, and will not affect community character. Visual impacts could result in minor changes to the character of the area in limited locations that are both very close to the Project that have a view of the Project, as the scenic quality of the Project site would change from open/agricultural land to industrial. However, as shown in the visual analysis in Section 5.0, the extent of visibility is limited due to topography, trees, and structures in the area. Thus overall, the Project would not change the community character of the area except in limited locations very close to the Project site where views exist.

With respect to positive impacts, the significant revenues going to the Town of Wawayanda, and more specifically the Minisink Valley Central School District, will allow the Town to improve its services to residents, and the school district to improve the general quality and character of its school system. Additionally, 25 jobs will be created for operation of the Project. CPV expects all 25 positions to be filled locally.

16.7 REFERENCES

American Hospital Directory (AHD). 2008. www.ahd.com/freesearch.php3. Site accessed June, 2008.

Capitol Impact. 2008. www.capitolimpact.com/gw. Site accessed August 19, 2008.

City of Middletown. 2007. City of Middletown Comprehensive Plan – Task 1: Existing Conditions Technical Memorandum. Saccardi & Schiff, Inc.

Historic Paramount Theatre (HPT). 2008. Historic Paramount Theatre. http://www.middletownparamount.com/History.aspx. Accessed October 13, 2008.

Middletown School District. 2008. www.middletowncityschools.org. Site accessed August 19, 2008.

Minisink Valley Central School District (Minisink Valley CSD). 2008. About Minisink. http://www.minisink.com/index.php?id=74. Accessed November 5, 2008.

National Register of Historic Places Listings in Orange County, New York (NHRP). 2008. List of Registered Historic Places in Orange County, New York. http://en.wikipedia.org/wiki/National_Register_of_Historic_Places_listings_in_Orange_County_New_York

Orange County. 2008. Orange Arts. http://www.orangetourism.org/orangearts.html. Accessed October 29, 2008.

Orange County Museums. 2008. Museums. http://www.orangetourism.org/Joomla/index.php?option=com_context&task=category&sectionid=4&id=16&Itemid=52. Accessed October 29, 2008.

Orange County. Orange County Department of Planning. 2003. Orange County Comprehensive Plan: Strategies for Quality Communities. Orange County, New York.

Town of Wawayanda. 2006a. Saratoga Associates. Town of Wawayanda Final Comprehensive Plan. Wawayanda, New York.

Town of Wawayanda. 2008. Town of Wawayanda Website. www.townofwawayanda.com. Site accessed June, 2008.

U.S. Census Bureau, Census 2000. American FactFinder. http://factfinder.census.gov. Site accessed June, 2008.

U.S. Census Bureau, Census 2000. State and County QuickFacts. http://quickfacts.census.gov. Site accessed June, 2008.

Wikipedia. 2008. Dunning House. http://en.wikipedia.org/wiki/Dunnng_House. Accessed October 13, 2008.

Wikipedia. 2008a. Primitive Baptist Church of Brookfield. http://en.wikipedia.org/wiki/Primitive_Baptist_Church_of_Brookfield. Accessed October 13, 2008.

Wikipedia. 2008b. Sawyer Farmhouse. http://en.wikipedia.org/wiki/Sawper_Farmhouse.

Yellowbook. 2008. www.yellowbook.com. Site accessed June, 2008.

17.0 CUMULATIVE IMPACTS

17.1 INTRODUCTION

This section addresses the potential cumulative effects associated with the construction and operation of the CPV Valley Energy Center. Cumulative effects result when the effects of an action are added to or interact with other effects in a particular location and within a particular time. The DEIS includes the following cumulative impact studies:

- Potential social economic and fiscal cumulative impacts on community services within the Town of Wawayanda.
- Cumulative traffic impact assessment for site access roadways.
- Conduct of a cumulative air quality compliance modeling analysis, using NYSDEC protocol.
- The cumulative impacts of the gas, and electric transmission lines, grey water lines and the construction and operation of the CPV Valley Energy Center.
- Impact of gas, electric and grey water transmission lines.

17.2 SOCIAL ECONOMIC AND FISCAL CUMULATIVE IMPACTS ON COMMUNITY SERVICES WITHIN THE TOWN OF WAWAYANDA

This section will assess to what extent the Project and its interconnection lines (electric, gas, water, sewer) may contribute to cumulative socio-economic impacts in the Town of Wawayanda and the surrounding area. There are eight (8) proposed development projects being planned or under construction in the immediate Project area that were identified by the Town of Wawayanda or the Orange County Planning Department. Accordingly, this analysis evaluates these eight projects with respect to cumulative impacts for socio-economics. Figure 3-4 shows the location of the proposed projects, which are summarized below:

- The proposed Concrete Properties/Panattoni Development will be located on the northwestern side of Route 6 across from the Project site. This proposed project is approximately 0.20 miles from the Project site. This project consists of a warehouse/ industrial facility (two buildings totaling 747,240 square feet) located on the northwest side of Route 6 at Pine Lane.
- Horizons at Wawayanda is 106 dwelling unit, workforce housing development located on Route 6 adjacent to the Project site (8.9 acres). This project is approximately 0.40 miles from the Project site. Construction at this site is nearing completion and applications are being accepted for fall 2008 occupancy. Horizons at Wawayanda is a project built with a combination of private and public funding to develop affordable housing for Orange County's working families at below market rates. Horizons at Wawayanda was constructed on a formerly vacant parcel adjacent to a cemetery, commercial, and industrial properties and directly bordering the MI Zoning District.

- Simon Business Park consists of 9 commercial lots of 2 to 3 acres each located on the south side of Dolsontown Road, east of Caskey Lane. This proposed project is approximately 1.10 miles from the Project site.

- Brookfield Resource Management consists of an 80,000 square foot commercial recycling center located on the north side of Dolsontown Road east of Route 17M. This proposed project is approximately 1.30 miles from the Project site.

- Sterling Parc of Middletown, LLC is a 192-dwelling unit townhouse residential development located on County Road 108 just west of Route 17M in Middletown. This proposed project is approximately 0.70 miles from the Project site.

- Sutton Hills Apartments – Phase II is a 116-dwelling unit apartment development located off of County Road 108, west of Route 17M in Middletown. This proposed project is approximately 0.90 miles from the Project site.

- Howard Shapiro consists of a 62-unit, single-family subdivision located off of County Road 56, south and east of Route 6 in Wawayanda. This proposed project is approximately 0.75 miles from the Project site.

- Razzano Commercial is a 23,000 square foot retail development located at the intersection of Route 6 and Ridgebury Hill Road in Wawayanda. This proposed project is approximately 1.50 miles from the Project site.

The CPV Valley Project will have a positive impact on the financial revenues of the Town of Wawayanda via a PILOT agreement and through other secondary economic revenues associated with both the construction and operation of the Project. The above referenced Projects will also provide economic benefits to the Town though on a much smaller scale, and therefore there will be a cumulative positive impact on revenues going to the Town.

With respect to the cumulative impact on costs related to municipal services, the CPV Valley Energy Center (inclusive of the gas interconnect and other utility lines) is expected to result in very little additional demand and resulting costs to municipal services (See Section 7.3.6). The other proposed projects listed above are expected to result in various levels of increased demand for municipal services. As an example, the CPV Valley Project will not result in increased costs associated with municipal water needs as it will use treated effluent for its process water needs. In addition, as the CPV Valley Project is not expected to result in the in-migration of construction workers or require a large workforce for its operation, no increases in school enrollment costs or other costs related to induced population growth are expected. The various housing projects described above including Horizons at Wawayanda, Sterling Parc of Middletown, LLC, Sutton Hills Apartments, and Howard Shapiro, will result in new families living in the town and thus higher school costs, municipal water costs, emergency response costs, and new roadway traffic that cumulatively, could result in new traffic control costs or roadway maintenance/improvement costs. As well, the other new commercial/industrial projects described above (Concrete Properties/Panattoni Development, Simon Business Park, and

Brookfield Resource Management) will result in added roadway traffic and associated costs. The CPV Energy Center will not add measurably to community service costs and will in fact will most likely offset some of the added costs associated with the other projects.

In summary, from a cumulative socio-economic standpoint, the large revenues related to the CPV Valley Energy Center will provide much needed revenue for the Town and will help to offset the additional costs for municipal services that will result from the other proposed projects.

17.3 CUMULATIVE TRAFFIC ASSESSMENT

Section 8.0, Traffic and Transportation, presents a detailed operational traffic impact analysis for the Project, and considers the traffic from the eight other planned projects located within the study area. This detailed, cumulative impact analysis indicates that there would be no adverse impacts created at any of the intersections studied as a result of the operation of the proposed Project. The addition of the traffic generated by the Project during the morning and evening peak periods (20 total morning vehicle trips and 20 total evening vehicle trips) is not be expected to result in a significant deterioration of the projected future Levels of Service at the intersections studied.

Table 17-1 illustrates this finding in comparing the "No-Build" to "Build" scenarios. The future year "No Build" condition includes the eight identified development projects exclusive of the CPV Valley Energy Center. The "Build" condition adds in the traffic of the CPV Valley Energy Center. However, when comparing the existing levels of service to the levels of service that reflect the cumulative traffic from the Project and the eight other developments (i.e. "Existing" vs. "No-Build"/"Build"), there are select locations where this combination of additional traffic would cause deterioration in Level of Service (LOS). Those study locations where these drops in LOS would occur are summarized below.

During the AM peak hour, increases in delays/densities result in only single level drops to no worse than LOS "D". These are typically considered acceptable Level of Service changes for such intersections during the peak hours.

During the PM peak hour, the "Stop" sign controlled intersections of Route 6 and Kirbytown Road, and Route 6 and County Road 56 would experience more significant drops in LOS – LOS "c" to "e" and LOS "c" to "f", respectively. These intersections could be monitored in the future as the Project and the other developments are built to determine if these impacts materialize, and then identify what, if any, mitigation measures may be considered.

Table 17-1
2012 Operation – Overall Level of Service Summary

PEAK AM HOUR						
Intersection	**Existing**		**No-Build**		**Build**	
	LOS	**DELAY**	**LOS**	**DELAY**	**LOS**	**DELAY**
Route 17M & County Road 108 / Dolsontown Road	C	26.5	D	37.5	D	37.6
Route 6 & Kirbytown Road	C	15.6	d	31.9	d	33.2
Route 6 & County Road 56	B	13.2	c	16.3	c	16.4
Merge / Diverge	**LOS**	**DENSITY**	**LOS**	**DENSITY**	**LOS**	**DENSITY**
Route 17M NB Merge with ramp from I-84 EB	A	8.8	b	11.3	b	11.3
PEAK PM HOUR						
	LOS	**DELAY**	**LOS**	**DELAY**	**LOS**	**DELAY**
Route 17M & County Road 108 / Dolsontown Road	D	35.8	E	67.2	E	67.6
Route 6 & Kirbytown Road	C	17.8	e	38.5	e	40.0
Route 6 & County Road 56	C	23.3	f	61.8	f	62.8
Route 6 & Route 284	C	17.8	d	29.0	d	29.2
Merge / Diverge	**LOS**	**DENSITY**	**LOS**	**DENSITY**	**LOS**	**DENSITY**
Route 17M SB Diverge to I-84 WB	A	9.3	b	12.2	b	12.3

Notes:
LOS results for signalized intersections are represented by uppercase letters with average delay in seconds per vehicle.
LOS results for unsignalized intersections are represented by lowercase letters with average delay in seconds per vehicle.
LOS results for merges/diverges are represented by lowercase letters with average density in passenger cars per mile per lane.
Source: TRC, September 2008.

17.4 AIR QUALITY CUMULATIVE ANALYSES

Maximum predicted impacts of the Project were below significant impact levels (SILs) defined by EPA for CO, NO_2, and SO_2. Therefore, Project impacts are considered to be insignificant, and no cumulative impact modeling was required for these pollutants. Maximum predicted Project impacts exceed the 24-hour SIL for PM_{10} for scenarios involving the firing of ULSD (oil) in the combustion turbines. The associated significant impact area was approximately 4.6 km. Maximum predicted Project impacts were below the 24-hour SIL for PM_{10} for natural gas firing scenarios in the combustion turbines and were also below the annual SIL for PM_{10}. Therefore, cumulative impact modeling was conducted for PM_{10} and only for oil firing scenarios in the combustion turbines.

