Section 1 – Project Description

Figures (provided following the text)

Tables

List of Acronyms and Abbreviations – Section 1

%	percent
ACM	asbestos containing materials
CEA	Critical Environmental Area
CEMS	Continuous Emissions Monitoring Systems
CESQG	conditionally-exempt small-quantity generator
CO	carbon monoxide
CO_2	carbon dioxide
ConEd	Consolidated Edison Company of New York
CVE	Cricket Valley Energy Center, LLC
DCS	Distributed Control System
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
GE	General Electric
GHG	Greenhouse Gas
GIS	gas insulated switchgear
gpm	gallons per minute
H_2	hydrogen
HRSG	heat recovery steam generator
Iroquois	Iroquois Natural Gas Transmission System LP
ISO	International Organization for Standards
kV	kilovolts
kWh	kilowatt-hour
Laydown Site	30-acre construction worker parking and laydown site
M	Town of Dover's Industrial/Manufacturing District
MMBtu/hr	million British thermal units per hour
MW	megawatts
N_2	elemental nitrogen
NFPA	National Fire Protection Association
NO_x	nitrogen oxides

NYISO	New York Independent System Operator
NYSDEC	New York State Department of Environmental Conservation
O_2	Oxygen
OSHA	Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
ppmvd	parts per million by volume dry
Project Development Area	The 57-acre portion of the 131-acre Property proposed for development
the Property	The 131-acre property optioned by CVE
RCRA	Resource Conservation and Recovery Act
SCR	selective catalytic reduction
SO_x	sulfur oxides
SPDES	State Pollutant Discharge Elimination System
U.S.	United States
ULSD	ultra low sulfur diesel
USEPA	United States Environmental Protection Agency
VOC	volatile organic compounds
ZLD	zero liquid discharge

1. PROJECT DESCRIPTION

Cricket Valley Energy Center, LLC (CVE) proposes to construct and operate a highly efficient, combined cycle natural gas powered 1,000-megawatt (MW) electric generating facility on an approximately 131-acre property (the Property) in Dover, Dutchess County, New York. The following sections outline the project purpose and need, and provide characteristics of the site and the project to allow for an understanding of the proposed action and a basis for assessment of its potential impacts to the community and environment.

1.1 Project Purpose, Public Need and Benefits

The purpose of the project is to produce electricity in an efficient and environmentally conscious way to offset the increasing long-term regional energy demand and reduce dependence on older, less efficient, and higher emitting electric generators that currently serve the New York region. The project will use the most advanced, state-of-the-art power generation technology available, making it one of New York's most efficient energy producers.

The New York Independent System Operator (NYISO) is responsible for overseeing the safe and reliable operation of the New York bulk electric transmission system. Over the past number of years, NYISO has issued a *Power Trends* report, assessing New York's electricity supply, infrastructure and needs. The 2010 report recognizes that the addition of new generating resources over the past decade has relieved what was a critical need for additional electricity supply. While the current economic climate has depressed electric demand to some degree over the short-term, the *Power Trends* report explains that an economic recovery "can be expected to spur a resurgence of power demands."

NYISO explains further that in order to maintain a safe, reliable electricity supply, the "production and use of electricity must become more efficient, as must the power system itself." The report recognizes the likely onset of additional regulatory mandates aimed at lowering carbon emissions, as well as further emission reductions of nitrogen oxides (NO_x) and sulfur oxides (SO_x), which could force the early retirement of older, inefficient electric generating plants. Specifically, NYISO states "if such circumstances [NO_x emissions limitations leading to power plant retirements] arise and replacement resources are not available, reliability concerns could develop as soon as the program starts in 2012."

CVE's generation capabilities would provide reliability for the electric transmission grid, serving as a replacement resource for retired plants. In addition, the project's more efficient technology will help displace the operation of existing, less efficient plants, as quantified in the economic dispatch analysis provided in Appendix 1-A. Due to the project's superior efficiency it will be dispatched ahead of higher emitting generators, causing those units to operate less frequently, thereby yielding a net air quality benefit across the region. The regional emissions reductions expected are quantified in Section 4 (see Table 4-32). Thus, while NYISO recognizes that short-term power needs are not of immediate concern, the State must be vigilant to ensure the power system will continue to reliably, efficiently and economically serve the State's changing energy needs into the future.

NYISO's 2009 Comprehensive Reliability Plan, which evaluates proposed solutions to address reliability needs over a ten-year planning period, mirrors concerns over reduced generating capacity available due to the implementation of new environmental emissions restrictions. For example, with the implementation of new NO_x requirements (Reasonably Available Control Technology), "it is reasonable to expect that up to 25 percent of affected units would not be able to retrofit to meet the requirements," and unless replacement resources are available, the generating resource adequacy criterion could be violated, impacting the reliability of the New York bulk transmission system.

The project is also consistent with the New York State Energy Plan which was issued by the State Energy Planning Board in December 2009. The 2009 Plan has identified five policy objectives:

- Maintain Reliability: Assure that New York has reliable energy and transportation systems;
- Reduce Greenhouse Gas (GHG) Emissions: Support energy and transportation systems that enable the State to significantly reduce GHG emissions, both to do the State's part in responding to the dangers posed by climate change and to position the State to compete in a national and global carbon-constrained economy;
- Stabilize Energy Costs and Improve Economic Competitiveness: Address affordability concerns of residents and businesses caused by rising energy bills, and improve the State's economic competitiveness;
- Reduce Public Health and Environmental Risks: Reduce health and environmental risks associated with the production and use of energy across all sectors; and
- Improve Energy Independence: Improve the State's energy independence and fuel diversity by developing in-state energy supply resources.

The project is consistent with these objectives. The 2009 Plan explains "in general, new plants use technologies that are more efficient than those used in older plants. As older facilities retire and newer, more efficient plants come on line, the average heat rate[1] of the power plant fleet in New York is expected to improve. The State's markets and its commitment to continually improve them will facilitate this substitution." The project will generate electricity far more efficiently than the existing fleet of plants and do so using natural gas instead of higher emitting fossil fuels like oil or coal. Thus, since the project has the ability to provide electricity more cost effectively and efficiently with a significantly better emissions profile, CVE can play a critical role in achieving the State's Energy Plan goals.

CVE also provides an environmental and economic opportunity to rehabilitate an inactive industrial site, currently in disrepair, and return it to productive use. The project at this site will result in economic growth for Dutchess County and the Town of Dover without a significant burden on the community or significant adverse impact to the environment. Benefits to the region, in addition to the electricity that will be contributed to the regional grid, include job creation and contributions to the tax base, as discussed in Section 6.7, as well as the cleanup of an inactive industrial complex.

The project is expected to employ up to 750 workers during the 36-month construction period, with the peak employment occurring for approximately five months. Once operational, the facility is expected to employ between 25 to 30 full-time employees. Construction, beginning with demolition of existing structures and site preparation, is planned to begin in early 2012 and commercial operation is planned to begin in early 2015.

In summary, the project has been designed to provide an efficient, environmentally conscious source of electricity that both complements the New York State Energy Plan and supports the objective of the NYISO to ensure a safe and reliable electricity supply. As environmental regulations aimed at reducing emissions take hold, the project is positioned to displace, or if necessary, replace older, less efficient generators resulting in a regional air quality benefit. The project will also provide local and regional economic and environmental benefits by adding temporary and permanent jobs and by reusing a dilapidated industrial site in a productive and environmentally sensitive manner. The project will also provide a long-term revenue source for the Town of Dover and Dutchess County through contributions to the tax base.

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[1] Heat rate is defined as the fuel required to produce one kilowatt-hour (kWh) of electricity.

1.2 Site Description

The site was selected specifically for this project due to existing infrastructure, current zoning, and advantageous topography and tree cover that provide a natural buffer to the surrounding community. The Property consists of 131 acres and is generally bounded to the east by New York State 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 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.

