



FINAL ENVIRONMENTAL ASSESSMENT

DEPARTMENT OF ENERGY LOAN GUARANTEE TO AE POLYSILICON CORPORATION
FOR CONSTRUCTION AND STARTUP OF THEIR PHASE 2 POLYSILICON PRODUCTION
FACILITY IN FAIRLESS HILLS, PENNSYLVANIA

U.S. Department of Energy
Loan Guarantee Program Office
Washington, DC 20585

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ACRONYMS AND ABBREVIATIONS**Full Phrase**

AEP	AE Polysilicon Corporation
BCCD	Bucks County Conservation District
BMP	Best Management Practices
CAA	Clean Air Act of 1970
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMS	Corrective Measures Study
CWA	Clean Water Act of 1972
CO	Carbon Monoxide
DOE	U.S. Department of Energy
EA	Environmental Assessment
EEBD	Emergency Escape Breathing Device
EIS	Environmental Impact Statement
EPAct	Energy Policy Act of 2005
ER	Emergency Response
ERP	Emergency Response Plan
ESA	Endangered Species Act
E&S	Erosion and Sediment
FBR	Fluidized Bed Reactor
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GPD	Gallons Per Day
GPM	Gallons Per Minute
H ₂ O	Water
HASP	Health and Safety Plan
HAZOP	Hazard and Operability (analysis)
HCl	Hydrochloric Acid
HI	Heavy Industrial
IPCC	Intergovernmental Panel on Climate Change
ISO	Intermodal Container (International Organization of Standardization defines the dimensions)
ITE	Institute of Traffic Engineers
KIPC	Keystone Industrial Port Complex
KOIZ	Keystone Opportunity Improvement Zone
KVA	Kilo Volt Amperes
kW	Kilowatt
µg/m ³	Micrograms per Cubic Meter
mg/m ³	Milligrams per Cubic Meter
MPM	Materials Processing and Manufacturing
MSCs	Medium-Specific Concentrations
MSL	Mean Sea Level

ACRONYMS AND ABBREVIATIONS	Full Phrase
NAAQS	National Ambient Air Quality Standards
NaCl	Sodium Chloride
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NHPA	National Historic Preservation Act of 1966
NOAA	National Oceanic and Atmospheric Administration
NO _x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
PADEP	Pennsylvania Department of Environmental Protection
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PAFBC	Pennsylvania Fish and Boat Commission
PAGC	Pennsylvania Game Commission
PCSM	Post Construction Storm Management (plan)
PEL	Permissible Exposure Limit
PENTOXSD	Pennsylvania Single Discharge Waste Load Allocation Program for Toxics and Other Substances
PM _{2.5}	Particulates with an aerodynamic diameter of 2.5 microns or less
PM ₁₀	Particulates with an aerodynamic diameter of 10 microns or less
PNDI	Pennsylvania Natural Diversity Inventory
PNHP	Pennsylvania Natural Heritage Program
PPC	Pollution Prevention Control
ppm	Parts Per Million
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
ROL	Release of Liability
RFI	RCRA Facility Investigation
SCFH	Standard Cubic Feet per Hour
SiO ₂	Silicon Dioxide
SEPTA	Southeastern Pennsylvania Transportation Authority
SHPO	State Historic Preservation Office
SO ₂	Sulfur Dioxide
SO _x	Sulfur Oxides
SPCC	Spill Prevention, Control, and Countermeasure
STC	Silicon Tetrachloride
SVOC	Semi-Volatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure
TCS	Trichlorosilane
TMDL	Total Maximum Daily Load
TPY	Tons Per Year
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

ACRONYMS AND ABBREVIATIONS

Full Phrase

VOC

Volatile Organic Compounds

EXECUTIVE SUMMARY

INTRODUCTION

The U.S. Department of Energy's (DOE's) proposed action is to issue a loan guarantee to AE Polysilicon Corporation (AEP) to be used for construction and startup of a Phase 2 commercial polysilicon production unit consisting of three silicon refining process blocks. The polysilicon product would be used in the subsequent manufacture by others of solar photovoltaic (PV) cells and modules. One polysilicon process block (Phase 1) at the AEP production facility is currently completing construction and has an estimated full-load annual output of 1,800 metric tons. AEP plans to construct the Phase 2 project adjacent to the existing Phase 1 polysilicon production facility. The Phase 2 expansion would add three additional process blocks and could increase total annual polysilicon production maximum full-load capacity by an estimated 5,400 metric tons to a total facility production capacity of 7,200 metric tons.

DOE has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act of 1969 (NEPA) (42 USC 4321, et seq.) Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR Parts 1500-1508) and DOE NEPA regulations (10 CFR Part 1021). The EA examines the potential environmental impacts associated with the proposed action and alternatives and determines whether the proposed action has the potential for significant environmental impacts. The information contained in the EA will enable DOE to fully consider the potential environmental impacts of issuing a loan guarantee for Phase 2 of the AEP commercial polysilicon production facility.

If successfully realized, the AEP production facility would have the potential to attract companies to build additional manufacturing facilities in Pennsylvania and throughout the U.S. to meet the growing domestic demand for clean, domestically produced and manufactured solar energy. AEP's internationally based sponsors and customers currently have significant international operations and have been in discussion with AEP to expand their operations into the U.S. The AEP polysilicon production facility is intended to serve as a catalyst for building a robust U.S. solar energy industry.

PURPOSE AND NEED

The Energy Policy Act of 2005 (EPAc 2005) established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII of EPAc 2005 authorizes the Secretary of Energy to make loan guarantees for a variety of types of projects, including those that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the U.S. at the time the guarantee is issued." The two principal goals of the loan guarantee program are to encourage commercial use in the U.S. of new or significantly improved energy-related technologies and to achieve substantial environmental benefits. Rising energy prices and global climate change resulting from elevated greenhouse gases in the atmosphere provide further need for the accelerated commercial use of new and significantly improved energy technologies. The purpose and need for the agency's action is to comply with DOE's mandate under EPAc 2005 by selecting eligible projects that meet the goals of EPAc. DOE is using the

NEPA process to assist in determining whether to issue a loan guarantee to AEP to support construction and startup of Phase 2 of the project.

PROPOSED ACTION AND ALTERNATIVES

DOE's proposed action is to issue a loan guarantee to AEP to be used for construction and startup of a Phase 2 commercial polysilicon production unit consisting of three silicon refining process blocks; supporting utilities; asphalt-paved truck-circulation and car-parking areas; stormwater management infrastructure; and a fire water retention and emergency containment pond.

AEP is commercializing an innovative polysilicon production process using advanced technology. AEP's objective is to be one of the lowest cost producers of high-purity granular polysilicon used to meet the rapidly increasing global demand for solar energy. Their innovative fluid bed technology constitutes an important and significant improvement in polysilicon production technology for solar energy application when compared with traditional commercial technologies currently in service in the U.S. AEP's closed loop fluidized bed reactor (FBR) method benefits from both a lower operating temperature and higher throughput from its continuous operation, thus resulting in lower energy consumption and fewer by-products compared to traditional commercial technologies. The FBR method addresses three shortcomings of other traditional methods of polysilicon production: (1) high operation cost and energy consumption due to its batch processes and extreme operating temperatures, with up to 90% of the energy dispersed and lost to the cold walls of the reactor; (2) the limited availability of highly volatile feedstock gas; and, (3) the production of environmentally harmful by-products, which can be expensive to dispose of and/or have limited marketability.

The Phase 2 project would occupy approximately 15 acres of an approximately 32-acre site located within the Keystone Industrial Port Complex (KIPC) in Fairless Hills (Falls Township, Bucks County), Pennsylvania. KIPC is designated as a Keystone Opportunity Improvement Zone by the Commonwealth of Pennsylvania and is the former US Steel Fairless Works facility. KIPC is a rapidly re-developing industrial Brownfield site comprised of nearly 2,500 acres located along the Delaware River north of Philadelphia, Pennsylvania and south of Trenton, New Jersey. KIPC is zoned by Falls Township for materials process and manufacturing. The AEP site was previously occupied by large mill buildings associated with steel making and finishing forging that were part of US Steel's former Fairless Works facility.

The No-Action Alternative would be for DOE not to issue a loan guarantee. Without a loan guarantee, AEP plans nevertheless to proceed with the construction and startup of the Phase 2 project as planned, but using non-federal funds. Consequently, the environmental impacts of the no action alternative would be the same as those of the proposed action.

SUMMARY OF ENVIRONMENTAL EFFECTS

The EA evaluates the potential environmental effects that could result from implementing the proposed action and no action alternative. Table 1 summarizes the potential environmental consequences that could result from implementing the proposed action and from the no action alternative. Only a very small overall impact on the environment, health or safety is noted. The environmental impact of the no action alternative would be the same as the under the proposed action, because without a loan guarantee, construction of AEP's Phase 2 project would

proceed as planned, but under a different funding scenario. Therefore the impacts listed in Table 1 apply to both the proposed action and the no action alternative.

Table 1. Summary of Impacts by Resource

Resource Area	Proposed Action and No Action Alternative
Land Use, Zoning and Public Policy	No significant adverse impacts to land use, zoning and public policy are expected. The proposed action would be consistent with existing industrial and manufacturing land uses presently on the project site and conform to the requirements of the Township Zoning Code.
Visual Resources	No significant adverse impacts on visual resources are expected. The proposed action would conform to the density, design and architectural characteristics permitted in the Township's zoning district and would be consistent with the surrounding industrial properties.
Air Quality	<p>Construction would result in short-term, minor air quality impacts. However they are not expected to result in significant exceedances of current pollutant levels within the project study area.</p> <p>Operation emissions would be generated during the silicon purification process. Anticipated emissions include approximately 82 metric tons per year of particulate matter (PM₁₀). All particulate emissions would pass through a baghouse filter system that is 99.9% effective, prior to release into the atmosphere, which significantly reduces potential PM emissions. Other chemical emissions would pass through a baghouse filter or scrubber system prior to release to the atmosphere and would be regulated under a Pennsylvania Department of Environmental Protection (PADEP) air permit. Emissions from the operations would not have an effect on surrounding properties.</p> <p>Gasoline and diesel-powered vehicles used by commuting employees and to deliver raw materials would result in emissions of several criteria pollutants and greenhouse gases. The resultant small emissions increase of ozone precursors would have a negligible effect on the moderate nonattainment (federal) status for ozone of Bucks County. The nonattainment (state) status for particulate matter (PM_{2.5}) in Bucks County would be negligibly impacted by the minor increase in emissions of delivery vehicle trips through the emissions of diesel exhaust.</p> <p>The operation of process blocks 2, 3 and 4 would result in approximately 55,000 metric tons per year of carbon dioxide emissions. These emissions would be offset by the significant reduction in GHG emissions realized by the application of the polysilicon to photovoltaics.</p>
Noise	Construction noise resulting from mobile and stationary sources would be temporary and localized. Operational on-site noise levels would be consistent with those of an isolated industrial and manufacturing site. There are no sensitive receptors within close proximity to the project site; therefore there would be no adverse noise impacts on schools, hospitals or residences.

Resource Area	Proposed Action and No Action Alternative
Geology	<p>There are no geologic hazards associated with the AEP site. All proposed structures would employ engineering designs that are in conformance with the 1977 Falls Township Uniform Construction Code. An Erosion and Sediment approval was granted on July 14, 2008 with a revised approval on September 2, 2008 for earth disturbance activities associated with the project.</p>
Water Resources	<p>Water Supply The proposed production facility requires approximately 657,600 gallons per day for normal usage and approximately 1.8 million gpd at peak usage. The Keystone Industrial Port Complex (KIPC) water system has sufficient capacity to service the AEP facility.</p> <p>Wastewater The proposed action would generate approximately 4,000 gallons of sewage per day and 350 – 450 gpm of industrial wastewater to be conveyed to and treated at the US Steel Real Estate Wastewater Treatment Plant. This plant can process up to 20 million gallons of wastewater per day, and has adequate capacity and appropriate permits to accept the projected wastewater flows from the proposed action.</p> <p>Water Quality To protect surface waters during construction, the project requires and has obtained a NPDES General Permit to address stormwater discharges associated with construction and post-construction activities. Additionally, an Erosion and Sediment (E&S) Control Plan has been developed for earth disturbances on the site.</p> <p>Floodplains The project site is not located within the 100-year or 500-year floodplain of the Delaware River or Biles Creek, therefore the proposed action would not result in significant adverse impacts on floodplains.</p>
Natural Resources	<p>Protected and Sensitive Habitats No significant adverse impacts on wetlands or sensitive areas are expected to occur as a result of the proposed action. The project site is located within a highly disturbed area of an industrial complex. The closest wetland area is approximately 1,500 feet west of the project site. The closest riparian zone is approximately 3,500 feet east of the project site.</p> <p>Threatened and Endangered Species The proposed action is not expected to result in significant adverse impacts to threatened or endangered species. As identified through the Pennsylvania Natural Diversity Inventory (PNDI) search, the potential exists for impacts to the Eastern red-bellied turtle and Eastern mud turtle. Based on on-site research and as shown in the site photographs and as confirmed by the Pennsylvania Fish and Boat Commission (PAFBC) the project site does not contain appropriate habitat for either species.</p> <p>[Continued]</p>

Resource Area	Proposed Action and No Action Alternative
Natural Resources	<p>Wildlife Migration and Nursery Sites Construction and operations would not interfere with the movement of any native resident fish or wildlife species or with any known established migratory wildlife corridors. Because the project site has historically been developed, on-site construction activities are not expected to affect migratory wildlife.</p>
Cultural Resources	<p>No significant adverse impacts on historic, archaeological, or Native American resources are expected due to the lack of these resources at the project site and the highly disturbed nature of the project site.</p>
Socioeconomics and Environmental Justice	<p>The entire AEP Facility is expected to result in 145 fulltime positions (100 in Phase 1, and an additional 45 in Phase 2 (constructed under DOE's proposed action to issue a loan guarantee) and approximately 500 indirect jobs.</p> <p>The Phase 2 proposed action requires capital expenditures of over \$350 million, at least 95% of which is expected to be used by United States-based vendors and contractors for equipment, fabrication, and construction.</p> <p>Based on the limited residential population living within close proximity to the project site and the lack of identifiable environmental justice populations, there would be no disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.</p>
Health and Safety	<p>As a result of the documented contamination issues on the project site and hazardous materials to be stored at the facility and used in the industrial processes at the facility, a Health and Safety Plan (HASP) has been prepared that assess chemical exposure and physical hazards that may be encountered at the project site, examines anticipated emissions of hazardous air pollutants from normal process operations and assess the potential for public exposure. In addition the following have been prepared: an Emergency Response Plan (ERP) to address responses to potential hazardous material discharges and coordination with local, State, and Federal authorities; a Spill Prevention, Control and Countermeasure Plan (SPCC) to address the storage of petroleum based liquids and steps to be taken should an accidental spill occur; a Preparedness, a Prevention, and Contingency Plan (PPC) for the construction of Phase 2 that identifies spill, leak prevention, response, and other factors to control potential discharges of pollutants into nearby waters; a Post Construction Stormwater Management Plan (PCSM) to manage stormwater runoff after construction activities have ended; and a Risk Management Plan (RMP) already submitted to the USEPA as part of the plan approved requirements for Phase 1 would be modified as additional Phase 2 process blocks are built.</p> <p>Consistent with the development and implementation of these various plans, the proposed action is not expected to result in any significant adverse public health impacts.</p> <p>[Continued]</p>

Resource Area	Proposed Action and No Action Alternative
Health and Safety	<p>Silicon tetrachloride (STC), a byproduct of the production process, is a hazardous material and can be potentially fatal if inhaled in high concentrations. STC in liquid phase would react with water to form hydrochloric acid (HCl) vapor. If a spill or release of material were to occur, the liquid would be collected in the containment pits. Emergency workers would be equipped with self-contained breathing apparatus during any potential accidents associated with STC.</p> <p>The potential exists for air pollutant and emission impacts to nearby workers in other facilities and residential locations. The KIPC contains dozens of industrial operations where hundreds of workers are located. In addition, residential areas are located in Bordentown, New Jersey (approximately 1.3 miles), in Roebling, New Jersey (approximately 2.6 miles) and in Fairless Hills, Pennsylvania (approximately 3 miles). An event at the AEP facility could threaten the health and safety of these workers and residential areas. An Emergency Response Pre-plan has been prepared and examines some of the more likely accident scenarios and potential receptors of air-borne releases. With the development and implementation of the aforementioned plans the proposed action is not expected to result in any significant adverse public health impacts.</p>
Transportation	<p>The proposed action would not result in significant increases to traffic volumes on the local or regional road network. The increase in traffic from the proposed action would not result in any decrease in levels of service for the two main roads servicing the KIPC. In addition impacts from construction traffic would be localized and temporary.</p>
Cumulative Effects	<p>The cumulative contribution of impacts that the proposed action would make on the various environmental resources is expected to be minor. Long-term beneficial cumulative effects on socioeconomics are expected to occur from job creation from the proposed action in combination with the redevelopment of the KIPC. The project would result in long-term, sustained environmental benefits increasing the use of solar energy, thereby reducing dependency on fossil fuels and in turn, reducing GHG emissions and the adverse impacts of global climate change.</p>

CHAPTER 1

PURPOSE AND NEED

1.1 PURPOSE AND NEED

The Energy Policy Act of 2005 (EPAcT 2005) established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII of EPAcT 2005 authorizes the Secretary of Energy to make loan guarantees for a variety of types of projects, including those that “avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the U.S. at the time the guarantee is issued.” The two principal goals of the loan guarantee program are to encourage commercial use in the U.S. of new or significantly improved energy-related technologies and to achieve substantial environmental benefits. Rising energy prices and global climate change resulting from elevated greenhouse gases in the atmosphere provide further need for the accelerated commercial use of new and significantly improved energy technologies. The purpose and need for the agency’s action is to comply with DOE’s mandate under EPAcT 2005 by selecting eligible projects that meet the goals of the Act.

The U.S. Department of Energy’s (DOE) proposed action is to issue a loan guarantee¹ to AE Polysilicon Corporation (AEP). The loan guarantee would be used for construction and startup of AEP’s Phase 2 commercial polysilicon production unit consisting of three silicon refining process blocks; supporting utilities; asphalt-paved truck-circulation and car-parking areas; stormwater management infrastructure; and a fire water retention and emergency containment pond (altogether referred to herein as “Phase 2”). Polysilicon is the key raw material in the production of over 90% of all solar photovoltaic cells and modules. One polysilicon process block (Phase 1) at the AEP production facility is currently completing construction and has an estimated full-load annual output of 1,800 metric tons. The Phase 2 expansion would add three additional process blocks and could increase total annual polysilicon production maximum full-load capacity by an estimated 5,400 metric tons to a total facility production of 7,200 metric tons. A Site Plan showing Phase 1 and Phase 2 is provided in Figure 1. The location of the project site in Fairless Hills, Bucks County, Pennsylvania is shown in Figure 2.

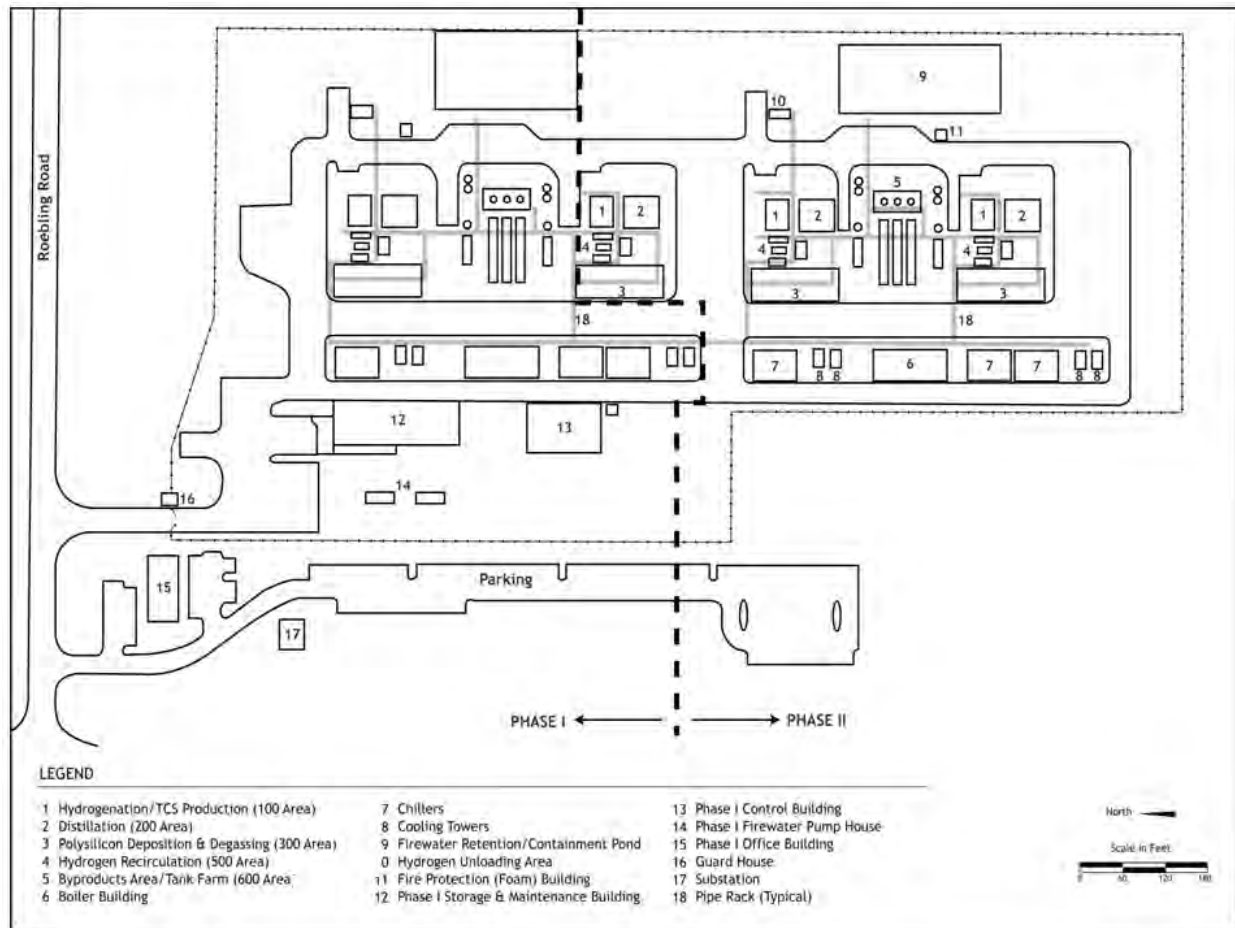
DOE is using the National Environmental Policy Act of 1969 (NEPA) process to assist in determining whether to issue a loan guarantee to AEP to support construction and startup of Phase 2.

1.2 BACKGROUND

Title XVII of EPAcT 2005 provides the basis of DOE’s Loan Guarantee Program. This title provides broad authority to DOE to guarantee loans that support early commercial use of advanced technologies, if “there is reasonable prospect of repayment of the principal and interest on the obligation by the borrower.” Loan guarantees are one way in which DOE promotes commercial use of innovative

¹ The amount requested for the loan guarantee is not being disclosed at this time because it is business sensitive. Moreover, should DOE approve a loan guarantee, the amount may differ from the original request.

Figure 1: Site Plan

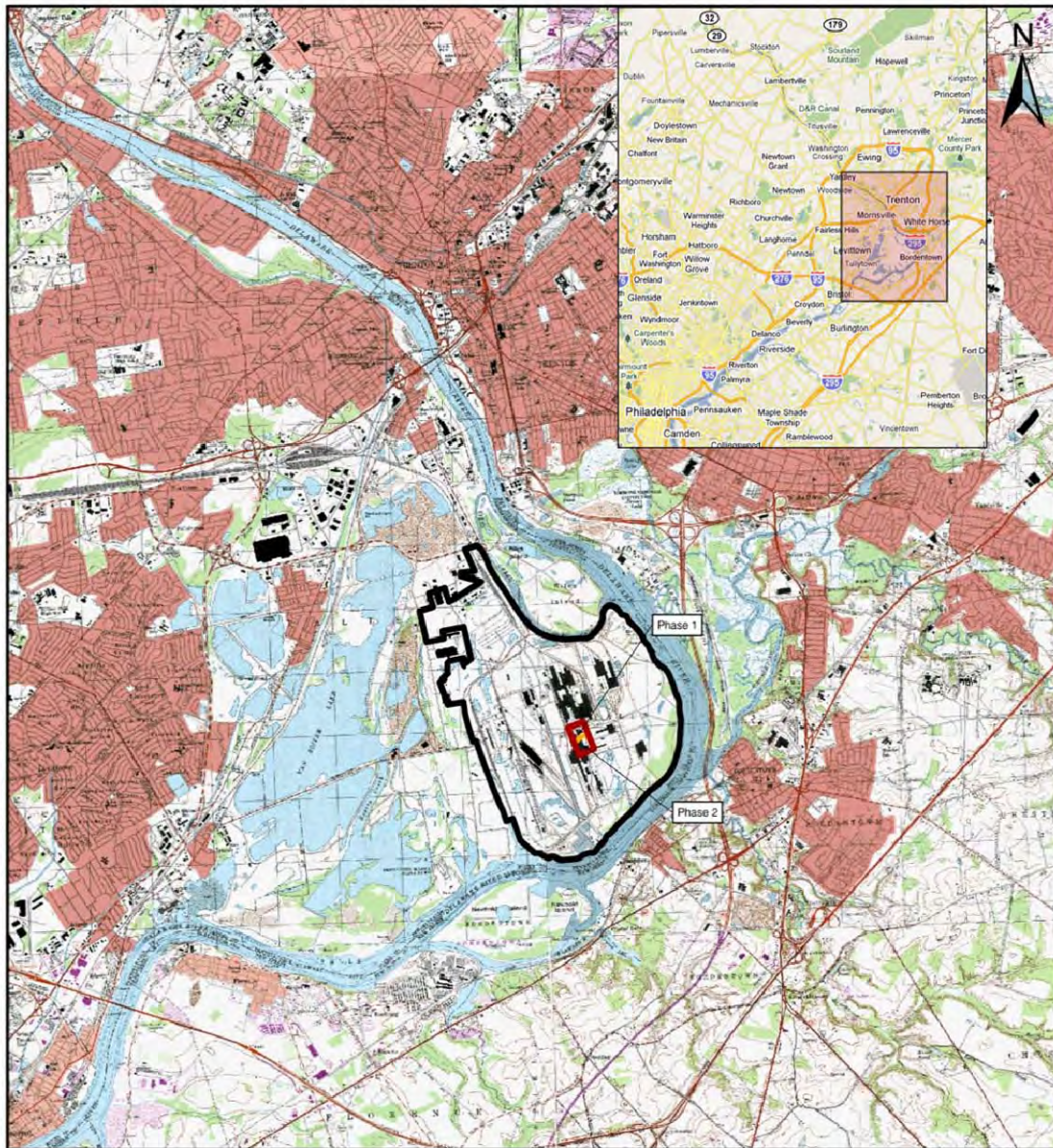


technologies. This tool is targeted at early commercial use only, rather than energy research, development, and demonstration programs. Accelerated commercial use of new or improved technologies will help sustain economic growth, yield environmental benefits, and produce a more stable and secure energy supply.

DOE published *Guidelines for the Loan/Guarantee Program* in the Federal Register and issued a solicitation announcement. The solicitation invited interested parties to apply for loan guarantees in support of debt financing for projects in the U.S. that employ energy efficiency, renewable energy, and advanced transmission and distribution technologies that constitute New or Significantly Improved Technologies. Loan guarantees issued under Section 1703 of Title XVII are intended to facilitate accelerated commercialization of energy efficiency, renewable energy and advanced transmission and distribution technologies.


Title XVII was amended by Section 406 of the American Recovery and Reinvestment Act of 2009, P.L. 111-5 (the "Recovery Act"), to create Section 1705 authorizing a new program for rapid deployment of renewable energy and electric power transmission projects (the "Section 1705 Program"). Section 1705

Figure 2: Site Location Map



Map Reference: USGS 7.5' Topographic Map, Princeton, Columbus, Pennington, Bristol, Trenton West and Trenton East Quads (1995)

Legend

-  Keystone Industrial Port Complex Boundary
-  AE Polysilicon Corporation Boundary
-  Phase Boundary

0 7,500 15,000
Feet



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SITE LOCATION MAP
FALLS TOWNSHIP

BUCKS COUNTY

PENNSYLVANIA

NEW JERSEY PENNSYLVANIA NEW YORK CONNECTICUT FLORIDA NEVADA

Project No.
002638304

Date
9/15/09

Scale
1" = 7,500'

Figure No.
2

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S:\data\002638304\ArcGIS\MapDocuments\Figure 2 Site Location Map.mxd

of Title XVII is authorized by the Recovery Act notwithstanding Section 1703 of job creation, infrastructure investment, energy efficiency and science, assistance to the unemployed, and State and local fiscal stabilization. The Section 1705 Program is designed to address the current economic conditions of the nation, in part, through rapid deployment of renewable energy and transmission projects. The Section 1705 Eligible Projects that are selected for loan guarantees issued under Section 1705 of Title XVII will be required to comply with the Final Regulations, as well as all the requirements of Title XVII, including the provisions of Sections 1703 and 1705, and all applicable provisions of the Recovery Act.

1.3 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) presents information on the potential impacts associated with guaranteeing a loan to AEP and covers the construction and startup of Phase 2 of their polysilicon production facility located in Fairless Hills, Bucks County, Pennsylvania. DOE has prepared this EA in accordance NEPA, Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500–1508), and DOE NEPA Implementing Procedures (10 CFR 1021). If no significant impacts are identified during preparation of this EA, DOE will issue a Finding of No Significant Impact (FONSI). If potentially significant impacts are identified, DOE would prepare an Environmental Impact Statement (EIS).

This EA: (1) describes the affected environment relevant to potential impacts of the proposed action and no action alternative; (2) analyzes potential environmental impacts that could result from the proposed action; (3) identifies and characterizes cumulative impacts that could result from the proposed action in relation to other ongoing or proposed activities within the surrounding area; and, (4) provides DOE with environmental information for use in decision making to protect, preserve, and enhance the human environment and natural ecosystems.

CHAPTER 2

PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

AE Polysilicon is commercializing an innovative polysilicon production process using advanced technology. This technology has a lower production cost base compared to traditional commercialized technologies and, combined with a unique product form, has the potential to reduce the overall cost of solar energy panel production and accelerate its adoption. AEP's objective is to be one of the lowest cost producers of high-purity granular polysilicon used to meet the rapidly increasing global demand for photovoltaic (PV) cells for solar energy. The polysilicon production facility is intended to serve as a catalyst for building a robust U.S. solar energy industry. AEP is headquartered in eastern Pennsylvania and is currently in the final stages of constructing their first polysilicon process block and support facilities (Phase 1) of the overall planned production facility.

