Section 6 – Community Resources

Figures (provided following the text)

Tables

Appendices

List of Acronyms and Abbreviations – Section 6

Acc/MWM	accidents per million vehicle-miles
ACS	American Community Survey
ADT	average daily traffic
a.m.	morning
ANSI	American National Standards Institute
APE	Area of Potential Effect
BEA	U.S. Bureau of Economic Analysis
CCSP	Comprehensive Site and Safety Plan
CEA	Critical Environmental Area
CEMS	Continuous Emissions Monitoring Systems
CO	Town of Dover's Commercial/Industry/Office Mixed Use District
ConEd	Consolidated Edison Company of New York
CVE	Cricket Valley Energy Center, LLC
dB(A)	A-weighted decibels
DFY	Division for Youth
EIS	Environmental Impact Statement
EJ	Environmental Justice
EJA	Environmental Justice Area
EMF	Electric and magnetic fields
FAA	Federal Aviation Administration
FLM	Federal Land Manager
FP	Town of Dover's Floodplain Overlay District
FTE	full-time equivalent
G	Gauss
GE	General Electric
HRSG	heat recovery steam generator
I/O	input-output
IDA	Industrial Development Agency
Iroquois	Iroquois Natural Gas Transmission System LP

kV	kilovolts
kV/m	Kilovolts per meter
kW	kilowatts
Laydown Site	30-acre construction worker parking and laydown site
LEED	Leadership in Energy and Environmental Design
$L_{##}$	percentile sound level
L_{eq}	equivalent sound level
$L_{eq(1\text{-}hour)}$	hourly equivalent sound level
LOS	Level of Service
L_{max}	maximum sound level
L_{min}	minimum sound level
m	meters
M	Town of Dover's Industrial/Manufacturing District
mph	miles per hour
m/s	meters per second
mG	milligauss
msl	above mean sea level
NAIP	National Agricultural Inventory Program
NDP	Northern Dutchess Paramedics
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
NYCRR	New York State Register and Official Compilation of Codes, Rules and Regulations of the State of New York
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
OPRHP	Office of Parks, Recreation and Historic Preservation
PILOT	Payment in Lieu of Taxes
p.m.	afternoon/evening
Project Development	the 57-acre portion of the 131-acre Property proposed for

Area	development
Property	The 131-acre property optioned by CVE
RC	Town of Dover's Resource Conservation District
RU	Town of Dover's Rural District
SC	Town of Dover's Stream Corridor Overlay District
SEQRA	State Environmental Quality Review Act
SHPO	State Historic Preservation Office
SM	Town of Dover's Soil Mining Overlay District
SPL	sound pressure levels
STC	Sound Transmission Class
TRB	Transportation Research Board
UDP	Unanticipated Discoveries Plan
USDA	U.S. Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
V/C	volume-to-capacity ratio
v/m	Volts per meter

6. COMMUNITY RESOURCES

This section describes the community resources setting and potential impacts for the Cricket Valley Energy Center, LLC (CVE) project, including: land use, zoning and community character; visual resources; traffic; noise; electric and magnetic fields; cultural resources; and socioeconomics. As discussed in Section 1.2, project activities will be restricted to the approximately 57-acre previously developed portion (the Project Development Area) of the 131-acre parcel (the Property).

6.1 Land Use

This section describes the project's relationship to existing land uses, local zoning and development standards, and local and regional planning objectives in the project area. The potential impact of the project, as proposed, on community character is an important element of land use and zoning compatibility, and is addressed as well. Potential impacts to existing land uses resulting from project construction and operation are also discussed. Mitigation has been identified to reduce potential impacts where practicable.

6.1.1 Applicable Laws, Regulations and Policies

The standard by which land use compatibility is generally assessed is through comparison of land uses within the immediately surrounding area and local zoning and other laws, regulations and guidelines established as community planning tools. For this project, the applicable laws, regulations and policies concerning impacts to land use and zoning are the Town of Dover Zoning Code and the Town of Dover Master Plan. The following sections provide a review of the characteristics of the Project Development Area and its surroundings, as well as specific information with regard to local laws and other policy requirements to assess the project's compatibility with land use and zoning requirements. The consistency of the project with local community character is also addressed.

6.1.2 Land Use Resources

6.1.2.1 Existing Site Land Uses

The Property consists of 131 acres and is generally bounded to the east by New York State (NYS) Route 22; to the north by an existing Consolidated Edison Company of New York (ConEd) 345-kilovolt (kV) transmission line right-of-way to which the project proposes to interconnect and which contains the existing Iroquois Natural Gas Transmission System LP (Iroquois) natural gas pipeline proposed to serve the project's fuel needs; to the south by

industrially-zoned property owned by Howlands Lake Partners, LLC; and to the west generally by the Swamp River (although small portions of the Property extend west of the river). An active Metro-North commuter railroad line (under separate ownership) transects the Property in a north-south direction as shown on Figure 1-1.

No project activities are proposed west of the railroad track; that portion of the Property (approximately 74 acres) consists almost entirely of forested areas and wetland bordering the Swamp River. A small pump house is located on the eastern bank of the Swamp River; under former Property uses, water was withdrawn via the pump house from the Swamp River to provide for fire protection. An access road runs from the rail line to the pump house. The remainder of the Property west of the railroad track is wooded and predominantly wetland, with some upland associated with rock outcrops and accessways.

The portion of the Property west of the railroad track has been designated as within the Great Swamp Critical Environmental Area (CEA) for its natural resource value, and a New York State Department of Environmental Conservation (NYSDEC)-mapped wetland system associated with the Swamp River extends through this area as well. This wetland system (DP-22) extends over 6,000 acres. The Great Swamp is identified in the most current New York State Open Space Conservation Plan (NYSDEC, 2009) as the largest and highest quality red maple hardwood swamp in southern New York. Located within Dover and Pawling in Dutchess County, as well as Patterson and Southeast in Putnam County, the swamp is considered to: contain critical habitat for bird and aquatic species; protect and purify water supply (much of the Great Swamp is within the Croton River Basin and flows directly into the East Branch Reservoir, a New York City water supply); attenuate flooding; and provide outstanding educational and recreational opportunities. The Open Space Conservation Plan identifies the need to safeguard the Great Swamp from development, including careful evaluation of runoff from development. The United States Department of Agriculture (USDA) Forest Service has identified nearly all of the Great Swamp's 63,000-acre watershed as one of several conservation focal areas in order to highlight this resource's value and focus on appropriate conservation. As discussed in Section 3, the Property is located in the northerly part of this extensive watershed area. The Swamp River flows northward through the Property to its confluence with the Ten Mile River just south of Dover Plains. In the vicinity of the Property the Swamp River meanders through a wide plain with braided channels.

Proposed project activities will be restricted to the Project Development Area, the approximately 57-acre portion of the Property located to the east of the railroad track. This

portion of the site has previously been designated as the Mica Products CEA[1] due to the need for clean-up associated with its former uses. The Project Development Area currently consists of about 18.6 acres of previously developed areas, and 38.4 acres of forested areas and wetlands, much of which will continue to serve as a natural buffer for the project. The majority of the 22-acre project footprint will be located on previously developed or disturbed land.

The Project Development Area has a long history of industrial use and numerous dilapidated, vacant industrial structures and associated debris are still located in that area. It was used as a magnesium refining facility from 1932 until 1966. Between 1966 and 1980 the Mica Products Corporation, a Formica production facility, operated at the site, manufacturing organ cabinets, cassette tape holders, and other laminated wood products. During the early 1990s until a January 1, 1996 fire, the site was operated by the Poly Tech Recycling Corporation as part of its tire recycling operation. There is still debris evidence on the site of its varied history.

The Property sits in relative isolation, with vegetation and topography that provide a natural buffer and limits views of existing on-site structures.

Figures 1-2 and 1-3 illustrate the Land Use Districts (zoning districts) and identify adjoining property owners for the Property, respectively. The majority of the Property is located within the Town of Dover's Industrial/Manufacturing District (M), which permits industrial and related uses. A small portion of the Property, west of the Swamp River, is in the RU district, intended to promote agriculture and compatible open space and rural uses by discouraging large-scale residential development.

6.1.2.2 Existing Land Uses Surrounding the Site

Land uses within 1 mile of the Property (as shown in Figure 6.1-1) are primarily forest or forested wetland, open space, or rural residential with smaller areas used for agriculture, industrial use, commercial use, or public use associated with the Dover High School/Middle School Complex.

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[1] Two parcels have been designated as within the Mica Products CEA, Tax Parcel No. 04-7061-00-580190 (which comprises the majority of the Project Development Area) and Tax Parcel No. 04-7061-00-585063 (which encompasses a small portion of the southerly extent of the Project Development Area and extends off-site).

The NYS Route 22 corridor is a major roadway extending in a north-south direction through the site surroundings. It serves as a primary connector to communities in the area, and along its length is characterized by small settlements; commercial, industrial and residential development; and open space. No major settlements are included along NYS Route 22 within 1 mile of the Property; rather, development along the road predominantly consists of scattered residences and businesses. Interconnecting local neighborhood and rural roads are limited within 1 mile of the Property.

The Property surroundings can be described through the use of rough "quadrants" defined by the NYS Route 22 corridor extending north and south, and the ConEd right-of-way traversing the 1-mile radius in a generally east-west direction.

The southwestern quadrant encompasses the entire Property and Project Development Area. As shown in Figure 6.1-1, the Project Development Area is immediately bounded by NYS Route 22 to the east; the ConEd right-of-way to the north; the Metro-North rail line to the west; and industrial property to the south. The topography surrounding the Swamp River extends at a similar elevation to the Project Development Area (377 to 538 above mean sea level [msl]) westerly for approximately 3,000 feet, where the terrain sharply increases, reaching elevations of 1,070 feet msl within the 1-mile radius. Most of this area is undeveloped, consisting of Swamp River floodplains, wooded areas, and steep terrain. In only two locations do other uses occur within the 1-mile radius. Limited residential development is located along Chippawalla Road which extends to the southwest off of NYS Route 22, south of the project. Off of Dover Furnace Road, north of the project, the Dover Furnace Shooting Grounds, a private hunting property, includes lodging structures and open space used for hunting and other private recreational purposes.

In the southeastern quadrant, east of NYS Route 22, terrain rises more immediately, with elevations along the upper ridgeline of Cricket Hill Road (approximately 2,000 feet from NYS Route 22) at approximately 581 feet above msl. Several areas of commercial development exist along NYS Route 22 in this area, including within the parcel opposite the Project Development Area. Residential development is scattered along Cricket Hill Road, including a home on the corner of Cricket Hill Road and NYS Route 22, adjacent to the ConEd right-of-way. Approximately 3,000 feet south of the Project Development Area is a larger area of residential development, including several houses on cul-de-sacs off of Cricket Hill Road. Additional residential development occurs along Old Post Road, which runs in a north-south direction through the eastern portion of this quadrant.

The intersection of NYS Route 22 with Routes 21 and 55 in Wingdale is outside of the 1-mile radius approximately 2 miles to the south of the Project Development Area and

represents another settlement area along these major travel corridors. Approaching this intersection, larger areas of development exist. The 199-acre Thomas J. Boyce Park, located in that area, includes a pavilion, playground, horseshoe pits, basketball courts, two baseball fields, a trap shooting area, a horse ring and a small pond used for skating.

The northeastern quadrant also rises in elevation rapidly from NYS Route 22. A few residences are located along NYS Route 22 on the hillside approximately 950 feet northeast of the Project Development Area. The Dover Middle/High School Complex, with the grounds and school buildings located approximately 2,000 feet and 2,800 from the Project Development Area, respectively, is at elevation 573 feet msl, overlooking NYS Route 22. The school complex includes extensive sports fields as well as educational buildings. Further north, approximately 4,600 feet from the Project Development Area, more intensive residential development exists along Woodside Drive and Anderson Road. Residential development also occurs off of roadways further to the east along Old Post Road, including Buttonwood Road and Orton Acres. Undeveloped land, including a substantial amount of forested area, surrounds the school and is interspersed throughout the residential areas. One area of commercial development is located just within 1 mile of the Project Development Area to the northeast.

The smallest quadrant, to the northwest, also includes areas of undeveloped land. Residences exist within the area, with one residence located just north of the ConEd right-of-way on the west side of NYS Route 22, and more regular residential use along Dover Furnace Road. Residential development on the western portion of Dover Furnace Road, however, is surrounded by a substantial area of sand and gravel mining operations. Mining uses also occur within this quadrant along NYS Route 22. The majority of land use along NYS Route 22 in this quadrant is agricultural, with open fields and related structures.

CVE has consulted with appropriate state and local agencies to identify recreational resources within the project vicinity. Recreational facilities within 1 mile of the Property include the fields at Dover Middle/High School. The Swamp River and nearby forested areas also provide opportunities for recreation including fishing, hiking, or hunting.

Through consultation with local agencies, CVE has determined that no significant new developments or changes in land use are proposed within a 1-mile radius of the Property. Ongoing review by the Town of Dover and NYSDEC is associated with the Rasco Materials facility, proposed to be located on industrial property immediately south of the Project Development Area. The Property under option to CVE and the proposed location of the Rasco Materials facility are under common ownership. However, the two projects are completely unrelated to each other. CVE will propose to the Town of Dover a lot line

adjustment to straighten the boundary line between the CVE Property and the property to the South, where the Rasco Materials facility is located, in order to maintain the existing drainage swale for the CVE stormwater plan and to help incorporate a plant loop road within the proposed CVE facility fence line.

Once CVE purchases the land under option and the lot line adjustment has been approved, all leases on the CVE property would be terminated and any tenants would vacate the CVE site.

Almost 2 miles farther south, the Knolls of Dover mixed use project in Wingdale also represents a significant proposal that would influence the community and its character. Both proposed projects (as shown on Figure 6.1-1) have been appropriately considered in the range of analyses completed for the Cricket Valley Energy facility, including but not limited to traffic (Section 6.3), noise (Section 6.4) and water (Section 5) impacts.

6.1.2.3 Existing Land Use On and Surrounding the Laydown Site

The Laydown Site, an approximately 30-acre parcel proposed for temporary construction worker parking and equipment laydown, is located approximately 2.5 miles north of the Property. The Laydown Site consists of active agricultural fields historically associated with a farming operation, and is a portion of a larger parcel including actively farmed fields, a former farm-related house and outbuildings, and undeveloped land south of the fields (see Figure 1-10).

The Laydown Site is bounded to the west by NYS Route 22, from which access will be provided. The Laydown Site is bounded to the east by Old State Route 22, a small wetland area, and the associated farming buildings, including a farmhouse, barn, silo, metal storage shed/lean-to, and a guesthouse, as well as several concrete pads and foundations indicating previous structures. The Laydown Site is bounded to the south by undeveloped partially wooded property, beyond which is Sherman Hill Road, along which are a few residences and the Sherman Hills residential development. Approximately 0.6 mile north of the Laydown Site, across Old Route 22, is the 144-acre Nellie Hill Preserve, owned by the Nature Conservancy.

6.1.3 Zoning and Regional Requirements

Figure 1-2 illustrates the zoning for the Property. The project is located within the Town of Dover's Industrial/Manufacturing District (M), which permits industrial and related uses, and is currently occupied by a collection of vacant, dilapidated, industrial buildings partially

destroyed by fire in 1996. The purpose of the Industrial/Manufacturing District, as discussed in the Town of Dover Zoning Code provided in Appendix 6-A, is to permit industrial and related uses and adult entertainment, in isolated and well-buffered locations, separated from commercial, office or residential use zones. The zoning of neighboring areas includes Commercial/Industry/Office Mixed Use District (CO) across NYS Route 22, Resource Conservation District (RC) west of Swamp River and southwest of the Property, and Rural District (RU) along the remaining Property boundaries to the north and southeast. Permitted uses within each zone are summarized in Table 6.1-1.

The Project Development Area includes no zoning overlay districts. However, the Property west of the Project Development Area along the Swamp River (west of the railroad track) includes Stream Corridor Overlay District and Floodplain Overlay District. The area north of Dover Furnace Road is designated with a Soil Mining Overlay District.

The temporary Laydown Site lies within both Commercial (CO) and Rural (RU) Districts. Because no structures or permanent alterations in existing use are proposed at this location, CVE will work closely with town officials to determine how best to evaluate planning and zoning requirements for this temporary use. The construction impacts of the project, including the temporary use of the Laydown Site, have been considered in the discussion of consistency with local zoning and planning requirements outlined in Section 6.1.4.

The project is not a “use explicitly” listed in the Town of Dover Zoning Code as either allowed or prohibited. Therefore, pursuant to Sections 145-10 and 145-60A of the Dover Town Code, the project will require a Special Permit issued by the Town Board. Section 145-65(A) of the Dover Zoning Code provides that Town Board Special Permit review requirements and procedures must follow those specified for Planning Board Special Permit applications. Further, the Zoning Code specifies that “[s]ite plan review shall be included as an integral part of the special permit approval process, and no separate site plan approval shall be required for uses requiring a special permit where a proposal is subject to Special Permit review.” In addition to Special Permit/Site Plan Review, which encompasses broad consideration of a range of issues relative to project compatibility with local standards and plans, the town will be responsible for issuing fire prevention permits and authorization for the use of explosives during construction. Associated activities, such as use of the temporary Laydown Site, will also be considered during project review.

Table 6.1-1: Zoning Districts

Zoning Designation	Definition in Dover Zoning Code
CO – Commercial/ Industry/Office Mixed-Use District	The purpose of this district is to allow areas for light industrial, service commercial, office, and research facilities. Such districts may also include, where compatible, housing and limited retail commercial development intended to support the primary uses or to provide adaptive reuses for existing commercial or industrial buildings.
Floodplain Overlay District (FP)	The purpose of this overlay district is to control development within the one-hundred-year floodplain in order to minimize flood damage and protect water resources. This district also incorporates by reference the town's existing Floodplain Protection Local Law.
M – Industrial/ Manufacturing District	The purpose of this district is to allow industrial and related uses and adult entertainment, uses that are not compatible with most commercial, office, or residential uses, in isolated and well-buffered locations.
RC – Resource Conservation District	The purpose of this district is to encourage forestry, recreation, land conservation, and very-low-density residential uses where agriculture is not a significant use and intensive residential development is undesirable.
RU – Rural District	The purpose of this district is to promote agriculture and compatible open space and rural uses by discouraging large-scale residential development.
Soil Mining Overlay District (SM)	The purpose of this overlay district is to provide appropriate locations for soil mining to occur where it can encourage commercially viable agriculture by enabling farm operators to supplement their farm income.
Stream Corridor Overlay District (SC)	The purpose of this overlay district is to protect the scenic character and water resource values of the Ten Mile River and its tributaries.

The Dimensional Table of the Town of Dover Zoning Code contains applicable setback requirements and height restrictions. Setbacks are established from roads and from adjoining property. In this instance, minimum front yard setbacks are established as 200 feet, side yard setbacks as 50 feet and rear yard setbacks as 75 feet. Maximum building height is limited to 35 feet, except as allowed through a Special Permit; note that the project stacks are presumed to be "chimneys" which are exempt from height requirements. The project's consistency with local zoning and planning requirements is discussed in Section 6.1.4.

Other local agencies will provide input to the Special Permit review, and will consider the project in accordance with their various responsibilities. For example, the Dover Planning Board will evaluate erosion/sediment control measures proposed (as discussed in Section 5.6.3) to confirm local standards are met and local resources protected, and the Dover Architectural Review Board will conduct a design review. In addition, the Dutchess County Planning Board will participate in review and provide input to the Special Permit/Site Plan Review process. The Dutchess County Health Department will also be active in the review of water well and septic system elements of the project to confirm that appropriate design standards are met.

The Town of Dover maintains a Master Plan to further guide development. As outlined in an article by Jayne Daley (Daley, 2003), the Town of Dover's history of reviewing proposed projects underscored the need to consider issues within a broader context than regulatory compliance. The desire for a more comprehensive approach, including engagement of the community in both advanced planning and in project review, led to the formation of a Master Plan Committee in 1991. The plan development process included extensive work, including a townwide survey that identified community character and goals for future development. On the basis of that effort, the Master Plan outlines measures with the aim of preserving the Town's traditional rural character and natural features, as well as supporting economic growth that will contribute to enhanced town services and recreational opportunities. Certain developments (mining, quarrying, and heavy industries) were discouraged without strict regulation. In fact, survey results indicated that the quality of the community character was valued such that an increase in local regulatory review as a safeguard would be appropriate. Zoning and planning decisions within the town include consideration of Master Plan guidance. The project's consistency with the Town's Master Plan is discussed in Section 6.1.5.

6.1.4 Consistency with Zoning and Planning Requirements

CVE submitted its Special Permit/Site Plan Discussion Application to the Town of Dover on November 4, 2009, in order to provide project information and initiate the State Environmental Quality Review Act (SEQRA) process. The application included 23 exhibits, addressing the requirements of the application process, including:

- A letter of intent, letter of intent narrative and land use application form;
- Identifying information about the applicant and its consultants;
- A completed SEQR Environmental Assessment Form, along with a draft scope for Draft Environmental Impact Statement (EIS) contents for review and comment;
- Completed town forms such as the fee schedule form, land owner authorization letter, agricultural data statement form, and disclosure of interest form;
- Draft plans and maps including a vicinity map, aerial photograph, land use district map, district overlay map, existing conditions, site plans, a plot plan, an elevation drawing and a general arrangement drawing;
- Information about adjoining property owners;
- A waiver request form and Town of Dover bulk regulation table;
- Existing and draft proposed grading and stormwater plans;
- A draft artist's rendering of the proposed facility;
- Correspondence regarding cultural resources;
- Correspondence regarding threatened and endangered species; and
- Wetland delineation report and wetland drawings.

Consistency with applicable dimensional requirements is outlined in Table 6.1-2.

Two requests for relief from Code requirements were identified in the Special Permit Application. As noted in Table 6.1-2, project structures will exceed the 35-foot height restriction. The second relief request identified was with respect to the Town of Dover Noise Standard at the property line along selected properties which also carry the industrial zoning classification "M." These properties are located along the southern property line and western boundary of the Project Development Area along the border of the Metro-North property and former railroad spur owned by Chippawalla Properties, Inc. Noise levels associated with the project comply with local and state noise requirements in all other locations. As addressed in detail in Section 6.4, the project will be requesting a slight adjustment (10 decibels) to the local noise standard with respect to property lines that abut other industrial properties.

Table 6.1-2: Cricket Valley Energy Consistency with Zoning Dimensional Requirements

Dimensional Requirement	Required	Proposed
Minimum lot size[a]	5 acres	131 acres
Minimum road frontage – private road	100 feet	N/A
Minimum road frontage – town road	200 feet	N/A
Minimum road frontage – county/state road	200 feet	1,200 feet
Minimum front yard setback – private/town road[b]	100 feet	N/A
Minimum front yard setback – county/state road[b]	200 feet	425 feet
Minimum side yard setback	50 feet	50 feet
Minimum rear yard setback	75 feet	100 feet
Maximum impermeable surface coverage[c]	30%	5-6%
Maximum height[d]	35 feet	Building/structure = 113 feet Equipment = 113 feet
Maximum footprint (in square feet) for nonresidential structures[e]	N/A	N/A

[a] For conventional subdivision as defined in §145-18A.
[b] Measured from center line of road. Front yard setbacks may be adjusted to prevailing setbacks in the immediate neighborhood on all roads.
[c] See definition in 145-73; applies to each lot and to an entire subdivision, including new roads and other public areas (see Article V).
[d] Above average grade; for height exceptions see 145-30D.
[e] Excluding agricultural structures and all structures legally completed or granted a building permit, special permit, site plan approval or variance prior to the adoption of this chapter. The purpose of this requirement is to maintain the historic scale and character of development in Dover. The intent of this provision shall not be evaded through the placement of multiple large buildings in rows or otherwise in a pattern that is inconsistent with the scale and character of the town.

No additional relief is anticipated to be required for the project other than: a variance to permit a building height of 113 feet where the existing height restriction is 35 feet; and a height limitation on fences. The relief with respect to the Building Height Restriction requires a variance from the Zoning Board of Appeals. CVE has minimized the height of project structures and buildings to the greatest extent practicable while maintaining the efficiency, functionality, integrity and safety of the project and its components. A grant of

the variance will allow the project to proceed, which will include razing the existing structures on site (considerably taller than the existing 35 foot limitation). The grant of the variance to CVE will allow the elimination of the current grandfathered, pre-existing, non-conforming uses (i.e., the partially destroyed buildings) on the CVE site. The grant of variance and Special Permit to the CVE project will cause the building and structures which comprise the CVE project to fully comply with the Dover Zoning Ordinance.

As mentioned above, the project stacks are presumed to be "chimneys" which are exempt from height requirements per Section 145-30(D)(1) of the Zoning Code.

CVE, for safety and security reasons, desires to have an eight foot fence located as close to its Property lines as possible where its Property borders non-residential uses to the south (the proposed Rasco facility) and to the west (the Metro-North railroad). Section 145-30(G) currently prohibits fencing of this height within setback areas. As the fencing will border non-residential uses and property zoned "M" for industrial uses, a revision to Section 145-30(G) is being requested to allow fencing of up to eight feet within setback areas when bordering either the Metro-North railroad track or "M" zoned property. This proposed change remains consistent with zoning and planning requirements, which protect the quality of life for residentially zoned properties, while permitting safety and security measures on property located and bordering industrially zoned properties.

In order for a Special Permit to be granted for the project, certain findings must be made. The required findings, and the way in which the project will address the finding requirements are outlined in Table 6.1-3. CVE believes the project will allow for applicable findings and granting of a Special Permit.

Table 6.1-3: Cricket Valley Approach to Special Permit Finding Requirements

Special Permit Findings Required	Cricket Valley Energy Approach to Special Permit Findings
Will comply with all land use district, overlay district, and other specific requirements of this chapter and other local laws and regulations and will be consistent with the purposes of this chapter and of the land use district in which it is located.	Given its location, size and other attributes of the Project Development Area and proximity to necessary infrastructure, the project is consistent with the purposes of the Zoning Chapter and the industrial district in which it will be located. The project will also comply with all special zoning requirements that apply with limited areas where relief will be sought, as outlined in Section 6.1.

Special Permit Findings Required	Cricket Valley Energy Approach to Special Permit Findings
Will not result in excessive off-premises noise, dust, odors, solid waste, or glare or create any public or private nuisances.	Demonstration of compliance with local and state noise standards is provided in Section 6.4. Measures to prevent offsite dust, particularly during construction, are outlined in Section 4. Details of the lighting plan intended to eliminate off-site glare are provided in Section 1.5.1.4. As outlined in Section 1.5.8, the project's solid waste will not be excessive and will be disposed of properly. The project has been designed to avoid creating any public or private nuisance.
Will not cause significant traffic congestion, impair pedestrian safety, or overload existing roads, considering their current width, surfacing, and condition, and any improvements proposed to be made to them by the applicant.	Demonstration that adverse traffic effects will not result is provided in Section 6.3. No impact to pedestrian safety will result.
Will be accessible to fire, police, and other emergency vehicles.	The project will be accessible to fire, police and other emergency vehicles, as discussed in Section 1.5.12.
Will not overload any public water, drainage, or sewer system, or any other municipal facility.	The project will not overload public water, drainage, or sewer system (as addressed in Section 5), or any other municipal facility (as addressed in Section 5.
Will not materially degrade any watercourse or other natural resource or ecosystem or endanger the water quality of an aquifer.	The project will not degrade a watercourse or natural resource or ecosystem or endanger aquifer water quality, as outlined in Sections 3 and 5. In fact, the project will include restoration of on-site wetlands to improve their quality and function.
Will be suitable for the property on which it is proposed, considering the property's size, location, topography, vegetation, soils, natural habitat, and hydrology, and, if appropriate, its ability to be buffered or screened from neighboring properties and public roads.	The project's suitability for this site has been addressed in this EIS. Significant buffering existing from public roads and neighboring properties due to natural topography and vegetation.
Will be subject to such conditions on operation, design and layout of structures, and provision of buffer areas as may be necessary to ensure compatibility with surrounding uses and to protect the natural, historic, and scenic resources of the town.	The project is considered compatible with the planned and zoned industrial use for the site, as well as with its former uses. Its presence at the site is anticipated to represent minimal visual change, as outlined in Section 6.2.
Will be consistent with the goal of concentrating retail uses in hamlets, avoiding strip commercial development, and buffering nonresidential uses that are incompatible with residential use.	N/A. This industrial use is proposed within an industrially zoned area.
Will not adversely affect the availability of affordable housing in the town.	The availability of affordable housing will not be affected by the proposed project.

Special Permit Findings Required	Cricket Valley Energy Approach to Special Permit Findings
Will comply with applicable site plan criteria in § 145-65D.	The project will comply with applicable site plan criteria to the extent appropriate, and will work with the town for any appropriate adjustments.
If the property is in a residential district, will have no greater overall off-site impact than would full development of the property with uses permitted by right, considering relevant environmental, social, and economic impacts.	N/A. The project is not located in a residential district.