The Property is located within the Town of Dover's Industrial/Manufacturing District (M), which permits industrial and related uses. Figures 1-2 and 1-3 illustrate zoning and land ownership for the Property vicinity, respectively.

As further discussed below and in Section 2.2, the portion of the Property east of the railroad line has a long history of industrial use and numerous dilapidated, vacant industrial structures and associated debris are located in that area. This portion of the Property has previously been identified by Dutchess County as the Mica Products Critical Environmental Area (CEA) due to the need for clean-up associated with its former uses. Proposed project activities will be restricted to the approximately 57-acre portion of the Property located to the east of the railroad track, referred to as the "Project Development Area." Within the Project Development Area, approximately 30 acres will be re-developed.

The portion of the Property located west of the railroad tracks is currently relatively undeveloped, and is not proposed for any development activity related to the project. A small pump house associated with former Property uses is located on the eastern bank of the Swamp River. 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. This portion of the Property has been designated as within the Great Swamp 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. The Swamp River, which has historically provided a portion of the Property's water needs via the existing pump house, flows northward past the site to its confluence with the

Ten Mile River just south of Dover Plains. In the vicinity of the site, the Swamp River meanders through a wide plain with braided channels evident.

The Property sits in relative isolation, with vegetation and topography that provide a natural buffer for visual, aesthetic and noise impacts. The Project Development Area is located near the bottom of a western facing slope, along a small north-south trending ridge that separates the Swamp River and the Ten Mile River. Although the Project Development Area is relatively flat, there is a westerly trending slope toward the active commuter rail line and the Swamp River. Several wetland areas are located outside of the currently developed portions of the Project Development Area. The eastern side of the Project Development Area rises steeply (approximately 30-40 feet) to the elevation of New York State Route 22, and consists of rock outcropping, vegetation, and sparse to thick stands of trees. The vegetation and trees provide a natural buffer, and currently limit views of existing on-site structures.

The Project Development Area includes many dilapidated structures, all of which will be removed as part of the proposed project development. Figure 1-4 provides an aerial photograph indicating the location of each existing on-site structure, referenced by letters. A description of each of the on-site structures is provided in Section 2.2. The Property (and in particular the Project Development Area) has a long history of industrial use. 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 1996 fire, the site was operated by the Poly Tech Recycling Corporation as part of its tire recycling operation. There is still debris as evidence of the site's varied industrial history. For more information on existing site conditions and structures, see Section 2.2.

1.3 Facility Overview

This section provides an overview of the major and ancillary project equipment, emissions controls, water use and discharge processes, proposed stormwater management practices, a description of the on-site storage tanks, a description of the proposed utility interconnections, and a summary of the total electrical output.

1.3.1 Major Project Equipment

The proposed combined cycle facility will generate approximately 1,000 MW of electricity firing only natural gas in its combustion turbine generators. The facility will be comprised of three General Electric (GE) 7FA.05 combustion turbines; three heat recovery steam generators (HRSGs); and three GE A14 steam turbine generators utilized in combined cycle mode. The HRSGs will each include a natural gas-fired duct burner (supplemental firing system) to allow for additional electrical production during periods of high electricity demand.

1.3.2 Ancillary Project Equipment

A low NO_x natural gas-fired ***auxiliary boiler*** will operate as needed to keep the HRSGs warm during periods of turbine shutdown, and provide sealing steam to the steam turbine during startups to reduce startup times and emissions. The auxiliary boiler will have a maximum input capacity of 48.6 million British thermal units per hour (MMBtu/hr) and will be limited to 4,500 hours per year of operation.

Four diesel-fired ***black start generators***, each with a maximum power rating of 3 MW, will be used to re-start the facility's combustion turbines in the event of a total power loss on the local or regional transmission grid. All four generators will be required to start one of the combined cycle turbines. Once a turbine is up and operating, power from that turbine will be used to start the other turbines. The black start generators will fire ultra-low sulfur diesel (ULSD) fuel and would only be used in case of emergency; as such their operating hours will be limited to 500 hours per year for readiness testing.

The project will have a ***back-up fire pump*** to provide on-site fire fighting capabilities. The emergency fire pump will use ULSD fuel, and will typically only operate for testing and to maintain operational readiness in the event of an emergency. It will be limited to a maximum of 500 operating hours per year for readiness testing, with each testing event limited to 35 minutes.

1.3.3 Emissions Control

Clean-burning natural gas from the adjacent Iroquois pipeline will be the sole fuel for the combustion turbines and HRSGs' duct burners. Exhaust will be released through three co-located facility stacks, approximately 282.5 feet tall. The project will be equipped with state-of-the-art emissions control technology, including dry low NO_x burners and selective catalytic reduction (SCR) technology to control emissions of NO_x, and an oxidation catalyst to control carbon monoxide (CO) and volatile organic compounds (VOC) emissions. A continuous emissions monitoring system (CEMS) will be utilized to ensure and document facility compliance with applicable emissions standards.

1.3.4 Water Use and Discharge

The project will use air-cooled steam condensers to minimize water demand. Process water supply is planned from new on-site bedrock wells, as described in detail in Section 5.4. Sanitary and wash water will also be provided from the on-site well system, with bottled water provided for drinking purposes. In addition, a zero liquid discharge (ZLD) system will recycle and reuse water internally, reducing the need for process water and ensuring that no process wastewater will be discharged. Instead, residual solids from the ZLD process will be collected and transported to an off-site licensed landfill. Sanitary discharge will be via an on-site septic system and associated leach field.

1.3.5 Stormwater Management

CVE will apply best management practices developed using the latest New York State Stormwater Management Design Manual to limit peak runoff rates and improve the quality of the runoff leaving the Project Development Area. Stormwater flows will be managed through a system that reflects existing site drainage patterns and incorporates a wet extended detention pond, smaller bio-retention facilities, roof top rain capture, and other best management practices to maintain peak rates of discharge and minimize the potential for erosion and sedimentation (see Section 5.6).

1.3.6 Storage Tanks

Storage tanks on the site will include a 1,000,000-gallon raw water storage tank, used to supply facility water needs and for fire protection, a 250,000-gallon demineralized water storage tank, and two 30,000-gallon aqueous ammonia storage tanks. Consistent with New York State requirements, a secondary safety containment area will be provided around the ammonia tanks, sized to hold 110 percent of the entire volume of the tanks.

Only small quantities of ULSD fuel and lubricating oil will be stored and used on-site, since the project's combustion turbines and majority of other ancillary equipment will consume only natural gas. Permanent ULSD fuel storage on-site will be limited to the fire pump's integrated 650-gallon fuel tank and the four emergency black-start generators with integrated 1,000-gallon fuel storage containers. Other lubricating and cooling oils will be associated with the combustion turbine/steam turbine generating equipment lubricating system and the transformers. All tanks, equipment, and vessels containing ULSD fuel and/or lubricating oils will be inside a concrete containment, sump or curbed dike area as required for spill control and management.

1.3.7 Utility Interconnections

The project's electrical interconnection will be to the existing ConEd 345-kV transmission line that extends east/west along the northern boundary of the site. A switchyard and substation, incorporating gas-insulated switchgear (GIS) to minimize footprint requirements, will be located on-site from which approximately 700 feet of new overhead transmission lines will extend to reach the existing ConEd right-of-way.

An approximately 500-foot-long 12-inch-diameter natural gas pipeline will extend from a new gas metering station, located on the northern portion of the Project Development Area, to the Iroquois pipeline located on the northern portion of the ConEd transmission line right-of-way that abuts the site to the north.

1.3.8 Electrical Output

Of the total energy production, at International Organization for Standardization (ISO) conditions (59 degrees Fahrenheit [^{o}F] and 60 percent relative humidity), approximately 627 MW will be produced by the combustion turbines. The exhaust heat from the combustion turbines will be sent to the HRSGs to produce steam that will drive the steam turbine generators. This process will result in the generation of an additional approximately 309 MW without duct burners operating and 443 MW with duct burners operating. Approximately 24 MW are consumed within the facility to power necessary electric systems, resulting in a total net output of 1,046 MW at ISO conditions with duct firing. Table 1-1 summarizes plant output, including duct firing, over a range of temperatures.