Two separate cumulative impact analyses for PM_{10} were conducted. One analysis included the Project and an inventory of PSD and other large sources located within approximately 55 km of the Project and predicted PM_{10} concentrations at receptors located within the significant impact area for the Project. All of the modeled sources were assumed to consume a portion of the available increment. Maximum predicted annual and high second-high 24-hour PM_{10} impacts from the modeled sources were determined and compared to the corresponding Class II PSD increments. This comparison demonstrated compliance with the Class II PSD increments. The maximum predicted annual and high second-high 24-hour PM_{10} impacts from the modeled sources were also added to conservative background concentrations, and the resulting estimates of total PM_{10} concentrations were compared to the corresponding National Ambient Air Quality Standards (NAAQS) for PM_{10}. This comparison demonstrated compliance with the NAAQS for PM_{10}.

Another separate cumulative impact modeling analysis for PM_{10} included the Project and local sources (within about 10 km) and predicted PM_{10} concentrations at receptors located within the significant impact area of the Project. Maximum predicted annual and high second-high 24-hour impacts from the modeled sources were determined and added to conservative background concentrations, and the resulting estimates of total PM_{10} concentrations were compared to the corresponding NAAQS for PM_{10}. This comparison also demonstrated compliance with the NAAQS for PM_{10}.

17.5 GAS LINE CUMULATIVE IMPACT ANALYSIS

CPV Valley will utilize clean burning natural gas as its primary source of fuel and will likely utilize a combination of firm and interruptible natural gas transportation to serve the natural gas supply requirements of the Facility. It is intended that the supply and transportation portfolio developed to serve the Facility will minimize gas supply costs and provide high levels of reliability and operational flexibility. CPV Valley's primary upstream transportation path will be the FERC-regulated Millennium Pipeline, currently under construction and is planned to be operational in late 2008. This upstream transportation path will be linked to the plant via one of two incremental service options currently the subject of on-going evaluation.

CPV Valley is reviewing two discrete options for gas transportation service to link the Facility to the Millennium system. Discussions with each of the two potential service providers, Millennium Pipeline ("Millennium") and Orange & Rockland ("O&R"), are in the preliminary stages, and will continue through the development process to fully define the commercial options available to the proposed CPV Valley Energy Center. Both entities have provided initial indications of their ability to provide gas transportation service to the CPV Valley Energy Center with the addition of certain facilities to tie the facility to the existing natural gas pipeline transportation grid. It is contemplated that any new natural gas pipeline lateral would be developed under Article VII of the N.Y.S. Public Service Law or the Federal Energy Regulatory Commission (FERC) under its Section 7(c) certificate authority. The licensing of the natural gas pipeline lateral ultimately used to transport natural gas supplies to the Project is not part of this SEQRA review because, as an independent project, it would go through its own separate environmental review and approval process under a separate non-affiliated entity from CPV Valley LLC.

The two potential options include a direct interconnection with the Millennium system, which will also be the upstream transportation path for the CPV Valley Energy Center, via a new lateral pipeline from the Millennium system to the CPV Valley Energy Center, with an estimated length of 7 to 8 miles. The lateral would be built, owned and operated by Millennium Pipeline Company L.L.C., a FERC-regulated interstate pipeline company, and would be the subject of a separate FERC Section 7(c) permitting and environmental review process. The exact location and routing of the lateral would be determined by Millennium and approved by FERC as part of this process.

The second option for service to the facility is a connection to the O&R distribution system via a new lateral to the CPV Valley Energy Center. Preliminary discussions have indicated that the laterals would be 2 to 3 miles in length and would interconnect with a proposed O&R bulk transportation line that will originate at Minisink and terminate in New Hampton. As is the case with the Millennium option, the O&R lateral would be the subject of its own permitting and environmental review process through the Article VII of the N.Y.S. Public Service Law, with location and final routing to be determined by O&R and approved by the appropriate regulatory agencies.

Due to the preliminary nature of these discussions, the commercial terms related to either of these options, such as service characteristics, operational flexibility and associated costs have yet to be determined or evaluated. CPV Valley LLC will be continuing discussions with both parties over the coming months to establish the most suitable transportation option. Once a service provider is selected, the commercial agreements necessary to support the development of the appropriate gas transportation infrastructure will be negotiated and associated permitting activities will be initiated. For informational purposes, Figure 17-1 provides CPV's approximation of potential corridor scale routings of the two lateral options under consideration. As was indicated previously, the final decision, routing and alternative routings will be the responsibility of the transportation service provider selected and will be the subject of an independent permit review and approval process and, as such, may differ materially from those presented herein.

A map level and literature review of the potential environmental impacts to wildlife, wildlife habitats, wetlands, water bodies and resources, groundwater soils, vegetation, cultural resources and land use along the potential routing options has been conducted. NYSDEC wetland crossing information was obtained from the NYSDEC freshwater wetland GIS data layer. Federal wetland crossing information was obtained from review of NWI data obtained from the U.S. Fish and Wildlife Service wetland data. Water body crossings and soils information were obtained from Orange County GIS data. Cultural resource information was obtained from review of New York State and National Historic Register GIS data. Land use information was determined from electronic image data specific to each town in the corridor. Where electronic land use data were not available, aerial photograph interpretation was performed. Information related to crossing lengths of wetlands, water bodies and land use was measured along the centerline of the Potential Routing Option corridor.

Table 17-2 summarizes the results. Details of the corridor level map and literature review study are presented in Appendix 17-A. The evaluation shows that Potential Routing Options 1 and 2 because of their shorter length than the other Potential Routing Options and have fewer wetland crossing and stream crossing areas. For the longer Potential Routing Options with several identified wetland and stream crossings, further evaluation of routing alignments would likely result in the avoidance of a number of wetland and waterbody crossings.

Soils along the Potential Routing Options are mostly similar with some variations along sections of the routes. Forested areas are less prevalent along Potential Routing Option 1, somewhat prevalent along the other Potential Routing Options with Potential Routing Option 4 having the most forested areas. Further evaluation and potential re-routing may be considered to avoid forested areas. Cultural resources are not anticipated to be affected by the Potential Routing Options. Residential land use is present along the majority of Potential Routing Options 1 and 2, open/agricultural land use is present along the majority of Potential Routing Options 3, 5 and 6, and forested land use is present along the majority of Potential Routing Option 4.

Routing options are anticipated to have relatively minimal environmental impacts with portions of potential alignment options located in some cases in existing roadway rights-of-way and existing utility rights-of-way, with further evaluations and re-routing likely in sections of the lines where it would be possible to avoid wetland and waterbody crossings. Utilization of construction techniques that minimize potential impacts in sensitive locations along potential routing options are standard practice in the construction of underground pipelines. Regulatory agencies view impacts associated with pipeline construction as temporary in nature. Once construction is completed, rights-of-way are restored wherever possible to their original conditions.

Table 17-2 Summary of Potential Gas Routing Options								
Alternatives	**Distance**	**NY DEC Wetlands Crossed**	**Federal Wetlands Crossed**	**Number of Water bodies Crossed**	**Predominate Soils**	**Vegetation**	**Cultural Resources**	**Predominate Land Use**
Potential Routing Option 1	3.1 miles	0	275 ft	0	Silty loams, sandy loams and gravelly loams with some stony soils	6% Forested	0	83% Residential
Potential Routing Option 2	3.97 miles	636 ft	426 ft	0	Silty loams, sandy loams and gravelly loams with some stony soils	16% Forested	0	71% Residential
Potential Routing Option 3	7.1 miles	0	7,337 ft	7 streams	Silty loams, sandy loams and gravelly loams with some stony soils	15% Forested	0 (located south of Primitive Baptist Church	41% Open/agriculture 22% Residential
Potential Routing Option 4	9.6 miles	3,093 ft	4,703 ft	2 lakes or ponds, 6 streams	Stony, silty loams, sandy loams, and gravelly loams with some much and rock outcrop	50% Forested	0	50% Forested 42% Residential
Potential Routing Option 5	8.1 miles	2,424 ft	8,853 ft	10 streams	Stony, silty loams, sandy loams, and gravelly loams with some rock outcrop	13% Forested	0 (located south of Primitive Baptist Church	44% Open/agriculture 22% Residential
Potential Routing Option 6	9.4 miles	452 ft	8,727 ft	3 streams	Stony, silty loams, sandy loams, and gravelly loams with some rock outcrop	21% Forested	0 (located south of Primitive Baptist Church	36% Open/agriculture 26% Residential

17.6 ELECTRIC TRANSMISSION LINE AND WASTE WATER LINE CUMULATIVE IMPACT ANALYSIS

Routing of the electric transmission line and waste water line are anticipated to have relatively minimal environmental impacts with sections of routing selected in existing roadways and in some cases in areas already disturbed during installation of a now existing utility connection. In addition, routing has also been designed to avoid, wherever possible, the crossing of natural areas and wetlands to the extent possible.

17.6.1 Electric Transmission Line Routing

The Project would interconnect to NYPA's 345-kilovolt (kV) transmission system. The Marcy South line is located less than 1 mile from the Project site. A combination of underground and overhead transmission line will be constructed between the Project's step up transformers and the NYPA transmission line. The transmission line contained within the Project site will be overhead. Once the transmission leaves the Project site until just prior to the interconnection with NYPA, the transmission line will be underground utilizing Route 17M right-of-way.

The route for interconnecting to NYPA's Marcy South 345 kV Right-of-Way electric transmission system is via five overhead steel transmission monopoles within a 150 foot on-site wide right-of-way, before the line transitions onsite to an underground duct bank configuration near the intersection with Route 17M. The underground duct bank will be 4 feet wide and will be located, off pavement primarily within the western drainage swale, within the right-of-way of NY Route 17M. The duct bank will terminate next to a riser pole, on, or next to NYPA's Marcy South transmission right-of-way, just north of the intersection of NY Routes 6 and 17M. The Project is currently proceeding through the interconnection process with the NYISO, and ultimately will receive input from NYPA as the interconnecting utility. Upon completion of the NYISO and NYPA's review, some changes to the routing of the transmission line may be required. The assessment of the electric transmission line is evaluated throughout the EIS in detail and summarized below.

Wildlife Habitat

The onsite portion of the electric transmission line routing will result in limited loss of wildlife habitat in cleared areas. No Federal and state endangered and threatened wildlife species occur along the electric transmission line routing. The portion of the line within the Route 17M right-of-way does not represent wildlife habitat.

Wetlands

As outlined in Section 14.0, Ecology, on-site ecological resources affected by this route include clearing of 2.32 acres of forested uplands and 0.92 acres of forested wetlands (red maple-hardwood swamp), and permanent maintenance (i.e., prevention of tree growth) of a 130 foot wide by 1,300 foot utility corridor. Other aspects of ecological impacts are temporary and relatively minor, since the majority of the proposed right-of-way is currently non-forested, and utility pole installation requires minimal land disturbance. The proposed alternative placement of the electrical interconnect on the site minimizes clearing of forested communities by routing through the narrowest portion of forest on the site – the southern site boundary along Route I-84. Any other alignment to the north would require additional clearing and fragmentation of forested wetland and upland communities. This also reduces the affects of forested habitat loss.

Waterbodies and Water Resources

The electric transmission line routing makes two crossings of a stream that has a width of less than 40 feet. One crossing occurs in the portion of the routing that is overhead. The second crossing will involve construction activities in the stream. Upon completion of construction, the stream bank will be restored to its current condition.

Groundwater

Groundwater is expected to be encountered in sections of this route where the underground line traverses the one stream. Limited dewatering for a short duration could be required.

Soils

The Orange County Soil Survey (USDA, 2008) includes mapped soils for the electric transmission line routing. The electrical interconnection overhead poles on the Facility site will be installed through soils similar to those found on the Project site and Erie gravelly loam (as found on flat terrain. The underground portion will also run through Erie gravel for a short run until paralleling Route 17M (USDA, 2008). At that point the excavation will be in areas where soils have been removed to support historical development.

Vegetation

The electric transmission line routing crosses areas with vacant and commercial land.

Cultural Resources

No cultural resources have been identified in the electric transmission line routing.

Land Use

The overhead portion of the electric transmission line routing is internal to the Project site. The underground portion of the electric transmission line routing will be located in the right-of-way of NY Route 17M. No impacts to adjacent land uses have been identified.

17.6.2 Water/Wastewater Line Routings

Construction of the potable water line will be within Route 6 and interconnect to the potable waterline that is to be extended for another nearby development. The grey water supply and wastewater return pipelines from and to the Middletown WWTP will be collocated within existing rights of way along Route 6 and 17M. The grey water pipeline will travel past the NYPA ROW and cross Route 17M at juncture of Route 6 and proceed up Route 17M to Dolsontown Road and follow an existing force main corridor to the north and east.