DOE's proposed action is to issue a loan guarantee to AEP to be used for construction and startup of a Phase 2 expansion of the AEP facility, which calls for three additional process blocks to provide three times the capacity of commercial polysilicon production in Phase 1.

2.2 PROPOSED ACTION

DOE's proposed action is to issue a loan guarantee to AEP for the proposed construction and startup of Phase 2 of the AEP commercial polysilicon production facility. A more detailed description of the project is provided herein.

Proposed Project

The Proposed Project is the construction and startup of a Phase 2 expansion of the AEP commercial polysilicon production facility, a silicon-refining plant for production of high purity granular polysilicon as shown in Figure 3. Polysilicon is the key source material used in the subsequent manufacture by others of solar photovoltaic (PV) cells and modules. AEP has developed an innovative closed-loop fluidized bed reactor (FBR) technology. A Phase 1 process block is in the final stages of construction and would be in production prior to commencing construction of Phase 2. Closed-loop FBR constitutes a significant improvement in polysilicon production technology as opposed to traditional commercial production technologies for "chunk" polysilicon in the U.S. AEP's FBR method benefits from both a lower operating temperature and higher throughput from its continuous operation, thus resulting in lower energy consumption and fewer by-

Figure 3: Granular Polysilicon



Granular polysilicon requires no additional processing prior to its use. It is in a physical form that promotes PV manufacturing efficiency. As opposed to the chunk form produced by conventional block crystal growth processes, granular polysilicon lends productivity advantages and allows innovations in high-speed, high-volume solar cell and module manufacturing.

products. The closed-loop FBR method addresses three shortcomings of traditional methods of polysilicon production: (1) high operation cost and energy consumption due to its batch processes and extreme operating temperatures, with up to 90% of the energy dispersed and lost to the cold walls of the reactor; (2) the limited availability of highly volatile feedstock gas; and, (3) the production of environmentally harmful by-products, which can be expensive to dispose of and/or have limited marketability.

Phase 2 consists of three process blocks. A “process block” comprises six areas (designated as areas 100, 200, 300, 400, 500, and 600) made up of a number of individual but interconnected production process modules and production support facilities. The three process blocks proposed in Phase 2 would have an annual polysilicon production maximum capacity of 5,400 metric tons.

Phase 2 also includes the construction of supporting utilities; asphalt-paved truck-circulation, car-parking areas; stormwater management infrastructure; and a fire water retention and emergency containment pond. A Site Plan showing the proposed project (Phase 2) as well as Phase 1 which is currently under construction, is provided in Figure 1.

Project Location

AEP plans to construct the Phase 2 project adjacent to the Phase 1 polysilicon production facility. The Phase 2 project would occupy approximately 15 acres of the approximately 32-acre site. The AEP site is located within the Keystone Industrial Port Complex (KIPC) in Fairless Hills (Falls Township, Bucks County), Pennsylvania (Figure 2). KIPC is designated as a Keystone Opportunity Improvement Zone (KOIZ) by the Commonwealth of Pennsylvania and is the former US Steel Fairless Works facility. KIPC is a rapidly re-developing industrial Brownfield site comprised of nearly 2,500 acres located along the Delaware River north of Philadelphia, Pennsylvania and south of Trenton, New Jersey. Neighboring facilities in KIPC include Gamesa Wind, Toll Brothers and Dominion Energy. KIPC is zoned by Falls Township for materials process and manufacturing.

The AEP site was previously occupied by large mill buildings associated with steel making and finishing forging that were part of US Steel’s former Fairless Works facility. Building structures that formerly existed on the AEP site included billet mill and condition buildings, a bar mill building, a roll shop, an 80-inch hot strip mill, and a billet yard. Most of this former building mass was situated on the western portion of the AEP site. All of the building structures on the AEP site were demolished in the early 1990s; except for a portion of the 80-inch hot strip mill motor room adjacent to the site’s western boundary. While the above-ground portions of these former US Steel structures no longer exist, extensive below-grade elements and substructure basements, foundations, slabs, cooling beds, pits and vaults remain in place.

In addition to the former building substructure, underground utilities exist within the AEP site. The majority of these existing buried utilities are bundled in two north-south corridors within the central portion of the AEP site. These utility corridors are situated between the former mill buildings. Many of the existing utilities would be used during construction and build-out of AEP’s proposed facility.

Construction

Construction of the first of the three process blocks would occur over approximately 18 months, with the full build-out expected to occur over a period of up to 36 months.

Construction of the Phase 2 polysilicon production facility would include the foundations, structures, cooling towers, process modules, storage tanks, hoppers, and other utilities associated with the three new process blocks. As shown in Figure 1, the three process blocks would be constructed in-line with the Phase 1 process block. Also included in Phase 2 are additional stormwater management facilities and firewater retention ponds needed to accommodate surface water run-off from the process blocks and new impervious surfaces. Additional car parking, truck circulation, and utility infrastructure would be added as well.

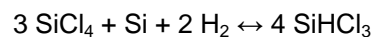
Production Process

Each of the proposed three process blocks would have six process areas referred to as:

- 100 Area -- hydrogenation/trichlorosilane, SiHCl₃ (TCS) production;
- 200 Area – distillation,
- 300 Area -- polysilicon deposition and degassing;
- 400 Area -- utilities (cooling towers, hot oil and chiller modules);
- 500 Area -- H₂ recirculation;
- 600 Area -- waste gas scrubbing and tank farm.

The production process would use an advanced fluidized bed reactor technology to form ultra-pure solar grade polysilicon granules. Byproducts produced during the production process would be integrated back into the production process in a closed-loop. There are two core steps of a complex production cycle: hydrogenation and deposition:

- (1) In the hydrogenation process (100 Area), >98% pure metallurgical grade silicon (MG-Si) feedstock would be fed along with a recycled stream of silicon tetrachloride SiCl₄ (STC) plus H₂, under pressure and high temperature. The adiabatic (i.e., no heat is added or removed), reactions to convert the silicon (Si) in the feed MG-Si to trichlorosilane, SiHCl₃ (TCS) can be simplified as:

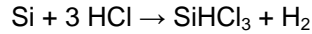
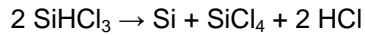


This TCS could be considered as the building block in the final production of polysilicon.

- (2) In a subsequent deposition process, TCS would be fed into a FBR at a temperature high enough to allow the TCS to decompose to elemental Si and to form polysilicon granules, the polysilicon end-product. There would be a number² of FBRs per process block, each FBR designed to

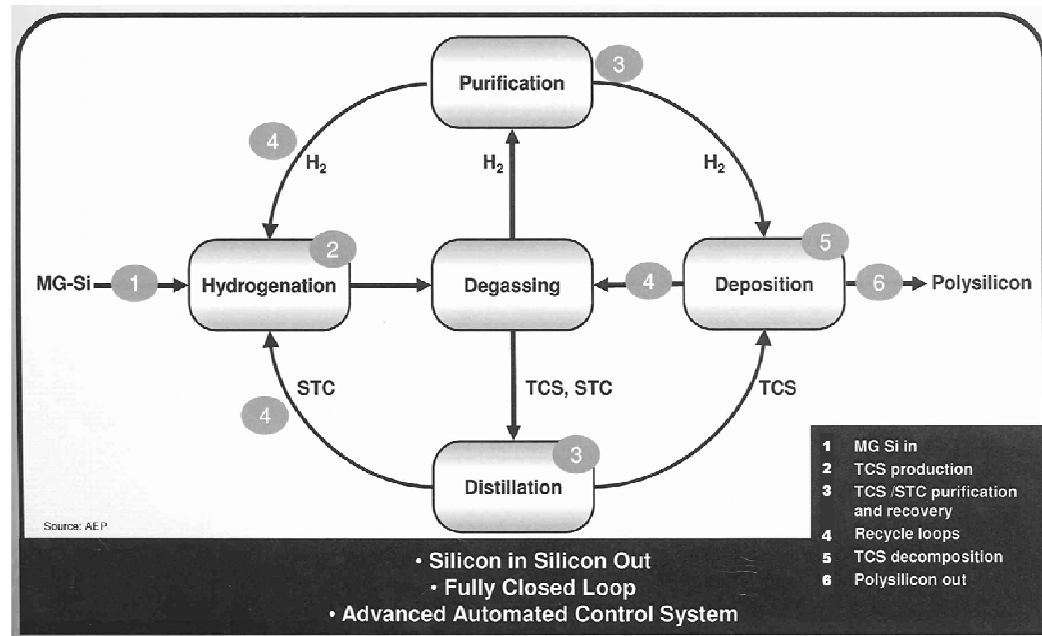
²As of the time of writing (November 2010) AEP has not finalized the number of FBRs. This might range between 4 larger sized FBRs to 12 smaller sized FBRs in each process block. The materials consumed, polysilicon production capacity, and process

produce polysilicon, which would have a purity of 99.999999 percent (referred to as “9N”). The reactions occurring in the decomposition reactors are as follows:



A schematic overview of the closed loop process is shown in Figure 4.

Figure 4. Closed Loop Process



Process waste streams would be treated in the 600 Area. They would be first collected in a “knock out” tank which is designed to separate liquids and vapors. The liquid would be transferred to a liquid recovery tank and the vapors would be neutralized with a caustic soda solution (sodium hydroxide [NaOH]) prior to being discharged to atmosphere. Filtered solids would be disposed of off-site as non-hazardous “Filter Cake” (mostly silica [SiO₂]). Wastewater and sanitary water would be discharged into respective US Steel pipelines. These waste discharges are discussed in the Operation Plan below.

The tank farm area is to consist of tanks for the storage of TCS and STC. An emergency tank and scrubbing system would be provided in order to collect gases and liquids from the depressurization of the high pressure reactors in the event of an emergency or maintenance shutdown.

The electric distribution system for each block would comprise of a feeder supplied from existing US Steel switchgear on the KIPC site. Natural gas would be used for the production of steam in boilers. N₂ and H₂ would be supplied by truck as refrigerated liquids and unloaded into storage tanks. Potable and process water would be supplied by US Steel. (See Table 2 for amounts).

emissions would not change.

Operation Plan

AEP has developed a sequential and comprehensive plan to identify the necessary steps to successfully commission, start up, and operate a polysilicon production facility that would guide their operating philosophy. This plan was developed to operate the facility safely, efficiently and in full compliance with all regulatory requirements. A summary of the key objectives for the operational plan are listed below.

- Develop life critical procedures, inclusive of emergency response training;
- Provide basic operator training, inclusive of equipment unit operations;
- Provide specific process training (i.e. hydrogenation technology, distillation, deposition reactors, utilities, etc.);
- Provide by-products training;
- Develop and implement punch listing plan inclusive of tracking capability;
- Complete technical review of all piping and instrumentation designs with appropriate “sign off” tracking;
- Develop, implement and complete system leak checking with nitrogen and follow with H₂;
- Develop and complete passivation³ activities for all equipment; and
- Develop and implement silicon tetrachloride (STC) recycle plan.

The life critical procedures address specific procedures and operations at the facility where the storage and handling of hazardous materials could lead to life threatening situations if not monitored and correctly handled. By-products and end-products in the industrial process are either recycled back into the industrial process or are captured and neutralized. The entire system would initially be leaked checked using nitrogen which would aid in identifying gross leaks. A final leak check would be performed by using H₂ which can be detected using more sensitive instrumentation. The main gas materials in the process would be STC and TCS. The STC recycling plan targets the capture and reuse of STC in the industrial process. However it would be necessary to supplement approximately 3% of the STC used. This supplemental STC would be delivered to the facility by tanker trucks, transferred to storage tanks, and stored as a liquid at ambient temperature and pressure.

The tank farm area would consist of tanks for the storage of pure TCS and STC. There would also be one tank for the storage of “off spec” TCS and/or STC that would be fed back in to the process to be further purified, and a tank for material that would be fed into the neutralization system.

An emergency vent tank and scrubbing system is to be provided in order to collect gases and liquids from the depressurization of the high pressure reactors in the event of an emergency or maintenance shutdown.

Once Phase 2 is operational, additional materials would be needed to manufacture the polysilicon including metallurgical grade silicon, STC, H₂, service water, potable water, natural gas, and electricity. Estimated utility usage needed to run the polysilicon production process is provided in Table 2. AEP’s anticipates that their polysilicon production process would generate the following waste effluents from various points in the production process:

³ Forming a protective coating and making more corrosion resistant.

- From Boilers:
 - Carbon monoxide (CO)
 - Nitrogen oxides (NO_x)
 - Sulfur oxides (SO_x)
 - Hydrocarbons and volatile organic compounds (HC/VOC)
 - Particulate matter (PM₁₀)
- From Scrubber:
 - Hydrochloric Acid (HCl) less than 3ppm
- From Cooling Towers, Vent Filters, and Bag Houses:
 - PM₁₀
- From Filter Unit:
 - Non-hazardous Filter Cake (mostly SiO₂), based on chemical modeling.
 - 10-14% NaCl/H₂O Solution
- From General Operations:
 - Waste Oil (Non-hazardous)

Table 2. Anticipated Phase 2¹ Utility Demand².

UTILITY		Phase 1 (One Process Block) 1,800 TPY Maximum Polysilicon	Phase 2 (Three Process Blocks) ² 5,400 TPY Maximum Polysilicon	Phases 1 and 2 (Four Process Blocks) ² 7,200 TPY Maximum Polysilicon
Service Water for Operations	Peak	300 gpm	800 gpm	1,100 gpm
	Normal	100 - 150 gpm	300 - 400 gpm	300 - 550 gpm
Service Water for fire fighting		3,000 to 15,000 gpm	3,000 to 15,000 gpm	3,000 to 15,000 gpm
Industrial Wastewater	Peak	350 gpm	850 gpm	12,000 gpm
	Normal	150 - 200 gpm	350 - 450 gpm	350 - 650 gpm
Potable Water	Peak	100 gpm	150 gpm	250 gpm
	Normal	2,400 gpd	4,000 gpd	6,400 gpd
Sanitary Sewer	Peak	40 gpm	70 gpm	110 gpm
	Normal	2,400 gpd	4,000 gpd	6,400 gpd
Natural Gas		43,300 SCFH	126,000 SCFH	169,000 SCFH
Electric Power		7,000 KVA	19,000 KVA	26,000 KVA
TPY = Tons Per Year gpd = Gallons Per Day gpm = Gallons Per Minute SCFH = Standard Cubic Feet Per Hour KVA = Kilo Volt Amperes				
¹ Initial Phase 1 demand, and total Phase 1 plus Phase 2 demands are also shown for comparative purposes.				
² Some utilities and equipment would be shared among process blocks. Hence, utility demands are not directly proportional.				

Industrial wastewater from Phase 2 would be generated by boiler and cooling tower blowdowns, evaporative condensers, non-contact cooling water, filtered scrubber water and other equipment cleaning processes. The water would consist of trace quantities of boiler and cooling tower treatment chemicals and salt, all of which have been approved for disposal by the Pennsylvania Department of Environmental Protection (PADEP). The water would be conveyed to and treated at the US Steel Real Estate Wastewater Treatment Facility (refer to Section 4).

Volatile silane gases such as monosilanes and chlorosilanes can be produced during the refining process and are reactive in the presence of oxygen, water or moisture. AEP has significantly reduced the risk of these gases by designing and implementing a closed-loop production process. This process would reduce the risk of exposure from the handling and disposing of the potentially dangerous substances by recycling them back into the production process.

AEP has a USEPA Identification Number⁴ with “small quantity” generator status. Based on chemical modeling, the main waste generated would be a “non-hazardous” filter cake (mainly silica) that would be disposed of in a local landfill pending Toxicity Characteristic Leaching Procedure (TCLP) analysis once the facility is in operation. AEP is currently looking into alternative disposal options, such as Portland cement, for the filter cake as opposed to landfilling the filter cake material if it is confirmed to be non-hazardous. Should the filter cake prove to be hazardous, AEP would request a change from small quantity generator to “large quantity” generator and provide for the appropriate disposal of the material. Table 3 provides a summary of the truckloads per year for production and disposal associated with Phase 2.

Table 3. Estimated Truck Loads per Year and TPY of Materials in the Production and Disposal for Phase 2

Production or Disposal Material	Trucks per Year	TPY
Metallurgical Grade Silicon	250 - 300	5,000 - 6,000
Silicon Tetrachloride	20 - 40	400 - 800
Hydrogen	20 - 40	100 - 200
Nitrogen	40 - 75 (see Note 1)	1,000 - 1,500
Sodium Hydroxide (50%)	75 - 100	1,500 - 2,000
Filter Cake	150 - 200	1,500 - 2,000
Polysilicon Final Product	300+ (see Note 2)	Up to 5,400
Miscellaneous Deliveries	1,300 (see Note 3)	

Note 1: AEP plans on installing on-site Nitrogen generating equipment that would eliminate or dramatically reduce the number of truck loads required.
 Note 2: This number could be somewhat higher because shipments would not always be made in 20 metric ton quantities.
 Note 3: Miscellaneous deliveries of spare parts and consumables.
 Note 4: Certain assumptions were used in generating these estimates including: MG Silicon weight is 20 tons/load; STC weight is 20 tons/load; H₂ weight is 5 tons/load; N₂ weight is 20 tons/load; NaOH weight is 20 tons/load; and, Filter Cake weight is 10 tons/load.

⁴ RCRA requires individuals who generate or transport hazardous waste, or who operate a facility for recycling, treating, storing, or disposing of hazardous waste, to notify USEPA or their authorized State waste management agency of their regulated waste activities and obtain a US EPA Identification (ID) Number. An EPA ID Number is not a permit, it is issued to identify a facility for hazardous waste management and tracking purposes. Small Quantity Generators generate between 100 kg and 1000 kg of non-acute hazardous waste a month, less than 1 kg of acute hazardous waste a month, and less than 100 kg of spill residue from acute hazardous waste; whereas Large Quantity Generators generate 1,000 kg or more of hazardous waste or 1 kg or more of acutely hazardous waste a month.

Containment

Fire water collection and spill containment would be provided wherever a potentially hazardous liquid could be accidentally released. This includes the following functional areas:

- Process Area 100-Hydrogenation
- Process Area 200-Distillation
- Process Area 300-Deposition
- Process Area 400-Utilities
- Process Area 600-Waste Gas Scrubbing
- Process Area 600-Tank Farm Consisting of four tanks:
 - Tank 1: Pure TCS storage
 - Tank 2: Pure STC storage
 - Tank 3: Rework tank
 - Tank 4: Neutralization Feed tank
- Truck Unloading Area for Caustic Soda Solution (50% Aqueous Sodium Hydroxide)
- Truck Unloading Area for TCS/STC.
- Caustic Tank Storage Area

A small volume of TCS would be required to commission each process block and may need to be brought on site from an outside supplier.

Sufficient containment volume would be provided within each process block to contain the potential spill volume expected from the largest tank, the volume of a 24-hour rainfall from a 100-year storm, and a volume allowance for "freeboard." This local containment would be by means of curbing and sumps constructed of concrete at the base of the process blocks. Refer to Figure 1 for the locations of the containment areas.

In addition to the process block spill containment area, there would also be a lined pond that can retain firewater released from sprinklers in the process blocks. Each of the process block spill containment areas would be connected to the firewater retention pond in such a way that released firewater can flow to the pond without need for intervention by plant operating personnel. There would also be a connection with a manual block valve that would allow collected spills or collected rainwater to flow to the lined firewater retention pond. Normally, spills of process liquids would be kept in the process block containment sumps. Uncontaminated rainwater would be allowed to transfer to the lined firewater retention pond.

The firewater retention ponds have been sized to retain approximately 600,000 gallons of released firewater. After testing, any uncontaminated water collected in the pond would ultimately be transferred to the stormwater system at a limited transfer rate via gravity flow. This transfer would be initiated only after the collected water is tested and found to be acceptable. Should the firewater retention pond water quality be unacceptable, the contents would be pumped out for appropriate treatment and disposal.

Production

Once the entire AEP facility (Phase 1 and Phase 2) is operating, approximately 145 employees would be employed with the production employees running on a rotation schedule for 24 hours a day/7 days a week ("24/7"). Approximately 100

employees are expected to be employed through Phase 1 (currently completing construction) and an additional 45 employees are expected to be employed with the addition of Phase 2 (constructed under DOE's proposed action to issue a loan guarantee). It is expected that the primary increase in jobs for Phase 2 would be associated with direct labor/operations positions with minimal increase in support and administrative positions. Job functions and duties needed to operate the facility include management, administrative, manufacturing, operations, quality control, maintenance, health and safety, engineering, information technology and accounting.

AEP estimates that the Phase 2 facility would be able to produce approximately 5,400 metric tons of polysilicon annually. The granulated polysilicon would be packaged, palletized, and transported by truck for freight shipment. For international customers, the product would be shipped via oceangoing containers.

Project Schedule

AEP has worked with its engineering and construction contractors ensuring contracts were in place with performance guarantees and milestones for their Phase 1 facility, and would use similar contracting methodologies to facilitate the Phase 2 schedule. A project schedule is shown below.

- Planning and funding in place; contracting purchasing begins:
- Begin construction: 3 months
- First phase of project construction complete/production start-up of begins: 15 months
- Second phase of project construction complete/production start-up begins: 21 months
- Third (final) phase of project construction complete/production start-up begins: 24 months
- All three phases production start-up completed and full-production achieved: 24 months

Permits and Approvals

The AEP polysilicon production facility (Phase 1 and Phase 2) has received a number of permits and approvals to date. (* Indicates where copies of approvals are included in Appendix A.)

- Erosion and Sedimentation Control Approval from the Bucks County Conservation District (BCCD)*;
- Storm water Discharge Approval from BCCD*;
- National Pollutant Discharge Elimination System (NPDES) Permit for Earth Disturbance from the PADEP. This permit is for the entire site and covers both Phase 1 and Phase 2 construction activities*.
- US Steel's NPDES Permit for Industrial Discharge has been modified to include AEP's waste water streams. The US Steel Real Estate Wastewater Treatment Facility at KIPC has a 20 million gallon per day treatment capacity.
- A Phase 1 Air Quality Plan Approval/Construction and a Temporary Operating Permit from PADEP have been issued (Appendix A). When construction of Phase 1 is complete, the facility would enter in to a 180

day “shake-down” period, whereupon the operation of the permitted control devices would be verified by monitoring, recording and performing stack tests. Conditions set forth in the Plan Approval are negotiable and can be amended based on the results of these tests. This 180 day period can be extended if needed. The conditions must be finalized prior to submitting a State-Only Operating Permit application*.

- Boiler Permit issued by PADEP;
- Release of Liability from PADEP under the Land Recycling Program (Act 2)*;
- Act 537 Sewer Planning Approval from PADEP*;
- Land Development Approval from Falls Township*;

To start construction of the Phase 2 project, additional permits and approvals would be needed. These include:

- Approval of Phase 2 Site Plan by Falls Township;
Two additional PADEP Air Quality Plan Approvals, one for Process Block 2 which would share some resources with Process Block 1 (Phase 1), and a second for Process Blocks 3 and 4 which would be built concurrently and would share some resources. (The additional process blocks 2, 3, and 4 constitute the Phase 2 expansion.) Once construction of each of these blocks is completed, they would go through a “shake-down” period before being added to the facilities Operating Permit.
- Building Permits from Falls Township.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED

During selection of a site for the polysilicon production facility, AEP evaluated several locations in the U.S. and abroad including locations in Pennsylvania, Washington State, Alabama, Asia (Taiwan), and the Middle East. The Fairless Hills, Pennsylvania site was chosen because of the number of major colleges and universities in the region and the number of regional chemical facilities from which to hire talented people. Additionally, none of the other sites evaluated were found to have closer proximity to major state and interstate highways, port facilities, or rail facilities. AEP also considered the significant environmental value and tax benefits in redeveloping an existing brownfield site designated as a KOIZ by the Commonwealth of Pennsylvania.

AEP is seeking a loan guarantee from DOE for construction and startup of the Phase 2 project at their commercial polysilicon production facility. The Phase 1 component of their facility is currently under construction and will not be funded by the loan guarantee. Phase 1 includes one silicon process block. The proposed Phase 2 project consists of the construction of process blocks two, three and four at the facility. To achieve the efficiency and environmental benefits of AEP’s closed loop silicon refining process and meet the needs of the project, these blocks must be constructed in-line. There are no other areas on the site, alternate layouts or configurations, or design modifications that would be more prudent and feasible than the preferred alternative shown in Figure 1. Further, there are no unresolved conflicts concerning alternative uses of available resources associated with the project site that would suggest the need for other alternatives

2.4 No-ACTION ALTERNATIVE

The No-Action Alternative would be for DOE not to issue a loan guarantee. Without a loan guarantee, AEP plans nevertheless to proceed with the construction and startup of the Phase 2 project as planned, using non-federal funds. Consequently the environmental impacts of the no action alternative would be the same as the proposed action. If in the event Phase 2 were not to proceed (albeit that is not envisioned) the environmental impacts would remain those of Phase 1.

CHAPTER 3

AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes the existing social, economic, and environmental conditions of the project site. This information is used in Chapter 4, Environmental Consequences, as the baseline for identifying and evaluating impacts resulting from the proposed action and the no action alternative described in Chapter 2, Proposed Action and Alternatives.

3.2 LAND USE, ZONING AND PUBLIC POLICY

This section describes the land use and zoning on the project site and adjacent areas, and the relevant public policy as it pertains to redevelopment of the project site.

3.2.1 Land Use

The AEP polysilicon production facility is located in the central portion of KIPC in Fairless Hills, Pennsylvania. The KIPC is an approximately 2,500-acre industrial site located along the banks of the Delaware River in Fairless Hills, an incorporated area within Falls Township, Pennsylvania (Figure 2). The AEP site is bounded on the north and east by Roebling Road, on the south by Sinter Road, and on the west by Sorrells Boulevard (Figure 5). The site is relatively flat with pockets of sparse vegetation typical of a disturbed industrial site. Remnants of the prior industrial use—the US Steel facility that previously occupied the site from 1952 through 2001—are present including concrete and brick floor and asphalt paving. The site includes extensive below-grade elements and substructure components including basements, foundations, slabs, cooling beds, pits and underground utilities, the majority of which are bundled in two north-south corridors in the central portion of the site. See “Utilities” section for additional analysis. The site also includes portions of a local railroad network owned by US Steel.

The AEP site is set within KIPC, which is bounded north to south by the Delaware River and on the west by Van Sciver Lake (Figure 2). Similar to the AEP site, KIPC is an industrial site that is predominantly earth-lined but features more substantial vegetation, trees and grass, especially along the western boundary near Van Sciver Lake and the eastern boundary along the Delaware River. The KIPC includes a road network and several similar industrial, energy and manufacturing businesses including Gamesa Wind, Toll Brothers, Dominion Energy, Exelon/PECO Energy, Waste Management and Kinder-Morgan. A deep-water, ocean vessel port facility operated by Kinder Morgan is located on the Delaware River, approximately 1.20 miles southwest of the AEP site. Rail lines owned by US Steel that serve the Norfolk Southern Rail Road span the majority of KIPC.

Figure 5. Site Access Plan



Map Reference: DVRPC Aerial Photography of Bucks County (2006), Road/Street Map provided by Google

Legend

- Keystone Industrial Port Complex Boundary
- AE Polysilicon Corporation Boundary
- Phase Boundary
- Rivers
- Roads
- Railroads



**SITE ACCESS PLAN
FALLS TOWNSHIP**

BUCKS COUNTY		PENNSYLVANIA	
Project No. 002638304	Date 9/15/09	Scale 1" = 1,500'	Figure No. 5

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3.2.2 Zoning

The AEP site is located within a Materials Processing and Manufacturing (MPM) zoning district designated by Falls Township (Figure 6). The MPM district provides an existing area in Falls Township devoted to integrated, large-scale industrial production of iron, steel, or other materials, processing, fabrication and related activities which utilize massive or heavy equipment; manufacture products from primary raw material sources; require large outdoor storage of equipment or machinery for processing or storage purposes; are massive users of highway, rail or water transportation, including port facilities; or, are exceptionally large users of water or waste disposal facilities, all on a land area which is physically isolated from the principal residential districts of the Township.

Permitted uses in the MPM district include, but are not limited to, power generation and transmission facilities, including substations; yards, buildings and structures used for the conveyance, distribution, processing, manufacturing and storage of raw, semi-finished or finished or finished materials, fuels, products or by-products, marine port and terminal facilities; remanufacturing, blast furnaces, coke ovens, open-hearth facilities, rolling or processing mills; or, other uses related to steel production.

Under the MPM zoning district, development is limited to a minimum lot area of 0.5 acres; a maximum building coverage of 60% of the lot, which includes area occupied by buildings, utility structures; fixed equipment not under cover, storage tanks and sheds; and, impervious surface coverage is limited to 75% of the lot. The MPM district requires a minimum front yard setback of 100 feet, as defined by §209-5 of the Township Code in the definition of "yard, front" shall be provided where a tract abuts a street, interior roadway or highway.

The majority of KIPC is located within the MPM zoning district. A largely vegetated, undeveloped area in the northeastern section of KIPC, however, is located in a Heavy Industrial (HI) district. The HI district provides areas in Falls Township for large-scale industrial operations including those which utilize massive or heavy equipment, manufacture products from primary raw material sources, require large outdoor storage of equipment or machinery for processing or storage purposes, are massive users of highway, rail or water transportation or exceptionally large users of water or sewage disposal facilities, at locations both advantageous to the industrial user and safely and aesthetically buffered from residential and other incompatible uses.

Permitted uses in the HI district include, but are not limited to offices and office buildings, industrial and manufacturing buildings, product distribution and warehousing transportation terminals and freight handling facilities, electrical substations, plumbing, heating and roofing and building material yards and fuel sales, marine port and terminal facilities. In the HI district the maximum building coverage is the same as the MPM district. For parcels over 8 acres, the maximum allowable impervious surface coverage is 80% of the lot.

3.2.3 Public Policy

This section identifies public policies relevant to the proposed utilization of the AEP site that primarily involve industrial and manufacturing. Approximately 1,258 acres of KIPC, including the entire AEP site, is located within a KOIZ. The KOIZ program was established in 2005 by the Commonwealth of Pennsylvania under

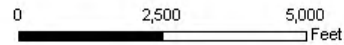
Figure 6. Land Use/Zoning Map



Map Reference: DVRPC Aerial Photography of Bucks County (2006), Zoning Map of Falls Township Prepared by Permoni & Associates, Inc. June 1996.