Table 1-1: Estimated Plant Output at Selected Operating Temperatures

Temperature (^oF)	Net Output (MW)
0	1,118
59	1,046
90	986

1.4 Overview of Combined-Cycle Operation

The process of using both the power generated in a combustion turbine generator as well as that generated by a steam turbine generator is commonly referred to as "combined cycle" generation, and is one of the most efficient technologies for producing electricity. Since a combined cycle plant uses less fuel than either a utility boiler with a steam turbine or a simple cycle gas turbine to generate a kilowatt-hour of electricity, the savings in fuel and, therefore, energy costs are significant. Another benefit of combined cycle technology is that, because less fuel is consumed, environmental emissions are less than that of traditional fossil fuel technologies per megawatt-hour of power generated.

The project will comprise three separate power blocks, each operating in combined cycle mode. Each power block will consist of one GE 7F A.05 combustion turbine generator; one HRSG; one GE A14 steam turbine generator; and an associated air cooled condenser. A conceptual flow diagram of the proposed facility is shown in Figure 1-5.

The fuel (natural gas) is ignited in the combustion section of the turbine. The combustion results in high temperature exhaust gases which are expanded through the power turbine section. The expanding exhaust gas causes the turbine blades and shaft to rotate. A generator is coupled to the turbine shaft to convert rotational mechanical energy into electrical energy. The combustion turbine generators will generate approximately two-thirds of the project's electrical output.

Waste heat will be recovered from the hot combustion gases exiting the combustion turbine generator in the HRSG to generate steam. Steam generated in the HRSG is routed to a steam turbine. The expansion of the steam in the steam turbines rotates the turbine shaft. A generator is coupled to the turbine shaft to convert rotational mechanical energy to electrical energy, producing the balance of the facility's electrical output.

All of the exhaust gases associated with the combined combustion systems exhaust through the HRSG stacks. The closed loop steam/water cycle will transport the exhausting steam from the steam turbine to the air cooled condensers, where it is condensed back into water and pumped to the HRSG for reuse.

As noted above, combined cycle technology is one of the most efficient technologies for producing electricity. Consideration of alternative technologies and an analysis demonstrating that the project as proposed is the best alternative is provided in Section 7.6.

1.5 Project Description

Details of the project are provided in the following sections.

1.5.1 Facility Layout

The project has been designed to be complementary to the site's environmental resources and surrounding land uses. By limiting the Project Development Area to the portion of the Property already altered due to past industrial uses, the extent of change to the site and its surroundings is minimized. Figure 1-6 provides the layout of equipment and features on the Project Development Area. Figure 1-7 provides a detailed view of the power island. An elevation drawing of the equipment is provided in Figure 1-8. A conceptual rendering of the facility is provided in Figure 1-9.

1.5.1.1 Project Access

The project will utilize the existing access driveway that extends from New York State Route 22 and slopes down to the west toward the level portion of the Project Development Area. Minor widening and improvements to the driveway, to improve stormwater flow control, for example, may be undertaken; its general location and footprint, however, will remain consistent with the current driveway feature. The driveway, until a point just prior to the project's security gate and fencing, will be shared with other industrial uses located south of the Project Development Area. At that point, other uses will continue along a roadway (modified slightly from those currently in place) directing traffic to the south, outside of the Project Development Area.

Facility traffic entering the site must pass through a security gate. Employee and service parking will be provided immediately upon entering the secured area, adjacent to the administration and warehouse building. To limit traffic into the secured area, additional parking is provided outside the security fence for visitors and daily deliveries. Most facility traffic will be restricted to these two parking areas. However, a ring road will be constructed to encircle the facility and to provide access to the various equipment areas as well as allow for emergency response equipment to reach all areas of the site. An alternate entrance will be located south of the administration and warehouse building as a second emergency entrance/exit. Geometry of the project roadways has been designed to accommodate large vehicles that will access the site and material delivery areas incorporate curbing and containment for unloading and storage areas. A full discussion of traffic and transportation issues is provided in Section 6.3.

1.5.1.2 Buildings and Structures

An administration and warehouse building will be located near the facility entrance. Office space, a meeting room, kitchen, storage area, restroom facilities, warehouse space and a maintenance area will be located in this building.

Laid out from east to west within the Project Development Area are three electric generating units designed to operate independently for maximum flexibility. The components associated with each unit are the same, and each unit is oriented in the same manner. They are positioned to keep quieter elements of the operations closer to New York State Route 22 and nearby land uses.

The three combustion turbine generators will be enclosed in a single turbine generator building, which also will enclose ancillary mechanical equipment, such as pumps, piping, and electrical equipment needed for facility operation. The combustion turbine generators will be located just west of the administration and warehouse building and switchyard. The turbine generator building will house overhead cranes inside the building to facilitate major equipment maintenance activities. Elevated platforms will be provided for access to equipment and piping. The roof of the structure will be designed to support metal decking and insulating panels. The walls will be insulated metal siding supported on a steel frame.

The steam turbine generator extends out of the turbine generator building for each of the three units, with the HRSG further to the west. Each HRSG exhausts its emissions to one of three 282.5 foot stacks, which are co-located in order to minimize the visual effect from surrounding areas and to enhance dispersion of the exhaust plumes. Further west of each unit is its air cooled condenser.

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

- Administration/control room building – 40 feet x 115 feet, 15-foot height;

- Maintenance shop/warehouse building – 40 feet x 95 feet, 30-foot height;
- Turbine generator building – 670 feet x 100 feet, 75-foot height;
- HRSG enclosure – 128 feet x 160 feet, 113-foot height;
- Water treatment building – 50 feet x 195 feet, 25-foot height;
- Fin fan cooler – 200 feet x 100 feet, 30-foot height;
- Ammonia storage tanks – 12 feet in diameter x 35-foot height;
- Air cooled condenser – 190 feet x 190 feet, 113-foot height;
- Service/fire water storage tank – 60 feet in diameter, 50-foot height;
- Demineralized water storage tank – 40 feet in diameter, 30-foot height; and
- Wastewater holding tank – 30 feet in diameter, 30-foot height.

Major generation equipment is further described in the following sections.

1.5.1.3 Power Generation Equipment

The major pieces of generating equipment are three GE 7FA.05 combustion turbines with an evaporative inlet air cooler, three HRSGs with duct burners, three GE A14 steam turbines, three air cooled condensers, an auxiliary cooling system, an electric fire pump, an emergency diesel fire pump, four black-start emergency diesel generators, an auxiliary boiler, and HRSG exhaust stacks. Additional support systems and equipment include:

- Feed-water systems;
- Condensate system;
- Water treatment system including storage tanks for service and demineralized water;
- SCR system;
- Oxidation catalyst;
- Chemical storage and injection systems;
- Sanitary waste collection and subsurface disposal system;
- Fire protection system (including detection and alarm system);
- Water well system;
- Instrument and service air systems;
- Heating, ventilating and air conditioning systems;
- ZLD system;
- Oil/water separators;
- On-site natural gas interconnection natural gas metering station;

- On-site natural gas conditioning and pressure reduction station;
- 345 kV overhead electrical transmission system;
- 345 kV GIS substation/switchyard; and
- Controls and instrumentation.

Major facility components are described in the following sections.

1.5.1.3.1 Combustion Turbine Generators

The project will utilize three GE 7FA.05 combustion gas turbine generators firing solely natural gas. Each combustion turbine will produce approximately 209 MW of electric power at ISO conditions.

The three combustion turbine generators are internal combustion engines that operate with rotary motion (rotates a shaft to generate electricity). The turbines are composed of three major components: the compressor, combustor, and power turbine. A description of the combustion turbine generation process is as follows:

- In the compressor section, ambient air is drawn through a combination filter and evaporative cooler housing for cleaning and cooling the air, respectively. The air passes though a silencer section, which reduces the turbine compressor's noise, and is then compressed and directed to the combustor section.