Wildlife Habitat

The grey water supply and wastewater lines cross areas primarily within existing roadway rights-of-way with a small portion crossing areas of undeveloped land. The ecological community present along the route includes primarily mowed roadside/path in various stages of management, or actual portions of paved roadway.

Wetlands

The waste water line routing does not cross NYSDEC or Federal wetlands.

Waterbodies and Water Resources

The waste water line routing crosses two streams that have a width of less than 40 feet. One of these stream crossings is of Monhagen Brook. Crossings will be in culverted portions of these streams.

Groundwater

Groundwater might be encountered nearby the two stream crossings. Limited dewatering for short durations may be required.

Soils

The Orange County Soil Survey (USDA, 2008) includes mapped soils for the waste water line routing. Water and waste water lines will be installed in previously disturbed soils from the Project site, along Route 6 (where the water line interconnection will be completed), Route 17M, and Dolsontown Road. Where the waste water interconnection leaves Dolsontown Road to the waste water treatment plant, gravelly silty loam will be encountered.

Vegetation

The waste water line routing crosses areas mainly within existing roadway rights-of-way with a small portion crossing areas of undeveloped land. The ecological community present along the route includes primarily mowed roadside/path in various stages of management, or actual portions of paved roadway. No endangered or threatened plant species have been identified along the wastewater line routing.

Cultural Resources

Cultural resources are not crossed by the wastewater line routing.

Land Use

The waste water line routing crosses areas mainly within existing roadway rights-of-way with a small portion crossing areas of undeveloped land. No land use impacts will occur during construction. Temporary access will be maintained when land use access drives are crossed.

17.6.3 Installation Techniques

Installation techniques for the electric transmission line and the waste water line will be similar to those conventional techniques discussed in Appendix 17-A.

18.0 OTHER ENVIRONMENTAL IMPACTS

This section addresses other potential environmental impacts associated with the Project, including short- and long-term impacts; unavoidable adverse environmental impacts; irreversible and irretrievable commitment of resources; growth inducing aspects of the proposed action; and effects of the proposed action on the use and conservation of energy. This section also presents an analysis of Electric and Magnetic Fields. An assessment of potential cumulative impacts associated with the construction and operation of the Project is presented in Section 17.0, Cumulative Impacts.

18.1 REASONABLY RELATED SHORT-TERM AND LONG-TERM IMPACTS

This section presents the short-term and long-term impacts associated with the Project as identified in the DEIS environmental analyses.

18.1.1 Short-Term Impacts

Short-term impacts associated with the Project are anticipated as a result of construction-related disturbances; these include the presence of construction equipment and workers at the Project site and associated noise, fugitive dust and traffic increases that could temporarily impact adjacent or nearby land uses. In as much as the Project area is characterized by commercial development and only a limited number of residences are located within the Project area, the impact of these temporary construction activities should not be significant. The most notable short-term impact would result from traffic associated with the peak construction worker period. However, the peak construction worker period would last for a relatively short time during the entire construction period. Detailed analyses addressing the potential short-term construction impacts of the Project are discussed in detail in Section 15.0, Construction Impacts.

18.1.2 Long-Term Impacts

Long term impacts associated with the Project are those anticipated to occur during facility operation for the life of the Project. Accordingly, long-term land use, visual, traffic, air quality, and noise impacts are anticipated. The economic benefits of the Facility operation represent a long-term positive impact.

18.1.2.1 Land Use Impacts

Construction of the Project would result in the development of vacant land and the siting of an energy facility at an appropriately industrial-zoned parcel. The 122-acre site is located within the Manufacturing Industrial (MI) zone (See Figure 3-2). The intent of the MI zoning district is to provide areas for various industrial and manufacturing enterprises within well-planned complexes on parcels with good access to the regional transportation system, where they can be free of potentially incompatible land uses. Section 195-9 of the Zoning Code contains a list of prohibited uses. The proposed use of this site is not among those prohibited uses. The Schedule of Zoning District Regulations for the MI zoning district lists principal permitted uses, special uses, and accessory uses allowed within the zone. The only principal permitted uses in the zoning district are agriculture and minor wireless communications facilities. Among the special uses (uses requiring a Special Use Permit) is “other industrial uses,” the category under which this Project would fall. Therefore, CPV will seek to obtain a Special Use Permit from the Town of Wawayanda Town Board, as well as site plan approval from the Town Planning Board.

Further, as indicated in Section 3.5.1.2, the proposed Project is not expected to limit or effect zoned uses in adjacent parcels or within the primary study area.

18.1.2.2 Visual Impacts

As detailed in Section 5.0, Visual Resources and Aesthetics, the results of the viewshed analysis and field survey show that the areas with the greatest potential for views of the Project are limited to open areas in both low lying locations and at higher elevations where views are not obscured by hills and vegetation. Views from most parks, schools, and other sensitive receptors considered in this study would be very limited as a result of dense tree cover and intervening topography.

The photosimulations show the type of view that could be seen with various distances to the Project under different lighting conditions. They are representative of the kinds of views that can be found in the given landscape environment located north, south, east and west of the site. Using guidance document NYSDEC “Assessing and Mitigating Visual Impacts”, it was determined that most of the specific viewpoint locations analyzed do not have views of the facility. There will however, be partial views of the facility from some residential locations in the vicinity during both leaf-on and leaf-off conditions. In these situations, most of the visibility as shown in the photosimulations can be attributed to the height of the stacks rather than a view of the entire facility. Additionally, with distance and the presence of foreground elements or topography, visual impacts are minimized as the Facility and stacks are not the dominant visual focus of the landscape. Some of the views will be of short duration during travel along roadways due to prevailing topography and vegetation while other areas may show a greater abundance of views.

18.1.2.3 Traffic Impacts

A detailed assessment of the potential traffic impacts associated with operation of the Project was presented in Section 8.0, Traffic and Transportation. The analysis considered the impact, if any, of the traffic generated by the operation of the proposed Project and reflected the conditions that will occur when the facility is in operation. The results of the traffic analyses revealed that that there would be no impacts created at any of the study intersections during the operation of the Project for either the morning or evening peak hour periods.

18.1.2.4 Air Quality Impacts

Operation of the Project would result in the emission of criteria pollutants. As detailed in Section 9.0, Air Quality, proposed facility emissions would not result in a contravention of state and national ambient air quality standards. To determine this, anticipated facility emissions were modeled in accordance with the approved Air Quality Modeling Protocol submitted to the New York State Department of Environmental Conservation (NYSDEC) and United States

Environmental Protection Agency (USEPA). Final Project emission rates and stack parameters were used in conjunction with the methodologies presented in the Modeling Protocol. The results of the air quality dispersion modeling revealed that the maximum-modeled ground-level concentrations for the Project are less than the USEPA defined Significant Impact Levels (SILs) and therefore all criteria pollutants with the exception of $PM_{2.5}$ when using backup oil. Total ground-level concentrations (i.e., sum of maximum modeled and background concentrations) are below the National Ambient Air Quality Standards (NAAQS) for all pollutants and averaging periods. Therefore, the potential long-term air quality impacts of the CPV Valley Energy Center are not considered significant.

18.1.2.5 Noise

Operation of the Project would result in a minor long-term increase in ambient noise levels in the vicinity of the Project area. The potential significance of this increase in ambient noise levels is addressed in Section 10.0, Noise. The results of the study indicate that proposed Facility would not result in significant noise impacts. Operation of the proposed Facility at all locations would comply with NYSDEC noise guidelines and the Town of Wawayanda noise standards.

18.1.2.6 Energy

The Project would result in long-term beneficial energy impacts. The purpose of the Project is to provide an efficient, reliable, and competitive source of electric energy to assist in addressing the need for additional electricity, increased competition, and improved system reliability in New York. The facility would generate a peak of 630 megawatts MW of electric energy and interconnect to the NYPA transmission system.

18.2 ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROJECT IS IMPLEMENTED

Unavoidable adverse impacts are defined as those that meet the following two criteria:

- There are no reasonably practicable mitigation measures to eliminate the impact; and
- There are no reasonable alternatives to the proposed Project that would meet the purpose and need of the action, eliminate the impact, and not cause other or similar significant adverse impacts.

As detailed in Sections 3.0 through 16.0 of this DEIS, the Project would not result in significant adverse environmental impacts, with the possible exception of the traffic impacts that may be experienced in the Project area during the peak construction period, and limited impacts to select viewshed locations

The potential traffic impacts associated with the peak construction of the proposed Facility are detailed in Section 8.7.

A comparison of projected future traffic conditions with and without construction related traffic was performed, including a calculation and comparison of the Level of Service (LOS) for each study location, giving details for each turning movement. There are a few instances when construction related traffic will cause deterioration in Level of Service at a study location. The drop in LOS is generally moderate and will be temporary, lasting only during the 4 or 5 months of peak construction activity. Thereafter, conditions will return to pre-construction levels. Viewshed impacts will be mitigated through landscaping and building treatment.

18.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

This section presents those natural and human resources identified in the EIS environmental analyses that will be consumed, converted, or otherwise made unavailable for future use if the Project is implemented.

The permanent resource commitments associated with the proposed CPV Valley Energy Center are described below.

18.3.1 Land Use

Construction of the Project would result in the development of 21.25 acres of a 122-acre property for the purpose of electric generation. The Project site is located within the Manufacturing Industrial (MI) zone (See Figure 3-2). The intent of the MI zoning district is to provide areas for various industrial and manufacturing enterprises within well-planned complexes on parcels with good access to the regional transportation system, which allows electric generating facilities by special permit. Thus, from a land use planning perspective, the Town specifically envisions development of the property for the purpose of industrial uses.

18.3.2 Community Facilities

No community facilities would be impacted in an irreversible or irretrievable manner.

18.3.3 Cultural Resources

Based on the Phase I cultural resource assessment prepared for the entire 122-acre parcel, archaeological resources are not expected to be found on-site. Accordingly, no cultural resources would be impacted in an irreversible or irretrievable manner.

18.3.4 Earth and Terrestrial Resources

As detailed in Section 14.0, Terrestrial Ecology, impacts as a result of the CPV Valley Energy Project construction, permanent impacts will occur to 21.25 acres of Cropland/row crop ecological community, permanent filling of 0.34 acres of Federal jurisdictional wetland, and an additional 0.02 acres of both federal and state jurisdictional wetlands for electric interconnect structures. Temporary, or construction related impacts include conversion of 0.92 acres of Red maple-hardwood swamp (also federal/state jurisdictional wetlands) to non-forested wetlands (likely to Shrub swamp and/or Shallow emergent marsh), conversion of 2.32 acres of upland Beech-maple mesic forest to non-forested upland (likely to Successional old field or

Successional shrubland), approximately 5 acres of temporary impacts to Successional old field and hayfield for construction laydown/parking areas, and up to 0.14 acre (6,000 sq. ft.) of impacts to Shallow emergent marsh for installation of the underground electrical conduit. Additionally, permanent impacts to wetlands will be mitigated through on-site replication of 0.7 acres of wetlands, providing a wetland replacement ratio of 2:1. This wetland replication area will also provide enhanced wildlife habitat functions for the site.

As previously indicated in Section 14.0, Terrestrial Ecology, no rare threatened, endangered species, populations, communities, or associated habitats would be impacted by the CPV Valley Energy Center.

18.3.5 Water Resources

Operation of the proposed Facility water supply requirements will typically range from approximately 63,360 gallons per day (gpd) (44 gallons per minute [gpm]) when firing natural gas to 648,000 gpd (450 gpm) when firing oil. The Project proposes to draw water from the City of Middletown Sewage Treatment Plant distribution system to satisfy process water supply needs. The Facility would operate under an agreement with City of Middletown Sewage Treatment Plant. The Project requires no upgrades to the general distribution system (that is, no additional or replacement pumps or storage capacity).

The Project avoids any adverse water supply impact through adopting air cooling and incorporating other water minimization measures such as recycle/reuse of HRSG blowdown and inlet air cooler blowdown. In addition, the Project includes installation of a raw water/fire water storage tank and demineralized water storage tank, which would both serve to minimize short-term peak impacts on the local distribution system and ensure continued Facility operation during any temporary curtailment in water supply services. Facility wastewater will be routed back to the City of Middletown Sewage Treatment Plant.