6.1.5 Consistency with Land Use and Community Character

The CVE project will be consistent with the uses permitted in the M District as set forth in the Zoning Code. The majority of the 22-acre project footprint will be located on previously developed or disturbed land. Construction of the project will also involve the removal of existing abandoned and collapsed industrial buildings and debris, solid waste, dumped slag, and refuse which currently exist on the site.

The proposed footprint will alter an estimated 12.8 acres of currently undisturbed portions of the Property. Approximately 5.3 acres of forest will be converted to scrub/shrub areas and 1.5 acres of mixed forested and shrub wetland will be converted to entirely shrub wetland. Approximately 4.8 acres of forest and 0.3 acre of wetland (comprised of non-jurisdictional and previously degraded jurisdictional wetland) will be converted to rock, earth, fill, and/or road, paved areas, and approximately 1 acre of forest will be used to create stormwater bioretention facilities. The remaining wetlands, trees, and vegetation immediately surrounding the project footprint (approximately 27 acres) will remain largely undisturbed or be allowed to completely revegetate. This includes an approximately 300-foot wooded buffer between NYS Route 22 and the project. In addition, the lands west of the Metro North Railroad commuter line (approximately 74 acres of wetlands, forests, and the Swamp River) will remain undisturbed.

The use of a previously developed industrial property and the limited extent of new impacts minimize the potential for impacts to surrounding or nearby land uses. As discussed in Section 6.2, views of the project will be limited due to surrounding topography and vegetation. Mitigation has been incorporated into the overall design through siting the project to minimize new disturbance areas and to maintain existing mature vegetation and topography to the greatest extent possible.

The temporary Laydown Site, an approximate 30-acre agricultural parcel located approximately 2.5 miles north of the Property, will be in use only during the project's construction period, approximately 30 to 36 months. During that period, CVE will work closely with the town and local landowners to incorporate measures to minimize potential impact to the community and environment. Following completion of facility construction, the temporary Laydown Site will be restored to its original agricultural use.

CVE has incorporated key elements and recommendations of the Town of Dover Master Plan into its project plans to minimize the potential for adverse change to community character. The project's consistency with the community values, economic growth goals, and preservation objectives identified in the Master Plan is discussed below.

6.1.5.1 Community Values

The Master Plan explains that Dover aspires to preserve its traditional rural character and natural features, as well as to support economic growth that will contribute to enhanced town services and recreational opportunities. The local population includes residents of varying backgrounds, from multi-generational families to more recent arrivals. Balancing these demands presents a challenge that is addressed by the Dover Master Plan, which provides a blueprint to preserve and protect community values.

CVE's project is reflective of Dover's core community goal of balancing its traditions and natural resources with responsible economic growth. The project is designed to preserve natural features and minimize impacts to its surroundings:

- The project will remove unsightly, partially destroyed buildings from the Property as well as solid waste and other debris remaining on the site from previous occupants.
- The project will utilize a natural buffer of trees and topography to minimize its aesthetic impact and will limit its development to a previously disturbed industrial footprint.
- The project design will respect and preserve important water resources by minimizing water use through air cooled technologies and a zero liquid discharge process that will reduce water consumption by up to 98 percent compared to a similarly sized, wet-cooled facility.
- The project will replace existing, dilapidated industrial structures with a new state-of-the-art facility that will produce jobs and generate tax revenues for the town.

- The project plans to donate or conserve approximately 74 acres comprised primarily of NYSDEC-designated wetlands to preserve forever its character as a natural wetland and forested area.

6.1.5.2 Historical Preservation

The project is an opportunity to rehabilitate an inactive industrial site, currently in disrepair, and put it to use as a vehicle for economic growth for Dover. As discussed in Section 6.6, the Property neither contains nor will impact any structures listed on the State and National Registers of Historic Places, another advantage of the specific property that is consistent with the Master Plan.

6.1.5.3 Economic Development

The Dover Master Plan calls for restoration and rehabilitation as a catalyst for economic revitalization. The project will replace the existing, partially destroyed industrial structures with a new facility that will produce jobs and generate significant tax revenues for the town. The Property is specifically recommended to maintain its industrial designation in the Master Plan, referencing the site location as the "Mica plant."

Dover's Master Plan calls for the diversification of the economic base and suggests that "long-term economic health depends on Dover finding creative ideas to generate jobs and revenues." The proposed project will generate up to 750 construction jobs and 25-30 high-skilled, permanent positions. The facility will materially expand the town's tax base, supporting education, municipal services, community activities, and recreational opportunities. CVE is committed to locally sourcing necessary goods and services and hiring locally to the extent possible during the various phases of the project. The economic benefits of the project will be significant, with little long-term demand on municipal services, as further discussed in Section 6.7.

6.1.5.4 Housing

The Master Plan states that "housing forms the framework for the Town's land use pattern and largely determines its overall character." As further discussed in Section 6.7, 25 – 30 permanent positions are not expected to burden municipal services nor generate a need for new housing. Workers are anticipated to be existing Dover residents, commute from nearby communities, or utilize available lodging in the vicinity.

6.1.5.5 Community Resources

The Master Plan explains that "community facilities are the physical components that give a town its identity… and help create the very sense of community." As populations grow, these facilities, which are generally financed through taxation or user fees, need to be expanded or upgraded to adequately provide for the town. As further discussed in Section 6.7, CVE will work closely with the Town of Dover to ensure that its development produces no new strain on municipal services, and if and where it does, to ensure those services are provided.

The facility will be protected by private security with a direct link to the Dutchess County Sheriff's Office, New York State Police and other emergency service providers; no new police services will be needed. Fire protection will be self-sufficient and self-contained. CVE will continue to work with the J.H. Ketcham Hose Company to ensure it will not be overburdened by the facility.

With 25 – 30 permanent employees expected to be filled to the extent possible from the local community, the operation of the plant is not expected to burden the school system with new students. In fact, the project would substantially increase the school budget through a negotiated tax agreement.

6.1.5.6 Transportation

The Master Plan states "the transportation network is an essential component of the community [and] transportation systems have a direct impact on growth within the Town by supporting economic activities that provide employment opportunities for residents of Dover." However, the Master Plan also notes that while industrial uses "contribute to the economic well being of the Town, improperly sited and controlled uses can detract from the Town by, among other things, funneling heavy truck traffic onto residential streets and country roads, and consuming large amounts of land for operations which may not be compatible with the more rural characteristics of the area."

A detailed assessment of project-related traffic is presented in Section 6.3. As noted in that section, CVE will work with local authorities to ensure that construction traffic related to the project, even at its peak, is managed in order to preserve mobility. CVE plans use of a temporary Laydown Site in order to alleviate traffic and logistics issues. In addition, CVE plans to provide shuttle services to the Wingdale and/or Dover Plains Metro-North Railroad Stations in order to encourage construction workers to use public transportation for their work commute.

Aside from acceleration/deceleration lanes on Route 22 associated with the Laydown Site (temporary), no new roads will be built; therefore, road maintenance by the Dover Town Highway Department will not be required. Upon completion, the facility will employ 25 – 30 permanent employees, generating approximately 23 round trips of traffic each day. In addition, five trips of truck traffic, including deliveries, can be expected each day. As discussed in Section 6.3, given the existing traffic on NYS Route 22, a heavily traveled state highway, and low project related traffic volumes, traffic impacts resulting from operation of the project are expected to be minimal.

6.1.5.7 Natural Resources

The Master Plan suggests that "environmental compatibility assessments should underlie all land use decisions. A better understanding of the area's natural systems enable communities to both use and protect the resource base on which they depend." CVE has conducted an assessment of the Property's existing environmental conditions. Wetlands and species issues are addressed in Section 3, and water resources are addressed in Section 5. Potential impacts to natural resources have also been considered when evaluating the range of issues (for example, the benefits to natural resources of cleaning up debris and other material at the site) for the project. CVE has made plans to maintain or improve conditions of natural resources throughout the project's development, as discussed in Section 3.3.

CVE will minimize changes to on-site natural resources by using the footprint established by previous uses of the site. As a result, the project will require modification to only 13 additional acres, less than 10 percent of the 131-acre site. Impacts to wetland have been minimized as well (less than 0.1 acre of jurisdictional wetlands is proposed for permanent fill), and significant improvement to existing degraded wetlands, including the creation of new wetland is also planned, as addressed in Section 3. CVE will maintain an approximately 300-foot wooded buffer along NYS Route 22, providing an aesthetic visual barrier between the facility and its surroundings. In addition, all lands west of the Metro-North Railroad, about 74 acres of wetland and forest, will remain untouched and retained as vital habitat along the Swamp River. The Great Swamp and the Swamp River are important natural resources within the community. Project plans will allow for preservation of the portions of the Swamp River that extend through the Property, as well as improvements to on-site wetland systems that feed into the Swamp River watershed.

6.1.6 Conclusions

Since its initial exploration of the project, CVE has completed studies, met with community members and taken steps to affirm or revise its approach in order to ensure its consistency with the existing land use, the goals of the Master Plan and the Town of Dover's zoning code.

The project is located on a previously developed industrial parcel with a large natural vegetative and topographic buffer and will not impact the rural characteristics of the area. It has been carefully designed to be consistent with the Town of Dover's Zoning Code and Master Plan. The limited impact of new development on the site is offset by the removal of partially collapsed and dilapidated buildings and removal and clean up of solid waste scattered around the project site, as well as the preservation of the forested wetland habitat west of the railroad track, where the Swamp River flows. In addition, the project will restore a previously degraded wetland and adjacent area and create additional new wetland. The project will provide an opportunity to expand the tax base and create jobs, without placing a corresponding burden on area roads, important land areas or municipal services. In fact, the project will revitalize a previously disturbed footprint that is specifically recommended to maintain its industrial designation in the Master Plan.

6.1.7 References

Daley, 2003. What's Really Needed to Effectuate Resource Protection in Communities, Jayne E. Daley, Vol. 20 Pace Environmental Law Review 189 (2003).

NYSDEC, 2009. 2009 New York State Open Space Conservation Plan.

Town of Dover, 1999. Zoning Code. Adopted April 28, 1999.

Town of Dover, 1993. Town of Dover Master Plan. Adopted September 21, 1993.

6.2 Visual Resources and Aesthetics

This section provides a discussion of the visual impact assessment performed for the proposed project. Identification of potential viewpoints, viewshed analyses, photographic simulations, impact assessments, and mitigation analyses are provided for representative viewpoints within a 5-mile radius from the Project Development Area. In addition, an analysis of potential stack plume visibility is provided. Visual impact is assessed in terms of

the anticipated change in visual resources, including whether there would be a change in the character or quality of the view.

6.2.1 Applicable Laws, Regulations and Policies

SEQRA identifies aesthetic resources as one of the criteria that factor into determining the significance of a proposed action (6 New York State Register and Official Compilation of Codes, Rules and Regulations of the State of New York [NYCRR] Part 617.7(c)(1)(v)). On July 31, 2000, NYSDEC issued a program policy entitled "Assessing and Mitigating Visual Impacts" (Visual Program Policy) (NYSDEC, 2000). This program policy provides the framework for evaluating visual and aesthetic impacts associated with proposed facilities. The methodologies, standards, and definitions used for assessing visual resources generally follow the procedures outlined in the Visual Program Policy. Agricultural Handbook Number 701, Landscape Aesthetics: A Handbook for Scenery Management (USDA, 1995) was also relied upon for evaluating potential visual impacts.

6.2.2 Character and Visual Quality of the Existing Landscape

The Town of Dover's Master Plan indicates that Dover's environmental features and natural beauty are very important and states that protecting stream corridors, preserving wildlife areas, maintaining the town's rural character, and preserving wetlands are important issues to be considered in land use and development decisions.

Landscape character is largely determined by the topography, land use, vegetation and water features that define and contribute to the available vistas and views. Figure 1-3 presents an aerial view of the area immediately surrounding the Project Development Area. As can be seen from that figure, the Project Development Area is identifiable by the existing industrial buildings and structures. The Swamp River represents a valued water feature that extends through the area of the Property that will remain undisturbed. Views of the river and from the river near the Project Development Area are obscured by vegetation. Figure 1-3 also shows adjacent residential and commercial development interspersed throughout the area and the Dover Middle/High School complex is located approximately 2,700 feet from the proposed facility. None of these represent a dominant element of the setting, largely due to terrain and vegetation.

The Town of Dover is located in the Harlem Valley portion of eastern Dutchess County, a geographic area generally characterized by a north-south valley running from Pawling to North East. The Project Development Area is located on the western slope of the north-south trending ridge that separates the Swamp and Ten Mile rivers. Areas immediately

surrounding the Project Development Area are relatively flat, associated with floodplain surrounding the Swamp River. Elevations rise from approximately 400 feet msl within the Swamp River floodplain to 1,066 feet msl to the west (West Mountain). To the east, elevations rise approximately 40 to 50 feet from the Project Development Area to NYS Route 22, with elevations continuing to rise to approximately 580 feet msl further east (East Mountain).

Much of the area surrounding the Project Development Area – with the exception of the immediately adjacent industrial uses – is rural and relatively undeveloped. A significant portion of the surrounding area is wooded. The wooded areas are typically dense, mostly mixed deciduous forests. Wooded areas also exist within the Project Development Area that effectively screen views of the site from NYS Route 22 and screen views of the Swamp River from the Project Development Area. Additional information characterizing the setting, viewers and potential visibility is provided in the viewshed analysis presented in Section 6.2.4.

6.2.3 Visual Characteristics of the Project

The project is proposed to be located on an existing industrial site, largely within the footprint of existing industrial development. Despite the dilapidated and partially destroyed industrial buildings and debris currently on the site, the Project Development Area is not currently an intrusive element of the landscape due to its topographic location in a valley setting and the vegetation that surrounds it. The project will take advantage of the existing topography and vegetation to maintain natural visual buffering for the facility.

Figure 1-9 provides an artist's rendering of the proposed project. As discussed in Section 1, the largest elements of the project will be the turbine generator building (670 feet by 100 feet, and 75 feet tall), the Heat Recovery Steam Generator (HRSG) enclosure (128 feet by 160 feet, and 113 feet tall), the three co-located stacks (19.5-foot outside diameter and 282.5 feet tall), and the air cooled condenser units (190 feet by 190 feet, and 113 feet tall). Structure walls will be insulated metal siding supported on a steel frame.

The stacks, to be located west of the turbine generator/HRSG structures, will be a neutral color steel construction and will include a galvanized test platform, stack lighting platform and intermediate platform. Stack lighting has been recommended by the Federal Aviation Administration (FAA) that would consist of a dual lighting system that would result in red lighting at night and medium intensity white lights during daytime hours. CVE intends to consult further to reduce lighting requirements to minimize offsite impacts while maintaining aviation safety.

The air cooled condenser units will be located approximately 65 feet west of the HRSG enclosure. The air cooled condenser structure consists of a large bank of fans on a steel support structure. Although no building enclosure is associated with the air cooled condenser, the fan bank itself represents a solid visual element at the top of the air cooled condenser.

Ancillary buildings, equipment and storage tanks will have an industrial appearance but will be considerably smaller than the main structures. None of these elements is anticipated to affect the potential for visual impact from the project as proposed.

As discussed in Section 1, a key design goal of the project is to maintain as much of the Property's existing vegetation as possible. The Property has substantial wooded vegetation to the west of the railroad track; none of that vegetation will be removed, and no work is proposed on that portion of the Property. Although small amounts of clearing will be required around the project footprint, a significant amount of wooded buffer will be maintained around the Project Development Area, including an approximately 300-foot buffer between the Project Development Area and Route 22. Four areas are planned for landscaping or forest restoration, as shown on the Landscaping Plan provided in Appendix 6-B. Landscaping is planned at the plant entrance, near the front of the administration building, and near the associated visitor parking area. There will also be forest and vegetation restoration between the natural gas metering area and Wetland No. 1, just south of the on-site 345 kV transmission lines. This restoration area (shown in Figure 3-9) will provide additional visual buffer from NYS Route 22, along the ConEd transmission line right-of-way.

Lighting for the project has been designed to have minimal impact on the surrounding community while providing for safe operations. Project area lighting (as detailed in Appendix 6-C) will meet the standards of the Illuminating Engineering Society Lighting Handbook and the code requirements of the Town of Dover. Lighting will generally consist of the following:

- Main entrance and internal roadway lighting – 400 watt high pressure sodium fixtures mounted at 30 feet above grade with full cut-off optics to reduce unwanted glare and fugitive light. Fixtures will be oriented towards the plant and will be controlled by light sensing switches.

- Entry door and truck access doorway lighting – 70 watt high pressure sodium and 100 watt high pressure sodium wall lighting fixtures, respectively. These fixtures will also include full cut-off optics to reduce unwanted glare and fugitive

light. The doorway fixtures, controlled by photovoltaic cells, will be located above the doors and directed downward.

- Platform lighting – The walkway areas of the air cooled condenser, fin-fan coolers and associated access stairs, Continuing Emissions Monitoring Systems (CEMS) equipment platforms and other equipment-related platforms will be lit by 70 watt, 100 watt and/or 150 watt high pressure sodium heavy-duty, stanchion mounted area lights, typically mounted 8 feet above the platform elevation. Typically, the stairway fixtures and platform area lighting are off during normal operation and turned on during maintenance from locally mounted switches and photovoltaic cells. This reduces nighttime fugitive light.

6.2.4 Viewshed Analysis

The viewshed analysis for the project was completed through first identifying aesthetic resources of statewide significance and consulting with the Town of Dover to further identify local resources of particular concern. Areas of potential visibility within a 5-mile radius were then determined based on computer modeling that considered both topography and vegetation. Within this area, types of viewers and land uses were considered, leading to selection of vantage points from which photographic simulations were prepared illustrating representative views both under current conditions and with the proposed project in place.

6.2.4.1 Inventory of Aesthetic Resources

6.2.4.1.1 Visual and Aesthetic Resources of Statewide Significance

In accordance with NYSDEC's Visual Program Policy, the inventory of aesthetic resources of statewide significance is derived from one or more of the following categories:

- A property on or eligible for inclusion in the National or State Register of Historic Places;
- State Parks;
- Heritage Areas (formerly Urban Cultural Parks);
- State Forest Preserve;
- National Wildlife Refuges, State Game Refuges and State Wildlife Management Areas;
- National Natural Landmarks;
- The National Park System, Recreation Areas, Seashores, Forests;
- Rivers designated as National or State Wild, Scenic or Recreational;

- A site, area, lake, reservoir or highway designated or eligible for designation as scenic;
- Scenic Areas of Statewide Significance;
- A state or federally designated trail, or one proposed for designation;
- Adirondack Park Scenic Vistas;
- State Nature and Historic Preserve Areas;
- Palisades Park; and
- Bond Act Properties purchased under Exceptional Scenic Beauty or Open Space category.

The New York Office of Parks, Recreation, and Historic Places (OPRHP) serves as the State Historic Preservation Office (SHPO) in New York and administers programs authorized by the National Historic Preservation Act of 1966 and the New York State Historic Preservation Act of 1980, including the New York State and National Registers of Historic Places. On September 25, 2009, CVE received a letter with a determination of no effect upon cultural resources (Appendix 6-G). A review of the National Register of Historic Places found two listed sites within 5 miles of the Project Development Area. The Tabor-Wing House is located on NYS Route 22 in Dover Plains, New York, about 4 miles north of the Project Development Area. It is a frame house built in 1810 by a prominent family in the area, relatively intact today. It was listed on the National Register of Historic Places in 1982. Between 1979 and 2003 it was also the home of the Dover Plains Library. After the library moved out, the Dover Historical Society donated the building to the Town of Dover, which began a restoration that finished in 2006. Today it houses some municipal government offices and a local history museum. The Dover Plains Second Baptist Church is a historic Baptist church located on Mill Street in Dover Plains, about 4.3 miles north of the Project Development Area. It was originally built in the 1830s and was added to the National Register of Historic Places on August 30, 2010.

The nearest New York State Park is James Baird State Park, located over 10 miles west of the Project Development Area. The nearest Connecticut State Park is Macedonia Brook State Park, located approximately 6 miles northeast of the Project Development Area.

The Heritage Area System, formerly called the Urban Cultural Park System, is also administered by the OPRHP. The Heritage Area nearest the Project Development Area is located in Kingston, New York, over 20 miles from the Project Development Area.

The State Forest Preserve consists of lands in the Adirondack and Catskill Forest Preserves and is protected by Article XIV of the New York State Constitution. The portion of

the State Forest Preserve nearest the Project Development Area is the Bluestone Wild Forest near Kingston, approximately 30 miles northwest of the Project Development Area.

The nearest National Wildlife Refuge is the Shawangunk Grasslands National Wildlife Refuge in Wallkill, New York, approximately 30 miles west of the Project Development Area. No State Game Refuges are currently designated in New York; the State Game Refuges were supplanted by Wildlife Management Areas. The nearest State Wildlife Management Area is the Cranberry Mountain Wildlife Management Area located over 10 miles south of the Project Development Area in Putnam County.

The nearest National Natural Landmark is Cathedral Pines in Cornwall, Connecticut, approximately 17 miles northeast of the Project Development Area. The nearest National Natural Landmark in New York is Thompson Pond near Pine Plains, approximately 20 miles north-northwest of the Project Development Area.

The nearest portions of the National Park system are the Vanderbilt Mansion and Franklin D. Roosevelt National Historic Sites located approximately 18 miles west of the Project Development Area in Hyde Park, New York. The nearest portion of the National Park system in Connecticut is the West Fork National Historic Site, located 37 miles southeast in Wilton, Connecticut. The closest in Massachusetts is the Springfield Armory National Historic Site, approximately 70 miles to the northeast. The nearest National Recreation Area is the Gateway National Recreation Area located approximately 75 miles to the south of the Project Development Area, with units in three New York City boroughs and northern New Jersey. The nearest National Seashore is the Fire Island National Seashore located approximately 75 miles south of the Project Development Area in Long Island, New York. There are no National Forests in the vicinity of the Project Development Area; there are no National Forests in New York, Connecticut, or Massachusetts.

The nearest National Wild, Scenic or Recreational River is the Farmington Wild and Scenic River, located over 30 miles north and east of the Project Development Area near Riverton, Connecticut. The Project Development Area is not located in an area with any State-designated Wild, Scenic or Recreational Rivers; there are no designated river segments located east of the Hudson River (Sheppard, 2010).

The nearest site, area, lake, reservoir or highway designated or eligible for designation as scenic is the Taconic Parkway located approximately 9.8 miles west of the Project Development Area. The Taconic Parkway is part of the State Scenic Byway program. Elements of the State Scenic Byway program include Scenic Roads designated by NYSDEC prior to creation of the State Scenic Byway Program; parkways that exhibit

statewide scenic, recreational, cultural, natural, historic, or archaeological significance; and the North Country Touring Routes.

New York State's designated Scenic Areas of Statewide Significance are currently located only along the Hudson River Corridor. The nearest Scenic Areas of Statewide Significance are the Estates District and Esopus-Lloyd Scenic Areas of Statewide Significance located approximately 17.5 miles due west of the Project Development Area. The Hudson River has also been designated an American Heritage River by Executive Orders 13061, 13080, and 13093.

The nearest state or federally designated trail, or one proposed for designation, is the Appalachian National Scenic Trail. Several miles of the trail are within 5 miles of the Project Development Area. The trail roughly parallels the New York-Connecticut border before turning more southwest to head south of Wingdale. At its closest point, the trail is approximately 2.8 miles from the Project Development Area.

The Adirondack Park and its Scenic Vistas are located in the northern portion of the state, over 100 miles from the Project Development Area.

The only state-owned lands within 5 miles of the Project Development Area are West Mountain State Forest, located about 3.5 miles south of the Project Development Area, and the Swamp River Access located along Old State Route 22 and Sherman Hill Road approximately 2 miles north of the Project Development Area. The NYSDEC Division of Lands and Forests, Bureau of State Land Management manages more than 760,000 acres of State Forests, which include Reforestation Areas, Multiple-Use Areas, Unique Areas and State Nature and Historic Preserves, throughout New York State. West Mountain State Forest and the Swamp River Access are not part of the State Nature and Historic Preserve. The list of properties in the State Nature and Historic Preserve is located in §45-0117 of New York's Environmental Conservation Law.

The state resources identified within the 5-mile radius – portions of the Appalachian Trail, the West Mountain State Forest, and the Swamp River Access – were considered in the assessment of areas from which the Project Development Area would be potential visible, as discussed in Section 6.2.5.1.

6.2.4.1.2 Visual and Aesthetic Resources of Local Concern

The Town of Dover has not identified visually or aesthetically sensitive areas or visual or aesthetic resources of local concern in either its zoning code or the Town's Master Plan. However, the Master Plan identifies the Ten Mile River as the most important natural

resource contributing to the Town's appearance and environment. The Ten Mile River is located approximately 0.8 mile east of the Project Development Area and runs parallel and just east of Old Post Road. The Swamp River, extending through a portion of the Property, is also a significant resource for the state and local area. Each of these corridors was considered in the analysis of areas from which the project could be visible.

In the absence of resources identified in the Town's planning documents, visual and aesthetic resources of local concern were identified by CVE's consultation with the Town Supervisor, distribution of the Draft EIS scope to Town agencies and through public scoping meetings. Through this consultation, potential views from the proposed Knolls of Dover project were identified as of interest. No additional locations beyond those identified in the draft scope for the EIS were identified by either the public or local entities consulted.

6.2.5 Visual Impact Assessment

A detailed viewshed analysis has been conducted to determine the potential visibility of the project, as well as the nature and degree of visual change resulting from the project. Because no permanent off-site features will be associated with the project, the visual impact analysis has focused on the larger structures that will be associated with the project, as well as water vapor plumes that may occasionally be visible from the stacks' exhaust.

6.2.5.1 Areas of Potential Visibility

A viewshed analysis was conducted for an area within a 5-mile radius of the Project Development Area. Computerized methods were used to identify areas from which the stack or other elements of the facility might be visible. This was done by creating a digital elevation model of the area from United States Geological Survey (USGS) terrain data. Using the visibility function within the computer model Viewshed Analysis for ArcGIS™ Spatial Analyst, the areas from which the top of the stacks (282.5 feet above ground level) could potentially be seen were identified.

Figure 6.2-1 illustrates the visual screening effect of terrain, without taking vegetation into consideration. The figure reflects the north-south trending ridgelines within the area and the valley within which the project is proposed, showing potential views primarily from the valley area immediately surrounding the Project Development Area and along ridgelines facing the site. Even without considering the effect of the forested areas surrounding the Project Development Area, potential visibility from the west is effectively limited to areas

within the surrounding valley and the immediate east-facing ridgelines. Views from the east indicate a greater number of west-facing ridgelines with potential visibility.

To account for the additional screening effects of vegetation, the approximate extent of forested areas was identified through the use of 2005 land cover data available from the USGS National Land Cover Database, supplemented by aerial interpretation of National Agricultural Inventory Program (NAIP) satellite photographs dated 2008. This evaluation assumes that all views from forested areas are blocked. It is possible that steep terrain changes or clearing since 2008 may provide isolated views of the project that are not included in the viewshed indicated in Figure 6.2-2. Mature forested areas were assigned a conservative vegetation height (20 meters) based on local assessment, and combined with the digital elevation model to create a model that accounted for both terrain and vegetation.

Figure 6.2-2 shows the results of this analysis. As can be seen from that figure, the presence of forest cover provides considerable additional visual screening of the project. Locations within the surrounding valley area from which potential views are indicated have been significantly reduced, as has ridgeline vantage potential. The pattern of potentially visible area remains strongly influenced by terrain, but has been focused such that the majority of the remaining areas from which the project could be visible are focused within approximately 2 miles of the Project Development Area. Other, more distant areas of potential visibility follow the valley configuration within a relatively narrow band.

In addition, Figure 6.2-2 indicates distances considered by U.S. Forest Service visual assessment methodology to be the areas from which views would be considered to be in the foreground, middleground or background. These “distance” zones provide a frame of reference to classify the degree to which details of the viewed project would be factors in assessing potential visual impact. The “foreground” area, identified as occurring from 0 to ½ mile from the Project Development Area, is considered to be the location from which project element detail would be visually clear. In the “middleground,” classified as the area from ½ to 4 miles from the Project Development Area, viewers still have the potential to distinguish individual forms and can observe some texture and color as well. In steeper topography, where viewers may focus down towards a project, this view tends to provide a sense of a project within the overall landscape. At a “background” distance, from 4 miles to the horizon, viewers would lose texture and color but may be able to distinguish land patterns. As shown in Figure 6.2-2, computer modeling indicated that viewing potential is generally within the foreground and middleground categories.