- In the combustor section, fuel is introduced and combusted. Hot gases from combustion are diluted with additional air from the compressor section and directed to the power turbine section at high temperature.

- In the power turbine section, energy from the hot exhaust gases is recovered in the form of shaft horsepower (i.e., horsepower present at turbine shaft). More than 50 percent of the shaft horsepower is needed to drive the internal compressor and the balance of recovered shaft horsepower is available to drive the turbine and generate electricity.

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

1.5.1.3.2 Heat Recovery Steam Generators

In the HRSGs, the heat from the combustion turbine exhaust gas (ranging from 1,075^{o}F to 1,130^{o}F) is transferred to water/steam tubes which are immersed in the HRSG gas flow, first to boil the water into steam and then to superheat the steam for use in the steam turbine. The exhaust gases from the HRSG are exhausted to the stack at 175^{o}F to 215^{o}F.

Each proposed HRSG will be a multi-pressure, horizontal unit with reheat capability. The HRSG design includes the following components:

- A multi-pressure level heat recovery system;
- An economizer;
- Steam reheater;
- Steam superheaters;
- Relief valves, stop and check valves and connections to periodically remove water from the boiler (i.e., boiler blowdown);
- Chemical injection and drum level instrumentation; and
- Silencers for all safety relief valves and power operated start-up vent valves.

The HRSGs will each have supplemental fuel firing provided by an approximately 540 MMBtu/hr natural gas-fired duct burner (maximum input capacity). The HRSGs will each have a chemical feed system to maintain feedwater pH and oxygen levels in accordance with the manufacturer's and Electrical Power Research Institute's guidelines. The HRSG chemical feed systems will include a phosphate/polymer feed skid and an oxygen scavenger and neutralizing amine feed skid.

1.5.1.3.3 Steam Turbine Generators

To increase efficiency, steam generated in each HRSG will be expanded through a steam turbine coupled with a generator (steam turbine generator) to generate additional electricity. Each steam turbine generator will be a multi-stage, reheat, condensing turbine and will produce approximately 147.5 MW of electric power at an average ambient temperature of 59ºF, with the HRSG duct burners in operation. Each steam turbine generator will utilize an air cooled condenser.

Each steam turbine generator will be designed to run continuously, and will also be capable of operating as a cycling unit (e.g., be turned off and on) to respond to fluctuations in electricity demand. The steam turbine generators will be located in the generation building.

1.5.1.3.4 Main System Cooling (Air Cooled Condenser)

An air cooled condenser will be associated with each turbine train to provide cooling for the steam exhausted from the steam turbine. Each air cooled condenser will be located approximately 65 feet west of the HRSG enclosure. The air cooled condensers will rely solely on ambient air as a direct steam-cycle heat sink without the use of any water or other intermediary heat transfer medium. Steam will be routed from the steam turbine exhaust through ducts to a series of fin tube heat exchangers. The steam flows through the tubes and condenses inside the tubes forming condensate while air flows over the outer tube surface. The energy lost from the steam when it condenses is transferred to the air stream. Condensate will be collected from the air cooled condenser and pumped back to the HRSG. Air is moved through the air cooled condensers by fans, with ambient air drawn from below the condenser and the heated air discharged from the top of the condenser at approximately 15^{o}F to 20^{o}F warmer.

1.5.1.3.5 Auxiliary Cooling System (Fin-Fan Cooler)

The facility incorporates an auxiliary cooling system for plant equipment and sub-systems, utilizing a fin-fan cooler which will be located on the southern side of the Project Development Area. The fin-fan cooler design utilizes air-cooled heat exchange technology that rejects heat from a fluid directly to ambient air using a series of tubes, fins, and fans similar to an automobile radiator. Propylene glycol, a non-hazardous regulated coolant, will be used rather than ethylene glycol (antifreeze), which is classified as hazardous. The fin-fan cooling system will be designed to support base load capability of the plant up to an ambient temperature of 105ºF. This system will be controlled remotely from the facility control room.

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

- Steam turbine generator coolers;
- Combustion turbine generator coolers;
- Steam turbine and combustion turbine generator lube oil coolers;
- Steam turbine and combustion turbine generator auxiliaries;
- Steam turbine generator hydraulic power unit coolers;
- Sample coolers;
- Service and instrument air compressors;
- HRSG blowdown sump coolers; and
- HRSG feed pump oil coolers.

1.5.1.3.6 Exhaust Stacks

The exhaust gas from the HRSGs will flow into three 282.5 foot (above grade) stacks, each with a flue diameter of 19 feet, co-located to the west of the HRSG structures. Each exhaust stack will include the following accessories and features:

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

1.5.1.3.7 Natural Gas Auxiliary Boilers

An auxiliary boiler will primarily be used during the winter months to keep the HRSGs warm during periods of turbine shutdown and provide sealing steam to the steam turbine in case of warm and hot shutdowns. The auxiliary boiler will be fired by natural gas. The auxiliary boiler will have a maximum input capacity of 48.6 MMBtu/hr, and total boiler hours for the facility will be limited to 4,500 hours per year. Air pollution control systems for the auxiliary boiler will include a low-NO_x burner and flue gas recirculation to reduce emissions of NO_x.

1.5.1.3.8 Emergency Black Start Generator

The facility will be equipped with four emergency black start generators, each with a power rating of 3 MW. The generators will combust ULSD fuel. If power from the electrical grid is not available, one diesel generator will automatically operate to maintain essential services (safety and control systems, lighting, communications, etc.) until off-site power is restored. In the event of a widespread power outage, the generators can be used to restart one of the combustion turbines. Once one combustion turbine has been restarted, electricity from that unit will be used to restart the remaining two units. The diesel generator set comprises either an in-line or V-type multi-cylinder turbocharged diesel engine directly driving an electric generator at 1,800 revolutions per minute. Generator output is at 4,160 volts/60 Hertz. The engine is provided with a sealed jacket water system that is cooled by an air-cooled radiator, which also cools the turbocharger aftercooler and the engine lube oil cooler. The engines' exhausts are equipped with SCR for the control and reduction of NO_x emissions.

1.5.1.3.9 Emergency Diesel Fire Pump

An emergency diesel driven fire pump will be located at the facility. The fire pump will be used only to maintain on-site fire fighting capability if electric power is not available from the utility grid. The fire pump will operate on ULSD fuel. Except for occasional testing to ensure the fire pump is operating properly, the fire pump will not normally operate. To account for short-term testing of the fire pump as well as possible emergency use, it will be permitted to operate up to a total of 500 hours per year for readiness testing, with each testing event limited to 35 minutes.

1.5.1.3.10 Fuel Gas Dew Point Heater

An electrically powered fuel gas dew point heater will be used to maintain the natural gas above its dew point temperature prior to input to the turbine and duct burner. Heating of the gas above its dew point temperature reduces the possibility of the gas condensing into a liquid due to change in pressure and temperature. The temperature of the gas supplied to the gas turbine will be maintained at a temperature of 50°F or more above the dew point of the gas.

1.5.1.3.11 Storage Tanks

Above ground storage tank systems will be used for storage of raw water, demineralized water, wastewater and aqueous ammonia. A small amount of fuel oil and hydrogen will also be stored on site. Each of these systems is described below.

<u>Water and Wastewater Storage</u> **–** One 1,000,000-gallon water storage tank for untreated service/fire water and one 250,000-gallon storage tank for demineralized water will be located to the north of the site within the water treatment/fire protection area. The service/fire water tank (which will store untreated water) will be 50 feet tall and 60 feet in diameter. The demineralized water tank will be 30 feet tall and 40 feet in diameter. A storage tank that will hold process wastewater before reuse in the facility, 30 feet tall and 30 feet in diameter, will also be located in this area.