18.3.6 Air Resources

The Facility does represent a new source for air emissions in the local area. With respect to NOx and VOCs, the purchase of offsets at a 1.15:1 ratio should result in a net improvement for these two pollutants. The Facility will also purchase Emission Reduction Credits (ERCs) given the ozone non-attainment status of the area.

18.3.7 Construction Materials

Although the construction materials to be used for the proposed Project are physically retrievable, it would likely be economically infeasible to do so; these materials must, therefore, be considered irretrievably committed resources. However, the Project would incorporate recycling programs to minimize waste materials to the maximum extent practicable.

18.3.8 Energy

The purpose of the Project is to provide an efficient, reliable, and competitive source of electric energy to assist in addressing the need for additional electricity, increased competition, and improved system reliability in New York State. The Facility would generate a peak of 630 MWs of electric energy and connect to the NYPA transmission system.

The State Energy Plan 2005 Annual Report and Activities Update, the most current State Energy Plan, provides a summary of state's energy policy objectives. Included in summary were the following objectives[1]:

- Stimulating sustainable economic growth, technological innovation, and job growth in the State's energy and transportation sectors through competitive market development and government support.
- Increasing energy diversity in all sectors of the State's economy through greater use of energy efficiency technologies and alternative energy resources, including renewable-based energy.
- Promoting and achieving a cleaner and healthier environment.

The CPV Valley Energy is consistent with the State Energy Plan's energy policy objectives in various areas including significant capital investment in new technology in New York's energy infrastructure and market. This is an indication that the New York energy market is sending appropriate signals to market participants to attract new investment within the State.

18.4 GROWTH-INDUCING ASPECTS OF THE PROPOSED ACTION

This section provides an overview of the potential growth inducing effects of the proposed Project. The Project would represent a net benefit to the community due to its provision of energy, employment, infrastructure improvement, and tax dollars, and its minimal impact on existing community services.

18.4.1 Employment and Associated Demand for Housing

Construction and operation of the proposed Facility would not result in major growth-inducting impacts. As detailed in Section 7.0, Socioeconomics and Environmental Justice, no significant increase in population or demand for additional residential development is expected to occur as a result of the Project. It is expected that the Project would generate approximately 664 peak construction jobs. The average construction workforce level is expected to be approximately 298 construction employees. Construction is expected to be completed within a 24-month timeframe. The locally available construction labor force in the area is estimated to be adequate to satisfy the needs of the CPV Valley Energy Center, and no significant in-migration of construction workers is expected. Similarly, the existing employee base of powerplant operational staff located in the Project is expected to provide for the 25 person operating staff at the Facility without significant in-migration. Since the required operating staff is expected to currently reside in the area, there is no expected increase in the local population or in the demand for housing. Further, there would be no expected incremental increase of municipal service costs attributed to the operating staff.

[1] Energy Coordinating Workgroup, *"State Energy Plan – 2005 Annual Report and Activities Update"*, March 2006

Further, the proposed Project would provide substantial local tax benefits. Accordingly, the only effect of demographics would be the increase in employment resulting from the Project.

18.4.2 Economic Benefits and Fiscal Impacts

As detailed in Section 7.0, Socioeconomics and Environmental Justice, the Project will result in a capital investment of $800 million for construction of the Facility. Based on the existing marketplace factors, the Project will significantly boost the local economy by generating new jobs regionally, increasing income, and increasing local revenues. When completed, the CPV Valley Energy Center will represent a long-term source of additional revenue for the Town of Wawayanda, Orange County and local school district through a PILOT (Payment in Lieu of Taxes) and Host Community Benefits agreements. The economic benefits to be realized from these agreements have not been reflected in the analyses below, and therefore, are incremental economic benefits generated by the Project.

The Project will also provide a significant boost for the local economy with the creation of well-paying jobs both in the short-term during construction and long-term employment opportunities for people in the area once the Project is completed. It is expected that approximately 664 construction jobs (union) will be created during peak on-site construction, and about 25 well-paying permanent jobs will be created once the Facility is completed.

18.4.3 Infrastructure Improvement

The purpose of the Project is to provide an efficient, reliable, and competitive source of electric energy to assist in addressing the need for additional electricity, increased competition, and improved system reliability in New York State. Therefore, the CPV Valley Energy Center represents an improvement to the energy infrastructure of Orange County. By virtue of its construction and operation, the Facility would generate a peak of 630 MW of electric energy and interconnect with the NYPA transmission system. Because the demand for electricity in New York, and Orange County in particular, is rising faster than the ability of the region's infrastructure to generate and deliver it, locating an additional source of electricity at the Project site is an appropriate response to the increased demands for power supply in Orange County and would result in improved system reliability.

18.4.4 Creation of Further Growth Potential by Construction of Improved Infrastructure

Development of the proposed Facility is consistent with the goals of the Town of Wawayanda, as is reflected by the site's MI industrial zoning, which expressly allows electric generating facilities by special permit. The development of the CPV Valley Energy Center is not expected to significantly increase the growth potential of the area. The need for electricity to be generated by the Facility has been established through statewide planning efforts. Further, the need for the Project has been demonstrated in various sections of this DEIS, including Section 1, Project Purpose and Need.

18.5 EFFECT OF THE PROPOSED ACTION ON THE USE AND CONSERVATION OF ENERGY

The proposed Facility would result in the generation of additional electric capacity to assist in addressing the need for additional electricity, increased competition, and improved system reliability in the lower Hudson Valley region of New York State.

The Project would interconnect to NYPA's 345-kilovolt (kV) transmission system less than one mile from the Project area via an onsite overhead transmission line and an offsite underground transmission conduit bank on Route 17M, to be constructed between the Project's step up transformers and the new 145 kV switchyard to be constructed in the eastern portion of the Project's 122-acre parcel. A System Reliability Impact Study (SRIS) is underway, which includes analyses for thermal, voltage, short circuit and stability, and would evaluate the impact of the new plant on the NYPA system. The study is being conducted in accordance with the NYISO SRIS Criteria and Procedures provided to the New York State Independent System Operator (NYISO) for review and approval.

This natural gas demand of the Facility would not impact regional energy systems nor would they impact or preclude service to other users. Moreover, the natural gas pipeline lateral that would be constructed by others to serve the facility would improve the distribution of natural gas in the area.

The Facility would be permitted to allow the use of ultra-low sulfur distillate for up to the equivalent of 720 hours per year as the back-up fuel for the combustion turbine. The provision of backup fuel supply is necessary to ensure the reliable operation of the electricity grid. Without a backup fuel source, should natural gas supply be interrupted for any reason, the Facility would shut down and no longer supply electricity to the grid. Although termination of natural gas supply is unlikely, it is necessary to have the capability to operate on alternate fuel during such contingencies. Further, the Project's ability to operate on low sulfur distillate would allow the natural gas that would otherwise be consumed by the Facility to be used by other users in the region, without impacting the Project's ability to generate electricity.

18.6 USE AND CONSERVATION OF ENERGY

The Project is a combined-cycle power generation facility, which is one of the most efficient methods of producing electricity. Also, the Project's high efficiency, along with the clean burning nature of natural gas, creates a positive environmental impact. With the higher efficiency of combined-cycle technology, less fuel is required to be burned to produce the equivalent amount of energy. Therefore, there is less fuel consumption. This attribute combined with the cleanliness of natural gas make CPV Valley Energy Center one of the State's most environmentally responsive generating facilities.

18.7 ELECTRIC MAGNETIC FIELD

18.7.1 Introduction

This section investigates the electric fields and magnetic fields associated with the Project's 345 kV electric transmission interconnection. The Project will interconnect with the New York Power Authority's (NYPA) 345-kilovolt (kV) transmission system. The transmission interconnection will consist of two segments the total length of which will be less than one mile and will operate at 345 kV. A 345 kV double circuit overhead transmission line segment will extend from the Project to a riser structure. From the riser structure, a 345 kV double circuit underground cable segment will be installed in a 4 foot wide underground duct bank, located in a 10 foot right-of-way, and will be located, off pavement primarily within the western drainage swale, within the right-of-way of NY Route 17M. The duct bank will connect to NYPA's existing 345kV system by means of a second riser structure. The second riser structure will be installed adjacent to NYPA's Marcy South Transmission Right-of-Way, just north of the intersection of NY Routes 6 and 17M. Both segments will be located within the right-of- way of the NY Route 17M, off-pavement and primarily within the western drainage swale.

The overhead segment of the interconnection will be supported on double circuit 345 kV steel pole structures centered on the right-of-way. The average height of a typical tangent double circuit structure will be 120 feet. Each phase conductor will consist of a bundle of two 1590 kcmil 45/7 ACSR "Lapwing" conductors. An elevation view of a typical tangent structure is shown in Figure 18-1.

The underground segment of the interconnection will consist of six 3000-kcmil copper XLPE transmission cables installed in either a vertically or horizontally configured duct-bank. Associated communication fiber and grounding wires will also be installed in the duct bank. The conductors will be encased in PVC conduits, surrounded by concrete and covered by flowable fill above. An elevation view of vertically or horizontally duct bank is shown in Figure 18-2.

18.7.2 Overview

18.7.2.1 Electric Fields

Voltage on any wire, whether an overhead phase conductor or a lamp cords, produces an electric field in the area surrounding the wire. Electric fields are invisible lines of force that repel or attract electrical charges. As with a magnet, if the charges are the same (i.e., either both positive and both negative), the charges repel each other. If the charges are different (i.e., one negative and one positive), there would be an attractive force between them.

Electric fields are proportional to the operating voltage of the transmission line. The line voltage is controlled within a small range (usually ± 10 percent) and, hence, little variation is expected in the electric field levels.

18.7.2.2 Magnetic Fields

Any object with an electric charge has a voltage (potential) at its surface and can create an electric field. When electrical charges move together (an electric current) they create a magnetic field, which can exert force on other electric currents. All currents create magnetic fields. Magnetic fields occur throughout nature and are one of the basic forces of nature. The strength of the magnetic field depends on the current (higher currents create higher magnetic fields), the configuration/size of the source, spacing between conductors, and distance (magnetic fields grow weaker as the distance from the source increases).

Magnetic fields can be static, i.e., unchanging in direction (caused by "direct current", "DC") or changing in direction (caused by alternating current", "AC"). Some electrical devices operate on a DC system while others operate on an AC system. The magnetic field from AC sources (such as the electrical transmission lines) differ from DC fields (like the Earth) because the field is due to alternating currents ("AC") and changes direction at a rate of 60 cycles per second or 60 Hertz (Hz) in the United States and certain other countries.

The characteristics of magnetic fields can differ depending on the field source. A magnetic field near an appliance decreases rapidly with distance away from the device. The magnetic field also decreases with distance away from line sources, such as power lines, but not as rapidly as it does with appliances. Electric transmission line magnetic fields attenuate at a rate that is inversely proportional to the distance squared, whereas magnetic fields from appliances attenuate at a rate proportional to the distance cubed. For electric transmission lines, magnetic and electric field levels are highest next to the transmission lines (typically near the center of the electric transmission line right-of-way) and decrease as the distance from the transmission right-of-way or corridor increases.

Measured magnetic field strengths can be compared to magnetic fields typically associated with existing transmission line rights-of-way and with those typically associated with various electrical devices and phenomena. Typical magnetic field levels produced at distances of 1 ft. and 2 ft. from some common household appliances are shown in Table 18-1, below.

Table 18-1
Magnetic Field Levels of Various Household Appliances

Appliance	Magnetic Field at 1 ft.	Magnetic Field at 2 ft
Hair Dryer	Bg - 70	Bg -10
Window A/C	Bg - 20	Bg – 6
Color TV	Bg - 20	Bg – 8
Dishwasher	6 - 30	2 – 7
Refrigerator	Bg - 20	Bg – 10
Can Opener	40 - 300	3 – 30
Microwave Oven	1 - 200	1 – 30
Washing Machine	1 - 30	Bg – 6
Power Drill	20 - 40	3 – 6
	mG	mG

Bg = Measurement indistinguishable from background levels.
Source: EMFRAPID Program June 2002.

Electric and magnetic guidelines have been established by various organizations, and comparison to these values helps assess the potential for human health impacts from transmission line fields. Table 18-2, below, summarizes the levels of magnetic fields associated with various devices or phenomena along with several guidelines established by various organizations.