Legend

- AE_Polysilicon_Boundary_9_16_09
- Keystone Industrial Port Complex Boundary
- Phase Boundary



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NEW JERSEY PENNSYLVANIA NEW YORK CONNECTICUT FLORIDA NEVADA

LAND USE/ZONING MAP
FALLS TOWNSHIP

BUCKS COUNTY		PENNSYLVANIA	
Project No.	Date	Scale	Figure No.
002638304	9/15/09	1" = 2,500'	6

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the Keystone Opportunity Expansion Zone Act and is administered by the Department of Community and Economic Development to develop abandoned, unused, underutilized land and buildings into business districts and residential areas that present a well-rounded and well-balanced approach to community revitalization. Currently, there are 12 KOIZs throughout Pennsylvania. KOIZs are designated by the local communities and approved by the Commonwealth and are typically located in areas within close proximity to major interstates, ports, rail lines and international airports. KOIZs provide companies certain tax benefits. The benefits are applied to state corporate net income taxes, sales and use tax for purchases consumed and used in the zone, other miscellaneous state taxes, local earned income, net profit tax, county and city sales and use tax, property tax and other miscellaneous local taxes. The KOIZ for KIPC will be effective until 2018.

3.3 VISUAL RESOURCES

There are no scenic resources on or near the AEP site. Both the immediate project site and KIPC have been used historically as an industrial and manufacturing site. The portion of the Delaware River closest to the project site, approximately 1.2 miles, is not identified as a National Wild & Scenic River.

3.4 AIR QUALITY

This section presents a discussion of general air quality information, regional information, greenhouse gases and climate change.

3.4.1 Regulatory Framework

Clean Air Act

The Clean Air Act (CAA) of 1970, as amended (42 United States Code [USC] §§ 7401 et seq.), regulates emissions from stationary, mobile, and area sources and establishes national ambient air quality standards for pollutants that can harm human health or the environment. Under the CAA, USEPA is responsible for revising these standards when necessary as new air quality data and related impacts on the human environment become available.

National Ambient Air Quality Standards

National Ambient Air Quality Standards (NAAQS) have been adopted for six criteria pollutants—ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate matter (PM₁₀ and PM_{2.5}), and airborne lead. The national ambient air quality standards may include primary or secondary standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Averaging periods vary by criteria pollutants based on potential health and welfare effects of each pollutant. The national ambient air quality standards are enforced by the states via local air quality agencies. States may choose to adopt their own air quality standards, but state standards must be at least as stringent as federal standards. The NAAQS are incorporated by reference by the State of Pennsylvania into the Pennsylvania Code as part of the ambient air quality standards addressed in 25 Pa. Code Sec. 131.3. Table 4, National Ambient Air

Quality Standards, lists the national ambient air quality standards.

EPA evaluates whether the criteria air pollutant levels within a geographic area meet national ambient air quality standards. Areas that violate air quality standards are designated as nonattainment areas for the relevant pollutants. Non-attainment areas are sometimes further classified by degree (marginal, moderate, serious, severe, and extreme for ozone, and moderate and serious for carbon monoxide and PM₁₀). Areas that comply with air quality standards are designated as attainment areas for the relevant pollutants. Areas that have been redesignated from nonattainment to attainment are considered maintenance areas. Areas of uncertain status are generally designated as unclassifiable but are treated as attainment areas for regulatory purposes.

Federal law requires states to develop plans, known as state implementation plans, describing how they would attain NAAQS. State implementation plans are approved by USEPA and are federally enforceable.

State Ambient Air Quality Standards

Pursuant to 25 PA Code Section 131, Pennsylvania has adopted all of the National Ambient Air Quality Standards and has also developed several specific standards of its own. Pennsylvania specific ambient air quality standards are presented in Table 5.

A state implementation plan for Bucks County, Pennsylvania was completed by the PADEP and recently revised in August 2007 to address eight-hour ozone nonattainment.

Pursuant to 25 PA Code Section 122.1 the State of Pennsylvania has adopted the Standards of Performance for New Stationary Sources promulgated by the USEPA under the Clean Air Act (42 U.S.C.A. §§ 7401—7642) and codified in 40 CFR 51, regulating the construction or modification of stationary sources. The standards are adopted to make them independently enforceable by the PADEP. A new source is major if it has the potential to emit any pollutant regulated under the CAA in amounts equal to or above major source thresholds of 100 tpy or 250 tpy of air pollutants and 10/25 tpy of hazardous air pollutants and as predicated by its industrial category. As discussed in Chapter 4, the AEP Facility after Phase 2 expansion would emit substantially under these thresholds, and would not be a major source under the Prevention of Significant Deterioration (PSD), Non Attainment/New Source Review, or Title V operating permit programs. It would be permitted as a minor source by PADEP.

Clean Air Act Conformity Guidelines

Section 176(c) of the federal CAA contains requirements that apply specifically to federal agency actions, including actions receiving federal funding. This section of the CAA requires federal agencies to ensure that their actions are consistent with the CAA and applicable state air quality management plans. Federal agencies are required to evaluate their proposed non-exempted actions to ensure that they would not cause or contribute to new violations of any federal ambient air quality standards, that they would not increase the frequency or severity of any existing violations of federal ambient air quality standards, and that they would not delay the timely attainment of federal ambient air quality standards.

Table 4. National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ⁽¹⁾	None	
	35 ppm (40 mg/m ³)	1-hour ⁽¹⁾		
Lead	0.15 µg/m ³	Rolling 3-Month Average ⁽²⁾	Same as Primary	
	1.5 µg/m ³ ⁽³⁾	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m ³)	Annual (Arithmetic Mean)	Same as Primary	
	0.100 ppm	1-hour ⁽⁴⁾	None	
Particulate Matter (PM ₁₀)	150 µg/m ³	24-hour ⁽⁵⁾	Same as Primary	
Particulate Matter (PM _{2.5})	15.0 µg/m ³	Annual ⁽⁶⁾ (Arithmetic Mean)	Same as Primary	
	35 µg/m ³	24-hour ⁽⁷⁾	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour ⁽⁸⁾	Same as Primary	
Sulfur Dioxide	75 ppb	1-hour ⁽⁹⁾	None	
	0.5 ppm	None	3-hour ⁽¹⁾	
	0.03 ppm	Annual (Arithmetic Mean) ⁽¹⁰⁾ ⁽¹⁾	None	
	0.14 ppm	24-hour ⁽¹⁰⁾ ⁽¹⁾	None	
ppb =parts per billion ppm =parts per million ⁽¹⁾ Not to be exceeded more than once per year. ⁽²⁾ Maximum arithmetic 3-month mean concentration for a 3-year period (§50.16). Final rule signed October 15, 2008. ⁽³⁾ Notwithstanding the promulgation of 3-hour lead NAAQS of 0.15 µg/m ³ , the 1.5 µg/m ³ quarterly average will continue to apply to all area until one year after the effective date of the NAAQS lead attainment designation of an area. ⁽⁴⁾ To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm USEPA published a final rule on February 9, 2010 that established a new 1-hour standard at a level of 100 ppb, based on the 3-year average of the 98th percentile of the yearly distribution of 1-hour daily maximum concentrations. This final rule became effective on April 12, 2010. ⁽⁵⁾ Not to be exceeded more than once per year on average over 3 years. ⁽⁶⁾ To attain this standard, the 3-year average of the weighted annual mean PM _{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m ³ . ⁽⁷⁾ To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m ³ (effective December 17, 2006). ⁽⁸⁾ To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008). The USEPA has proposed to strengthen the 8-hour primary ozone standard to a level within the range of 0.060 to 0.070 ppm, and to issue final standards by August 31, 2010. ⁽⁹⁾ New standard effective June 22, 2010. The three-year average of the annual (99th percentile) of the daily maximum 1-hour average sulfur dioxide concentrations less than or equal to 75 ppb. ⁽¹⁰⁾ Notwithstanding the promulgation of the new 3-hour national ambient air quality standards of 75 ppb for sulfur dioxide, this standards will continue to apply to all areas until one year after the effective date of the NAAQS sulfur dioxide attainment designation of an area.				

Table 5. Additional Pennsylvania Air Quality Standards beyond the NAAQS

Pollutant	Average Time	Concentration
Beryllium	30-Day	0.01 µg/m ³
Fluorides	24-Hour	5 µg/m ³
Hydrogen Sulfide	24-Hour	0.005 ppm
	1-Hour	0.1 ppm

25 PA Code, Section 131.3

USEPA has promulgated separate rules that establish conformity analysis procedures for transportation-related actions and for other (general) federal agency actions. The general conformity rule requires a formal conformity determination document for federally sponsored or funded actions in nonattainment or maintenance areas⁵ when the net increase in direct and indirect emissions of nonattainment or maintenance pollutants exceeds specified *de minimis* thresholds.

The relevant CAA conformity *de minimis* thresholds for federal actions in Bucks County, Pennsylvania are 25 tpy each of ozone precursors (volatile organic compounds and nitrogen oxides) and 100 tpy of particulate matter (40 CFR Part 51.853).

Current Air Permitting of Phase 1

Air pollutant emissions from the Phase 1 process block currently under completion- are permitted by the PADEP under Plan Approval 09-0203 (see Appendix A). This approval applies to the Construction of Phase 1 and allows for a 180-day operation period pending the issuance of an operation permit. An extension of the 180-day shakedown period can be made if further evaluation is necessary. Two boilers associated with this operation are permitted under PADEP General Permit BAQ-GPA / GP-1 (see Appendix A). The AEP Phase 1 process block 1 silicon purification process was not considered a “major source” of potential air emissions and not subject to Title V permitting requirements. During initial start up operations of Phase 1, emissions will be monitored in accordance with Plan Approval, 09-0203 (see Appendix A).

As seen in Chapter 4, estimations of maximum potential emissions from Phase 2 (process blocks 2, 3 and 4) as well as those from Phase 1 are such that AEP does not anticipate becoming a major source of emission during completion and operation of the facility and would not be subject to Title V PSD permitting requirements.

3.4.2 Regional Air Quality

The AEP site is located in Falls Township, Bucks County, Pennsylvania. Air quality for stationary and mobile sources in Bucks County is regulated by the PADEP Southeast Regional Office, which has jurisdiction over air quality in the five counties located in southeastern Pennsylvania.

⁵ A maintenance area is an area a state has re-designated from nonattainment to attainment. The state submits to USEPA a plan for maintaining the NAAQS in the maintenance area as a revision to the state implementation plan. Federal law requires states to develop plans, known as state implementation plans, describing how they would attain NAAQS. State implementation plans are approved by USEPA and are federally enforceable. The maintenance plan must show that the NAAQS will be maintained for at least 10 years after re-designation and must include contingency measures to address any violation of the NAAQS.

Ozone

Bucks County is designated as a moderate nonattainment area for the 1997 8-hour 0.08 ppm federal ozone standard. In March 2008, the USEPA revised the 8-hour ozone standard to 0.075 ppm and no current designations are available.

Particulate Matter

Bucks County is designated as nonattainment for particulate matter compared with the 1997 particulate matter standard. In September of 2006, the USEPA lowered the 24-hour PM_{2.5} standard from 65 to 35 µg/m³. Bucks County is designated as a nonattainment area for particulate matter 2.5 (PM_{2.5}) 2006 standard.

Bucks County is listed as either attainment or unclassified area for the remainder of the National Ambient Air Quality Standards. The nearest monitoring station is located at Roosevelt Junior High School on Rockview Lane in Bristol Township, Bucks County.

3.4.3 Greenhouse Gases and Climate Change

Greenhouse gases are gases in the Earth's atmosphere that are transparent to short-wave length incoming solar radiation, but absorb the longer wave length infrared radiation re-emitted from Earth's surface warmed by incoming solar radiation. In simple terms they "trap heat." Over time, the amount of energy sent from the sun to the Earth's surface should be about the same as the amount of energy radiated back into space, leaving the temperature of the Earth's surface roughly constant. Most studies, however, indicate that the Earth's climate has warmed over the past century and that human activity affecting the atmosphere is likely an important contributing factor. Computer-based modeling suggests that rising greenhouse gas concentrations generally produce an increase in the average temperature of the Earth, which may produce changes in sea levels, rainfall patterns, and intensity and frequency of extreme weather events. Collectively, these effects are referred to as "climate change." The Intergovernmental Panel on Climate Change (IPCC), in its Fourth Assessment Report, stated that warming of the earth's climate system is unequivocal and that warming is very likely due to anthropogenic greenhouse gas (GHG) concentrations (Intergovernmental Panel on Climate Change, 2007).

Gases exhibiting greenhouse properties come from both natural and human sources. Water vapor, carbon dioxide, methane, and nitrous oxide are examples of greenhouse gases that have both natural and manmade sources, while other gases such as chlorofluorocarbons are exclusively manmade. In the U.S., greenhouse gas emissions come mostly from energy use. These are driven largely by economic growth, fuel used for electricity generation, and weather patterns affecting heating and cooling needs. Energy-related carbon dioxide emissions represent 81% of total U.S. manmade greenhouse gas emissions (National Energy Information Center, 2009).

3.5 NOISE

This section identifies and describes mobile, stationary and construction noise sources on the AEP site and within the KIPC. Mobile sources are those noise sources that move in relation to a noise-sensitive receptor i.e., automobiles,

buses, trucks, aircraft and trains. Stationary noise sources are typically machinery or mechanical equipment associated with industrial and manufacturing uses. Construction noise sources include both mobile and stationary sources. Construction noise is examined separately since its sources are temporary.

3.5.1 Mobile Source Noise

There are few mobile source noise sources on the AEP site. As an isolated industrial area, the road network within the site does not support high volume traffic. The vast majority of automobile and truck traffic is limited to employees, construction and delivery service vehicles. Train traffic on the two rail lines (CSX and Norfolk Southern) in KIPC is limited to freight. Freight train traffic traverses the site every 4-6 weeks to collect scrap metal from nearby demolition areas. The trains are owned by US Steel.

There are no sensitive receptors such as schools, hospitals or residences located within the immediate AEP site. The nearest sensitive receptors are residential homes located in Fieldsboro, New Jersey, approximately one mile south of the AEP site.

The Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978 (42 USC 4901-4918), delegates to the states the authority to regulate environmental noise. It also directs government agencies to comply with local community noise statutes and regulations, and to conduct their programs to promote an environment free of any noise that could jeopardize public health or welfare.

In addition, the Falls Township Code §155-1 prohibits any person or persons from producing, reproducing or making any "loud or unnecessary or disturbing noise."

Typically, appropriate interior noise in commercial, industrial and office buildings are a function of the use of space and is evaluated on a case-by-case basis.

The closest existing mobile noise source to the AEP site is the traffic on Interstate 295 (I-295), which is located approximately 1.5 miles to the north.

3.5.2 Stationary Source Noise

Although the majority of the AEP site is cleared and vacant, the existing manufacturing and industrial facilities pose potential stationary noise sources.

3.5.3 Construction Noise

There are no sensitive receptors located within one mile of the AEP site. Construction noise would be contained within and near the project site.

3.6 GEOLOGY

This section describes the regulatory framework related to the geology of the site topography, the regional geologic setting and the local geology.

3.6.1 Regulatory Framework

Pennsylvania Land Recycling Program Environmental Remediation Standards Act (Act 2)

The Pennsylvania Act 2 program encourages the voluntary cleanup and reuse of contaminated commercial and industrial sites. This program is built on the following four cornerstones that break down redevelopment obstacles:

1. Uniform cleanup standards;
2. Liability relief;
3. Standardized reviews and time limits; and
4. Financial assistance.

The program allows an owner or purchaser of a Brownfield site to choose any one or combination of cleanup standards to guide the remediation. By meeting one or a combination of the background standards, the statewide standards, or the site-specific standard, the remediator would receive liability relief for the property. An Act 2 Remedial Investigation Report for US Steel and AEP was prepared in 2007 to document site conditions to support obtaining a Release of Liability (ROL) (Langan 2007). The ROL was obtained from the PADEP on September 19, 2007 (Appendix A).

The USEPA (Region 3) and the Pennsylvania Department of Environmental Protection (PADEP) signed a Memorandum of Agreement, which is referred to as Pennsylvania's One Cleanup Program. The objective of this agreement is to allow a Release of Liability (ROL) granted by the PADEP under the Act 2 program to satisfy Resource Conservation and Recovery Act (RCRA) obligations and to allow the USEPA to issue an eventual Final Agency Determination for a site once all RCRA issues are addressed. The USEPA provides "comfort letters" for reports once they are approved by the PADEP. Once all RCRA issues are addressed the USEPA would then issue the Final Agency Determination for the entire facility. The US Steel facility has entered into the One Cleanup Plan with the USEPA and PADEP for site groundwater and soil environmental issues.

Falls Township Uniform Construction Code

The 1977 Falls Township Uniform Construction Codes are based on the Pennsylvania Construction Code Act of 1999 (Act 45). These codes regulate any modification of the natural terrain, the alteration of drainage, the maintenance of artificial structures and surfaces, and the removal of topsoil within the township.

3.6.2 Site Topography

Ground surface across the majority of project site is fairly level at 20 to 21.5 feet above mean sea level (MSL). The existing ground surface slopes gradually downward with localized depressions having elevations as low as 18 feet MSL.

3.6.3 Regional Geologic Setting

The project site overburden is comprised of fill material overlying fine to coarse sand/gravel, silts and clays. In general, the fill varied in thickness from a few feet to at least 15 feet below the ground surface. Fill materials generally included a

heterogeneous mix of fine to coarse sand and gravel (black, brown, orange brown, and yellow), silt (brown, gray, red, black, and yellow), clay (red and gray), asphalt, slag, gravels, brick, and scraps of metal and wood fragments. Native soils often encountered beneath the fill appear to be indicative of the Trenton Gravel Series generally consisting of fine to coarse gravel, sand, with some silt and minor amounts of clay. Bedrock was not encountered during the remedial investigation; however, the 1997 RCRA Facility Investigation Report noted that the project site is underlain by the Wissahickon Schist and bedrock generally is located approximately 80 to 100 feet below the ground surface.

3.6.4 Local Geology

According to the Soil Survey of Bucks and Philadelphia Counties, Pennsylvania: U. S. Department of Agriculture, Map 73 (Tompkins, 1975), the project site is covered by Urban Land (UfuB)⁶, 0 to 8 percent slopes (Figure 7). The Urban Land is the second most predominant soil type in KIPC. The Urban Land series is composed of soil that has been modified by disturbance of the natural layers with additions of fill material several feet thick to accommodate large industrial and housing installations.

The Regional Geology of the project site is mapped within the Atlantic Coastal Plain Province (Figure 8). The Atlantic Coastal Plain is part of a low sandy plain that runs along the southeast corner of Pennsylvania. The site-specific geology can be divided into the following units:

- Crystalline Bedrock (pre-Cretaceous);
- Lower Raritan Formation (Cretaceous);
- Upper Raritan Formation (Cretaceous); and,
- Man-made Fill, Alluvial deposits and Pleistocene sands and gravels.

The Lower Raritan Formation is comprised of the Farrington Sand, Lower Clay, and Sayreville Sand members. The Farrington Sand, located approximately 110 to 150 feet below MSL, forms the lowermost confined aquifer and is overlain by the Lower Clay. The Lower Clay, located approximately 80 to 120 feet below MSL, is the confining unit that separates the Farrington Sand from the Sayreville Sand. The Sayreville Sand, located approximately 50 to 80 feet below MSL, is the uppermost confined aquifer and is overlain by the Middle Clay member of the Upper Raritan Formation.

The Upper Raritan Formation is comprised of the Middle Clay, Old Bridge Sand, and Upper Clay members. The Middle Clay, located approximately 30 to 60 feet below MSL, is the confining unit that separates the Sayreville Sand member of the Lower Raritan Formation from the Old Bridge Sand. The Old Bridge Sand, located approximately 20 to 40 feet below MSL, is considered part of the water table aquifer and is overlain by the Upper Clay, Magothy Formation deposits, Trenton gravel and Holocene alluvium. The water table aquifer comprises all deposits above the Middle Clay confining unit. Groundwater flow in the water table aquifer flows towards the Northeast, East and Southeast towards the Delaware River. In general, monitoring wells screened between 20 and 50 feet are screened within the Water Table Aquifer and wells screened in excess of 60 feet are screened beneath the Middle Clay in the Confined Aquifer.

⁶ Urban Land "UfuB" is one of the soil types listed by the U.S. Department of Agriculture, Natural Resources Conservation Service.

Figure 7. Soils Map



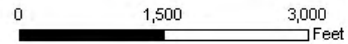
Map Reference: Flood Zone Information from the FEMA DFIRM for Bucks County (2007); DVRPC Aerial Photography of Bucks County (2006)

Legend

- Keystone Industrial Port Complex Boundary
- AE Polystyrene Corporation Boundary
- Phase Boundary

Soil Map Units Within Project Areas

- DaA - Delaware fine sandy loam, 0 to 3 percent slopes
- Ua - Udorthents, gravelly
- UcB - Udorthents, sandy
- UfuB - Urban land, 0 to 8 percent slopes



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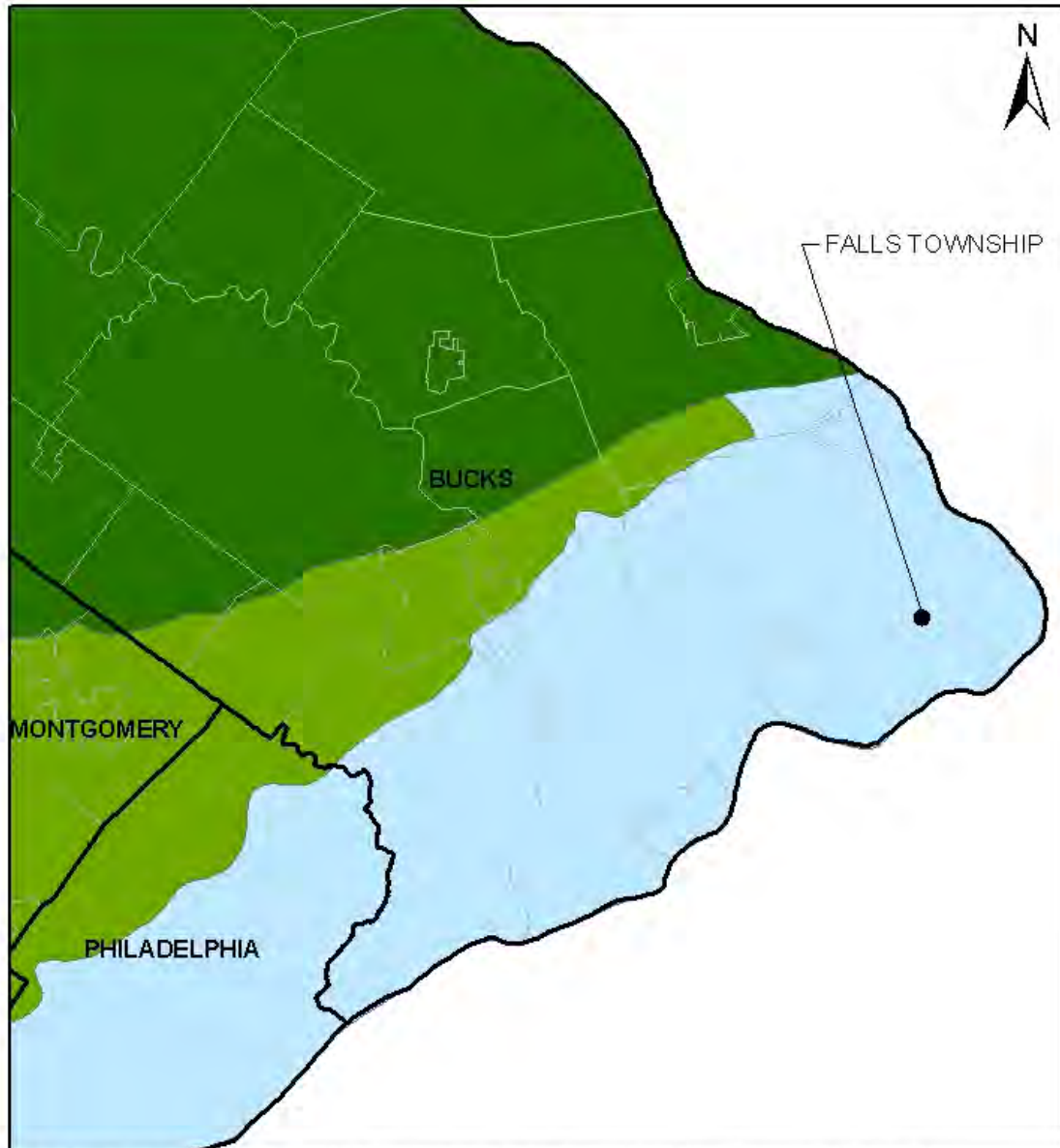
**SOILS MAP
 FALLS TOWNSHIP**

BUCKS COUNTY		PENNSYLVANIA	
Project No.	Date	Scale	Figure No.
002638304	9/15/09	1" = 1,500'	7

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Figure 8. Regional Geology



Map Reference: County Boundaries from PENNDOT, 2009; Physiographic Provinces from PA DCNR Bureau of Topographic and Geologic Survey.

<p>County Boundary</p> <p>Municipality Boundary</p>	<p>Physiographic Provinces</p> <p>ATLANTIC COASTAL PLAIN PROVINCE, Lowland and Intermediate Upland Section</p> <p>PIEDMONT PROVINCE, Gettysburg-Newark Lowland Section</p> <p>PIEDMONT PROVINCE, Piedmont Upland Section</p>
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<p>BUCKS COUNTY</p>		<p>PENNSYLVANIA</p>	
Project No.	Date	Scale	Figure No.
002638304	9/15/09	1" = 15,000'	8

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Based on previous observations, KIPC overburden is comprised of fill material overlying fine to coarse sand/gravel, silts and clays. The fill encountered varies in thickness from a few feet to at least 15 feet below the ground surface. Fill materials generally include a heterogeneous mix of fine to coarse sand and gravel (black, brown, orange brown, and yellow), silt (brown, gray, red, black, and yellow), clay (red and gray), asphalt, slag, gravels, brick, and scraps of metal and wood fragments. Native soils are indicative of the Trenton Gravel Series and generally consist of fine to coarse gravel, sand, with some silt and minor amounts of clay (Figure 9).

A geotechnical study, entitled "Revised Geotechnical Engineering Study" (Langan, 2008) of the AEP site was prepared by Langan Engineering and Environmental Services, dated 19 February 2008, to develop recommendation for building foundations and examine settlement issues. The subsurface stratigraphy at the AEP site, starting at the ground surface, generally consists 0.5 to 19 feet of fill material underlain by 5 to 16 feet of silty sand, underlain by 24 to 39 feet of the Trenton Gravel formation. Twenty of the 27 borings were terminated within the Trenton Gravel formation. Where penetrated, the Trenton Gravel was underlain by stiff clay and dense sand strata.

3.6.5 Geologic Hazards

No geologic hazards were identified in the Revised Geotechnical Engineering Study prepared by Langan Engineering and Environmental Services (Langan, 2008).

3.7 WATER RESOURCES

The nearest surface water body is the Delaware River, which is approximately 4,000 feet south of the project site (Figure 2). The Delaware River generally runs north to south and eventually drains into the Delaware Estuary prior to draining into the Atlantic Ocean. Biles Creek, a tributary of the Delaware River, is located approximately 4,600 feet northeast of the project site. Biles Creek flows directly into the Delaware River. Both water bodies are tidally influenced. Van Sciver Lake and Manor Lake are located approximately 7,000 feet west of the project site. Both lakes are man-made reservoirs that drain to the Delaware River and are used for recreational purposes.

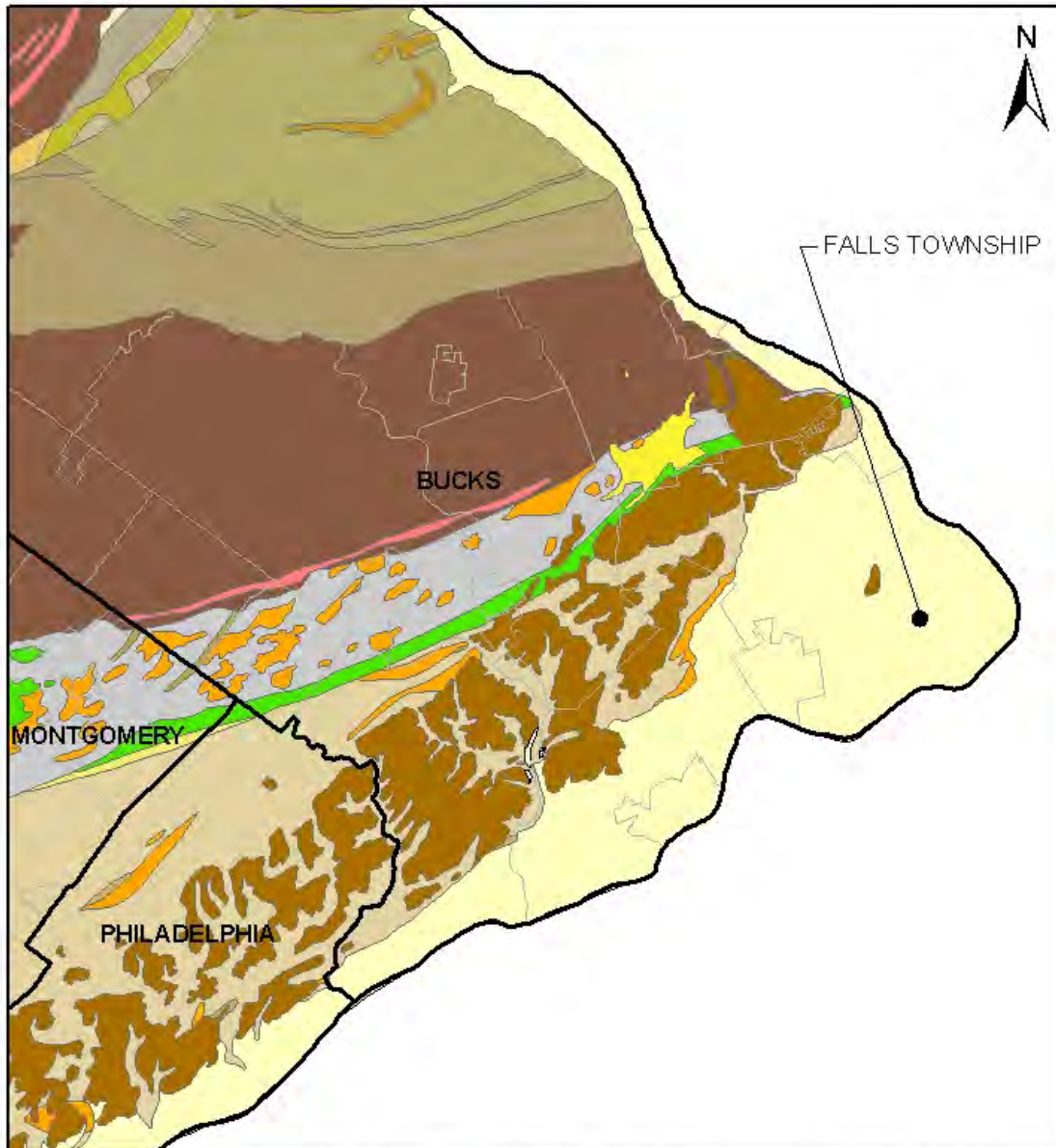
3.7.1 Regulatory Framework

Applicable Federal Plans, Policies, and Regulations

The Clean Water Act (CWA) of 1972, as amended (33 USC §1251 et seq.), regulates surface water quality in Waters of the U.S. The CWA establishes the basic framework for regulating discharges of pollutants into Waters of the U.S. The CWA gives USEPA the authority to set standards for discharge of point source pollutants, as well as set water quality standards for all contaminants in surface waters. USEPA publishes surface water quality standards and toxic pollutant criteria at 40 CFR Part 131.