<u>Ammonia</u> – The SCR system requires aqueous ammonia injection for NO_x emissions control. A 19 percent aqueous ammonia solution will be stored in two 30,000-gallon tanks. The tanks will be located on the southern side of the site, approximately 60 feet south of the southernmost HRSG. The 12 foot diameter by 35 foot tall tanks will be welded steel construction. The tanks will be located within a concrete safety containment area capable of storing 110 percent of the tank contents. The tanks will be tightness tested before use and inspected on a regular schedule. A leak detection system will be installed. The system will have an audible alarm in the control room. The storage tank and containment design will include provisions for overfill detection and prevention.

Fuel Oil – As the project's combustion turbines and most ancillary equipment will use natural gas, the project will need to store only small quantities of ULSD fuel and lubricating oil for use on-site. Permanent ULSD fuel storage on-site will be limited to: the fire pump's integrated 650-gallon ULSD fuel tank and the four emergency black-start generators with integrated 1,000-gallon ULSD fuel storage containers. Other lubricating and cooling oils will be associated with the combustion turbine generator and steam turbine generator equipment lubricating system and the transformers. All tanks, equipment, and vessels containing ULSD and/or lubricating oils will be inside a concrete safety containment, sump or curbed dike area as required for spill control and management.

Hydrogen – The combustion turbine and steam turbine generators' internal cooling media will be hydrogen. Hydrogen gas is circulated in a closed loop within the generator to remove heat from its active parts; then it is cooled by gas-to-water heat exchangers that are part of the stator frame. The frame is tightly sealed to prevent gas leakage, and oil seals are installed on the shaft at each end of the stator to prevent leakage as the shaft emerges from the stator frame. Hydrogen storage will be required for generator maintenance (refill after safe purging) and makeup. A portable tube trailer with approximately 60,000 standard cubic feet of hydrogen will be stored at a safe and protected location on site, per national, state, local, and industrial standards.

1.5.1.4 Landscaping and Lighting

1.5.1.4.1 Landscaping

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 New York State Route 22. Four areas are planned for landscaping or forest restoration. The landscaping will occur at the plant entrance sign and two locations near the front of the administration building and associated visitor parking area as discussed in Section 6.2. The forest and vegetation restoration will be between the natural gas metering/conditioning area and Wetland No. 1, just south of the new on-site 345-kV transmission lines. This restoration area will provide additional visual buffer from New York State Route 22, along the ConEd transmission line right-of-way. Wetland restoration in areas previously filled by industrial activities will also be undertaken as described in Section 3.3.1.

1.5.1.4.2 Lighting

Lighting, both for normal operation and emergency or temporary shutdown will be provided throughout the facility. The project's proposed lighting design will minimize off-site impacts, while providing sufficient lighting to ensure worker safety during routine operations and maintenance. Site lighting will be designed to meet the standards of the Illuminating Engineering Society Lighting Handbook and the code requirements of the Town of Dover.

The main entrance and internal roadway lighting will consist of 400 watt high-pressure sodium fixtures mounted at 30 feet above grade. These fixtures will include full cut-off optics to reduce unwanted glare and fugitive light (e.g., light emitted beyond the Property boundary). Fixtures will be controlled by light sensing switches and directed inwards toward the facility.

Entry door and truck access doorway lighting are anticipated to consist of 70 watt 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 is anticipated to consist of 70 watt, 100 watt and/or 150 watt high-pressure sodium heavy-duty, stanchion mounted, area lights. The term "platform lighting" includes the walkway areas of the air-cooled condenser, fin-fan coolers and associated access stairs, CEMS equipment access platforms and any other equipment-related platforms. 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 allows for the reduction of nighttime fugitive light. The fixtures are typically mounted 8 feet above the platform elevation. The proposed Site Lighting Plan is discussed in Section 6.2.

A Federal Aviation Administration (FAA) Determination of No Hazard to Air Navigation is required for the project because the stack height will be greater than 200 feet. Filings were made on February 25, 2010, and Determinations of No Hazard were issued by the FAA on March 19, 2010 for all three stacks. Currently, the FAA notes the need for lighting on all three stacks, recommending 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.

1.5.2 Site Preparation and Demolition

The project will be constructed in the location of existing abandoned industrial buildings on the site and can take advantage, to a great degree, of that previously disturbed footprint. Building demolition will be a component of early-stage project construction.

Prior to demolition, a Pre-Demolition Characterization Survey will be conducted in order to evaluate potential environmental concerns. The results from the survey will be used for the preparation of demolition specifications for the removal of existing building materials as part of a site-wide demolition project. All existing exterior and interior buildings, stacks, and tanks will be surveyed as part of this effort. This survey will provide the general locations and estimated quantities of any of the following materials: asbestos containing materials; lead-based paint; chlorofluorocarbons; metallic dusts; mercury; polychlorinated biphenyls (PCBs); fluorescent tubes for lighting; and solvent materials.

Before demolition activities commence, silt fences, geotextiles, crushed rock, hay bales, and settling tanks or ponds will be utilized to minimize surface erosion and to prevent ingress of sediment into the temporary and permanent drainage systems. In other areas to be left undeveloped, surface areas will be finished with topsoil (if required) and vegetation to protect against surface erosion. Stockpiles and temporary excavation cut slopes will be covered to minimize erosion and thus control against sediment washing into storm drainage systems. A full description of best management practices for stormwater runoff is provided in Section 5.6.

All of the materials identified in the survey will be evaluated for removal from the buildings and property prior to demolition. Some lead-based paint and asbestos containing material areas (such as window glazing or roofing) will be difficult to remove. A variance or an exemption for certain types of non-friable asbestos may be requested from the Town of Dover, based on the survey results. Removal and disposal methods will strictly adhere to all applicable federal, state, and local guidelines for such activity, including the disposal of removed demolition wastes. Trucks and vehicles transporting demolition debris offsite will be covered and cleaned prior to leaving the site in accordance with applicable regulations and best management practices as noted in Section 2.3.5.

The abatement of hazardous materials will be performed by licensed contractors in accordance with applicable federal, state, and local regulations governing each material and as outlined by the project's demolition procedures and specifications. Each phase of the work will be overseen by a third party environmental monitor and, where required, environmental sampling will be conducted on a continuous or periodic basis.

Asbestos containing material will be abated from the site according to the New York State Industrial Code, the U.S. Environmental Protection Agency's (USEPA's) National Environmental Standard for Hazardous Air Pollutants and site specific project specifications. Asbestos project monitoring and air sampling will be conducted at the site by licensed personnel representing a third party consultant. The removal of hazardous materials from the site, including PCBs, mercury, fluorescent lights, and solvent materials, if present, will be performed by licensed and experienced contractors. All waste containers will be properly labeled prior to removal from the site. Disposal sites and landfills will be pre-approved for each type of waste that is to be disposed.

All contractors performing the removal of materials from the site will be supervised by a third party safety consultant to ensure strict adherence to personal protection requirements. All contractors will be required to conduct employee monitoring according to the applicable Occupational Safety and Health Administration (OSHA) regulations for each of the materials encountered. Prior to selecting a demolition contractor and commencing work, safety policies and project specific plans will be thoroughly reviewed.

Existing buildings will be demolished using conventional demolition methodology, such as a crane with drop ball working in conjunction with grapple/shear equipped excavators and track loaders. The final building demolition methods will be chosen based on actual demolition work scope specification and other approved methods to collapse or dismantle structures. Demolition debris will be prepared for disposal by segregating metals from brick and concrete. If possible, clean concrete and brick will be crushed and recycled as fill on site, as permitted. Demolition debris, for deposal or reuse, will be tested utilizing the Toxicity Characteristic Leaching Procedure for lead and other metals that might be suspected. The debris will be classified according to test results and properly disposed of, or recycled as fill, in accordance with applicable disposal regulations. Steel will be transported to an approved recycler. Combustible building debris will be transported offsite for proper disposal.