Table 18-2
Magnetic Field Levels of Various Devices, Phenomena and Standards

Device, Phenomenon or Standard	Magnetic Field
Magnetic Resonance Imaging (MRI) scan	20,000,000 (DC)
Permanent magnet	100,000 (DC)
Earth's magnetic field (over the United States)	470 to 590 (DC)
IEEE standard for the general public (2002)	9,040
ICNIRP occupational guideline (1998)	4,167
ACGIH guideline for occupational exposures (2002)	10,000
ACGIH guideline for individuals with pacemakers	1,000
ICNIRP general public guideline (1998)	833
New York Edge of ROW interim standard (1990)	200
Hair dryers and electric blankets	100 to 500
Typical household appliance	40 to 80
Typical in-home fields away from appliances	0.5 to 2.5
	mG

Notes: (DC) These magnetic fields are steady fields (not time-varying) as opposed to the other fields listed in Table 18-1, which are low-frequency (60 Hz), time-varying fields.

18.8 ELECTRIC AND MAGNETIC FIELD STANDARDS

18.8.1 General

There are no Federal standards limiting residential or occupational exposure to 60 Hz magnetic or electric fields.

18.8.2 New York Public Service Commission Electric Field Standards

The applicable electric field strength standards established by the PSC are set forth in Opinion No. 78-13 (issued June 19, 1978). The opinion established an electric field strength interim standard of 1.6 kilovolts per meter (kV/m) for electric transmission lines, at the edge of the right-of-way, one meter above ground level, with the line at the rated voltage.

18.8.3 New York Public Service Commission Magnetic Field Standards

The magnetic field standards established by the PSC are set forth in the PSC's Interim Policy Statement on Magnetic Fields, issued September 11, 1990. The interim policy established a magnetic field strength interim standard of 200 milligauss (mG), measured at one meter above grade, at the edge of the right-of-way, at the point of lowest conductor sag. The measurement is based on the expected circuit phase currents being equal to the winter-normal conductor rating.

18.9 COMPUTER CALCULATIONS

18.9.1 General

The post-construction magnetic field levels for the Project's 345 kV electric transmission line interconnection were calculated using *ENVIRO* and *SUBCALC*, two EMF related software programs that are part of the EPRI ELECTRIC AND MAGNETIC FIELD WORKSTATION (EMF WORKSTATION) developed by Enertech Consultants. *ENVIRO* was used to calculate lateral profiles for magnetic field levels along the overhead and underground segments of the interconnection. In addition, *ENVIRO* was used to calculate lateral profile for electric field levels along the overhead segment of the interconnection. To facilitate the investigation, calculations were developed along a profile that was oriented to be at right angles to the proposed transmission line. *SUBCALC* was used to model the magnetic field levels at the cable risers adjacent to NYPA's Marcy South transmission right-of-way producing a magnetic field level contour map and a 3-dimensional plot.

Input parameters used in the computer calculations were:

- The physical location and geometry of the overhead power conductors and overhead ground wires and underground cables;
- The physical specifications of the power conductor and overhead ground wire and underground cables;
- The operating voltages and currents; and
- The phasing orientation of the power conductors and underground cables.

The phase configuration for the double circuit transmission interconnection was assumed to be as follows: the easterly circuit is configured A-B-C from top to bottom, the westerly circuit is configured C-B-A from top to bottom. This technique reverses the phases in alternate adjacent circuits and results in lower levels of electric and magnetic fields.

18.9.2 Overhead Segment

The overhead segment of the interconnection will be supported on double circuit 345 kV steel poles centered on a 150 foot right-of-way. The average height of a typical tangent double circuit structure will be 120 feet. An elevation view of a typical tangent structure is shown in Figure 18-1. The structure will support two 19#10 Alumoweld overhead shield wires. Each phase conductor will consist of a bundle of two 1590 kcmil 45/7 ACSR "Lapwing" conductors. A 10% overvoltage factor was used. The New York Power Pool Winter Normal conductor rating was assumed, i.e., 2039 amperes per subconductor. This resulted in a phase current of 4078 amperes per phase. With our back to the Project and facing the NYPA interconnection, the phasing of the 345 kV circuit on the left was assumed A-B-C from top to bottom while the phasing of the circuit on the right was assumed C-B-A from top to bottom. Magnetic and electric field levels were calculated at 5 foot intervals along a profile at right angles to the centerline of the structures at two locations: at the structure and at midspan. Table 18-3, below, summarizes the results of the magnetic field level calculations at selected distances from the centerline of the transmission line. Table 18-4, also below, summarizes the results of the electric field level calculations at selected distances from the centerline of the transmission line.

Table 18-3 Magnetic Field Levels for the Overhead Segment		
Location	**Magnetic Field Level at the Structure**	**Magnetic Field Level at Midspan**
- 200	8.3	8.7
- 100	35.2	53.6
-75	54.7	103.5
- 50	83.7	223.7
- 20	121.4	545.3
- 10	128.7	622.8
0	130.9	644.4
+ 10	127.7	621.4
+ 20	119.5	543.3
+ 50	81.0	222.7
+ 75	52.4	103.2
+ 100	33.6	53.6
+ 200	8.0	8.9
Feet	mG	mG

Table 18-4 Electric Field Levels for the Overhead Segment		
Location	**Electric Field Level at the Structure**	**Electric Field Level at Midspan**
- 200	0.03	0.06
- 100	0.26	0.06
-75	0.55	0.29
- 50	1.00	1.70
- 20	1.20	5.61
- 10	1.08	4.44
0	1.00	2.57
+ 10	1.08	4.44
+ 20	1.20	5.61
+ 50	1.00	1.70
+ 75	0.55	0.29
+ 100	0.26	0.06
+ 200	0.03	0.06
feet	kV/m	kV/m

18.9.3 Underground Segment

The underground segment of the interconnection will occupy either a vertically or horizontally configured duct-bank centered on a 4 foot easement. Much of this area is accessible to public pedestrian traffic. Each phase conductor will consist of one 3000-kcmil copper XLPE transmission cable. Associated communication fiber and grounding wires will also be installed in the duct bank. The conductors will be encased in PVC conduits, surrounded by concrete and covered by flowable fill above. Figure 18-2 provides details of the conceptual underground cross-sections for either duct-bank configuration.

A 10% overvoltage factor was used. A phase current of 2000 amperes was assumed. The vertical duct bank is 2 ducts wide and 3 ducts high. With our back to the Project and facing the NYPA interconnection, the phasing of the 345kV circuit on the left was assumed A-B-C from top to bottom while the phasing of the circuit on the right was assumed C-B-A from top to bottom. The horizontal duct bank is 3 ducts wide and 2 ducts high. With our back to the Project and facing the NYPA interconnection, the phasing of the 345kV circuit on the left was assumed that A-B-C would occupy the lower left – upper left – upper middle ducts. The phasing of the 345kV on the right was assumed that A-B-C would occupy the upper right – lower right – lower middle ducts. Magnetic field levels were calculated at 5 foot intervals along a profile at right angles to the centerline of the duct bank. Table 18-5, below, summarizes the results of the magnetic field level calculations at selected distances from the centerline of the transmission line for both the vertical duct bank and the horizontal duct bank.

Table 18-5
Magnetic Field Levels for the Underground Segment

Location	Magnetic Field Level Vertical Duct Bank Vertical Duct Bank	Magnetic Field Level Horizontal Duct Bank
-150	1.3	1.9
-100	1.9	2.8
-75	2.5	3.7
-50	3.8	5.7
-25	8.1	12.0
-10	18.9	40.4
-5	21.9	89.8
0	47.9	146.3
+5	57.2	78.2
+10	35.5	32.7
+25	11.0	10.6
+50	4.6	5.4
+75	2.9	3.6
+100	2.1	2.7
+150	1.4	1.8
feet	mG.	mG.

Where portions of the project will be installed underground, no above-ground electric fields would be produced and no changes in ambient electric field strengths would result from the proposed Project. Consequently, in the underground segment, it is necessary to consider impacts only on magnetic fields, which were assessed through modeling.

18.9.4 Cable Riser at Interconnection

The underground segment of the Project’s 345 kV transmission line will interconnect with NYPA’s 345 kV overhead transmission system. A new vertically configured structure will be installed in line with the NYPA circuit being connected to. The new structure will facilitate opening up NYPA's existing circuit so that the Project's double circuit can be looped off of it. The overhead connections will be routed to a 345 kV cable riser structure located 75 feet away from NYPA's circuit and located so that the overhead to underground connections can enter the Project's duct bank. Figure 18-3 shows the overhead plan for the interconnection.

The magnetic field levels were modeled in and around the cable riser. All circuits were vertically configured. The phasing of NYPA's circuit, as well as, the overhead connection to and at the riser structure was assumed to be A-B-C from top to bottom. A phase current of 2000 amperes was assumed in the phases of all circuits and connections to and including that portion of the underground circuit contained in the model. Two models were prepared where the underground circuits were contained in a horizontal duct bank and then in a vertical duct bank. The magnetic field levels and thus the resulting magnetic field contours were essentially the same irregardless of which duct bank arrangement was assumed.

It should be noted that the magnetic field levels are calculated at 1 meter above ground. This is the location of the calculation plane. At the cable riser, the energized conductors pass through the calculation plane. As a result, the contour map and the 3-dimensional plot both display a very high magnetic field level "spike" at the riser structure.

For the purpose of this report, only the results of the model using the horizontal duct bank are included. Figure 18-4 shows the magnetic field level contour map. Figure 18-5 shows the magnetic field level 3-dimensional plot.

No computation of magnetic levels was completed in the vicinity of the other cable riser which is installed between the overhead segment and the underground segment of the interconnection.

18.10 ANALYSIS AND CONCLUSIONS

18.10.1 Analysis

The maximum magnetic field strength guideline value at the edge of a right-of-way for a major transmission line in New York is 200 mG as set forth in the PSC's Statement of Interim Policy Statement on Magnetic Fields, issued and effective September 11, 1990.

The maximum electric field strength guideline value at the edge of a right-of-way for a major transmission line in New York is 1.6 kV/m as set forth in PSC Opinion No. 78-13, issued and dated June 19, 1978.

It was assumed that the typical right-of-way for a double circuit 345 kV transmission line is 150 feet wide.

The results of the calculations summarized in Table 18-3 show that the magnetic field level at 75 feet either side of the centerline of the overhead structures is 54.7 mG and 52.4 mG at the structure and 103.5 mG and 103.2 mG at midspan. In every case, the calculated levels are less than 200 mG.

The results of the calculations summarized in Table 18-4 show that the electric field level at 75 feet either side of the centerline of the overhead structures is 0.55 kV/m at the structure and 0.29 kV/m at midspan. In each case, the calculated levels are less than 1.6 kV/m.

The results of our calculations summarized in Table 18-5 show that the magnetic field level at 75 feet either side of the centerline of the vertical duct bank is 2.5 mG and 2.9 mG, and at 75 feet either side of the centerline of the horizontal duct bank is 3.7 mG and 3.6 mG. In every case, the calculated levels including those within the 4 foot easement are less than 200 mG.

Finally, in Figure 18-4 and Figure 18-5, the magnetic field levels in the vicinity of the cable riser are generally less than 50 mG. The exception is the very high magnetic field level "spike" at the riser structure. The modeling results described in Figure 18-4 and Figure 18-5 show that the magnitude of the "spike" is 1746 mG. Through use of a shroud or enclosure made of aluminum or high density metal on the cable riser, in conjunction with installation of a security fence to insure adequate separation from the general public, the PSC magnetic field guideline will be achievable.

18.10.2 Conclusions

The calculations reveal that all magnetic and electric field levels produced by the overhead segment at the edges the 150 foot right-of-way in this study are substantially below the 200 mG and the 1.6 kV/m levels permitted at the edges of a transmission right-of-way in New York. In addition, all magnetic field levels produced by the underground segment, even within the 4 foot easement, are below the 200 mG level. This same conclusion applies to levels in and around the cable riser at the interconnection. The exception is the 1746 mG level where the overhead circuits that terminate on the riser are carried down to the underground duct bank. This spike in levels will be mitigated through construction of a shroud and fencing off the riser pole from the general public, taking advantage of the deterioration of magnetic fields with distance.

The applicant has concluded that it is prudent and wise to investigate and incorporate in the construction of this Project techniques that will limit or discourage public access into those areas of the project where high field levels will exist. Examples of such techniques include the strategic location and installation of fencing or barricades. In addition, the applicant is also investigating and considering mitigation techniques that will reduce field levels. For example, the use of an enclosure or shroud made from hi-mu material surrounding the cable riser may prove to be a practical method for reducing the magnetic field level encountered by the public.