Figure 6.2-2 also illustrates the specific areas identified as being of statewide or particular local significance. Each of the statewide or locally significant areas was reviewed to determine the potential for project views:

- Appalachian Trail – The Appalachian Trail winds through the study area, following ridgelines to the east. Modeling does not indicate that the trail falls within areas from which the project is anticipated to be visible. Although it is possible that hikers could divert from the trail to find overlooks that may offer a distant view of the project, views would occur near the transition zone between middleground and background views. Based on the modeling results and field reconnaissance, no simulations were considered to be appropriate for completion from the Appalachian Trail. In the event that an off-trail location offered a view of the project, the scale would be similar to the representative middleground distance view from the Knolls of Dover, discussed below.
- West Mountain State Forest – The West Mountain State Forest is also located within the transition area from middleground to background viewing, and its position to the southwest results in intervening terrain that would obstruct views from that location. Modeling does not indicate that the forest falls within areas from which the project is anticipated to be visible.
- Swamp River and the Swamp River Access – The Swamp River extends through the center of the 5-mile radius in a north-south direction, and extends through a portion of the Property. Although small areas along the river corridor indicate the project could be visible (as shown in Figure 6.2-2), particularly near the Project Development Area, field inspection of visibility potential indicates that forested areas intervening between the river and the project will continue to effectively shield potential views. The Swamp River Access areas are not located in areas from which project views are indicated.
- Tabor-Wing House – The Tabor-Wing House is located near the Dover Plains Elementary School, residences, and commercial properties such as McDonalds. The Tabor-Wing House is not located in an area from which project views are indicated.
- Dover Plains Second Baptist Church – The Dover Plains Second Baptist Church is located more than 4 miles north of the Project Development Area, surrounded by residential and commercial properties on Mill Street. The Second Baptist Church is not located in an area from which project views are indicated.
- Ten Mile River – The Ten Mile River extends through the middleground distance zone. Modeling does not indicate that this river corridor falls within areas from which the project is anticipated to be visible.

- Knolls of Dover – The Knolls of Dover project is proposed approximately 3 miles south of the Project Development Area along NYS Route 22 in Wingdale. Modeling (Figure 6.2-2) shows select locations within the overall development with the potential for visibility. A view from the base of the former hospital on the hill at the Knolls of Dover is provided in Section 6.2.5.4. This view provides a representative middleground distance (approximately 3 miles from the Project Development Area).

Although none of the specifically identified resources are anticipated to have significant project viewing potential, visual quality and character is an important element of the Town of Dover. Therefore, an understanding of the anticipated change in views associated with the project was assessed through selection of several vantage points within the viewshed intended to represent local views.

6.2.5.2 Landscape Similarity Zones

Within the 5-mile radius, discrete landscape similarity zones were identified (Figure 6.2-3). These zones were determined based on a review of topography, vegetation, water, land use and user activities. The landscape similarity zones identified are described below, as well as the manner in which visibility assessment was carried forward for each.

- Open Water: A small but significant element within the 5-mile radius includes the Swamp River and a portion of the Ten Mile River as it traverses the area. This zone would include recreational viewers. Open Water zones, however, are screened from views of the Project Development Area by existing vegetation, and no representative view was selected.
- Village/City: This zone consists of dense residential settlements. Within the 5-mile radius, settlements are represented by Dover Plains, approximately 4 miles to the north, and Wingdale, approximately 2 miles to the south. Although small portions of this area show the potential for visibility, this type of area occurs within the zone from which views of the project would, if visible at all, not be prominent. A representative view from the Knolls of Dover project area, approximately 3 miles south of the project setting, was selected from this area (see Section 6.2.5.4).
- Industrial Zone: This zone within the 5-mile radius is limited to the immediate project setting, and has not been assessed.
- Topographic Ridge Zone: This zone, comprised of elevations over 915 feet msl, reflects landforms extending in a generally north-south direction to the west and east of the Project Development Area. No views were indicated as occurring

from the Topographic Ridge Zone to the west based on visibility assessment modeling and land use. To the east, although ridge zone areas do not indicate visibility, lower elevation ridgelines that define the eastern "side" of the valley along NYS Route 22 have some viewing potential. Two views were selected within the foreground/middleground zone to represent anticipated views from residences on Cricket Hill Road and users of the Dover Middle School/High School Complex. Selection of locations within this distance category provides for the most direct potential representative views.

- Highway Commercial Corridor: The primary corridor within the 5-mile radius is NYS Route 22. Areas of visibility are located to the north along Dover Furnace Road, extending approximately 1.7 miles, west of the Project Development Area along the Swamp River, and portions of open space along NYS Route 22, north and south of the Project Development Area. A view from NYS Route 22 looking south to the Project Development Area in a location where the ConEd right-of-way reduces vegetative screening was selected (See Section 6.2.5.4).
- Rural Residential: The balance of the study area is classified as being in this zone. Residences and other uses occur along local roadways interspersed with open or wooded undeveloped areas. Although some more densely developed residential neighborhoods exist within this area, they are rare. Views from such areas are represented by both views from Cricket Hill Road and the view from NYS Route 22.

6.2.5.3 Viewer Groups

Based on the field and data review, specific viewer groups within the study area were identified. These groups were identified based on the frequency and duration of exposure to views of the project, the viewer's position in the landscape, and the viewer's activity and presumed sensitivity to alteration of the visual landscape. It is important to note that the existing industrial site proposed for the project is an existing visual element in the landscape that is currently experienced by all viewers. Viewer groups identified within the study area included:

- Local Residents: These individuals have views that are likely to be stationary. They have knowledge of the local landscape and may be sensitive to changes in particular views that are important to them. The population density of viewers within 5 miles of the Project Development Area is quite variable (Figure 6.2-4). For much of the 5 mile radius, population density is extremely low, with almost 46 percent at an average density of 52 – 85 people per square mile and almost 35 percent at 85 – 200 people per square mile (US. Census Block Groups with

2007 update). The area east of Route 22, and a few other isolated locations, reflects population density of 200 – 305 people per square mile. Wingdale represents a population cluster of 305 – 1,515 people per square mile, approximately 2.7 miles south of the Project Development Area. Pleasant Ridge, located approximately 4 miles southwest of the Project Development Area also has the same density. The Dover Plains census block group, located approximately 3.75 miles to the north of the Project Development Area is a larger population cluster, at 1,515 – 2,048 people per square mile.

- Through Travelers: These individuals are travelling through the area on local roadways and along NYS Route 22, which extends in a north-south direction to the east of the Project Development Area. Detailed information with regard to the volume of travelers on local roadways is provided in Section 6.3. These viewers, because they are driving, are typically focused on the route and other travelers and would experience only transitory views of their surroundings. Consequently, their views of the surrounding landscape will generally be peripheral and relatively brief.

- Tourists and Seasonal Residents: These individuals come to the area specifically to enjoy the recreational and scenic resources that are associated with the region. Many tourists and seasonal residents will have a high sensitivity to a change in visual quality and landscape character, with the exception of those focused on a particular recreational activity (such as hunters or golfers). It is important to note that the industrial site on which the project is proposed is an existing industrial element of the area's visual character that would currently be experienced by users including tourists and seasonal residents.

- Recreational Users: These individuals include local people also involved in outdoor recreational activities. This group includes boaters, fishermen, hunters, hikers and cyclists. Their sensitivity to visual quality is variable, but to some, visual quality is an important part of the recreational experience they are enjoying.

6.2.5.4 Selected Viewpoint Locations

The goal for selecting visual receptor locations was to ensure views from a variety of compass directions and distances that would provide representation of the closest potential views of the proposed project, taking into consideration various uses and

potential viewers within the area. Visual receptor locations were selected utilizing the NYSDEC screening process and local contact information, the information shown in Figure 6.2-2 and the following:

- Representative or typical views from unobstructed or direct line-of-sight views;
- Significance of viewpoints (for example, high public use areas would be of particular concern for assessment);
- Level of viewer exposure (that is, frequency of viewers or relative numbers, including residential areas, or high volume roadways); and
- Existing and proposed land uses.

As noted above, locations that have been identified include views from Route 22 where the ConEd right-of-way minimizes vegetative screening, Dover High School, and residences off of Cricket Hill Road. The proposed visual receptors were identified in the scope for the Draft EIS distributed to both state and local agencies for review. In addition, a view has been included to represent the future Knolls of Dover development area to provide a representative "middleground" view, albeit somewhat obstructed by existing topography. No additional locations were identified either through the scoping process or through additional consultation with local planning agencies. Figure 6.2-5 illustrates the location of each of the selected viewing locations.

At each of the selected locations, photographs were taken. The photographs shown in Figures 6.2-6 through 6.2-11 were taken using a digital camera with a standard (50 millimeter for summer photos and 36 millimeter for winter) lens. Each view is described below:

- View 1 – Southbound on NYS Route 22. This location is intended to represent the visual experience of travelers along NYS Route 22 as they pass through the vicinity of the project. The location can also represent views from the limited residences located just north of the Project Development Area. Figures 6.2-6 and 6.2-7 were taken from the shoulder of NYS Route 22, facing southwest, just north of the ConEd transmission line. The goal in selecting this location was to provide the most direct view possible of the Project Development Area. This was facilitated by the presence of existing industrial structures at the site. Photographs from this location were taken under two different seasonal conditions. The photograph taken under leaf-off conditions represents the most direct viewing conditions, while the photograph taken while leaves are on the trees indicates the degree of vegetative screening during other times of the year.

In Figure 6.2-6, the leaf-off conditions, foreground elements of the photograph include road shoulder fencing, a marker associated with the natural gas pipeline, and significant structures associated with the ConEd transmission line. Vegetation in this area indicates a grassy field, with some more shrubby vegetation present in the middle ground of the photograph, under the ConEd transmission line structures. Beyond the ConEd right-of-way, deciduous and evergreen trees screen views of the existing industrial site. Just to the right of center, the dilapidated base of the former water tower at the site can be seen as an orienting landmark within the industrial property. Beyond the Project Development Area, the view includes a backdrop of rolling hills and skyline. Figure 6.2-7 indicates the same view and features. However, under leaf-on conditions, the water tower in the center of the photograph is even more difficult to see. It is evident that the effect of leaves on deciduous vegetation provides for significant additional vegetative screening.

It should be noted that this viewing condition occurs only where the ConEd right-of-way transects NYS Route 22; immediately to the north and south of this location, significant intervening vegetation exists.

- View 2 – Cricket Hill Road Residences. This location is intended to represent the visual experience of residential dwellers overlooking the valley toward the project. At the crest of the ridgeline on Cricket Hill Road is an area of existing and planned residential development that currently has open views of the Project Development Area and its surrounding vista. The photographic location is just south of a new residential road. From this location, the tops of existing stacks associated with current industrial structures within the Project Development Area can be seen, and the most direct vantage of the proposed project is anticipated. Photographs were taken during both leaf-off and leaf-on conditions.

  Figure 6.2-8, leaf-off conditions, shows the generally level hilltop where residential development is planned in the foreground. Terrain drops off in front of the viewer, and background views appear in the form of distant hills, with the ConEd electric transmission line ascending the hill to the left. Against the backdrop of the hills, the tops of two existing industrial stacks can just be seen over the tree line in the center of the photograph.

  Figure 6.2-9 reflects a similar view during leaf-on conditions. The primary difference during leaf-on conditions is in the vibrancy of green vegetation and

the blue skies, against which certain features of the existing industrial landscape are more visible. The ConEd transmission line corridor is more easily discernable, as are the red brick tops of the existing stacks visible from the Project Development Area.

- View 3 – Dover Middle/High School Complex. This view was selected as the most proximate public use to the Project Development Area. With school buildings as well as playing fields, the complex is frequently used not only by students, teachers and parents, but by other members of the community who use the facilities as a gathering place. The majority of the complex does not have direct views of the existing industrial structures within the Project Development Area due to topography and vegetation. The photographs were taken at the northwestern edge of the playing fields located just south of the school buildings.

  From this location, the most direct views of the Project Development Area were available. In the foreground, the edge of the level playing field area can be seen. Terrain drops off steeply to NYS Route 22. The view is completely comprised of dense trees; even under leaf-off conditions, their density and location prevent views of NYS Route 22 and significantly limit visibility beyond. Through the tree line, views of the existing dilapidated water tower could just be seen through the dense trees in Figure 6.2-10. Background views through the trees consist of distant hills. No leaf-on view was taken from this location, as even under leaf-off conditions, viewing is difficult.

- View 4 – Knolls of Dover. This view was selected to represent a “middleground” view from a further (3 mile) distance from the Project Development Area and is representative of a Village or City location, although not currently populated. The Knolls of Dover is a phased mixed use development complex which proposes to include 1,376 dwellings, as well as commercial space, and community facility or recreation center space. This location is approximately ½ mile from the Appalachian Trail, and while the proposed project is not likely to be visible from the trail itself, this view would approximate a scenario where a trail user might view the facility if they were to divert off-trail near this area. This view was taken at the base of the former hospital on the hill at the future Knolls of Dover project site looking northwest towards the Project Development Area (Figure 6.2-11). From this location looking through the treeline, the top of the dilapidated water tower at the Project Development Area is just visible, as is the ConEd transmission tower which is several hundred feet behind the Project

Development Area. Additionally the old west brick stack at the Project Development Area is barely visible in this view. In the background are distant hills.

6.2.5.5 Project Impact on Selected Viewsheds

For each of the selected receptor locations, a computer simulation assessment was undertaken by Burns & Roe using MicroStation® and Photoshop® software. The modeled simulation of the project was inserted into the photograph as an overlay. The change in view with the project in place for each identified vantage point is shown in Figures 6.2-6 through 6.2-11, designated as the "anticipated" view. Through a comparison of the existing viewshed, also shown in those figures, to the view following construction of the project, the extent of change in that view as a result of the project can be determined. Each of the views are considered to be within the foreground or middleground viewing distance; any more distant views would be further attenuated by scale and atmospheric conditions that would render the project a less distinct visual element in the overall landscape. The colors used in the simulations represent a “worst case” (highly visible) scenario. CVE will work with the Town of Dover during the design review process and will incorporate building materials and colors that best minimize visual impact.

- View 1 – Southbound on NYS Route 22 (Visual experience of travelers). Visual simulations were completed for this location during both leaf-off and leaf-on conditions. Under leaf-off conditions (Figure 6.2-6), the project can be seen beyond the existing row of evergreen vegetation. The tops of the three HRSG enclosures can be seen, with the most proximate units most visible. The top of the air cooled condenser is also visible from this vantage. The electrical interconnection to the existing transmission lines represents a new visual element from this location. Although the stacks are visible as tall vertical elements of the landscape, because they are co-located, all three stacks are not visible from this location.

  Figure 6.2-7 reflects leaf-on conditions from a slightly different point within the same vantage area. The increase in deciduous vegetation blocks views of a more significant portion of the HRSG enclosures and other structures. Structures associated with the closest unit and the air cooled condenser are still quite visible, and the shift in perspective from this location brings on-site storage tanks into view. The stacks remain visible, although greater screening from deciduous vegetation has the potential to block more of these structures such that only the stack tops are visible.

This location represents the most direct potential view of the project. Whereas the existing dilapidated industrial structures were only partially visible from this location – in part due to their condition – a significantly greater portion of the proposed facility will be visible under both leaf-on and leaf-off conditions. Under both conditions, the existing topography and remaining vegetation will continue to limit views of the facility.

Both existing views and proposed views are seen as having ConEd electric transmission structures in the foreground. The majority of viewers from this location would be represented by through travelers on NYS Route 22. Through travelers would be primarily focused on the road and on other drivers and potential hazards. For these viewers, the glimpse of the project would be momentary, passing in a matter of a few seconds at speeds of up to 55 miles per hour. Viewers walking along NYS Route 22 would have a more protracted view of the project, but as in the case of through travelers, the view of the project would be unlikely to significantly detract from their purpose for passing through the area.

A limited number of residences are located in the general vicinity of this viewpoint. Views from these locations, however, are significantly screened by vegetation.

- View 2 – Cricket Hill Road Residences (visual example of local residents). Visual simulations were completed at this location for both leaf-off and leaf-on conditions. As can be seen in Figures 6.2-8 and 6.2-9, both views indicate that the top of the project structures will be visible over the tree line. The cluster of three stacks will create a vertical visual element against the backdrop of the distant hills. The primary difference between the leaf-off and leaf-on conditions is the color and texture of the background against which the project elements are viewed.

  The project from this location is an element of the overall landscape. Although the existing industrial stacks are visible above the tree line, the proposed project stacks and structures are taller and do add to visibility of the industrial elements at the Project Development Area. However, other human-influenced elements are visible, as evidenced by the ConEd right-of-way traversing the hills. Expansive views of the hills are available from this vantage in many directions, and the addition of the project to this view is one element within the overall panorama.

- View 3 – Dover Middle/High School Complex (visual experience from public use buildings). A leaf-off simulation only was completed; given the significant vegetative screening of the school complex, off-site views would be substantially screened by deciduous vegetation under leaf-on conditions. The visual simulation illustrated in Figure 6.2-10 indicates that project stacks can barely be viewed through the trees, although they are not an obvious visual element given the vertical nature of the foreground views.

- View 4 – Knolls of Dover (visual experience from a village/city). A leaf-off simulation only was completed for this view, since the view is limited by distance and topography and would be substantially screened under leaf-on conditions. As can be seen from Figure 6.2-11, a portion of the top of the project structures will be visible over the tree line. The cluster of three stacks is slightly visible against the backdrop of the distant hills. During leaf-on conditions it is anticipated that this view would be more obstructed by vegetation.

Factors that limit views include location of the project within a large Property, and focusing it within the existing developed area onsite. This area is currently well-screened by topography and vegetation. By maintaining dense vegetation around the project area, this existing visual buffer will continue to exist. Even without leaves on the deciduous vegetation, this vegetation provides significant screening of the project building enclosures. Project stacks are substantially taller than the existing stacks located at the Project Development Area, and will be visible from certain surrounding areas. However, the position of the Project Development Area relative to surrounding topography results in stacks being viewed against the backdrop of surrounding hills rather than positioned above the horizon line. Change in the character of the view is, therefore, limited to the very specific location of the project.

During construction, views will not be significantly different. Although tall cranes will be temporarily employed at the Project Development Area, they will again be viewed as linear elements extending above the tree line. The balance of the temporary construction activity will occur interior to the Project Development Area and would be shielded from view, which eliminates the need for further assessment of the construction condition.

During the night, project lighting is an additional visual element. Lighting at the Project Development Area itself is not anticipated to present a significant impact. Lighting is limited to that necessary for safety, will be directed towards the facility and will be

shielded to prevent excess light off-site, and in many instances will be limited unless triggered due to motion or manually turned on.

As discussed previously, the FAA has determined that navigational lighting is required on the stacks associated with the project. The FAA has recommended a Medium-Dual Lighting system, per their Advisory Circular, AC 70/7460-1K (Change 2), "Obstruction Marking and Lighting." The FAA defines a Medium-Dual Lighting system as red lights for nighttime and medium intensity flashing white lights for the daytime and twilight at the top of the stack and steady-burning red obstruction lights located midway between the top of the HRSG enclosure and the top of the stack. The stack will not require any special FAA painting schemes or colors. CVE intends to work with the FAA to reduce stack lighting requirements to the minimum necessary for air navigation safety. The addition of lights on the project stacks will present a new visual element in the vicinity of the Project Development Area.

6.2.5.6 Plume Simulations

In addition to the project's structural elements, visual impact potential exists with regard to water vapor plumes generated during project operation. Because the project incorporates air cooling, a major potential source of plume visibility has been eliminated. For this project, the only potential visible plume would be water vapor generated from the stacks under certain operating conditions. A simulation was conducted to identify the anticipated visual impact of this water vapor.

Detailed modeling completed for similar combined cycle power projects utilizing dry cooling was examined to determine a representative plume frequency and length. Any visible water vapor plume from this source would be the result of water vapor condensation forming in the exhaust plume as it exits the stacks, similar to a person's visible breath on a cold winter morning. Like a visible breath, the water vapor plume would be more prevalent during the cooler seasons (late fall, winter, and early spring), when atmospheric conditions are conducive to condensation of the water vapor entrained in the exhaust and during humid conditions.

The frequency, persistence, and size of a potential water vapor plume will depend primarily on meteorological conditions, as well as the temperature and water content of the exhaust. Based on detailed modeling performed for similar projects, and assuming that the project would operate at full capacity for every daylight hour, a visible vapor plume of at least 50 meters (m) long was estimated to have the potential to occur for between 10 and 20 percent of daylight hours. This visibility would occur during periods

with high ambient relative humidity that would be expected to have naturally occurring fog that would tend to obscure the project's visible plume, as well as periods of low ambient temperatures when the water vapor would condense.

Views 2 (Cricket Hill Road) and 4 (Knolls of Dover) were selected as appropriate representative views from which to consider potential plume visibility impact, representing views from closer and more middleground locations. For View 2, using leaf-on conditions as a basis results in the highest possible contrast of the plume against blue summer skies. In actuality, stack plumes would most often be viewed against greyer skies, with snow cover or other seasonal ground cover providing the setting. There would therefore be less contrast between the plume and its setting than in the simulation.

Figure 6.2-12 depicts a representative plume from the three project stacks exceeding 50 m in length. The predicted plume shape is based on near-neutral dispersion conditions with representative high wind speed (between 5 and 8 meters per second (m/s), at 10 m above ground); the plume remains more compact and is therefore more likely to be visible under these conditions. SCREEN3 (a single-source Gaussian plume model) predicts a plume height of 335 m with a wind speed of 8 m/s, and 485 m at 5 m/s. The warm stack plume expands rapidly as it entrains ambient air during buoyant rise. This "buoyancy-induced dispersion" will generally cause the visible plume to dissipate as it rises, except during periods with very high humidity. While thermal inversions can occur at valley locations, plumes from the project would exist above these inversions and the appearance of these plumes would not be affected by them.

Figure 6.2-13 depicts the same representative plume as above from the three project stacks from a greater distance (3 miles).

As previously noted, maximum plume visibility impact conditions also would occur in the winter months. During most of any given year, water vapor plumes would not be visible from the project stacks.

6.2.6 Conclusions

Visual impact is assessed within the framework of a wide range of factors, including the context of the viewers, the duration of the view, the degree of discernable detail, the number of viewers, the degree of natural buffering, and the scenic value of the setting. Although modeling did not indicate a potential change in view from identified federal, state or local areas of visual importance, the rural character of Dover and its surrounding communities is of high local value. The visual analysis indicates that, although the project

will be visible from certain locations, the Project Development Area possesses a number of qualities that will minimize visual impacts to its surroundings including its location within a valley, a substantial buffer of mature trees, and a hillside that will shield the majority of the project structures from view. Project feature designs have been purposefully located within a compact footprint, including co-locating the three stacks in order to minimize their visual impact on surroundings. Given the design attributes of the project, the natural buffer of its surroundings, the context and number of viewers, the duration of the view, the degree of discernable detail, and the scenic value of the setting, the visual impact of this project is assessed as minimal.

6.2.7 References

NYSDEC. 2000. Assessing and Mitigating Visual Impacts. NYSDEC Program Policy DEP-00-2.

NYSDEC. 2010. The SEQR Handbook – 3rd Edition. NYSDEC Division of Environmental Permits.

Sheppard, Douglas. 2010. Telephone Conversation. NYSDEC Division of Fish, Wildlife and Marine Resources. July 12, 2010. Telephone Conversation Record by Kallin, Robert, ARCADIS.

USDA. 1995. Landscape Aesthetics: A Handbook for Scenery Management. Agricultural Handbook Number 701. U.S. Forest Service.

6.3 Traffic and Transportation

This section discusses traffic and transportation issues associated with the construction and operation of the CVE project. The analysis includes a description of the existing roadway network and traffic characteristics (Existing Conditions), anticipated traffic conditions for the future years that would occur without the project (No Build), anticipated conditions that would result during the peak year of project construction (2013) including transportation of construction workers and materials and equipment (Construction), and an assessment of impacts that may result from the addition of project-related traffic once the project becomes operational in 2015 (Build).

The Town of Dover is accessed by Interstate highways I-84 and I-684, located approximately 20 miles to the south/southwest. Dover has no major highways within its town borders, but has two major thoroughfares: NYS Route 22, which crosses from the

Pawling town line to the Amenia town line and runs generally north-south; and NYS Route 343, which generally runs east-west and runs concurrent with NYS Route 22 in Dover Plains. Metro-North provides commuter rail service to the Town of Dover.

The Project Development Area is located off of NYS Route 22, just to the south of the intersection of NYS Route 22 and County Route 26 (Cricket Hill Road) in the Town of Dover (See Figure 6.3-1). NYS Route 22 is a two-lane, undivided state highway which operates with a current average daily traffic (ADT)[2] of approximately 6,900 vehicles. As a State Highway, there is no pedestrian traffic. A minimal amount of traffic may be related to agricultural or farming activities in the area; however, it is not assumed to be significant percentage of the total number of vehicle trips in the area. There is limited public transit/bus service within the Town of Dover, though none within the study corridor as shown in Figure 6.3-1

The CVE facility will be accessed via an existing driveway on the west side of NYS Route 22, which will be widened as part of the project improvements. A construction worker parking and materials storage area (Laydown Site) will be located approximately 2.5 miles north of the project site, on the east side of NYS Route 22. The Laydown Site will be accessed by a new, temporary driveway which will be constructed as part of the project. The internal traffic circulations at the Project Development Area and the Laydown Site are shown on Figures 1-6 and 1-10, respectively.

The project will result in a number of additional vehicle trips during construction and a small number of additional vehicle trips during operation. Impacts associated with these additional vehicle trips can be mitigated such that there is little effect on traffic operations in and around the project area. During the peak construction period in 2013, it is estimated that the proposed project will generate 733 trips in each of the morning (a.m.) and afternoon/evening (p.m.) peak hours. The project is anticipated to go into operation in 2015 and will generate 28 trips in each of the a.m. and p.m. peak hours during the first year of operation. The methods used to describe the projected volumes, anticipated impacts associated with these volumes and mitigation measures proposed to reduce these impacts are described in detail in Sections 6.3.4 and 6.3.5.

[2] ADT is the average number of vehicles two-way passing a specific point in a 24-hour period, normally measured throughout a year.

6.3.1 Applicable Laws, Regulations and Policies

Traffic conditions are typically assessed according to potential changes in traffic congestion as measured by the operational service level and safety of key intersections and roadway segments. Level of service (LOS) is a measure of operational conditions within a traffic stream generally in terms of parameters such as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience (Transportation Research Board [TRB], 2000). This concept is described further in Section 6.3.2.5. It is anticipated that a highway work permit will be required for modifications to the existing site driveway at NYS Route 22; details of proposed changes and activities to occur within the state roadway will be reviewed by the New York State Department of Transportation (NYSDOT) for consistency with guidelines such as Policy and Standards for Entrances to State Highways (NYSDOT, 2003) and the New York State Manual of Uniform Traffic Control Devices (NYSDOT, 2007) and to confirm that a significant reduction in LOS of the study area will not result from the change. Local planning review of the project will also consider the extent to which project traffic would affect operational service levels and safety. In addition, CVE will work closely with Town of Dover officials, law enforcement officials, and NYSDOT, particularly during the planning and construction period, to respond to any traffic concerns.

6.3.2 Existing Conditions

6.3.2.1 Key Intersections for Construction and Operation

As shown on Figure 6.3-1, the study area is located along NYS Route 22 in the Town of Dover, New York, and includes 6.4 miles of roadway. The following intersections on NYS Route 22 were analyzed to assess the project's impact on traffic in the vicinity of the proposed facility:

- NYS Route 55
- Pleasant Ridge Road
- Cricket Hill Road
- Dover Furnace Road
- Dover High School driveway
- Duncan Hill Road
- Sherman Hill Road
- Old Route 22
- Cemetery Road
- CVE Project Development Area driveway
- CVE Laydown Site driveway

6.3.2.2 Roadway Characteristics and Use

An inventory of the existing conditions within the study area was performed. Below is a description of relevant segments in the study area:

- NYS Route 22 is a two-lane, undivided roadway with a posted speed limit of 55 miles per hour (mph). It runs north-south along the study corridor and is the primary arterial through the Town of Dover and the study area. The average lane and shoulder widths on NYS Route 22 within the study corridor are 12 feet and 6 feet, respectively. Within the study area, it provides access to residential areas, commercial businesses, and schools, including the Dover Middle/High School complex. This roadway provides the primary access to and egress from the Project Development Area and Laydown Site as well as the approach and departure route to and from the Project Development Area and Laydown Site for workers, deliveries, and police, fire, ambulance, and other emergency vehicles.

- NYS Route 55 is a major two-lane, undivided corridor with a few businesses and an elementary school to the north of Pleasant Ridge Road. It has a posted speed limit of 45 mph and provides access to Fairfield County in the State of Connecticut. This roadway intersects NYS Route 22 at an unsignalized intersection on the southern side of the study area. The average lane and shoulder widths on NYS Route 55 at both intersections are 12 feet and 2 feet, respectively.

- Pleasant Ridge Road is a major two-lane, undivided, east-west road connecting the Town of Dover with the towns of Union Vale and Lagrange. It has a posted speed limit of 30 mph at its intersection with NYS Route 22 and serves both an industrial area and residential communities to the west of NYS Route 22. It intersects NYS Route 22 at a signalized intersection and NYS Route 55 at an unsignalized intersection. The average lane and shoulder widths on Pleasant Ridge Road at its intersection with NYS Route 22 are 12 feet and 2 feet, respectively.