The CWA mandates water quality-based control measures. Water quality standards define the goals for a water body by designating its uses, setting criteria to protect those uses, and establishing provisions to protect water bodies from pollutants (EPA 2008). Water quality standards are set by states, territories,

Figure 9. Bedrock Geology



Map Reference: County Boundaries from PENNDOT, 2009; Physiographic Provinces from PA DCNR Bureau of Topographic and Geologic Survey.

County Boundary	Bryn Mawr Formation	Stockton Formation	Wissahickon Formation
Municipality Boundary	Chickies Formation	Stockton conglomerate	
Allentown Formation	Marfic gneiss	Trenton Gravel	
Brunswick Formation	Felsic gneiss	Pensauken and Bridgeton Formations, undifferentiated	

0 15,000 30,000 Feet

<p>ENGINEERING & ENVIRONMENTAL SERVICES 30 South 17th Street Suite 1300 Philadelphia, PA 19103 P: 215.264.0640 F: 215.264.0671 www.langan.com</p>	BEDROCK GEOLOGY		FALLS TOWNSHIP	
	BUCKS COUNTY		PENNSYLVANIA	
Project No. 002638304	Date 9/15/09	Scale 1" = 15,000'	Figure No. 9	

© 2008 Langan Engineering and Environmental Services, Inc. S:\data\32638304\WROGS\MapDocuments\Figure 9 - Bedrock Geology reu9-15-09.mxd

and authorized tribes. Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop lists of impaired waters that do not meet water quality standards and establish total maximum daily loads (TMDL) for specific pollutants. TMDLs are the maximum amount of a pollutant that a water body can receive from all contributing point and nonpoint sources and safely meet water quality standards.

USEPA gives authority to the U.S. Army Corps of Engineers (USACE) to regulate wetlands and Waters of the U.S. under Sections 401 and 404 of the CWA. Under Section 401 of the CWA, a permit is required for activities including, but not limited to, the construction or operation of facilities, which may result in any discharge into navigable waters. The Delaware River is listed as navigable waters. Under Section 404 of the CWA, a permit is required for the depositing of dredged or fill material into Waters of the U.S., including wetlands. Wetland boundaries are identified in accordance with the guidelines described in the 1987 US Army Corps of Engineers Wetlands Delineation Manual (US Army Corps of Engineers, 1987). Based upon the methodology established in this manual, a regulated wetland is present if the following three parameters exist - the presence of hydric soils, dominance of hydrophytic vegetation, and the presence or indicators of wetland hydrology.

State Water Quality Standards

PADEP is responsible for the water quality standards for surface waters in the Commonwealth under the Pennsylvania Code, Title 25, Chapter 93 – Water Quality Standards. These standards are based upon water uses which are to be protected and will be considered by PADEP in implementing its authority under the CWA and other statutes that authorize protection of surface water quality. According to Chapter 93 (e), the Delaware River, Biles Creek, Van Sciver Lake and Manor Lake are mapped as a Warm Water Fishes (Figure 10) by the PADEP.

State and Regional Plans, Policies, and Regulations

The PADEP is responsible for the comprehensive regulation and supervision of dams, reservoirs, water obstructions and encroachments in the Commonwealth under the Pennsylvania Code, Title 25, Chapter 105 – Dam Safety and Waterway Management regulations. PADEP is responsible for regulating direct and secondary impacts to natural and man-made waterways and associated floodways under the Chapter 105 regulations.

The BCCD is a unit of local government authorized and formed by the Bucks County Board of Commissioners to provide for the wise use, management, and development of the county's soil, water and related natural resources under the provisions of the Conservation District Law, Act 217 of 1945, as amended. Under the authority of the Clean Stream Law and Chapter 102, the BCCD reviews and approves NPDES General Permits for stormwater discharges associated with construction activities.

3.7.2 Floodplains

Floodplains are lowlands and relatively flat areas adjoining inland and coastal waters, including flood-prone area of offshore islands that are subject to a 1% or greater chance of flooding in any given year (Executive Order 11988, Floodplain

Figure 10. Surface Water Quality Map



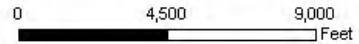
Map Reference: DVRPC Aerial Photography of Bucks County (2005) and New Jersey 2007 - 2008 High Resolution Orthophotography provided by the NJ Office of Information Technology (NJGIT), Office of Geographic Information Systems (OGIS)

Legend

- Keystone Industrial Port Complex Boundary
- AE Polysilicon Corporation Boundary
- Phase Boundary

Surface Water Use

- WWF (WARM WATER FISHES)



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SURFACE WATER QUALITY MAP
 FALLS TOWNSHIP

BUCKS COUNTY		PENNSYLVANIA	
Project No.	Date	Scale	Figure No.
002638304	2/9/10	1" = 4,500'	10

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Management). The 100-year floodplain may be present in low-lying regions, typically near rivers or drainages, or in coastal areas that are not well protected from sea swells.

The PADEP and Falls Township regulates floodplains under the Pennsylvania Code, Title 25, Chapter 106 – Floodplain Management. This regulation encourages planning and development which are consistent with sound land use practices.

According to the Federal Emergency Management Agency (FEMA), the project site is not mapped within the 100-year floodplain (or 500-year floodplain) of the Delaware River or Biles Creek (Figure 11). According to FEMA, the base flood elevation of the Delaware River is mapped at elevation 15 feet National Geodetic Vertical Datum (NGVD) 1929 and the base flood elevation of Biles Creek is mapped at elevation 17 feet NGVD 1929.

3.7.3 Surface Water

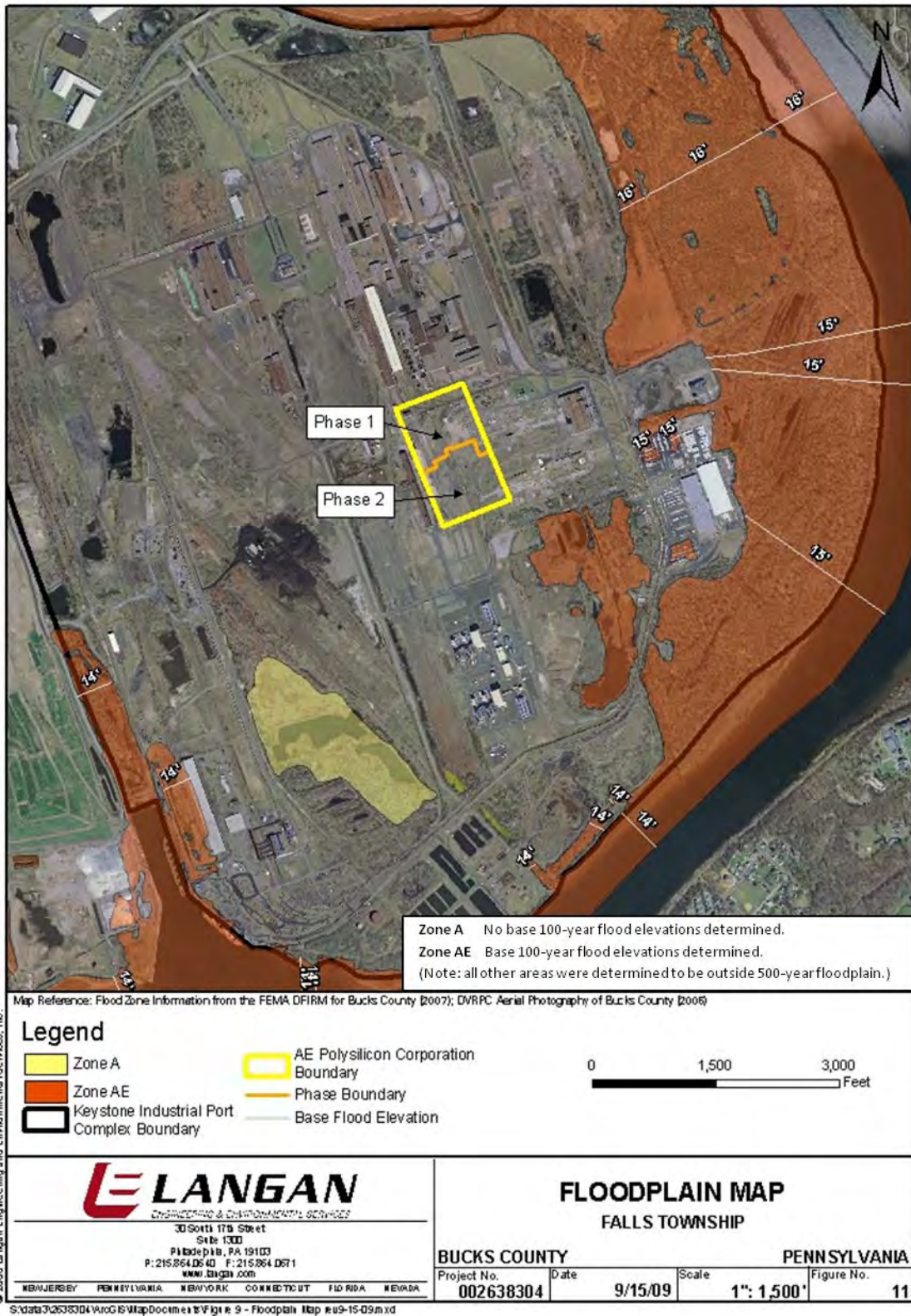
Biles Creek, a tributary of the Delaware River, is approximately 4,600 feet northeast of the project site. Biles Creek flows directly into the Delaware River. Van Sciver Lake and Manor Lake are located approximately 7,000 feet west of the project area. Both lakes are man-made reservoirs which drain to the Delaware River and are used for recreational purposes. The project site does not contain any regulated wetlands or waterways (Conestoga-Rover and Association 2007). Additionally, National Wetland Inventory Mapping shows no wetland areas within the project site (Figure 12).

A Stormwater Management Report was prepared by Showalter & Associates for the AEP site in 2007 (Showalter & Associates, September 2007). According to this report, the AEP site has two distinct drainage areas, one flowing to the east and the other flowing to the west (Pre-Development Drainage Plan). The AEP site is located within the Stormwater Management District-C of the Delaware River South watershed. To meet the requirements of the Falls Township stormwater management ordinance, several onsite stormwater basins were proposed. Phase 1 of the AEP facility contains three stormwater management facility basins (Basins A, B, and C) and one firewater retention and emergency containment pond. These features were designed and constructed as part of the land development for this portion of the AEP site and were not pre-existing. Basin A is an in-ground detention basin located on the western portion of the site, made up of two basins. Basins B and C are also in-ground basins located at the eastern portion of the AEP facility within Phase 1 and are not part of Phase 2. The basins discharge to the existing KIPC stormwater management network that eventually leads to the Delaware River.

3.7.4 Groundwater

US Steel entered into a “Formal Administrative Order On Consent” (USEPA Docket Number: RCRA-III-065-CA) under Section 3008(h) of the Resource Conservation and Recovery Act as amended, 42 U.S. C. Section 6928(h) for corrective action. The effective date of the consent order was April 20, 1993. Site-Wide Groundwater has been evaluated in numerous reports prepared by US Steel, including:

Figure 11. Floodplain Map



- Description of Current Conditions US Steel Fairless Works (July 1993, Revised March 1994);
- Technical Approach to the RCRA Facility Investigation (RFI)/Corrective Measures Study (CMS) dated February 1994; Phase I RFI Work Plan dated November 1994 (and revised January 1995);
- Phase I Interim Report dated March 1996 (and revised June and August 1996);
- Model Verification Report dated September 1996 (and revised November 1996);
- Phase I RFI dated September 1997 (and revised April 1998);
- Request for Non-Use Aquifer Determination dated January 1999; and
- Non-use aquifer determination issued by PADEP on April 9, 1999.

US Steel focused their investigation activities on Site-Wide Groundwater conditions at the site within these reports. A Site-Wide Groundwater model was used to establish a perimeter monitoring network. In 1996, in association with the Phase I RFI, the perimeter monitoring wells (30 total) were sampled for RCRA Appendix IX hazardous constituents⁷ (except PCBs and pesticides). Based on the 1996 RFI monitoring results, further investigation of Site-Wide Groundwater quality in the confined aquifer was determined to be unnecessary; and, additional Site-Wide Groundwater monitoring in the water table aquifer was recommended due to sporadic, low level, exceedances of the screening criteria. In 2000, US Steel collected a second round of Site-Wide Groundwater samples from the perimeter monitoring wells. The results of the sampling event confirmed the results of the 1996 Phase I RFI. A non-use aquifer determination was granted for the facility by the PADEP in 1999 based on the lack of communication between the water table aquifer and the confined groundwater unit, the fact that there was no current or future use of the water table aquifer and the demonstrated lack of impact to the Delaware River from site-wide groundwater.

Three rounds of Site-Wide Groundwater monitoring were conducted at the site between 1996 and 2000 by US Steel. The following briefly summarizes the results of these events.

December 1996 Site-Wide Groundwater Sampling Event:

- A total of 30 wells were sampled;
- 25 wells were analyzed for Metals and VOCs; and
- 5 wells were analyzed for Metals, Semi-Volatile Organic Compounds (SVOCs) & VOC.

Results indicated sporadic low level detections but were below their respective non-residential groundwater non use aquifer Medium-Specific Concentrations (MSCs).

February 1997 Site-Wide Groundwater Sampling Event:

- A total of 29 wells were sampled;
- 25 wells were sampled and analyzed for SVOCs; and
- 4 wells were samples for specific VOCs including for VOCs were analyzed for (1,4-Dichlorobenzene, 1,2,4-Trichlorobenzene, M-Dichlorobenzene, & 1,2-Dichlorobenzene).

⁷ Groundwater monitoring is required for hazardous constituents listed in Appendix IX to 40 CFR 261.

Results indicated sporadic low level detections but were below their respective non-residential non use aquifer groundwater MSCs.

November 2000 Site-Wide Groundwater Sampling Event:

- 30 wells were sampled and analyzed for Metals, SVOCs & VOC.

Results indicated sporadic low level detections but were below their respective non-residential non use aquifer groundwater MSCs.

A Site-Wide groundwater investigation was completed in 2008-2009 to support a Remedial Investigation/Final Act 2 Report in accordance with the final provisions of the July 17, 1997, Pennsylvania Land Recycling and Environmental Remediation Standards Act (Act 2), revisions to Act 2 dated November 24, 2001, the Land Recycling Program Technical Guidance Manual (TGM) final draft dated December 1997, and revisions to the TGM dated June 8, 2002. The scope of work for the site characterization was determined based on a review of information provided by US Steel including an evaluation of the results of previous investigations as documented in Langan's January 17, 2008 Groundwater Sampling and Analysis Plan, and May 21, 2009 Groundwater Sampling and Analysis Plan Addendum. In addition, the Remedial Investigation/Final Act 2 Report was developed based on communication and meetings with the Pennsylvania Department of Environmental Protection (PADEP) and the United State Environmental Protection Agency (USEPA). The following items were completed in response to USEPA comments:

- Reviewed historic Site-Wide groundwater and Site-Wide soil data for Trichlorofluoromethane, which was not detected in Site-Wide groundwater or Site-wide soils.
- Reviewed historic Site-Wide soils data against PADEP's Non-Residential used aquifer soil MSCs and the U.S. USEPA Region III Risk-Based Concentrations. None of the soil data indicated an ongoing source to groundwater from soils.
- Compared historic and current groundwater data to the PADEP used non-residential aquifer MSCs, even though the site is designated as a non-use aquifer (April 1999). There were no significant differences noted based on this comparison and all exceedances were carried forward in the PENTOXSD modeling.

These evaluations did not alter the sampling approach as documented in Langan's January 17, 2008 Groundwater Sampling and Analysis Plan, and May 21, 2009 Groundwater Sampling and Analysis Plan Addendum.

The Remedial Investigation activities were completed between October 2008 and June 2009. The objective of the Remedial Investigation/Final Act 2 Report was to document remedial activities that support obtaining a Release of Liability (ROL) and an eventual Final Agency Determination for Site-Wide Groundwater in accordance with the Pennsylvania's One Cleanup Program and Memorandum of Agreement between the PADEP and Region 3 of the USEPA.

Site-Wide Groundwater Sampling – October 2008

In October 2008, Site-Wide Groundwater samples were collected from 49 site monitoring wells (24 perimeter monitoring wells, 11 monitoring wells identified in

the 2002 BP-20 Post Closure Permit, and 14 monitoring wells located within the interior of the site, upgradient of the perimeter monitoring wells and between the Areas of Concern, Solid Waste Management Units and the Delaware River) to confirm the groundwater sampling results collected from the perimeter monitoring well network in 1996 and 2000. Samples were analyzed for VOCs, SVOCs and metals. All sampling activities were completed in accordance with the PADEP Groundwater Monitoring Guidance Manual dated December 1, 2001 and the Groundwater Sampling and Analysis Plan, dated January 17, 2008.

Results of the October 2008 of Site-Wide Groundwater sampling activities identified benzo(b)fluoranthene, benzo(gh,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene exceeding PADEP non-residential non-use aquifer groundwater MSCs in at least one monitoring well location. No other compounds were identified at concentrations exceeding the PADEP non-residential non-use aquifer MSCs at any of the monitoring wells sampled. No compounds were detected in either the rinseate or trip blanks.

Site-Wide Groundwater Sampling – June 2009

In June 2009, Site-Wide Groundwater samples were collected from 28 site monitoring wells (22 perimeter monitoring wells and 4 monitoring wells located within the interior of the site, upgradient of the perimeter monitoring wells and between the Areas of Concern, Solid Waste Management Units and the Delaware River) for VOCs, SVOCs and metals to confirm baseline results obtained during the October 2008 Site-Wide groundwater sampling event. All sampling activities were completed in accordance with the PADEP Groundwater Monitoring Guidance Manual dated December 1, 2001 and the Groundwater Sampling and Analysis Plan Addendum dated May 21, 2009.

Results of the June 2009 Site-Wide Groundwater sampling activities identified benzo(b)fluoranthene, benzo(gh,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene exceeding PADEP non-residential non-use aquifer groundwater MSCs in at least one monitoring well location. No other compounds were identified at concentrations exceeding the PADEP non-residential non-use aquifer MSCs at any of the monitoring wells sampled. No compounds were detected in either the rinseate or trip blanks. As a conservative measure and in response to USEPA comments, Langan completed PENTOXSD⁸ modeling for 11 organic compounds and four metals that were detected above the non-residential, used-aquifer groundwater as well non-residential, non-used aquifer screening criteria during October 2008 and June 2009. Calculated waste load criteria (computed as so-called waste load allocations) were derived for chronic fish criterion, acute fish criterion, target human health, and cancer risk level. Calculated waste load allocations for all compounds included in this analysis were at least an order of magnitude greater than detected concentration in site-wide groundwater. This means that Site-Wide Groundwater based on the October 2008 and June 2009 sampling results would not exceed PA Chapter 16 surface water quality standards if it were to discharge to the Delaware River.

Inhalation Assessment

Reviewed the groundwater screening values in PADEP's January 24, 2004

⁸ The primary purpose of the Pennsylvania Single Discharge Waste Load Allocation Program for Toxics and Other Substances (PENTOXSD) model is to determine appropriate surface water NPDES discharge permit limits for toxics and certain other substances.

Vapor Intrusion Guidance against all site groundwater data collected in 2008 and 2009 and found that all concentrations in groundwater were below screening levels. This analysis specifically included the 11 organic compounds evaluated with the PENTOXSD modeling as outlined above. Because the Site-Wide Groundwater results were below these PADEP screening values, there is negligible risk for vapor intrusion threats at the site associated with these compounds in groundwater.

Groundwater Receptor Evaluation

Based on a review of available information (Falls Township Municipal Offices and Pennsylvania Geologic Survey PAGWIS Database Version 3.0), 16 wells (monitoring wells/pumping wells) were identified on the Site. These wells are not used for potable purposes and are only used for groundwater monitoring. Currently, there are no withdrawals of groundwater for potable or non-potable purposes between the upgradient boundary of KIPC and the Delaware River. Since April 1999, the Site has been designated a non-use aquifer by PADEP.

The only identified potential receptors for Site-Wide Groundwater include the Delaware River and potential vapor intrusion, both of which are not impacted from site groundwater.

Summary

Three rounds of Site-Wide groundwater monitoring were completed at the Site between 1996 and 2000. Two rounds of Site-Wide attainment groundwater monitoring were conducted at the site between October 2008 and June 2009. Samples were analyzed for VOC, SVOCs, and metals identified as RCRA Appendix IX analytes during the attainment sampling. The PADEP non-residential non-use aquifer statewide MSCs for Site-Wide Groundwater has been met for all VOCs, SVOCs, and metals identified as RCRA Appendix IX analytes with the exception of benzo(b)fluoranthene, benzo(gh,i)perylene, benzo(k)fluoranthene, chrysene, and dibenzo(a,h)anthracene. Based on historic site activities, historic environmental investigations, recent site investigation activities, and results of the PENTOXSD model demonstrating compliance with Chapter 16 Surface Water Quality Standards, attainment of the site-specific standard has been demonstrated for all VOC, SVOCs, and metals identified as RCRA Appendix IX analytes. The site is part of an industrial park and only non-residential uses of the property are permitted for the future. By Environmental Covenant, the uses of the Site-Wide potable groundwater will be prohibited and the site will be restricted to non-residential use. In addition, a notice will be recorded in the land records of Bucks County that discloses the types of hazardous substances present on the site. Therefore it is expected that the PADEP will issue a Release of Liability and the USEPA will issue a "comfort letter"⁹ stating that there are no additional requirements or activities for site groundwater.

US Steel focused their investigation activities on groundwater conditions at the AEP site within these reports. A groundwater model was used to establish a perimeter monitoring network which was biased most heavily toward detection of

⁹ The issuance of "comfort" letters by USEPA is designed primarily to assist parties who seek to cleanup and reuse brownfields. USEPA headquarters and regional offices often receive requests from parties for some level of "comfort" that if they purchase, develop, or operate on brownfield property, USEPA will not pursue them for the costs to clean up any contamination resulting from the previous use. The majority of the concerns raised by these parties can be addressed through the dissemination of information known by USEPA about a specific property and an explanation of what the information means to USEPA.

any potential migratory impacts at the perimeter of the AEP site. In 1996, in association with the Phase I RFI, the perimeter monitoring wells (30 total) were sampled for RCRA Appendix IX hazardous constituents (except PCBs and pesticides). Based on the 1996 RFI monitoring results, further investigation of groundwater quality in the confined aquifer was determined to be unnecessary; and, additional groundwater monitoring in the water table aquifer was recommended due to sporadic, low level, exceedances of the screening criteria. In 2000, US Steel collected a second round of groundwater samples from the perimeter monitoring wells. The results of the sampling event confirmed the results of the 1996 Phase I RFI. A non-use aquifer determination was granted for the facility by the PADEP in 1999 based on the lack of communication between the water table aquifer and the confined groundwater unit, the fact that there was no current or future use of the water table aquifer and the demonstrated lack of impact to the Delaware River from site groundwater.

3.8 NATURAL RESOURCES

Natural resources, as described in this section, include native or naturalized plants and animals and their habitats. Protected and sensitive natural resources include specific habitats and the plant and animal species listed as threatened or endangered by the United States Fish and Wildlife Service (USFWS), the Pennsylvania Fish and Boat Commission (PAFBC), Pennsylvania Game Commission (PAGC), or Pennsylvania Department of Conservation and Natural Resources (PADCNR) or are otherwise protected under federal or state law.

3.8.1 Applicable Federal Plans, Policies, and Regulations

Section 404 of the CWA of 1972, as amended, regulates development in wetlands and surface water bodies and requires agencies to obtain a permit from the USACE to dredge or fill in Waters of the U.S. Executive Order 11990, Protection of Wetlands, directs federal agencies to avoid to the extent possible adverse impacts associated with the destruction or modification of wetlands. Executive Order 11988, Floodplain Management, directs federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development whenever there is a practicable alternative.

The principal statutes pertaining to the protection of plants and animals are the federal Endangered Species Act (ESA), as amended, which requires protection of federally listed threatened and endangered species and their habitats. The ESA is administered by the USFWS and the National Oceanic and Atmospheric Administration (NOAA) and establishes protection and conservation of threatened and endangered species and the ecosystems upon which they depend.

The Migratory Bird Treaty Act of 1918 is the domestic law that implements the U.S. commitment to four international conventions (with Canada, Japan, Mexico, and Russia) for the protection of a shared migratory bird resource. Each of the conventions protects selected species of birds that are common to both countries. The act protects all migratory birds and their parts, including eggs, nests, and feathers.

3.8.2 Applicable Pennsylvania Plans, Policies, and Regulations

Commonwealth of Pennsylvania Endangered Species Act

The Pennsylvania Natural Heritage Program (PNHP) - Pennsylvania Natural Diversity Inventory (PNDI) database conducts inventories and collects data regarding the Commonwealth's native biological diversity. The PNDI is an online database maintained by PNHP containing information about threatened and endangered species managed by the PNHP. The PHNP is a partnership between the Western Pennsylvania Conservancy, PADCNR, PAFBC, and PAGC. The PNDI database also contains information related to federally-listed species under the jurisdiction of the USFWS and National Marine Fisheries Service. The PNDI information system is continually refined and updated to include recently discovered locations and to describe environmental changes affecting known sites of threatened and endangered species. PADEP requires a PNDI search for the submission of all permits proposing impacts to wetlands or waterways.

Pennsylvania Fish and Boat Commission

Pennsylvania Title 58, Chapter 75, Fish and Boat Code, as amended March 6, 2009, provides information related to threatened, endangered, and candidate species and permit requirements related to the take, catch, kill or possession of fish, reptile, or amphibian species.

Pennsylvania Game Commission

Pennsylvania Title 58, Chapter 133, Game and Wildlife Code, as amended December 21, 2007, provides information related to threatened and endangered birds and mammals. Pennsylvania Title 34, Section 2167 provides information related to the possession, transportation, capturing or killing of threatened or endangered species. Permits and penalties related to the importation, exportation, sale, exchange, taking, or possession of threatened or endangered species are addressed in Pennsylvania Title 34, Section 2924.

Pennsylvania Department of Conservation and Natural Resources

Pennsylvania Title 17, Chapter 45, Conservation of Pennsylvania Native Wild Plants, as amended June 18, 1993, establishes a plant classification system, creates permit and license procedures and regulates other activities related to the Commonwealth's native wild plant management. This chapter applies to vulnerable plants, naturally occurring wild plants native to the Commonwealth, and activities and person associated with those plants. Subchapter B of this chapter also provides a list of extirpated, endangered, threatened, rare, and vulnerable plant species. Subchapter C of this code provides restrictions related to the selling and exporting of plants listed as threatened or endangered. Subchapter D of this code provides permitting information. Subchapter G of this code provides penalties for unlawful conduct related to the illegal possession or unpermitted impact to threatened or endangered plants.

3.8.3 Ecoregions and Vegetation

Ecoregions are areas of similar ecosystems, and type, quality and quantity of environmental resources. The project site is located within the Eastern Broadleaf

Forest (Oceanic) Province of the Humid Temperate ecoregion. The Humid Temperate ecoregion contains forests of broadleaf deciduous and needleleaf evergreen trees. The Eastern Broadleaf Forest (Oceanic) Province is characterized by tall broadleaf trees that provide a dense canopy (Bailey, 1995).

No trees exist within the AEP project site. The project site contains mostly gravel and dirt areas. Noxious weeds consisting of annual ragweed (*Ambrosia artemisiifolia*), field clover (*Trifolium campestre*), bull thistle (*Cirsium vulgare*), and yellow foxtail (*Setaria pumila*) are located in sparse locations of the project site. Mature trees and wooded areas are located to the east of the project site along the Delaware River.

3.8.4 Protected and Sensitive Habitats

Sensitive habitats include wetlands, waterways and riparian habitat. The closest wetlands occur approximately 1,500 feet west of the project site (Figure 12). Riparian habitat is limited to the areas directly adjacent to the Delaware River and Biles Creek. The Delaware River is located approximately 4,000 feet south of the project site and Biles Creek is located approximately 4,600 feet northeast of the project site.

3.8.5 Fish and Wildlife

Fish and wildlife resources include indigenous and migratory animal species. These resources include wildlife individuals and populations and their relationship to habitat, including wetland and riparian ecosystems. The disturbed nature of the project site does not provide high-quality habitat, and limited wildlife species are expected to occur. A site visit and assessment of potential biological resources was conducted on August 25, 2009. This site visit was conducted as part of the research required to prepare this report.

The project site is located in a highly disturbed area of KIPC. Species that may occur include transient avian species, although breeding or other critical habitats do not occur on the project site. Five Canada geese (*Branta canadensis*) were observed on the AEP site during the August 25, 2009 site investigation. Canada geese are protected under the Migratory Bird Treaty Act of 1918, however, due to the increased disturbance in the vicinity of the project site, these species are presumed to be transient. No nests were observed within the project site.

Threatened and Endangered Species and Special Habitat Status Species

Information regarding the presence of endangered species/critical habitat on or within a ¼-mile radius of the project site was requested from the PNHP. In their response dated June 12, 2007, PNHP stated “no known impacts” were anticipated within or adjacent to the project site (Appendix A). Since PNHP’s determination is valid for one year, a revised request was submitted on August 20, 2009 for the preparation of this EA. Based upon the revised request, PNHP determined “potential impacts” to a threatened species and a species of special concern under the jurisdiction of the PAFBC.