It should be noted that in this analysis, the assumed current for the overhead segment of the transmission line was the winter normal rating of the bundled phase conductors, i.e., 4039 amperes per phase. The assumed current for the underground segment which utilized one 3000 kcmil copper XLPE cable per phase was 2000 amperes. If the current rating of the cable, 2000 amperes, determines the maximum operating ampacity of the entire interconnection, the magnetic field levels produced in the overhead portion of the line will never reach those calculated in this report.

19.0 ALTERNATIVES

19.1 INTRODUCTION

This section presents a discussion of Project alternatives that have been considered, including the no-action alternative. The section also explains the basis for CPV Valley's selection of the proposed CPV Valley Energy Center Project site and CPV Valley's selection of the Facility design and technologies. The alternatives presented include the following:

- No action alternative;
- Alternative Project Sites considered for the CPV Valley Energy Center;
- Electric Interconnect alternative right-of-ways considered;
- Alternative project technology, including cooling technologies;
- Site design alternatives including facility size, site access, and layout configuration;
- Fuel right-of-way alternatives;
- Fuel use alternatives; and
- Cooling water alternatives

19.2 "NO-ACTION" ALTERNATIVE

The "no-action" alternative assumes that the proposed CPV Valley Energy Center would not be constructed at the Project site, and that the site would remain undeveloped. The "no-action" alternative is not an objective of the Project sponsor, CPV Valley, as it intends to provide reliable baseload electric services to the New York Power Grid to meet the needs identified by the NYISO. Please refer to Section 1.0 Purpose and Need. To meet the NYISO identified NY electric needs, CPV Valley intends to construct and operate the Project. Without the Facility, both the capacity and reliability needs of the region are left undressed.

From an environmental perspective, under the "no-action" alternative, the approximately 122-acre site and proposed on-site interconnection routes would not be developed. Therefore, under the "no-action" alternative, the existing conditions of the land would remain the same.

Under the "no action" alternative, the socioeconomic benefits of the Facility during construction and operation would not be realized. Revenues associated with the host community benefit package and PILOT agreement with the Orange County IDA would not be generated. The construction phase labor and material supply economic benefits would also not occur.

The benefits to regional air quality would also be lost with the continued dependence on existing older generating facilities which operate with lower environmental efficiency.

Greenhouse or Global Warming gases (GWGs) contribute to climate change by increasing the ability of the atmosphere to trap heat. The principal GWGs are CO_2, methane (CH_4), and nitrous oxide (N_2O). Because these gases differ in their ability to trap heat, one ton of CO_2 in the atmosphere has a different effect on warming than one ton of CH_4. To express emissions of the different gases in a comparable way, atmospheric chemists often use a weighting factor called global warming potential. The heat-trapping ability of one metric ton (1,000 kilograms) of CO_2

is taken as the standard, and emissions may be expressed in terms of metric tons of carbon dioxide equivalent (abbreviated MTCDE). More commonly, emissions are expressed in terms of metric tons of carbon equivalent (MTCE). Carbon comprises 12/44 of the mass of carbon dioxide; thus to convert from CO_2 equivalent to C equivalent, one multiplies by 12/44. This section uses the units of MTCE, or million MTCE (MMTCE).

The proposed CPV Valley Energy Center would be primarily fueled by natural gas with provisions to use ultra low sulfur distillate fuel oil as the back-up fuel. The greatest proportion of the potential global warming gas emission from the Project would be as CO_2 from the combustion process. Trace amounts of VOCs, expressed as methane, would be emitted in varying quantities depending on the operating conditions. Emissions of VOCs are considered negligible, when compared to the total CO_2 emissions, and would not be considered as significant to the Global Warming issues.

Overall facility wide CO_2 emissions would range from approximately 150 to 343 tons per hour depending on the Facility operating scenario, with a maximum annual average of about 61.5 MTCE per hour. Assuming the maximum emission rate of 61.5 MTCE per hour, the maximum annual CO_2 emission rate from the proposed Project would be approximately 539,100 MTCE per year. Assuming a 30-year life cycle for the Project, a total of approximately 16.2 MMTCE of carbon equivalent would be released by the Project during its lifetime.

Under the "no action" alternative there would be 150 to 343 tons per hour fewer CO_2 emissions.

However, the CO_2 emissions of the CPV Valley Energy Center are orders of magnitude less on a unit basis than older generation plants.

The proposed combined-cycle Facility would generate approximately 630 megawatts (MW) of electricity. On a hot day (90°F ambient dry bulb temperature) approximately 365 MW of this power would be produced using F Class combustion turbine generator sets. Exhaust heat from the combustion turbines would be sent to a heat recovery steam generators (HRSGs) to produce steam to drive a steam turbine generator. The steam turbine generator would provide approximately 288 MW, the balance of the Facility's gross output. Approximately 23 MW are consumed to drive necessary Facility auxiliaries, leaving net Facility output at 630 MW. The HRSGs would include a natural gas-fired duct burner (supplemental firing system). Selective catalytic reduction technology (SCR) and an oxidation catalyst would be used to control oxides of nitrogen (NO_x) and carbon monoxide (CO) emissions, respectively. Exhaust steam from the steam turbine would be cooled (i.e., condensed) and then returned to the HRSG using an air-cooled condenser. Air-cooled condensing would be employed to minimize water use and eliminate potential cooling tower plume impacts. The Facility would be designed to operate as an intermediate load electric generating plant.

Under the "no-action" alternative there would be approximately 630 MW less of electricity supplied to the state's electric grid.

19.3 ALTERNATIVE PROJECT SITES

CPV considered various sites throughout New York State for potential development of an energy center such as CPV Valley. However, through careful screening and analysis, the Project site in Wawayanda was determined to be the preferred site. CPV's screening process evaluated sites based on various technical, infrastructure, environmental and economic attributes. The following lists screening criteria used by CPV in evaluating potential sites:

- Proximity to Electric Transmission System
- Proximity to Natural Gas Supply
- Site Size (Site Buffer)
- Zoning
- Transportation Infrastructure
- Water Supply and Disposal Availability
- Wetlands & Water Bodies
- Proximity to Sensitive Receptors
- Topography
- Emissions and Environmental Climate

Based on these critieria, CPV evaluated alternative sites for feasibility using a phased approached. First by performing a high level review, potential sites are ranked based on the above mentioned criteria. Those sites that are identified to have a fatal flaw are removed from consideration. A second and more detailed review is performed on the remaining sites. This second review is more extensive and requires significant technical and environmental review and consideration. As fatal flaws are identified with particular sites, those sites are removed from consideration.

CPV's screening process identified several sites and through its selective screening process selected with the Wawayanda site. An alternative site in Stoney Point, New York was considered and optioned. Although the site was optioned, it was terminated due to a fatal flaw that was later identified during the technical analysis.

As a result, the Project site in Wawayanda was the preferred site as it contains a number of features that make it ideal for hosting a combined-cycle power plant. The following are some of the site attributes:

- Proximity to interconnects for electric power transmission, water supply and wastewater discharge;

- Sufficient acreage to allow CPV Valley to integrate a buffer to adjacent land uses and provide for on-site and nearby construction staging, as well as ample wetland mitigation;

- Location within an area designated by the Town of Wawayanda approved Comprehensive Plan for industrial development;

- Optimum site access due to proximity to I-84, Route 17M and Route 6;

- Favorable air dispersion characteristics and a relatively isolated location that will mitigate potential visual and noise impacts; and

- Proximity to the Middletown publicly owned treatment works (POTW), which will supply treated effluent for Project process water needs and accept Project wastewater discharge.

There are no suitable alternate sites under CPV Valley's control. Therefore, it is concluded that no alternative is preferable for the Project.

19.4 ELECTRIC INTERCONNECT ALTERNATIVE RIGHT-OF-WAYS

The Project will interconnect to the 345 kilovolt (kV) NYPA Marcy South system, located less than one mile from the site to the northeast. The interconnection would be made via a new on-site 345kV substation, with above ground 345 kV transmission lines on site, and underground 345kV electric transmission cables offsite.

The electrical interconnect to NYPA's Marcy South 345 kV Right-of-Way electric transmission system is via five overhead steel transmission monopoles on a 150 foot on-site wide right-of-way, before the line transitions onsite to an underground duct bank configuration on the west side of Route 17M. The underground duct bank will be 4 feet wide within a 10 foot right-of-way and will be located, off pavement primarily within the western drainage swale, within the right-of-way of NY Route 17M. The duct bank will terminate on a riser pole, on, or next to NYPA's Marcy South transmission right-of-way, just north of the intersection of NY Routes 6 and 17M at one of the options identified below.

Figure 19-1 shows the location of potential electric transmission routing options considered by CPV Valley for this Project. Routing alternatives will be evaluated through interaction with NYPA. The interaction with NYPA will also include evaluation of alternative designs for connecting directly with the existing transmission grid which may impact the transmission line routing.

19.4.1 Alternative 1

For all of the alternatives discussed herein, the first segment of the route would be the same. This segment is contained on the Project Site and extends eastward via overhead lines from the on-site substation to the eastern property line at Route 17M. At Route 17M, the overhead lines would transition to an underground conduit, crossing the on-site tributary to Monhagen Brook. Alternative 1 considered by CPV Valley would continue north along the western shoulder of Route 17M to the NYPA 345 kV line right-of-way. Along this route the conduit would cross the Route 6/17M intersection via jack-and-bore, continue north and then west and transition back to an overhead line at the NYPA right-of-way.

As outlined in Section 14.0, Ecology, on-site ecological resources affected by this route include clearing of 2.32 acres of forested uplands and 0.92 acres of forested wetlands (red maple-hardwood swamp), and permanent maintenance (i.e., prevention of tree growth) of a 130 foot wide by 1,300 foot utility corridor. Other aspects of ecological impacts are temporary and relatively minor, since the majority of the proposed right-of-way is currently non-forested, and utility pole installation requires minimal land disturbance. The proposed alternative placement of the electrical interconnect on the site minimizes clearing of forested communities by routing through the narrowest portion of forest on the site – the southern site boundary along Route I-84. Any other alignment to the north would require additional clearing and fragmentation of forested wetland and upland communities. This also reduces the affects of forested habitat loss.

19.4.2 Alternative 2A

This alternative would extend from the overhead to underground transition point at Route 17M (same as Alternative 1) but continue east beneath Route 17M (Figure 19-1). This route would cross beneath a culverted section of the tributary stream flowing from the site. The lines would continue via underground conduits to the east, crossing Sunrise Park Drive and a second culverted section of the tributary stream. East of Sunrise Park Drive, the lines would transition to overhead via riser poles, and continue east across Monhagen Brook to a set of tie-in structures at the existing NYPA lines.

Due to the significant elevation differences of at least 30 feet between the tributary stream/surrounding land area and the adjacent roadways, not including the additional required depth for the bore itself, this alternative would require two deep, oblique-angled jack-and-bore operations at Route 17M and Sunrise Park Drive. Both road/culvert crossings would be required to extend below the bottom of the stream culverts, adding significant dewatering and groundwater discharge issues and cost, as well as significantly raising the risk of bore failure, damage to the culverts and flooding of the bore and/or final conduits. Additionally, this alternative would require purchase and clearing of a forested parcel east of Sunrise Park Drive to accommodate the transition riser poles, and placement of new overhead structures adjacent to Monhagen Brook at the existing NYPA lines tie-in.

19.4.3 Alternative 2B

This alternative shares most of its route with Alternative 2A, but would cross Sunrise Park Drive at more of an angle to the northeast. This would avoid a second culvert crossing of the tributary stream, but would immediately cross Monhagen Brook east of the Sunrise Park Drive. A set of overhead transition pole structures would be placed adjacent to Monhagen Brook, and the overhead lines would extent north to additional new tie-in structures at the NYPA line right-of-way.

East of Sunrise Park Drive, the underground and overhead portions of this alternative are entirely within wetlands and floodplain, including Monhagen Brook itself. Boring beneath Sunrise Park Drive and Monhagen Brook would require substantial excavation of a jack-and-bore pit within an active floodplain and riparian wetland, requiring temporary wetland filling, extensive pit dewatering and groundwater discharge.