- Cricket Hill Road (County Route 26) is a two-lane, undivided roadway with a posted speed limit of 45 mph. It connects a residential community to NYS Route 22 at a non-signalized T-intersection. The average lane width on Cricket Hill Road at this intersection is 12 feet, and it does not have any shoulder.

- Dover Furnace Road is a two-lane, undivided roadway with a posted speed limit of 30 mph. It provides access to an industrial area and residences to the west of NYS Route 22 and intersects NYS Route 22 at a non-signalized T-intersection. The average lane width on Dover Furnace Road at this intersection is 12 feet, and it does not have any shoulder.

- The Dover High School driveway intersects NYS Route 22 at a signalized T-intersection. The average lane width at the Dover High School driveway at this intersection is 12 feet, and it does not have any shoulder.

- Duncan Hill Road and Sherman Hill Road both have two undivided lanes and operate with 40 mph and 35 mph speed limits, respectively. They provide access to residential communities to the east and west of NYS Route 22, and their intersections with NYS Route 22 are unsignalized. The average lane widths on Duncan Hill Road and Sherman Hill Road at their intersections with NYS Route 22 are 12 feet, and neither road has any shoulders.

- Old Route 22 is an undivided, two-lane road that operates with a posted speed limit of 40 mph. It connects residential, industrial, and commercial communities to NYS Route 22 at an unsignalized T-intersection.

- Cemetery Road is an undivided, two-lane road that operates with a posted speed limit of 30 mph. It intersects NYS Route 22 at an unsignalized T-intersection and provides access to residential neighborhoods.

Based on the windshield survey conducted in the study area, the sight distance at each intersection appeared to be adequate given the speed limits on roadways.

The 2009 Pavement Data Report for New York State Highways (NYSDOT, 2009) was reviewed to assess highway conditions in the study area. Since 1981, a windshield survey has been used by NYSDOT to assign a pavement surface rating (a 1 to 10 rating scale) to describe the severity and extent of pavement surface distress. A rating of 9 – 10 represents excellent roadway conditions, 7 – 8 represents good roadway conditions, and 1 – 5 shows poor roadway conditions. NYS Route 22 in the study area has a rating of 7, which represents good roadway conditions. The report also shows that NYS Route 22 roadway

conditions in the study area include isolated alligator cracks[3] and low-severity widening drop-offs.[4] As a State Highway, NYS Route 22 currently accommodates a variety of vehicles including heavy construction vehicles.

According to NYSDOT highway bridge data (NYSDOT, 2010), there is one bridge on NYS Route 22 in the study area. The National Bridge Inventory structure number for the bridge is 1016720, and it is located 4.4 miles north of the intersection of NYS Route 22 and NYS Route 55. The operating rating of the bridge is 41.7 metric tons (NYSDOT, 2010), which refers to the absolute maximum permissible load level to which the structure may be subjected for the vehicle type used in the rating. It represents the total mass of the entire vehicle measured in metric tons. The NYSDOT bridge condition rating scale ranges from 1 to 7, with 7 being in new condition and a rating of 5 or greater considered as good condition. The last NYSDOT inspection performed for the bridge in 2009 provided it a rating of 5.286. The status of the bridge in the 2009 inspection was noted as "functionally obsolete." "Functionally obsolete" refers to a bridge's inability to meet current standards for managing the traffic volume it carries, not its structural integrity. For example, a bridge may be functionally obsolete if it has narrow lanes, no shoulders, or low clearances.

The review of existing pavement and structural conditions shows that roadways and bridges in the project study area should be adequate for normal traffic and equipment transportation. Any delivery of major components will be coordinated with NYSDOT to alleviate load bearing issues.

6.3.2.3 Accident History

Accident data from 2007 through 2009 were obtained from NYSDOT and are provided in Appendix 6-D. Accident rates and crash types along the study area are summarized in Table 6.3-1.

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[3] Alligator cracking: A series of interconnecting cracks in an asphalt pavement surface forming a pattern that resembles an alligator hide. In its early stages, alligator cracking may be characterized by a single longitudinal crack in the wheel path. The cracks indicate fatigue failure of the surface layer generally caused by repeated traffic loadings.

[4] Widening drop-off occurs when Portland cement concrete slabs are overlaid and widened with asphalt. The asphalt overlay may crack and settle at the edge of the underlying slab and create a vertical displacement.

Table 6.3-1: Accident Summary for NY Route 22 by Type and Year

Location	Location Type	Angle	Collision with an Animal/Object/Ditch	Collision with Pedestrian	Collision with Bicycle	Rear-End	Sideswipe Opposite Direction	Sideswipe Same Direction	Unknown	Total	Fatalities	Injuries
2007												
Cricket Hill Road	Spot					1				1		
NY Route 55	Spot	2	1						1	4		4
Pleasant Ridge Road	Spot	1	1					1		3		
Plymouth Rock Drive	Spot	1	1			1			1	4		2
N. Chippawalla Road	Spot							1		1		
Dover Furnace Road	Spot	1	1				1			3		2
Anderson Road	Spot		1							1		1
E. Duncan Hill Road	Spot		1							1		
367 meters North of Pleasant Ridge Road	Segment – SB		1							1		
530 meters North of Pleasant Ridge Road	Segment – NB		1							1		1
2007 Total	**-**	**5**	**8**	**0**	**0**	**2**	**1**	**2**	**2**	**20**	**0**	**10**
2008												
NY Route 55	Spot	1				1			1	3		3
Pleasant Ridge Road	Spot		1			2			1	4		4
Dover Furnace Road	Spot	1	1			1			1	4		1
E. Duncan Hill Road	Spot								1	1		
Rural Ave	Spot		1				1			2		
Sherman Hill Road	Spot	1								1		
High School Driveway	Spot			1		1			1	3		1
Cricket Hill Road	Spot								1	1		
South of Cricket Hill Road	Segment – SB		1							1		
North of Pleasant Ridge Road	Segment – NB		1							1		
North of Plymouth Rock Drive	Segment – SB		1							1		
North of High School Driveway	Segment – SB		1							1		
574 meters South of N. Chippawalla Road	Segment – NB		1							1		
2008 Total	**-**	**3**	**8**	**1**	**0**	**5**	**1**	**0**	**6**	**24**	**0**	**9**
2009												
Pleasant Ridge Road	Spot	1								1		1
456 meters North of Dover Furnace Road	Segment – SB					1				1		
E. Duncan Hill Road	Spot		1			1				2		1
Cricket Hill Road	Spot					1				1		
NY Route 55	Spot					1				1		
Sherman Hill Road	Spot		1					1		2		
South of Rural Avenue	Segment – SB		1							1		
Rural Avenue	Spot	1								1		
South of High School Driveway	Segment – NB		1							1		
South of Woodside Drive	Segment – SB		1							1		
136 meters South of Dover Furnace Road	Segment – WB								1	1		
Cricket Hill Road	Spot							1		1		
2009 Total	**-**	**2**	**5**	**0**	**0**	**4**	**0**	**2**	**1**	**14**	**0**	**2**
Total	**-**	**10**	**21**	**1**	**0**	**11**	**2**	**4**	**9**	**58**	**0**	**21**

As indicated in Table 6.3-1, the total number of motor vehicle accidents did not change significantly from 2007 through 2009. There was only one pedestrian crash observed, in 2008 near the Dover High School driveway, and there were no bicycle accidents. Figure 6.3-2 shows that, on average, 19 motor vehicle accidents occurred annually within the study area. As illustrated on Figure 6.3-3, "collision with an animal/object/ditch" is the most predominant crash type (mainly a result of collisions with deer). Table 6.3-2 compares accident rates in the study area with statewide accident rates. The annual statewide accident rates for 2007, 2008, and 2009 were requested from NYSDOT but have not been received. Therefore, the comparison was made using the available statewide accident rates on the NYSDOT website.[4] The website reported the accident rates for two time intervals: January 2007 – December 2008, and November 2007 – December 2009. The number of million vehicle miles were estimated by multiplying the study corridor length (6.4 miles), ADT (6,894 vehicles), and number of days in each year (365 days). The average daily traffic for the study corridor was estimated based on the historical average daily traffic counts taken on NYS Route 22. The counts were obtained from the NYSDOT and Poughkeepsie-Dutchess County websites.[5,6] These counts were comparable to 2010 ADT counts derived from the tube counts that were collected on NYS Route 22 for this project. Table 6.3-2 shows that the accident rates for 2007, 2008 and 2009 are lower than the statewide average accident rates.

[4] New York State Statewide Accident Rates:
https://www.nysdot.gov/divisions/operating/osss/highway/accident-rates

[5] New York State Historical ADTs:
https://www.nysdot.gov/divisions/engineering/technical-services/highway-data-services

[6] The Poughkeepsie-Dutchess County Transportation Council Online Traffic Counts Database:
http://www.dutchessny.gov/PlnRoadCnts/Default.aspx

Table 6.3-2: Motor Vehicle Accident Rate Comparison

Reporting Period	NYS Route 22 Within Study Area ADT (Estimated)	NY Route 22 Within Study Area Crash Rate (Accidents/Million Vehicle Miles, Acc/MVM)	Statewide Crash Rate (Accidents/Million Vehicle Miles, Acc/MVM)
January 2007 to December 2008	6,747	2.03	2.11
November 2007 to December 2009	6,845	1.76	2.01

6.3.2.4 School Bus Routes and Schedules

Dover Middle/High School is located between the proposed Laydown Site and the Project Development Area. There are 30 bus routes to the school, which are provided in Appendix 6-D. Traffic counts were collected when the school was in session to capture school traffic, and school bus traffic was included in the baseline traffic volumes. While the traffic impact analysis contained in this section conservatively assumes that peak construction traffic will coincide with peak traffic volume periods, the project will coordinate with school officials to minimize construction worker traffic during peak middle/high school bus arrival/departure times (6:05 a.m. to 7:10 a.m. and 2:00 p.m. to 3:05 p.m.). When the project is operational, project-related traffic will be an insignificant fraction of existing traffic volumes. Therefore, no special scheduling of traffic would be warranted.

6.3.2.5 Traffic Volumes and LOS

6.3.2.5.1 Traffic Volumes

Twenty-four-hour bi-directional volumes and vehicle classification counts were collected on NYS Route 22, 750 feet north of Cricket Hill Road and 750 feet south of NY Route 55 using tube counters. A peak period is a period of the day with highest traffic volume. Typically, there are two peak periods in a day, one occurring in the morning and one in the afternoon. Figure 6.3-4 shows that peak traffic was observed from 6:45 a.m. to 7:45 a.m. and from 4:00 p.m. to 5:00 p.m. on a weekday. Although the peak observed around 2:00 p.m. is comparable with the peak observed from 4:00 p.m. to 5:00 p.m., it only lasts 15 minutes (coinciding with school-related traffic). The volume counts showed that approximately 15

percent of daily traffic occurs during the a.m. and p.m. peak hours. Vehicle classification data indicated that trucks make up 10 percent of the peak-hour traffic.

Tube counts were collected along NYS Route 22 between Tuesday, March 23, 2010 and Monday, March 29, 2010 to understand the variation in traffic along the study corridor. The counts were collected 750 feet north of Cricket Hill Road and 750 feet south of NYS Route 55. There was only one peak period during the weekend. A comparison between weekday and weekend traffic counts showed that the weekday p.m. peak of 573 was higher than the weekend peak of 534. Therefore, weekday peaks were analyzed as the worst-case scenario. To assess the project's impact on peak traffic along NYS Route 22, turning movement counts were collected at the key intersections described in Section 6.3.2.2. The counts were collected from 6:15 a.m. to 8:15 a.m. and from 4:00 p.m. to 6:00 p.m. Figure 6.3-5 shows the existing year (2010) peak-hour volumes at each of these intersections.

6.3.2.5.2 Level of Service

LOS is one of the measures used to assess operational conditions at intersections. The Highway Capacity Manual 2000 (TRB 2000) defines six LOS, designated by the letters A through F. LOS A represents the best operating conditions, and LOS F represents the worst. LOS criteria for signalized and unsignalized intersections are listed in Tables 6.3-3 and 6.3-4, respectively. Following are the qualitative definitions of LOS for roadway links:

Table 6.3-3: LOS Criteria for Signalized Intersections

LOS	***Average Control Delay per Vehicle[7] (seconds)***
A	*• 10*
B	*>10–20*
C	*>20–35*
D	*>35–55*
E	*>55–80*
F	*>80*

Table 6.3-4: LOS Criteria for Unsignalized Intersections

LOS	**Average Control Delay per Vehicle (seconds)**
A	0–10
B	>10–15
C	>15–25
D	>25–35
E	>35–50
F	>50

[7] Average control delay per vehicle is defined as the average delay experienced by a vehicle when it passes through a signal or stop-controlled traffic intersection.

- LOS A describes completely free-flow conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway and driver preferences.

- LOS B also indicates free flow, although the presence of other vehicles becomes noticeable. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver.

- In LOS C, the influence of traffic density on operations becomes marked. The ability to maneuver within the traffic stream is clearly affected by other vehicles. Minor disruptions can cause serious local deterioration in service, and queues will form behind any significant traffic disruption.

- At LOS D, the ability to maneuver is severely restricted as a result of traffic congestion. Travel speed is reduced by the increasing volume. Only minor disruptions can be absorbed without extensive queues forming and service deteriorating.

- LOS E represents operations at or near capacity (an unstable level). Vehicles are operating with the minimum spacing for maintaining uniform flow. Disruptions cannot be dissipated readily, often causing queues to form and service to deteriorate to LOS F

- LOS F represents forced or breakdown flow. It occurs either when vehicles arrive at a rate greater than the rate at which they are discharged or when the forecast demand exceeds the computed capacity of a planned facility. Although operations at these points and on sections immediately downstream appear to be at capacity, queues form behind these breakdowns. Operations within queues are highly unstable, with vehicles experiencing brief periods of movement followed by stoppages. Travel speeds within queues are generally less than 30 mph.

Synchro Plus was used to model and optimize the existing and future traffic conditions on the study corridor. Microsimulation and animation of vehicle traffic was performed using SimTraffic.

Peak-hour traffic analysis results indicated that all intersections in the study area currently operate at LOS C or better during the morning and afternoon peak hours. Tables 6.3-5 and 6.3-6 list the existing LOS, delays, and volume-to-capacity ratios (V/C) at signalized and unsignalized intersections, respectively, during the a.m. and p.m. peak hours. LOS for each movement is provided in Appendix 6-D.

6.3.1 Future Traffic Conditions without the Project (No-Build)

6.3.1.1 Traffic Growth and Other Planned Projects

NY Route 22 is classified by NYSDOT as a rural principal arterial. In 2009, the roadway served approximately 6,894 vehicles per day. Based on historical ADT counts and the Dutchess County travel demand model, an annual growth rate of 1.5 percent is expected in the future throughout the corridor. Although the study area will not be impacted by any planned transportation improvement projects in Dutchess County, proposed developments in the Town of Dover may impact traffic operations in the study area during project construction and operation years. These projects include the Knolls of Dover (apartment, condominium, office, and retail), 22 West Properties (industrial), Plum Hill (industrial), Stony Brook Estates (condominium), Lands of Furnia (single-family residence), and Sherman Hills (single-family residence)[7] developments. However, because no timeline or trip distribution information was available for these projects (except for the Knolls of Dover development), traffic growth associated with the other planned projects was assumed to be included within the 1.5 percent per year background growth rate for the NYS Route 22 corridor. Based on a 2009 traffic impact study by John Collins Engineers, Phase 1 of the Knolls of Dover project will be completed by 2013, and Phase 2 will be completed by 2020. Therefore, Phase 1 of the Knolls of Dover project is the only proposed development explicitly considered in the estimation of future volumes in this study. Figures 6.3-6 and 6.3-7 show projected future volumes in the study area for 2013 (the anticipated peak construction period) and 2015 (the project operations year) without the project.

[7] The Poughkeepsie-Dutchess County Major Project 2008 Report: http://www.co.dutchess.ny.us/CountyGov/Departments/Planning/majorprojectsreportjandec2008.pdf

Table 6.3-5: Existing Year (2010) LOS at Signalized Intersections

Intersection	A.M.													P.M.										
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB	
	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at Pleasant Ridge Road	B	A	8.3	0.16	B	10.4	0..38	B	18.9	0.28	B	16.6	0.15	B	B	11.1	0.51	B	11.7	0.54	C	24.1	0.49	B	18.4	0.22
NY Route 22 at Dover High School Driveway	A	A	5.4	0.36	A	8	0.55	-	-	-	C	26.5	0.48	A	A	3.5	0.34	A	3.4	0.33	-	-	-	C	30.7	0.23

Table 6.3-6: Existing Year (2010) LOS at Unsignalized Intersections

Intersection	A.M.							P.M.						
	Intersection	EB			WB			Intersection	EB			WB		
	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at NY Route 55	-	-	-	-	B	14.8	0.43	-	-	-	-	C	15.0	0.26
NY Route 22 at Cricket Hill Road	-	-	-	-	C	26.5	0.48	-	-	-	-	B	11	0.06
NY Route 22 at Dover Furnace Road	-	B	11.5	0.05	-	-	-	-	B	11.9	0.06	-	-	-
NY Route 22 at Duncan Hill Road	-	A	0	0	B	13.6	0.12	-	B	14.1	0.04	C	15.3	0.14
NY Route 22 at Sherman Hill Road	-	B	10.6	0.02	C	15.9	0.03	-	B	14.2	0.05	C	15.8	0.06
NY Route 22 at Old Route 22	-	-	-	-	B	10.6	0.05	-	-	-	-	B	11	0.08
NY Route 22 at Cemetery Road	-	-	-	-	A	0	0	-	-	-	-	A	0	0

6.3.1.2 Future No-Build Intersection Service Levels

6.3.1.2.1 Construction Year (2013)

There is minimal growth in traffic in the construction year, so all studied intersections still operate at LOS C or better. Tables 6.3-7 through 6.3-10 show LOS, delays, and volume-to-capacity ratios at signalized and unsignalized intersections during the a.m. and p.m. peak hours and compare existing year and construction year conditions.

6.3.1.2.2 Operations Year (2015)

Similar to the construction year, the studied intersections operated at LOS of C or better during the operations year. Tables 6.3-11 through 6.3-14 show LOS, delays, and volume-to-capacity ratios at signalized and unsignalized intersections during the a.m. and p.m. peak hours and compare existing year and operation year conditions.

6.3.2 Construction Traffic Impacts (2013) (Construction)

6.3.2.1 Anticipated Construction Parking and Traffic Characteristics

Facility construction is proposed to start in the second quarter of 2012 and last approximately 36 months. During construction, there will be two types of traffic related to the project: construction workers and equipment/material deliveries. The daily hours of construction and material/equipment truck traffic are planned to be between 7:00 a.m. to 4:00 p.m. and typically from Monday through Friday. Construction workers will be expected to arrive at the Laydown Site at 7:00 a.m. for bus shuttling to the Project Development Area construction site and will be returned to the Laydown Site by 4:00 p.m. Truck traffic for materials/equipment will be dispersed through the construction hours, but no truck traffic will occur outside construction hours except for very limited special deliveries and heavy hauls of large equipment. Construction worker traffic will consist of vehicular trips to and from the Laydown Site and the shuttle buses, which will be used to transport workers from the Laydown Site to the Project Development Area. Equipment/material truck traffic will depend on the phase of the construction and can consist of:

- 25-cubic yard to 35-cubic yard tractor trailer trucks carrying demolition debris or fill/aggregate
- Flat-bed tractor trailers delivering equipment and basic building and process materials (i.e., steel, piping, cabling, etc.)
- Concrete ready-mix trucks for foundations

Table 6.3-7: Construction Year (2013) LOS at Signalized Intersections Without the Project (No-Build) Compared to Existing Year LOS (A.M.)

	Existing Year (2010)													Construction Year (2013) Without the Project (No-Build)										
	A.M.													A.M.										
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at Pleasant Ridge Road	B	A	8.3	0.16	B	10.4	0.38	B	18.9	0.28	B	16.6	0.15	B	A	8.7	0.21	B	11	0.43	C	20.2	0.36	B	16.7	0.17
NY Route 22 at Dover High School Driveway	A	A	5.4	0.36	A	8	0.55	-	-	-	C	26.5	0.48	B	A	6.2	0.42	A	9.8	0.63	-	-	-	C	27.3	0.55

Table 6.3-8: Construction Year (2013) LOS at Signalized Intersections Without the Project (No-Build) Compared to Existing Year LOS (P.M.)

	Existing Year (2010)													Construction Year (2013) Without the Project (No-Build)										
	P.M.													P.M.										
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at Pleasant Ridge Road	B	B	11.1	0.51	B	11.7	0.54	C	24.1	0.49	B	18.4	0.22	B	B	13.2	0.67	B	11.6	0.68	C	28.0	0.65	B	16.9	0.25
NY Route 22 at Dover High School Driveway	A	A	5.4	0.36	A	8	0.55	-	-	-	C	26.5	0.48	A	A	2.5	0.44	A	4.7	0.43	-	-	-	C	24.6	0.28

Table 6.3-9: Construction Year (2013) LOS at Unsignalized Intersections Without the Project (No-Build) Compared to Existing Year LOS (A.M.)

	Existing Year (2010)							Construction Year (2013) Without the Project (No-Build)						
	A.M.							A.M.						
	Intersection	EB			WB			Intersection	EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at NY Route 55	-	-	-	-	B	14.8	0.43	-	-	-	-	C	17.5	0.5
NY Route 22 at Cricket Hill Road	-	-	-	-	C	26.5	0.48	-	-	-	-	B	11	0.17
NY Route 22 at Dover Furnace Road	-	B	11.5	0.05	-	-	-	-	B	12.1	0.06	-	-	-
NY Route 22 at Duncan Hill Road	-	A	0	0	B	13.6	0.12	-	A	0	0	C	15.6	0.17
NY Route 22 at Sherman Hill Road	-	B	10.6	0.02	C	15.9	0.03	-	B	10.8	0.02	C	17.5	0.04
NY Route 22 at Old Route 22	-	-	-	-	B	10.6	0.05	-	-	-	-	B	10.9	0.05
NY Route 22 at Cemetery Road	-	-	-	-	A	0	0	-	-	-	-	A	0	0

Table 6.3-10: Construction Year (2013) LOS at Unsignalized Intersections Without the Project (No-Build) Compared to Existing Year LOS (P.M.)

	Existing Year (2010)							Construction Year (2013) Without the Project (No-Build)						
	P.M.							P.M.						
	Intersection	EB			WB			Intersection	EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at NY Route 55	-	-	-	-	C	15.0	0.26	-	-	-	-	C	20.2	0.39
NY Route 22 at Cricket Hill Road	-	-	-	-	B	11	0.06	-	-	-	-	B	11.9	0.09
NY Route 22 at Dover Furnace Road	-	B	11.9	0.06	-	-	-	-	B	13.8	0.12	-	-	-
NY Route 22 at Duncan Hill Road	-	B	14.1	0.04	C	15.3	0.14	-	C	18.1	0.09	C	19.3	0.21
NY Route 22 at Sherman Hill Road	-	B	14.2	0.05	C	15.8	0.06	-	C	15.9	0.10	C	19.7	0.10
NY Route 22 at Old Route 22	-	-	-	-	B	11	0.08	-	-	-	-	B	11.5	0.08
NY Route 22 at Cemetery Road	-	-	-	-	A	0	0	-	-	-	-	A	0	0

Table 6.3-11: Operation Year (2015) LOS at Signalized Intersections Without the Project (No-Build) Compared to Existing Year LOS (A.M.)

	Existing Year (2010)													Operation Year (2015) Without the Project (No-Build)											
	A.M.													A.M.											
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at Pleasant Ridge Road	B	A	8.3	0.16	B	10.4	0..38	B	18.9	0.28	B	16.6	0.15	B	A	7.7	0.21	B	10	0.44	C	22.3	0.38	B	18.4	0.2
NY Route 22 at Dover High School Driveway	A	A	5.4	0.36	A	8	0.55	-	-	-	C	26.5	0.48	B	A	6.2	0.43	B	10.8	0.67	-	-	-	C	27.5	0.54

Table 6.3-12: Operation Year (2015) LOS at Signalized Intersections Without the Project (No-Build) Compared to Existing Year LOS (P.M.)

	Existing Year (2010)													Operation Year (2015) Without the Project (No-Build)											
	P.M.													P.M.											
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at Pleasant Ridge Road	B	B	11.1	0.51	B	11.7	0.54	C	24.1	0.49	B	18.4	0.22	B	B	13.3	0.70	B	11.9	0.74	C	31.3	0.70	B	17.5	0.29
NY Route 22 at Dover High School Driveway	A	A	5.4	0.36	A	8	0.55	-	-	-	C	26.5	0.48	A	A	2.9	0.48	A	5.0	0.46	-	-	-	C	24.6	0.28

Table 6.3-13: Operation Year (2015) LOS at Unsignalized Intersections Without the Project (No-Build) Compared to Existing Year LOS (A.M.)

	Existing Year (2010)							Operation Year (2015) Without the Project (No-Build)						
	A.M.							A.M.						
	Intersection	EB			WB			Intersection	EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at NY Route 55	-	-	-	-	B	14.8	0.43	-	-	-	-	C	19.5	0.56
NY Route 22 at Cricket Hill Road	-	-	-	-	C	26.5	0.48	-	-	-	-	B	11	0.17
NY Route 22 at Dover Furnace Road	-	B	11.5	0.05	-	-	-	-	B	13	0.11	-	-	-
NY Route 22 at Duncan Hill Road	-	A	0	0	B	13.6	0.12	-	A	0	0	C	15.9	0.19
NY Route 22 at Sherman Hill Road	-	B	10.6	0.02	C	15.9	0.03	-	B	11.1	0.03	C	19.1	0.07
NY Route 22 at Old Route 22	-	-	-	-	B	10.6	0.05	-	-	-	-	B	11.1	0.06
NY Route 22 at Cemetery Road	-	-	-	-	A	0	0	-	-	-	-	A	0	0

Table 6.3-14: Operation Year (2015) LOS at Unsignalized Intersections Without the Project (No-Build) Compared to Existing Year LOS (P.M.)

	Existing Year (2010)							Operation Year (2015) Without the Project (No-Build)						
	P.M.							P.M.						
	Intersection	EB			WB			Intersection	EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at NY Route 55	-	-	-	-	C	15.0	0.26	-	-	-	-	C	23.0	0.45
NY Route 22 at Cricket Hill Road	-	-	-	-	B	11	0.06	-	-	-	-	B	12.3	0.08
NY Route 22 at Dover Furnace Road	-	B	11.9	0.06	-	-	-	-	B	14.6	0.12	-	-	-
NY Route 22 at Duncan Hill Road	-	B	14.1	0.04	C	15.3	0.14	-	C	16.2	0.07	C	22.9	0.27
NY Route 22 at Sherman Hill Road	-	B	14.2	0.05	C	15.8	0.06	-	C	17.5	0.10	C	20.8	0.10
NY Route 22 at Old Route 22	-	-	-	-	B	11	0.08	-	-	-	-	B	11.9	0.09
NY Route 22 at Cemetery Road	-	-	-	-	A	0	0	-	-	-	-	A	0	0

For the purposes of traffic, construction is divided into four phases:

- Phase 1 – Demolition and Grubbing/Clearing
- Phase 2 – Excavation, Underground Utilities, and Major Foundations
- Phase 3 – Erection of Buildings and Equipment and Installation of Piping/Cable/Instruments
- Phase 4 – Construction Completion, Final Commissioning, Testing, and Startup

For each phase, vehicle trips will be generated by the construction workforce, construction equipment, and delivery of facility equipment and materials to the Project Development Area and Laydown Site. The trips generated during each phase of the construction are shown in Appendix 6-D.

The total construction phase is planned to start in April 2012 and will last approximately 36 months. The following are estimated durations for each phase:

- Phase 1 – Construction Months 1 – 4 (4-month duration)
- Phase 2 – Construction Months 5 – 12 (8-month duration)
- Phase 3 – Construction Months 13 – 28.5 (16.5-month duration)
- Phase 4 – Construction Months 29.5 – 36 (7.5-month duration)

The peak construction vehicle period is anticipated to occur during Phase 3 of construction between July 2013 and December 2013. During this period, there may be daily peaks of up to 750 workers traveling to the Laydown Site shortly before 7:00 a.m. and briefly after 4:00 p.m. It is conservatively assumed that workers will commute to the project area in the a.m. peak period and leave the project area in the p.m. peak period and that 20 percent of the workers will carpool to the project area.[8] Therefore, the site-generated trips used in the traffic analysis include carpool trips. All workers will be transported between the Laydown Site and the Project Development Area by shuttle buses. Each shuttle bus will carry approximately 40 workers. Truck trips during construction are estimated to be approximately 18 percent of construction-related traffic. A limited number of heavy hauls for large equipment will occur during the construction activity year of 2013. The source of these trips is explained in Appendix 6-D. Table 6.3-15 shows the different types of site-generated trips used in the peak construction period analysis. Delivery trips include heavy haul and trucks.

[8] The basis for this assumption is explained in Appendix 6-D.