The PAFBC did not identify the threatened species, however, based on past experience on KIPC site the species is assumed to be the Eastern red-bellied turtle (*Pseudemys rubriventris*), a Pennsylvania threatened species (eNature.com. 2009, PNHP, 2008a). PAFBC identified the species of special

concern as the Eastern mud turtle (*Kinosternon subrubrum*).

Eastern Red Bellied Turtle

The Eastern red bellied turtle inhabits deep ponds, lakes, streams, rivers, and brackish marshes. This species prefers deeper water with sandy or muddy substrate and aquatic vegetation. Nesting sites are in upland habitat and usually within 100 meters of water (PNHP, 2008b). In Pennsylvania, the Delaware River and adjacent shores have been identified as breeding and over winter habitat for this species. Potential habitat has been identified through the PNDI process on other portions of KIPC, however no turtles or habitat have been identified immediately adjacent to the project site. These past site assessments have been approved by PAFBC. Based on the August 25, 2009 site investigation, there is no suitable habitat for this species on the project site.

Eastern Mud Turtle

The Eastern mud turtle is found along the coastal regions of the eastern portion of the U.S. In Pennsylvania, this species is confined to the coastal plain. Aquatic habitats used by this turtle consist of shallow ephemeral depressions that may be periodically wet to wetlands over three feet deep. Wetland areas typically contain soft muddy bottoms with abundant vegetation (PNHP2, 2008). This species can be found on land, typically in wet meadows, ponds, marshes, and drainage ditches (Ernst et. al., 1994). Based on the August 25, 2009 site investigation, there is no suitable habitat for this species on the project site.

PAFBC confirmed these findings and has since cleared the PNDI conflicts discussed above. The approval letter is included in Appendix A.

Critical Habitat

Bucks County, Pennsylvania has three federally listed threatened and endangered species according to the PNHP. These species consist of the bog turtle (*Glyptemys muhlenbergii*), dwarf wedgemussel (*Alasmidonta heterodon*), and shortnose sturgeon (*Acipenser brevirostrum*). None of these species has critical habitat on or in the vicinity of the project site.

Migratory Birds

Migratory birds in North America are an international resource, with numerous species breeding throughout the U.S. and Canada. In the falls these birds migrate south to winter in southern parts of the U.S., Mexico, and Central and South America. Because of the migratory nature of these species and their interstate and international movements, ultimate management authority lies with the federal government (USFWS, 2008).

The project site is located in the Atlantic flyway. Migratory birds include waterfowl, shorebirds, and other species that utilize marine, coastal, riparian, and forest habitat during migration. The project site may be used by migratory birds migrating through the area as evidenced by the visual account of Canada geese. The project site is not prime habitat for migratory birds and does not provide important sources of food, cover, breeding, or nesting habitat.

3.9 CULTURAL RESOURCES

The National Historic Preservation Act of 1966 (NHPA) is the primary federal law protecting cultural, historic, and Native American resources. Section 106 of the NHPA requires DOE to take into account the effects of its undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment (Advisory Council on Historic Preservation, 2009). Detailed requirements for complying with Section 106 of the NHPA are addressed in regulations promulgated by the Advisory Council on Historic Preservation under 36 CFR 800. The Section 106 process is initiated by first determining whether the proposed action is a type of activity that could affect historic properties. Historic properties are properties that are included on the National Register of Historic Places or that meet the criteria for listing on the National Register (Advisory Council on Historic Preservation, 2009).

At the request of DOE, the Bureau for Historic Preservation, which is part of the Pennsylvania Historic and Museum Commission (PHMC) and which serves at the State Historic Preservation Office for Pennsylvania, reviewed this project in accordance with Section 106. In a letter dated September 20, 2010, the Bureau for Historic Preservation affirmed that no National Register eligible or listed historic or archaeological properties are within the area of the proposed project, based on their survey files, which include archaeological sites and standing structures, and the information provided (see Appendix A).

Agencies such as DOE also consult with federally recognized American Indian Tribes when projects have the potential to affect historic properties on tribal lands or historic properties of significance to such tribes located off tribal lands. DOE searched and did not identify federally recognized tribes with an historic interest in Bucks County, Pennsylvania.

A Cultural Resources Notice submitted by Showalter & Associates on February 14, 2008 to PADEP in reference to Act 537 Sewer Planning Approval for AE Polysilicon land development, initiated a response from the Bureau of Historic Preservation on March 4, 2008 that commented on the potential effects of the projects development on cultural and archeological resources. This response affirmed that no National Register eligible or listed historic or archaeological properties were within the area of the proposed Project. Copies of this correspondence are also provided in Appendix A.

3.10 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Socioeconomic impacts may occur if the proposed project would directly or indirectly change population, housing stock, or economic activities in the project site. This section discloses changes that would be created by the proposed project and identifies whether these changes are significant.

3.10.1 Socioeconomics

The socioeconomic resources that influence the quality of the human environment include demographic information on population and housing and economic figures such as employment, income, and earnings. Population includes the number of residents in the area and recent changes in population growth. Housing includes numbers of housing units, home ownership, and housing unit vacancy rate. Employment data include labor sectors, labor force,

and statistics on unemployment. Income information is provided as per capita income as a measure of wealth among the different populations. The current socioeconomic setting in the project area is described using 2008 U.S. Census Bureau data (U.S. Census Bureau, 2010). No U.S. Census data is available on a census block level for 2008, therefore, 2000 U.S. Census Bureau data is used where indicated in Tables 6, 7 and 8.

Table 6: Socioeconomic Indicators for the Census Tract 1058.06, County and State

Geographical Area	Population	Housing Units	Housing Vacancy Rates (%)	**Median Home Value
*Census Tract 1058.06	103	45	15.6	\$100,000
Bucks County	620,057	240,287	5.3	\$330,700
Pennsylvania	12,418,756	5,476,136	10.9	\$155,400

Source: U.S. Census Bureau 2006-2008 American Community Survey, *Census Tract information from US Census Bureau 2000, **Median Value for all owner-occupied housing units.

Table 7: Total Percentage of Population by Race/Ethnicity

Geographical Area	White	Black, African American	Native American, Alaskan, Aleutian	Asian	Native Hawaiian, Pacific Islander	Some Other Race	Latino Hispanic, Any Race
*Census Tract 1058.06	98.1	-	-	0.97	-	-	0.97
Bucks County	91.1	3.7	0.1	3.3	0.01	0.6	3.4
Pennsylvania	83.8	10.3	0.1	2.4	0.03	2.0	4.6

Source: U.S. Census Bureau 2006-2008 American Community Survey , *U.S. Census Bureau 2000Source: U.S. Census Bureau 2006-2008 American Community Survey , *U.S. Census Bureau 2000

Table 8: Income and Poverty Level

Geographical Area	Median Household Income (In 2008 Inflation-adjusted dollars)	Per Capita Income (In 2008 Inflation-adjusted dollars)	Percentage of Individuals Living Below Poverty Level (2000)	Percentage of Individuals Living Below Poverty Level (2008)
*Census Tract 1058.06	\$47,813	\$20,476	0%	--
Bucks County	\$75,138	\$35,698	4.5%	4.8%
Pennsylvania	\$50,272	\$27,025	11%	11.9%

Source: U.S. Census Bureau 2006-2008 American Community Survey, *U.S. Census Bureau 2000

Protection of Children

As shown in Figure 13, the project site is part of census tract 1058.6, which is located in Fairless Hills, a census-designated place in Bucks County, Pennsylvania with a population in 2000 of 8,365. Census tract 1058.6 had a total population of 103 persons in 2000. According to U.S. Census Bureau information and as shown in Figure 13, this population is concentrated in the northern portion of the census tract, north of the KIPC project area boundary.

Table 6 shows socioeconomic indicators for census tract 1058.6, Bucks County, and Pennsylvania as a whole. Since the 2000 Census, the populations in Bucks County and Pennsylvania have increased by 3.8 percent and 1.1 percent, respectively. Housing vacancy rates in the project area are higher than Bucks County and Pennsylvania, however, the percentage is based on a significantly smaller number housing units given the small population within the census tract. In 2000, at \$100,000, the median home value for all owner-occupied housing units in census tract 1058.6 was higher than median home values for Pennsylvania (\$94,800) and lower than Bucks County (\$161,900). In 2008, median home values in Bucks County and Pennsylvania increased to \$330,700 and \$155,400, respectively.

3.10.2 Environmental Justice

In February 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. This order requires that "each federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities, on minority populations and low-income populations" (Executive Order 12898, 59 Federal Register 7629 [Section 1-201]).

CEQ has issued guidance to federal agencies to assist them with their NEPA procedures so that environmental justice concerns are effectively identified and addressed. CEQ guidance recommends that DOE consider pathways or uses of resources that are unique to a minority or low-income community before determining that there are no disproportionately high and adverse impacts on the minority or low-income population (U.S. Department of Energy 2004).

Demographics

Racial and ethnic data for the geographic areas and comparative data for census tract 1058.06, Bucks County and Pennsylvania are presented in Table 7, Total Percentage of Population by Race and Ethnicity. Given its small population, census tract 1058.06 was over 98 percent white and contained only 2 non-white persons in 2000. By comparison, 2008 U.S. Census Bureau data showed Bucks County and Pennsylvania are 91.1 and 83.8 percent white, respectively.

Income and Poverty Level

As shown in Table 8, in 2000, census tract 1058.6 did not contain a population with an income below poverty level. By comparison, 4.5 percent of Bucks County and 11 percent of Pennsylvania's population was below poverty level. Based on 2008 U.S. Census Bureau information, 4.8 percent of Bucks County population

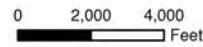
Figure 13. Census Tract Map



Map Reference: NAIP Aerial Photography (2008). US Census Bureau 2009, 2000 Census Tract TIGER/Line GIS Data.

Legend

- AE Polysilicon Corporation Boundary
- Phase Boundary
- Census Tract Boundaries
- Residential Areas within Census Tract 1058.06



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**CENSUS TRACT MAP
FALLS TOWNSHIP**

BUCKS COUNTY		PENNSYLVANIA	
Project No.	Date	Scale	Figure No.
002638304	6/9/10	1" = 4,000'	13

NEW JERSEY PENNSYLVANIA NEW YORK CONNECTICUT FLORIDA NEVADA
\\Langan.com\data\PH\data\3\2638304\ArcGIS\MapDocuments\Census Tract Map.mxd

and 11.9 percent of Pennsylvania's population were living below poverty level.

Another primary socioeconomic indicator is median income by household. Base on 2000 U.S. Census information, the last year data was available on a census tract level, the median income by household in the project area (\$47,813) was less than Bucks County (\$59,727), but higher than Pennsylvania (\$40,106). Based on information shown in Table 8, the median income by household in Bucks County increased by 32.2 percent to \$59,727 since 2000, and Pennsylvania increased by 25.3 percent to \$50,272. Per capita income for residents in the project area was \$20,476 in 2000, which was comparable to Pennsylvania (\$20,880) but less than Bucks County (\$27,430). According to 2008 U.S. Census information, the per capita income for Pennsylvania increased by 29.4 percent to \$27,025, and income in Bucks County increased by 30.1 percent to \$35,698.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks (Executive Order 12045, 62 Federal Register 19885), states that each federal agency shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. Environmental health risks and safety risks mean risks to health or to safety that are attributable to products or substances that children are likely to come into contact with or to ingest.

In 2000, 27.2 percent of the population of census tract 1058.06 was under the age of 18, which was comparable to Bucks County, in which 25.1 percent of the population was under 18 years of age. 23.1 percent of the population of Pennsylvania was under 18 in 2000. Based on 2008 U.S. Census Bureau information, 23.1 percent of the population of Bucks County and 22.4 percent of the population of Pennsylvania is under 18. No schools are located within one mile of the project site.

3.11 HEALTH AND SAFETY

This section addresses concerns related to the health and safety of the public, of construction workers during the construction period of Phase 2, and of workers on the project site at the completion of the Proposed Project. Approximately 200 construction workers would be onsite during the construction of Phase 2.

Construction sites are high-risk environments involving many opportunities for injury and exposure to hazardous materials. The disturbance of contaminated soils introduces an additional risk of hazardous material exposure, which could lead to various medical conditions depending upon the contaminant, the level of exposure and the person or persons being exposed. These medical conditions include, but are not limited to headaches, nausea, respiratory illness, skin reactions, and increased risk of cancer.

Soils at the AEP site were reviewed through the PADEP regulatory process. An "Act 2 Remedial Investigation/Final Report; Former US Steel Fairless Works; Proposed AE Polysilicon Corporation" (Langan, 2007) was prepared and submitted to the PADEP. Remediation for the soil under Act 2 has been completed for the AEP site.

Occupational health and safety rights for both construction workers and workers at the completed AEP site are protected through the federal Occupational Safety and Health Act (29 USC 651 et seq.). Under the Act, Congress created the Occupational Safety and Health Administration (OSHA), an agency of the U.S. Department of Labor. OSHA's mission is to assure the safety and health of America's workers and setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health.

The KIPC has been monitored and tested by USEPA under the RCRA for ground water quality. The testing is described in Chapter 3.7. A non-use aquifer determination was granted for KIPC by the PADEP in 1999 based on the lack of communication between the water table aquifer and the confined groundwater unit, the fact that there was no current or future use of the water table aquifer and the demonstrated lack of impact to the Delaware River from site groundwater.

Construction sites can also pose a safety hazard for members of the general public who access the site unauthorized. The sites often involve open holes in the ground into which an individual can fall, and structures in various stages of completion that can pose falling hazards. Workers at the completed AEP site would be working with hazardous materials on a daily basis that, if contacted, could pose health risks. All workers with potential for exposure to hazardous materials would be trained in proper handling procedures and would be outfitted with personal protective equipment, as necessary. Also, the AEP site is fully enclosed with security fencing and once in production would have a guard shack and stringent entrance precautions.

All personnel who enter the production area would be required to have an Emergency Escape Breathing Device (EEBD) with them at all times. Production personnel would be provided with their own unit while contractors and non-production personnel would be issued an EEBD when they receive authorization to enter a production area. All personnel would be trained on the proper use of the devices prior to issuance.

The Company has Standard Operating Procedures that address the requirement of Personal Protective Equipment and the circumstances when it is required, such as the during the use and handling of the various chemicals on site. Contractors would not be permitted to handle the production chemicals, but would be trained on the hazardous properties of all chemicals on site. The contractor training is valid for a two year period.

A list of surrounding facilities with emergency contact numbers has been created and is posted in the Company's control room. In the instance of an applicable emergency event, these facilities will be notified appropriately.

3.12 TRANSPORTATION

This section describes the transportation services and facilities on or near the project site and Study Area, including access to and within the project site, existing transportation routes and traffic conditions on these roadways and nearby intersections.

3.12.1 Roadway Network

As described previously, the project site is part of the KICP, an isolated, 2,400-acre industrial site along the Delaware River in Falls Township, Pennsylvania. Access to the project site from the local network is provided by Tyburn Road, located approximately 2.75 miles northwest, and South Pennsylvania Avenue, located approximately 2 miles directly north of the project site (Figures 14 and 15).

Tyburn Road

Tyburn Road provides primary access to the site for traffic traveling from the west and north. It is accessed in the general project site in the town of Fallsington, near the intersection of Pennsylvania Route 13, and intersects with South Pennsylvania Avenue at the entrance to the KICP site.

South Pennsylvania Avenue

South Pennsylvania Avenue provides primary access to the project site for traffic traveling from the south, east and north. It is accessed from the northeast via New Lincoln Highway (Route 1) through Trenton, New Jersey and Morrisville, Pennsylvania, from the east via Interstate 195 (I-195), which connects to NJ Route 29 and NJ Route 129 which travel in a westerly direction to South Pennsylvania Avenue.

Interstate 195

Interstate 195 (I-195) is an east-west freeway linking Trenton and Princeton, New Jersey to Lakewood and New Jersey shore areas to the east. As described above, I-195 connects with NJ Route 29 and NJ Route 129 as it travels west towards the project site. The junction of I-195 and I-295 is located approximately 2 miles northeast of the project site.

Interstate 295

Interstate 295 (I-295) in New Jersey is metropolitan Philadelphia's eastern bypass and provides access to KIPC for traffic travelling from the north and south. Located approximately 1.30 miles east of the project site at its closest point, I-295 intersects with I-195 approximately 2 miles northeast of the project site, which connects with local NJ Route 29 and NJ Route 129, as described above.

New Jersey Turnpike

The New Jersey Turnpike (I-95) is located approximately 3.25 miles east of the project site at its closest point and travels in a northeast and southwest direction. For traffic traveling southwest, access to KIPC is provided by I-95 which intersects with I-195 approximately 8 miles northeast of project site.

Local Access to the Project Site and Road Network

Direct local access to the project site is provided by South Pennsylvania Avenue, which is described above. Traveling south, South Pennsylvania Avenue travels approximately 0.6 miles south to the front entrance KIPC gate house, then

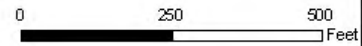
Figure 14. Aerial Map



Map Reference: DVRPC Aerial Photography of Bucks County (2006).

Legend

- AE Polysilicon Corporation Boundary
- Phase Boundary



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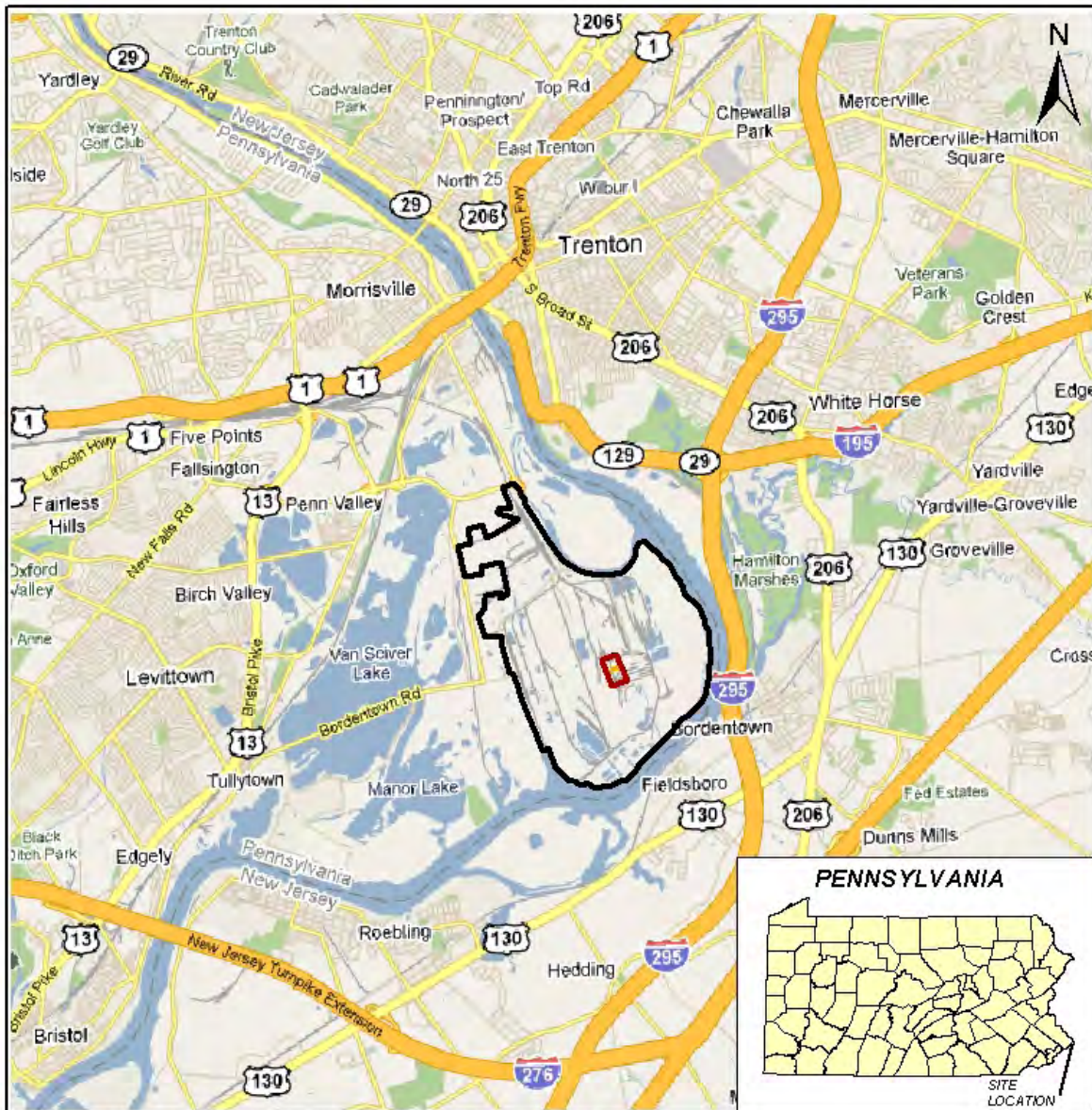
NEW JERSEY PENNSYLVANIA NEW YORK CONNECTICUT FLORIDA NEVADA

**AERIAL MAP
 FALLS TOWNSHIP**

BUCKS COUNTY		PENNSYLVANIA	
Project No.	Date	Scale	Figure No.
002638304	9/15/09	1" = 250'	14

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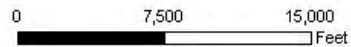
Figure 15. Transportation Network/Site Access Plan



Map Reference: DVRPC Aerial Photography of Bucks County (2006), Road/Street Map provided by Google.

Legend

- Keystone Industrial Port Complex Boundary
- AE Polysilicon Corporation Boundary
- Phase Boundary
- Rivers



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TRANSPORTATION NETWORK/SITE ACCESS PLAN
FALLS TOWNSHIP

BUCKS COUNTY		PENNSYLVANIA	
Project No.	Date	Scale	Figure No.
002638304	9/15/09	1" = 7,500'	15

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travels south approximately 0.4 miles to Old Bordentown Road. Old Bordentown Road travels directly west approximately 750 feet to the intersection of Ben Fairless Drive, located approximately 0.6 miles south of KIPC gate house. Ben Fairless Drive travels directly south for approximately 0.5 miles to Gamesa Drive. Gamesa Drive travels approximately 550 feet east to the intersection with Sorrells Boulevard. Sorrells Boulevard travels approximately 1.5 miles directly south to Roebing Road and the Project Site.

3.12.2 Existing Traffic Conditions

Main access to the KIPC and the AEP facility will be provided via South Pennsylvania Avenue, with Tyburn Road serving as a main arterial for vehicles from the west (Figure 15). Existing peak hour traffic count estimates were obtained in the fall of 2009 from the most current Pennsylvania Department of Transportation average daily traffic counts for these roads.

South Pennsylvania Avenue - The existing average daily traffic on South Pennsylvania Avenue just south of the intersection with Tyburn Road is 877 vehicles for both directions. Based on a given k factor (used to estimate the daily peak hour traffic volume) of 12%, the daily peak hour traffic volume on this section of South Pennsylvania Avenue is approximately 105 vehicles. The existing geometry on this section of South Pennsylvania Avenue consists of two lanes in each direction of travel. The existing average daily traffic on South Pennsylvania Avenue just north of the intersection with Tyburn Road is 3,644 vehicles for both directions. Based on a k factor of 9%, the daily peak hour traffic volume on this section of South Pennsylvania Avenue is approximately 328 vehicles. The existing geometry on this section of South Pennsylvania Avenue consists of one lane of traffic in each direction of travel.

Tyburn Road – The existing average daily traffic on Tyburn Road just west of the intersection with South Pennsylvania Avenue is 4,661 vehicles for both directions. Based on a k factor of 10%, the daily peak hour traffic volume is approximately 466 vehicles. The existing geometry on this section of Tyburn Road consists of two lanes in each direction of travel.

Capacity analyses were performed to determine the Levels of Service (LOS) of the two main roadways for typical AM and PM Peak hours using Highway Capacity software. Multilane capacity analysis was used for the two roadways with two lanes of travel in each direction (South Pennsylvania Avenue south of Tyburn Road and Tyburn Road). Two-Lane capacity analysis was used for the roadway section with one lane of travel in each direction (South Pennsylvania Avenue north of Tyburn Road).

Table 9 lists the results of capacity analysis for the AM and PM peak hour time periods for the existing traffic conditions. To be conservative we have used the estimated daily peak hour traffic volume for both the AM and PM peak hour time periods. For the multilane analysis, the level of service is followed by the density, which is measured in passenger cars per mile per lane (pc/mi/ln). For the two-lane analysis, the level of service is followed by the percent-time-spent-following. These are the measures of effectiveness for these types of roadway facilities.

3.12.3 Parking Supply and Demand

The project site has been cleared of most structures and buildings in anticipation

of development; therefore, there are no existing parking facilities.

Table 9. Existing Conditions - Levels of Service

Location	Direction	Existing	
		AM Peak	PM Peak
<u>Multilane – Level of Service (Density pc/mi/ln)</u>			
S. Pennsylvania Avenue (South of Tyburn Rd.)	Northbound	A (0.5)	A (0.6)
	Southbound	A (0.6)	A (0.5)
Tyburn Road	Eastbound	A (2.4)	A (1.9)
	Westbound	A (1.9)	A (2.4)
<u>Two-Lane – Level of Service (Percent Time-Spent-Following)</u>			
S. Pennsylvania Avenue (North of Tyburn Rd.)	Both	C (47.4%)	C (47.4%)

Based on Township zoning requirements in the MPM Zoning District, the minimum off-street parking requirement is one space per employee per shift. Therefore, the total minimum number of parking spaces on the project site at full build-out would be 140. Phase 1 of the AEP facility will require 87 spaces and an additional 59 future spaces would be added upon the completion of Phase 2.

3.12.4 Bikeways and Pedestrian Facilities

There are no bikeways or pedestrian facilities located on the project site.

3.12.5 Transit

Public transit in the region is provided by the Southeastern Pennsylvania Transportation Authority (SEPTA). The nearest SEPTA train stop is the Levittown Station in Levittown, located approximately 3.75 miles west of the Project Site. Light rail service is provided in New Jersey along the Delaware River by New Jersey Transit's River Line. The nearest River Line stop is located in Roebling, New Jersey, approximately 2.85 miles south of the project site.

3.12.6 Waterway Access

Waterway access to the project site is provided at the Kinder Morgan Bulk Terminal port facility, located along the Delaware River approximately 1.2 miles southwest of the project site.

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

The following sections describe the potential environmental effects that could result from implementing the no action alternative and the proposed action. Without a loan guarantee, construction of AEP's Phase 2 project would proceed as planned, but under a different funding scenario. Discussions of the environmental impacts of the no action alternative and of potential cumulative effects are provided at the end of the chapter.

4.2 LAND USE, ZONING AND PUBLIC POLICY

The proposed action, the construction and startup of Phase 2 of the AEP facility, is not expected to result in any significant adverse land use, zoning and public policy impacts. The proposed action would be consistent with existing industrial and manufacturing land uses presently on the project site and conform to the requirements of the Township Zoning Code within the MPM and HI zoning districts. Furthermore, the proposed action would conform to the requirements for KOIZ designation and inclusion in KIPC.

4.3 VISUAL RESOURCES

The proposed development would conform to the density, design and architectural characteristics (i.e. land uses, floor area ratio, bulk and height, etc.) permitted in the Township's MPM zoning district, subject to approval by the Falls Township Board of Supervisors (Township Board), and be consistent with the surrounding industrial properties. The proposed development would not create significant light or glare above existing levels on the project site.

The proposed development would not result in any significant adverse impacts on visual resources.

4.4 AIR QUALITY

Construction

Construction and start-up of Phase 2 would result in short-term, minor air quality impacts including, but not limited to, dust generated by clearing and grading activities and pile driving, exhaust emissions from gas and diesel-powered construction equipment, and vehicular emissions associated with the commuting of construction workers. Approximately 15 cranes, dozers, and lulls, and approximately 20 work trucks would be on-site during the three-year construction period. Table 10 provides an annual estimate of air emissions resulting from construction and was estimated based on the numbers of equipment and worker vehicles, anticipated hours of operation and typical emission rates for the equipment and vehicles.

Table 10. Anticipated Construction Emissions from the Proposed Action

Pollutant	Estimated Annual Emissions (metric tons per year)
Hydrocarbons	0.69
Carbon Monoxide (CO)	5.4
Nitrogen Oxides (NO _x)	0.35
Carbon Dioxide (CO ₂)	100
PM _{2.5} /PM ₁₀ (idle and dust)	0.004

Air emissions from construction are not expected to result in significant exceedances of current pollutant levels within the project study area. Temporary construction effects to local air pollutant levels is not expected to be significant because the number of vehicles generated by construction activities would be insignificant in relation to existing traffic volumes in the existing industrial area as well as the surrounding areas.

Dust migration would be minimized to the maximum extent practicable during construction through the implementation of soil erosion and sediment control measures as well as watering down exposed surfaces. Dust poses a risk to workers due to the contaminated nature of the soil with benzo(a)pyrene and chromium that exceed the Statewide Health direct contact values (Langan 2007). Watering down of disturbed surfaces would minimize the potential of soil becoming dry and becoming airborne. Workers have the potential to inhale the soil should it become airborne. The Phase 2 construction Health and Safety Plan would address this air quality issue and require, at a minimum, dust control measures by the contractor.

Furthermore, the proposed project would include buildings, process machinery and pavements that would cover existing, exposed surfaces that would result in lower potential particulate emissions from the finished site.

Operations

Operation emissions would be generated from process blocks 2, 3 and 4 during the silicon purification process. Estimated emissions from Phase 2 (process blocks 2, 3, and 4) are shown in Table 11. Table 11 also shows estimated Phase 1 (process block 1) emissions and estimated total Phase 1 and Phase 2 emissions.

To address potential air emissions, 2 additional Plan Approvals would be obtained from the PADEP Southeastern Regional Office for anticipated emissions from the silicon purification process from proposed process blocks 2, 3 and 4. Phase 1 (process block 1) Air Quality Plan Approval/Temporary Operating Permit from PADEP has been issued (Appendix A). When construction of Phase 1 is complete, the facility will enter in to a 180 day "shake-down" period. This is the time to monitor, record and perform stack tests to verify the operation of the permitted control devices. Conditions set forth in the Plan Approval are negotiable and can be amended based on the results of these tests. This 180 day period can be extended if needed. The conditions must be finalized prior to submitting a State-Only Operating Permit.