19.5 FUEL RIGHT-OF-WAY ALTERNATIVES

A discussion of the fuel right-of-way alternatives is provided in Section 17.0, Cumulative Impacts. CPV Valley is reviewing two discrete options for gas transportation service to link the

Facility to the Millennium system. Discussions with each of the two potential service providers, Millennium Pipeline ("Millennium") and Orange & Rockland ("O&R"), are in the preliminary stages, and will continue through the development process to fully define the commercial options available to the proposed CPV Valley Energy Center. Both entities have provided initial indications of their ability to provide gas transportation service to CPV Valley Energy Center with the addition of certain facilities to tie the Facility to the existing natural gas transportation grid. It is contemplated that any new natural gas pipeline lateral would be developed under Article VII of the Public Service Law or the Federal Energy Regulatory Commission (FERC) under its Section 7(c) certificate authority. The licensing of the natural gas pipeline lateral ultimately used to transport natural gas supplies to the Project is not part of this SEQRA review because, as an independent project, it would go through its own separate environmental review and approval process.

19.6 ALTERNATIVE PROJECT TECHNOLOGY INCLUDING COOLING TECHNOLOGY

For the CPV Valley Energy Center exhaust steam from the steam turbine would be cooled (i.e., condensed) and then returned to the HRSG using an air-cooled condenser. Air-cooled condensing would be employed to minimize water use and eliminate potential cooling tower plume impacts. Alternatives to using an air-cooled condenser for cooling are discussed below.

19.6.1 Once-Through Cooling

Open cycle (once through) cooling systems may be used for plants sited beside large water bodies such as the sea, lakes or large rivers that have the ability to dissipate the waste heat from the steam cycle. In the open system, water pumped from intakes on one side of the power plant passes through the condensers and is discharged at a point remote from the intake (to prevent recycling of the warm water discharge). The major advantages of once-through cooling systems are their simplicity and flexibility. Great quantities of unwanted heat can be removed very effectively and the relatively low water temperature allows cooling with a minimum heat transfer surface. Open systems typically have high flow rates and relatively low temperature rises to limit the rise in temperature in the receiving waters. Cooling water makeup requirements using once-though cooling at the site are estimated to range between 150 million gallons per day (mgd) and 200 mgd.

Cooling towers can be installed on the discharge from open systems in order to remove part of the waste heat, so that the load on the receiving waters is contained within pre set limits. These cooling towers are often used in the warmer summer periods to limit the temperature of the discharged cooling water, usually to less than 30º C.

Insufficient water supply is available to the Project to support the cooling water makeup requirements for once-through cooling.

19.6.2 Mechanical Draft (Wet) Cooling Tower System

A mechanical draft cooling tower uses evaporative cooling to cool the circulating water. A supply of makeup water (several million gallons per day) is required to account for evaporation losses. In addition to water lost by evaporation, water is also lost due to drift and blowdown. Drift losses result from water being entrained in the exhaust air stream. Drift losses are minimized by proper cooling tower design and maintenance. Blowdown (in the order of magnitude of one million gallons per day) is required of wet towers because evaporation concentrates the impurities in the circulating water. Blowing down the circulating water reduces the impurities.

CPV Valley would obtain its water supply from the Middletown Sewage Treatment Plant as the project site is landlocked and does not have a major surface water body (i.e., estuary, river, lake, etc.) available to meet the project's water supply requirements. The use of a wet cooling tower, with its large water and wastewater requirements, does not represent a technically viable option for the project.

In addition, water vapor in the saturated air discharged from the cooling tower would condense upon contact with cooler ambient air, creating a plume. The cooling tower plume could have significant visual impacts and potentially cause hazardous icing conditions during winter operations. Potential fogging impacts would also be a concern due to the project site's proximity to Interstate 84.

For all these reasons, the mechanical draft wet cooling alterative was eliminated from further consideration.

19.6.3 Hybrid (Wet/Dry) Cooling Tower System

A hybrid or wet/dry cooling system is similar to a wet cooling system, except that the cooling tower would include both dry tube heat exchanger sections and wet evaporative cooling sections. A wet/dry cooling tower works in combination to cool the circulating water. The hot water enters the tower and initially goes through the dry section (finned tube coil), and then through the wet (evaporative section). The dry section acts as a reheater, raising the temperature of air discharged from the system. This reduces the relative humidity of the air and partially or completely eliminates the visible water vapor plume. Moisture in the air discharged from the tower may still condense and form ice if it comes in contact with a cold surface during winter operation. Because the hybrid cooling system incorporates a wet evaporative cooling section, it requires make-up water (several million gallons per day) and generates blowdown (in the order of magnitude of one million gallons per day) in the same way as a wet cooling system. For these reasons, a hybrid cooling tower was not considered a viable alternative for the CPV Valley Energy Center.

19.6.4 Natural Draft Towers

Concrete natural draft towers have a large concrete shell. The heat exchange "fill" is in a layer above the cold air inlet at the base of the shell. The warm air rises up the shell utilizing the chimney affect, creating a natural draft to provide airflow and operate the tower. The cooling towers have two basic configurations for the directions of the flow of the air in relation to the falling water through the tower fill: (1) the counter-flow tower where air travels vertically up the fill; and (2) the cross-flow tower where air travels horizontally through the fill. The natural draft towers are only economical if they are large in scale, which justifies the cost of the concrete shell. Their performance is best suited to cooler and more humid areas.

19.7 ALTERNATIVE CONTROL TECHNOLOGIES

19.7.1 Selective Catalytic Reduction (SCR)

The proposed Facility design incorporates the use of an SCR. SCR is an add-on NO_x control technique that is placed in the exhaust stream following the gas turbine/duct burner. SCR involves the injection of ammonia (NH_3) into the exhaust gas stream upstream of a catalyst bed. On the catalyst surface, NH_3 reacts with NO_x contained within the flue gas to form nitrogen gas (N_2) and water (H_2O) in accordance with the following chemical equations:

$$4NH_3 + 4NO + O_2 \rightarrow 4N_2 + 6H_2O$$
$$8NH_3 + 6NO_2 \rightarrow 7N_2 + 12H_2O$$

The catalyst's active surface is usually a noble metal (platinum), base metal (titanium or vanadium) or a zeolite-based material. Metal-based catalysts are usually applied as a coating over a metal or ceramic substrate. Zeolite catalysts are typically a homogenous material that forms both the active surface and the substrate. The geometric configuration of the catalyst body is designed for maximum surface area and minimum obstruction of the flue gas flow path in order to achieve maximum conversion efficiency and minimum back pressure on the gas turbine/duct burner. The most common configuration is a "honeycomb" design. Ammonia is then fed and mixed into the combustion gas stream upstream of the catalyst bed. Excess NH_3 which is not reacted in the catalyst bed and which is emitted from the stack is referred to as NH_3 slip.

An important factor that affects the performance of an SCR is operating temperature. The temperature range for standard base metal catalysts is between 400 and 800°F. Since SCR's effective temperatures are below the turbine exit temperature and above the stack temperature, the catalyst must be located within the HRSG.

An undesirable side-effect of SCR is the potential formation of ammonium bisulfate (NH_4HSO_4) and ammonium sulfate ($(NH_4)_2SO_4$), referred to as ammonium salts, which are corrosive and can stick to the heat recovery surfaces, duct work, or stack at low temperatures and results in additional PM/PM-10 formation if emitted. NH_4HSO_4 and $(NH_4)_2SO_4$ are reaction products of SO_3 and NH_3. Use of low sulfur fuels minimizes the formation of SO_3 and the subsequent formation of these ammonium salts. The proposed Facility proposes to burn natural gas and ultra low sulfur distillate (a sulfur content of 0.0015% by weight) to minimize the formation of SO_3 and the subsequent formation of ammonium salts.

19.7.2 Selective Non-Catalytic Reduction (SNCR)

SNCR is another method of post-combustion control of NO_x emissions. SNCR selectively reduces NO_x into nitrogen and water vapor by reacting the flue gas with a reagent. The SNCR system is dependent upon the reagent injection location and temperature to achieve proper reagent/flue gas mixing for optimum NO_x reduction. SNCR systems require a fairly narrow temperature range for reagent injection in order to achieve a specific NO_x removal efficiency. The optimum temperature range for ammonia injection is 1,500° to 1,900°F. The NO_x removal efficiency of an SNCR system decreases rapidly at temperatures outside the optimum temperature window. Operation below this temperature window results in excessive ammonia emissions, also referred to as "slip". Operation above the temperature window results in increased NOx emissions.

Because the exhaust temperature at the exit of the project's combined cycle combustion turbine unit is between 200 – 300°F, which is significantly less than the optimum temperature range for the application of this technology, it is not technically feasible to apply this technology to the proposed Project.

19.7.3 XONON™

A newer NO_x control technology has been developed by Catalytica Energy Systems, with the trade name of XONON™. This combustion technology includes a pre-burner, a fuel injection and mixing system, a flameless catalyst module and a flameless burnout zone. The pre-burner starts the turbine and a fuel injection system provides a uniform fuel and air mixture to the catalyst, where a portion of the fuel is combusted at reduced temperature to reduce thermal NO_x emissions. Catalytica has reported NO_x emissions at less than 3 ppm at 15 percent O_2 from test units under 2 MW. The first commercial version of the XONON™ combustion system is operating in a 1.55 MW gas turbine in Santa Clara, CA. This system has demonstrated NO_x emission levels of less than 2.5 ppm.

The XONON™ system is not yet commercially available from Catalytica Energy Systems for turbines of the size proposed for the project. However, in December 2000 the California Energy Commission approved the construction of a 750-MW facility in Bakersfield, California. The Pastoria Energy Facility (Pastoria) proposes to use the XONON™ system as BACT to control NO_x emissions from three F-class combined cycle combustion turbines. The approval was based on the anticipation that the XONON™ technology will be available by the time installation of the project components is scheduled. Should XONON™ not be available in time, Pastoria will install SCR to control emissions of NO_x. Calpine completed construction of the Pastoria facility in 2005 and decided to install SCR. To date, XONON™ technology is not commercially available for large combustion turbines.

Based on the fact that the XONON™ technology is not currently commercially available and has not been proven on combustion turbines of the size proposed by the Project, it is not further considered in this analysis.

19.7.4 SCONO$_X$™

SCONO$_x$™ or Em$_x$™ is a proprietary catalytic oxidation and adsorption technology that uses a single catalyst for the control of NO_x, CO and VOC emissions. The catalyst is a monolithic design, made from a ceramic substrate with both a proprietary platinum-based oxidation catalyst and a potassium carbonate adsorption coating. The catalyst simultaneously oxidizes NO to NO_2, CO to CO_2, and VOC to CO_2 and water, while NO_2 is adsorbed onto the catalyst surface and chemically converted to and stored as potassium nitrates and nitrites. The SCONO$_x$™ potassium carbonate layer has a limited adsorption capability and requires regeneration approximately every 12-15 minutes in normal service. Each regeneration cycle requires approximately 3-5 minutes. At any point in time, approximately 20% of the 40 to 60 compartments in a $SCONO_x$™ system, would be in regeneration mode, and the remaining 80 percent of the compartments would be in oxidation/adsorption mode (Stone & Webster, *Independent Technical Review – $SCONO_x$™ Technology and Design Review*, and February 2000).

Because the $SCONO_x$™ catalyst can be "poisoned" or rendered inactive by even the very small amounts of sulfur compounds present in natural gas, a $SCOSO_x$ catalyst bed, intended to remove trace quantities of sulfur-bearing compounds from the exhaust gas stream, is installed upstream of the $SCONO_x$™ catalyst bed. Like the $SCONO_x$™ catalyst, the $SCOSO_x$ catalyst must be regenerated. Regeneration of the two catalyst types occurs at the same time, with the same regeneration gas supply provided to both; however, the sulfur-bearing regeneration gas for the $SCOSO_x$ catalyst exits the $SCONO_x$™ modules separately from the $SCONO_x$™ regeneration gas to avoid contaminating the $SCONO_x$™ catalyst beds. Both the regeneration gas streams are returned to the gas turbine exhaust stream downstream of the $SCONO_x$™ module (ABB Environmental).

LAER for NO_x is considered to be the use of either SCR or $SCONO_x$™ systems to achieve NO_x levels of 2.0 ppm for natural gas firing. SCR has a proven record of consistently achieving low NO_x emission levels in F-class turbines while $SCONO_x$™ does not. The project proposes to use SCR technology to meet a NO_x level of 2.0 ppm on a 3-hour average basis, which is consistent with LAER requirements for NO_x.