1.5.3 Construction Worker Parking and Equipment Laydown Site

An offsite location approximately 2.5 miles north of the Project Development Area will be used for temporary construction worker parking and equipment storage or laydown (Laydown Site). The approximately 30-acre Laydown Site consists of active agricultural fields historically associated with a farming operation, and is a portion of a larger parcel, which includes actively farmed fields, a former farm-related house and outbuildings, and undeveloped land to the south of the field (see Figure 1-10).

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, where a few residences and the Sherman Hills residential development are located. The Laydown Site is bounded to the west by New York State Route 22 from which access will occur.

1.5.4 Air Emission Sources and Control Systems

The project's turbines will fire natural gas exclusively, and will incorporate state-of-the-art controls, resulting in extremely low emissions. A summary of the emission controls incorporated in the project is provided below. Additional details are provided in Section 4.3.

The project's NO_x emissions will be reduced to the Lowest Achievable Emission Rates, as directed by the USEPA and NYSDEC, through the use of dry low NO_x burners and the SCR systems. The dry low NO_x burners utilize a lean-burn technology with fuel-to-air ratios below stoichiometric values. This type of fuel mixture limits the formation of thermal NO_x because there is a lower flame temperature. Aqueous ammonia (19 percent concentration) will be injected into the flue gas upstream of the SCR catalyst. There, it will mix with the NO_x in the presence of the SCR catalyst to form elemental nitrogen (N_2) and water vapor. The ammonia that does not react will pass through the HRSG and out of the stack; this small amount of un-reacted ammonia is called the "ammonia slip," and will be limited to 5.0 parts per million by volume dry (ppmvd) at all load conditions and ambient temperatures. The SCR system will reduce NO_x concentrations to 2.0 ppmvd at 15 percent oxygen (O_2), at all load conditions and ambient temperatures.

CO emissions from the combustion turbine generator will be reduced using an oxidation catalyst (also referred to as a CO catalyst). Exhaust gases from the turbine are passed over a catalyst bed where excess air oxidizes the CO to carbon dioxide (CO_2). The oxidation catalyst system will reduce CO concentrations to 2.0 ppmvd in the exhaust gas under all load conditions and ambient temperatures. The oxidation catalyst will also reduce VOC emissions to 1.0 ppmvd without duct firing at baseload conditions and 2.0 ppmvd with duct firing at baseload conditions.

Natural gas does not contain appreciable amounts of sulfur, so sulfur dioxide and particulate matter emissions will be minimized through the sole use of that fuel in the combustion turbines.

Upon leaving the HRSG, turbine exhaust gases will be directed to the exhaust stack. The stack will be equipped with a CEMS to monitor the concentrations of NO_x, O_2, CO, and opacity. A monitoring system to measure ammonia slip will also be provided. The stack will have a platform for access to the monitoring systems. The CEMS measures and reports (in appropriate units) the emissions products/release rates of the facility in accordance with the requirements of applicable state and federal codes and standards. Control room indicators will be triggered by the CEMS monitor for high levels and exceedances of each monitored emission parameter.

The project will incorporate data acquisition and control systems that will optimize turbine performance. These same systems will minimize pollutant emissions through a combination of operator and software-driven process adjustments and notifications.

1.5.5 Water Supply/Wastewater (Zero Liquid Discharge System)

The project has incorporated technologies to minimize water use and recycle process water to the greatest extent possible, including air cooled condensing for main system cooling, a fin-fan cooler for auxiliary cooling, internal reuse and recycling of process water, and a ZLD system to eliminate discharge of process wastewater from the project. The project's peak water requirements correspond with summer operation of combustion turbine inlet evaporative coolers (discharged as water vapor from the facility's stacks) and ZLD operation of recycling process wastewater (the bonded moisture in the non-hazardous waste solids after extracting water). The water demand will vary by season, ranging from approximately 10 gallons per minute (gpm) in winter months to 60 gpm in the summer, when ambient temperature exceeds 59°F and evaporative coolers are in use. A project water balance is illustrated in Figures 1-11 and 1-12 representing water demand for winter and summer conditions, respectively. The use of the advanced technologies incorporated in the project design reduces water use by approximately 98 percent when compared to an equivalent water-cooled facility.

To meet the project's process water needs, CVE proposes to use on-site, deep aquifer water wells. Section 5 describes the wells and their yield. Also addressed in Section 5 are the results of long-term pump tests and aquifer modeling that have been conducted to confirm that neighboring wells, nearby wetlands and the Swamp River will not be adversely affected.

Due to the soil and geotechnical subsurface conditions within the Project Development Area, use of a mound system for disposing of domestic wastewater is proposed, as discussed in Section 5.5.

The only water that will be discharged from the site will be rain/stormwater runoff through the designed and permitted stormwater management systems, as further described in Section 5.6.

1.5.6 Material Handling and Storage

Typical chemicals that will be needed on site during construction and operation are described in Tables 1-2 and 1-3, respectively. All chemical storage areas on site will be equipped with appropriate secondary containment that will meet all applicable safety codes, including highly visible labels/safety signs. A list of chemicals on-site, including their Material Safety Data Sheets, will be supplied to appropriate local emergency response and environmental agencies.

During construction all chemical materials will be evaluated during the material receiving process. Materials that are determined to be hazardous will be stored in designated storage areas that will include safety containment measures. Construction personnel will be trained on the proper use, handling, protective equipment, storage and disposal of “hazardous” materials.

When operational, the project’s most significant chemical storage requirements will be for the treatment of water supply and recycled wastewater, and operation of the SCR systems. Project operations will require limited amounts of lubricating oils and certain other industrial chemicals, which will be stored in covered areas. The project will also require chemicals for boiler feedwater treatment and SCR operation. Operating personnel will be trained on the proper use, handling, protective equipment, storage and disposal of all chemicals to be stored on the site.

The SCR reagent ammonia will be provided as a 19 percent concentration in an aqueous (water based) solution. For perspective, common household cleaning products can contain 1 to 5 percent ammonia, while janitorial or industrial-strength cleaning products can contain up to 10 to 12 percent ammonia.

Table 1-2: On-Site Chemical Storage During Project Construction

Product	Nominal Quantity	Storage Method
Medium WT Oil (new)	2,800 gallons	5-gallon containers on palettes in Conex box*
Waste Oil	200 – 500 gallons	55-gallon drums (bermed)
WD-40	110 gallons	1 gallon containers and spray cans
Thinners/Solvents/Xylene/Methyl Ethyl Ketone/Acetone	<110 gallons	1 gallon or less containers in Conex box*
Insecticides	30 – 55 gallons	Spray cans in tool room
Various Aerosol Cans (waste)	Potential for large quantities over the course of the construction effort	Punctured empty containers become regular waste
Paint	50 – 1,000 gallons	55-gallon drums and 5-gallon containers in Conex box*
Gasoline	500 gallons	Above ground portable storage tank with self-contained berm or fuel truck
ULSD Fuel	200 – 500 gallons	Above ground storage tank with self-contained berm or fuel tank
Chemicals Utilized in Cleaning of HRSG and Piping: • Citric Acid 5 percent (%) (3% weight concentration) • Caustic Soda 30% (pH to 9.0) • Sodium Nitrite (0.5% Weight) • OSI-1 Inhibitor (0.1 % Volume) • Pen-7 Surfactant (0.1% Volume) • Antifoam Agent	 40,000 pounds 875 gallons 63 gallons 2,750 pounds 63 gallons 63 gallons	Delivered by contractor at time of service
Cleaning Solvents		55-gallon drums in a Conex box*

*A Conex box is a steel cargo container per OSHA standards located inside a berm area.