Table 11. Estimated Phase 1, Phase 2, and Total (Phase 1 + Phase 2) Annual Emissions

Species Emitted	Estimated Phase 1 Annual Emissions (metric tons per year)	Estimated Phase 2 Annual Emissions (metric tons per year)	Estimated Total Annual Emissions (Phase 1 + Phase 2) (metric tons per year)
Carbon Monoxide (CO)	0.16	0.34	0.50
Nitrogen Oxides (NO _x)	2.82	8.47	11.29
PM ₁₀	27.2	54.8	82.0
Hydrogen (H ₂)	11.6	35.0	46.6
Nitrogen (N ₂)	22.3	38.7	61.0
Hydrochloric Acid (HCl)	0.0011	0.0033	0.0044
Methane (CH ₄)	0.54	1.64	2.18
Phosphine (PH ₃)	0.022	0.066	0.088

The facility will only have a single State-Only Operating Permit. As each process block comes on line and has gone through its “shake-down” period, it would be added to the existing permit.

Calculations indicate that the emergency generators meet PADEP exemption requirements for a Plan Approval. Table 14 depicts anticipated emergency generator emissions.

Process related air emissions in Phase 1 include particulate matter (PM₁₀) and HCl (anhydrous). These emissions would also be generated in the operation of Phase 2. All emissions would pass through a control device (bag-house, filter or scrubber system) prior to release.

These control devices are designed to be used for normal production operations and process flows. Release of material due to leaks or spills would not pass through these devices and may be released to the atmosphere. To prevent such releases from occurring, a number of process control and mitigation systems have been installed in Phase 1 and would be installed in Phase 2, to minimize any off-site impact. These include, but are not limited to manual and automatic shutoffs, interlocks, alarms and process relief devices. Release of certain materials, such as STC and TCS would be not part of the normal process flows and would only be due to leaks.

Gasoline and diesel-powered vehicles used by commuting employees and to deliver raw materials would result in emissions of several criteria pollutants and greenhouse gases. AEP anticipates that approximately 145 employees would travel to and from the site daily plus approximately 15 truck deliveries daily once Phase 2 is complete. Because of the limited number of these trips, only an estimate of annual emissions from combined Phase 1 and Phase 2 operations, (once Phase 2 was complete) are shown in Tables 12 and 13.

NO_x, VOC (hydrocarbons), and CO, potential precursors to ozone formation that would be emitted from these vehicles would have negligible effect on the moderate nonattainment status for ozone of Bucks County. The state nonattainment status for particulate matter (PM_{2.5}) in Bucks County would also be

Table 12. Anticipated Vehicle Emissions from Employees

Pollutant	Estimated Annual Emissions (metric tons per year)
Hydrocarbons	4.4
Carbon Monoxide (CO)	34
Nitrogen Oxides (NO _x)	2.2
Carbon Dioxide (CO ₂)	662
PM _{2.5} /PM ₁₀	0.005

Table 13. Anticipated Vehicle Emissions from Truck Deliveries

Pollutant	Estimated Annual Emissions (metric tons per year)
Hydrocarbons	2.6
Carbon Monoxide (CO)	20
Nitrogen Oxides (NO _x)	2.3
Carbon Dioxide (CO ₂)	382
PM _{2.5} /PM ₁₀	0.002

negligibly impacted by the minor increase in diesel exhaust and tire wear from delivery vehicles. The anticipated additional traffic generated by the proposed operation is small compared to the existing traffic observed in the surrounding population centers and major highways.

A maximum of 1 watt can currently be generated by a PV cell from about 7 grams of silicon (CNET, 2006). It can be estimated that PV cells made from the polysilicon produced every year by Phase 2, could generate approximately 20 million megawatt hours over a typical 20-year PV cell lifetime. About 14 million metric tons of CO₂ emissions would be avoided if this electric power was otherwise generated by traditional means (USEPA GHG Equivalencies Calculator, 2010). (If Phase 2 were to remain in full production for n years, total "avoided" CO₂ emissions would be $n \times 14$ million metric tons.) However, it is also recognized that in the absence of AEP lower-cost polysilicon, some of these PV cells could be manufactured using higher-cost polysilicon. Nevertheless, it is believed that the availability of lower-cost AEP polysilicon would substantially create additional demand and growth of the solar energy market, and benefits would echo those illustrated here. The project would create a product that because of its lower cost and enhanced properties is desirable for PV manufacture and hence be instrumental in stimulating the increased the use of solar energy, In turn this could would help reduce dependency on fossil fuels, reduce GHG emissions and help mitigate the adverse impacts of global climate change.

AEP estimates process blocks 2, 3 and 4 that constitute Phase 2, would be able to produce up to 5,400 metric tons of polysilicon per year. The proposed action would employ a closed loop FBR method, described in Chapter 1, which operates at a lower temperature and results in a higher output based on its continuous operation, which would reduce energy consumption and decrease operational by-products, described in Chapter 2. The closed-loop process also allows for the recycling of by-products, such as STC, back into various points in the front-end production process, thereby making the process more efficient and less reliant on volatile feedstock gases.

Each process block would include three 480 V diesel generator sets (“gensets”) designed to provide emergency power for up to 12 hours on a full tank of fuel. The gensets will be rated for 400 kilowatts (kW), 250 kW and 100 kW. Emergency power would be provided for essential systems, including lighting, heat tracing and uninterruptible power systems in the event of a loss of normal power. In the event of a facility-wide power failure estimates of the maximum air pollutant emissions per hour from the nine gensets in three process blocks in Phase 2 plus one genset in Phase 1, are shown in Table 14.

Table 14. Anticipated Emergency Generator Emissions

Pollutant	Gen 10 - 100 kW (TPY)	Gen 40 - 250 kW (TPY)	Gen 60 - 400 kW (TPY)
Total Organic Compounds	0.126	0.285	0.293
Carbon Monoxide (CO)	0.0210	0.0524	0.0838
Nitrogen Oxides (NO _x)	0.0822	0.2055	0.3287
Sulfur Dioxide (SO ₂)	0.0053	0.0134	0.0214
Particulate Matter (PM ₁₀)	0.0029	0.0072	0.091

Based on a history of uninterrupted power to the site over five years, it is envisioned that such emissions would seldom occur and would be short term (i.e., under one hour). As can be seen from Table 14 these emission rates are low, and impacts would be minimal. These air pollutant emissions would be encompassed within the PADEP operation air permit.

Decommissioning

Decommissioning would result in variable levels of air emissions, depending on which course of action AEP takes. Sale of the building as-is would result in no emissions. Replacing internal production lines would result in no emissions. Performing structural renovations would produce minimal emissions. Demolishment and reconstruction would require a new environmental compliance analysis as well as permits and approvals from Falls Township and would likely involve some air quality impacts.

4.5 NOISE

Project construction and startup activities would result in temporary increases in ambient noise levels that have the potential to affect adjacent industrial properties. These activities would be required to comply with applicable federal, Pennsylvania and local noise regulations including the Commonwealth of Pennsylvania Code and the Falls Township Code §155-1. With the proposed action, operational on-site noise levels would be consistent with those of an isolated industrial and manufacturing site.

Because there are no sensitive receptors within close proximity to the project site, there would be no adverse noise impacts on schools, hospitals or residences. Further, the construction noise resulting from mobile and stationary sources would be temporary and localized; therefore the proposed action is not expected to result in significant adverse construction noise impacts.

During operations, the manufacturing facility would generate ambient noise consistent with industrial uses. AEP has developed a Health and Safety Plan

which requires hearing protection in accordance with OSHA guidelines. This would include noise sampling of suspected areas and installation of signs in areas that would require hearing protection.

4.6 GEOLOGY

According to the Revised Geotechnical Engineering Study prepared by Langan Engineering and Environmental Services (Langan, 2008), there are no geologic hazards associated with the AEP site.

All proposed structures would employ engineering designs that are in conformance with the 1977 Falls Township Uniform Construction Code. The recommendations and conclusions presented in the Revised Geotechnical Engineering Study prepared by Langan Engineering and Environmental Services (Langan, 2008) would be incorporated prior to and during construction activities. An Erosion and Sediment (E&S) approval was granted on July 14, 2008 with a revised approval on September 12, 2008 for earth disturbance activities associated with Phase 1 and 2 of the project (Appendix A). All other appropriate permits and approvals would be obtained prior to commencement of construction activities.

4.7 WATER RESOURCES

Water Supply

The proposed production facility requires approximately 657,600 gallons per day (gpd) for normal usage and approximately 1.8 million gpd at peak usage. The peak usage period begins in June and runs through August. This usage is for service water for operations, potable water and sanitary sewer for a 24-hour period. Table 1 in Section 2.2 provides a breakdown of proposed water usage based on production capacity including usage for firefighting purposes. US Steel would provide water supply to the proposed production facility. US Steel has a potable water plant and distribution system at the KIPC with water production capacity of 3 million gallons per day and the rights to withdraw more than 300 million gallons per day from the Delaware River. The KIPC water system has sufficient capacity to service the AEP facility.

Each of the local spill containment areas would be connected to the lined firewater retention pond by underground pipes in such a way that released firewater can flow to the pond without need for intervention by plant operating personnel. There would also be a connection featuring a manual block valve that would allow collected spills or collected rainwater to flow to the lined firewater retention pond. Spills of process liquids would be stored in the local containment sumps.

The following process liquids could become part of any spill, STC, TCS, sodium hydroxide, dynalene (aliphatic hydrocarbon used for process cooling), syltherm (oil based heat transfer fluid), or vacuum pump oil. Spills of sodium hydroxide from either the truck unloading process or from leaks would be neutralized and disposed of at an approved disposal facility. Leaks of hydrocarbon based materials from the utility area would be collected in the containment dike and removed for recycling or disposal at an approved disposal facility. Spills of STC or TCS would be covered with AR-AFFF (Alcohol Resistant Aqueous Film-Forming Foam) to reduce vaporization and potential off-site impact, and then

pumped in to storage tanks for disposal. Disposal of any hazardous material would be done by licensed hazardous waste companies and only approved hazardous waste facilities would be used for acceptance of the waste.

A company confidential Emergency Response Pre-Plan has been developed for some of the more likely STC and TCS leak scenarios and the site Emergency Response Team has reviewed the required actions associated with these events.

The firewater retention pond would be sized to retain approximately 600,000 gallons of released firewater, 24-hour rainfall from a 100-year storm and allowance for freeboard based on the size of the AEP facility process blocks and PADEP requirements (25 Pa. Code Chapters 91-105). Any water collected in the pond would ultimately be transferred to the stormwater system at a limited transfer rate via gravity flow. .

Wastewater

Upon completion, the proposed action would be connected to the KIPC sewerage collection system. The proposed action would generate approximately 4,000 gallons of sewage per day and 350 – 450 gpm of industrial wastewater to be conveyed to and treated at the US Steel Real Estate Wastewater Treatment Plant located in the KIPC south of the project site along the Delaware River. The AEP facility is served by an eight-inch diameter PVC pipe located under Roebbling Road. The PADEP has granted approval to convey and discharge sanitary and industrial waste from the AEP facility to the US Steel Real Estate Wastewater Treatment Facility (Appendix A). The US Steel Real Estate Wastewater Treatment Plant can process up to 20 million gallons of wastewater per day, and has adequate capacity to accept the projected wastewater flows from the proposed action.

Water Quality

To protect surface waters during construction, the project requires a NPDES General Permit to address stormwater discharges associated with construction and post-construction activities from the BCCD. As part of this permit, AEP would be required to submit a stormwater report which addresses proposed best management practices (BMPs). The Phase 1 for the proposed action addresses proposed grading and drainage issues. The BCCD determined the proposed action was in conformance with stormwater management regulations. Additionally, an E&S Control Plan was submitted to BCCD for earth disturbances on the site. The BCCD determined the E&S plan to be adequate to meet PADEP rules and regulations governing erosion control and relating to the Pennsylvania Clean Streams Law described in Chapter 3. The approved NPDES and E&S permits are provided in Appendix A.

Two additional stormwater management basins (Basin D) and one additional firewater retention pond are proposed as part of Phase 2. Basin D would be an in-ground basin proposed to be located at the southeast corner of the project site and is made up of two smaller basins connected by an equalizing pipe. The firewater retention containment pond would also be an in-ground basin proposed to be located at the southeast corner of the project site. These basins would be excavated approximately four to five feet below ground surface. The location of each basin is shown on Figure 1. A NPDES permit has been obtained for the project through the BCCD (Appendix A) which approves stormwater

management on the site for construction and post-construction stormwater management during operation of the facility.

Floodplains

The project site is not located within the 100-year floodplain or 500-year floodplain of the Delaware River or Biles Creek, therefore the proposed action would not result in significant adverse impacts on floodplains (Figure 11).

4.8 NATURAL RESOURCES

Construction

Protected and Sensitive Habitats

Construction activities associated with the proposed action are not expected to result in significant adverse impacts on wetlands or sensitive habitats (habitats that could support state or federally listed species). The project site is located within a highly disturbed area of an industrial complex. The closest wetland area is approximately 1,500 feet west of the project site (Figure 12). The closest riparian zone is approximately 3,500 feet east of the project site, along the Delaware River. A NPDES permit has been obtained to address stormwater discharges associated with project construction activities. Additionally, an E&S permit has been obtained to address earth disturbance associated with both phases of the project. All land development approvals are provided in Appendix A.

Threatened and Endangered Species

The proposed action is not expected to result in significant adverse impacts to threatened or endangered species. As discussed in Section 3.8, a more recent PNDI search indicated there was the potential for impacts to one threatened species and one species of special concern under the jurisdiction of the PAFBC. The PAFBC did not specifically identify these species, however, based on prior information and study of the project site the species are assumed to be the Eastern red bellied turtle and Eastern mud turtle. Based on on-site research and as shown in the site photographs (Appendix B), the project site does not contain appropriate habitat for either species. Supplemental information was submitted to PAFBC in response to the results of the August 20, 2009 PNDI. The information summarized the August 25, 2009 site investigation and provided site information and photographs which conclude that the project site lacks the habitat required by either of these species. An approval letter from PAFBC is included in Appendix A.

The USFWS has responded to a separate request to PAFBC to confirm the PNDI finding that there would be no impact to federally protected species. The USFWS made a determination that that no federally listed species under their jurisdiction is known or likely to occur in the project area. The initiating request and the USFWS determination are included in Appendix A.

Wildlife Migration and Nursery Sites

Construction would not interfere with the movement of any native resident fish or wildlife species or with any known established migratory wildlife corridors.

Common wildlife species such as rodents, deer, and bird species may currently use the project site as transient habitat. Because the project site has historically been developed, on-site construction activities are not expected to affect migratory wildlife.

Operations

Operations would be contained inside the commercial facility, and all discharges of water and waste would be monitored and would abide by local, state, and federal laws. The operation of the proposed project would not result in significant adverse environmental impacts.

4.9 CULTURAL RESOURCES

No significant adverse impacts on historic, archaeological, or Native American resources are expected at the already highly disturbed project site consistent with the determinations by the Bureau of Historic Preservation (which serves as the SHPO) that there are no National Register eligible or listed historic or archaeological properties on the site. However, as required per Bureau of Historic Preservation correspondence (Appendix A), should archaeological resources be encountered during construction, all work would stop and they would be notified.

4.10 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Under the proposed action, direct and indirect beneficial impacts on socioeconomic resources would occur as a result of additional job opportunities. The AEP Facility is expected to result in 145 fulltime positions (100 in Phase 1 and 45 in Phase 2) and approximately 500 indirect jobs, of which 155 would be associated with Phase 2, based on analysis using the Regional Input-Output Modeling System II employment multiplier for Bucks County, Pennsylvania. According to the analysis, for each direct job created by AEP, 3.45 indirect jobs would be created.

Based on the rapidly increasing global demand for solar electric energy, the anticipated growth of the solar energy industry in the US, and the innovative manufacturing technology that would be employed at AEP, it is anticipated that the proposed action would result in long-term, direct and indirect local and regional economic benefits.

The proposed action requires capital expenditures of over \$430 million, at least 95% of which is expected to be used by United States based vendors and contractors for equipment, fabrication, and construction. Further, the production associated with the proposed action is expected to pose significant cost reductions that would improve the economic position and viability of solar energy.

Based on the limited residential population living within close proximity to the project site and the lack of an identifiable minority or low-income population, the proposed action is not expected to result in any disproportionate adverse socioeconomic impacts on low-income populations, minority populations, or children. No low-income populations have been identified in the surrounding community. No schools are located within a one-mile radius of the project site. Therefore, the potential impacts of air emissions, noise, or construction dust on children or minority populations in the area is not expected to be significant.

Construction of the new facility would occur on a site historically used for industrial and manufacturing purposes and is currently largely vacant land zoned for industrial use. The proposed action is expected to improve local and regional economic conditions by creating short-term construction jobs and long-term manufacturing and industrial jobs.

4.11 HEALTH AND SAFETY

Separate health and safety programs will be developed and implemented for construction and operation. The construction contractor would be responsible for the construction phase program and AEP would be responsible for the operations program. Both programs would meet all applicable OSHA and other regulatory requirements.

Occupational Health and Safety

Construction sites are high-risk environments involving many opportunities for injury and exposure to hazardous materials. The disturbance of contaminated soils introduces an additional risk of hazardous material exposure, which could lead to various medical conditions depending upon the contaminant, the level of exposure and the person or persons being exposed. These medical conditions include, but are not limited to headaches, nausea, respiratory illness, skin reactions, and increased risk of cancer.

Soils at the AEP site were reviewed through the PADEP regulatory process. An "Act 2 Remedial Investigation/Final Report; Former US Steel Fairless Works; Proposed AE Polysilicon Corporation" (Langan, 2007) was prepared and submitted to the PADEP. Remediation for the soil under Act 2 has been completed for the AEP site. The KIPC has been monitored and tested by USEPA under the RCRA for ground water quality. The testing is described in Chapter 3.7. A non-use aquifer determination was granted for KIPC by the PADEP in 1999 based on the lack of communication between the water table aquifer and the confined groundwater unit, the fact that there was no current or future use of the water table aquifer and the demonstrated lack of impact to the Delaware River from site groundwater.

Occupational health and safety rights for both construction workers and workers at the completed AEP site are protected through the federal Occupational Safety and Health Act (29 USC 651 et seq.). Under the Act, Congress created the Occupational Safety and Health Administration (OSHA), an agency of the U.S. Department of Labor. OSHA's mission is to assure the safety and health of America's workers and setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health.

Construction sites can also pose a safety hazard for members of the general public who access the site unauthorized. The sites often involve open holes in the ground into which an individual can fall, and structures in various stages of completion that can pose falling hazards. Workers at the completed AEP site would be working with hazardous materials on a daily basis that, if contacted, could pose health risks. All workers with potential for exposure to hazardous materials would be trained in proper handling procedures and would be outfitted with personal protective equipment, as necessary. Also, the AEP site is fully

enclosed with security fencing and once in production would have a guard shack and stringent entrance precautions.

All personnel who enter the production area would be required to have an Emergency Escape Breathing Device (EEBD) with them at all times. Production personnel would be provided with their own unit while contractors and non-production personnel would be issued an EEBD when they receive authorization to enter a production area. All personnel would be trained on the proper use of the devices prior to issuance.

The Company has Standard Operating Procedures that address the requirement of Personal Protective Equipment (PPE) and the circumstances when PPE is required, such as the use and handling of the various chemicals on site. Contractors would not be permitted to handle the production chemicals, but would be trained on the hazardous properties of all chemicals on site. The contractor training is valid for a two year period.

A list of surrounding facilities with emergency contact numbers has been created and is posted in the Company's control room. In the instance of an applicable emergency event, these facilities will be notified appropriately.

Based on data provided by AEP's insurance underwriter, it is estimated that the construction process would employ 200 construction workers. The Anticipated Recordable Incident Rate (Bureau of Labor Statistics, 2010) is 5.4 recordable cases of nonfatal occupational injuries and illnesses (henceforth incidents) per 100 full-time workers per year for a construction site. Therefore, over the proposed 2-year construction period for Phase 2, 22 recordable incidents could occur.

Based on data provided by AEP's insurance underwriter, it is estimated that the operations phase would employ 145 workers (100 for Phase 1 and an additional 45 for the proposed Phase 2). The Anticipated Recordable Incident Rate per hour worked (Bureau of Labor Statistics, 2010) data is 3.1 incidents per 100 full-time workers per year for a chemicals operation. Therefore, up to 5 incidents per year could be associated with the combined Phase 1 and Phase 2 operations, i.e., 3 incidents per year associated with Phase 1 and up to 2 incidents per year associated with the proposed Phase 2 operations.

Public Health and Safety

STC, a byproduct of the production process, is a hazardous material and can be potentially fatal if inhaled in high concentrations. STC in liquid phase will react with water to form HCl vapor. The AEP facility process blocks have containment pits at the bottom of the processing areas for capturing and containment of accidental spills. If a spill or release of material were to occur, the liquid would be collected in the containment pits. Depending on the size of the spill, the Emergency Response Team would take appropriate actions in an attempt to minimize any health or environmental issues. These actions are part of the company confidential Emergency Response Pre-Plan that has been developed.

Emergency workers would be equipped with self-contained breathing apparatus during any potential accidents associated with STC. The AEP facility Emergency Response Plan would address this situation and include practice scenarios with local response teams to ensure their understanding of the materials used at the

facility and proper emergency response by all parties involved.

All project activities, including construction and operation of the proposed facility, would be implemented in compliance with OSHA Standard 29 CFR 1910.120(b)(4), Hazardous Waste Operations and Emergency Response, to protect workers and visitors from potential adverse public health impacts. As a result of the documented contamination issues on the project site and hazardous materials to be stored at the facility and used in the industrial processes at the facility, a Health and Safety Plan has been prepared and would need to be amended to account for contractors working on site while hazardous chemicals are present. The plan would address project public health and safety concerns, no smoking policy, and lock-out/tag-out procedures, etc. in accordance with the above OSHA standards.

In addition, a series of plans have been prepared for Phase 1 to address emergency response, contingency planning, preparedness, and spill prevention. These plans would be modified to reflect changes made on-site by the construction of Phase 2:

- Emergency Response Plan (ERP);
- Spill Prevention, Control, and Countermeasure (SPCC) Plan;
- Preparedness, Prevention, and Contingency (PPC) Plan; and,
- Post Construction Stormwater Management (PCSM) Plan (completed).

The content of the Health and Safety Plan (HASP) may be changed or revised based on additional information being made available to health and safety personnel associated with the proposed action, or future monitoring results or programmatic and/or design changes to the proposed project. The HASP would outline and assess the general hazards, generally categorized as chemical exposure and physical hazards that may be encountered during field work activities at the project site through a task-by-task risk analysis. The HASP would also examine anticipated emissions of hazardous air pollutants from normal process operations and assess the potential for public exposure to such hazardous air pollutants.

All hazardous materials stored on the project site would be required to be delivered and disposed of by a licensed chemical transporter. The daily operations of the facility would comply with all applicable regulations regarding hazardous materials according to the standards of the Commonwealth of Pennsylvania Code and any local codes. It is anticipated that the project would require administrative approval through the local building permit process to ensure that the design, layout and construction of the facility would not interfere with any emergency response plans or evacuation plans and would not pose a public health hazard.

An Emergency Response Plan (ERP) has been prepared for the operation of the facility to address responses to potential hazardous material discharges and coordination with local, State, and Federal authorities. The ERP addresses potential accident scenarios including onsite accidental spills and releases, onsite release of hazardous air pollutants, onsite fire, onsite explosion, and the required responses. The ERP addresses storage, operation and material handling of potentially significant hazards including corrosives materials (sodium hydroxide, STC), flammable materials (H₂, natural gas) and compressed gases

(nitrogen). This plan would be amended to include the additional material brought on site as a result of the Phase 2 construction.

A Spill Prevention Control and Countermeasure (SPCC) plan has been prepared to address the storage of petroleum-based liquids on the project site. The SPCC plan documents the engineering and operational requirements to ensure that any potential liquid release is properly contained within the facility through secondary containment areas. Secondary containment areas are provided at each large storage tank area and below each process block. The SPCC plan also addresses steps to be taken should an accidental spill occur within the facility to protect natural resources downstream of the facility. This plan would be amended to include the additional material brought on site as a result of the Phase 2 construction.

A Preparedness, Prevention and Contingency (PPC) plan would be prepared by the contractor for the construction of Phase 2 of the AEP facility. A PPC plan is a written plan that identifies an emergency response program, material and waste inventory, spill and leak prevention and response, inspection program, housekeeping program, security and external factors, developed and implemented at the project site to control potential discharges of pollutants other than sediment into nearby waters during construction.

The materials used in the process can be corrosive and or flammable, and if exposed to air, potentially toxic. A formal Hazard and Operability analysis (HAZOP)¹⁰ has been performed and documented for the entire process for Phase 1 and would be applicable to Phase 2. This multi-disciplinary and systematic review identified potential process deviations. To help prevent these from occurring under the conditions identified, a variety of process control and mitigation systems would be installed to minimize both on-site and off-site impacts. The following is a list of some of the systems incorporated into the plant operations design:

- Process vents
- Relief valves
- Check valves
- Automatic shutoffs
- Manual shutoffs
- Process interlocks
- Alarms
- Emergency power

In the event of a release that could threaten on-site personnel, an Emergency Notification System has been installed for Phase 1 and would be used for Phase 2 as well. This Emergency Notification System includes unique alarms depending on the situation, and procedures identifying primary and secondary means of egress from the facility. Predetermined muster locations for personnel accountability have been established. All employees and contractors would be trained in these procedures. In the event of a release that could threaten facilities and/or personnel within the KIPC complex, a detailed listing of facilities with emergency contact information has been posted in the Control Room. In addition, Falls Township has a computerized telephone notification system that can be activated by calling 911. This system has been set up to include the

¹⁰ A HAZOP is a systematic method for examining complex facilities or processes to identify and evaluate actual or potentially hazardous procedures and operations that may otherwise present safety, environmental or operational risks.

facilities within the KIPC complex. Similar systems have been set up and include residential populations.

A Post Construction Stormwater Management (PCSM) plan would be prepared for the operation of Phase 2 of the AEP facility. The PCSM plan is a site specific plan identifying BMPs to manage stormwater runoff after construction activities have ended and the project site permanently stabilized to protect and maintain existing and designated uses. The BMPs should be designed to maximize infiltration technologies, minimize point source discharges to surface waters and protect the physical, biological and chemical qualities of the receiving water.

A Risk Management Plan (RMP) has been prepared and submitted to the USEPA as part of the plan approved requirements for Phase 1. The RMP would be reviewed and modified as additional process blocks are built and the on-site inventory of hazardous materials changes.

With the development and implementation of the various plans, including ERP, HASP, SPCC, PPC and PCSM, the proposed action is not expected to result in any significant adverse public health impacts.

Accident Analysis and Emergency Response Preparedness

The AEP system is a continuous process which purifies metallurgical grade silicon to semiconductor grade using high pressures and temperatures. The process stores, produces or uses a number of materials that could present a hazard if accidentally released, including: H₂, TCS and STC. The following is an assessment by AEP of accident analysis and of their emergency response preparedness. Key hazards of the process and their potential affect of any potential accidental releases are identified.

The AEP process uses the following extremely hazardous substances materials in large enough quantities to require documentation. Table 15 documents each material, its potential hazardous condition, and a note regarding management techniques being proposed or other information.

Other environmental health and safety materials that can present a hazard include phosphine (PH₃), which is generated as a byproduct in the hydrogenation unit. Phosphine is generated from the trace level phosphorus impurity (40 ppm) in the starting raw material metallurgical grade ("MG-grade") silicon. Approximately 10% of this would be reduced to PH₃, which would be continuously vented with nitrogen and hydrogen from the process scrubber. The level at the stack would be << 1 ppb, well below the Permissible Exposure Limit¹¹ (PEL) level of 300 ppb and would not pose a danger.

The primary risks to an employee or the public are: 1) exposure to a toxic or corrosive vapor; and, 2) release, thermal or overpressure energy from a flammable gas release. Two internal AEP confidential reports have been prepared assessing hazard risk and detection.

1. AE Polysilicon/Chemically Speaking LLC report "Gas Detection Systems AE Polysilicon Process". Jan 26, 2010

¹¹ OSHA sets enforceable permissible exposure limits (PELs) on the amount or concentration of a substance in the air to protect workers against the health effects of exposure to hazardous substances. PELs are based on an 8-hour time weighted average exposure.

2. AE Polysilicon/Chemically Speaking LLC report “Assessment of Damaging Overpressure AE Polysilicon Process”, March 11, 2010

Table 15. Process Hazardous Materials

Hazardous Material	Hazards	Comment
Ammonia (NH ₃)	Corrosive liquefied; Compressed gas	Chiller Unit, used as a closed loop system in an outdoor system. Likelihood of a catastrophic release is remote.
Hydrogen (H ₂)	Stored as cryogenic flammable liquid used in the process as a gas	Use all in outdoor system, cannot accumulate in large enough volume to pose an explosion hazard.
Trichlorosilane, TCS (SiHCl ₃)	Dangerous when wet; Corrosive; Flammable	Intermediate product which is produced and stored prior to deposition.
Silicon Tetrachloride, STC (SiCl ₄)	Corrosive liquid	Raw material.
Sodium Hydroxide (NaOH)	Corrosive liquid	Used for the scrubbers and neutralization systems. Tanks and scrubbers all have secondary containment or are surrounded by dikes.

Large liquid releases are the largest concern for offsite populations based on detailed HAZOPs reviews and internal AEP engineering confidential reports. Trichlorosilane is the most significant potential liquid release because of its potential to ignite and burn and the greatest potential for release exists in the intermodal container (ISO)¹² offloading process because that offloading process involves flexible lines to connect the containers. While the release risk is remote during the ISO offloading process, AEP has reviewed this in detail in the internal company confidential report “ISO Offloading ER Pre-plan AE Polysilicon” dated Feb 1, 2010 (Pre-plan). The report was the basis for additional safeguards that were proposed. During the intermodal container offloading process, an operator would be in attendance with foam carts in place to quickly mitigate releases. The Preplan recaps other emergency response (ER) actions that can be taken in the event of a release. Table 16 addresses potential emergency response actions based on release conditions.

The ISO offloading activity would occur only during the dayshift as a fully attended operation for short periods of time (three to four hours) to connect and offload ISO Modules. STC would be offloaded approximately ten to sixteen times per year. TCS would be offloaded approximately two to three times per year.

Foam carts would be staged to provide immediate vapor and fire suppression should the unlikely event of a large hole developing in the liquid flexible line take place. Even in the unlikely event of the worst case liquid line failure, mitigation would be underway within minutes. In this case the offsite affect would be small and brief.