Table 6.3-15: Peak Construction Period Site-Generated Trips (vehicles per hour)

Trip type	A.M.	P.M.	Total
Worker (including carpool)	675	675	1,350
Shuttle bus	38	38	76
Delivery	20	20	40
Total	733	733	1,466

Twenty-four-hour bi-directional traffic volume counts on NY Route 22 showed that 46 percent of traffic traveled in the northbound direction during the a.m. peak period. Based on this information, it is assumed that 45 percent of the construction workers commute to the Laydown Site from south of the Laydown Site, and 55 percent commute from north of the Laydown Site. All generated trips except shuttle bus trips were distributed to the approaches on NYS Route 22 based on the estimated a.m. and p.m. peak-hour background traffic volumes. Shuttle buses were assumed to have one origin and one destination and travel between the Project Development Area and the Laydown Site only. Figures 6.3-8 and 6.3-9, respectively, illustrate the site-generated and total volumes in the study area for 2013.

6.3.2.2 Intersection Service Levels During Construction and Proposed Mitigation

In the peak construction year (2013) with project construction traffic, all intersections will continue to operate at an acceptable LOS except for the Project Development Area driveway, Laydown Site driveway, and Duncan Hill Road intersections with NY Route 22 (see Tables 6.3-16 through 6.3-21).

The eastbound approach of the Project Development Area driveway (i.e., workers leaving) would operate at LOS E in the p.m. peak hour if the intersection is unsignalized. Low LOS indicates that trucks exiting the project site would not have a sufficient gap to make a turn to the northbound or southbound direction. Manually controlling this intersection during the construction activity period (2013) would improve the eastbound approach LOS to C, alleviate any delay in construction peak period traffic, enhance safety, and ensure sufficient time for the safe maneuvering of heavy trucks accessing the site.

Table 6.3-16: Construction Year (2013) LOS at Signalized Intersections With the Project (Build) Without Network Improvements Compared to Construction Year (2013) LOS at Signalized Intersections Without the Project (No-Build) (A.M.)

	Construction Year (2013) Without the Project (No-Build)													Construction Year (2013) With the Project (Build) Without Network Improvements											
	A.M.													A.M.											
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at Pleasant Ridge Road	B	A	8.7	0.21	B	11	0.43	C	20.2	0.36	B	16.7	0.17	B	B	14.1	0.34	B	12.5	0.47	C	23	0.45	B	17.8	0.18
NY Route 22 at Dover High School Driveway	B	A	6.2	0.42	A	9.8	0.63	-	-	-	C	27.3	0.55	B	A	9.3	0.73	B	18.7	0.82	-	-	-	D	53.5	0.77

Table 6.3-17: Construction Year (2013) LOS at Signalized Intersections With the Project (Build) Without Network Improvements Compared to Construction Year (2013) LOS at Signalized Intersections Without the Project (No-Build) (P.M.)

	Construction Year (2013) Without the Project (No-Build)													Construction Year (2013) With the Project (Build) Without Network Improvements											
	P.M.													P.M.											
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at Pleasant Ridge Road	B	B	13.2	0.67	B	11.6	0.68	C	28.0	0.65	B	16.9	0.25	C	A	9.5	0.55	B	19.1	0.87	D	48.7	0.73	C	33.7	0.36
NY Route 22 at Dover High School Driveway	A	A	2.5	0.44	A	4.7	0.43	-	-	-	C	24.6	0.28	A	A	2.9	0.4	A	5.9	0.61	-	-	-	D	42.1	0.26

Table 6.3-18: Construction Year (2013) LOS at Unsignalized Intersections With the Project (Build) Without Network Improvements Compared to Construction Year (2013) LOS at Unsignalized Intersections Without the Project (No-Build) (A.M.)

	Construction Year (2013) Without the Project (No-Build)							Construction Year (2013) With the Project (Build) Without Network Improvements						
	A.M.							A.M.						
	Intersection	EB			WB			Intersection	EB			WB		
Intersection	LOS	LOS	Delay (sec/veh)	V/C	LOS	Delay (sec/veh)	V/C	LOS	LOS	Delay (sec/veh)	V/C	LOS	Delay (sec/veh)	V/C
NY Route 22 at NY Route 55	-	-	-	-	C	17.5	0.5	-	-	-	-	C	21.1	0.57
NY Route 22 at Cricket Hill Road	-	-	-	-	B	11	0.17	-	-	-	-	C	16.4	0.4
NY Route 22 at Dover Furnace Road	-	B	12.1	0.06	-	-	-	-	C	18.1	0.13	-	-	-
NY Route 22 at Duncan Hill Road	-	A	0	0	C	15.6	0.17	-	A	0	0	C	24.2	0.38
NY Route 22 at Sherman Hill Road	-	B	10.8	0.02	C	17.5	0.04	-	B	11.1	0.02	D	30.7	0.08
NY Route 22 at CVE Driveway	-	-	-	-	-	-	-	-	C	23.8	0.15	-	-	-
NY Route 22 at CVE Laydown Site	-	-	-	-	-	-	-	-	-	-	-	F	389.4	0.96
NY Route 22 at Old Route 22	-	-	-	-	B	10.9	0.05	-	-	-	-	B	12.4	0.07
NY Route 22 at Cemetery Road	-	-	-	-	A	0	0	-	-	-	-	A	0	0

Table 6.3-19: Construction Year (2013) LOS at Unsignalized Intersections With the Project (Build) Without Network Improvements Compared to Construction Year (2013) LOS at Unsignalized Intersections Without the Project (No-Build) (P.M.)

	Construction Year (2013) Without the Project (No-Build)							Construction Year (2013) With the Project (Build) Without Network Improvements						
	P.M.							P.M.						
	Intersection	EB			WB			Intersection	EB			WB		
Intersection	LOS	LOS	Delay (sec/veh)	V/C	LOS	Delay (sec/veh)	V/C	LOS	LOS	Delay (sec/veh)	V/C	LOS	Delay (sec/veh)	V/C
NY Route 22 at NY Route 55	-	-	-	-	C	20.2	0.39	-	-	-	-	D	26.9	0.49
NY Route 22 at Cricket Hill Road	-	-	-	-	B	11.9	0.09	-	-	-	-	B	12.2	0.09
NY Route 22 at Dover Furnace Road	-	B	13.8	0.12	-	-	-	-	C	19.9	0.19	-	-	-
NY Route 22 at Duncan Hill Road	-	C	18.1	0.09	C	19.3	0.21	-	D	30.7	0.19	E	36.7	0.38
NY Route 22 at Sherman Hill Road	-	C	15.9	0.10	C	19.7	0.10	-	D	25.6	0.18	D	32.5	0.17
NY Route 22 at CVE Driveway	-	-	-	-	-	-	-	-	E	35.1	0.22	-	-	-
NY Route 22 at CVE Laydown Site	-	-	-	-	-	-	-	-	-	-	-	F	738.9	2.56
NY Route 22 at Old Route 22	-	-	-	-	B	11.5	0.08	-	-	-	-	C	17	0.14
NY Route 22 at Cemetery Road	-	-	-	-	A	0.0	0	-	-	-	-	A	0	0

Table 6.3-20: Construction Year (2013) Intersection LOS With the Project (Build) Without Network Improvements Compared to Construction Year (2013) Intersection LOS With the Project (Build) With Network Improvements (A.M.)

	Construction Year (2013) With the Project (Build) Without Network Improvements													Construction Year (2013) With the Project (Build) With Network Improvements											
	A.M.													A.M.											
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at NY Route 55	-	-	-	-	-	-	-	-	-	-	C	21.1	0.57	-	-	-	-	-	-	-	-	-	-	C	21	0.57
NY Route 22 at Cricket Hill Road	-	-	-	-	-	-	-	-	-	-	C	16.4	0.4	-	-	-	-	-	-	-	-	-	-	C	15.9	0.39
NY Route 22 at Dover Furnace Road	-	-	-	-	-	-	-	C	18.1	0.13	-	-	-	-	-	-		-	-	-	C	18.1	0.13	-	-	-
NY Route 22 at Duncan Hill Road	-	-	-	-	-	-	-	A	0	0	C	24.2	0.38	A	A	2.9	0.55	A	2.1	0.38	A	0	-	D	39.4	0.26
NY Route 22 at Sherman Hill Road	-	-	-	-	-	-	-	B	11.1	0.02	D	30.7	0.08	-	-	-	-	-	-	-	B	11.1	0.02	D	30.7	0.08
NY Route 22 at CVE Driveway	-	-	-	-	-	-	-	C	23.8	0.15	-	-	-	A	A	3.3	0.4	A	2.8	0.3	C	34.9	0.32	-	-	-
NY Route 22 at CVE Laydown Site	-	-	-	-	-	-	-	-	-	-	F	389.4	0.96	C	D	35.1	0.92	B	18.8	0.77	-	-	-	C	33.2	0.15
NY Route 22 at Old Route 22	-	-	-	-	-	-	-	-	-	-	B	12.4	0.07	-	-	-	-	-	-	-	-	-	-	B	12.4	0.07
NY Route 22 at Cemetery Road	-	-	-	-	-	-	-	-	-	-	A	0	0	-	-	-	-	-	-	-	-	-	-	A	0	0
NY Route 22 at Pleasant Ridge Road	B	B	14.1	0.34	B	12.5	0.47	C	23	0.45	B	17.8	0.18	B	B	15.6	0.34	B	17.7	0.47	C	24.2	0.44	B	19.1	0.17
NY Route 22 at Dover High School Driveway	B	A	9.3	0.73	B	18.7	0.82	-	-	-	D	53.5	0.77	B	B	10.5	0.73	B	17.2	0.83	-	-	-	D	51.6	0.72

Table 6.3-21: Construction Year (2013) Intersection LOS With the Project (Build) Without Network Improvements Compared to Construction Year (2013) Intersection LOS With the Project (Build) With Network Improvements (P.M.)

	Construction Year (2013) With the Project (Build) Without Network Improvements													Construction Year (2013) With the Project (Build) With Network Improvements										
	P.M.													P.M.										
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at Pleasant Ridge Road	C	A	9.5	0.55	B	19.1	0.87	D	48.7	0.73	C	33.7	0.36	C	B	10.2	0.57	C	26.6	0.91	D	49.1	0.76	C	29.2	0.33
NY Route 22 at Dover High School Driveway	A	A	2.9	0.4	A	5.9	0.61	-	-	-	D	42.1	0.26	A	A	3.6	0.41	A	2.6	0.62	-	-	-	D	38.9	0.30
NY Route 22 at NY Route 55	-	-	-	-	-	-	-	-	-	-	D	26.9	0.49	-	-	0	-	-	-	-	-	-	-	D	26.9	0.49
NY Route 22 at Cricket Hill Road	-	-	-	-	-	-	-	-	-	-	B	12.2	0.09	-	-	0	-	-	-	-	-	-	-	B	12	0.09
NY Route 22 at Dover Furnace Road	-	-	-	-	-	-	-	C	19.9	0.19	-	-	-	-	-	-	-	-	-	-	C	19.9	0.19	-	-	-
NY Route 22 at Duncan Hill Road	-	-	-	-	-	-	-	D	30.7	0.19	E	36.7	0.38	A	A	2.6	0.41	A	5.8	0.74	C	33.5	0.09	C	34.5	0.23
NY Route 22 at Sherman Hill Road	-	-	-	-	-	-	-	D	25.6	0.18	D	32.5	0.17	-	-	-	-	-	-	-	D	25.6	0.18	D	32.5	0.17
NY Route 22 at CVE Driveway	-	-	-	-	-	-	-	E	35.1	0.22	-	-	-	A	A	3.4	0.38	A	4.4	0.51	C	31.1	0.29	-	-	-
NY Route 22 at CVE Laydown Site	-	-	-	-	-	-	-	-	-	-	F	738.9	2.56	C	B	15.8	0.61	B	17.7	0.58	-	-	-	D	36.2	0.7
NY Route 22 at Old Route 22	-	-	-	-	-	-	-	-	-	-	C	17	0.14	-	-	-	-	-	-	-	-	-	-	C	17	0.14
NY Route 22 at Cemetery Road	-	-	-	-	-	-	-	-	-	-	A	0	0	-	-	-	-	-	-	-	-	-	-	A	0	0

Lower LOS at the Laydown Site driveway and Duncan Hill Road intersections is mainly a result of the increased peak-hour volume along the study corridor from commuting construction workers, shuttles running between Project Development Area and Laydown Site, and deliveries to and from the Project Development Area construction site. Although average intersection delays increased at other intersections compared to the no-build scenario, the increase in traffic is not sufficient to degrade the intersection LOS.

Without any network improvements, the westbound approach at the Laydown Site driveway intersection (i.e., workers leaving) would have a LOS of F in the a.m. period. The average delay per vehicle for the westbound approach would be 389 seconds, indicating that the shuttles exiting the driveway would not have a sufficient gap to make a left turn to the southbound direction. In the p.m. peak hour with the project construction traffic, worker vehicles exiting the Laydown Site would experience a LOS of F with an average delay of 739 seconds per vehicle.

These would be temporary conditions that would occur during the peak period of construction and would be less significant at other times. Nevertheless, to address the LOS issue at the Laydown Site intersection, it is recommended that the Laydown Site intersection be manually (traffic officer) controlled during peak traffic times and that the driveway entrance be widened to two full lanes. Even with these improvements, however, the southbound approach would have a LOS of F in the a.m. peak period, mainly a result of the heavy southbound left-turning movement entering the Laydown Site. Therefore, it is also recommended that a left-turn storage lane of 400 feet be added to the southbound approach. There is sufficient room on the southbound shoulder of NY Route 22 to accommodate a temporary 10-foot-wide passing lane for a distance of 400 feet while cars are waiting to make a left turn into the laydown site (see Figure 6.3-10). The temporary passing lane would be located within the existing NYSDOT right-of-way; thus, no property takings or easements would be necessary. Costs associated with the creation of the temporary lane will be borne by CVE. CVE will consult with NYSDOT personnel and the Town of Dover regarding this proposed temporary use to ensure that there are no adverse impacts to traffic operations or public safety.

With these additional improvements, the LOS for the westbound and southbound approaches at the Laydown Site intersection would be C and B, respectively, in the a.m. peak hour. In the p.m. peak hour, implementation of these recommendations would reduce the westbound approach delay to 36.2 seconds and improve intersection operations to a LOS of D.

Improvements are also recommended at the Duncan Hill Road intersection (either temporary signalization or manual control) to address increased delays in the westbound approach. Controlling this intersection would reduce the westbound approach delay and improve the approach LOS. Without improvements, the westbound approach delay would be 36.7 seconds. Based on the LOS criteria for unsignalized intersections, which are presented in Table 6.3-4, this approach would operate at LOS E. Signalizing the intersection would improve the westbound approach delay to 34.5 seconds and the approach LOS to C, based on Table 6.3-3

6.3.3 Operational Traffic Impacts with the Project (Build)

6.3.3.1 Anticipated Operational Traffic Characteristics

Compared to peak construction year traffic, the project's operational period traffic will experience considerably fewer trips generated. Estimated incoming and outgoing trips for employees, visitors, delivery trucks, and waste disposal trucks total 28 trips per day, based on the trip generation methodology described in Appendix 6-D. Table 6.3-22 presents a breakdown of the trips. Site-generated trips were distributed based on the estimated background traffic volumes in the operation year (2015). Figures 6.3-11 and 6.3-12, respectively, show the site-generated and total traffic volumes at the study corridor intersections in the operation year.

Table 6.3-22: Operation Year (2015) Project Site-Generated Peak-Hour Trips (Vehicles per Hour)

A.M. Peak Hour			P.M. Peak Hour			Trip Type
Total	In	Out	Total	In	Out	
21	17	4	21	4	17	Employees
2	1	1	0	0	0	Visitor/Vendor/Maintenance
1	1	0	1	0	1	Supply Trucks
2	1	1	2	1	1	Parcel Delivery
2	1	1	0	0	0	Aqueous NH_3 Delivery
0	0	0	2	1	1	Demin Trailer Delivery
0	0	0	2	1	1	Waste Disposal
28	21	7	28	7	21	TOTAL

6.3.3.2 Operational Intersection Service Levels

All intersections will operate at an acceptable LOS during the project's operational year (2015). No spillbacks (i.e., sustained queues that back up for a length of a segment) were recorded in the traffic simulation runs. Tables 6.3-23 through 6.3-26 summarize LOS, delays, and volume-to-capacity ratios for signalized and unsignalized intersections at the studied intersections during the a.m. and p.m. peak hours.

6.3.1 Metro-North Rail Usage

A potential option for project commuters during the construction and operation phases would be to utilize the Metro-North Harlem Valley-Wingdale Station. The current Metro-North northbound morning schedule has the earliest arrival into the Harlem Valley-Wingdale Station at 8:01 a.m. and would not support the project's construction start time of 7:00 a.m. Until the Engineering, Procurement and Construction contractor is selected, CVE is unable to project a change in ridership associated with project construction. Once the Engineering, Procurement and Construction contractor is selected and a determination made that ridership on the Metro-North would increase as a result of the project, CVE will pursue discussions with Metro-North regarding additional train service to accommodate construction workers for an arrival time of approximately 6:30 a.m. to 6:40 a.m. at the Harlem Valley-Wingdale Station. Under this scenario, CVE would arrange bus shuttle service to/from the station.

During the project operation phase, employees utilizing Metro-North services would be able to carpool with other employees passing the stations. This would help reduce operational traffic volume and impacts for the project.

6.3.2 Conclusions

Traffic analyses showed that project construction activities would temporarily increase traffic congestion along NYS Route 22 in the Town of Dover, mainly from construction workers commuting to and from the Laydown Site. These temporary conditions, however, improve to acceptable levels by applying enhancements to certain intersections in the study corridor during the construction period. Table 6.3-27 provides recommendations to improve traffic operations during the site construction year (2013). All intersections would operate at an acceptable LOS during the operation year (2015).

Table 6.3-23: Operation Year (2015) LOS at Signalized Intersections With the Project (Build) Compared to Operation Year (2015) LOS at Signalized Intersections Without the Project (No-Build) (A.M.)

	Operation Year (2015) Without the Project (No-Build)													Operation Year (2015) With the Project (Build)											
	A.M.													A.M.											
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at Pleasant Ridge Road	B	A	7.7	0.21	B	10	0.44	C	22.3	0.38	B	18.4	0.2	B	A	8.2	0.21	B	10.9	0.46	C	21.7	0.39	B	17.6	0.19
NY Route 22 at Dover High School Driveway	B	A	6.2	0.43	B	10.8	0.67	-	-	-	C	27.5	0.54	B	A	6.3	0.44	B	11.1	0.68	-	-	-	C	27.5	0.54

Table 6.3-24: Operation Year (2015) LOS at Signalized Intersections With the Project (Build) Compared to Operation Year (2015) LOS at Signalized Intersections Without the Project (No-Build) (P.M.)

	Operation Year (2015) Without the Project (No-Build)													Operation Year (2015) With the Project (Build)											
	P.M.													P.M.											
	Intersection	NB			SB			EB			WB			Intersection	NB			SB			EB			WB		
Intersection	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C	LOS	Delay (sec/ veh)	V/C
NY Route 22 at Pleasant Ridge Road	B	B	13.3	0.70	B	11.9	0.74	C	31.3	0.70	B	17.5	0.29	B	B	12.8	0.66	B	13.8	0.68	C	32	0.66	C	20.4	0.28
NY Route 22 at Dover High School Driveway	A	A	2.9	0.48	A	5.0	.46	-	-	-	C	24.6	0.28	A	A	4.9	0.46	A	4.6	0.43	-	-	-	C	28.7	0.22

Table 6.3-25: Operation Year (2015) LOS at Unsignalized Intersections With the Project (Build) Compared to Operation Year (2015) LOS at Unsignalized Intersections Without the Project (No-Build) (A.M.)

	Operation Year (2015) Without the Project (No-Build)							Operation Year (2015) With the Project (Build)						
	A.M.							A.M.						
	Intersection	EB			WB			Intersection	EB			WB		
Intersection	LOS	LOS	Delay (sec/veh)	V/C	LOS	Delay (sec/veh)	V/C	LOS	LOS	Delay (sec/veh)	V/C	LOS	Delay (sec/veh)	V/C
NY Route 22 at NY Route 55	-	-	-	-	C	19.5	0.56	-	-	-	-	C	19.5	0.56
NY Route 22 at Cricket Hill Road	-	-	-	-	B	11	0.17	-	-	-	-	B	11	0.16
NY Route 22 at Dover Furnace Road	-	B	13	0.11	-	-	-	-	B	13.1	0.11	-	-	-
NY Route 22 at Duncan Hill Road	-	A	0	0	C	15.9	0.19	-	A	0	0	C	15.6	0.16
NY Route 22 at Sherman Hill Road	-	B	11.1	0.03	C	19.1	0.07	-	B	11.3	0.03	C	19.4	0.05
NY Route 22 at CVE Driveway	-	-	-	-	-	-	-	-	C	15.8	0.03	-	-	-
NY Route 22 at CVE Laydown Site	-	-	-	-	B	11.1	0.06	-	-	-	-	B	11.3	0.06
NY Route 22 at Old Route 22	-	-	-	-	A	0	0	-	-	-	-	A	0	0
NY Route 22 at Cemetery Road	-	-	-	-	C	19.5	0.56	-	-	-	-	C	19.5	0.56

Table 6.3-26: Operation Year (2015) LOS at Unsignalized Intersections With the Project (Build) Compared to Operation Year (2015) LOS at Unsignalized Intersections Without the Project (No-Build) (P.M.)

	Operation Year (2015) Without the Project (No-Build)							Operation Year (2015) With the Project (Build)						
	P.M.							P.M.						
	Intersection	EB			WB			Intersection	EB			WB		
Intersection	LOS	LOS	Delay (sec/veh)	V/C	LOS	Delay (sec/veh)	V/C	LOS	LOS	Delay (sec/veh)	V/C	LOS	Delay (sec/veh)	V/C
NY Route 22 at NY Route 55	-	-	-	-	C	23.0	0.45	-	-	-	-	C	23.5	0.46
NY Route 22 at Cricket Hill Road	-	-	-	-	B	12.3	0.08	-	-	-	-	B	12.5	0.09
NY Route 22 at Dover Furnace Road	-	B	14.6	0.12	-	-	-	-	B	13.4	0.1	-	-	-
NY Route 22 at Duncan Hill Road	-	C	16.2	0.07	C	22.9	0.27	-	C	16.4	0.07	C	23.3	0.27
NY Route 22 at Sherman Hill Road	-	C	17.5	0.10	C	20.8	0.10	-	C	17.7	0.1	C	21.1	0.11
NY Route 22 at CVE Driveway	-	-	-	-	-	-	-	-	C	20.2	0.09	-	-	-
NY Route 22 at CVE Laydown Site	-	-	-	-	-	-	-	-	-	-	-	B	12	0.1
NY Route 22 at Old Route 22	-	-	-	-	B	11.9	0.09	-	-	-	-	A	0	0
NY Route 22 at Cemetery Road	-	-	-	-	A	0	0	-	-	-	-	C	23.5	0.46

Table 6.3-27: Recommendations for Site Construction Year

Intersection Location	Critical Approaches	Peak Hours Impacted	Recommended Improvements	Improved LOS
CVE Laydown Site Driveway	Southbound left movement	2013 a.m.	Manual control this intersection during both peak hours. Provide dual entrance and exit lanes on the westbound approach. Provide a 400-foot left-turn pocket on southbound approach.	B
	Westbound approach	2013 a.m. and p.m.		C/D
Duncan Hill Road	Westbound approach	2013 p.m.	Consider installing a temporary signal at this intersection, if feasible, or providing manual control. Traffic should be coordinated with the CVE Laydown Site driveway and high school driveway intersections.	C
CVE Project Development Area Entrance Driveway	Eastbound approach	2013 a.m. and p.m.	To avoid any delay in construction activity and to provide safety and sufficient time for maneuvering of heavy trucks, manual control this intersection.	C/C

6.3.3 References

NYSDOT, 2003. New York State Department of Transportation Policy and Standards for Entrances to State Highways, New York, 2003.

NYSDOT, 2007. New York State Manual of Uniform Traffic Control Devices, New York State Department of Transportation, New York, 2007.

NYSDOT, 2009. 2009 Pavement Data Report for New York State Highways, New York State Department of Transportation Pavement Management Unit, New York, 2009.

NYSDOT, 2010. New York State Bridge Data, New York State Department of Transportation, New York, 2010

TRB, 2000. Highway Capacity Manual 2000, Transportation Research Board, Washington, D.C., 2000.

6.4 Noise

This section characterizes the noise environment surrounding the project site and provides an assessment of the noise impacts of the construction and operation of the project. The noise impact assessment generally follows the procedures and information developed by NYSDEC (2000) and United States Environmental Protection Agency (USEPA) (1978).

To document the existing environmental sound levels and to assist in defining appropriate acoustic design goals for the project, CVE retained Cavanaugh Tocci Associates, Inc. to evaluate the acoustic environment in the community surrounding the project site (Cavanaugh Tocci Associates, 2010). This evaluation includes a review of applicable noise regulations, the results of an extensive sound monitoring program, and the results of computer modeling of the acoustic impact of the proposed project's construction and operational phases.

The objectives of this sound study evaluation were:

- To quantify and characterize the existing sound environment in the community surrounding the project.
- To define project acoustic design goals based upon the existing acoustic environment and applicable noise regulations.
- To estimate the acoustic impact of construction and operation of the proposed project in the surrounding community.

Appendix 6-E includes a glossary of acoustical terminology and the results of continuous sound measurements.

6.4.1 Applicable Laws, Regulations and Policies

Noise is a feature of all environments and is considered objectionable only when it is inconsistent with its environment; by being either too loud or by being distinctive in character (i.e., tonally or temporally varying). The purpose of environmental noise regulations is to provide a logical and equitable relationship between facility noise and existing environmental sound. To this end, acoustic design goals for the project have been established based on state guidelines and local noise regulations that are protective of the

community sound environment. The NYSDEC guidelines and Town of Dover regulations applicable to sound produced by the project are summarized below.

6.4.1.1 NYSDEC Noise Policy

NYSDEC issued a Program Policy Memorandum entitled "Assessing and Mitigating Noise Impacts" (October 6, 2000 revised February 2, 2001) to provide guidance for departmental evaluation of noise impacts from proposed or existing facilities. The memorandum provides guidance in determining when facility sound constitutes a significant impact in the following statements:

- "The goal for any permitted operation should be to minimize increases in sound pressure level above ambient levels at the chosen point of sound reception. Increases ranging from 0-3 dB[A][8] should have no appreciable effect on receptors. Increases from 3-6 dB[A] may have potential for adverse noise impact only in cases where the most sensitive of receptors are present. Sound pressure [level] increases of more than 6 dB[A] may require a closer analysis of impact potential depending on existing SPL's[9] and the character of surrounding land use and receptors."

- "In non-industrial settings the SPL should probably not exceed ambient noise by more than 6 dB(A) at the receptor. An increase of 6 dB(A) may cause complaints. There may be occasions where an increase of 6 dB(A) might be acceptable."

[8] The modifier "A" should be included here as it is customary to evaluate environmental sound levels using the A-weighted scale dB(A), that is, A-weighted decibels. The human ear is most sensitive to sound in the 500 Hz to 5,000 Hz frequency range. Above and below this range, the ear becomes progressively less sensitive. To account for this feature of human hearing, sound level meters filter acoustic signals to correspond to the varying sensitivity of the human ear to sound at different frequencies. This filtering is called A weighting. Sound level measurements that are obtained using this filtering are referred to as A-weighted sound levels and are signified by the identifier, dBA. A-weighted sound levels are widely used for evaluating human exposure to environmental sounds.

[9] SPL's – Sound pressure levels

- "The addition of any noise source, in a non-industrial setting should not raise the ambient noise level above a maximum of 65 dB(A). This would be considered the "upper end" limit since 65 dB(A) allows for undisturbed speech at a distance of three feet."

- "Ambient noise SPLs in industrial or commercial areas may exceed 65 dB(A) with a high end of approximately 79 dB(A) (EPA 550/9-79-100, November 1978)."

The guidance also indicates that the appropriate metric to evaluate existing and project-related ambient sound is the equivalent sound level (L_{eq}) as stated below:

- "Equivalent Sound Level is considered to be directly related to the effects of sound on people since it expresses the equivalent magnitude of the sound as a function of frequency of occurrence and time."

- "The L_{eq} value provides an indication of the effects of sound on people. It is also useful in establishing the ambient sound levels at a potential source."

6.4.1.2 Town of Dover Noise Regulations

The Code of the Town of Dover defines limits with respect to environmental sound associated with the proposed project in two separate chapters:

- Chapter 107 – Noise

- Chapter 145 – Zoning - Section 145-40(C)

Relevant aspects of the Code are listed below.