Table 1-3: On-Site Chemical Storage During Project Operation

Chemical	Purpose	Location	Storage Method
15% sodium hypochlorite solution	Biocide & cleaning micro-filter	Water treatment building - inside	3,500 gallon tank
3% potassium permanganate	Oxidation of iron and manganese	Water treatment building - inside	Four 55-gallon drums or 200 gallon totes
37% hydrochloric acid solution	pH adjustment and cation bed regeneration	Water treatment building - inside	3,500 gallon tank
40% ferric chloride solution	Coagulant/settling aid	Water treatment building - inside	Four 55-gallon drums or 200 gallon totes
25% sodium hydroxide solution	pH adjustment (low freeze point caustic)	Water treatment building – inside	Four 55-gallon drums or 200 gallon totes
35% calcium hydroxide solution	pH adjustment/settling aid	Water treatment building - inside	7,000 gallon tank
15% sodium carbonate solution	pH adjustment/settling aid	Water treatment building - inside	12,000 gallon tank
38% sodium metabisulfite, anhydrous	Reducing agent used to kill halogens	Water treatment building - inside	Four 55-gallon drums of 200 gallon totes
Phosphate	Corrosion control	Turbine building	Three 200-gallon totes
Oxygen scavenger	O_2 scavenger/corrosion control	Turbine building	Three 200 gallon totes
19% aqueous ammonia	Corrosion control	Turbine building	Three 200 gallon totes
19% aqueous ammonia	SCR system	Common to facility	Two 30,000 gallon tanks
Steam turbine lube & control oil	Steam turbine lubrication & Servo Vlv Control	Turbine building	Three 3,500-gallon tanks
ULSD fuel	Emergency black start generator	Common to facility	3,500 gallon tank
Gas turbine main lube oil	Gas turbine lubrication	Turbine building	Three 5,000-gallon tanks
Gas turbine control oil	GT Servo Valve Control	Turbine building	Combined with main lube oil

Table 1-3: On-Site Chemical Storage During Project Operation

Chemical	Purpose	Location	Storage Method
ULSD fuel	Fire pump	Common to facility	650 gallon tank
Antifreeze	Fire pump and emergency generator	Various	Ten 1-gallon containers
Lubricating oils	Fire pump, emergency generator, boiler feed pump	Various	Internal to engine oil sumps and coolers
Main transformer oil	Insulation and cooling	Various	Internal transformer casing
Auxiliary transformer oil	Insulation and cooling	Various	Internal Transformer Casing
Gas turbine compressor wash	Cleaning gas turbine compressor	Turbine building	One 55 gallon drum of detergent; 500 gallon mixing/ dispensing tank
CO_2 gas	Generator purge	Turbine building	35 - 100-pound cylinders
Hydrogen gas	Generator coolant	Turbine building	Tube trailers
CO_2 gas	Gas turbine fire protection	Turbine building	Four sets of 55 100-pound cylinders (includes spare)
N_2 gas	HRSG layup, fuel gas purge	HRSG	Cylinders (70 per HRSG)
O_2 gas	Maintenance	Maintenance warehouse	Cylinders (1-3)
Propane gas	Maintenance	Maintenance warehouse	Cylinders (1-3)
Acetylene gas	Maintenance	Maintenance warehouse	Cylinders (1-3)
CEMS gases	Calibration Gases	Warehouse & CEMS buildings	Cylinders (6 Sets)
Sulfur hexafluoride	Circuit breaker fault interrupting media	Turbine building/switchyard	Cylinders (2-5)

Two 30,000-gallon welded steel tanks will be provided for on-site storage of aqueous ammonia. To ensure safety, each of these tanks will be installed within a protective, concrete secondary containment designed and sized to accommodate 110 percent of the entire volume of each tank and protect against vehicular traffic. The tanks will be located within an impermeable containment area, surrounded by a wall. The floor of the containment area will be covered with plastic balls designed to float on the liquid surface in the event of a spill, thereby reducing the exposed surface area. Each tank will be leak-tested before use and inspected periodically.

On-site tanks will be equipped with a level gauge, and monitored in the control room, which will be staffed 24 hours per day, seven days per week. The project has incorporated technology and developed responses for any significant, although unlikely, change in tank level. For instance, in the event that the tank level were to fall at an abnormal rate, an alarm will sound in the control room and emergency response procedures will be initiated. In the event of a small leak (at a valve or pipe joint), project maintenance personnel, wearing appropriate protective gear, would initiate corrective measures (shut off control valves) and/or make immediate repairs. In the exceedingly unlikely event of a tank failure or rupture, the project will implement its Spill Prevention Control and Countermeasure Plan and Procedures, which will include notification of appropriate regulatory agencies.

Once the project is operational, it is anticipated to be a conditionally-exempt small-quantity generator (CESQG) under the federal Resource Conservation and Recovery Act (RCRA) because it will generate less than 100 kilograms (220 pounds) per month of any materials classified as hazardous (40 Code of Federal Regulations 261.5). There are no specific federal or state (6 New York State Register and Official Compilation of Codes, Rules and Regulations of the State of New York Parts 372-376) requirements for keeping records of the amount of hazardous waste generated by a CESQG, but the facility must comply with the requirements for CESQGs for storage, treatment and disposal. The project will not treat or dispose of waste material, nor will it store waste material for more than 90 days. Waste materials will be hauled off-site by transporters licensed under applicable RCRA and New York State law provisions for final disposal of waste materials at RCRA-permitted facilities.

1.5.7 Stormwater Management

The project has completed a preliminary hydrologic analysis using computer modeling for pre- and post-development conditions, and has prepared a preliminary Stormwater Pollution Prevention Plan for major activities associated with construction and operation of the project, as discussed in Section 5.6. Stormwater management design concepts are provided for water quality, runoff volume reduction, and sediment control facilities.

The stormwater management plan proposed for this project has been designed to promote stormwater reuse, natural filtration and reduced runoff. The proposed stormwater collection system, consisting of pipes, open drainage ways and on-site stormwater management facilities will adequately collect, treat, and convey the stormwater. A wet extended detention basin and bio-retention areas will be used to treat stormwater from the proposed development. Runoff from containment areas; and from the roofs of the administration/control room building, maintenance shop/warehouse building, GIS switchyard building, water treatment building, and Units 1-3 (i.e., step up transformer) for all storms will be captured and routed to the on-site storage tank via a pump for reuse within the facility. A detailed discussion of the project's stormwater management systems is provided in Section 5.6.

1.5.8 Solid Waste Management

In addition to removing existing abandoned and collapsed industrial buildings from the Project Development Area, CVE will also remove solid waste, dumped slag and refuse that currently exist on the Property. In 1979, the Property was first considered as a potential hazardous waste site when the NYSDEC filed a Reported Hazardous Waste Sites form and listed the Property as a "potential" waste site. A Phase II site investigation was conducted in 1989 and submitted to the NYSDEC in 1991. The corresponding report to this investigation found that dumped slag and other refuse associated with former site operations have had little impact to the groundwater, surface water, sediment and soils of the Property. The Property was removed from the NYSDEC List of Inactive Hazardous Waste Sites in 1991. The NYSDEC Division of Solid Waste recommends remediation and closure of three on-site waste piles, which CVE will mitigate and close per solid waste regulations. Section 2.2.1 provides additional information about Property conditions, while activities to address those conditions are described in Section 2.3.

1.5.9 Instrumentation/Control Devices

Instrumentation and control devices will be used to sense, indicate, transmit and control process variables as required for safe, efficient and reliable operation of the facility and its systems and components. A Distributed Control System (DCS) will be installed to monitor the combustion turbine generator and steam turbine generator and other associated equipment. The DCS system will implement both closed and open loop control to bring the facility from cold startup to the desired operating condition and back to shutdown. The DCS will also be used to monitor, display, and record process data received from field sensors and through communication links. This information will be used for general process supervision, calculations associated with facility equipment and performance, historical record keeping/trending including sequence of events recording and diagnostics for management and maintenance of the facility.

Other process instrumentation and control devices include:

- Control valves;
- Flow instruments;
- Level instruments;
- Pressure and differential pressure indicators;
- Process analyzers;
- Temperature instruments; and
- Vibration sensors.

1.5.10 Electric Transmission Interconnection

Electrical interconnection will be with the ConEd 345 kV transmission system through the project's 345-kV on-site combined substation/switchyard. The transmission line right-of-way abuts the site's northern property line.