¹² The acronym ISO is applied to intermodal containers because their dimensions have been defined by the International Organization for Standardization (“ISO”).

Table 16. Emergency Response Actions

Release Hole	5 min Release lbs	Emergency Response Actions
1" diameter Liquid	6,400	Foam Dike. Knockdown/dispersion of plume using monitor nozzles. Pump any liquid TCS into ER Tank.
¼" diameter Liquid	425	Because of the small amount of liquid, all of it would have been vaporized. No ER actions would be possible. If any liquid TCS is present, flood it with water spray.
½" diameter Vapor	<54	The amount released as vapor would have been immediately dispersed. There would not be sufficient time for the ER team to take any action in this release.
¼" diameter Vapor	<22	The amount released as vapor would have been immediately dispersed. There would not be sufficient time for the ER team to take any action in this release.

Other releases from the process would be short, with minimal offsite impact. The AEP Fairless Hills, Pennsylvania site is in the geographic center of a large, approximately 2,500-acre KIPC, which was formerly the US Steel manufacturing site. The area around the site is 50% vacant. The industries surrounding the site are not labor intensive so the number of potential exposures in the case of an incident is low.

The population most at risk would be the AEP employees followed by the KIPC tenants within a ½-mile radius of the site. Residential areas are over 1 mile from the site, as shown in Figure 16.

Bucks County has a Community Alert Network which would be used to alert any residents outside of the KIPC. This is accessed via the 911 system. Training in coordination with the LEPC and the Falls Township Fire Dept is underway and would be a continuing part of the AEP ER program. Table 17 summarizes the alert system in place.

Table 17. Alert System Summary

Population	Alert System	Leak Potential
AE Polysilicon	Walkie-Talkie and Notification Siren	Small to Large
KIPC Neighbors	Control Room Phone Call and Community Alert System	Medium to Large
Downwind Residential	Community Alert Notification System	Large

To provide timely and effective response to incidents, the AEP facility would have a minimum of four fully-trained and equipped emergency response team members on-site at all times. The emergency response team members would have been trained to the HazMat Technician level plus have structural fire fighting courses. As part of their ongoing training, the emergency response team

Figure 16. Risk Assessment Radius to Surrounding Sites



members would be trained through custom courses on the unique hazards of chlorosilane, foam carts and other systems being utilized on the site. The emergency response Preplan would be a critical component of their training to understand the effectiveness of certain actions.

Falls Township has contracted with the Trenton, New Jersey Fire Department hazardous materials response team (Trenton HazMat Team) to respond to any hazardous materials incidents at the facility. The Trenton Fire Department is a full time fire department with a specially-trained hazardous materials response team.

A formal training program has been initiated to familiarize the Trenton HazMat Team with the site and to train them on the products at the facility and their associated hazards. A joint drill between the AEP emergency response team and Trenton HazMat Team will be held in the fall of 2010.

Intentionally Destructive Acts

DOE believes that the AEP facility would present an unlikely target for intentionally destructive acts (terrorism) and would have an extremely low probability of being attacked. Protective fencing would be constructed around the perimeter of the 32-acre site within which all proposed activities would be confined. Public access to the host KIPC site is restricted to a gated single main entrance, which is continuously monitored. Nighttime security lighting would be used, which would also benefit the safety of the workers and public in the operation of the facility. The facility would be continuously operated and under worker surveillance 24 hours a day, 7 days a week. All areas of the facility buildings would be access controlled. All authorized personnel (employees and contractors) would be issued access key fobs to regulate entry into each closed facility building, including office and processing areas. Storage and use of hazardous materials would comply with federal, state, and local regulatory requirements. Thus the potential for impacts from intentionally destructive acts (terrorism) would be very small. Nevertheless, if destructive acts were somehow to occur, the consequences would not exceed those set forth in the risk scenarios presented above.

4.12 TRANSPORTATION

A site trip generation was performed to estimate the proposed development AM and PM Peak Hour trips for workers using data compiled by the Institute of Transportation Engineers (ITE) as contained in their publication *Trip Generation*, 8th Edition (ITE, December 2008). Table 18 presents the total vehicle trips which would be generated during the AM and PM peak hour time periods by the AEP facility. For the purposes of this analysis, and given the limited number of trips, Phase 1 of the AEP was included in the proposed action analysis.

Table 18. Total Trips for AEP Facility

Land Use Code 140 – Manufacturing 144,000 square feet					
Time Period	Equation / Average Rate	Directional Split	In	Out	Total
AM Peak Hour	0.62	78/22	70	20	90
PM Peak Hour	0.67	36/64	35	62	97

The amount of new site generated trips for the AEP facility is 70 vehicles entering and 20 vehicles exiting during the AM peak hour, and 35 vehicles entering and 62 vehicles exiting during the PM peak hour. The future increase in trips on the surrounding roadways associated with the site is approximately three new trips every two minutes during the peak hour time periods. The AEP facility would also generate approximately 5 to 10 truck trips per day (see Table 3).

A capacity analysis was performed adding the projected total trips for the AEP facility to the existing traffic conditions for the AM and PM peak hour time periods. Table 19 provides the results of the proposed conditions levels of services.

Table 19. Proposed Conditions Levels of Service

Location	Direction	Proposed	
		AM Peak	PM Peak
<u>Multilane – Level of Service (Density pc/mi/ln)</u>			
S. Pennsylvania Avenue (South of Tyburn Rd.)	Northbound	A (0.7)	A (1.4)
	Southbound	A (1.3)	A (0.9)
Tyburn Road	Eastbound	A (2.8)	A (2.0)
	Westbound	A (2.1)	A (2.7)
<u>Two-Lane – Level of Service (Percent Time-Spent-Following)</u>			
S. Pennsylvania Avenue (North of Tyburn Rd.)	Both	C (49.4%)	C (49.6%)

The multi-lane roadways of Tyburn Road and South Pennsylvania Avenue, which currently handle a minimal amount of traffic, are designed to accommodate a substantial amount of vehicles during the peak hours. In addition, the grade-separated interchange of South Pennsylvania Avenue and Tyburn Road is designed to accommodate a significant volume of traffic. With the addition of traffic to these roads during the operation of the AEP facility, there would be no change in levels of service compared to the existing conditions (see Table 9 in Chapter 3.12 of this EA).

The proposed action would not result in significant increases to traffic volumes on the local or regional road network. The increase in traffic from the proposed action would not result in any decrease in levels of service for the two main roads servicing the KIPC.

Parking

The proposed action would not result in adverse parking impacts. The project would conform to the Township zoning requirements in the MPM Zoning District by providing one space per employee per shift. Therefore, the total minimum number of required parking spaces on the project site at full build-out would be 140. Phase 1 of the proposed action would provide 87 spaces and an additional 59 future spaces would be added upon the completion of Phase 2. The project proposes a total of 146 off-street parking spaces at full build-out.

Construction Traffic

Impacts from construction traffic would be localized and temporary. Because there are no residents or sensitive receptors on or near the project site, the proposed action would not result in significant adverse construction traffic impacts. The local road network has accommodated construction, delivery and work activities on the project site, which was once one of the larger steel manufacturing plants in the U.S., for approximately 50 years; therefore, there is sufficient roadway network capacity on the project site to support construction

traffic.

4.13 CUMULATIVE EFFECTS

The primary goal of cumulative impact analysis is to determine the magnitude and significance of the environmental consequences of the proposed action, in the context of the cumulative effects of other past, present, and future actions. The CEQ regulations require cumulative impact analysis and define it as:

“...the impact on the environment which results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” (40 CFR 1508.7).

This cumulative effects analysis was based on the findings of direct and indirect impacts from the resources analyzed in Chapters 3 and 4 of this EA.

4.13.1 Methodology

Information was collected and reviewed on relevant past, present, and reasonably foreseeable future projects and actions that could interact, or overlap, in time or space with effects from the proposed action. For the purposes of this EA the approximate 2,500-acre Keystone Industrial Port Complex (KIPC) in Fairless Hills, within which the proposed action would occur, was selected as the geographical area. The time frame of the analysis focused on the potential build-out of the KIPC. The KIPC master plan information was reviewed to identify which were appropriate for inclusion and what future development is projected within the KIPC. This analysis differentiated, where appropriate, between cumulative impacts associated with short-term, overlapping construction impacts and longer-term impacts due to operations, and considered all potential activities including Federal, state, local, and private actions. The projects considered are discussed below.

AEP Phase 1

AEP's headquarters office, parking, and related infrastructure are currently operational at the site. Phase 1 of the AEP commercial polysilicon production unit consists of one silicon refining process block, support utilities, asphalt-paved truck-circulation and car-parking areas, stormwater management infrastructure and a fire water retention and emergency containment pond. Phase 1 is currently in the final stages of construction. Once completed, Phase 1 would have an annual polysilicon production capacity of 1,800 metric tons.

US Steel

US Steel is an integrated steel producer with major production operations in the United States, Canada, and Central Europe. The US Steel facility at Fairless Hills operates a hot dip galvanizing line where cold-rolled products are finished into galvanized sheet.

Gamesa Wind Energy

Gamesa is one of the main wind turbine manufacturers worldwide. The facility at KIPC is located on approximately 95 acres.

Waste Management Landfill

Waste Management is the leading provider of comprehensive waste and environmental services in North America. They are the largest network of landfills in the waste industry.

Kinder-Morgan

Kinder-Morgan is one of the largest pipeline transportation and energy storage companies in North America. The Kinder-Morgan facility at KIPC is located on approximately 100 acres. The facility consists of a 208,000 square foot warehouse storage building and three berths that total 2,200 feet. The facility handles steel slab, packaged coils, hot rod coils, rebar, round bars, billets, pipe, beams, plate, used rail, and bulk sacks.

Dominion Energy

Dominion is one of the nation's largest producers and transporters of energy, with approximately 27,000 megawatts of generation, 1.2 trillion cubic feet equivalent of proved natural gas and oil reserves, 14,000 miles of natural gas transmission, gathering and storage pipeline and 6,000 miles of electric transmission lines. The Dominion facility at KIPC is located on approximately 45 acres. This facility consists of two blocks of combined-cycle combustion turbines with a combined output of 1,180 megawatts. This facility produces enough electricity to power approximately 295,000 homes and uses natural gas as its primary fuel.

Exelon/PECO Co-Generation Landfill Gas

Exelon owns and controls one of the largest generation portfolios in the country which consists of approximately 33 gigawatts of low-cost owned and contracted generation. The Fairless Hill Generating Station is a two-unit, 60 megawatt station. These units were recently upgraded and are among the largest landfill gas generation plants in the United States.

Toll Brothers Homes

Toll Brothers is a Fortune 1000 company which builds luxury homes.

4.13.2 Environmental Impact

This section builds on the results of the resource-specific analyses found in Chapter 4. This environmental consequences discussion is a compilation of potential impacts; that is, the cumulative result of impacts of the proposed action and alternatives when added to the potential impacts of other actions. The cumulative impacts were analyzed for situations where planned or reasonably foreseeable projects overlapped with the proposed AEP project in terms of geographic area and timeframe.

The proposed action is not expected to result in incremental adverse effects on land use, visual resources, noise, geology, natural resources, cultural resources, socioeconomics, or public health and safety from implementing the proposed action. Therefore the proposed action would not incrementally contribute to cumulative impacts on those resources, and they are not considered in this analysis. The KIPC provides large redevelopment areas for current and future expansion of industrial uses that avoid significant impacts to natural resources. Regional infrastructure is in place to accommodate current and future uses. The following cumulative effects were identified:

- Minor long-term cumulative effects on water resources due to the regional increase in impervious surfaces that would be introduced from the proposed action in combination with all identified cumulative projects;
- Minor long-term cumulative effects on water resources due to the regional increase in industrial and wastewater discharges that would be introduced from the proposed action in combination with all identified cumulative projects;
- Minor short-term cumulative effects on water resources due to soil disturbance and related potential for polluted stormwater to enter waterways from the proposed action in combination with all identified cumulative projects;
- Minor long-term cumulative effects on traffic levels due to the combined increase in human use of the area as a result of the proposed action in combination with the redevelopment of KIPC;
- Minor short-term cumulative effects on air quality due to dust generated by soil disturbance and construction activities from the proposed action in combination with all identified cumulative projects;
- Minor long-term cumulative effects on air quality due to the increase in traffic emissions resulting from the proposed action in combination with all identified cumulative projects;
- Minor long-term cumulative effects on air quality due to increased emissions from the proposed project in combination with the AEP Phase 1 Facility, US Steel, Kinder-Morgan, Dominion Energy, and the Exelon/PECO Co-Generation Landfill Gas facilities;
- Short-term beneficial cumulative effects on socioeconomics from construction job creation from the proposed action in combination with all identified cumulative projects;
- Long-term beneficial cumulative effects on socioeconomics from job creation from the proposed action in combination with the redevelopment of the KIPC.

Consequently there would be no significant cumulative effects from implementation of the proposed AEP project.

4.13.3 Greenhouse Gases and Global Climate Change

The DOE is not aware of any methodology to correlate direct CO₂ emissions

exclusively from the proposed facility to any specific impact on global warming. However, studies such as the Intergovernmental Panel on Climate Change (IPCC) report support the premise that CO₂ emissions from the proposed project, combined with global GHG emissions, would very likely have a cumulative impact on global warming. Although construction and operational activities would employ the use of fossil fuels and thus would contribute to cumulative increases in GHGs and related climate change when combined with other global and local project emissions, emissions from the manufacture, assembly and distribution of polysilicon at AEP's Phase 2 production facility would be offset by the increased availability of products that use polysilicon such as solar cells and modules, and the role that increased production of polysilicon serves in the growth of the solar energy market (see 4.4). The use of products made from polysilicon would decrease emissions of GHGs into the environment and contribute to global and local efforts to reduce GHGs and slow climate change.

The operation of Phase 2 process blocks 2, 3 and 4 would result in the indirect emission of greenhouse gases as a result of fossil fuel energy use for operation of the facility. As shown in Table 2, Phase 2 would require approximately 126,000 scfh of natural gas to operate the facility, which would run 24 hours a day annually, the annual consumption of this natural gas would result in approximately 55,000 metric tons per year in carbon dioxide emissions (USEPA, 2009). In addition, an estimated 1.64 metric tons per year of CH₄ emissions (see Table 11) would contribute a CO₂-equivalent of 656 metric tons over a 20-year period¹³. Although not determined under USEPA regulations, these emissions would be more than offset by the reduction in GHG emissions realized by the photovoltaic solar cells made from the polysilicon manufactured by AEP.

¹³ The global warming potential of CH₄ is estimated to be 62 times that of CO₂ over a 20-year period.

CHAPTER 5

LIST OF PREPARERS

U.S. Department of Energy, Loan Guarantee Program Office

Dr. Alistair C.D. Leslie
Ph.D. Chemistry
Years Experience: 33
NEPA Document Manager

AE Polysilicon Corporation

Dr. York Tsuo
PhD, Chemical Engineering
Years Experience: 25
President and CEO

Anthony D. DeCicco
BS, Chemical Engineering
Years Experience: 20
Manager-Health, Safety & Environmental

Timothy McElvaine
BS, Business Administration
Years Experience: 3
Business Development Specialist

Langan Engineering & Environmental Services, Inc.

David Charette
MS, Ecology
BS, Environmental Biology
Years Experience: 20
Program Manager, Technical Editing

Kevin Roberts
BS, Environmental Resource Management
Years Experience: 11
Project Manager, Alternatives, Technical Editing

Linda Kenney
MS, Environmental Engineering Science
BS, Wildlife and Fisheries Science
Years Experience: 17
Geology, Water Resources, Natural Resources, Cultural Resources

Thomas Devaney
MCP, Regional Planning
BA, Communications
Years Experience: 10
Land Use, Visual Resources, Noise, Socioeconomics, Public Health and Safety, Transportation

Anthony Moffa
BA, Physics
Years Experience: 13
Air Quality, Health and Safety Plan

Showalter & Associates

Phil Kashner
Civil and Architectural Engineering
Years Experience: 40
Project Manager

CHAPTER 6

LIST OF AGENCIES CONTACTED

The following agencies were contacted during the preparation of the EA:

- Bucks County Conservation District, 1456 Ferry Road, Suite 704, Doylestown, PA 18901-5550
- Delaware River Basin Commission, 25 State Police Drive, P.O. Box 7360, West Trenton, NJ 08628-0360
- Falls Township, 188 Lincoln Highway, Suite 100, Fairless Hills, PA 19030
- Pennsylvania Department of Environmental Protection, Southeast Regional Office, 2 East Main Street, Norristown, PA 19401
- Pennsylvania Fish and Boat Commission, Natural Diversity Section, Division of Environmental Services, 450 Robinson Lane, Bellefonte, PA 16823
- Pennsylvania Historic and Museum Commission, Bureau for Historic Preservation, 400 North Street, Commonwealth Keystone Building, 2nd Floor, Harrisburg, PA 17120-0093

CHAPTER 7

REFERENCES

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APPENDIX A

PERMITS, APPROVALS AND AGENCY CORRESPONDENCE

- Pennsylvania Natural Diversity Inventory (PNDI) Project Environmental Review Report
- Threatened and Endangered Species Correspondence:
 - Pennsylvania Fish & Boat Commission response to PNDI Report
 - USFWS Determination of no federally listed species
- Cultural Resource Notice to PADEP
- Pennsylvania Bureau for Historic Preservation (SHPO) Correspondence:
 - Section 106
 - Act 537 Sewer Planning Approval
- Bucks County Conservation District Erosion and Sediment Control Approval
- Bucks County Conservation District Storm Water Discharge Approval
- PADEP General NPDES Stormwater Discharge Approval
- PADEP Air Quality Program Plan Approval
- PADEP Act 2 Remedial Investigation/Final Report Review Letter
- PADEP AE Polysilicon Sewage Planning Module Approval Letter
- Falls Township Development Application Approving Resolution

- PENNSYLVANIA NATURAL DIVERSITY INVENTORY (PNDI) PROJECT ENVIRONMENTAL REVIEW REPORT

1. PROJECT INFORMATION

Project Name: **AE Polysilicon**

Date of review: **8/20/2009 2:37:58 PM**

Project Category: **Development, New commercial/industrial development (store, gas station, factory)**

Project Area: **33.5 acres**

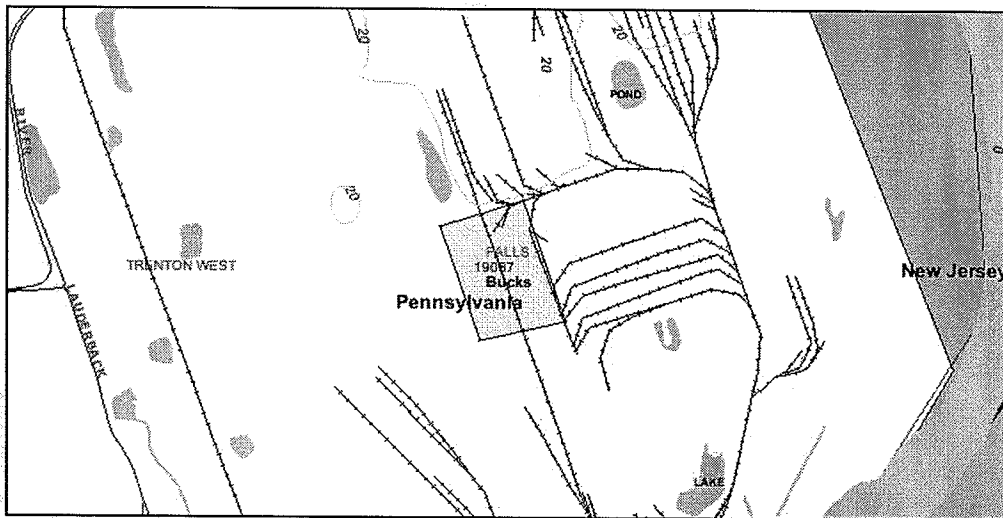
County: Township/Municipality:

Quadrangle Name:

ZIP Code:

Decimal Degrees: **40.15073 N, -74.74507 W**

Degrees Minutes Seconds: **40° 9' 2.6" N, -74° 44' 42.3" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	Potential Impact	FURTHER REVIEW IS REQUIRED, See Agency Response
U.S. Fish and Wildlife Service	No Known Impact	No Further Review Required

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Carbon, Chester, Cumberland, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) must comply with the bog turtle habitat screening requirements of the PASPGP.

RESPONSE TO QUESTION(S) ASKED

Q1: Accurately describe what is known about wetland presence in the project area or on the land parcel. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.

Your answer is: **1. The entire project will occur in or on an existing building, parking lot, driveway, road, road shoulder, street, runway, paved area, or railroad bed.**

Q2: Aquatic habitat (stream, river, lake, pond, etc.) is located on or adjacent to the subject property and project activities (including discharge) may occur within 300 feet of these habitats

Your answer is: **2. No**

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for one year** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt.

PA Game Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

PFBC Species:

Scientific Name: Kinosternon subrubrum

Common Name: Eastern Mud Turtle

Current Status: Special Concern Species*

Proposed Status: Special Concern Species*

Scientific Name: Sensitive Species**

Common Name:

Current Status: Threatened

Proposed Status: Special Concern Species*

RESPONSE: Further review of this project is necessary to resolve the potential impacts(s). Please send project information to this agency for review (see WHAT TO SEND).

U.S. Fish and Wildlife Service

RESPONSE: No impacts to **federally** listed or proposed species are anticipated. Therefore, no further consultation/coordination under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required. Because no take of federally listed species is anticipated, none is authorized. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

* Special Concern Species or Resource - Plant or animal species classified as rare, tentatively undetermined or candidate as well as other taxa of conservation concern, significant natural communities, special concern populations (plants or animals) and unique geologic features.

** Sensitive Species - Species identified by the jurisdictional agency as collectible, having economic value, or being susceptible to decline as a result of visitation.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, send the following information to the agency(s) seeking this information (see AGENCY CONTACT INFORMATION).

Check-list of Minimum Materials to be submitted:

- ___ SIGNED copy of this Project Environmental Review Receipt
- ___ Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
- ___ Project location information (name of USGS Quadrangle, Township/Municipality, and County)
- ___ USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.

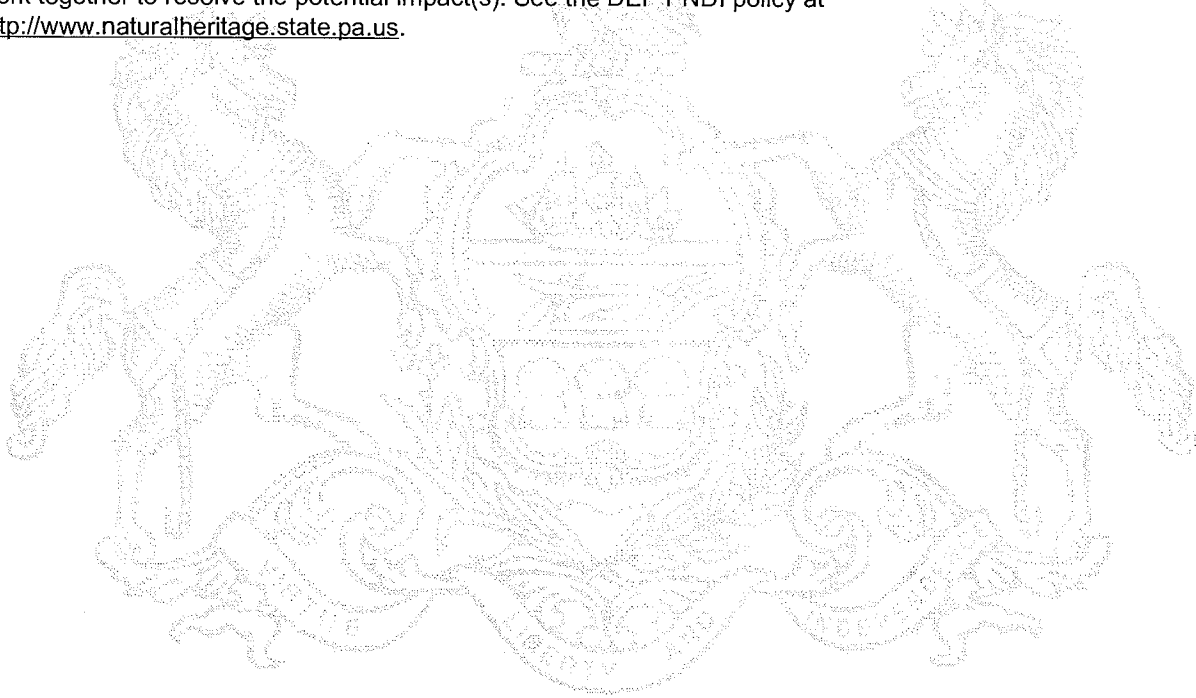
- ___ A basic site plan (particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
- ___ Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
- ___ Information about the presence and location of wetlands in the project area, and how this was determined

(e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams

____ The DEP permit(s) required for this project

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application should be submitted to DEP along with the PNDI receipt, a completed PNDI form and a USGS 7.5 minute quadrangle map with the project boundaries delineated on the map. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at <http://www.naturalheritage.state.pa.us>.



5. ADDITIONAL INFORMATION

The PNDI environmental review website is a **preliminary** screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA. 17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service

Endangered Species Section
315 South Allen Street, Suite 322, State College, PA. 16801-4851
NO Faxes Please.

PA Fish and Boat Commission

Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

PA Game Commission

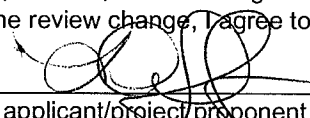
Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name: Linda Kenney
Company/Business Name: Langan Engineering & Environmental Services
Address: PO Box 1569
City, State, Zip: Doylesstown PA 18901
Phone: (215) 491-6500 Fax: (215) 491-6501
Email: LKenney@Langan.com

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

 8/20/09
applicant/project proponent signature date

- THREATENED AND ENDANGERED SPECIES CORRESPONDENCE:
 - PENNSYLVANIA FISH & BOAT COMMISSION RESPONSE TO PNDI REPORT
 - USFWS DETERMINATION OF NO FEDERALLY LISTED SPECIES



established 1866

Pennsylvania Fish & Boat Commission

Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823-9620
(814) 359-5237 Fax: (814) 359-5175

September 14, 2009

IN REPLY REFER TO
SIR # 32518

LINDA KENNEY
LANGAN ENGINEERING AND ENVIRONMENTAL SERVICES
30 SOUTH 17TH STREET
SUITE 1300
PHILADELPHIA, PA 19103

RE: Species Impact Review (SIR) - Rare, Candidate, Threatened and Endangered Species
AE POLYSILICON CORPORATION EXPANSION
PNDI Search Number (if available): 20090820207071
FALLS Township, BUCKS County, Pennsylvania

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code. The absence of recorded information from our files does not necessarily imply actual conditions on site. Future field investigations could alter this determination. The information contained in our files is routinely updated. A Species Impact Review is valid for one year only.

X **NO ADVERSE IMPACTS EXPECTED FROM THE PROPOSED PROJECT**

____ Except for occasional transient species, rare, candidate, threatened or endangered species under our jurisdiction are not known to exist in the vicinity of the project area. Therefore, no biological assessment or further consultation regarding rare species is needed with the Commission. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

X An element occurrence of a rare, candidate, threatened, or endangered species under our jurisdiction is known from the vicinity of the proposed project. However, given the nature of the proposed project, the immediate location, or the current status of the nearby element occurrence(s), no adverse impacts are expected to the species of special concern.

If you have any questions regarding this review, please contact the biologist indicated below:

____ Chris Urban 814-359-5113 X Kathy Gipe 814-359-5186
____ Nevin Welte 814-359-5234 _____ Bob Morgan 814-359-5129

Thank you in advance for your cooperation and attention to this important matter of species conservation and habitat protection.

SIGNATURE: Christopher A. Urban DATE: September 14, 2009
Christopher A. Urban
Chief, Natural Diversity Section

Our Mission:

www.fish.state.pa.us

To protect, conserve and enhance the Commonwealth's aquatic resources and provide fishing and boating opportunities.



David T. Orsak, P.E., P.P.
George P. Kelley, P.E.
George E. Darick, P.E.
Michael A. Soranno, Jr., P.E.
Nicholas De Franco, P.G.
Andrew J. Giaccia, P.C.
George E. Lewis, P.E.
Randolph P. Fitch, P.E., G.E.
Kathryn A. Fernald, C.L.A.
Cynthia Cerdillo, P.H.
Christina M. Gonzalez, P.E.

February 9, 2010

Mr. David Densmore
Natural Diversity Section
Pennsylvania Fish and Boat Commission
Division of Environmental Services
450 Robinson Lane
Bellefonte, PA 16823

U.S. FISH AND WILDLIFE SERVICE
 Pennsylvania Field Office
 315 South Allen Street, Suite 322
 State College, Pennsylvania 16801-4850

No federally listed species under our jurisdiction is known or likely to occur in the project area. This determination is valid for two years. Should project plans change, or if additional information on listed species become available, this determination may be reconsidered.

Cindy Lubott
 Acting Supervisor 4-14-10

Re: **PNDI Coordination**
AE Polysilicon Corporation
PNDI Search Number 20090820207071
Falls Township, Bucks County, Pennsylvania
Langan Project No. 002638304

~~RECEIVED~~

~~FEB 12 2010~~

~~PA Fish & Boat Commission
Division of Environmental Services~~

Dear Mr. Densmore:

On behalf of the AE Polysilicon Corporation (AEP), Langan Engineering & Environmental Services, Inc. (Langan) submits this request for information associated with a search of the Pennsylvania Natural Diversity Inventory (PNDI) database. A search of the PNDI database was performed on August 20, 2009 which resulted in "No Further Review Required" under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS). However, as part of the NEPA documentation for the loan guarantee by the Department of Energy, written correspondence addressing the presence or absence of threatened and endangered species is required from your agency.

AEP proposes to expand their existing facility within a 30-acre parcel at the Keystone Industrial Port Complex in Falls Township, Bucks County, Pennsylvania. The expansion includes adding their Phase 2 polysilicon production facility; supporting utilities; asphalt-paved truck-circulation, and car-parking areas; stormwater management infrastructure; and a fire retention and emergency containment pond.

The project site is mostly dirt and gravel with remnants of several former building foundations. Areas of invasive and noxious weed species are also located within the project site. The site currently contains AEP's headquarters office building, Phase 1 polysilicon production facility, warehouse space, parking areas, and utilities as shown on the Land Development Plan. The project site is located primarily surrounded by commercial and industrial facilities. The project site is also enclosed by a chain link fence. No wetlands or waterways are located within the project site. The Delaware River is located approximately 4,000 feet south of the project area and Biles Creek is approximately 4,800 feet northeast of the project area. Site photographs are

- CULTURAL RESOURCE NOTICE TO PADEP

NOTICE


 COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF ENVIRONMENTAL PROTECTION

CULTURAL RESOURCE NOTICE

DEP USE ONLY

Date Received

Read the instructions before completing this form.