Chapter 107 defines the following general standard as unlawful:

> *The creation of any unreasonably loud, disturbing and unnecessary noise is prohibited. Said noise shall be prohibited when it is of such character, intensity and duration or of any type or volume that a reasonable person would not tolerate under the circumstances and that is detrimental to the life, health or welfare of any individual or would cause or create a risk of public inconvenience, annoyance or alarm.*

Chapter 107(B)(5) also prohibits construction noise between the hours of 9 p.m. and 7 a.m. except in case of an urgent necessity in the interest of public safety.

Chapter 145-40(C)(2) defines the following property-line sound level limits:

- 60 dB(A) between the hours of 7:00 a.m. and 8:00 p.m.
- 50 dB(A) between the hours 8:00 p.m. and 7:00 a.m.

Chapter 145-40(C)(4) provides exemptions from the aforementioned lot line sound limits including:

- Noises emanating from construction and maintenance activities between 8:00 a.m. and sunset, Monday through Friday.
- The noises of safety signals, warning devices, emergency pressure-relief valves or other emergency warning signals.

6.4.2 Existing Area Sound Levels

An environmental sound survey (Appendix 6-E) was conducted to quantify and characterize the existing acoustic environment in the vicinity of the proposed project. In order to document the time-varying characteristics of environmental sounds in the project area, the sound monitoring program implemented both long-term continuous sound measurements, and short-term intermittent sound measurements. The results of the survey allow both quantitative and qualitative analyses of the acoustical environment surrounding the project.

6.4.2.1 Sound Monitoring Locations

A review of the existing land use in the community was conducted to identify the closest and most representative receptor locations. In addition, the measurement locations were selected to obtain an adequate spatial representation of the ambient noise environment. Five measurement locations were selected. These locations are identified in Figure 6.4-1, and are described below.

- Location 1: The former Green Acres Conference Center (approximately 2,900 feet northwest of the center of the main power block of the proposed project). This location represents the nearest noise-sensitive receptor to the northwest of the Project Development Area.

- Location 2: The ConEd right of way near #3 Vincent Road (approximately 2,100 feet north of the center of the main power block of the proposed project). This location conservatively represents residences and the Dover High School/Middle School complex further to the north.

- Location 3: Residence at the address of #7 Cricket Hill Road (approximately 1,200 feet northeast of the center of the main power block of the proposed project). This location represents the closest residence to the Project Development Area.

- Location 4: East property line across the street from #2238 NYS Route 22 (approximately 1,000 feet southeast of the center of the main power block of the proposed project). This location represents commercial uses along NYS Route 22 as well as residential areas further east.

- Location 5: North Chippawalla Road (approximately 3,000 feet south of the center of the main power block of the proposed project). This location represents areas to the south of the Project Development Area.

6.4.2.2 Continuous Monitoring

To identify typical patterns in environmental sound levels, and to quantify time-varying ambient sound levels in the community, continuous monitoring was performed at all five sound monitoring locations. The continuous monitors were installed for a seven-day period (168 hours) starting at 2:00 p.m. on September 16, 2009.

For the continuous measurements, sound levels were monitored using Rion NL 31 environmental noise monitors outfitted with ½-inch electret microphones, and windscreens. The instruments were calibrated before and after the measurement period using a Larson Davis Instruments model CA-250 acoustical calibrator. The monitors, microphones, and signal processing conform to American National Standards Institute (ANSI) S1.4 for Type 1 precision sound measurement instrumentation, and all instruments used have current calibration certificates traceable to the National Institute of

Standards and Technology (NIST). For this study, the monitors were programmed to record the following hourly A-weighted environmental noise descriptors:

- Maximum sound level (L_{max});
- Minimum sound level (L_{min});
- Percentile sound levels (L_{99}, L_{90}, L_{50}, L_{10}, and L_{01}); and
- Equivalent sound level (L_{eq}).

Figures 6.4-2 through 6.4-6 present graphs of the measured hourly L_{eq} sound levels at each of the five measurement locations. Since the hourly L_{eq} sound levels also vary from hour to hour, these figures also include the "nominally lowest" hourly L_{eq} sound level. The "nominally lowest" hourly L_{eq} sound level is calculated by averaging the lowest measured hourly equivalent sound level ($L_{eq(1\text{-}hour)}$) that occurred in each of the seven 24-hour periods that were monitored. This value represents a conservative estimate of the typical lowest hourly L_{eq} sound levels that occur during the quietest periods. A complete listing of all hourly measurement results at each monitoring location can be found in Appendix B of the Baseline Sound Study attached as Appendix 6-E.

6.4.2.3 Intermittent Monitoring

Intermittent sound measurements were performed for 10-minute intervals at all five selected measurement locations to provide additional noise information, including the frequency distribution of sound levels into octave bands. The measurements were conducted during daytime hours (1:30 p.m. to 3:30 p.m.) on September 16, 2009, and early morning hours (12:00 midnight to 2:00 a.m.) on September 17, 2009. The measurements were conducted with a Bruel and Kjaer Instruments Type 2250 sound level analyzer outfitted with a ½-inch electret microphone and windscreen. The instrument was calibrated before and after each use with a Bruel and Kjaer Instruments Type 4231 acoustical calibrator. During all measurements, the meter was mounted on a tripod with the microphone situated approximately 5 feet above the ground. These instruments conform to ANSI S1.4 for Type 1 precision sound measurement instrumentation and have current calibration certificates traceable to the NIST.

The data collected during the attended 10-minute monitoring intervals is compiled in Appendix C within the Baseline Sound Study attached as Appendix 6-E. The data presentation format has three chief elements. The first is a listing of A-weighted descriptors on the upper left hand side of each figure. Note that the statistical descriptors (L_n) are presented in order of decreasing value. Logically, the L_{max} is the highest sound level reached during the 10-minute interval; the L_{01} is the next highest since it is

exceeded only 1 percent of the time interval, and so forth. The L_{eq} is shown shaded, as this value is the key descriptor used in evaluating ambient sound levels.

The second element in these figures is a 1/3-octave band spectrum of the L_{eq} sound pressure level. This spectrum is used to identify the presence of distinct tonal characteristics and to quantify the frequency content associated with the background sounds.

The third element at the bottom of these figures is a graphic level record, or time-history, of the A-weighted sound level in 1-second increments recorded over the 10-minute interval. The "peaks" in the time-history identify transient events associated with passing cars, aircraft activity, etc.

6.4.2.4 Weather Conditions During Sound Measurements

During the majority of the continuous monitoring the weather was suitable for measuring environmental sounds (i.e., no precipitation and light winds). Our review of hourly meteorological data obtained from the National Weather Service monitoring station at the Poughkeepsie-Dutchess County Airport indicates that that rain occurred for a brief period at approximately 12:00 noon on September 17, 2009 and that elevated wind gusts occurred during the afternoon of September 18, 2009. These short intervals of inclement weather have little or no impact on the statistical analysis of environmental sound for this study.

6.4.2.5 Sound Measurement Survey Results

Table 6.4-1 provides a summary of the results of the environmental sound survey. Ambient sound in the community is dominated by traffic on NY Route 22 and local roads. Hourly equivalent sound levels typically follow a diurnal pattern, with the lowest levels occurring in the early morning hours when traffic is at a minimum. Regular train activity on the rail line west of the Project Development Area also contributes high-level transient sounds. Finally, noises produced by birds, insects, and wind blowing through foliage and over tall grasses are sources of background sound at all locations in the project vicinity. These indigenous sounds depend on many factors including weather and time of year.

Table 6.4-1: Summary of Measured Environmental Sound Levels (dB(A))

Measurement Location	Long Term	Intermittent Measurements	
	9/16 – 9/23 Nominally Lowest Hourly L_{eq}	Daytime 13:30 – 15:30 9/16/09 $L_{eq\text{-}10min}$	Nighttime 00:00 – 2:00 9/16/09 $L_{eq\text{-}10min}$
Location 1 – Green Acres Conf. Center	36	46	42
Location 2 – ConEd ROW near 3 Vincent Road	41	53	44
Location 3 – #7 Cricket Hill Road	40	55	49
Location 4 – 2238 NYS Route 22	51	59	45
Location 5 – North Chippawalla Road	48	56	53

6.4.2.6 Facility Acoustic Design Goal

Table 6.4-1 includes a column labeled "Facility Acoustic Design Goal." In accordance with the NYSDEC Program Policy Memorandum, facility noise will not be expected to produce a significant impact if it does not raise existing sound levels by more than 6 dB(A). To this end the project has conservatively chosen the "nominally lowest" measured hourly L_{eq} as the basis for impact assessment with respect to the NYSDEC Program Policy Memorandum. In order to limit sound level increases to 6 dB(A) or less, facility sound levels will need to be controlled to no more than 5 dB(A) above the measured "nominally lowest" hourly L_{eq}. In addition, to comply with the Town of Dover noise regulations, facility sound at property lines must not exceed the most stringent nighttime sound level limit of 50 dB(A).

6.4.3 Predicted Project Noise Impacts

6.4.3.1 Acoustic Modeling Methodology

Project-related sound impacts will be associated with sound emissions from many individual project-related sound sources. To evaluate the acoustic impact of the proposed project, environmental sound modeling was conducted for each individual sound source at the proposed project. These impacts were then combined to produce an estimate of cumulative environmental sound levels produced by the project. The acoustic modeling requires information on equipment sound emission characteristics, the location of the source relative to the receiver, and information on how the noise may propagate from the source to the receiver. Estimates of operational sound levels produced by the

project were calculated using CadnaA environmental sound modeling software (Version 3.7.123 DataKustic GmbH). The CadnaA sound modeling software uses algorithms and procedures described in International Standard ISO 9613-2:1996 "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation." The methodology described in this standard provides estimates of A-weighted sound levels for meteorological conditions that are favorable for the propagation of sound (downwind with a wind speed of 1 – 5 m/s). This methodology is also valid for sound propagation under well-developed moderate ground-based temperature inversions, which commonly occur on clear, calm nights.

Receptor sound levels for all significant project related sound sources were calculated using the following data and corrections:

- Source sound power level (in octave bands);
- Source directivity;
- Distance between source and receptor (geometric divergence);
- Atmospheric absorption (10 degrees Celsius and 70 percent relative humidity);
- Reflections from building and barrier structures;
- Screening by obstacles (from earth contours and or man-made structures); and
- Propagation over the ground (ground effect).

6.4.3.2 Construction Noise

6.4.3.2.1 Construction Sound Sources

Construction of the project will occur over approximately a 36-month period. The construction phases will include overlapping activities for initial site clearing/demolition/preparation, major foundations, steel and building erections, equipment delivery and sitting, piping and electrical installation, and commissioning and startup. The following is a high level sequence of these activities:

- Installation of construction stormwater and erosion control measures; demolition and removal of existing structures; clearing, potential minimal blasting, and rough grading; and construction of office trailers, utilities, and parking (site clearing and excavation).

- Installation of major foundations and underground utilities including yard piping and electrical duct banks (excavation and foundations).

- Erection of structural steel and buildings; and the delivery and setting of major equipment (erection).

- Installation of interconnection piping and wiring, balance of plant equipment, controls and instrumentation, and final grading (erection).

- Testing, commissioning, and startup of the systems, final road tops, landscaping, and complete facility (finishing).

6.4.3.2.2 Construction Sound Estimates

Construction noise is highly variable because many construction machines operate intermittently, and the types of machines in use at a construction site change with the construction phase. Appendix D within the Baseline Sound Study attached as Appendix 6-E provides a list of common construction equipment, and typical maximum sound levels produced by this equipment.

The USEPA has published data on noise produced by typical construction machinery (USEPA, NTID300.1, December 31, 1971). The USEPA document also includes a procedure for predicting energy-average (that is, L_{eq}) construction noise levels based upon typical construction practices in the United States. The model distinguishes between type of construction ("housing," "office building," "industrial," and "public works") and between construction phase ("site clearing", "excavation," "foundations," "erection" and "finishing"). The model is based upon:

- The number of each item of equipment typically present at a site in each given phase of construction;

- The operating duty cycles of this equipment; and

- The average noise levels from the equipment during operation.

The USEPA procedure for estimating construction noise impacts provides typical equivalent levels (L_{eq}) at a distance of 50 feet from the noise source for two conditions: "all pertinent equipment present at site," and "minimum required equipment present at site." The USEPA levels for the worst of these two conditions during construction of industrial facilities are listed in Table 6.4-2 (row labeled, "USEPA Model @ 50 feet"). Since specific information on types, quantities, and operating schedules of construction equipment is not available at this point in project development, information from the USEPA document has been used to estimate sound produced by construction for each

construction phase at each of the five receptor locations. To estimate construction related sound levels at distant receptors, 50-foot sound levels have been reduced using standard divergence attenuation based on receptor distance to the approximate center of the Project Site. This estimate is conservative since the only attenuating mechanism considered was divergence. Shielding effects from buildings and earth contours, and atmospheric absorption are not included in the calculations.

Table 6.4-2 also presents estimates of L_{eq} sound levels at each of the five selected receptor locations. These estimates are those that would be experienced by people outdoors. Sound levels indoors would be reduced by 10 – 15 dB(A) (open windows) and 20-30 dB(A) (closed windows). Noise associated with project construction will occasionally be noticeable at the nearest receptor properties, particularly during the "excavation" phase of construction which may include; rock splitting, blasting, and pile driving. Construction-related sound at the more distant residential properties is expected to be consistent with typical daytime background sounds, and will have only minimal impacts. Because of the temporary nature of the construction noise, no adverse long-term effects are anticipated.

Table 6.4-2: Estimates of Project Construction Sound Levels dB(A)) at Selected Receptors

Location	Construction Phase				
	Ground Clearing	**Excavation**	**Foundations**	**Erection**	**Finishing**
USEPA Model @ 50 Feet	84	89	78	85	89
Location 1 Green Acres Conf. Center	49	54	43	50	54
Location 2 ROW near 3 Vincent Road	52	57	46	53	57
Location 3 7 Cricket Hill Road	56	61	50	57	61
Location 4 2238 SR-22	58	63	52	59	63
Location 5 North Chippawalla Road	49	54	43	50	54

6.4.3.2.3 Special Construction Events (Blasting and Steam Blows)

As indicated above, during the site preparation phase of construction, controlled use of explosives to fracture and excavate rock (blasting) may occur. Sound produced by this activity would be very intermittent and would be controlled by using blast mats and minimizing charge size. If required, controlled blasting would only occur during daylight hours, when background sounds are significantly higher. Sounds produced by the controlled blasts are not expected to be disruptive at any of the nearby occupied properties. As discussed in Section 2.3.2, CVE will implement a detailed safety plan and a comprehensive public outreach plan should blasting be required. The public outreach plan will detail the approach to communicating blasting plans to the surrounding community and emergency officials

Prior to initial steam turbine powering, steam blows are use to clear debris and surface scale from steam piping that could potentially damage steam turbine blades. The sound generated during this process can be significant if it is not properly controlled. Mitigation for this sound will include the use of temporary steam blow silencers which be selected to limit sound impacts to less than 70 dB(A) at the nearest residences. This process is brief in duration, typically lasting 2 – 3 minutes per blow. Approximately 30 – 50 blows are required to clean the lines, which occurs over a 2 – 3 week period. This type of event will be limited to weekday daytime hours only and will be communicated to the public via a comprehensive public outreach plan.

6.4.3.2.4 Construction Vehicular Traffic Noise

Noise produced by traffic associated with the construction of the project will have a negligible impact in the surrounding community. This is because of the high volume of traffic that already exists on roads where construction related traffic is expected to occur (e.g., NYS Route 22).

6.4.3.2.5 Construction Sound Mitigation Measures

The Project will meet the NYSDEC and Town of Dover noise policies during the construction period. Construction noise is difficult to control because of the mobile nature of its sources, and the flexibility of schedule inherent in most construction work. However, construction is also temporary in nature. In order to mitigate the possible effect of noise caused during the temporary construction period, the following steps will be taken:

- Construction activity will be concentrated to a limited on-site area at significant distances from receptor properties.

- Construction producing significant noise levels will be limited to daylight hours, to the extent possible. Some limited activities, such as concrete pours, will be required to occur continuously until completion for the benefit of public safety (i.e., concrete and structural integrity). During daytime hours, background sound in the surrounding area increases significantly due to traffic activity on NYS Route 22. For the most part, at nearby residences, sound produced by construction activities is expected to be masked by or consistent with traffic related sounds.

- Federal regulations limiting truck noise will be followed.

- The construction equipment manufacturers' sound muffling devices will be used, and will be kept in good repair throughout the construction process.

6.4.3.3 Operational Noise

6.4.3.3.1 Facility Sound Sources

Principal sources of environmental sound produced by the power plant are listed below and detailed in Figure 6 and 7 of Appendix E contained within the Baseline Sound Study & Environmental Sound Evaluation attached as Appendix 6-E:

- Air cooled condensers (3 units - 16 cells/unit)
- Fin-fan coolers (3 units - 15 cells/unit)
- Combustion turbine exhausts through the HRSG stacks (3 stacks)
- Combustion turbine air inlets (3 air inlets)
- Turbine compartment ventilation fans (3 roof penetrations)
- Exhaust compartment ventilation fans (3 roof penetrations)
- Transformers (3 combustion turbine generators, 3 steam turbine generators, 3 auxiliary)
- Power generation building structures which includes:
    - Combustion turbine/generator primary enclosure (3 units)
    - Steam turbine and generator (3 units)
    - Heat recovery steam generators (3 HRSGs)
    - Boiler feed pumps
    - Building ventilation

6.4.3.3.2 Facility Sound Mitigation Measures

The design and engineering of specific sound control features will be completed during the detailed design phase of the project. However, for sound level modeling, the following noise abatement options were incorporated into the project's conceptual design:

- Low noise air cooled condensers with a maximum sound level of 51 dB(A) at a distance of 400 feet from the edge of a single tower (16 cells).
- Low-noise fin-fan coolers with a maximum sound level of 45 dB(A) at a distance of 400 feet from the edge of a single unit (15 cells).
- Depending on the sound attenuating characteristics of the HRSG system, a duct silencer may be required in the exhaust outlet duct or stack. A maximum sound level of 42 dB(A) at a distance of 400 feet perpendicular to a single stack has been assumed.
- The combustion turbine air intake will require duct silencers. A maximum sound level of 40 dB(A) at a distance of 400 feet perpendicular to a single inlet has been assumed.
- Reduced noise transformers with a National Electrical Manufacturers Association (NEMA) ST-20 sound rating of 70 dB(A) or less.
- The combustion turbines, steam turbines, and generators will be enclosed with vendor-supplied equipment to reduce equipment noise within the power generation building. Duct silencers will be required to mitigate sound produced by turbine compartment and exhaust compartment ventilation fans.

The combustion turbines, HRSGs, steam turbines, generators, boiler-feed pumps, and other auxiliary equipment will be housed within various building structures. Sound transmitted through the walls and roofs of these buildings is based on average interior sound levels of 85 dB(A). The walls and roofs of the buildings will be constructed of 2-inch thick insulated metal panels with 22-gauge sheet metal on the interior and exterior sides. To account for penetrations of the panels for ventilation, the analysis assumed that 10 percent of all building surfaces are acoustic louvers and de-rated the acoustic performance of the building façades of approximately a Sound Transmission Class (STC) 25 rating. In addition, all building ventilation equipment (louvers, and exhaust fans), and entryways will be carefully oriented, and/or acoustically treated to meet project acoustic design goals.

6.4.3.3.3 Facility Operational Sound Estimates

Figure 6.4-7 presents an aerial photograph of the project area and includes isopleths of estimated sound levels produced by the project. Table 6.4-3 provides a summary of the results of computer modeling of project-related sound at various sensitive receptors surrounding the site.

Table 6.4-3: Estimates of Project Operational Sound Levels (dB(A)) at Selected Receptors

Location	Existing Background	Estimate of Facility Operating Sound Level	Background plus Facility	Increase above Existing Background
Receptor 1 – Green Acres Conf Ctr.	36	37	40	4
Receptor 2 – 3 Vincent Road	41	33	42	1
Receptor 3 – 7 Cricket Hill Road	40	45	46	6
Receptor 4 – 2238 NYS Route 22	51	45	52	1
Receptor 5 – North Chippawalla Rd	48	32	48	0

As demonstrated by the isopleths on Figure 6.4-7 and Table 6.4.3, the project's operational sound levels attenuate to below existing ambient levels over a relatively short distance from the Project Development Area. The predicted sound levels increase 6 dB(A) or less above the nominally lowest hourly L_{eq} at all acoustically sensitive receptors surrounding the project. Sound level impacts further to the north (Dover High School/Middle School complex) and east (residences along Cricket Hill Road) will be less than those shown in Table 6.4-3 and generally imperceptible at distances beyond the coverage of the receptors analyzed. Thus, the project is not expected to produce a significant acoustic impact at these nearest receptors and, therefore, is consistent with the levels established in the NYSDEC guidelines.

Once the facility is fully operational, CVE will measure the actual project operational sound levels at the selected residents and property lines. These measurements and associated report will be conducted by a third party licensed acoustical engineer in accordance with industry practices and any applicable state and local regulatory requirements.

Figures 9 through 13 in the Baseline Sound Study and Environmental Sound Evaluation (Appendix 6-E)) includes plots of octave band estimates of project-related sound at the

five selected receptors. These data indicate that facility sound is devoid of prominent discrete tones, and will be consistent with existing background sounds in the community.

The Town of Dover zoning ordinance defines sound limits at project property lines, therefore the maximum project-related sound levels at each of the nearest property lines have also been estimated and are listed below:

- North property line: 48 dB(A)
- East property line: 48 dB(A)
- South property line: 58 dB(A) (at the proposed property line)
- West property line: 59 dB(A)

Despite the incorporation of state-of-the-art design and engineering components to mitigate facility sound, there are locations along two property lines where noise mitigation measures will not mitigate so as to be totally compliant with the performance standards set forth in Section 145-40. While the project is expected to comply with the most restrictive night time sound level limit (50 dB(A)) of the Town of Dover Zoning Code at the north and east property lines, the west property line abutting the Metro-North rail line and the southern proposed property line abutting other industrial zoned property are expected to be non-compliant (> 50 dB(A)). However, these properties are not occupied by noise-sensitive uses. To the contrary, the non-compliant property lines abut a railroad track and a proposed industrial facility.

CVE proposes to address this non-compliance by petitioning the Town Board to amend the Town of Dover Zoning Code (Section 145-40) so as to permit the anticipated noise levels. To ensure that sensitive noise receptors (i.e., residences) are not adversely affected, this amendment would apply only where a proposed industrial use abuts other properties zoned Industrial. Such amendment, permitting no sound level to exceed 60 dB(A) between the hours of 8:00 p.m. and 7:00 a.m. — only where abutting an manufacturing/industrial zoning district — recognizes the legislative intention of permitting certain property to be used for industrial uses while not negatively affecting community character and residential uses. A minor legislative amendment to the Code could be accomplished via the italicized text below:

SECTION 145-40(C)

(2) No person, firm or corporation shall allow the emission of sound which, as measured at the property lines, has a sound level in excess of:

(a) Sixty decibels on the A-weighted scale between the hours of 7:00 a.m. and 8:00 p.m.; and

(b) Fifty decibels on the A-weighted scale between the hours of 8:00 p.m. and 7:00 a.m., *unless the property line is abutting an "M" zoning district in which case no sound level shall exceed sixty decibels on the A-weighted scale between the hours of 8:00 p.m. and 7:00 a.m.*

6.4.4 Conclusions

CVE has carefully considered noise impacts to the surrounding community in developing the project layout and in the selection of facility components and orientation. As such, the project is not expected to produce a significant noise impact and will be consistent with the levels established in NYSDEC and local noise guidelines.

To demonstrate compliance with NYSDEC noise guidelines and the local Town of Dover Zoning Code, CVE conducted a sound evaluation study to quantify and characterize the existing acoustic environment in the vicinity of the proposed project. Results of the noise modeling for project construction activities indicates that noise will occasionally be noticeable at the nearest residential properties, particularly during the excavation phase of construction. Construction-related sound at the more distant residential properties is expected to be consistent with typical daytime background sounds, and will have only minimal impacts. Because of the temporary nature of the construction noise, no adverse long-term effects are anticipated.

Results of the noise modeling for project operation indicate that the project will comply with applicable NYSDEC guidelines at all of the five measurement locations analyzed. The project is not expected to produce a significant acoustic impact at these nearest residences.

While the project is expected to comply with the most restrictive night time sound level limit of the Town of Dover Zoning Code at the north and east property lines, the west property line abutting the Metro-North rail line and the southern proposed property line abutting other industrially zoned property are expected to be non-compliant. However, these properties

are not occupied by noise-sensitive uses. CVE is requesting a minor amendment to the Town of Dover Zoning Code so as to permit the anticipated noise levels without negatively impacting community character and residential uses.

6.4.5 References

Cavanaugh Tocci Associates, 2010. Cricket Valley Energy Center Baseline Sound Study & Environmental Sound Evaluation. June 10, 2010.

NYSDEC, 2000. Assessing and Mitigating Noise Impacts. October 6, 2000. Revised February 2, 2001.

USEPA, 1971. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, USEPA Document NTID300.1, December 1971

USEPA, 1978. Office of Noise Abatement and Control, Protective Noise Levels. USEPA Report No. 550/9-79-100.

6.5 Electric and Magnetic Fields

This section assesses changes to electric and magnetic fields (EMF) that would be expected to occur along the electrical lines to be constructed to connect the project's electrical output with the ConEd 345 kV electric transmission lines located immediately north of the project site.

Electric and magnetic fields are found in nature, where they are created by such things as lightning and static electricity. They are found almost everywhere. For example, the earth's natural magnetic field makes compasses point North. Manmade fields are found wherever people use electricity, such as near powerlines and electrical appliances. Both electric and magnetic fields are present around wires and appliances. The movement of any electrical current through a wire, whether an overhead transmission line, wiring in homes or electrical appliances, will create EMF.

An electric field is produced by voltage, which is a measure of the electric "pressure" used to push electricity through a wire, similar to the pressure of water as it is pushed through a pipe. As the voltage increases, the electric field increases in strength. An electric field's strength decreases with the distance from the source. Electrical field strength is measured in terms of the voltage existing between two points which are 1 meter apart, and expressed as volts per meter (V/m) or kilovolts per meter (kV/m). The electric field can be shielded

(reduction of strength) by any conducting surface; such as trees, fences, walls, buildings, and structures.

Table 6.5-1 provides typical electric field strengths measured near household appliances at a distance of one foot.

Table 6.5-1: Typical Household Appliances Electric Field Strengths

Electric appliance	Electric field strength (V/m) At distance of 1 foot
Stereo receiver	180
Iron	120
Refrigerator	120
Mixer	100
Toaster	80
Hair dryer	80
Color TV	60
Coffee machine	60
Light Bulb	5

Reference: World Health Organization (www.who.int)

A magnetic field is produced by the flow of current (the number of charges moving through a wire per unit of time), therefore, the stronger the current, the greater the magnetic field. Similar to electric fields, magnetic field strength decreases with the distance from the source. Magnetic fields are measured in units of Gauss (G) or milliGauss (mG).

Table 6.5-2 provides typical magnetic field strengths measured near household appliances at a distance of one foot and two feet.

Table 6.5-2: Typical Household Appliances Magnetic Field Strengths

Electric appliance	Magnetic field strength (mG) At distance of 1 foot	Magnetic field strength (mG) At distance of 2 feet
Hair Dryers	ND – 70	ND – 10
Electric Face Shavers	ND – 100	ND – 10
Window A/Cs	ND – 20	ND – 6
Color TVs	ND – 20	ND – 8
Dishwashers	6 – 30	2 – 7
Microwave Ovens	1 – 200	1 – 30
Washing Machines	1 – 30	ND – 6
Vacuum Cleaners	20 – 200	4 – 50

Notes:

1) ND = Non-Detectable
2) Reference: EMFRAPID Program June 2002

6.5.1 Applicable Laws, Regulations and Policies

There are no federal standards limiting residential or occupational exposure to EMF. However, the NYS PSC has established interim standards to be applied at the edge of rights-of-way for high voltage electric transmission lines. The interim standard was implemented by the PSC to avoid unnecessary increases in existing level of EMF exposure.

The NYS PSC applicable electric field strength standards are stated in Opinion No. 78-13 (issued June 19, 1978). It established an interim electric field strength standard of 1.6 kV/m for electric transmission lines at the edge of the right-of-way, with the line at the rated voltage, one meter (approximately 3.28 feet) above ground level.

The PSC has also set forth magnetic field standards under the PSC's Interim Policy Statement on Magnetic Fields, issued on September 11, 1990. This policy sets up an interim magnetic field strength standard of 200 mG, measured at one meter above grade, at the edge of the right-of-way and at the point of lowest conductor sag (e.g., Mid Span).

As described below, the project will not create edge-of-right-of-way EMF levels above the limits set forth by the PSC.

6.5.2 Proposed Electrical Connection

The project's electrical output will be connected to the ConEd 345 kV transmission line via two new 345 kV interconnection lines, to be located entirely within the project site and adjacent ConEd right-of-way. The existing ConEd transmission line will be "looped-in" on one new interconnection line and "looped-out" on the other.