To date, $SCONO_X$™ technology has been commercially demonstrated on natural gas and dual-fuel turbines with an electric generating capacity ranging from 5 to 45 MWs. Since $SCONO_X$™ has not been demonstrated in practice on a unit larger than 45 MW and the project proposes to utilize ultra low-sulfur distillate oil as a backup fuel, the project was not considered to be a candidate for the use of this technology since it cannot be shown that the sulfur absorption system can accommodate the somewhat increased sulfur loads associated even with low sulfur distillate oil.

19.8 FACILITY DESIGN ALTERNATIVES

CPV Valley evaluated a number of alternatives to the Project that would have resulted in a project of a smaller or larger generating capacity. The alternatives investigated included different turbine technologies, including "G" class turbines and a Siemens Westinghouse V84.3 steam turbine, and a project configuration without duct firing.

CPV Valley is also evaluating the alternative of providing a separate administrative building for the Facility. The building would be located adjacent to the site access drive to the west of the turbine building and be approximately 4,500 square feet in size.

19.8.1 Alternative Gas Turbine Generating Capacities

19.8.1.1 "G" Class Turbines

A Siemens Westinghouse "G" frame turbine would result in a project of a larger generating capacity. The currently proposed 501F turbine would produce approximately 200 MWs of electric power. A G frame turbine would be capable of producing approximately 235 MWs of electric power. The Siemens Westinghouse "G" technology, although derived from their "F" technology base, is a relatively new gas turbine configuration. Only a limited number of units are in operation and cumulative operational hours are correspondingly low. The current operating fleet size is approximately 15 units with the lead unit having accumulated less than 15,000 operating hours. With the recent slowdown in the merchant energy market and associated slowdown in the construction of new power plants, the "G" turbine fleet size is not expected to grow rapidly.

Although the "G" turbines have a better heat rate than the proposed "F" technology and would result in a plant of a larger generating capacity, this advantage was more than offset by the risks associated with the relatively new "G" technology as compared to the proven reliability and performance of the "F" machines. The "F" technology would be better supported by the original equipment manufacturer and there would be a better established secondary market for parts, service, and performance upgrades over its lifetime as a result of its larger fleet size. Further, CPV Valley believed that use of an "F" class turbine, as compared to the "G" turbine, better fit within the envelope of parameters articulated by NYPA within its RFP.

19.8.1.2 Siemens-Westinghouse V84.3

The Siemens Westinghouse V84.3, slightly smaller in rating than the 501 F, is capable of producing approximately 170 MW of electric power. Siemens Westinghouse has discontinued this unit and only a few units remain to be placed. Approximately 40 units are either in operation or construction worldwide. Due to the limited fleet size, there may be long-term support issues and few performance upgrades developed.

19.8.1.3 Conclusion

In summary, CPV Valley determined that the "F" technology would be the best equipment for the project. It was determined to be the lowest-risk technology and, over the project's lifetime, would be the most cost-effective choice to satisfy the overall envelope of parameters articulated by NYPA within its RFP, including NYPA's capacity needs and operating requirements.

19.8.2 Facility Duct Firing Options

CPV Valley originally considered the development of the proposed CPV Valley Energy Center without a gas-fired duct burner. Duct burner firing is currently proposed to increase the electric output of the Facility's steam turbine generator by about 49 MWs. Accordingly, without the proposed gas-fired duct burner the proposed Project would be capable of generating slightly more than 600 MWs. Through consultation with NYPA, CPV Valley incorporated the use of a gas fired duct burner to provide the Facility with a "merchant component," consistent with the development of competitive electric markets in New York State.

19.8.3 Alternate Site Layouts

As part of the development of the Facility site plan CPV Valley considered a number of potential site layouts on the 122-acre parcel. Locating the Facility at the southern center portion of the 122-acre parcel was preferred for three reasons. First, it placed the proposed Facility proximate to nearby Route 6 and Interstate 84 and proposed industrial properties thereby providing for a continuation of the orderly development of the Project area by avoiding a fragmented development condition. Second, it placed the Project further away from nearby visual receptors in an effort to mitigate potential visual impacts. Third, the location minimizes impacts to wetlands and natural vegetation.

In terms of Facility layout, CPV Valley considered alternate site plans to further optimize the layout. The final siting of the Facility general arrangement within the southern portion of the 122-acre parcel was determined based on a site plan that minimized the overall Facility footprint; utilized mostly cleared, non-forested portions of the site, avoided potentially significant impacts to wetlands, and complied with the Town of Wawayanda setback requirements.

19.8.4 Alternate Stack Heights

Concerted efforts were expended by CPV Valley to minimize the visibility of the proposed Facility including changes to the Facility profile and size. The Facility's combustion turbine stacks are the most visually prominent feature. One way to minimize stack height is to limit the height of nearby structures that determine the Good Engineering Practice stack height. Preliminary modeling considered stack heights of up to 325 feet based on Good Engineering Practice stack height associated with an initial Facility design. Project design changes, including the reduction in the height of the ACC to 115 feet, reduced the Good Engineering Practice stack height to 287.5 feet. The final stack height of 275 feet for the combustion turbines was selected based on modeling that showed that this height was adequate to largely avoid increases in predicted impacts that can result from the effects of building induced downwash on stacks that are below Good Engineering Practice stack height.

19.9 FUEL USE ALTERNATIVES

The purpose of the Project is power generation using natural gas. Natural gas is preferred because it is the cleanest fossil fuel available today. Non-combustion alternative energy sources are not practical for the Project because of limited land availability and the need to produce large amounts of power that can respond to market conditions on a continuous basis. Alternative methods of natural gas power generation, other than the proposed combined cycle generation method, include conventional boilers or simple cycle peaking turbines. Conventional boilers are less efficient and have higher emissions per unit of electric energy produced than turbine-based generation either for baseload or peaking power production. Simple cycle turbines are not competitive with combined cycle plants for purposes of baseload or intermediate load generation, which is the anticipated duty of the Project, but can be part of a competitive portfolio because of their ability to start faster than a combined cycle project. Given feasibility, combined cycle generation is preferable to simple cycle generation for reasons of economic competitiveness.

19.10 WATER SUPPLY SOURCE ALTERNATIVES

19.10.1 Grey Water from POTW

The Middletown Sewage Treatment Plant is permitted for a flow of 6.0 mgd under New York SPDES Permit No. 0026328. The receiving body for the Middletown Sewage Treatment Plant is the Wallkill River, a NY DEC Class B stream. The plant serves a population of approximately 30,000 people.

Average monthly flow over the period March 2002 through June 2006 has ranged from a low of 3.6 mgd to a high of 7.1 mgd. Daily and weekly variations in flow to the Facility will need to be confirmed, but adequate capacity appears to be available to meet projected process makeup requirements for the project through reuse of treated effluent.

The treatment train at the plant currently includes a barminutor, grit classifier, primary clarifier, high rate trickling filter, oxidation ditch, secondary clarifier, rapid sand filtration system and UV disinfection. Disinfection is seasonal based on recreational use of the Wallkill River.

The plant routinely monitors its effluent for the following parameters: flow, total suspended solids, carbonaceous biological oxygen demand, oxygen demand, pH, temperature, settable solids, ammonia nitrogen and keldahl nitrogen. In general, the plant produces a good quality tertiary treated effluent.

The Middletown Sewage Treatment Plant is located approximately 1.3 miles from the proposed site assuming that required easements can be obtained along US Route 6 and Route 17M to pipe treated effluent to the proposed Site.

19.10.2 Ground Water

Bedrock fractures and potential high yielding bedrock well sites may exist in the site vicinity. Bedrock mapping indicates that a bedrock fracture passes through the southwestern corner of the site, suggesting that development of anon-site bedrock well may be feasible. In addition, stratified sand and gravel deposits underlie the site, which form the northeastern (upgradient) extent of the Monhagen Brook Aquifer. The development potential for wells installed in the Monhagen Brook Aquifer is characterized as ranging between 10 and 100 gallons per minute.

As an alternative to reuse of tertiary treated effluent, CPV has also investigated the potential redevelopment of an existing on-site groundwater well to satisfy all or a portion of the Facility's process makeup requirements. The existing well taps the bedrock aquifer at a depth of 238 feet below ground surface. Based on preliminary pump test results, the well appears to have adequate water supply development potential to yield up to 250 gpm or approximately 360,000 gallons per day (gpd).

19.10.3 Surface Water Withdrawal

The only major surface water body in the site vicinity that could potentially meet all or a major portion of the proposed Facility's process make-up requirements is the Wallkill River. The Wallkill River is situated approximately 2.6 miles southeast of the proposed site, but would require installation of a 3+ mile pipeline depending upon where easements could be obtained.

The 7-day 10-year low flow for the Wallkill River at Phillipsburg, NY, which has a drainage area of 419 square miles, is reported to be 22 cubic feet per second (cfs) or 14.3 mgd. The estimated 7-day, 10-year low flow for the Wallkill River at Pellets Island, NY, which has a drainage area of 385 square miles, is reported to be 13.41 cfs. In general, withdrawal of less than 10% of the 7-day, 10-year low flow for a stream is feasible from a regulatory perspective, provided that the stream is not considered "stressed" under existing conditions. According to the NYSDEC, aquatic life, recreational uses and hydrologic/habitat conditions are known to experience minor impacts in this portion of the Wallkill River due to silt/sediment loads, the result of extensive agricultural activities in the watershed. Stream channelization and other channel modifications to support agricultural operations also effect water quality and use support. In particular, the impacts of pesticide use in the watershed also raises some concerns regarding fish consumption. The river is also used to assimilate flow from several wastewater treatment facilities located within the watershed. As such, withdrawal of water from the river would reduce the available dilution and assimilative capacity of the river to accept existing flows and loads.

19.10.4 Municipal Water

The proposed CPV Valley site is located in the Town of Waywayanda's Water and Sewer District No. 1. This district obtains water from the City of Middletown and is currently allocated to withdraw up to 200,000 gpd from the Middletown distribution system. Water allocations are regulated by the NYS Department of Health (NYSDOH) and the NYS Department of Environmental Conservation (NY DEC). TRC expects that the district currently has available capacity of 100,000 +/- gpd.

The City of Middletown's water system is owned and operated by the City of Middletown. The City of Middletown is the single largest water purveyor in the site vicinity. Operation and maintenance of the system falls under the direction of the Commissioner of Public Works.

The Middletown water system consists of surface water reservoirs, a groundwater well, water treatment facilities, and a distribution system. The distribution system contains approximately 7,165 service connections, which serve a population of approximately 26,400 people. Of these accounts, 316 are located outside of the City limits in the towns of Wallkill and Wawayanda. Water rates as of 2007 were $4.26 per 1,000 gallons, and $4.26 per 1,000 gallons for sewer users.

The City of Middletown obtains its raw water from surface supplies consisting of three reservoirs, one small impoundment and one groundwater well. The combined watershed for the surface water reservoirs is mostly owned by the City and encompasses approximately 1,500 acres, which is considered small relative to the population served. The City's distribution system, which includes pipes ranging from 4 inches to 24 inches is diameter, extends approximately 75 miles. The distribution system contains five finished water storage tanks. The tanks are located within the City of Middletown and in neighboring sections of the Towns of Wallkill, Wawayanda, and Mount Hope.

Raw water for the Middletown system is processed through two water treatment plants:

(1) The Monhagen Treatment Facility, which was initially built at the turn of the century and incrementally expanded and upgraded, consists of pre-chlorination, aluminum sulfate addition for coagulation, flocculation and sedimentation. The settled water is then filtered by gravity through sand filters. Chlorine is added for residual chlorination and sodium hydroxide is added for pH adjustment.

The Monhagen Treatment Facility is scheduled to be replaced by a new 5.0 mgd water treatment facility. The new facility will tap the same supply sources as the existing facility, and as such, the raw water supply capacity will not change.

(2) A new package water treatment plant, capable of producing 1.5 mgd, went online in November of 2003. The treatment plant consists of aluminum sulfate addition to enhance coagulation, potassium permanganate addition to reduce iron and manganese (staining effect), dissolved air floatation to remove flocculated matter, rapid sand filtration, and ultraviolet disinfection. Sodium hypochlorite is added to finish water to maintain chlorine (disinfectant) residual within the distribution system and sodium hydroxide for pH adjustment.

Water and Sewer District No. 1 can meet the potable water supply requirements of the proposed Facility (2 gpm or 2,880 gpd), but would not be capable of using potable water to meet significant percentage of the process makeup requirements due to insufficient supply capacity under drought conditions.