SECTION A. APPLICANT IDENTIFIER

Applicant Name AE POLYSILICON CORPORATION
 Street Address 100 PASSAIC AVENUE, SUITE 2
 City CHATHAM State NJ Zip 07928
 Telephone Number 973-635-5858

Project Title AE POLYSILICON LAND DEVELOPMENT

SECTION B. LOCATION OF PROJECT

Municipality FOLS TOWNSHIP County Name BUCKS DEP County Code 09

SECTION C. PERMITS OR APPROVALS

Name of Specific DEP Permit or Approval Requested: ACT 537 SEWAGE PLANNING MODULE

Anticipated federal permits:

- Surface Mining 404 Water Quality Permit
 Army Corps of Engineers Federal Energy Regulatory Commission
 401 Water Quality Certification Other: _____

SECTION D. GOVERNMENT FUNDING SOURCES

- State: (Name) _____ Local: (Name) _____
 Federal: (Name) _____ Other: (Name) _____

SECTION E. RESPONSIBLE DEP REGIONAL, CENTRAL, DISTRICT MINING or OIL & GAS MGMT OFFICE

- DEP Regional Office Responsible for Review of Permit Application Central Office (Harrisburg)
 Southeast Regional Office (Norristown) Northeast Regional Office (Wilkes-Barre)
 Southcentral Regional Office (Harrisburg) Northcentral Regional Office (Williamsport)
 Southwest Regional Office (Pittsburgh) Northwest Regional Office (Meadville)
 District Mining Office: _____ Oil & Gas Office: _____

SECTION F. RESPONSIBLE COUNTY CONSERVATION DISTRICT, if applicable.

County Conservation District BUCKS Telephone Number, if known 215-345-7577

SECTION G. CONSULTANT

Consultant, if applicable SHOWALTER & ASSOCIATES ATT: PAUL KOSKOW
 Street Address 116 E. BUTLER AVENUE
 City CHALFONT State PA Zip 18914
 Telephone Number 215-822-2990

SECTION H. PROJECT BOUNDARIES AND DESCRIPTION

REQUIRED

Indicate the total acres in the property under review. Of this acreage, indicate the total acres of earth disturbance for the proposed activity.

Attach a 7.5' U.S.G.S. Map indicating the defined boundary of the proposed activity.

Attach photographs of any building over 50 years old. Indicate what is to be done to all buildings in the project area.

Attach a narrative description of the proposed activity.

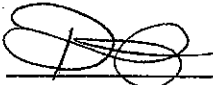
Attach the return receipt of delivery of this notice to the Pennsylvania Historical and Museum Commission.

REQUESTED

Attach photographs of any building over 40 years old.

Attach site map, if available.

SECTION I. SIGNATURE BLOCK

 Paul Kosman, AGENT FOR
Applicant's Signature RE POLYMERCON

2/14/2008
Date of Submission of Notice to PHMC



CULTURAL RESOURCE NOTICE

APPLICANT'S CHECKLIST

Please check the following list to make sure that you have included all the required information. Place a checkmark in the column provided for all items completed and/or provided.

Failure to provide all of the requested information will delay the processing of the application and may result in the application being placed on hold with no action, or will be considered withdrawn and the application file closed.

	Requirement	Check <input checked="" type="checkbox"/> If Included
1.	Attachments, where appropriate	<input checked="" type="checkbox"/>
	a) Section B - Additional municipality information.	<input checked="" type="checkbox"/>
	b) Section B - Additional county information.	<input checked="" type="checkbox"/>
	c) Section H - 7.5' USGS Map (with defined boundaries of proposed activity).	<input checked="" type="checkbox"/>
	d) Section H - Narrative description of proposed activity.	<input checked="" type="checkbox"/>
	e) Section H - Photographs of any buildings over 50 years old. Indicate what is to be done to all buildings in the project area.	N/A
	f) Section H - Total acres in property under review. Of this acreage, total acres of earth disturbance for the proposed activity.	<input checked="" type="checkbox"/>
	g) Return receipt of delivery of Cultural Resource Notice to the Pennsylvania Historical and Museum Commission.	<input checked="" type="checkbox"/>
2.	Mailings	
	a) Notice mailed to PHMC on <u>2/14/2008</u> .	<input checked="" type="checkbox"/>
	b) Received return receipt from PHMC on _____.	
	c) Submitted application to DEP Regional, Central, District Mining or Oil and Gas Mgmt. Office on _____ with copy of return receipt from PHMC as proof of submittal. or	
	d) Submitted application to County Conservation District Office on _____ with copy of Return Receipt from PHMC as proof of submittal.	
	Requests	Check <input checked="" type="checkbox"/> If Included
3.	Attachments requested, where appropriate	<input checked="" type="checkbox"/>
	a) Section H - Photographs of any buildings over 40 years old.	N/A
	b) Section H - Site maps of the proposed activity, if available.	<input checked="" type="checkbox"/>

- PENNSYLVANIA BUREAU FOR HISTORIC PRESERVATION (SHPO) CORRESPONDENCE:
 - SECTION 106
 - ACT 537 SEWER PLANNING APPROVAL



Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

September 20, 2010

Alistair C. D. Leslie, Ph.D.
Loan Guarantee Program Office
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

RE: ER File No. 2008-1037-017-B
DOE Loan Guarantee to AE Polysilicon
Corporation, Phase 2 Production Facility in
Fairless Hills, Pennsylvania, Falls
Township, Bucks County, Pennsylvania

Dear Dr. Leslie:

The Bureau for Historic Preservation (the State Historic Preservation Office) has reviewed the above named project in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended in 1980 and 1992, and the regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation as revised in 1999 and 2004. These regulations require consideration of the project's potential effect upon both historic and archaeological resources.

Based on our survey files, which include both archaeological sites and standing structures, and the information you provided, there are no National Register eligible or listed historic or archaeological properties in the area of this proposed project. Should you become aware, from any source, that historic or archaeological properties are located at or near the project site, please notify the Bureau for Historic Preservation at (717) 783-8946.

Sincerely,

A handwritten signature in black ink, appearing to read "Douglas C. McLearn".

Douglas C. McLearn, Chief
Division of Archaeology &
Protection



Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

March 4, 2008

Phil Kashner
Showalter & Associates
116 E. Butler Avenue
Chalfont, PA 18914

TO EXPEDITE REVIEW USE
BHP REFERENCE NUMBER

Re: File No. ER 2008-1037-017-A
DEP ACT 537 Program: Sewage
Planning Module, AE Polysilicon
Corporation, Falls Twp., Bucks Co.

Dear Mr. Kashner:

The Bureau for Historic Preservation has reviewed the above named project under the authority of the Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 *et seq.* (1988). This review includes comments on the project's potential effect on both historic and archaeological resources.

Based on our survey files, which include both archaeological sites and standing structures, there are no National Register eligible or listed historic or archaeological properties in the area of this proposed project.

However, should you encounter archaeological resources during construction, you must stop the project, notify the Bureau for Historic Preservation at (717) 783-8946 as well as the Department of Environmental Protection.

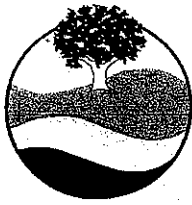
Sincerely,

A handwritten signature in black ink, appearing to read "D. McLearn".

Douglas C. McLearn, Chief
Division of Archaeology &
Protection

CC: DEP, Southeast Region
DCM/lmm

- BUCKS COUNTY CONSERVATION DISTRICT EROSION AND SEDIMENT CONTROL APPROVAL



BUCKS COUNTY CONSERVATION DISTRICT

1456 FERRY ROAD, SUITE 704
DOYLESTOWN, PA 18901-5550

In Pursuit of Environmental Excellence

July 14, 2008

AE Polysilicon
1777 Pennsylvania Avenue
Morrisville PA 19067
(Attn: Kimberly Ricci)

Subject: AE Polysilicon
TMP # 13-51-1-24 & 13-51-1
Total Acres: 32.6 Acres to be disturbed: 32.6
Date of Plan: 6/10/08 Sheet(s): 2, 8 & 9 of 15 & 2 of 3
Location: Roebbling Road & Sorrells Blvd.
Falls Township, Bucks County, PA

Dear Sir or Madam:

This letter summarizes the review by the Bucks County Conservation District (BCCD) of the erosion and sediment pollution control plan created for the above referenced site. Any revisions made to these approved drawings must be submitted to BCCD for review and approval.

The revised plan, as submitted, is **Adequate** for erosion and sediment pollution control and does meet the minimum requirements of the Pennsylvania Department of Environmental Protection (PaDEP) Rules and Regulations, Chapter 102 Erosion Control, relating to the Pennsylvania Clean Streams Law.

At the pre-construction meeting, the erosion and sediment control plan indicated in the Conservation District official letter of Adequacy must have the same date as the plan produced by the developer or agent. If the plan dates are not identical, the meeting will be terminated, without exception.

A pre-construction meeting is requested by the BCCD prior to the start of Phase II. No earthwork may begin until the NPDES permit has been issued.

Pre-construction meetings are mandatory for non-residential projects with at least 5000 square feet of earth disturbance, all residential projects of three or more units, or at the discretion of the site inspector. Failure to adhere to this policy will result in the immediate and automatic revocation of your erosion & sediment control adequacy letter. To schedule a pre-construction meeting, please call the inspector listed in the copy list below.

Telephone Number: 215-345-7577
Fax Number: 215-345-7584
Website: www.bucksecd.org

Page 2 of 2
July 14, 2008
Falls Township
RE: AE Polysilicon

The BCCD requires a notification of 3 working days prior to site disturbance in order that we may perform the necessary erosion and sediment pollution control inspections. Failure to begin earthmoving within two (2) years will require a resubmission of the erosion and sediment pollution control plan.

Please note: Resubmissions must include a new application and the appropriate fee.

Respectfully,



Rich Krasselt
Environmental Protection Specialist I

cc: / e&s/municipal files/bcpc files
/ Falls Township Supervisor
/ Falls Township Engineer
/ Richard Krasselt, BCCD Site Inspector
/ Showalter & Associates
116 E. Butler Avenue
Chalfont PA 18914
(Attn: Phil Kashner)
/ AE Polysilicon Corp.
100 Passaic Avenue, Suite #2
Chatham NJ 07928
(Attn: York Tsuo)



BUCKS COUNTY CONSERVATION DISTRICT

1456 FERRY ROAD, SUITE 704
DOYLESTOWN, PA 18901-5550

In Pursuit of Environmental Excellence

September 12, 2008

AE Polysilicon
1777 Pennsylvania Avenue
Morrisville PA 19067
(Attn: Kimberly Ricci)

Subject: AE Polysilicon
TMP # 13-51-1-24 & 13-51-1
Total Acres: 32.6 Acres to be disturbed: 32.6
Date of Plan: 7/28/08 Sheet(s): 8 & 9 of 15
Location: Roebbling Road & Sorrells Blvd.
Falls Township, Bucks County, PA

Dear Sir or Madam:

This letter summarizes the review by the Bucks County Conservation District (BCCD) of the erosion and sediment pollution control plan created for the above referenced site. Any revisions made to these approved drawings must be submitted to BCCD for review and approval.

The revised plan, as submitted, is **Adequate** for erosion and sediment pollution control and does meet the minimum requirements of the Pennsylvania Department of Environmental Protection (PaDEP) Rules and Regulations, Chapter 102 Erosion Control, relating to the Pennsylvania Clean Streams Law.

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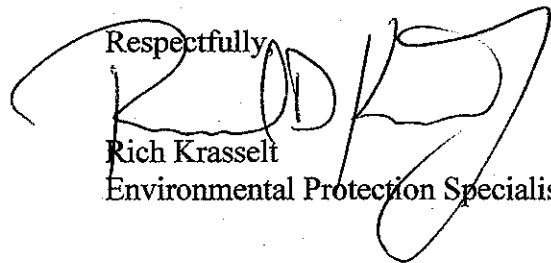
Telephone Number: 215-345-7577
Fax Number: 215-345-7584
Website: www.bucksccd.org

Page 2 of 2
September 12, 2008
Falls Township
RE: AE Polysilicon

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Please note: Resubmissions must include a new application and the appropriate fee.

Respectfully,



Rich Krasselt
Environmental Protection Specialist I

cc: / e&s/municipal files/bcpc files
/ Falls Township Supervisor
/ Falls Township Engineer
/ Richard Krasselt, BCCD Site Inspector
/ Showalter & Associates
116 E. Butler Avenue
Chalfont PA 18914
(Attn: Phil Kashner)
/ AE Polysilicon Corp.
100 Passaic Avenue, Suite #2
Chatham NJ 07928
(Attn: York Tsuo)

- BUCKS COUNTY CONSERVATION DISTRICT STORM WATER DISCHARGE APPROVAL



BUCKS COUNTY CONSERVATION DISTRICT

1456 FERRY ROAD, SUITE 704
DOYLESTOWN, PA 18901-5550
www.bucksccd.org

In Pursuit of Environmental Excellence

October 8, 2008

AE Polysilicon Corporation
C/O York Tsuc
1777 Pennsylvania Avenue
Morrisville, PA 19067

**SUBJECT: AE POLYSILICON CORPORATION/ NPDES PERMIT #PAG2000907069-1
TMP # 13-51-1-24 & 13-51-1 SHEET(S): 8 & 9 OF 15
ACREAGE: 32.6 PERMITTED PROJECT ACRES: 32.6
DATE OF PLAN: 07/28/2008
LOCATION: 150 ROEBLING ROAD, FAIRLESS HILLS, PA 19030
FALLS TOWNSHIP, BUCKS COUNTY, PA**

Dear Sir:

Attached please find the above referenced permit which authorizes the discharge of storm water from the construction activity described in the final erosion and sedimentation control plan and Notice of Intent (NOI). Please ensure that the above- mentioned erosion and sedimentation control plan approval letter is fully implemented and available at the construction site.

Please read carefully Parts A, B and C of the permit which detail the terms and conditions of this authorization. Conservation District Staff and/or representatives of the Department of Environmental Protection may inspect this earthmoving activity to determine compliance with applicable permit requirements, Chapter 92, 101 and 102 Rules and Regulations and the Clean Streams Law.

Permit requirements and federal regulations at 40 C.F.R. 122.21(b) require "when a facility or activity is owned by one person but is operated by another person, it is the operator's duty to obtain a permit". *(Please be advised that once a contractor has been selected for the project, the permit must either be transferred to the contractor or the contractor must be made a co-permittee. The enclosed form must be used to add a co-permittee.)*

Enclosed is a Notice of Termination (NOT) form to complete and file when construction activities have ceased and final stabilization has been achieved.

Page 2 of 2

October 8, 2008

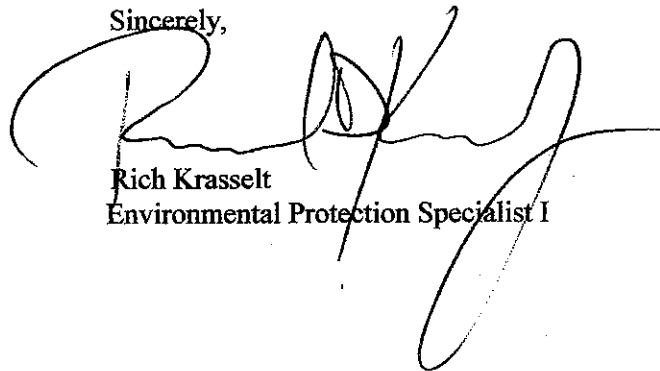
AE Polysilicon Corporation, C/O York Tsuo

RE: AE POLYSILICON CORPORATION / NPDES PERMIT # PAG2000907069-1

This authorization does not relieve the applicant from applying for and obtaining any and all additional permits or approvals from local, state or federal agencies for the construction activity described in the Notice of Intent.

If you have any questions regarding this authorization please contact the Bucks County Conservation District (215) 345-7577.

Sincerely,

A handwritten signature in black ink, appearing to read 'Rich Krasselt', written over a horizontal line. The signature is stylized and cursive.

Rich Krasselt
Environmental Protection Specialist I

RM/
cc:

/NPDES file/E&S/NPDES Report File

/Falls Township Supervisor(s)

/Falls Township Engineer

/Phil Kashner, Showalter & Associates, 116 E. Butler Avenue, Chalfont, PA 18914

/Sharon Moore, DEP SE Regional Office, 2 East Main Street, Norristown, PA 19401

/Jake Borden, BCCD Site Inspector

- PADEP GENERAL NPDES STORMWATER DISCHARGE APPROVAL



**APPROVAL OF COVERAGE UNDER THE GENERAL NPDES
PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH
CONSTRUCTION ACTIVITIES
PAG-2 (2002 Amendment)**

NPDES PERMIT NO: PAG2000907069-1

Project Name & Address

Permittee Name & Address

AE POLYSILICON CORPORATION

AE POLYSILICON CORPORATION

150 ROEBLING ROAD

1777 PENNSYLVANIA AVENUE

FAIRLESS HILLS, PA 19030

MORRISVILLE, PA 19067

FALLS TOWNSHIP, BUCKS COUNTY, PA

In compliance with the provisions of the Clean Water Act, 33 U.S.C. Section 1251 et seq. ("the Act") and Pennsylvania's Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq., the Department of Environmental Protection hereby approves the Notice of Intent (NOI) submitted for coverage to discharge stormwater to the following surface water(s)

DELAWARE RIVER (WWF-MF)

from a 1 to less than 5-acre project with a point source discharge (or)
 5 acres or larger project

subject to the Department's enclosed PAG-2 which incorporates all effluent limitations, monitoring and reporting requirements and other terms, conditions, criteria and special requirements for the discharge of stormwater from point sources composed entirely of stormwater associated, in whole or in part, with construction activity, as defined in this general permit, to surface waters of the Commonwealth, including to municipal separate storm sewers and non-municipal separate storm sewer.

APPROVAL TO DISCHARGE IN ACCORDANCE WITH THE TERMS AND CONDITIONS HEREIN MAY COMMENCE ON THE DATE OF THE APPROVAL OF COVERAGE, AND IS VALID FOR A PERIOD OF FIVE YEARS WHEN CONDUCTED PURSUANT TO SUCH TERMS AND CONDITIONS. COVERAGE MAY BE EXTENDED BY THE DEPARTMENT IF A TIMELY ADMINISTRATIVELY COMPLETE AND ACCEPTABLE NOI RENEWAL IS SUBMITTED TO THE DEPARTMENT AT LEAST 90 DAYS PRIOR TO DATE OF COVERAGE TERMINATION, UNLESS PERMISSION FOR SUBMISSION AT A LATER DATE HAS BEEN GRANTED BY THE DEPARTMENT. THE PERMIT MAY BE TERMINATED PRIOR TO THE EXPIRATION DATE UPON NOTICE TO AND APPROVAL BY THE DEPARTMENT OR AUTHORIZED COUNTY CONSERVATION DISTRICT. NO CONDITION OF THIS PERMIT SHALL RELEASE THE PERMITTEE OR CO-PERMITTEE FROM ANY RESPONSIBILITY OR REQUIREMENT UNDER PENNSYLVANIA, OR FEDERAL ENVIRONMENTAL STATUTES, AND REGULATIONS OR LOCAL ORDINANCES.

COVERAGE APPROVAL DATE: 10/08/2008

COVERAGE EXPIRATION DATE: 10/08/2013

AUTHORIZED BY: 

TITLE: Environmental Protection Specialist I

- PADEP AIR QUALITY PROGRAM PLAN APPROVAL

- PADEP ACT 2 REMEDIAL INVESTIGATION/FINAL REPORT REVIEW LETTER



Pennsylvania Department of Environmental Protection

2 East Main Street
Norristown, PA 19401
September 19, 2007

Southeast Regional Office

Phone: 484-250-5960
Fax: 484-250-5961

Mr. Jeffrey Smith, P.G.
Langan Engineering &
Environmental Services
30 South 17th Street, Suite 1300
Philadelphia, PA 19103

Re: ECP - Special Projects - Act 2
Former U.S. Steel Fairless Works, Lot 8
EFACTS No. 694210
1 Ben Fairless Drive
Falls Township
Bucks County

Dear Mr. Smith:

The Department of Environmental Protection (Department) has received and reviewed the August 20, 2007, document titled "Act 2 Remedial Investigation/Final Report; Former U.S. Steel Fairless Works; Proposed AE Polysilicon Corporation 30-Acre Parcel," for the property located at the Keystone Industrial Port Complex, Fairless Hills, Pennsylvania. The report was prepared by Langan Engineering & Environmental Services and submitted to the Department in accordance with the Land Recycling and Environmental Remediation Standards Act (Act 2) and constitutes a "Final Report" as defined in Chapter 3, Sections 303 and 304 of Act 2.

A Final Report summary has been attached which describes the area(s) of the property characterized, contaminants identified, remediation performed, and standards attained. A figure depicting the areal extent and the reference coordinates of the sites remediated is included. The Department approves this report for the substances identified and remediated to an Act 2 standard within the site(s) specified. Chapter 5, Section 501 of Act 2, provides the liability protection where attainment of Act 2 cleanup standards is demonstrated. Cleanup liability protection provided by this chapter applies to the current and future owner or any other person who participated in the remediation; a person who develops or occupies the site; successor or assign of any person to whom liability protection applies; and public utility to the extent the public utility performs activities on the identified site.

Since this project attained a "Site-Specific" and a "Non-Residential Statewide Health Standard," a Deed Notice is required in accordance with Section 304(m) of Act 2.

Although remediation for soil under Act 2 is now complete for this site, you are advised that any future earth disturbance or development may require either approvals or permits from the appropriate county soil conservation district. Therefore, you should contact the conservation district before engaging in any such activities.

Thank you for your cooperation in working with the Department in the remediation of this site. Your efforts are helping to return land to productive use and prevent the needless loss of greenspace across the Commonwealth.

If you have any questions or need further information regarding this matter, please contact the Environmental Cleanup Program.

Sincerely,



Stephan Sinding
Regional Manager
Environmental Cleanup

Enclosures

cc: Mr. Payne
Mr. Horvat
Mr. Reyda
Ms. Bass
Ms. Fries
Mr. Kennedy
Mr. Gallagher
Mr. Crownover
Falls Township
Bucks County Health Department
Bucks County Conservation District
Mr. Chang – AE Polysilicon Corporation
Ms. Mayher – U.S. Steel Corporation
Regional
(joh07)257-7

- PADEP AE POLYSILICON SEWAGE PLANNING MODULE APPROVAL LETTER



Pennsylvania Department of Environmental Protection

**2 East Main Street
Norristown, PA 19401**
September 26, 2008

Southeast Regional Office

Phone: 484-250-5970
Fax: 484-250-5971

Mr. Peter Gray, Manager
Falls Township
188 Lincoln Highway, Suite 100
Fairless Hills, PA 19030

Re: Planning Module for Land Development
AE Polysilicon Corporation
DEP Code 1-09002-192-3
Status: ISSUED
APS ID 636879, SITE ID 701224
Falls Township
Bucks County

Dear Mr. Gray:

Approval is hereby granted by the Department of Environmental Protection (Department) for the above-referenced revision to the Falls Township Official Sewage Facilities Plan. In accordance with the Pennsylvania Sewage Facilities Act and Title 25, Chapter 71 of the Department's Rules and Regulations, Falls Township is responsible for implementing this revision as per the approved planning module.

This revision provides for adequate sewage facilities planning to permit the development of a manufacturing facility. This project is located at the intersection of Roebing Drive and Sorrells Boulevard in Falls Township, Bucks County.

This project will be connected to the USS Real Estate collection system and will generate 4,525 gallons of sewage per day to be treated at the USS Real Estate Wastewater Treatment Facility.

The collection system serving only AE Polysilicon Corporation facilities will be owned by AE Polysilicon Corporation. The conveyance system on the site that receives the flows from AE Polysilicon Corporation's collection system, as well as off-site flows, will be owned by USS Real Estate.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. Section 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, 717-787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, 800-654-5984. Appeals must be filed with the Environmental Hearing Board within 30 days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at 717-787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

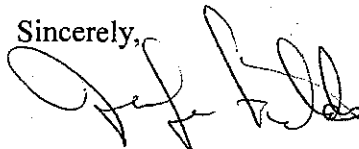


IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717-787-3483) FOR MORE INFORMATION.

If you have any questions, please feel free to contact Mr. John M. Veneziaie of our office at 484-250-5175.

Sincerely,



Jenifer Fields, P.E.
Regional Manager
Water Management

cc: Bucks County Planning Commission
Bucks County Health Department
Bucks County Conservation District
Mr. Chang
Showalter & Associates
Mr. Buschmann - USS Real Estate
Mr. Veneziaie
Ms. Moore
Planning Section
Re 30 (GJE08WQ)269-15

- FALLS TOWNSHIP DEVELOPMENT APPLICATION APPROVING RESOLUTION

TOWNSHIP OF FALLS
RESOLUTION NO. 08-16

WHEREAS, AE POLYSILICON CORP. has submitted an Amended Final Plan of Land Development for certain proposed improvements to one certain parcel of land, more particularly hereinafter described, consisting of a FIFTEEN (15) sheet plan series with associated stormwater management report, dated July 28, 2008 prepared by Showalter & Associates, Chalfont, Pennsylvania; and

WHEREAS, the parcel in question is referenced as Tax Map Parcel No. 13-51-1, consisting of 32.05 acres and is located at or near Roebbling Road and Sorrells Boulevard, Falls Township, Bucks County, Pennsylvania; and

WHEREAS, the Property is zoned MPM (Materials Processing & Manufacturing District); and

WHEREAS, Applicant's proposed improvements consist of the construction of building(s) for the production of renewable energy resources; and

WHEREAS, the Board of Supervisors is prepared to grant approval of the Amended Final Plan subject to compliance with certain terms and conditions as set forth hereinafter;

NOW, THEREFORE, be it resolved, and it is hereby resolved by the Board of Supervisors of Falls Township, that the Board of Supervisors hereby grants approval of the Amended Final Land Development Plan for the Property subject to the following conditions:

- (D) Approval of the Falls Township Fire Marshal;
- (E) Approval of the Falls Township Traffic Engineer;
- (F) Approval of the Falls Township Environmental Advisory Council, if required;
- (G) Building permits, construction permits, road opening permits, electrical permits, earth disturbance permits from Falls Township and construction trailer installation permit, if applicable;
- (H) PennDOT Highway Occupancy Permit, if required;
- (I) Shop drawings for all materials associated with water, sanitary sewer and storm sewer utilities shall be submitted, reviewed and approved by the Township Engineer prior to the commencement of construction;

2. Material specifications and standards of construction shall be in accordance with Falls Township requirements.
3. Compliance with all regulations, rules, resolutions and ordinances of the Township are a condition, except as otherwise provided for herein.
4. All administrative, legal and engineering expenses owed to the Township for plan review shall be paid in full by the applicant prior to release of signed mylar record plans.
5. The Applicant shall provide three (3) paper copies of the complete final record plan and two (2) signed and notarized mylars, no larger than 24" x 36" of the record plans to the Township. The record plan mylar shall be reviewed by the Township Engineer and signed by the Township Engineer and the Board of Supervisors prior to its return to the owner for recording purposes. The Applicant shall be required to provide to the County an additional paper copy along with the fully executed record plan for recording.

I. SUBDIVISION AND LAND DEVELOPMENT ORDINANCE PROVISIONS

1. Section 191-64(B). The Township Fire Marshal must be consulted and approve the revised Fire Protection Water line layout.

II. GENERAL STORMWATER MANAGEMENT COMMENTS

1. The proposed equalization pipe must be revised to provide a minimal slope to prevent any pooling in the pipe bottom.
2. The crest elevation and length information provided on the Emergency Spillway Worksheet, page 50 of the Stormwater Management Report, does not correspond to the information provided in the Pond Report on page 69. The calculations must be corrected and the detail of the outlet structure for Basin A must be revised to show the emergency spillway.
3. The plans indicate that the contractor should "brick up" the end of an existing storm pipe which will no longer be used. If the existing pipe can not be removed then it must be filled with concrete and abandoned.

III. GENERAL COMMENTS

1. Prior to construction, the Applicant shall submit to the Township evidence of all required permits and approvals necessary to complete construction, including but not limited to the following:
 - (A) PaDEP Sewage Facilities Planning Modules and any other applicable PaDEP permits;
 - (B) Soil Erosion and Sediment Pollution Control Plan approval by the Bucks County Conservation District;
 - (C) NPDES permit;

6. Following release and recording of the record mylar plan, the Applicant shall notify the Township Manager and the Township Solicitor in writing of the plan book, page number and date of recording by the Bucks County Recorder of Deeds Office.
7. The owner shall comply in all respects with the rules, regulations and requirements of all governmental agencies and/or bodies having jurisdiction with respect to this plan application and shall assume all costs, expense and responsibility in connection therewith, without any liability whatsoever on the part of the Township.

ADOPTED as a Resolution by the Board of Supervisors of the Township of Falls this 19th Day of August, 2008.


(TOWNSHIP SEAL)

FALLS TOWNSHIP
BOARD OF SUPERVISORS

Attest: 
JONATHAN SNIPES
Secretary

By: 
ROBERT HARVIE
Chairman

Attest: 


AE POLYSILICON CORP.
Authorized Representative

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APPENDIX B
PHOTOGRAPHS AND PHOTOGRAPH LOCATION PLAN



Map Reference: DVRPC Aerial Photography of Bucks County (2009).

- Legend**
- AE Polysilicon Corporation Boundary
 - Phase Boundary
 - Photo Location and Orientation



PHOTO LOCATION PLAN
FALLS TOWNSHIP

BUCKS COUNTY PENNSYLVANIA
 Project No. 002698304 Date 9/15/09 Scale 1" = 250' Figure A



Photograph 1. Southern view of southwest corner of project site



Photograph 2. Eastern view of central portion of project site



Photograph 3. Southern view of southeastern corner of project site



Photograph 5. Northern view of adjacent Phase I polysilicon production facility



Photograph 4. Northern view of chain link fence surrounding project site and adjacent Phase I area



Photograph 6. Southern view of gravel area at eastern portion of adjacent Phase I polysilicon production facility



Photograph 7. Eastern view of stormwater management facility basin C



Photograph 9. Northern view of stormwater management facility basin B



Photograph 8. Northern view of firewater retention and emergency containment pond

\\Langon.com\data\PH\daa3\002\638304\Engineering_Data\Natural Resources\PND\Photograph_Log.docx