The two electrical interconnection lines will each consist of five steel transmission poles, as shown on Figure 1-6. A single 2156 aluminum steel reinforced "Bluebird" conductor per phase, with 9/16", #7 shield wire, will be strung along the poles. An approximate 275-foot clearing, or right-of-way, will accommodate the two lines, which will be separated by a minimum 94 feet or 125 feet, depending on the pole's height and configuration. The edge of the right-of-way will be approximately 75 feet from the center of the tower structure. Typical elevation views of the typical transmission structures and a summary of the heights and configurations are provided in Appendix 6-F.

6.5.3 Anticipated Field Effects

The post-construction EMF levels for the CVE 345 kV interconnection transmission lines were calculated using PLS-CADD, Version 9 Software Program. The software is developed by Power Line, Inc., Madison, Wisconsin, and is capable of performing overhead transmission line EMF calculations. These calculations are based on the methodology described in Chapter 8 of the Electric Power Research Institute Red Book, 2008.

The PLS-CADD software calculates the lateral profile of electric field level along the interconnection transmission lines. In addition, the PLS-CADD software calculates the lateral profiles for magnetic field levels along the interconnection transmission lines. To facilitate the investigation, the calculations were developed along a profile that was oriented to be at right angles to the proposed transmission lines. Inputs into the PLS-CADD software were:

- Physical location and geometry of the transmission line towers, power conductors, and overhead ground wires.
- Technical specifications of the overhead conductors and ground wires.
- Transmission line operating voltages and currents.
- Transmission line phasing orientation of the overhead conductors.

A detailed analysis of the EMF field strengths anticipated to be experienced at a distance of 200 feet from the center of each structure/pole (within and outside the interconnection line's right-of-way) is provided in Appendix 6-F.

Tables 6.5-3 and 6.5-4 provide a summary of the maximum electric and magnetic field strengths along the path of the right-of-way when one interconnecting transmission line is de-energized and the other line is carrying full power plant electrical output.

Table 6.5-3: Summary of Right-of-Way Maximum Electric and Magnetic Field Strengths (Line No. 1 at Full Output and Line No. 2 De-Energized)

	CVEC Transmission Line No. 1 (West Line)		
	Distance from Transmission Line Centerline	**Maximum Electric Field Strength (kV/m)**	**Maximum Magnetic Field Strength (mG)**
Outside Right-of-Way (West of Line)	-200 ft	0.268	12.195
	-100 ft	0.905	39.612
	-75 ft	1.313	59.539
Edge of ROW at -75ft			
Inside Right-of-Way (East of Line)	-50 ft	1.793	92.064
	-20 ft	1.668	141.532
	-10 ft	1.252	152.980
	Centerline (0 ft)	0.804	157.929
	10 ft	1.080	155.294
	20 ft	1.200	145.579
	50 ft	0.919	98.814
	75 ft	0.748	63.083
	100 ft	0.631	42.260
	200 ft	0.283	13.522

Table 6.5-4: Summary of Right-of-Way Maximum Electric and Magnetic Field Strengths (Line No. 2 at Full Output and Line No. 1 De-Energized)

	CVEC Transmission Line No. 2 (East Line)		
	Distance from Transmission Line Centerline	**Maximum Electric Field Strength (kV/m)**	**Maximum Magnetic Field Strength (mG)**
Inside Right-of-Way (West of Line)	-200 ft	0.268	154.992
	-100 ft	0.905	42.320
	-75 ft	1.313	62.699
	-50 ft	1.793	95.748
	-20 ft	1.668	144.809
	-10 ft	1.252	155.264
	Centerline (0 ft)	0.804	158.810
	10 ft	1.080	154.720
	20 ft	1.200	143.864
	50 ft	0.919	94.047
Edge of ROW at 75ft			
Outside Right-of-Way (East of Line)	75 ft	0.748	60.470
	100 ft	0.631	39.895
	200 ft	0.283	152.959

6.5.4 Conclusions

The project's electrical interconnection will occur entirely within project and ConEd property. The project's electrical interconnection right-of-way is restricted and buffered from public access by approximately 300 feet of trees and vegetation. Nonetheless, the maximum field strengths were calculated at edge of the outer right-of-way, approximate 75 feet from the centerline of the structure, and compared to the PSC interim standards.

A comparison of the maximum electric and magnetic field strengths predicted to occur is provided in Table 6.5-5.

Table 6.5-5: Calculated Edge-of-Right-of-Way Maximum Field Strengths

	Electric Field (kV/m)	Magnetic Field (mG)
NYS PSC Standard	1.6	200
Maximum Edge of Right-of-Way Levels (East / West)	0.75 / 1.31	153.0 / 59.5

The maximum electric and magnetic field strengths calculated at the edge of the right-of-way are well below the PSC interim standards. Thus, anticipated impacts associated with EMF relating to the project are insignificant.

6.5.5 References

State of New York Public Service Commission, "Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities"; Issued September 11, 1990.

State of New York Public Service Commission - Transmission Lines, Opinion No. 78-13, Issued June 19, 1978.

6.6 Cultural Resources

This section addresses the potential for project impact to historic or archaeological resources, based on consultation with NYS OPRHP.

6.6.1 Applicable Laws, Regulations and Policies

Section 106 of the Natural Historic Preservation Act of 1966 affects construction in areas of cultural significance. The federal legislation requires that any federal action (including granting of permits) with the potential to impact cultural resources listed in or eligible for listing in the National Register of Historic Places be reviewed by the Advisory Council on Historic Preservation. OPRHP is the agency delegated to implement this federal review process in New York State, both on its own behalf and to recommend actions to the Advisory Council. This office is also the state agency responsible for the coordination of New York State's Historic Preservation Programs. The project has, therefore, consulted with OPRHP to determine whether any such potential impact is likely to occur.

6.6.2 Agency Consultation

In order to determine the need for additional investigation and review for archaeological resource potential, an investigation of existing known resources was undertaken as well as consultation with OPRHP. A review of the OPRHP website found no historic resources are identified in the vicinity of the Project Development Area. In addition, the Project Development Area has been substantially disturbed by previous industrial activities. However, the Property and associated Laydown Site are both entirely within areas identified as "archaeologically sensitive" (as shown in Figure 6.6-1). With this in mind, early consultation with OPRHP was undertaken to determine the need for additional investigation.

CVE submitted general correspondence to OPRHP on June 2, 2009 identifying the Property location and requesting a file review to determine the presence of archaeological or cultural resources. After telephone conversations with OPRHP identifying the need to better understand the particular regulatory framework under which the request was made, revised correspondence from CVE was submitted on August 13, 2009. In addition to identifying the project location, the letter provided a brief description of the proposed project and its anticipated regulatory review requirements. Details regarding the existing structures located on the Project Development Area, including photographs, were provided as well.

Based on this information, in a letter dated September 3, 2009, OPRHP requested additional information upon which to base its determination of effect/impact. Specifically, OPRHP requested mapping to show existing and proposed site condition to support an understanding of where project activities were proposed.

CVE submitted a letter to OPRHP on September 15, 2009 that confirmed no project activities are proposed west of the Metro-North railroad track, and provided a preliminary grading plan for the proposed project. The preliminary grading plan was shown with an overlay of the existing on-site buildings highlighted in order to clearly illustrate the proposed work location relative to the areas of existing disturbance.

Following review of this additional information, on September 25, 2009, OPRHP issued an opinion that the project will have "No Effect" upon cultural resources in or eligible for inclusion in the National Register of Historic Places. This letter addressed both archaeological and historic structures, but specifically did not include review with respect to New York State parklands, noting potential impacts to such resources should be addressed pursuant to the SEQRA process (or the National Environmental Policy Act, as

may apply).

Copies of all agency correspondence are provided in Appendix 6-G.

The potential for visual impact to historic resources is addressed in Section 6.2. As noted in that section, no listed historic structures are located within 5 miles of the Project Development Area. The potential locations from which the project could be viewed have been identified, and an evaluation of the anticipated change in view has been completed. No existing or eligible historic resources are anticipated to be affected by views of the proposed facility.

6.6.3 Laydown Site

On July 22, 2010, an OPRHP opinion was also sought for the Laydown Site. Because the area is in active agricultural use, no structures are located on the Laydown Site and the soil surface is routinely disturbed through plowing and planting. Soils at the site, which are classified as prime farmland, will be temporarily removed and stockpiled. Subsoils at the site are gravelly in nature, and suitable for use for equipment laydown and parking. This temporary use will continue for approximately 30 – 36 months, after which time the stockpiled soils will be returned, and the Laydown Site's agricultural use will continue. No adverse impact to historic or archaeological resources is anticipated through the temporary use of the Laydown Site.

On August, 16, 2010, OPRHP responded with a request for a Phase 1A Archaeological Survey to be conducted for the Laydown Site. A Phase 1A Literature Review and Sensitivity Analysis was prepared by CITY/SCAPE Cultural Resource Consultants in December, 2010. The results of the Phase 1A survey indicated a low potential for the presence of historic cultural resources at the Laydown Site, but a moderate to high potential for the presence of prehistoric cultural resources. As a result, CITY/SCAPE recommended that a Phase 1B field reconnaissance survey be undertaken at the identified Area of Potential Effect (APE) which comprised all of the approximately 30-acre Laydown Site. The field reconnaissance survey was initiated in mid-December, 2010. Survey crews were able to complete 217, or about one-half of the total number of planned test pits, before snow and cold weather suspended further work. No prehistoric material has been found in any of the shovel tests to date. Work will resume at the site as soon as the weather permits. In the interim, CVE has made the commitment that no work will be undertaken at the Laydown Site until the Phase 1B field work is complete and until the project has received all of its permits and approvals. In a letter to OPRHP on January 31, 2011, CITY/SCAPE provided a status of the Phase 1B survey and opined that it is not likely that

any finds made at the site would preclude development of the Laydown Site. In a letter dated February 11, 2011, OPRHP concluded that the project is unlikely to have an adverse impact on cultural resources, provided that CVE complete the Phase 1B survey at the Laydown Site prior to commencing construction. Correspondence with OPRHP regarding the Laydown Site, along with the Phase 1A Report and Phase 1B Interim Report is provided in Appendix 6-G.

6.6.4 Unanticipated Discoveries Plan

Although the Project Development Area has been determined to have a low potential for archaeological significance, and results of the interim results of the Phase 1B survey at the Laydown Site indicate that adverse impact to historical resources is unlikely, it is prudent to have plans in place in the event of an unanticipated discovery of archaeological resources during the course of project construction. In the unexpected event that resources of cultural, historic or archaeological importance are encountered in the excavation process, procedures outlined in the Unanticipated Discovery Plan (UDP) presented in Appendix 6-G will be activated.

Consistent with the UDP, construction related work in the vicinity of any discovery will cease upon encountering possible archaeological or human remains. OPRHP and the New York State Police, if appropriate, will be notified. The methodology used to assess any such discoveries will follow the most recent *Standards for Cultural Resource Investigations and Curation of Archaeological Collections in New York State* (New York Archaeological Council, 1994). Such an assessment will be conducted by a professional archaeologist meeting qualifications standards of the New York Archaeological Council and the National Parks Service (36 CFR 61).

In the event that significant cultural resources are identified, CVE would identify potential measures to avoid or minimize adverse effects to those resources. The OPRHP coordinator will be consulted throughout the investigation, as outlined in the UDP and the Town of Dover and NYSDEC will be informed of the status and results of the investigations.

6.6.5 Conclusions

CVE has minimized the potential for adverse impacts to cultural resources by utilizing a previously disturbed site, largely within the footprint of a previously developed area. OPRHP has determined that there will be “No Effect” to cultural resources at the Project Development Area and that impact to cultural resources at the Laydown Site are unlikely, based on its review of the potential for impacts to historic or archaeological resources.

Additional documentation will be provided to OPRHP regarding the Phase 1B survey results for the Laydown Site, once the weather allows for the completion of the field survey. CVE has developed a UDP (see Appendix 6-G) that establishes procedures to follow in the unanticipated event that a cultural resource is discovered during project construction. CVE has also committed that it will perform no work at the Laydown Site until the Phase 1B survey is complete, although OPRHP concurs that adverse impact to cultural resources is unlikely. CVE will provide OPRHP with an update of the findings upon completion of the Phase 1B survey once the weather becomes more favorable.

6.6.6 References

The New York Archaeological Council, 1994. Standards for Cultural Resource Investigations and Curation of Archaeological Collections in New York State.

6.7 Socioeconomics

This section assesses the direct and indirect socioeconomic benefits associated with construction and operation of the proposed project. Project development and construction will require an estimated investment of approximately $955 million, which will provide a significant benefit to the local, regional, and state economies. In the short-term, it is expected that an average of 300 construction jobs will be created during the three-year construction of the project, with up to 750 jobs during the five-month peak construction period. Once completed, operation of the facility will support approximately 28 well-paying permanent jobs in Dover. The investment in the plant, during both construction and operation, will also result in significant secondary economic benefits. As payments to suppliers and worker wages are spent and recirculated in the area economy, additional jobs, income and revenue will be created in a variety of industries, such as lodging, eating and drinking establishments, retail stores, wholesalers, and service providers. Project construction is estimated to generate and induce creation of 2,202 full-time equivalent (FTE) jobs, including 751 secondary jobs. Upon completion, the project will create 56 FTE jobs, including 26 secondary jobs. The project will also provide a long-term revenue source for the Town of Dover, Dutchess County and the Dover Union Free School District through an anticipated Payment in Lieu of Taxes (PILOT) agreement.

6.7.1 Applicable Laws, Regulations and Policies

There are no applicable laws or regulations directly associated with the socioeconomic impacts of the project. Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations” requires federal permitting

agencies to consider disproportionate adverse impacts on minority and low-income populations. As confirmed through the EIS scoping process, there are no designated environmental justice communities located proximate to the project site. However, the project has been carefully designed such that no element of the surrounding community or region would experience significant long-term effects associated with its operations.

6.7.2 Existing Conditions

6.7.2.1 Demographics – Population, Housing, Workforce

In order to provide an understanding of the site's socioeconomic context, basic demographic information for New York State, Dutchess County, and the Town of Dover are presented below. Table 6.7-1 provides selected population and employment data from the 2000 Census.

Table 6.7-1: Population, Employment and Income (2000)

	Population	Median Household Income	Civilian Workforce	Poverty Rate	Unemployment Rate
New York State	18,976,457	$43,393	9,023,096	14.60%	7.1%
Dutchess County	280,150	$53,086	138,723	7.50%	5.7%
Dover	8,565	$50,361	4,139	8.40%	3.8%

Source: Census 2000

The Census Bureau also provides periodic updates and estimates for certain demographic information. Table 6.7-2 illustrates population and household estimates from 2008 and 2009 for New York State and Dutchess County. The Census does not provide updates for geographies as small as the Town of Dover. According to the Census Bureau, Dutchess County has grown by approximately five percent since the last census, reaching a total population of approximately 293,562 in 2009. This exceeded the rate of overall growth for the state. Dover's population, as reported in 2000, is approximately 8,565.

Table 6.7-2: Population, Employment and Income (2008-2010)

	Population (2000)	Population (2009)	Population % Change	Poverty Rate (2008)	Median HH Income (2008)	Unemployment Rate (6/10)*
New York	18,976,457	19,541,453	3.0%	13.7%	$55,980	8.2%
Dutchess County	280,150	293,562	4.8%	8.7%	$68,752	7.4%

Source: US Census Bureau.

*New York State Department of Labor, Local Area Unemployment Statistics Program

Median household income for Dutchess County was reported to be $68,752 in 2008, which significantly exceeds the New York State median. Dutchess County also has fewer individuals below the poverty line (9 percent), and a lower unemployment rate than New York State. The 2000 data indicate that while Town of Dover income levels exceeded the New York State median, they were lower than the Dutchess County median. The Town of Dover poverty rate was also somewhat higher than Dutchess County's.

The 2000 Census reported a civilian labor force of approximately 138,723 people in Dutchess County, while the Town of Dover had a labor force of approximately 4,139. Based on employment levels, the major industries within Dutchess County are: education, health and social services; manufacturing; retail trade; and professional and management services. The major industries for Dover are: education, health and social services; manufacturing; retail trade; and construction.

Current New York State and Dutchess County unemployment rates are worse than when reported for the 2000 Census, with both witnessing a relatively dramatic jump in the period after 2008. This coincides with the recession and continued challenging economic conditions. Dutchess County's June 2010 unemployment rate stood at 7.4 percent, while the New York State figure was 8.2 percent. Current labor data are not available at the town level; however, it is assumed that the Town of Dover has experienced a similar increase in unemployment.

Table 6.7-3 presents general housing information reported in the 2000 Census for New York State, Dutchess County and the Town of Dover. In 2000, Dutchess County had more than 6,500 vacant units and a vacancy rate of 6.2 percent. Excluding those units used for seasonal or recreational use, the vacancy rate would be closer to 3.9 percent. The Town of Dover had approximately 232 vacant units, yielding a vacancy rate of approximately 7.1 percent. Excluding seasonal units, the vacancy rate would be approximately 4.4 percent.

Table 6.7-3: Housing - 2000

	Housing Units	Vacant Units	Vacancy Rate	Vacant Units (excluding seasonal)	Vacancy Rate (excluding seasonal)
New York	7,679,307	622,447	8.1%	387,404	5.0%
Dutchess	106,103	6,567	6.2%	4,157	3.9%
Dover	3,266	232	7.1%	143	4.4%

Source: Census 2000

The American Community Survey (ACS) provides periodic population, demographic and housing unit estimates for larger geographies. As reported in the 2008 ACS, excluding seasonal units, Dutchess County's vacancy rate was estimated to be approximately 6.1 percent. Dutchess County also performs annual rental housing surveys. As reported in the 2009 Dutchess County Rental Housing report, multifamily rental complexes in Dutchess County had an estimated vacancy rate of 3.3 percent in 2009, down somewhat from the 2008 estimate of 4.2 percent.

6.7.2.2 Property Tax

The Property consists of four tax parcels (Grid Nos. 7060-00-493989, 7061-00-465190, 7061-00-580190 and 7061-00-585063). Together, they have a combined assessed value of $792,100. Property in Dover is assessed at 47 percent of full value.

Table 6.7-4: Assessed Value – Existing Conditions

Parcel	Assessed Value
7060-00-493989	$26,400
7061-00-465190	$16,200
7061-00-580190	$729,500
7061-00-585063	$20,000
Total	**$792,100**

Source: Dutchess County Real Property Tax Service Agency, Parcel Access. Final Roll – July 1, 2010.

According to the Town of Dover Assessor's Office, property-based taxes applicable to the Property include the Town of Dover property tax, school district tax, fire district tax, and library tax. In addition, Dutchess County also collects property tax revenues. Table 6.7-5 illustrates the division of property-based taxes among the various taxing districts.

Table 6.7-5: Property Tax Rates - 2010

District	Tax Rate per $1,000 Assessed Value	Total Jurisdiction Tax Levy
County	$6.75	$100,811,575
Town	$5.15	$1,911,825
Dover Union Free School District	$36.08	$12,931,017
Fire District	$1.57	$606,256
Library	$0.61	$225,176

Source: Dutchess County Real Property Tax Service Agency, 2010 County/Town Tax Rates

The existing property tax generation from these lots is detailed in the table below. The School District receives approximately $28,500 annually, which is the largest proportion of the tax revenue (approximately 72 percent of the overall total.) Dutchess County receives approximately $5,300 (approximately 13 percent) and the Town of Dover receives approximately $4,000 (approximately 10 percent) annually. The special districts (fire and library) receive relatively small amounts of property tax from the Property.

Table 6.7-6: Current Annual Tax Generation from the Property

District	Tax Rate per $1,000 Assessed Value	Assessed Value	Current Tax Generation from the Property
County	$6.75	$792,100	$5,347
Town	$5.15	$792,100	$4,079
Dover Union Free School District	$36.08	$792,100	$28,579
Fire District	$1.57	$792,100	$1,244
Library	$0.61	$792,100	$483
Total	$50.16	$792,100	$39,732

6.7.3 Potential Impacts

6.7.3.1 Economic Effects of Project Construction

6.7.3.1.1 Direct Employment

Construction of the project is anticipated to occur over a three-year period. It is expected that development of the project would support approximately 300 construction jobs on average. During the peak construction period, on-site construction employment is expected to increase to approximately 750 workers. Table 6.7-7 illustrates the anticipated construction jobs, by discipline, expected to be employed on average, as well as during the peak construction period.

Table 6.7-7: Anticipated Construction Workforce by Discipline

Discipline or Trade	Number of Workers	
	Peak	Quarterly Average
Site Management/Engineers	54	22
Boilermakers	56	23
Carpenters/Millwrights	137	55
Laborers	76	30
Painters	7	2
Pipefitters/Steamfitters	177	71
Electricians	165	66
Operating Engineers	62	25
Iron/Steel Workers	3	2
Insulators	7	2
Cement Masons/Finishers	6	2
Total	**750**	**300**

Table 6.7-8 illustrates, on a semi-annual basis, the estimated construction manpower necessary during the construction period. It is expected that the construction activity and labor force will peak during the second half of the second year of construction.

Table 6.7-8: Estimated Construction Period Workforce

Month	1-6	7-12	13-18	19-24	25-30	31-36
Estimated Workforce	50	150	350	750	350	150

The total construction payroll, excluding benefits, is estimated to be approximately $142.3 million. Estimated payroll expenditures for each year of the project are summarized in Tables 6.7-9 and 6.7-10.

Table 6.7-9: Estimated Annual Construction Payroll

	Year 1	Year 2	Year 3	Total
Man-Hours	229,303	1,240,320	614,949	2,084,571
Total Payroll	$15,582,171	$83,669,486	$43,020,343	$142,272,000

Table 6.7-10: Estimated Payroll Subtotals by Discipline

Discipline or Trade	Year 1	Year 2	Year 3	Total
Site Management/Engineers	$1,121,916	$6,024,203	$3,097,465	$10,243,584
Boilermakers	$1,184,245	$6,358,881	$3,269,546	$10,812,672
Carpenters/Millwrights	$2,867,119	$15,395,185	$7,915,743	$26,178,048
Laborers	$1,558,217	$8,366,949	$4,302,034	$14,227,200
Painters	$124,657	$669,356	$344,163	$1,138,176
Pipefitters/Steamfitters	$3,677,392	$19,745,999	$10,152,801	$33,576,192
Electricians	$3,428,078	$18,407,287	$9,464,475	$31,299,840
Operating Engineers	$1,308,902	$7,028,237	$3,613,709	$11,950,848
Iron/Steel Workers	$62,329	$334,678	$172,081	$569,088
Insulators	$124,657	$669,356	$344,163	$1,138,176
Cement Masons/Finishers	$124,657	$669,356	$344,163	$1,138,176
Total Payroll	$15,582,171	$83,669,486	$43,020,343	$142,272,000

Non-payroll direct expenditures (e.g., services, rentals) made locally during the construction period are anticipated to be limited to services such as transportation of workers, security, catering, and cleaning. These expenditures are currently estimated to be approximately $2.7 million annually.

6.7.3.1.2 Secondary Economic Impact

Table 6.7-7 presents the estimated construction manpower during the construction period. It is expected that the project would require approximately 750 full-time equivalent (FTE) employees during the peak construction months, and approximately 300 FTE employees on average. Construction is expected to be completed within a 36-month timeframe. It is anticipated that much of the required construction labor force for the project would be met with the available trades' workforce in Dutchess County. According to the U.S. Census data for 2007, approximately 5,700 construction trade workers reside within Dutchess County (U.S. Census Bureau, 2007). As of July 2010, data from the New York State Department of Labor indicates that there are approximately 3,900 construction workers actively seeking employment in Dutchess County (New York State Department of Labor, 2010a). The unemployment rate in Dutchess County was 7.2 percent in April 2010 (New York State Department of Labor, 2010b).

The total construction payroll for the project is anticipated to be approximately $142.3 million (see Table 6.7-9). This estimate is based on the anticipated construction trades required to support project construction. Construction payroll, excluding benefits but with overtime included, was calculated at an average of $65 per hour based on CVE's experience in building these types of projects.

Study Methodology

To assess the direct and indirect socioeconomic benefits associated with construction and operation of the proposed project an input-output (I/O) methodology employing IMPLAN software (Minnesota IMPLAN Group, 2009) developed by the U.S. Government and the University of Minnesota was used to determine the economic and fiscal impacts of the project on the Dutchess County economy. The IMPLAN model was chosen because of its ability to construct a model using data from Dutchess County while maintaining detail on impacts for hundreds of industrial sectors. In addition to being widely used in regional economic analysis, the model and its methodology have been extensively reviewed in the professional and academic literature.

Input-output models, such as IMPLAN software, map the linkages of inter-industry purchases and economic output within a given county, region, state or country. In essence, the model estimates the total impact of a project on regional output, earnings, and employment. These models use the inputs of a given economy, derived from Bureau of Labor Statistics data for all industries, to produce a dollar of output for a specified industry. The model also factors how much of the required inputs can be supplied locally from within the study area.

In addition to the direct spending required to produce a dollar amount of a given product or service, economic impacts occur as a result of "indirect" purchases that businesses, organizations, and government make using the revenue gained from the initial direct spending. This is often referred to as "indirect spending." "Induced spending" includes the purchases made by individuals and households within the study area as a result of the income (wages) they receive from the direct and indirect economic activity in the region. Input-output models yield "multipliers" that are used to calculate the total direct, indirect, and induced effect on jobs, income and output resulting from a dollar of spending on goods and services in the study area.

Impacts were modeled for Dutchess County for both the construction and operating phases of the project. Substantial additional impacts will also occur beyond the Dutchess County economy as a result of the manufacture and purchase of industrial equipment (i.e., gas and steam turbines) used for the generation of power, the manufacture of construction machinery, and as the result of other business revenues or wage and salary income earned as a result of the project. While some of this economic activity is anticipated to occur in the Hudson Valley region and elsewhere in New York State, without a greater level of certainty on sources of supply, this additional activity was not included in the model.

Direct and Secondary Economic Impacts Due to Project Construction

In analyzing the project's direct impact on Dutchess County and New York State, it is estimated that approximately $126.6 million of the $955 million total facility project construction and development expenditures will occur in the Dutchess County region (Table 6.7-11). This was calculated by deducting $828.4 million from the $955 million cost of construction, which accounts for the cost of specialized equipment and machinery used in the generation of power (i.e., gas and steam turbines), as well as project financing, pieces of the engineering, design, development costs, and other project costs. In order to be conservative, it is assumed that the majority of these expenditures will not be captured by businesses in Dutchess County. Some portion of these, however, may well benefit the New York State economy. For example, GE Energy, with operations in Schenectady, is expected to supply three steam turbines at an estimated cost of approximately $90 million. However, without a greater level of certainty, these benefits have been excluded from the assessment of project impacts to ensure conservative results.

Table 6.7-11: Impact of Project Construction Expenditures

(Three-year Construction Period) (2010 Dollars)

Dutchess County	Total
Direct Effect	$124,400,000
Indirect Effect	$ 28,100,000
Induced Effect	$ 71,700,000
TOTAL	$224,300,000

In addition to construction budget expenditures of $126.6 million, which includes the purchase of local labor and materials for project construction, ancillary expenditures (e.g., services, rentals) made locally during the construction period are anticipated to be approximately $2.7 million annually and total $8.1 million over the construction period. The total direct input to the model was therefore estimated at $134.7 million.[10]

The economic analysis conducted indicates that the $134.7 million in direct construction project expenditures and ancillary services will result in total output of $224.3 million in Dutchess County, including $124.4 million in direct effects, $28.1 million in indirect effects, and $71.7 million in induced effects.

Direct effects represent the set of expenditures applied to the predictive model (i.e., I/O multipliers) for impact analysis, in this case the $134.7 million in direct construction expenditures associated with the project. These initial expenditures are applied to the multipliers in the IMPLAN model to determine how the region will respond economically. Indirect effects are the economic impacts of local industries buying goods and services from other local industries and are calculated by applying direct effects to the model multipliers. Induced effects estimate the economic impact of purchases made by individuals and households within the study area as a result of the income (wages) they receive from the direct and indirect economic activity in the region. IMPLAN's default multiplier recognizes that labor income (employee compensation and proprietor earnings) will be spent in the

[10] The model uses internal calculations based on data from the Bureau of Labor Statistics to estimate a local economy's capacity to capture the assigned direct economic activity. Because the Dutchess County economy may be limited in its capacity to provide certain goods and specialized labor associated with project construction, the I/O model has reduced the overall direct effect from $134.7 million to $124.4 million. For example, structural steel that would be used in the project would likely not be fabricated in Dutchess County, nor would the raw inputs required to make this product be transferred between firms in Dutchess County. The IMPLAN model accounts for these kinds of "leaks" from the local economy.

regional economy, and that this money is re-circulated through the household spending patterns causing further local economic activity.

Direct and Secondary Job Impacts during Construction

The job impacts from construction activity will be substantial, with indirect and induced (multiplier) impacts occurring across many industries. The model estimates that a total of 1,451 construction industry and construction related (FTE) jobs will be supported as a result of direct project construction expenditures over the three-year construction period (Table 6.7-12). This estimate reflects the 300 FTE jobs on average with a peak demand for 750 FTE jobs during the anticipated construction period.