In order to minimize the project footprint and avoid wetland intrusion, a state-of-the-art GIS substation has been selected. The substation is located adjacent to the facility footprint, to the north of the site and outside of wetland areas.

The substation/switchyard will incorporate a bus-type arrangement with five ring breakers serving the six generator step-up transformers. Six main generator step-up transformers will serve the three power blocks (two transformers for each unit, one for the combustion turbine generator and one for the steam turbine generator). Each transformer will step up the generator voltage of the steam turbine generator and the combustion turbine generator from 18 kV to 345 kV feed into the plant substation/switchyard.

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. A 228-foot clearing, or right-of-way, will accommodate the two lines, which will be separated by approximately 78 feet. The electrical interconnection line route is shown on Figure 1-6. The two electrical interconnection lines will each consist of three 109-foot high steel transmission poles. A bundle of two sets of 1351.5 thousand circular mil, 45/7 aluminum conductor, steel reinforced conductors will be strung along the two sets of three poles.

The project has entered the NYISO Large Facility Interconnection process, under the Federal Energy Regulatory Commission Electric Tariff, for the interconnection to the local and regional electrical transmission grid. A Feasibility Study, performed by the NYISO, has been completed and concluded that an interconnection of 1,000 MW at this location can be supported without the need for substantial upgrades and improvements. The second step in the process is the System Reliability Impact Study to evaluate the impact of the interconnection on the reliability of the New York and adjoining affected transmission systems. The System Reliability Impact Study is also being conducted by NYISO and currently in process. The third major step in the process is a Facilities Study to determine the cost and allocation of the transmission system's facility upgrades for corresponding NYISO Class Year interconnections. The last step is the Large Generator Interconnection Agreement which is used to construct the physical interconnection and transmission system upgrades to allow the project to connect to the ConEd system.

1.5.11 Natural Gas Interconnection Pipeline

The project will utilize natural gas as the sole fuel for its combustion turbines and HRSG duct burners. Pipeline-quality natural gas will be delivered via an interconnection with the existing 24-inch, 1,480 pounds per square inch gauge Iroquois interstate pipeline. A short on-site 12-inch-diameter lateral of approximately 500 feet will connect the project with the Iroquois pipeline that abuts the site's northern property line located within the ConEd electric transmission line right-of-way.

Natural gas will be provided to the project through a combination of firm and interruptible natural gas transportation contracts to meet facility requirements. It is intended that the arrangement will minimize gas supply costs and provide high levels of reliability and operational flexibility.

1.5.12 Safety and Security

Combined cycle, electric generating plants have excellent safety records, and safety is CVE's top priority. CVE will follow all applicable federal, state and local codes and standards. In addition to incorporating advanced safety technology, CVE will coordinate its safety plans for the design and operational configuration of the facility with local emergency agencies and the Dover Fire Department (J.H. Ketcham Hose Company). Using the latest technology in controls and fire protection/detection, the project will be one of the safest electric generating facilities in New York State.

Prior to commencement of construction, a comprehensive security plan will be developed and implemented that will address both construction and operational phases of the project. The plan will include perimeter fencing that secures the complete operations of the site and

Iroquois fuel gas metering station. A chain link fence, a single sliding gate and surveillance equipment will be used to permit only authorized access to the project service drive, structures and operations. The gate will be locked at all times with access provided by project personnel. The control room will have surveillance views of the gate, and the ability to open the gate. Normal plant lighting and emergency temporary lighting will be provided throughout the project.

During construction, on-site staff will monitor this system throughout all construction phases. Once the facility is operational, on-site staff operation and surveillance will be 24 hours per day, 7 days per week, and 365 days per year. All vehicle and personnel traffic will be controlled through the single main gate via the control room building, with substantial surveillance in and around the Property.

The continuously staffed control room will include equipment for communications with local fire and rescue teams, emergency services, the Dutchess County Sheriff's Office, and the New York State Police. In addition, the Dover Fire Department will have the ability to fully access the property in the event of an emergency.

1.5.13 Fire Protection

The facility's fire protection systems will be designed and constructed to the latest, state-of-the art requirements. These include the National Fire Protection Association (NFPA) "Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations." In addition to NFPA regulations, these systems will comply with all applicable state and local codes, and will be designed, installed, documented and coordinated with the Dover Fire Department to ensure compatibility with firefighting equipment and capabilities.

NFPA fire protection systems will be fully automated to provide alarm, detection, and suppression capability for all hazard areas. The facility will contain a reliable, on-site fire water supply system. Firewater will be supplied to the fire protection system via two 100 percent capacity fire pumps. One pump will be electric motor driven and the other pump will be diesel engine driven. The diesel-driven pump will serve as backup to the motor-driven pump.

Dedicated water source for fire protection will be allocated from the 1,000,000-gallon on-site water storage tank, with the fire pump taking suction directly from the tank. Water quality of the stored water will be suitable for process uses. The fire water distribution system will include yard hydrants and automatic and manual suppression systems serving areas requiring protection. Prior to commencing facility operations, facility personnel will be trained as an on-site fire brigade, working cooperatively with the Dover Fire Department, to function as the first line of defense in the event of a fire at the facility.

1.6 Required Permits and Approvals

Development and construction of the project will require or involve a number of discretionary federal, state and local regulatory agency notifications, actions, permits and approvals. Table 1-4 lists each permit, review or approval and its current status.

Table 1-4: Status of Permits and Approvals for the Cricket Valley Energy Project

Agency	Permit, Review or Approval	Status
Federal		
United States Army Corps of Engineers	Section 404 Permit	Joint Permit filed 1/22/10
United States Fish and Wildlife Service	Endangered Species Act Section 7 consultation	Correspondence received 7/20/09 and 9/21/09
FAA	Notice of Proposed Construction or Alteration	Determination of No Hazard received 3/19/10
State		
NYSDEC	Part 201 permit (air quality)	Application filed 3/26/10
	Prevention of Significant Deterioration (PSD) permit	Application filed 3/26/10
	Title V operating permit (air quality)	To be filed within 12 months following facility operation
	Title IV Acid Rain permit (air quality)	To be filed within 24 months prior to facility operation
	Freshwater Wetlands Permit	Joint application filed 1/22/10
	Clean Water Act Section 401 Water Quality Certification	Joint application filed 1/22/10
	SPDES General Permit for Stormwater Discharges from Construction Activities	Pending
	Natural Heritage and Endangered Species program consultation	Correspondence received on 6/10/09
	Oil and chemical storage authorization	Pending
	Notification for large asbestos removal, if applicable	Pending
Office of Parks, Recreation and Historic Preservation	National Historic Preservation Act Section 106 consultation	Correspondence received on 9/3/09 and 9/25/09
New York State Department of	Highway work permit for non-utility work	Pending

Agency	Permit, Review or Approval	Status
Transportation		
New York State Public Service Commission	Section 68 Certificate of Public Convenience and Necessity	Pending
Local		
Dutchess County Health Department	Water Well Construction	Notifications provided for temporary wells on 7/22/09; final well notifications pending
	Septic System Approval	Pending
	Abandonment of Water Well, if applicable	Pending
Dutchess County Planning Board	Site Plan Review	Application filed 11/4/09
Town of Dover Town Board	Special Permit/Site Plan Review	Application filed 11/4/09
	Fire Prevention Permits	Pending
	Use of Explosives	Pending
Town of Dover Planning Board	Erosion/Sediment Control	Pending
Town of Dover Zoning Board	Zoning Variances (height, noise)	Pending
Town of Dover Architectural Review Board	Design Review	Pending
Building Inspector	Building/Occupancy Permits	Pending

1.7 Project Schedule

Construction of the facility will require approximately 30-36 months. Building demolition, clearing, and grading will be a component of early-stage project construction. Construction is currently proposed to start in early 2012, with a proposed commercial operation date for the facility in early 2015. A preliminary construction schedule for the project is shown in Figure 1-13.