Table 6.7-12: Job Impacts of Cricket Valley Energy Project (Three-year Construction Period)

Dutchess County	Total Jobs (FTE)
Direct Effect	1,451
Indirect Effect	180
Induced Effect	571
TOTAL	2,202

This estimate is derived using standard methodologies within the I/O model. The dollar value of the project's construction expenditures occurring in the region is divided by the average worker productivity (the value of what each worker produces in one year) employed in non-residential construction industries within the region (commercial, industrial and utility structures). 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.

While the model employs a base estimate of the number of construction industry workers needed to construct the project, additional adjustments were made to arrive at the final estimate. First, CVE's project management and consultants' expertise, derived from experience in building similar projects elsewhere in the country, was used to determine the approximate number of jobs that require specialized skills and would not likely be staffed from the local labor pool. For example, it is estimated that up to 85 percent of the electricians required would come from Dutchess County. Estimates were made for all disciplines in the trade mix for the project, and it was determined that approximately 74 percent of the total jobs created by the project during construction would likely be filled by workers from the Dutchess County area and 26 percent from outside Dutchess County. The

jobs likely to be filled by workers from outside Dutchess County were removed from the input-output model to produce a more accurate estimate of the impacts likely to occur in the local economy.

Second, data from the New York State Department of Labor and the U.S. Census Bureau (County Business Patterns, 2007) for Dutchess County were reviewed to determine the number of firms and the occupational distribution of non-residential construction industries in the region. These data were then compared to the estimated employment impacts of constructing the project. It was determined that the Dutchess County economy has the capacity to fill all jobs anticipated to be filled by local trades people (i.e., 74 percent of the total estimated workforce needed for construction).

The model-based estimates of the employment impacts of the construction phase, adjusted for the factors noted previously, are presented in Table 6.7-12. These employment estimates are based on industry averages in the region and are not specific to any individual company. Because productivity, practices, and staffing patterns of individual construction companies vary, work estimates of any individual company may differ from the model-based estimates. However, the model outputs represent an empirically sound and conservative estimate of the employment impacts of the construction phase of the project.

In addition to the direct construction employment impacts from project expenditures, the indirect and induced economic activity resulting from project construction will support another 751 jobs in Dutchess County in a wide variety of industries (see Table 6.7-12). Table 6.7-13 highlights some industries besides the construction trades that are forecast to experience job growth in Dutchess County as a result of project construction.

Table 6.7-13: Anticipated Indirect and Induced Job Impacts (Selected Industries) of Cricket Valley Energy Center (Three-year Construction Period)

Dutchess County	Total Jobs (FTE)
Food Services and Drinking Places	77
Investigation and Security Services	60
Real Estate Services (inc. lodging/apartment leasing and rentals)	43
Offices of Physicians, Dentists, and Other Health Practitioners	40
Retail Stores—Food and Beverage	31
Transit and Ground Transportation Service	25
Employment Services	19

Secondary Labor Income Impacts during Construction

The direct, indirect, and induced employment impacts resulting from the construction of the project will increase labor income in Dutchess County by $147.1 million over the three-year construction phase. This includes $112.7 million in direct effects, $11.0 million in indirect effects, and $23.4 million in induced effects from household spending. The impacts of the project's construction on labor income are presented in Table 6.7-14.

Table 6.7-14: Labor Income Impacts of Project Construction (Three-year Construction Period) (2010 Dollars)

Dutchess County	Labor Income Total
Direct Effect	$112,700,000
Indirect Effect	$ 11,000,000
Induced Effect	$ 23,400,000
TOTAL	$147,100,000

6.7.3.1.3 Workforce Availability

The majority of the construction labor force demand is anticipated to be satisfied from workers within Dutchess County and the Harlem/Hudson Valley region. The construction of the project will result in some in-migration for specialized services from outside the local labor market. As discussed previously, approximately 74 percent of the total jobs created would be anticipated to be filled by Dutchess County workers. However, the local labor market encompasses those areas where workers would be able to commute daily to the site. The local labor market for the project would therefore be larger than Dutchess County and would extend to include the Hudson Valley region and parts of Connecticut. In total, workers from within the local labor market would be anticipated to account for approximately 90 percent of the overall labor force.

Table 6.7-15 identifies available workers from Dutchess County in a variety of construction trades. As can be seen in Table 6.7-16, the number of available workers for each trade is significantly larger than the average required workforce for the proposed project. These figures also do not include workers throughout the larger Harlem/Hudson Valley region (e.g., Putnam, Ulster, Westchester, and Orange Counties in New York and Fairfield and Litchfield Counties in Connecticut), who would be able to commute daily to the project site and constitute the local labor market.

Table 6.7-15: Dutchess County – Construction Job Seekers (June 2010)

Available Workers			Breakdown By Years of Experience			Breakdown By Years of Education				
Job Title	**Total Job Seekers**	**Average Desired Salary**	**One or more**	**Less than one**	**None**	**16 or more**	**14**	**13**	**12**	**Less than 12**
Brickmasons and Blockmasons	84	$39,470	41	18	25	2	4	20	43	15
Carpenter Helpers	63	$28,645	26	9	25	3	3	20	23	14
Carpet Installers	20	$28,210	9	3	8	1	1	6	8	4
Cement Masons and Concrete Finishers	99	$41,966	51	28	20	2	8	10	54	25
Construction and Building Inspectors	39	$54,004	24	3	12	14	6	7	10	2
Construction and Related Workers, not listed separately	143	$37,349	74	20	46	7	6	24	64	42
Construction Carpenters	795	$41,393	453	193	148	33	69	182	386	125
Construction Laborers	991	$30,613	433	139	408	37	46	188	466	254
Electrician Helpers	77	$27,687	31	14	31	5	3	31	28	10
Electricians	430	$46,915	204	118	107	37	78	120	171	24
Floor Layers, Except Carpet, Wood, and Hard Tiles	17	$31,760	10	2	4	1	3	3	8	2
Highway Maintenance Workers	43	$35,154	26	7	10	1	6	4	20	12
Insulation Workers, Mechanical	15	$31,200	1	3	11	3	1	4	6	1
Painter, Paperhanger, Plasterer, and Stucco Mason Helpers	24	$26,757	7	4	12	1	2	4	13	4
Painters, Construction and Maintenance	260	$31,888	142	50	66	13	13	44	116	74
Pipe Fitters	139	$47,837	55	65	19	6	16	44	69	4
Pipelayer, Plumber, Pipefitter, and Steamfitter Helpers	76	$31,278	28	16	31	3	6	22	34	11
Plumbers	246	$39,780	126	58	62	10	18	64	123	31
Roofers	74	$33,504	43	14	17	1	3	10	37	23
Rough Carpenters	75	$44,276	42	6	27	6	8	11	39	11
Sheet Metal Workers	106	$46,545	51	23	32	7	9	21	63	6
Structural Iron and Steel Workers	69	$43,638	15	42	12	4	5	12	38	10
Tile and Marble Setters	26	$43,940	17	2	7	3	2	6	12	3

Source: NYS Department of Labor, One Stop Operating System. Accessed June 28, 2010.

Table 6.7-16: Comparison of Workforce Needs and Dutchess County Construction Job Seekers

Discipline or Trade	Number of Workers		Reported Dutchess County Construction Job Seekers
	Peak	Average	
Site Management/Engineers	54	22	NA[1]
Boilermakers	56	23	106[2]
Carpenters/Millwrights	137	55	795
Laborers	76	30	991
Painters	7	2	260
Pipefitters/Steamfitters	177	71	215
Electricians	165	66	430
Operating Engineers	62	25	NA[3]
Iron/Steel Workers	3	2	69
Insulators	7	2	15
Cement Masons/Finishers	6	2	99

[1] Bulk of construction management staff anticipated to come from out of area
[2] No "boilermaker" classification used in NYS Department of Labor reporting – sheet metal workers used as comparable
[3] No comparable classification used in NYS Department of Labor reporting

The Knolls of Dover project is located within approximately 3 miles of the site and is in the process of preparing first phase site plan drawings for review by the Town of Dover. That project is proposed for 1,376 dwelling units and approximately 245,000 square feet of commercial space. Construction of that project is anticipated to occur incrementally over a 10-20 year build-out period. The proposed project would be completed in three years (with completion currently targeted for early 2015.) As reported in the Knolls of Dover Draft EIS, complete development of the project would support approximately 3,360 construction jobs over the build-out period. If that project were to be completed in a 10-year period, the total annual employment supported would be about 336 jobs. If it occurred over a 20-year period, the annual employment would average 168 jobs. These figures are not so large as to absorb the available workforce in Dutchess County, or the larger Hudson Valley region. In addition, residential construction has a somewhat differing trade emphasis than the proposed project. For example, pipefitters are anticipated to be the largest employment need for the proposed project, but would not likely be in significant demand for labor at the Knolls of Dover project. As a result of these factors, other than those highly specialized trades that may not exist within the local labor market, it is expected that there will be more than enough available labor within commuting distance to satisfy the employment needs of

both projects. As noted below, there are some specialized services that will likely be satisfied by in-migration from outside of the local labor market.

6.7.3.1.4 Worker In-Migration and Housing

As described above, there is an ample local labor force and the majority of the construction labor force demand is anticipated to be satisfied from workers within the Hudson Valley region. However, the construction of the project will result in some in-migration for specialized services from outside the local labor market. At peak, workers from outside of the local labor market (Harlem/Hudson Valley region) would be anticipated to be approximately 10 percent of the overall labor force. The maximum number of in-migrating workers would therefore be approximately 75 employees. These employees would be expected to make individual arrangements for housing either through rentals or hotels and motels within Dutchess County. As indicated in the demographics discussion, Dutchess County has an approximately 6 percent overall vacancy rate and a 3 – 4 percent vacancy rate for multifamily rental complexes. There are small motels located in Wingdale and Dover Plains (Dutchess Motor Lodge – 18 rooms, Foothills Motel – 13 rooms) that are closely proximate to the project site. The nearby hamlet of Poughquag also hosts a small motel. In addition, there are several small hotels to the south along NYS Route 22 in Putnam County and concentrations of large hotels near Poughkeepsie and Fishkill that could provide lodging resources. Listings available through the Dutchess County Tourism search engine indicate nearly 1,100 hotel rooms in Poughkeepsie and approximately 1,200 rooms in Fishkill.

The duration of worker stays will vary depending on their specific assignments. However, most of the in-migrating workers would be expected for short-term durations. For example, the largest in-migration would occur during the peak construction period, which would be expected to last approximately five months.

6.7.3.2 Economic Effects of Project Operation

The annual operation of the project is estimated to result in an increase in regional economic activity of $21.8 million. The impacts that occur as a result of the operation of the facility will occur annually and may increase over time. The annual impact of operations is presented in Table 6.7-17.

Table 6.7-17: Annual Revenue Impact of Project Operations (2010 Dollars)

Dutchess County	Revenue Total
Direct Effect	$18,500,000
Indirect Effect	$ 1,000,000
Induced Effect	$ 2,300,000
TOTAL	$21,800,000

6.7.3.2.1 Direct Employment

The proposed project will create a variety of permanent, well-paying job opportunities in Dover. In total, operation of the power plant is expected to require a workforce of approximately 28 employees, with an annual payroll of approximately $2.3 million excluding benefits. Table 6.7-18 below provides a breakdown of the types of jobs and payroll for a typical operating year.

Table 6.7-18: Estimated Operating Workforce

Position	Annual Salary and Overtime	Number of Employees	Payroll
Plant Manager	$140,000	1	$140,000
Plant/Environmental Engineer	$105,000	1	$105,000
Operation Manager	$110,000	1	$110,000
Maintenance Manager	$100,000	1	$100,000
Shift Supervisor	$92,000	4	$368,000
Operator (senior)	$80,500	5	$402,500
Operator (junior)	$60,000	5	$300,000
Instrument & Electrical Technician	$86,250	4	$345,000
Maintenance Mechanic	$74,750	4	$299,000
Administrative Assistant	$40,000	1	$40,000
Water Treatment Specialist	$86,250	1	$86,250
Total		**28**	**$2,295,750**

Operation of the power plant will also involve an annual shutdown to perform scheduled maintenance on the combustion and steam turbines. GE Energy would manage the turbine maintenance, with local tradesmen, such as millwrights and pipefitters, hired to support the effort. Based on information from the supplier, the maintenance work performed by local hires would involve approximately 10,300 man-hours, which equates to approximately five FTEs. The total payroll for these workers is estimated to be approximately $336,663.

Other local expenditures likely to be made during typical operations are generally limited to site maintenance activities such as building maintenance and repair, landscaping and snow removal, painting, cleaning of the administration building, purchase of administrative supplies and replacement furniture, and vehicle repair. These types of purchases would

contribute additional activity to the local economy, but would be minimal in comparison to payroll expenditures. They are currently estimated at approximately $170,000 annually.

6.7.3.2.2 Secondary Jobs and Associated Economic Activity during Facility Operation

This section provides an estimate of the annual secondary employment and economic activity likely to be generated in the Dutchess County economy by project operation. For the purposes of this analysis, secondary revenues pertain to economic activity generated by the expected employment required for facility operations. Once constructed, operation of the facility is expected to provide approximately 28 higher-wage, full-time jobs (e.g. engineers, operations and shift managers, specialists and operators). An additional five full-time equivalents would be supported by the annual turbine maintenance. The estimated total salary amount for these positions is estimated to be approximately $2.6 million excluding benefits, with an average salary of $91,830 for plant operation employees. In addition, another 26 indirect and induced jobs will be created in the region as a result of the operations of the facility and spending associated with income earned by plant workers in Dutchess County. The annual direct, indirect and induced employment impacts total 56 jobs and will contribute approximately $3.7 million in labor income to Dutchess County.

Table 6.7-19 presents total annual job impacts from the facility's operations (employment).

Table 6.7-19: Job Impacts of Cricket Valley Energy Center (Operations)

Dutchess County	Job Total
Direct Effect	30
Indirect Effect	7
Induced Effect	19
TOTAL	56

Table 6.7-20 presents total annual labor income impacts on the Dutchess County economy as a result of the operation (employment) of the project.

Table 6.7-20: Annual Labor Impact of Project Operation (2010 Dollars)

Dutchess County	Total
Direct Effect	$ 2,600,000
Indirect Effect	$ 300,000
Induced Effect	$ 800,000
TOTAL	$ 3,700,000

6.7.3.2.3 Property Tax/Revenue Generation for Local Tax Jurisdictions

As is typical for projects of this nature, the Cricket Valley Energy project will seek economic development assistance through the Dutchess County Industrial Development Agency (IDA). IDAs are public benefit corporations created to promote economic development and job creation. They can offer several benefits including exemptions from the sales tax on construction materials and equipment, exemption from the mortgage recording tax, and real property tax abatement. When an IDA takes title or a leasehold interest in a property, the property becomes exempt from real property taxes. In order to ensure that the local community receives economic benefits from the project, IDAs are authorized to negotiate a PILOT agreement.

PILOT agreements are typical for development of new electric generating plants. In fact, no new electric generating plant has been developed in New York State without the benefit of a PILOT or Empire Zone arrangement within the past 15 years. CVE is currently in discussions with the Dutchess County IDA regarding a PILOT arrangement and, as a result, the exact payment schedule is not known at this point. However, recent experience with a closely comparable plant in Athens, New York provides useful information regarding the type of payment structure that will likely be made. Typically, the Town, County and School District will also provide input on the PILOT discussions. PILOT agreements provide greater certainty for the taxation of complex industrial facilities such as generating plants, which are often difficult to value. In addition, they create revenue certainty for the tax jurisdictions (making budgeting easier) and payment certainty for the company (making financing for the project easier). PILOT agreements can also be used to cover payments during construction years.

The Athens Generating Project is closely comparable to the proposed project in capacity and power generating technology. The Athens facility is a 1,080 MW natural gas-fired combined cycle generating facility that was constructed between 2001 and 2003. Its PILOT agreement was executed in 2003 and has a term of 20 years (Athens Generating, 2003). The Athens PILOT schedule is summarized in Table 6.7-21.

Table 6.7-21: Athens Generating Project PILOT Schedule

Year	Payment to Tax Districts
2004	$2,750,000
2005	$2,750,000
2006	$2,750,000
2007	$2,750,000
2008	$2,750,000
2009	$4,095,000
2010	$4,095,000
2011	$4,095,000
2012	$4,095,000
2013	$4,095,000
2014	$4,725,000
2015	$4,725,000
2016	$4,725,000
2017	$4,725,000
2018	$4,725,000
2019	$5,000,000
2020	$5,000,000
2021	$5,000,000
2022	$5,000,000
2023	$5,000,000
Total	**$82,850,000**

Since the Dutchess County PILOT agreement has not yet been negotiated and will depend on the circumstances specific to this project, this payment schedule is offered as a point of reference for informational purposes only. It is not intended as a representation of the payments that will be made to the Dutchess County IDA for this project.

6.7.3.3 Impact on Local Services

6.7.3.3.1 School District

The Property is located within the Dover Union Free School District, which operates four schools and educates approximately 1,755 students (kindergarten through 12th grade) (Dover Union Free School District, 2010). The District's last major expansion project occurred in 1997 in order to meet an expected peak of approximately 2,000 students. Enrollment peaked in the 2001-2002 school year at 1,872 and has continued to decline since then. The District's projections through 2012-2013 indicate further decreases in enrollment (Onofry, 2009).

Since the project does not involve the construction of new residences, its operation would not be expected to generate additional school children for the district. Even in the event that the 28 plant employees represent new households within the district, public school children from those 28 new households could amount to an estimated additional 16

students (Rutgers, 2006). This would represent less than 1 percent of district enrollment. The existing surplus capacity and trend of declining enrollments would be sufficient to accommodate these additional schoolchildren. As a result, there would be no significant operating or infrastructure costs to be incurred.

As described above, significant worker in-migration would not be required to meet the project's construction labor demand. The bulk of the temporary workers coming from outside of the region would stay for relatively short durations and would not relocate their entire family. As a result, it is not likely that the project construction period would result in new households with schoolchildren within the district. Therefore, it is not expected that the schools would incur increased costs, either during or after construction. However, as part of the negotiated PILOT agreement, the school district would receive significant additional revenue, resulting in a fiscal benefit not reduced by costs associated with additional demand for services. It is assumed that the PILOT payments would be distributed proportionately to the various taxing districts' share of the property tax. Again, since the PILOT agreement has not yet been negotiated and will be based on circumstances specific to this project, the payments to be made to the school district are not yet known. However, to provide a sense of magnitude, if the project were to involve an agreement comparable to the Athens PILOT, the School District payment would be expected to range from approximately $2 million annually in the early years to $3.6 million annually towards the end of the period. At that level, the project would be covering a significant percentage of the School District levy.

6.7.3.3.2 Fire/Emergency Protection

Fire protection service in the Town of Dover is provided by the J.H. Ketcham Hose Company, an all-volunteer fire department. The fire department has approximately 200 volunteers that operate three engines, one rescue/pumper, one quint (5 function engine and ladder truck), two utility trucks, two ambulances, and two staff automobiles. The fire department currently has a 75-foot aerial ladder truck.

As proposed, the CVE facility will include fire protection systems designed and constructed to the latest, state-of-the-art requirements, including the National Fire Protection Association (NFPA) "Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations." The fire protection systems will also comply with all applicable state and local codes.

NFPA fire protection systems will be fully automated to provide alarm, detection, and suppression capability for all hazard areas. Fire water will be supplied to the fire protection system via an electric motor driven pump. A diesel-driven pump will serve as back up to

the motor-driven pump. The fire pumps will take suction directly from a 1,000,000-gallon on-site water storage tank supplied by on-site wells, and supplemented by rooftop rainwater capture. The fire water distribution system will include yard hydrants and automatic and manual suppression systems serving areas requiring protection. In addition, a Comprehensive Site and Safety Plan (CCSP) will be prepared, in coordination with the Hose Company, State Police and Sherriff's Office, detailing safety procedures, training and testing that must be completed before workers can enter the site.

With a comprehensive on-site system for fire emergencies, it is not anticipated that the project would necessitate new equipment for the Hose Company or other significant increases in operating or infrastructure costs. It is noted however, that while the project would not likely result in significant additional costs, the project is located in the fire district and will generate tax revenue for the Hose Company.

Emergency medical services in Dover are provided by Northern Dutchess Paramedics (NDP) and the J.H. Ketcham Fire Company. NDP provides coverage during the daytime hours, while the fire company provides services during the nighttime hours. NDP offers on-call services when required during the fire company's coverage. As mentioned previously, the project would not result in a significant population increase; therefore, no significant increases in call volumes that would warrant the purchase of new equipment or changes in operations would be anticipated.

6.7.3.3.3 Police Protection

The project will include perimeter fencing to secure the complete operations of the site. The project will also maintain on-site staff operation and surveillance 24 hours per day, seven days per week. All vehicle and personnel traffic will be controlled through the single main gate via the main control room building. The continuously manned operation control room will include equipment for communications with the Dutchess County Sheriff's Office and the New York State Police. The project will also employ private security and coordinate traffic control and site access with the New York State Police during the construction phase. As a result, it is anticipated that any increase in demand for police services from operation of the project would be minimal and limited to traffic control assistance and the rare event of an emergency. Compensation would be provided as required for provision of traffic control by police officers during construction. Therefore, no additional operating or infrastructure costs are expected to be incurred to provide for public police services.

6.7.3.3.4 Water/Sewer/Solid Waste

The project is proposed to include the latest commercially available water saving technologies, including use of a zero liquid discharge system used to internally recycle/reuse process water and the use of air-cooling rather than traditional water-cooling. The result is that the project is expected to have a water demand ranging from approximately 10 to 60 gallons per minute, based upon the ambient temperatures. This would be supplied by on-site wells and supplemented by the facility's rooftop rain capture system, as available. There are no municipal sewer systems in the immediate area; therefore, an on-site septic leach field system will be installed. The implementation of the zero liquid discharge system will result in no wastewater being discharged from the site. The only water leaving the site will be stormwater that has flowed through the stormwater management system, water vapor from the facility's stacks, and inherent moisture in the non-hazardous waste solids from the water treatment systems. A subsurface sewage disposal system will be utilized to dispose of domestic wastewater. Since the project relies on on-site wells and a subsurface disposal system, there are no potential municipal cost implications related to water or sewer infrastructure. Similarly, a licensed private hauler will be used for the removal of solid waste during both construction and operation, so there would therefore be no related municipal costs for this item.

6.7.3.3.5 Other Municipal Services

The Town of Dover provides a variety of municipal services, ranging from general administrative and management functions (e.g., tax collection, town justice, various permits and licenses) to infrastructure (e.g., highway maintenance, recycling) to programs for citizens (e.g., recreation, youth programs). As described above, it is anticipated that the required construction labor force for the project would be readily met with available workers within Dutchess County and the Hudson Valley region. As a result there would not be significant in-migration of construction workers. Accordingly, there would be minimal increase in demand for municipal services during construction. Similarly, the operation of the facility is expected to require a 28-person staff. These employees may or may not live in the Town of Dover, but in either case would represent an insignificant population increase and would not be expected to increase municipal service costs. As part of the negotiated PILOT agreement, the Town of Dover would receive additional revenue, resulting in a fiscal benefit not reduced by additional municipal service costs.

Dutchess County also provides a wide range of administrative and programmatic services to its constituents (e.g., courts, land records, health and social services, etc.). As with the Town of Dover municipal services described above, the project would result in an insignificant increase in the Dutchess County population. As a result, Dutchess County

would not be expected to incur increased general service costs. It would, however, receive additional revenue as part of the negotiated PILOT agreement.

6.7.4 Environmental Justice

NYSDEC has identified potential Environmental Justice Areas (EJAs) of concern relating to impacts on communities or facilities housing disadvantaged population groups. The NYSDEC Environmental Justice (EJ) Policy establishes the New York State urban EJ threshold for minority population at 51.1 percent and the New York State EJ threshold for low-income population at 23.59 percent. The NYSDEC map of potential EJAs in Dutchess County was reviewed; the only potential EJA in the eastern portion of Dutchess County is the location of a former state hospital and detention center (Harlem Valley Psychiatric Center). That property has been sold for private development, and, as described in more detail below, no longer houses the disadvantaged population that resulted in the EJA classification.

The Town of Dover consists of three Census Tracts. The project is located in Census Tract 400.02. Table 6.7-22 depicts the minority and income disadvantaged population percentages for the three Census Tracts in the Town. Population demographics in terms of minority percentage and income are also shown on Figure 6.7-1. Note that Census Tract 6200 is the former Harlem Valley Psychiatric Center. While a majority of the facility was closed at the time of the Census, the site still hosted a New York State Division for Youth (DFY) juvenile detention facility and the figures below reflected a largely institutionalized population. The DFY moved their operations in 2004 and the site has been approved for redevelopment as a mixed-use community. Thus, the Census Tract 6200 data presented below based upon the 2000 Census are no longer accurate.

Table 6.7-22: Minority and Disadvantaged Demographics by Census Tract

Census Tract	Black (Alone or in combination with other race)	Hispanic	Pct. below Poverty Line
400.01	2.5%	4.5%	10.1%
400.02	8.1%	6.4%	6.1%
6200	62.4%	19.2%	0%

Sources: Census 2000

Harvard School of Public Health – The Public Health Disparities Geocoding Project Monograph

The USEPA Region 2 Environmental Justice Geographic Assessment Tool was also consulted. According to the assessment tool, Census Tract 6200 (the former Harlem Valley Psychiatric Center) was the only Community of Concern within 10 miles of the project site.

The 2000 Census data for Census Tract 6200 indicated that of a total population of 213 people, 76 were identified as white alone, 131 as black or African-American alone, one as Asian alone, two as some other race alone, and three as two or more races. Of the total population in the tract, about 81 percent (172 people) were housed in an institutionalized population, with a breakdown of 17 in mental/psychiatric wards and 155 in training schools for juvenile delinquents. The institutionalized population consisted of 39 people identified as white alone, 127 as black or African-American alone, one as Asian alone, two as some other race alone, and three as two or more races. Accordingly, the institutionalized population comprised 133 of the 137-person non-white population, or 97 percent.

The institutionalized population in the census tract resided at the Harlem Valley Secure Center for Juveniles. On March 28, 2004, the Office of Children and Family Services closed the juvenile detention center. Without the large minority population once housed at the facility, this census tract would no longer meet the criteria to be considered a Community of Concern under USEPA Region 2 Guidelines for Conducting Environmental Justice Analyses or the NYSDEC criteria to be considered a potential EJA.

As such, there are no EJAs of concern that will be impacted by the proposed project.

6.7.5 Conclusions

During its construction and long-term operation, the project will produce significant direct and indirect socioeconomic benefits to the local, regional, and state economies. The project also will result in induced spending, additional economic activity resulting from the increase in direct and indirect economic activity. The project will not result in significant demand on infrastructure or services, or significant operating or infrastructure costs to the Town of Dover, Dutchess County, or the Dover Union Free School District.

Project development and construction will require an estimated investment of approximately $955 million, which will provide a significant benefit to the local, regional, and state economies. It is expected that an average of 300 construction jobs will be created during the three-year construction of the project, with up to 750 jobs during the five-month peak construction period. Once completed, operation of the facility will support approximately 28 well-paying permanent jobs in Dover. The investment in the plant, during both construction and operation, will also result in significant secondary economic benefits to the local, regional and state economy. The project will also provide a long-term revenue source for the Town of Dover, Dutchess County and the Dover Union Free School District through an anticipated Payment in Lieu of Taxes agreement.

6.7.6 References

Athens Generating, 2003. PILOT Agreement 2003.

Dover Union Free School District, 2010. http://www.doverschools.org/

Minnesota IMPLAN Group, Inc., 2009. IMPLAN System (2008 data and software), 1725 Tower Drive West, Suite 140, Stillwater, MN 55082, www.implan.com, 2009.

New York State Department of Labor, 2010a. Labor Statistics: Available Workers (July 2010). (http://www.labor.ny.gov/stats/wsearch2.asp?reg=hud Accessed July 8, 2010)

New York State Department of Labor, 2010b. Local Area Unemployment Statistics Program (June 2010).

Onofry, Craig T., Ed.D, 2009. Dover Union Free School District Superintendent, letter, 6/24/09, as reported in Dover Knolls Final Environmental Impact Statement.

Rutgers, 2006. Rutgers University Center for Urban Policy Research. Residential Demographic Multipliers (New York), June 2006. SFH detached, 3-br multiplier – 0.64. (25 units X 0.64 public school children/unit = 16 students.)

U.S. Census Bureau, 2007. County Business Pattern 2007 (http://censtats.census.gov/cgi-bin/cbpnaic/cbpdetl.pl Accessed July 8, 2010).

U.S. Department of Labor, Bureau of Labor Statistics. Local Area Unemployment Statistics, Dutchess County, NY (April 2010) (http://data.bls.gov:8080/PDQ/servlet/SurveyOutputServlet;jsessionid=623024d5f5c9f4838322 Accessed July 20, 2010).